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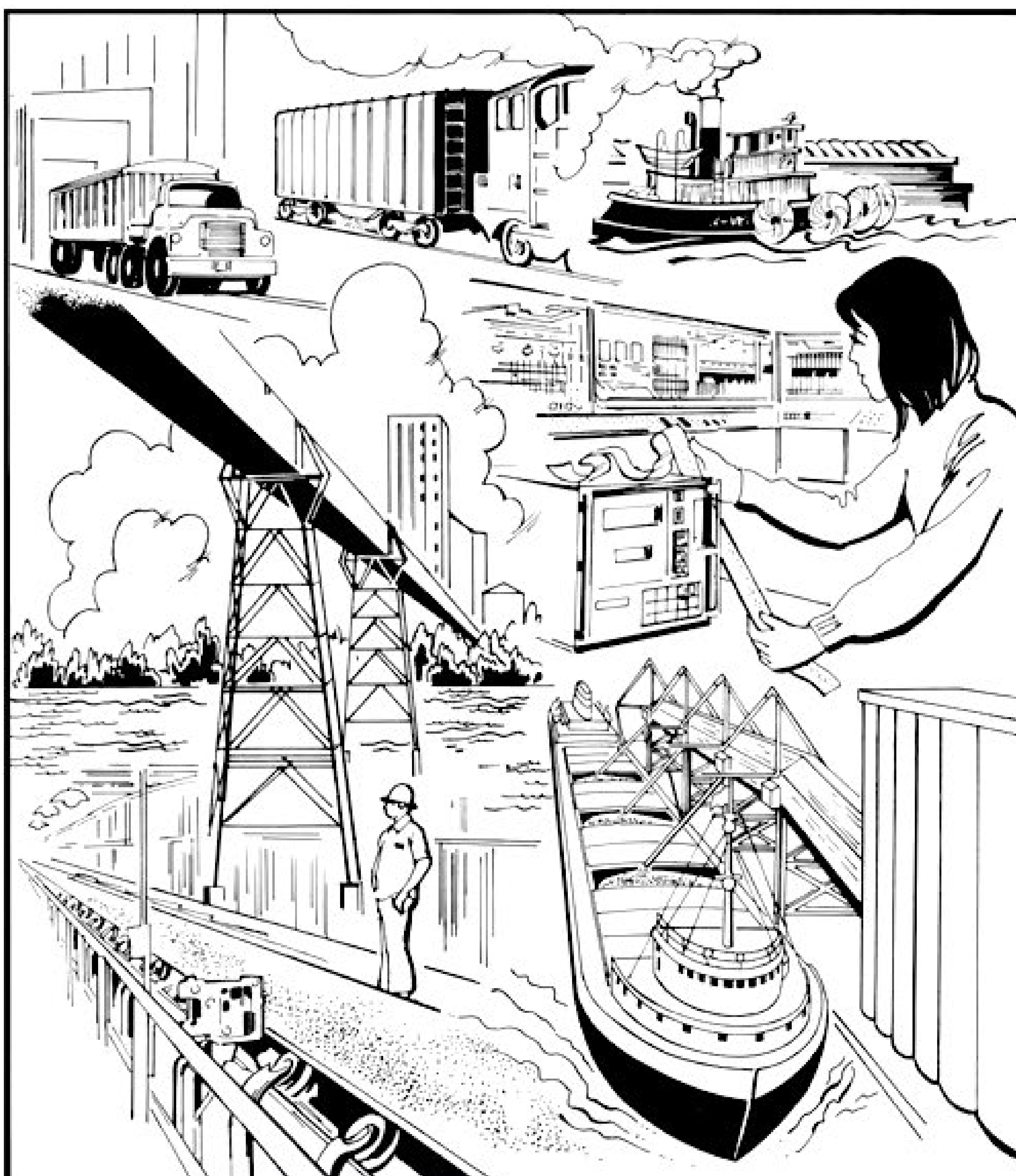
Weighing Handbook



Program Handbook

December 27, 2010

Weighing Handbook

Foreword

This handbook sets forth policies and procedures for providing official weighing services and is divided into chapters that pertain to major areas of weighing. The information contained in this handbook is applicable to Federal Grain Inspection Service (FGIS) field offices and to delegated and designated agencies.

NOTE: Those chapters published in this Handbook since 2008 conform to the concept of primary use of SI metric measurements recommended in the Omnibus Trade and Competitiveness Act of 1988 by citing SI units before inch-pound units where both units appear together and placing separate sections containing requirements in inch-pound units. In some cases, however, trade practice is currently restricted to the use of inch-pound units; therefore, some requirements in this Handbook will continue to specify and use examples only in inchpound units until the National Conference on Weights and Measures achieves a broad consensus on the permitted SI units.

It should be noted that a space has been inserted instead of commas in all numerical values greater than 9999 in this document published since 2004, following a growing practice, originating in tabular work, to use spaces to separate large numbers into groups of three digits. This avoids conflict with the practice in many countries to use the comma as a decimal marker.

/s/ Robert Lijewski
Robert Lijewski, Director
Field Management Division

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CHAPTER 1
PROCEDURES FOR OFFICIAL WEIGHING SERVICES

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1.1 TERMS

a. Grain Handling Terms.

(1) **Belt/Conveyor.** Grain moving devices that transport grain in a horizontal or inclined direction. Usually constructed of an endless rubberized belt that moves over rollers, between a motor-driven head pulley, and a nonmotorized tail pulley.

(2) **Bin Floor**. Name commonly given to the area directly above shipping and/or storage bins. The bin floor usually contains a variety of chutes, spouts, conveyor belts, and trippers that allow grain to be moved to various parts of the facility.

(3) **Boot**. The covering (usually metal) around the bottom of an elevator leg. Grain is thrown off a horizontal conveyor belt into the boot where it is scooped up by buckets attached to the vertical elevator leg. The boot may be located in a sunken portion of elevator floor, referred to as the "boot pit."

(4) **Boxcar**. A carrier used to transport grain by rail. Access doors for loading and unloading are located on each side and require specialized loading and unloading equipment and procedures.

(5) **Carrier.** A truck, trailer, truck/trailer combination, railcar, barge, ship, or other container used to transport bulk or sacked grain.

(6) **Container**. A bin or other storage space, bag, box, or other receptacle for grain.

(7) **Delivery System**. A system used to deliver inbound grain from the carrier to the scale or to deliver outbound grain from the scale to the carrier. The delivery system includes all belts, pits, bins, legs, chutes, and spouts through which the grain must travel in order to reach its intended destination.

(8) **Distributor**. A piece of equipment used to direct grain to any of several bins, belts, or spouts. The distributor can be a movable spout or a movable turnhead that can be positioned over a number of stationary spouts or chutes.

(9) **Diversion Point**. Any point in the delivery system where the direction of the grain flow can be changed. Diversion points existing in a facility define the grain flow security system and are prime areas for spills and leaks.

(10) **Diverter-Type Mechanical Sampler**. A mechanical grain sampling device that periodically removes a proportional amount of grain from the flow for inspection purposes.

(11) **Draft**. An amount of grain that is weighed in one weighing operation, especially on a large-capacity scale.

(12) **Elevator Legs**. Vertical conveyor belts (usually enclosed in a metal covering) that lift grain through the facility by means of buckets made of various materials.

(13) **Elevator Facility Handbook**. The guide to a facility which provides official personnel with detailed information on the facility in which they work.

(14) **Floating Rig**. A waterborne grain handling and weighing system used to remove and weigh grain from barges directly to other waterborne carriers.

(15) **Gallery**. An elevated structure that houses shipping belts and trippers that direct grain through spouts to vessels or barges. In some locales, the diverter-type mechanical sampler is also located in the gallery.

(16) **Garner**. A temporary holding area above or below the weigh hopper included in the grain weighing system to allow for continuous grain flow.

(17) **Grain Cleaning Apparatus**. Devices that remove nongrain material or that clean grain for shipment or storage. Cleaners that remove large pieces of metal, wood, and other nongrain foreign material from the grain are usually called “scalpers”. Cleaners that remove fine grain particles or dirt from grain are often called “shakers” and operate with a series of screens that separate fine particles as the grain passes over the screens.

(18) **Grain Flow Security**. Measures taken by official personnel to guard against grain losses and verify grain movement throughout a facility’s grain weighing and delivery system.

(19) **Head Floor**. Name given to an elevator floor where elevator legs turn and deposit grain into garners above weigh hoppers. In many facilities, grain cleaning equipment is also located on the head floor. The head floor is usually the top floor of the elevator building.

(20) **Hopper Car**. A carrier used to transport grain by rail. Hopper cars have access doors for loading on the top and are unloaded by opening slides at the bottom of the cars.

(21) **Limit Switches**. Mechanically activated switches used to indicate the position of slides, gates, and valves.

(22) **Permissive (Official)**. A term used in this handbook referencing a physical release, indication, or response by official personnel to maintain grain flow security e.g., response to an equipment failure alarm, releasing the control of equipment, consent to proceed to the next level of loading or unloading.

(23) **Permissive Device**. Grain flow devices which have to be disengaged by official personnel before facilities may control the use of the elevator equipment.

(24) **Scale Floor**. The area of the elevator building that contains weigh hoppers and weighing equipment. In most elevators, the scale floor is directly below the upper garners of the head floor.

(25) **Seals**. A security device that allows official personnel to secure and monitor the flow of grain in areas where they are not permanently stationed.

(26) **Shipping Bins**. Temporary holding bins for grain intended for shipment. Shipping bins are usually smaller than elevator storage bins and can be used to hold ship sublots for inspection purposes.

(27) **Slides/Gates**. Control devices that give elevator personnel the ability to change the direction of grain flow. Slides and gates are usually found at the bottom of shipping and storage bins, junction of spouts, and in some trippers.

(28) **Spout**. A cylindrical or rectangular chute through which grain passes while being loaded aboard a vessel or into other carriers. Spouts can also be used within the elevator to direct grain to other types of delivery systems.

(29) **Surge Bins**. Small temporary holding bins that allow the elevator to quickly shut off the grain supply (when located in the gallery) or allow the weigh hopper to discharge quickly.

(30) **Tripper**. A movable device for directing grain. Trippers are used on conveyor belts to direct grain into storage or shipping bins or to direct grain into a number of different loading spouts. There can be more than one tripper on a conveyor belt.

(31) **Trolley Spout**. A spout located beneath the weigh hopper that can be moved to various positions, directing grain to different locations in the elevator.

(32) **Unit Train**. A group of hopper cars weighed and certified as one lot. Unit trains may have a specific identification name or number or may be identified using the identification of the hopper cars comprising the unit train.

(33) **Valves**. A device used to direct, limit, or seal off the flow of grain at any given point. There are several kinds of valves, these include: (1) basket valves, which control a flat plate that swings on pivots right or left to close off one side or the other of a spout; (2) slide valves, which control the flow of grain through a spout by means of a sliding plate; and (3) clam shell valves, comprised of two half-plates that swing in an arc and bite together to either completely or partially close off a spout.

(34) **Weighback Spout**. A movable or stationary device through which grain in shipping bins is directed back into elevator legs for reweighing.

b. Official Personnel/Certification Terms.

NOTE: Certification Procedures are found in Chapter 2 of this handbook.

(1) **Agency**. Any state or local Government agency, or any person, designated by the Administrator pursuant to subsection (f) of Section 7 of the Act for the conduct of official inspection (other than appeal inspection), or subsection (c) of Section 7A of the Act for the conduct of Class X or Class Y weighing (other than review of weighing).

(2) **Agricultural Marketing Act of 1946 (AMA)**. A law passed by Congress to facilitate the marketing and distribution of agricultural products.

(3) **Combined Lots**. Grain loaded aboard, being loaded aboard, or discharged from two or more carriers.

(4) **Conversion Factor**. Any mathematical factor used to convert one form of measured units to another.

(5) **Cutoff**. A requested ending of the weighing and/or inspection of grain for shipment prior to completing the loading. An official certificate is issued for grain weighed before the cutoff and for grain weighed after the cutoff. The portions shall be treated as separate lots.

(6) **Delegated Agency**. A State agency delegated authority under the Act to perform official inspection functions and official Class X and Class Y weighing functions at one or more export port locations in the State.

(7) **Designated Agency**. A State or local Government agency or person designated by the Service to perform all or specified official inspection functions and/or official Class X and Class Y weighing functions at locations other than export port locations.

(8) **Grain Additives**. Material approved by the Food and Drug Administration (FDA) or the Environmental Protection Agency (EPA) and added to grain for the purposes of insect and fungi control, dust suppression, or identification.

(9) **Intercompany Grain Movement**. Movement of grain from a facility belonging to one party to another facility belonging to a different party.

(10) **Intracompany Grain Movement**. Movement of grain from a facility belonging to one party to another facility belonging to the same party.

(11) **Key Control**. Measures taken to safeguard and provide accountability for keys to padlocks used in the grain flow security system.

(12) **Local Movement**. Movement of grain within a single facility.

(13) **Master Key.** A single key that will unlock a group of similar locks used in the grain flow security system.

(14) **Official Personnel**. Persons licensed or otherwise authorized by the Administrator pursuant to Section 8 of the Act to perform all or specified functions involved in official inspection, Class X or Class Y weighing, or in the supervision of official inspection or Class X or Class Y weighing.

(15) **Official Weighing**. (Referred to as Class X weighing). The determination and certification by official personnel of the quantity of a lot of grain under standards provided for in the Act, based on the actual performance of weighing or the physical supervision thereof, including the physical inspection and testing for accuracy of the weights and scales and the physical inspection of the premises at which the weighing is performed and the monitoring of the discharge of grain into the elevator or conveyance. (The terms “officially weigh” and “officially weighed” shall be construed accordingly).

(16) **Post-loading Survey**. An examination of a carrier and delivery system to assure that all grain weighed for a carrier was entirely delivered to the carrier.

(17) **Post unloading Survey**. An examination of a carrier and delivery system to assure that grain in an identified carrier was properly removed from the carrier and delivered entirely to the scale.

(18) **Pre-loading Survey**. An examination of any carrier for any condition that might affect its ability to transport grain and of the delivery system to assure that all grain weighed for a carrier is delivered to the carrier.

(19) **Pre-unloading Survey**. An examination of a carrier for any condition that may have affected its ability to transport grain and of the delivery system to assure that all grain removed from the carrier is entirely delivered to the scale.

(20) **Regulations**. The official rules as formulated for the purpose of implementing the United States Grain Standards Act (7 CFR 800, 801, and 802).

(21) **Reject and Return (R & R)**. Terms used to describe the return of grain to the elevator storage which does not meet load order requirements.

(22) **Scale Official**. An employee of the Service or delegated State official who is responsible for the weighing systems at locations as assigned. He/she should be consulted for any scale problems or possible malfunctions.

(23) **Shift Supervisor**. An individual responsible for the day-to-day weighing and inspection activities of official personnel at locations as assigned.

(24) **Spill**. A loss of grain during loading or unloading of a carrier.

(25) **Spill Estimation Formulas**. Geometric formulas which compute the volume of various shapes, convert that volume to bushels and then to pounds.

(26) **Stowage Examinations**. An examination of the stowage spaces of a carrier conducted by official personnel to determine the suitability of a carrier or container to receive and store grain.

(27) **Sublot**. A proportional amount of a lot collected and examined by official personnel for the purpose of determining the uniformity and quality of the grain.

(28) **Supervision of Weighing**. (Referred to as Class Y Weighing). Such supervision by official personnel of the grain-weighing process as is determined by the Administrator to be adequate to reasonably assure the integrity and accuracy of the weighing and of certificates which set forth the weight of the grain and such physical inspection by such personnel of the premises at which the grain weighing is performed as will reasonably assure that all the grain to be weighed has been weighed and discharged into the elevator or conveyance.

(29) **Test Weight**. The weight in pounds per Winchester bushel as determined on an approved device.

(30) **Trade Weight**. Standard test weights used for estimating quantities of grain when exact test weights are not known.

(31) **United States Grain Standards Act (USGSA)**. A law passed by Congress that provides a system by which grain may be marketed in an orderly and timely manner, and trading in grain may be facilitated.

(32) **Official Weigher**. Official personnel who perform or supervise the performance of Class X or Class Y weighing services and certify the results thereof including the weight of the grain.

c. Scale Systems Terms.

(1) **Battery Back-up**. A mechanism in electronic weighing systems that allows the information to be retained in the event of a loss of power.

(2) **Bindicator**. A switch in bins that indicates the level of grain. A bindicator may be used in some instances to verify the cleanout of shipping bins.

(3) **Calibration Value**. Some electronic systems are equipped with a calibration button which, when pressed, displays figures in the digital display. The displayed figure is known as the “Calibration Value” and should not vary from the value posted on the console.

(4) **Certified Capacity**. The maximum weight limit that has been approved by the Service for a scale for weighing under the Act. It is posted on the scale’s nomenclature plate.

(5) **Control Board**. A scaled down diagram of the facility's grain flow system indicating belts, legs, scales, and distributing areas. It may contain indicating lights and controls for equipment used to direct grain flow.

(6) **Control Room**. Houses consoles, printers, and control boards. It may be located within the facility or removed from it.

(7) **Dead Load**. The fixed force of the weighbridge, platform, and other load supporting structures of the scale. The dead load is permanently balanced or canceled out in the weight indicating or measuring system.

(8) **Digital Instrument**. Receives input from the operator and receives and processes information received from load cells, limit switches, and the printer.

(9) **Draft**. The amount of grain weighed in one weighing cycle.

(10) **Full Electronic Scale**. Uses only load cells (as opposed to load cells and levers) to register the weight of the scale's contents. The load cell converts force into an electrical signal proportional to the weight.

(11) **Gross Weight**. The weight of a quantity of grain including the container or carrier.

(12) **Indicator Lights**. Lights which, when activated, show the position of a slide, gate, belt, or scale (i.e., belt running, slide closed or open). Indicator lights are usually connected to switches.

(13) **Inspection Doors**. Doors which allow access to weigh hoppers, bins, or garners for the purpose of inspecting the area inside.

(14) **Levertronic Scale**. Uses a system of load cell(s) and levers to register the weight of the scale's contents. The load cell(s) converts force into an electrical signal proportional to the weight.

(15) **Limited Access Areas**. Areas in the console and/or printer of electronic systems that allows manipulation of switches and controls that can affect the automatic operation or digital readout.

(16) **Load Cell**. A device which produces an output signal proportional to the applied load. The load cell may utilize any physical principle in the field of, but not limited to, electrical, hydraulics, magnetics, and pneumatics or combination thereof.

(17) **Load Receiving Element**. That element of a scale which is designed to receive the load to be weighed. For example; platform, deck, rail, or hopper.

(18) **Malfunction**. With respect to official weighing, any occurrence that provides inaccurate or unverifiable weight information.

(19) **Minimum Division**. The smallest unit in which a weighing device can register a weight.

(20) **Motion Detection**. The process of sensing a rate of change of applied load to determine when a given weighing system has reached state of equilibrium.

(21) **Net Weight**. The weight of quantity of grain exclusive of the container or carrier.

(22) **Overdraft**. Any draft that exceeds the certified capacity of the scale.

(23) **Preset Tare**. A reference amount that represents an empty scale condition.

(24) **Process Control**. Feature of an electronic weighing system that can, in the automatic mode, control the garner and weigh hopper gates, the digital display, the printing functions, and will repeat in succession without involving the human operator.

(25) **Radio Frequency Interference (RFI)**. An electrical disturbance which, when introduced into electronic and electrical circuits, may cause deviations from the normally expected performance.

(26) **Railway Track Scale**. A scale especially designed to weigh railcars.

(27) **Scale Component**. Any part of the unit which weighs grain including levers, load cells, and the weigh hopper itself.

(28) **Scale Tape**. A continuous sheet of paper on which weight information is printed. Scale tapes are part of the documentation used to support official weighing results.

(29) **Settling Time**. The amount of time required for a scale to stop fluctuating prior to printing a gross or tare weight.

(30) **Tare Weight**. The weight of an empty container or vehicle. Also called “light weight” with respect to a container or a vehicle.

(31) **Vehicle/Truck Scale**. A scale designed for use in determining the weight of bulk grain in a motorized vehicle or in a trailer drawn by a motorized vehicle.

(32) **Warmup Period**. When the power supply to an electronic weighing system has been shut off, a warmup period from 1/2 to 1 hour is required before official weighing can begin on the scale or scales.

(33) **Weighment**. A single complete weighing operation.

(34) **Zero-Load Balance**. A representation of zero when there is no load on the load receiving element.

d. Sacked Grain Terms.

(1) **Carrier**. A truck, trailer, truck/trailer combination, railroad car, barge, ship, or other container used to transport bulk or sacked grain.

(2) **Checkloading**. Determining that the carrier is suitable to receive grain, counting the containers of grain loaded into the carrier, observing the condition of containers, and monitoring the disposition of grain spilled from torn and leaking sacks.

(3) **Container**. A bin, or other storage space, bag, box, or other receptacle for grain.

(4) **Gross Weight**. The overall weight of the filled container which includes the weight of all packaging components and the grain.

(5) **Lot**. A specific quantity of grain identified as such.

(6) **Lot Size**. The number of containers in the lot.

(7) **Net Weight.** The actual weight of grain minus the container and packaging components.

(8) **Official personnel**. Persons licensed or otherwise authorized by the Administrator pursuant to Section 8 of the Act to perform all or specified functions involved in official inspection, Class X or Class Y weighing, or in the supervision of official inspection, or Class X or Class Y weighing.

(9) **Official Weight Sample**. Sacks of grain obtained at random by or under the complete supervision of official personnel from a lot of sacked grain for the purpose of computing the weight of the grain in the lot.

(10) **Weighing On-Line**. Sacks of grain randomly selected as the lot is being produced and weighed.

(11) **Pallet**. A frame usually made of wood on which sacked grain is stacked and transported to a carrier for shipment.

(12) **Random Sampling**. A process of selecting a weight sample from a lot whereby each unit in the lot has an equal chance of being chosen. Ordinary haphazard choice is generally insufficient to guarantee randomness. Devices, such as tables of random numbers, are used to remove subjective biases inherent in personal choice.

(13) **Warehouse Weighing**. Sacks of grain randomly selected from a warehouse lot and weighed.

1.2 GENERAL EMPLOYEE RESPONSIBILITIES

The integrity of an official weight certificate is essential. Official personnel must avoid or eliminate situations that might affect or raise questions on the accuracy of a weight certificate.

a. Supervisor Responsibilities.

(1) General. Managers and supervisors[1] must ensure that official personnel[2] perform weighing procedures correctly.

(2) Specific.

(a) Ensure official personnel:

1 Follow weighing instructions and procedures;

2 Follow proper security procedures for communication equipment, seals, keys, and certificates; and

3 Complete documentation, such as weight and seal logs, neatly and correctly.

(b) Provide official personnel with applicable weighing equipment, instructions, handbooks, and other required materials.

(c) Make certain at export elevator locations that grain handling systems are tested at least annually using the procedures in Program Directive 9160.4, Grain Handling System Testing, before using for official weighing.

(d) Ensure smooth and complete communication of pertinent information occurs between shifts or work crews.

(e) Solve or direct to responsible personnel all weighing and personnel problems.

(f) Provide technical weight training to personnel as necessary.

(g) Ensure proper communication with elevator management of instructions, complaints, equipment failures, scale malfunctions, delivery system problems, safety hazards, or other pertinent information.

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[1]The term "manager" as used in this chapter means FGIS Field Office Manager (FOM) or equivalent supervisory position agency manager (AM) at an official agency. The term "supervisor" means FGIS shift supervisor or equivalent supervisory position at an official agency.

[2]Throughout the text, the term "weigher" will be interchangeable with "official personnel." The weigher's responsibilities may be different in automated weighing systems approved by FGIS.

(h) Maintain an up-to-date Facility Handbook.

(i) Inform management of any grain handling or weighing systems changes. (Section 800.46 of the regulations under the United States Grain Standards Act (Act) requires an elevator to notify official agencies).

(j) Oversee the completion, issuance, and proper disposition of all official weight documents. (All unusual situations shall be documented on the weight loading log, scale tapes, or other applicable documents).

(k) Comply with safety requirements, including documentation of safety hazards. Follow applicable instructions.

b. Weighers Responsibilities.

(1) General. To perform weighing procedures properly, the weigher must:

(a) Prior to each shift, ensure conditions necessary for proper scale(s) operation (see Section 1.5) and operate or supervise operation of scale(s) according to instructions.

(b) Thoroughly document weighing process and be responsible for the issuance of legible, accurate certificates.

1 Maintain and implement current procedures, instructions/directives, and notices for weighing services; possess working knowledge of scales operated or supervised and of grain handling system including diversion points; and recognize and document scale malfunctions.

2 Ensure security of keys, communication equipment, locks, seals, certificates, scale tapes, tickets, certificate software or electronic access, and other records.

3 Provide on-the-job training for assigned personnel.

4 Communicate, if directed, to elevator personnel/management any instructions, complaints, equipment failures, scale malfunctions, safety hazards, or other pertinent information.

5 Perform all other weighing duties as directed by supervisor to ensure accurate certification of weights.

(2) Specific. Unless automated methods are in place, the weigher monitors weighing activities of elevator personnel and verifies control board settings, digital weight displays, and printer operation and output. Control board or monitor settings must be physically verified a minimum of once per shift and results documented on export weight loading log. Comparison of the visually checked digital weight indicator to the printout assures proper system operation. Managers determine frequency of printer/visual checks which must be documented on scale tapes. Specifically, the weigher must:

(a) Recognize actual or potential problems with elements in the weighing and/or printing system affecting the accuracy of weights. Noted scale and printer malfunctions must be documented following Chapter 2 of the Weighing Handbook;

(b) Verify seals on the limited access areas of scales used for official weighing or supervision of weighing and document checks on Scale Record Log and Seal Record Log; and

(c) Observe control board or monitor to ensure grain flow security by verifying that the lights, switches, and control board monitors are operating properly and the controlled gates, slides, and valves are in correct alignment. Assistance from the elevator weighman to activate the display switch may be required. Security checks made on the handling and weighing system are documented on the Weight Loading Log.

(d) Ensure scale operation according to Section 1.5:

1 Verify digital weight indicator to printed weight through monitoring the weighing of drafts, and inspecting weigh hoppers, vehicle scale platforms, lever systems, and load cells for conditions impairing normal scale operations.

2 Inspect scale and garner hopper gates for leaks at least once per shift.

3 Managers determine the frequency of checks between the digital weight indicator and printed weight. Checks must be denoted on the scale tapes.

(3) Conduct surveys of weighing system:

(a) Verify elevator's scale and delivery system are clear of grain.

(b) Ensure necessary conditions for proper performance of equipment.

(c) Secure spouts, trippers, distributors, and other diversion points with seals, locks, or electrical lockouts to ensure grain flow security.

(d) Check and record numbers and location of seals and locks on Seal Log.

(e) Check cleanout of shipping bins.

(4) Examine Carriers. Obtain carrier identification and, if possible, examine conditions of carrier that would affect quantity of grain shipped or received. For inbound grain, carrier must be checked according to Section 1.2 for cleanout after weighing operation. For shiplot grain, stowage of grain on carrier must be documented.

(5) Monitor Diversions. Monitor all diversion points to maintain grain flow security including belts, conveyors, boot pits, elevator legs, shipping bins and other diversion points, and marine legs, clam shells, loading spouts, or other loading/unloading apparatus.

(6) Observe Weighbacks. Monitor weighbacks, rejected and returned (R&R) shipping bins, and offloading or discharging of grain from carrier.

(7) Document. Thoroughly document all official weighing operations.

1.3 INBOUND MOVEMENT

Inbound grain movements are weighed at the applicant's request. Inbound intercompany barge movements at export elevators must be weighed officially under the Act. Incidents of suspected attempts to avoid these mandatory requirements must be reported as directed in Chapter 2, "Weighing Grain Without Official Supervision."

Weigher's duties are to monitor the efficient transfer of all approved railroad track, vehicle platform or hopper scales; monitor grain weighed in hopper scales; use seals, locks, control board lockouts or other approved means, including FGIS approved automated weighing systems, for Class X weighing; and document spills as instructed in Sections 2.3 and 2.4 of this handbook.

a. General Unloading Operation Guidelines.

(1) Pre-unloading Responsibilities. FGIS personnel must supervise pre-unloading operations from barge, rail, or truck movements. Specifically, they must:

(a) Record on the weight certificate carrier identification and any factual conditions pertinent to the carrier's ability to transport grain, and if possible, identify type of grain. In the absence of official inspection, use of verified elevator manifests is acceptable. Managers establish verification procedures which may include checking conveyor belts, checking D/T samplers, performing random pre-unloading checks, observing closed-circuit television monitors, or communicating with co-workers in the carrier's vicinity.

(b) Record railcar seal disposition at the applicant's verbal or written request noting the date, requester's name and carrier(s). The verified disposition of each of the lower seals, (i.e., intact, broken, not present or not properly applied), must be recorded in the "Remarks" section of the weight certificate as follows:

1 Individual cars:

"Seals on B-1 and B-2 intact; seal not present or broken on B-3."

2 For unit trains:

"The following carrier compartment seals were broken or not present (e.g. NAHX 40963-B-1 and B-2); all other carrier compartments were properly sealed."

3 Safety reminder:

CRAWLING UNDER HOPPER CARS TO VERIFY SEAL CONDITIONS IS PROHIBITED!

(c) Survey the elevator's scale and delivery system each shift prior to the start of weighing or if a spill is suspected. Document any conditions that might affect performance of the scale or other grain handling equipment.

(2) Unloading Responsibilities. During the unloading operation the weigher must:

(a) Follow procedures in Section 1.5 for operating and monitoring scales;

(b) Document inbound carrier supervision with scale tapes or tickets; and

(c) Maintain grain flow security by ensuring delivery to the scale with minimal waste.

(3) Post-unloading Responsibilities. Upon completion of unloading, official personnel must:

(a) Ensure removal of all possible grain from carrier and from delivery system. Excluding barges, if possible estimate the grain remaining in the carrier which could reasonably be removed and/or grain that was spilled;

(b) Verify cleanout by visual, mechanical or electronic methods with frequency determined by type of carrier. Barges require continual supervision. Rail and truck carriers require periodic checks, with frequency and documentation procedures determined by the manager as necessary to maintain acceptable results; and

(c) Follow certification procedures in Chapter 2.

(4) Scale Testing Responsibilities. Where house grain cannot be used to conduct a build-up on a hopper scale test, the weigher must:

(a) Use inbound carrier's grain to conduct a build-up test on a hopper scale. If the test shows the scale out-of-tolerance or needing adjustment, the scale official determines the correct weight; and

(b) Issue an unqualified certificate and write explanation on scale tape or ticket.

b. <u>Specific Operations Guidelines</u>.

(1) Inbound Trucks Weighed on Platform Scales.

(a) Establish a consistent policy of either weighing drivers/riders on or off scales.

(b) Obtain tare weight: Weigh empty vehicle exactly as full vehicle was weighed for gross weight (i.e., same riders or accessories.)

(c) Do not use pre-determined tare weights for empty vehicles.

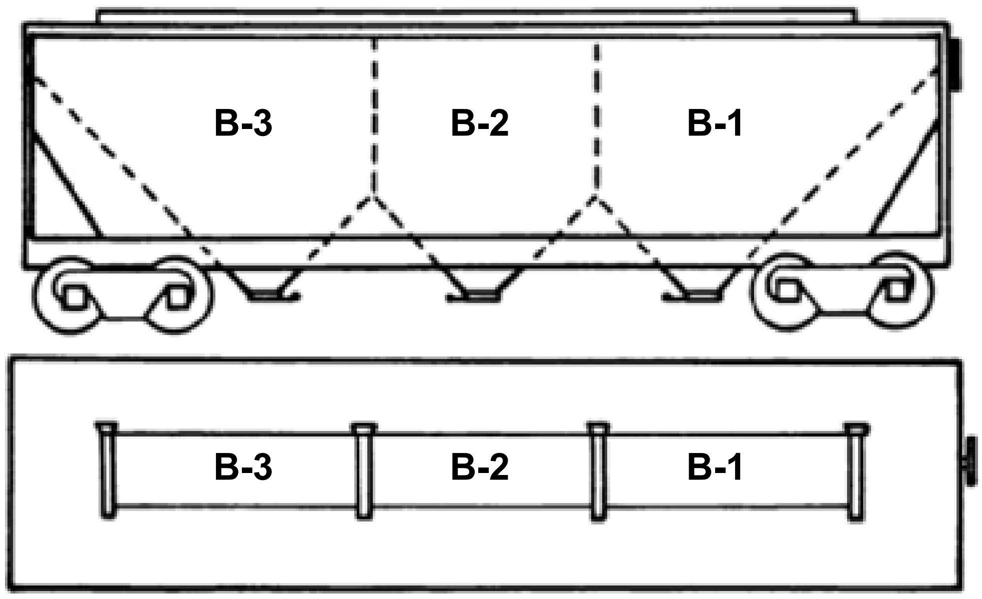
(2) Local Movements.

(a) Officially weigh movements of grain within the elevator upon request of elevator management.

(b) Follow all procedures in Chapters 1, 2, and 3, of the Weighing Handbook for operation of scales, monitoring grain flow, documenting facts and certifying results.

(3) Documentation Terminology. When documenting carrier condition or grain location on inbound carriers, use the following terms:

HOPPER CAR DIAGRAM



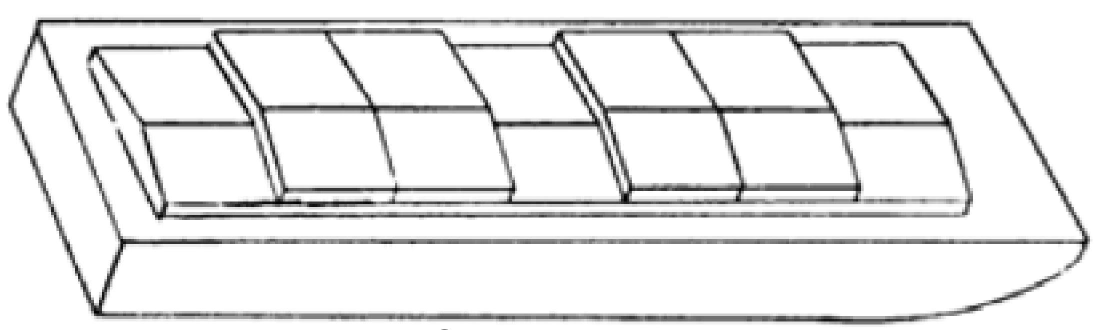
(a) Hopper Cars.

Identify brake end as “B” end; label hopper nearest brake end “B-1” and remaining hoppers toward opposite end in sequence (e.g. “B-2” and “B-3”.)

BARGE DIAGRAM

Port

Stern



Bow

Starboard

(b) Barges.

Term forward end of the barge “bow” and after end the “stern.” When facing the bow end, the left side is “port” and right side is “starboard.”

1.4 OUTBOUND MOVEMENT

Export shipments require official weighing; other movements are weighed at the applicant's request. Exempted export shipments are identified in FGIS Program Directive 9020.1, Exemptions and Waivers of Official Inspection and Class X Weighing Requirements.

Outbound grain movements must be efficiently delivered to the carrier without avoidable waste or loss. Monitor grain flow from scale to carrier, and for Class X weighing, secure system by use of seals, locks, control board lockouts, or other approved means. Correct for spills and certify according to instructions in Chapter 2 of the Weighing Handbook. Also, dust removed from the grain flow during loading does not need to be deducted from the net weight.

a. General Loading Operation Guidelines.

(1) Pre-loading Responsibilities.

(a) Secure elevator's scale and delivery system and clear it of all grain prior to weighing operations. Examine seals, locks, and/or gate indicators to verify their working condition. Complete preweighing checks listed in Section 1.5.

(b) Perform a required stowage examination on land and export waterborne carriers, and at the applicant's request, on domestic waterborne carriers. Follow official inspection stowage examination procedures exactly.

(2) Loading Responsibilities.

(a) Follow scale operation procedures in Section 1.5 for weighing grain to the carrier.

(b) Maintain grain flow security with methods specified in Section 1.5.

(c) Prevent addition to or removal of material through cleaning, drying, or other processing of the grain enroute to the carrier unless allowed by regulation or applicable instructions.

(3) Post-loading Responsibilities.

(a) Examine the grain handling system by visual or electronic methods for the correct distribution of weighed grain.

(b) Document spillage or lost grain as instructed in Chapter 2.

(c) Conduct a survey of the grain handling system at the completion of each export lot.

b. Vessel Loading Requirements.

(1) Sublot Determination and/or Verification. Determine the exact weight of each sublot or verify the accuracy of the weight as determined by elevator personnel and record on the Weight Loading Log.

(a) When there is direct correlation with the inspection sample (e.g., there are no surge or shipping bins between scales and mechanical samplers), follow these procedures:

1 Confer with elevator management to determine sublot size;

2 Keep a running total of drafts to determine the end of the sublot;

3 Inform both inspection and elevator personnel when a sublot completes; and

4 Document all actions taken on the Weight Loading Log.

(b) When there is no correlation with the inspection sample (e.g., grain is held in surge or shipping bins after the scales but before the mechanical samplers), follow these procedures:

1 Establish a system to accurately determine the designated sublot size;

2 Make sublot determination except when practicality shows elevator personnel can best do this; and

3 Develop and implement a procedure to verify the accuracy of the sublot determination system.

(2) Shipping Bin Examinations.

(a) When the grain quality inspection takes place prior to grain being loaded aboard the carrier, examine each shipping bin for cleanout as it empties. Visual or electronic examination is acceptable.

1 Post the time when shipping bins are checked at the beginning and end of each lot, or cutoff for a visual, or electronic examination.

2 Verify accuracy of an electronic indicator and document according to procedures established by the manager and explained in the Facility Handbook.

(b) Deliver to the carrier or weigh back and account for by correction any grain remaining in a shipping bin after the lot is completed.

(c) At facilities where bins do not continually self-clean, and the remaining material does not meet the definition for grain or is substantially below load order quality:

1 Do not allow this material to be loaded;

2 Get bin design corrected or develop a procedure to estimate grain in this material and replace or deduct the amount from the certified weight; and

3 Do not allow the return of contaminated grain to sound grain bins.

(3) Shipping Bin Reject & Returns.

(a) Subtract from the total weight the amount of grain rejected and returned to the house because of grade, and record this on the Weight Loading Log.

(b) Draw a red line through the returned amount and show "R&R" on the log.

(c) Adjust and document scale tapes and tickets as "R&R".

(4) Discharging Grain from an Outbound Carrier.

(a) Determine grain amount to be removed.

(b) Ensure grain flow system is secure and clear.

(c) Monitor grain flow.

(d) Weigh grain and deduct the weighed amount from the net weight.

(e) Document all discharges and, at the applicant's request, issue a weight certificate for discharged amount (see Chapter 2).

(5) Weight Cutoff During Loading Operation.

(a) At the applicant's request, stop weighing, deliver grain to the carrier, and certify the amount delivered.

(b) Include only the amount of grain on the carrier; do not include grain weighed but not delivered (e.g., grain in shipping bins.)

(c) Re-weigh the bins and subtract the amount from the total if the quantity in the shipping bins at the time of cutoff is unknown.

(6) Sealing Shipping Bins.

Whenever official personnel leave the elevator, they must secure shipping bins containing weighed grain by using seals, locks, or electronic security methods.[3] If, upon returning to the elevator, they believe the grain security voided and the quantity changed, they must return the grain to the house and follow these procedures:

(a) When the exact amount of grain in the shipping bin is known, subtract that weight amount from the net weight loaded on the vessel;

(b) When the amount of grain in the shipping bin is unknown, subtract the total capacity from the net weight loaded on the vessel; and

(c) Document the Weight Loading Log.

c. Barge and Container Guidelines.

(1) Seal Requirements for Outbound to Export Carriers.

(a) If shippers request an export certificate identifying the ocean carrier at the time of loading, i.e., containers, lash barges, etc.:

1 Seal the inland carrier;

2 Record seal numbers on the weight certificate;

3 Use identification of inland container; and

4 Mark certificate “out” movement.

(b) On loading the domestic carrier aboard the vessel, the local office will:

1 Obtain all certificates—original and copies;

2 Check seals;

3 Re-weigh the carrier if seals are not intact;

4 Checkload the carrier aboard ocean-going vessel; and

5 Issue export certificate with identification of ocean-going vessel and net weight of the carrier loaded, or for a combined-lot certificate, the combined net weight with the other carriers loaded.

(c) When the shipper does not request the identification of an ocean carrier on the export certificate, seals are unnecessary.

[3]These sealing provisions provide for sealing grain flow to maintain quantity. The sealing of access openings to control the addition of sweepings or other grain is at the manager’s discretion. The use of locks on the bottom of shipping bins prevents the grain security from being voided.

(2) Seal Requirements for Outbound to Domestic Carriers. When the shipper applies seals and requests they be shown on the weight certificate:

(a) Verify seal numbers;

(b) Record seal numbers on weight certificate;

(c) Documentation for Outbound Barges;

(d) Scale tapes or tickets are required; and

(e) Managers may require additional documentation.

d. Outbound Railcar Guidelines.

(1) Loading Single Railcars, Unit Trains and Combined Lots.

(a) Weigh individually, collectively as a unit train, or batch-weigh as a combined lot.

(b) Certify following procedures in Chapter 2.

(2) Recording Seals at Applicant's Request.

(a) Verify proper application of seals using procedures in 1.2.

(b) List seal numbers in "Remarks" section of weight certificate.

(3) Documentation Requirements.

(a) Use scale tapes or tickets.

(b) Obtain list of railcar identification numbers for certification for unit trains and combined lots.

e. Procedures for Weighed Export (Containers) or Outbound Trucks.

(1) Driver's Position. Establish consistent policy of either weighing drivers/riders on or off scales.

(2) Tare Weight. Obtain tare weight: the tare weight must include the material to be used for the bulkhead. The ideal situation is to weigh all of the material to be used for the bulkhead at the time the tare weight is obtained. However, the alternative procedure it to establish the bulkhead weight by weighing all of the material that will be used in one bulkhead and using that predetermined weight for all export containers until one of the materials used in the bulkhead is replaced.

(3) Gross Weight. Obtain gross weight: weigh full vehicle exactly as empty vehicle was weighed for tare weight (i.e., same riders or accessories).

(4) Seals Optional. Record seals at the applicant's request.

(a) Verify proper application of seals using procedures in 1.2.

(b) List seal numbers in "Remarks" section of weight certificate.

1.5 SCALE OPERATION

Knowledge of weighing systems by official personnel is essential for certification of weights. Specifically, this includes familiarity with the parts of each system, proper use of weighing systems, knowledge of procedures to be followed, and of signs of system breakdowns. If the performance of the scale is questionable, the weigher must notify the supervisor and, if necessary, the scale official.

a. Electronic Weighing Systems.

(1) General Description. An electronic weighing system includes a load receiving element, and indicating element, a printer, and the associated material handling equipment. The load cell(s) senses the amount of applied load in the load receiving element and produces an output voltage that is sent to the digital instrument. The digital instrument converts the output voltage into a digital display. The tape printer records the digital display to a tape or ticket for a permanent record. Resolve any problems with the supervisor and, if necessary, with the scale specialist.

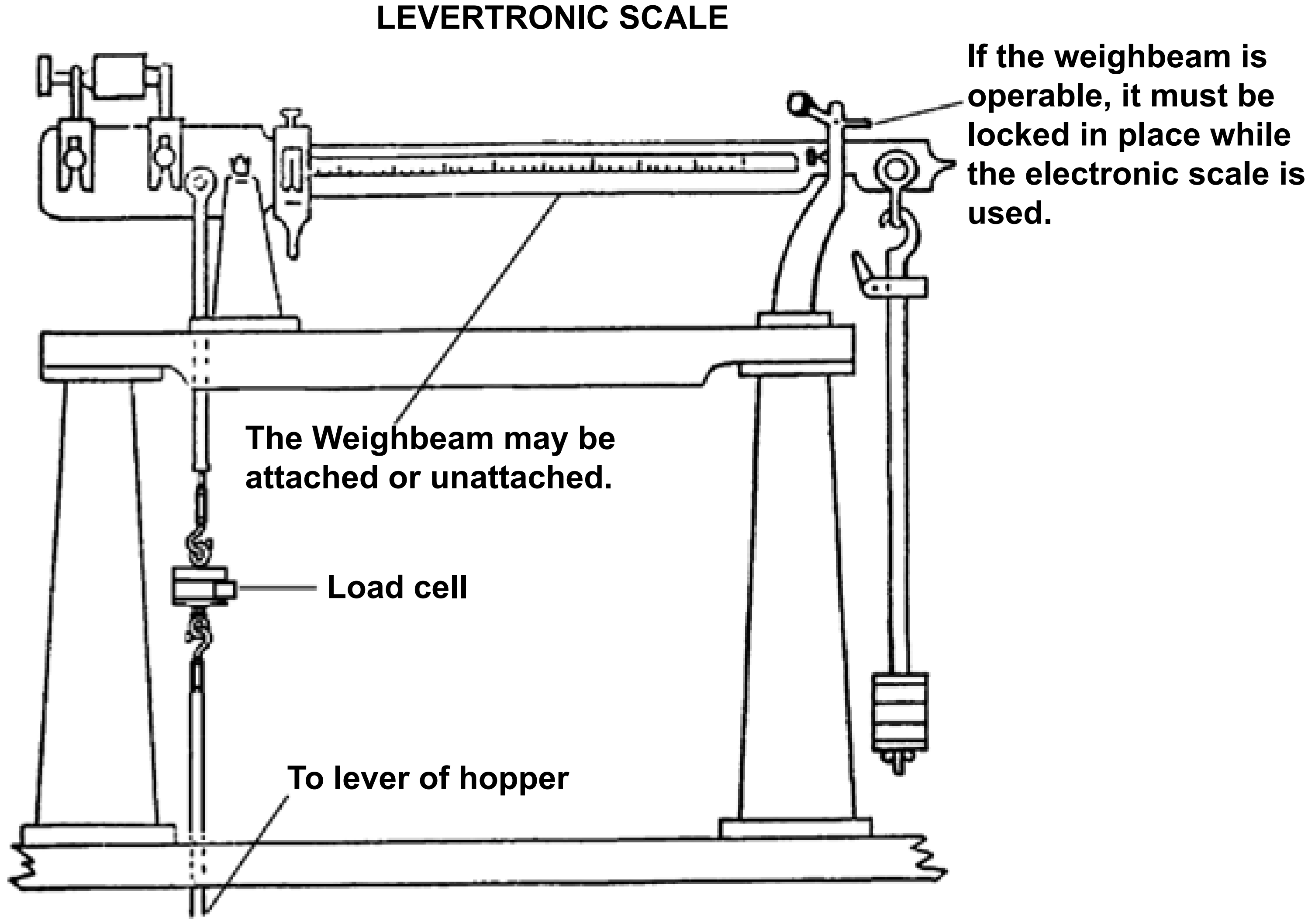
(a) There are two types of electronic scales.

1 Levertronic Scale

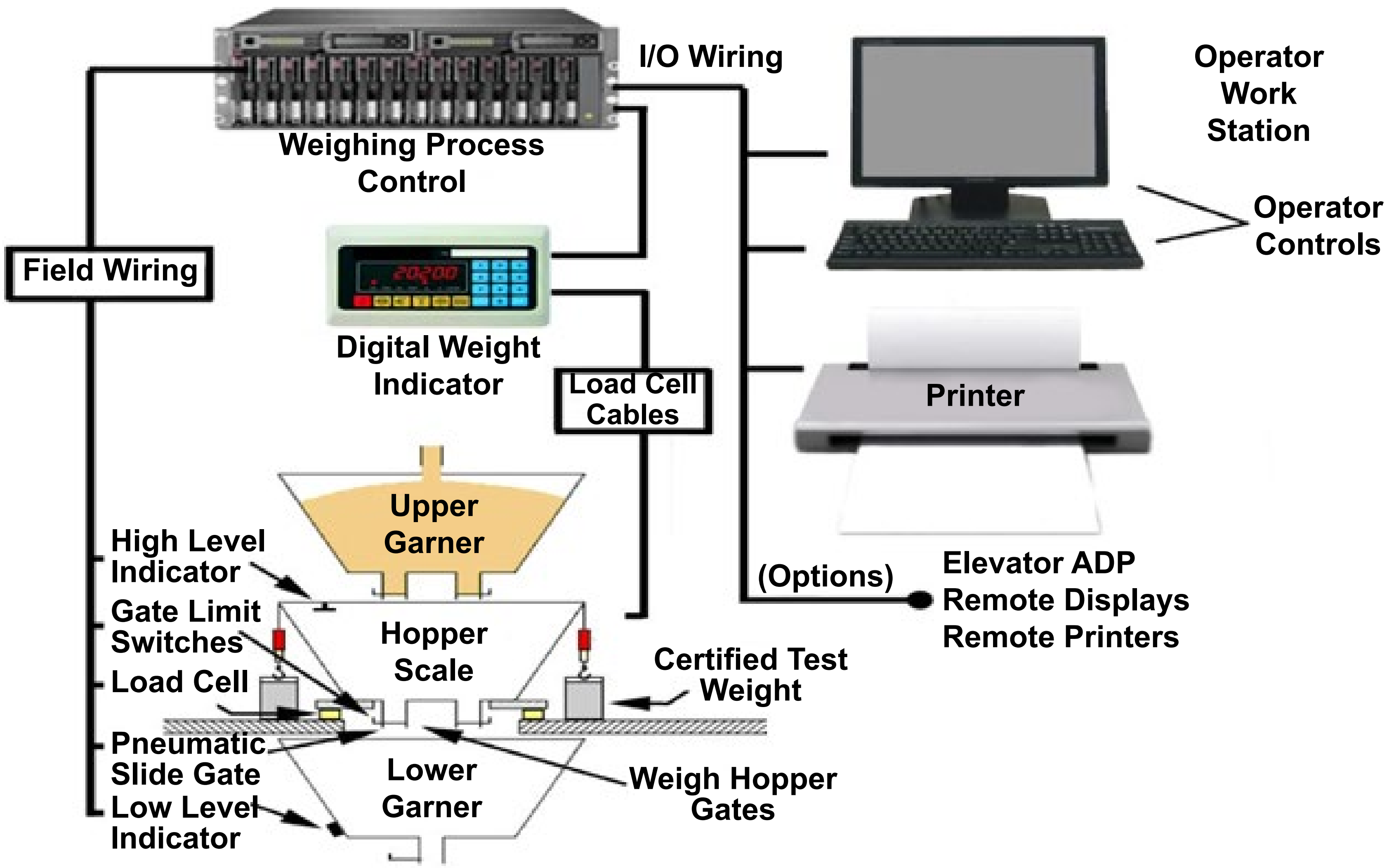
Converted from a mechanical scale by the insertion of a load cell into the lever system.

Digital instrument and printer usually replace weighbeam or dial.

LEVERTRONIC SCALE



FULL ELECTRONIC SCALE
(Automatic Bulk Weighing System)



2 <u>Full Electronic Scale</u>

Full electronic scales have load cells directly supporting the load receiving element.

Personnel control levertronic or full-electronic scales either in or out of the elevator, this area, the control room, contains digital instruments, printers, and control board monitors.

a) Official remote digital instrument displays (CRTs) and printers can be approved.

b) Digital instruments have a process control that allows operators to control grain flow into and out of garners and scales manually or by automatic mode. In the automatic mode, the scale fills and empties (cycles) by itself; manually, the operator controls the cycling of each draft. Operators monitor grain flow from control boards or monitors that designate scaled diagrams of the elevator's grain handling system. Elevator personnel can control bin selection, tripper movement, diversion points, legs, conveyor belts, and slides/gates with switches on the control board

(2) Pre-weighing Responsibilities. At the beginning of each work shift, the weigher must:

(a) Ensure the load receiving elements of the scale components are free from binds, obstruction, and debris; that the load cells and wiring are intact; and that all scale components are free from build-ups of grain;

(b) Ensure that there is a warm-up period for the load cells and electronic units. One-half to one hour is required when power has been shut off to the scale;

(c) Examine the Scale Record Log to determine whether a malfunction occurred in the weighing system during the previous work shift. Resolve any problems with the scale official before using the scale for official weighing;

(d) Observe the digital display in an empty scale condition. If the weight value fluctuates in excess of plus or minus one division, determine if it is the result of a scale malfunction. No-load balance is a condition in which the scale will record a representation of zero load when the scale is empty; and

(e) Establish for reference the operating tare. Tare is the reference amount that represents an empty scale condition; it is usually printed as a negative value on the scale tape, however, there are some scales that if the tare goes below the zero it may be shown as a positive value. If the tare goes below zero:

1 The weighing cycle may stop;

2 The weight display will display below zero and print a positive tare. Net weight is obtained by subtracting (or adding if below zero) the tare weight from the gross weight; and

3 Perform any other tests built into the weighing system which identify equipment problems (e.g., calibration check, printer check, LED display check, etc.), inform the supervisor, and consult the scale official as necessary.

(3) Electronic System Operating Procedures.

(a) Ensure proper system operation and detect any printer malfunctions.

(b) Verify that the weight display value on the digital instrument is identical to the printed value on the scale tape or ticket.

(c) Document checks on scale tapes as instructed by manager.

(d) At the end of the sublot or pre-determined interval, total and record the sublot or tape number.

(e) Record the date, time, carrier identification, kind of grain, and scale number.

(f) Show the calculated net weight if it has to be manually calculated from a running total or verify the accuracy of the information.

(g) Initial the tape.

(h) Auxiliary indicting displays (e.g., scoreboards) are not to be used for the official digital weight indication.

(4) <u>Checks Performed During Each Work Shift</u>.

(a) Examine the garner gate and weigh hopper gate for leaks. Discontinue the use of the scale if a leak is found until it is corrected. Document on the Weight Loading Log, scale tapes, scale record logs, an event printer, as determined by the manager. Perform the check as follows:

<u>1</u> With the garner at least 50 percent full, all gates closed, and the scale operation stopped; observe the digital display for a continuing increase in weight. An increase indicates that grain is leaking from the upper garner into the weigh hopper; and

<u>2</u> With the weigh hopper at least 50 percent full, all gates closed, and the scale operation stopped; observe the digital display for a continuing decrease in weight. A decrease indicates that grain is leaking from the weigh hopper.

(b) Examine the gross weights from previous drafts printed on the scale tapes. If the grain flow to the scale is constant, the gross weights are constant. Large variations during automatic operation must be investigated by the scale official for a possible malfunction in the weighing system.

(c) Observe printed tare weights for consistency (they should not change several divisions when the flow rate is constant or unchanged and while the scale is in automatic mode).

<u>1</u> Changes that do not necessarily indicate inaccurate weights:

a) Occasional increases that return to normal may indicate that material was struck in the weigh hopper for a brief period of time. Fluctuations at the start of sublot or at the end of sublot weighing often causes change in the grain flow rate into the weighing system and the reason for tare weights not to remain equal; and

b) Gradual long-term increases may result from build-up on the scale structure or a temperature change. These do not necessarily indicate inaccurate weights;

2 Erratic changes or gradually decreasing tare weights must be investigated.

(d) During the print cycle, when the gates are closed, the digital display must settle to plus or minus one division prior to printing. A motion detection design, approved through the prototype and through initial installation examinations, senses the proper settling of the scale.

(5) Specific Situations Requiring Caution.

(a) Design specifications on electronic hopper scales used for inbound weighing require that the tare weight is determined and printed at the beginning of each draft to reflect that the scale was empty when weighing began. Design specifications on scales for outbound weighing require that the tare weight is determined and printed at the end of each draft to reflect that all of the draft was delivered to the carrier.

1 Some scale models can change from one mode to the other simply by selecting the weighing sequence. Changing the weighing sequence while grain is in the weigh hopper and a draft is in progress can cause inaccurate results in the scales total net weight accumulator. For example, when a carrier is being weighed in and is being directly transferred to export, there exists potential for this situation to occur. Often times the whole carrier is not used and many transfers and changes of mode of operation and weighing sequence occur. Weighers are to allow changes in weighing sequence only between carriers or a complete weighing cycle (a tare and gross).

2 Scales to weigh inbound may be used to weigh outbound if the scale is manually cycled while the scale is empty and by printing a tare and gross at the end of the weighing cycle. If scales to weigh outbound are used to weigh inbound, specifically when shipping scales are used to weigh rejected grain back to the house and when shipping scales are used to weigh inbound grain, perform the procedure before the weighing cycle begins.

(b) Certified capacity of a scale is the maximum weight limit that has been approved for that scale and, along with the minimum division size; it must be conspicuously displayed on the front of the digital instrument. If draft weight exceeds certified capacity, do not certify the excess. For overdrafts, follow these procedures:

1 For outbound or export grain, the elevator may option to return grain to the house until the amount in the hopper is at or below certified capacity, or certify the weight of grain up to certified capacity; and

2 For inbound grain, the elevator must discharge grain from the overloaded hopper until the amount in the scale is at or below certified capacity. Weigh the remaining grain in the hopper. Weigh the discharged grain. Add the net weight to the total net weight of the draft. If it is impossible to re-weigh the grain, certify the weight to certified capacity and place a qualified statement on the certificate indicating the number of drafts which exceeded certified capacity (see Chapter 2).

(c) Do not retain grain in the scale hopper beyond the normal operating cycle time except for emergencies, such as trimming a load or carrier cleanout. Consult the scale official if elevator management regularly requests retaining grain in a hopper.

(d) Limited access areas to digital electronic scale instruments, including the manual printer, must always be sealed.

(e) Verify the remote tape with any other printer tapes three to four times per shift when it is the official tape.

1 Where there is no battery backup and a power loss occurs, use one of the following procedures when the power is restored:

2 If an accumulated total is stored in the mechanical printer; weigh any grain remaining in the hopper, clear (total) the tape and add the drafts beginning with the last subtotal before the power loss, verify the total with the accumulated total registered by the printer, notify the supervisor of discrepancies, and document the situation.

3 If the accumulated total is stored in the electronic digital memory: calculate the tape manually to get the total, clear the printer, document the situation, and resume weighing.

(f) Precycling is the interruption of a normal weighing cycle to prevent the scale from completely filling the weigh hopper. Precycling will cause the tare weight to be abnormally high or the gross weight to be abnormally low, depending on when the precycling was initiated. Precycling must not be regularly allowed, but it is infrequently acceptable, during emergency conditions, such as the overfill of the upper hopper. Weighers must initial or explain these instances on the tape. At facilities where the upper garner often fills before the scale is ready to cycle, managers must provide procedures in the Facility Handbook explaining when precycling is condoned. (Such instructions may negate the requirement to initial all precycles).

(6) Handling Malfunctions.

(a) Any occurrence resulting in inaccurate or unverifiable weight information is a malfunction. A malfunction in any part of the electronic weighing system, regardless of its location, may adversely affect the entire weighing system.

(b) The weigher is neither responsible for determining the specific cause of a malfunction, nor for trouble-shooting the system, but is responsible for determining the accuracy of the results. Weighers must recognize the malfunction as it occurs, inform personnel responsible for identifying and correcting the malfunction, document the situation, and certify the weight according to Chapter 2.

(c) When the weight of the grain is questionable due to a malfunction, re-weigh the grain if possible. If the grain cannot be re-weighed, carefully consider every factor before certification. If the weigher and supervisor discontinue the use of the scale, the scale official determines when to resume using it. Record on the scale tape, Weight Loading Log, and Scale Record Log the date, time, and nature of the malfunction, and whether use of the scale was discontinued.

(d) Four areas in the weighing system where malfunctions occur are: 1) the operator; 2) the digital instrument; 3) the printer; and 4) the weighing mechanism.

(e) Weighers recognize malfunctions in electronic weighing systems by analyzing and understanding alarm or error messages on weighing system displays and printed messages. Messages vary with systems. Consult supervisors, Facility Handbooks, or manufacturer’s operating manuals to be knowledgeable about the terminology. (Customized terminology used in process controls or other grain handling system controllers must be defined and explained in the Facility Handbook.)

(f) Operator errors cause some system malfunctions. Official personnel must know the manufacturer’s operating procedures, evaluate the affect of errors on weight information, and make proper corrections. Improper use causes malfunctions that are not evident until after the error has been made. Malfunctions can occur any time during the weighing that involves the operator, and can have varying affects on printed weight totals. Proper observation of elevator operators by official personnel avoids or quickly rectifies operator errors.

(g) Continual use and unfavorable environmental conditions can have a detrimental affect on digital instruments. A breakdown within the instrument may affect the whole system. This instrument may control gates, printers and load cells, and it may receive signals from this equipment, including the first indications of malfunctions in the equipment. Possible cause of the malfunction in this equipment is the digital instrument.

1 When a malfunction occurs and the weigher questions the accuracy of a digital instrument, the weigher must:

a) Inform elevator personnel, supervisor, and scale official immediately;

b) Cease all official weighing on the unit in question; and

c) Thoroughly document on appropriate tapes both the malfunction and subsequent action.

2 Common digital instrument malfunctions.

a) Failure of the system to start, stop, or operate automatically.

b) Printed weight totals, gross weights, and/or tare weights are incorrect or different from digital displays.

c) Indicator lights cease to function or provide false readings.

d) Digital display readout is illegible or incomplete.

e) Control button switches are ineffective or work improperly.

f) Digital display shows the filled or empty hopper is not settling.

g) The printed tape is an official record of all weighing. Discontinue official weighing unless all the printed information is legible and accurate. Corrective action depends on the severity of the malfunction and can range from adjustment to replacement.

3 Common printer malfunctions.

a) Printovers because the paper is not advancing.

b) “Stretched” or illegible information because the paper advances while printing.

c) Lost print because the ribbon or printing element malfunctions.

d) Nonsense characters print.

4 Verify the flow of grain through the scale, when a printer malfunction occurs. The weight must:

a) The accumulated total can often be used for certification; and (See auto-printing malfunctions in Section 2.4.)

b) Manually record the gross, tare, and net weight from the digital display on the digital instrument, if the printer stops. The supervisor decides when to allow official weighing in the manual mode for automatic bulk weighing scales. Note the circumstances on the scale tape. (Note: Manual gross or net weight entries for vehicle scales are permitted to correct erroneous tickets only.

(h) Scales are regularly tested to detect weigh system problems and to adjust or modify the equipment. Possible malfunctions in the load receiving element are:

1 Gates cease to function properly allowing scales to exceed capacity or leak;

2 Holes in the garner or weigh hopper allow grain to escape the system without being weighed;

3 Levers bind affecting the weighing accuracy of the scale; or

4 Load cell malfunctions.

(i) Report repair work performed on the system's lever or load cells to the scale official to determine if testing is necessary.

(7) Weighing Operation Checks – Gate Leaks.

Each work shift examines the garner and weigh hopper for leaks using the following procedure.

(a) Garner check: With the garner at least 50 percent full and all gates closed, take the scale out of the automatic mode to stop the weighing cycle. If the weight on the display continually increases grain from the upper garner is leaking into the weigh hopper.

(b) Weigh Hopper check: With the weigh hopper at least 50 percent full and all gates closed, take the scale out of the automatic mode to stop the weighing cycle. If the weight on the display continually decreases, grain is leaking from the weigh hopper.

(c) If a leak is found do not use the scale until the system has been repaired and document the gate leak check on the Weight Loading Log.

(d) Vehicle scale checks: Inspect the gap around the edges of the scale for any material that could be lodged in the gap. The scale should move freely and return to zero.

(8) <u>Specific Situations Requiring Caution</u>.

(a) The maximum weight certified or approved by FGIS for official weighing is the certified capacity and must be conspicuously displayed on the front of the weighbeam shelf. An overdraft occurs when grain fills the weigh hopper beyond its certified capacity. For overdrafts follow these procedures:

<u>1</u> For Outbound or Export Grain, the elevator at its options may:

a) Return grain to the house until the amount remaining in the hopper is at or below the certified capacity of the scale and then have the remaining grain weighed; or

b) Have the weight certified for only the certified capacity of the scale. Do not certify a weight in excess of the scale's certified capacity.

2 For Inbound Grain:

a) Grain must be discharged from the overload hopper until the amount remaining in the scale is at or below the certified capacity;

b) Weigh the grain remaining in the hopper;

c) Weigh the discharged grain and add the net weight to the total weight of the draft; and

d) Certify the weight to the certified capacity and place a qualified statement on the certificate showing the number of drafts which exceeded the certified capacity, if it is impossible to re-weigh the grain (see Chapter 2).

e) Sources of weighing error include foreign objects or loose material in the form of nuts, bolts, washers, or other material.

(9) <u>Handling Malfunctions</u>.

(a) When the accuracy of the amount of grain is questionable, re- weigh the grain if possible.

(b) If the grain cannot be re-weighed, carefully consider every factor before certification.

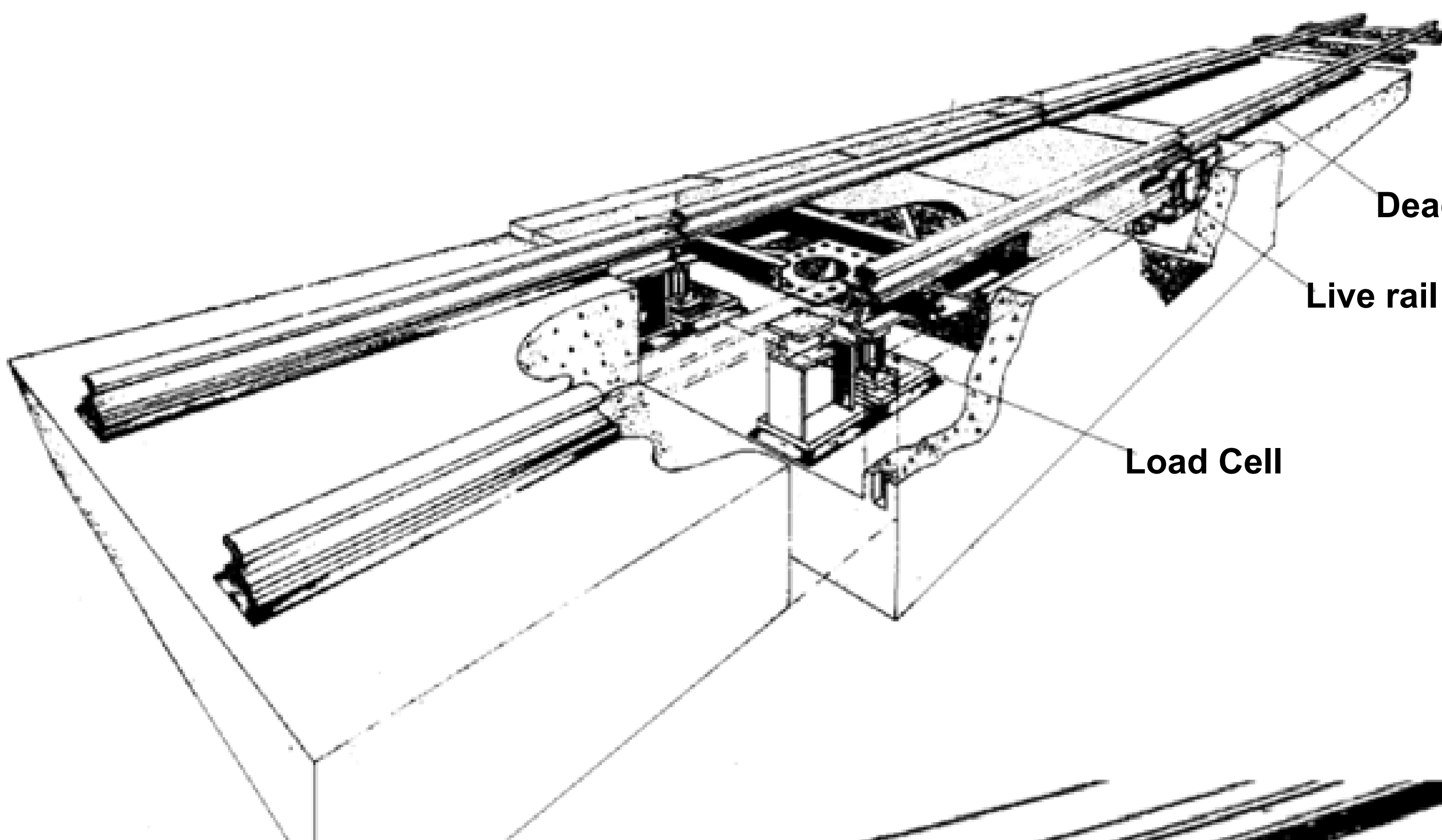
(c) If the weigher and supervisor discontinue the use of the scale, the scale official determines when to resume using it.

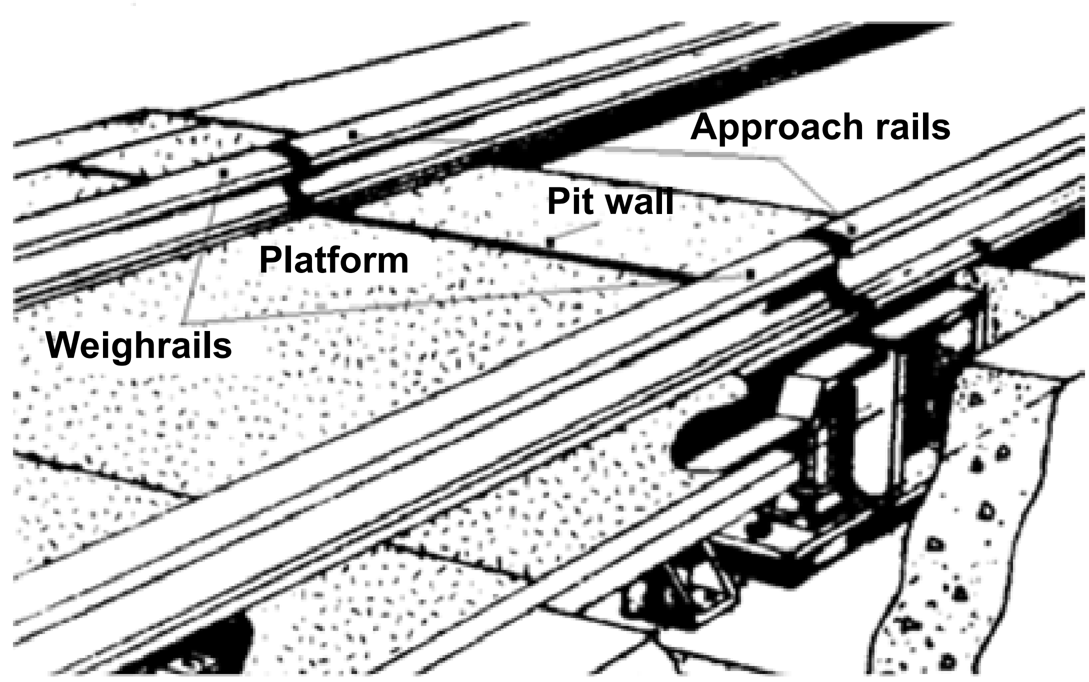
(d) Record on the scale tape, Weight Loading Log, and Scale Record Log, the date, time, and nature of the malfunction and whether the use of the scale was discontinued.

(e) Notify the supervisor or scale official when a scale has been adjusted (other than for zero balance) to determine if the scale requires retesting.

(f) Do not use the scale, if retesting is required, until the scale official approves it for use.

b. Railway Track Scales.





(1) General Description.

Procedures for operating the scale are explained earlier in this section. Procedures specific to the scale design follow. Seek approval from a scales official before weighing loads other than railcars on a railway track scale.

(2) Specific Requirements.

(a) Inspect the levers, load cells, and scale pit for excessive grain debris or water build-up. Do not enter scale pits in confined work areas.

(b) Before using the scale, the scale platform must be free from interference or binds.

(c) An adequate clearance not less that 1/8 inch or more than 5/8 inch between the approach rails and weighrails must exist.

(d) No preset tare is used; the scale must indicate zero after each weighing.

(e) Obtain the gross weight of a railcar in one weighing.

1 Ensure that the railcar is uncoupled at both ends and that all wheels are on the weighrails when the railcar is weighed.

2 In-motion weighing must be permitted only where scales have been approved for it.

(f) Obtain a correct tare weight of the unloaded railcar by weighing the empty uncoupled car. (Do not use pre-determined or stenciled tare weights for empty railcars).

VEHICLE/TRUCK SCALE

c. <u>Vehicle/Truck Scales</u>.

(1) <u>General Description</u>.

Procedures for operating the vehicle scale are explained earlier in this section. Procedures specific to the scale design follow. Seek approval from a scales official before weighing loads other than vehicles on a vehicle scale.

(2) <u>Specific Requirements</u>.

(a) Inspect the levers, load cells, and scale pit for excessive grain debris or water build-up. Do not enter scale pits in confined work areas.

(b) Check that there is adequate clearance - 3/8 inches between the scale platform and pit walls.

(c) Periodically re-zero vehicle scales, when the scale does not automatically reset itself to zero.

(d) Do not zero balance the scale during the weighing cycle of a truck.

(e) Obtain the gross weight of a tractor trailer or truck trailer in one weighing using vehicle scales.

(f) Obtain a correct tare weight of the unloaded vehicle by weighing the empty trailer with the same riders and truck accessories on the scale as when the gross weight was obtained.

(g) Do not use pre-determined tare weights for empty vehicles.

(h) Follow a consistent established policy of either weighing drivers or riders on or off the scales.

(i) Where the truck leaves the scale between the gross and tare weights, or the gross and tare weights are taken on different scales:

1 Check the zero balance every 30 minutes;

2 Notify the supervisor and scale official if the scale does not hold the zero balance for two consecutive checks; and

3 Continue to use the scale unless it malfunctions.

1.6 GRAIN FLOW SECURITY

Grain flow security is critical to the grain weight certification process. For official weighing of inbound grain, official personnel must ensure grain security from the unloading of the carrier to the completion of the weighing. For outbound grain movements, official personnel are responsible for correct weighing and for the secured movement of the grain from scale to carrier. A weight certificate attests to a known weight of grain in an identifiable carrier. The certificate must be accurate.

a. Detecting, Estimating, and Recording Grain Spills.

(1) General Responsibilities.

(a) When grain is spilled during shipping operations, collect and return sound grain to the grain flow, estimate and add a like amount of grain to the flow, or estimate and subtract from the weight credited to the carrier.

(b) Estimate grain spilled during unloading or left in inbound carriers, and record the estimated weight with a qualifying statement in the remarks section of the weight certificate.

(c) Round grain spill estimates to the applicable minimum scale division size.

(d) Follow certification procedures in Chapter 2 for spilled grain and grain left in carriers.

(e) Accurately determine the weight of a spill using one of the following methods which are listed in order of preference.

1 Weigh the grain if possible.

2 Use the grain spill formulas and a calculator for Rectangular, Cone, Cylindrical or Trapezoidal and constant running spills.

3 Analytically estimate spills, i.e., the grain filled ten 100 pound grain sacks or a portable hopper was filled half-full and the hopper's normal capacity was known.

4 Any method which requires action by the elevator before the estimate is made usually requires constant supervision to assure the delivery of the grain, and therefore it is less desirable.

(2) Specific Responsibilities.

(a) Use a handheld calculator or for an easy, time-efficient, and reliable method of calculating grain spills.

1 Use the actual test weight if the spill is from a lot of grain that has been officially inspected. Multiply the volume (bushels or hectoliters) by the test weight, pounds per bushel or kilograms per hectoliter. Use the trade weight if the spill has not been officially inspected. (See Section (c) for trade weights).

2 To measure spills as accurately as possible, estimate irregular shapes by using an average of several measurements taken at different points to calculate a radius, width, or height. Determine the volume of the measurements and record the amount on the documentation. Mentally or physically form irregular spills into a shape that fits one of the formulas.

(b) Use mathematical formulas if it is impossible to weigh the spill.

1 Measure spills using a tape measure or a similar device.

2 Mentally or physically form irregular spills into a shape that fits one of the formulas.

3 Estimate irregular shapes by taking an average of several measurements at different points to calculate a radius, width, or height.

4 Convert any measurements in inches or centimeters to tenths or hundredths of feet or meters for these formulas.

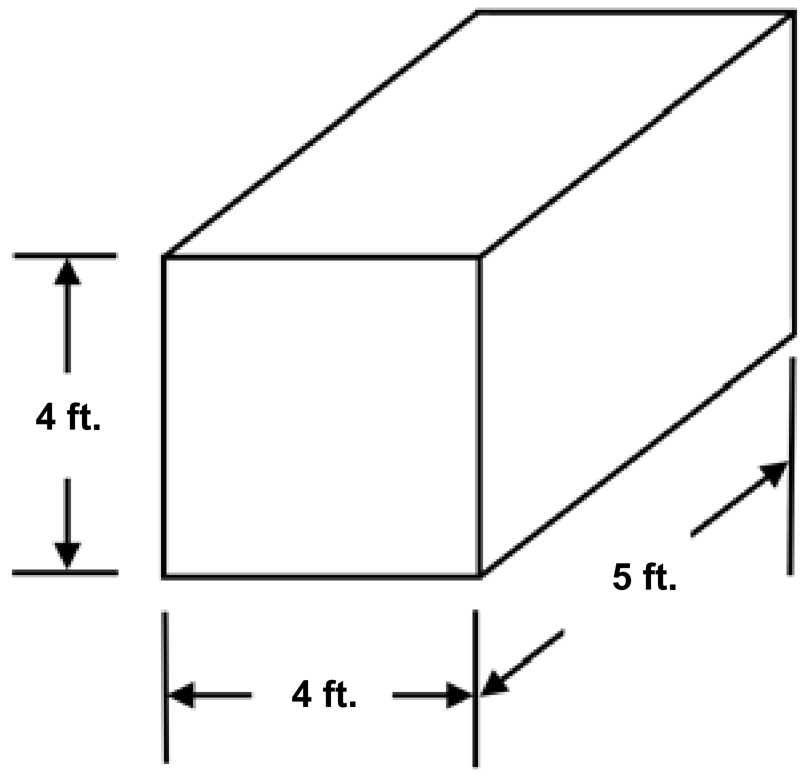
5 The 0.8 bushel per cubic foot and 10 hectoliter per cubic meter constant factors in these formulas converts the cubic feet measurement to bushels, and cubic meters to hectoliters respectively.

6 Multiply the bushels or hectoliters by the test weight of the grain to obtain the weight of the spill in pounds or kilograms.

7 Specific Formulas.

a) Rectangular or Cube Formula.

Length x Width x Height x 0.8 bu/ft x Test Weight Per Bushel = Pounds
Example: Rectangular corn spill with dimensions as shown.

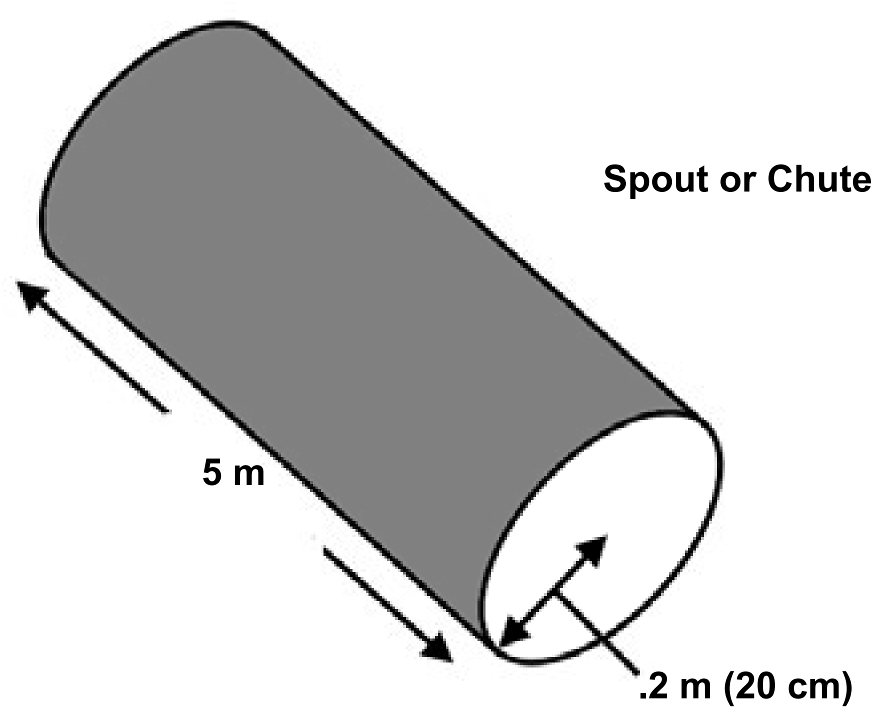


Answer: 5 ft x 4 ft x 4 ft x 0.8 bu/ft x 56 lb/bu = 3,584 lb
Round final weight figure to 3,580 lb.

b) Cylindrical Formula.

(In metric units m = meters, hl = hectoliters)
π(3.14) x r2 x Height x 10 hl/m x Test Weight Per hl = Kilograms (kg)

Example: Cylindrical corn spill with dimensions as shown.

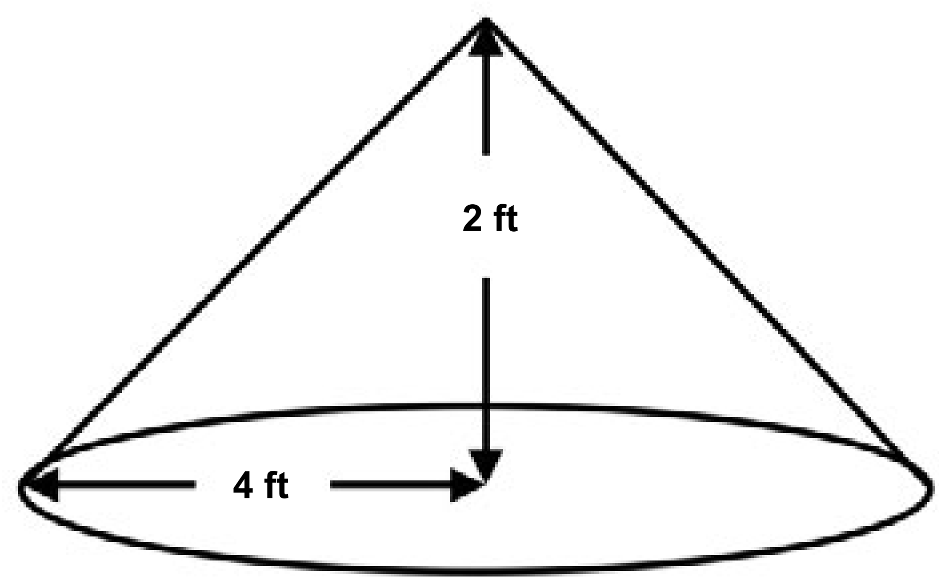


Answer: π x .2 m x .2 m x 5 m x 10 hl/m x 72.1 kg/hl = 4,528 kg.
Round final weight figure to 4,530 kilograms.

c) Cone Formula.

$\frac{\pi \text{ x r2 x Height}}{3}$ x 0.8 bu/ft x Test Weight Per Bushel = Pounds

Example: Conical soybean spill with dimensions as shown.



Answer: r2 = (radius x radius). Radius = diameter.

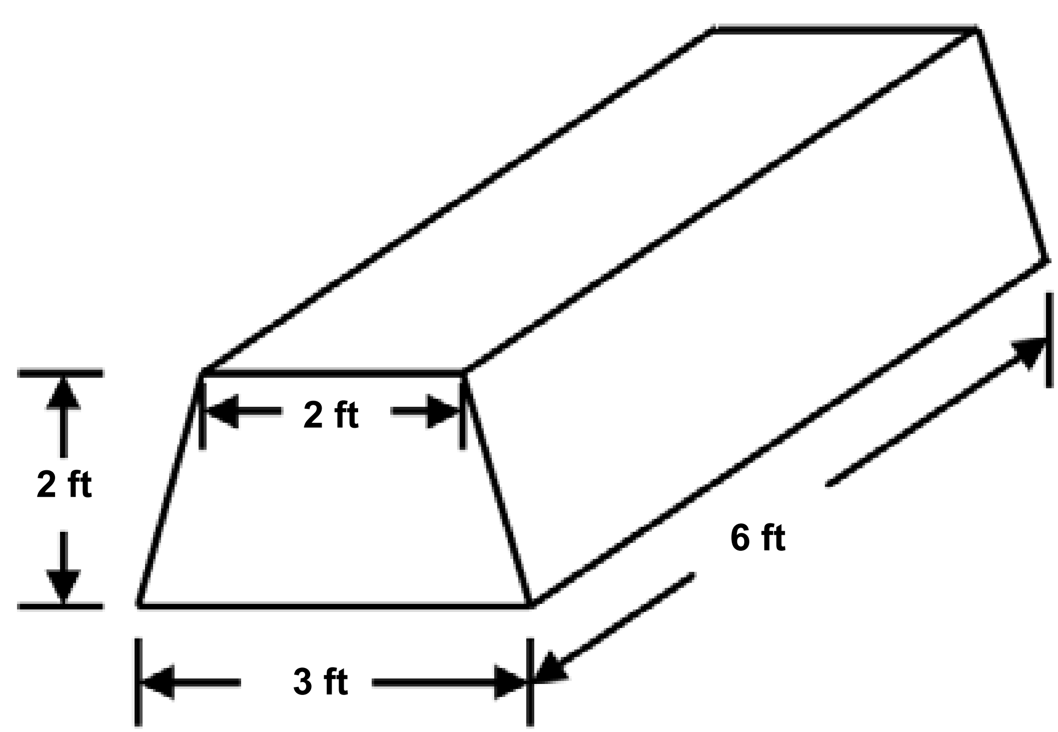
$\frac{\pi \text{ x 4 ft x 4 ft x 2 ft}}{3}$ x 0.8 bu/ft x 60 lb/bu = 1607.7 lb

Round final weight figure to 1,610 lb.

d) Trapezoid Formula.

(Base + Top Width) x Height x Length x 0.8 bu/ft x Test Weight/bu = lbs.

Example: Trapezoid wheat spill with dimensions as shown (Visualize as an inverted conveyor belt).



Answer: $\frac{\text{(3 ft + 2 ft)}}{2}$ x 2 ft x 6 ft x 0.8 bu/ft x 60 lb/bu = 1,440 lb

e) Constant Running Formula.

Spills may occur over water from shipping belts or spouts. If a spill is observed from the time it begins until the time it ends, estimate the entire amount of the spill. If only a part of a spill is observed falling into the water, estimate the observed amount. Determine flow rates by estimating or calculating the feed on the shipping belts. Determine the amount of grain that the belt can run at 100 percent feed and calculate the percent at which the belts were running during the spill.

Flow Rate (Pounds/Hour) x Running Time (Fraction of an Hour) = lbs.

Example: Corn spilling into the water for 3 minutes. Flow rate on belt estimated to 50,000 bushels per hour, (2,800,000 Pounds per hour).

Answer: 2,800,000 lb/hr x 0.05 hr = 140,000 pounds

(or)

2,800,000 lb/hr x 3 minutes x 1 hr/60 minutes = 140,000 pounds

(c) Use Trade Weight Table to determine the test weight when the grain spill occurred from a flow of grain that was not officially inspected.

Trade Weight Table		
Grain	**Pounds/Bushel**	**Kilogram/Hectoliter**
Corn	56	72
Sorghum	56	72
Flaxseed	56	72
Rye	56	72
Wheat	60	77
Soybeans	60	77
Oats	32	41
Barley	48	62
Triticale	48	62
Sunflower Seed	28	36
Canola	50	64
Mixed Grain	32	41
Corn Screenings	44	57
Cracked Corn	52	67

(d) Pertinent Conversion Factors.

<u>Cubic Meter Conversion Factor</u>
1 cubic meter = 10 hectoliters

<u>Cubic Foot Conversion Factor</u>
1 cubic foot = 0.8 bushel

<u>Conversion of Hectoliters of Grain to Kilograms</u>
Hectoliters x Test Weight kg/hl = Kilograms

<u>Conversion of Bushels of Grain to Pounds</u>
Bushels x Test Weight Per Bushel = Pounds

<u>Conversion of Pounds to Tons</u>
Total Pounds / 2,000 Pounds = Short Tons
Total Pounds / 2,240 Pounds = Long Tons

<u>Conversion of Pounds to Metric Units</u>
Total Pounds x 0.45359237 = Kilograms
Kilograms / 1,000 = Metric Tons
2,204.623 pounds = 1 Metric Ton

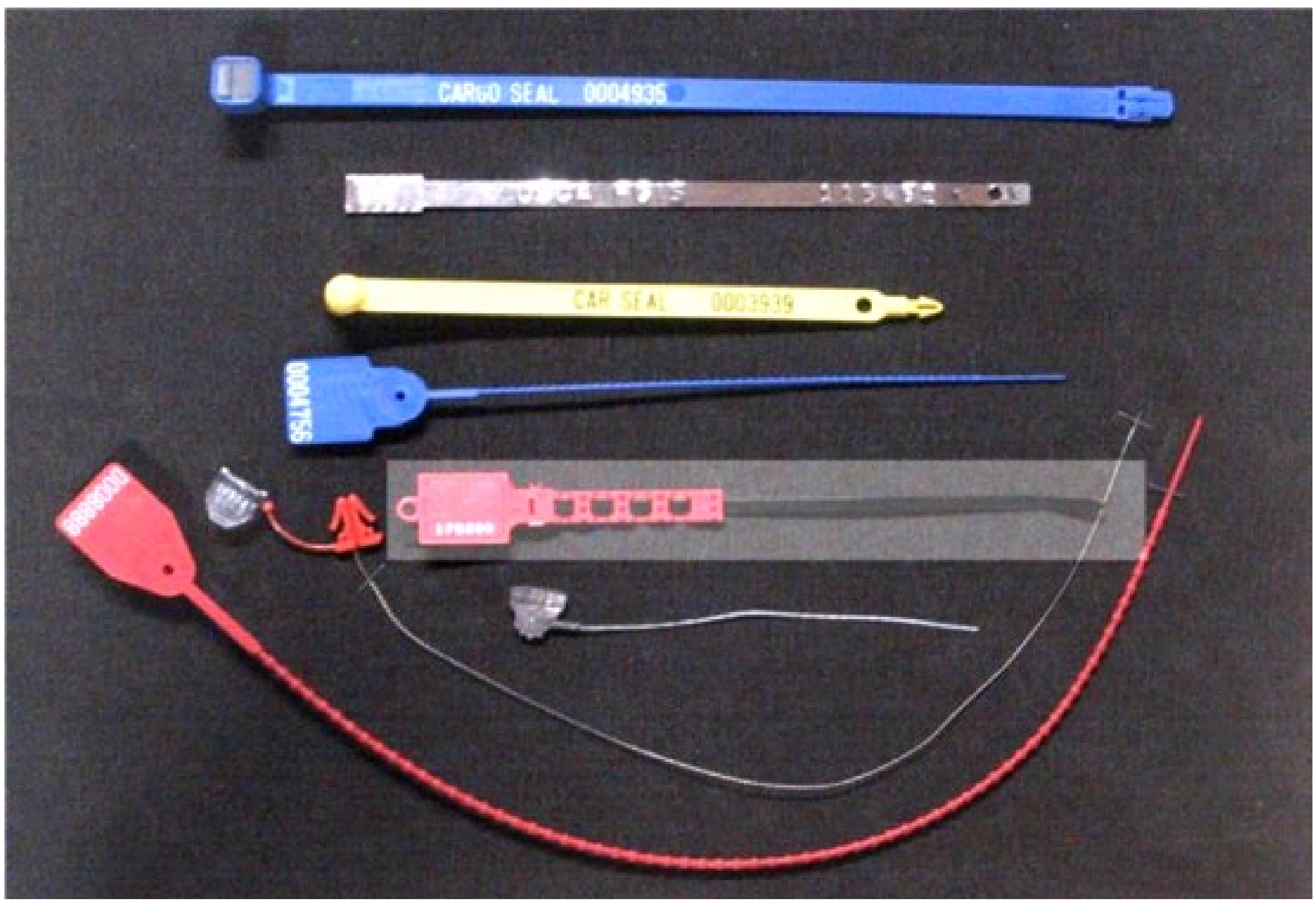
b. Diversion Points Controls to Ensure the Integrity of Grain Flow.

(1) General Controls.

Maintain security by using numbered railway strip seals, numbered padlocks, numbered cable seals, numbered wire seals, and electronic lockout (permissive) control devices. Multiple security devices may be required. Periodically check and record the number and placement of the seals and/or locks whenever any sealing system is used.

(2) Specific Controls.

Examples of Numbered Seals



(a) Any type of seal (metal, plastic, wire) are acceptable (any length suitable for purpose) but must permanently lock when one end is inserted into the opposite end and tighten suitably for security. Seals must be permanently impressed, engraved, etched, or stamped with previously assigned numbers or ID and/or letters, which create an accountable record to prevent unauthorized breakage and unauthorized application of another seal. Although easily broken, numbered seals provide a means of securing grain flow.

(b) Use padlocks in areas where greater physical security is needed, where security systems are frequently broken or tampered with, or when the reusability of security systems is advantageous. Permanently identify security padlocks with letters and numbers to create a unique identity for each padlock and record it in the Seal Log when a lock is either applied or removed.

<u>1</u> Master keying systems can be established. One key opens a series of padlocks at a particular elevator and change keys open individual locks only. This system of keying provides security, flexibility, and ease.

<u>2</u> Develop a system of key control to maintain the security of any padlock program.

(c) Use cable seals in areas where grain flow security is established on a permanent basis; they can only be removed by extreme force (e.g., hack saw, bolt cutters).

(d) Lockouts are incorporated in many control boards and can be used for maintaining grain flow security. Official personnel must:

<u>1</u> Control the keys that operate the lockouts; and

<u>2</u> Verify export grain flow integrity on the Weight Loading Log every shift using an established facility checklist.

(e) Electronic lockout (permissive) control devices are provided at many facilities to monitor and ensure system security and grain flow integrity. In some facilities, these lockouts are not electric panels and switches, but are programmable controllers or computers with visual displays. Lockout devices designate a switch or keyboard directly controlled by official personnel which, when activated, permit the movement of an elevator materials handling device, such as a gate or turnhead, from one position to another. Permissive devices ensure that grain flow patterns cannot be changed without official authorization. All critical monitoring points shall be inspected; during the initial facility review, after a major renovation of the facility or its control system or during the six-month acceptance test of an automated weights monitoring system (FGIS Program Directive 9160.3). All critical monitoring points shall be inspected at least once per year or more frequently at the discretion of the field office manager. To minimize any hampering of facility operations, the inspection should proceed incrementally, with only a small number of points being checked at any one time.

(3) Unauthorized Seal or lock Breakage Procedures.

When a seal or lock is found broken while grain is being officially weighed, the supervisor and the person having the most knowledge of the situation must find the cause of the problem. This includes the unauthorized tempering with limit switches and shipping bin empty indicators.

(a) Answer the following questions:

1 When was the seal or lock last checked and found intact? Use the Seal Log to estimate the length of time that the seal or lock has been broken.

2 Can it be determined whether the breakage was accidental or deliberate, and did the grain flow remain secure during that time the seal or lock was broken?

3 Is this a constant problem at this grain elevator?

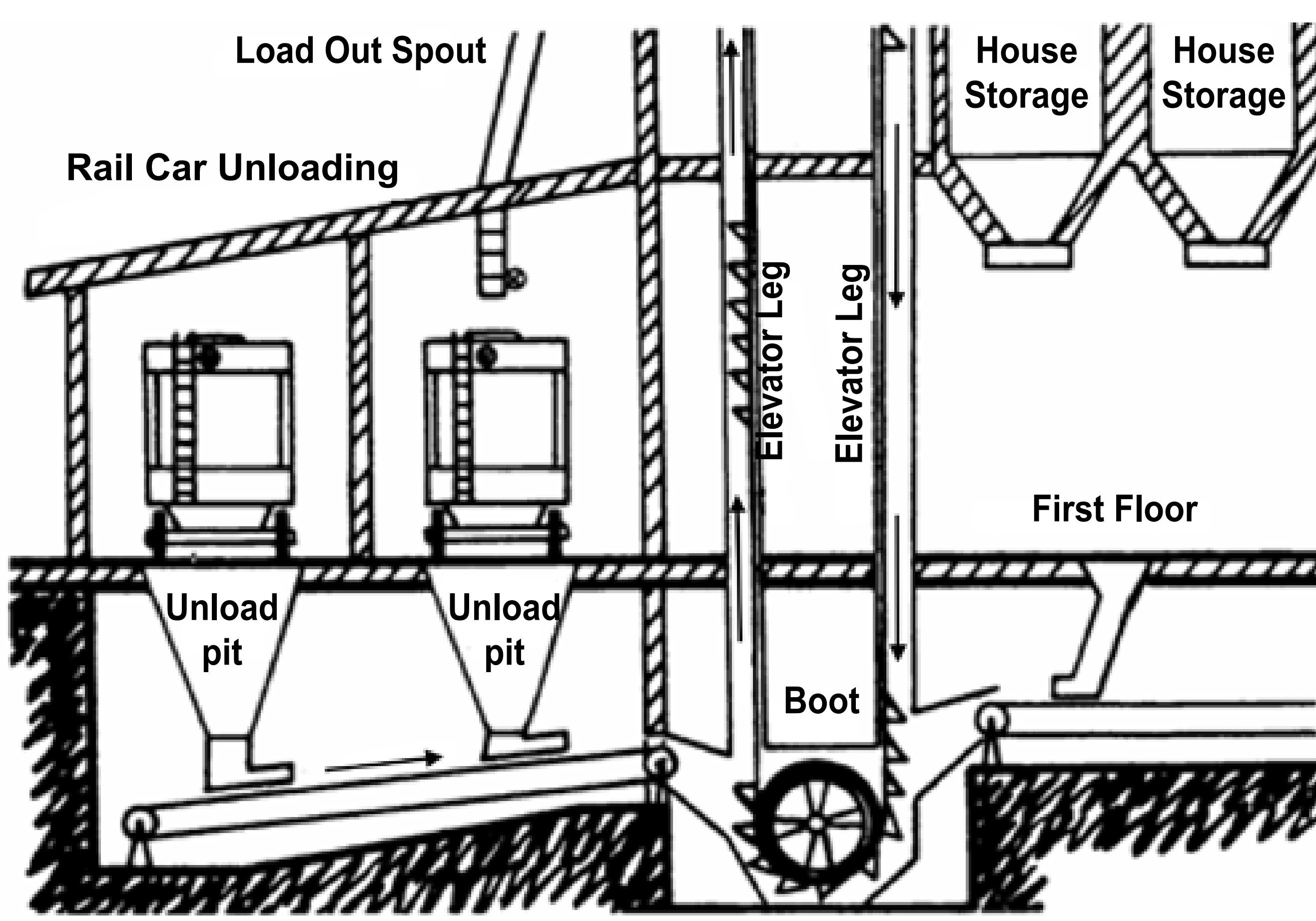
4 Can the amount of grain weighed during the time that the seal or lock was broken be certified on the weight certificate?

(b) Notify the FOM.

(c) Correct the problem and ensure against future breakages.

(d) Make proper notations on the Seal Log and the Weight Loading Log.

RAILCAR UNLOADING AREA DIAGRAM



c. <u>Inbound Grain Flow Operations</u>.

Grain is generally received by railcar, truck, or barge and weighed either on vehicle/truck scales, railway track scales, or is elevated to be weighed on hopper scales in the house.

(1) <u>Inbound Carrier Unloading Area</u>.

(a) The railcar unloading area consists of unloading pits that receive grain from cars. Grain is usually moved by conveyor belts into the boot of an elevator leg which lifts the grain through the elevator and deposits it into a holding garner above the scale.

<u>1</u> The railcar unloading pit is a rectangular shaped bin that funnels grain from railcars to conveyor belts located underneath the pit. Grain frequently overflows the unloading pit and spills out onto the track area. If uncontaminated, push this grain back into the pit upon completion of each railcar or unit train (however the lot is being certified). The pit itself must be completely free of grain when the lot is finished. Carefully monitor the area beside the conveyor belt for grain spills (especially the area below the unloading pit).

<u>2</u> A railway track scale weighs the railcar prior to (gross weight) and after (tare weight) unloading. When obtaining the weight of grain from an inbound railcar on a railway track scale, the grain flow does not have to be monitored by official personnel.

(b) The truck unloading area consists of the truck dump pit and/or the truck platform scale. In many locations, the platform scale also functions as a hydraulic truck dumper.

<u>1</u> The truck unloading pit is a small bin used to funnel grain to the conveyor belt or boot of an elevator leg.

a) The elevator leg lifts the grain through the elevator to deposit in a garner above a scale for weighing.

b) If the weight of the grain from a truck is obtained on a vehicle/truck scale: 1) grain flow does not have to be monitored; and 2) spills along basement conveyor belts need not be recorded (unless they pose a safety hazard).

c) If grain from the truck is weighed in the elevator on its house scales: 1) spills must be recorded; and 2) the unloading pit must be emptied between each lot.

<u>2</u> A vehicle/truck scale is used to weigh the truck prior to (gross weight) and after (tare weight) unloading.

(c) The barge unloading area consists of a marine leg (or a similar unloading device) and a conveyor belt that transports grain into the elevator facility to a leg and then to a scale for weighing. In some areas, inclined belts are used to elevate the grain from the barge to the house scales.

<u>1</u> A marine leg is similar to an elevator leg except smaller, movable, and positioned to remove grain from waterborne carriers.

a) The leg is lowered into a barge or vessel hold.

b) he marine leg's lower pulley is exposed to allow grain to be removed from the carrier.

<u>2</u> Monitor the entire route the grain travels from the barge unloading area to the scale(s) for spills, leaks, and diversion points.

(2) <u>Movement of Inbound Grain Within the Elevator</u>.

(a) The basement contains conveyor belts that carry grain from storage bins, truck receiving pits, and car receiving pits to the boots of elevator legs.

(b) The boot encloses the tail pulley of an elevator leg. Grain is deposited into the boot by spouts or belts. The grain is picked up by the elevator leg to travel to the head floor. Many boots are surrounded by a pit area. This is a prime location for spilled grain because constantly moving grain can wear holes in the metal. Grain leaks out through the holes and accumulates in the boot pit or the area surrounding the leg.

(c) An elevator leg raises grain by the use of buckets attached to a vertical belt which moves around a drive (head) pulley located at the top (head floor) and a pulley (tail) at the bottom. As the belt moves around the lower pulley, each bucket scoops up grain and carries it to the head floor where it is usually deposited into the upper garner. The elevator leg is completely enclosed by tin or steel plates.

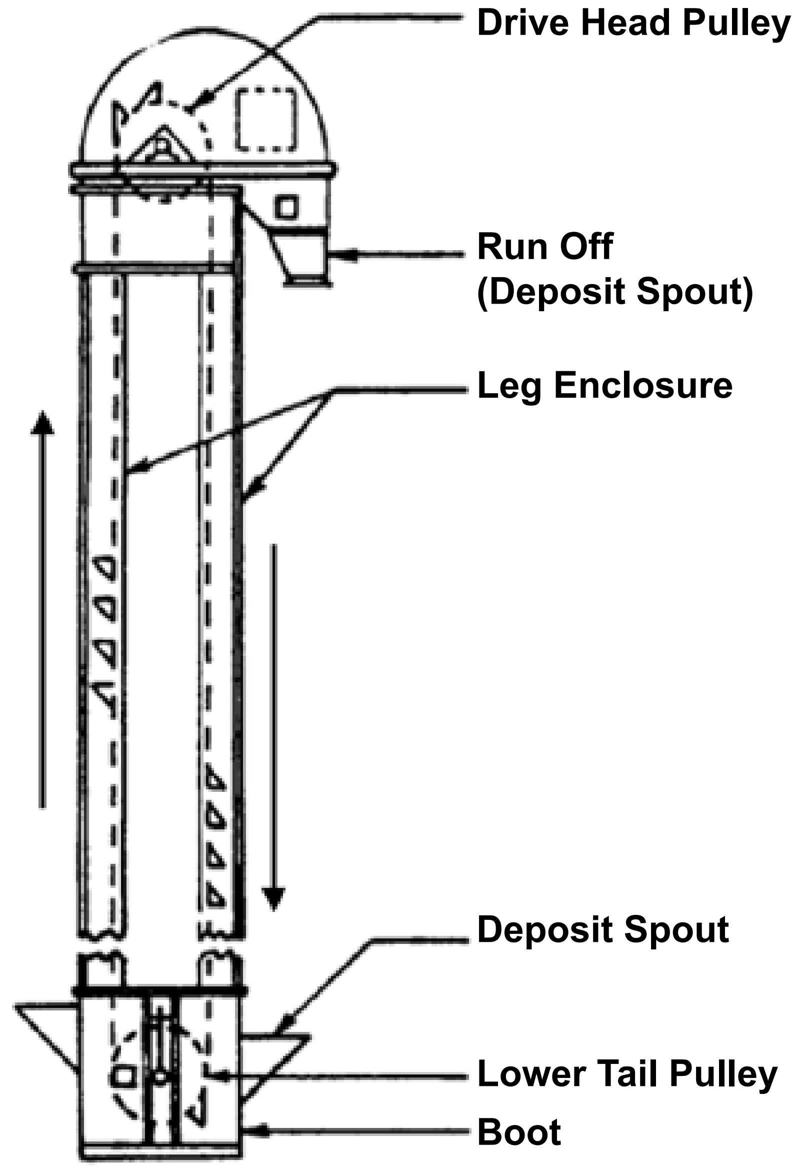
Grain elevators may have several legs and official personnel must know the following:

<u>1</u> The locations of all legs;

<u>2</u> What belts or spouts supply them with grain; and

<u>3</u> Where the legs can deliver the grain.

ELEVATOR LEG



Moving grain can cause holes to wear in the leg encasement, resulting in leaks and spills on any floor in the facility. Emergency release doors exist in the run-off spouts of some legs to prevent “choking” the leg when the upper garner of a scale system overfills. This allows grain to escape the delivery system and, on inbound grain that has not been officially weighed, requires recording the grain as a spill.

Slipping drive belts and loose or separated buckets are safety hazards. Report them immediately to the supervisor.

INCLINE BELTS

Incline belts are used by some elevators to elevate the grain. Instead of elevator legs the grain is elevated on conveyor belts which are inclined at about 30-45 degrees. Some elevators use these belts to carry grain to and from the wharf, while others completely replace the elevator legs and exclusively use incline belts to elevate grain.

(d) The Head Floor is the top floor in the elevator. It houses the head pulleys of the elevator legs, the upper garner inspection doors, and possible diversion points in the grain flow, grain cleaning devices, and sampling equipment. In some elevators, grain can be diverted immediately after elevation. Secure this area and monitor for inbound grain.

(e) Grain cleaning apparatus separate large nongrain materials, such as pieces of wood, stones, cans, etc., from the grain or are used to separate screenings (dust or broken kernels) from whole grain. A cleaner can be located anywhere within the grain flow system. Inbound grain must not be cleaned before it is weighed.

(f) A Diverter-Type (D/T) Mechanical Sampling, an inspection device located in the path of grain flow, is used to obtain grain samples for determining grain quality and may be found in many locations throughout the elevator. Refer to the Mechanical Sampling Systems Handbook for specifics and requirements.

(g) Inspection doors of the upper garner allow access to the upper garner for cleaning or inspection and also allow the introduction into the upper garner of sweepings or materials other than grain to be officially weighed. The weight of this material affects the quality and the accuracy of the officially weighed lot and is prohibited. Sealing these doors is at the discretion of the manager.

(h) Located below the head floor, the scale floor houses the upper garner, weigh hopper, and bulk weighing equipment (mechanical, electronic, or both), and may contain lower garners and turnheads.

1 The upper garner is located above each weigh hopper to serve as a holding bin during the movement of grain prior to weighing. Upper garners are essential to the efficient operation of any grain weighing system; without them, the entire grain supply would have to be shut down during scale discharge.

2 The upper garner gate(s) regulates the flow of grain into the weigh hopper. The gates are controlled by electric motors, air pressure, hydraulically controlled cylinders, or manually operated levers.

3 The weigh hopper is a bin that is independently suspended from or supported by levers or load cells. The weigh hopper temporarily holds grain until a weight can be obtained. Weigh hopper access doors and observation ports must be closed securely to prevent the escape of grain resulting in spills. The weigh hopper lever system must be kept clean of grain and dust to ensure free movement of the lever system.

4 The weigh hopper gate(s) regulates the flow of grain out of the weigh hopper. Control mechanisms are similar to those used for the upper garner gates.

d. Outbound Grain Movement.

Outbound grain movement begins immediately upon weighing. Once weighed, the identity of a lot of grain changes. For example, if grain from a unit train is weighed and then conveyed to an export vessel, after the grain has been weighed, the identity of the grain will be that of the vessel. Grain weighed and loaded into other carriers, regardless of its original source, is outbound grain.

(1) Scale Floor Description.

(See the section 1.5 c. (h)).

(2) Lower Garner or Surge Bins.

Additionally, some elevators have a lower garner or surge bins which are located beneath the weigh hopper to regulate the flow of grain. While they are not as essential as upper garners and many elevators do not have them, they do allow for a quick and even scale discharge, and therefore, a more efficient weighing operation.

(3) <u>Distributor Floor Description and Functions</u>.

Usually located below the scale floor, its main function is to give the elevator versatility in moving grain through the elevator to a loading or storage area. Many types of mechanisms are found here including turnheads, trolley spouts, tripper/belt combinations, and permanent or movable spouting.

Spills occur on the distributor floor during changes in grain flow direction and as a result of wear in spouts caused by moving grain. When spills occur, the intended destination of the grain must be known to correctly account for spills. The distributor floor, the most concentrated area of diversion points in the elevator, must be particularly well monitored to ensure correct weights.

DISTRIBUTOR

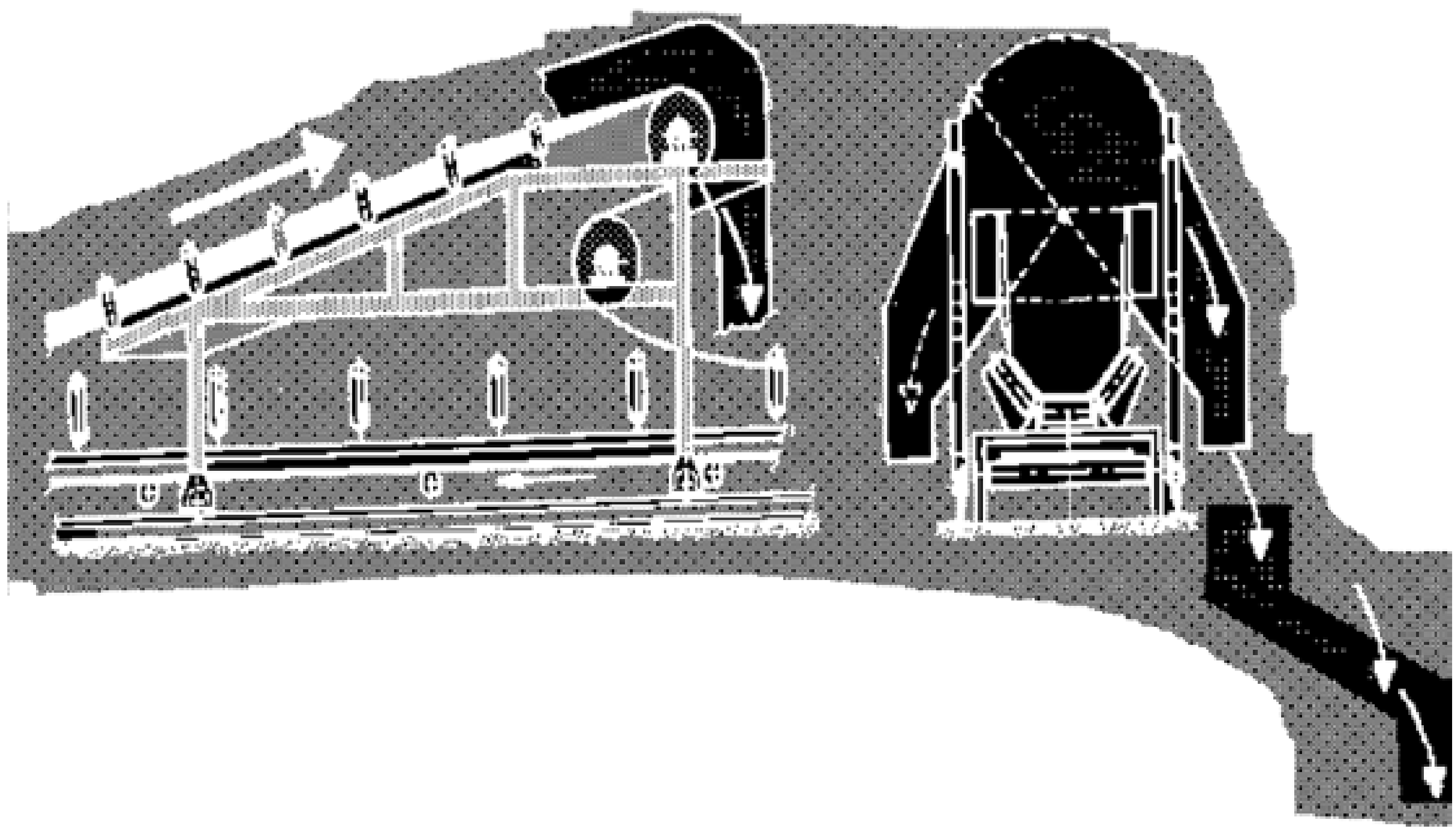
Distributors (rotary pictured) are movable spouts or mechanical devices located outside or inside the elevator and positioned to revolve over permanent spouting. Distributors (turnheads) control distribution of grain to bins or to carriers.

(4) Bin Floor Description.

The bin floor houses cleaner machines, screw conveyors, conveyor belts, overhead access to shipping bins, house storage bins, screening bins, and spouts.

(a) Valves direct, limit, or seal off the flow of grain at any given point. Official personnel must know the different types (see glossary); their capabilities, and control (e.g., manual or hydraulic).

CONVEYOR BELT WITH TRIPPER



(b) A conveyor belt travels between two pulleys to carry grain.

(c) A tripper is a mechanical device for directing the flow of grain off of a conveyor belt into a spout or bin. More than one tripper on a conveyor belt is possible and most are movable. Some trippers can direct grain off either side of a conveyor belt; the weigher must ensure proper direction so that the grain flow is not misdirected.

(d) The shipping bin area houses shipping belts and bins. Spills at any point along this path must be recorded or else immediately returned to the flow of grain. Spills are found most often where the path of grain makes an abrupt change in direction (i.e., out of a spout and onto a conveyor belt, belt junctions, and trippers).

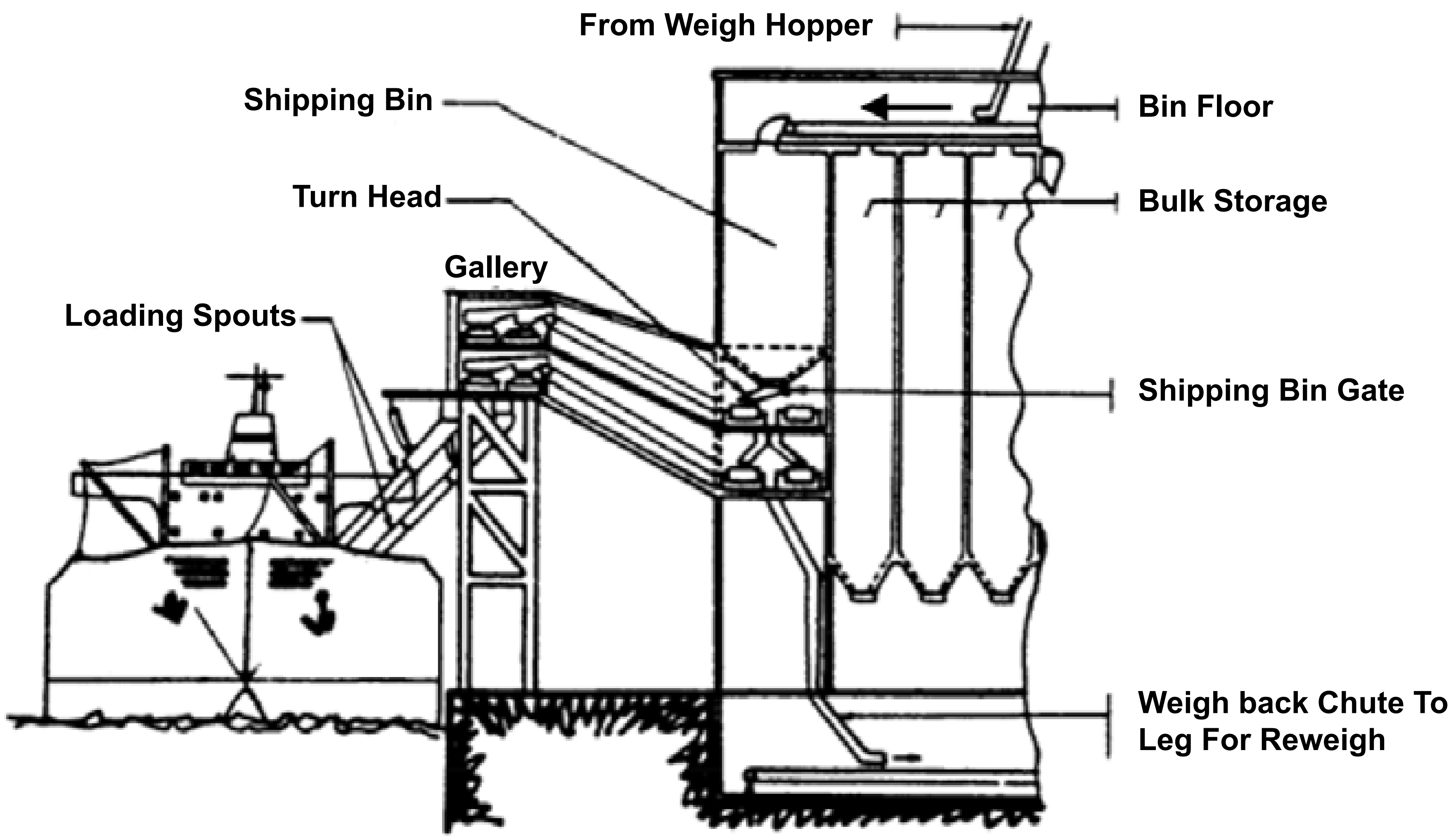
e) Shipping bins are used to hold grain prior to carrier loading and add to the responsibilities of official personnel.

(f) Access openings to the bins for cleaning and inspection are located on the bin floor.

1 Sealing these openings is at the discretion of managers.

2 Use of shipping bins varies from elevator to elevator. 1) Facilities that sample grain before it is loaded into shipping bins often completely fill and empty the bins for each sublot. 2) Other facilities use shipping bins to control the flow of grain and for mixing purposes, and will continuously run grain into and out of them.

SHIPPING BIN AREA DIAGRAM



3 Shipping bin gates regulate the flow of grain from the shipping bins. Their use is restricted by the grain flow security system. Shipping bin gates must be secured in the absence of official personnel.

(g) Shipping belts carry grain to the loading spouts.

(h) Weighback spouts return grain from the shipping bins to be elevated and re-weighed, can be movable or permanently fixed, and must be secured when not in use.

SHIPLOADING AREA

(i) Waterborne carriers are loaded and unloaded in the shiploading area. The gallery, loading spouts, and marine legs are located here.

1 The gallery is an extension of the shipping bin area. Conveyor belts and/or chain drags located here direct grain to the loading spouts. This is another location where trippers are found on conveyor belts. Some elevators may have D/T mechanical samplers located in the gallery.

2 Loading spouts direct grain into the vessel's stowage area. Moving grain often wears holes in the metal loading spouts resulting in grain spill and leaks. Monitor the delivery system, report damage immediately, and account for all grain spills and leaks.

3 Monitor the vessel area and account for spills on the deck, on the dock, and into the water.

1.7 SUPERVISION OF WEIGHING (CLASS Y)

FGIS and agencies, upon request, provide Class Y weighing service under the authority of the United States Grain Standards Act (USGSA). Weighing facility operators may request Class Y weighing service for grain shipments not requiring mandatory Class X weighing service as prescribed in Section 5 (a) (2) of the USGSA (i.e., export shipments and inbound intercompany barge shipments at export port locations). Approved weighing personnel under FGIS or agency supervision provide the Class Y weighing service using approved weighing equipment.

a. Procedures for Requesting Service.

written request for Class Y weighing service must be filed with official personnel responsible for the area where the service will be provided. It must include: 1) The applicants name and mailing address; 2) if applicable, a request for Form FGIS-1001, “Application for Approval to Operate as a Weighing Facility”; 3) the scope and effective date of Class Y weighing service desired; and 4) other pertinent information requested by official personnel.

To qualify for Class Y weighing services, the applicant must comply with applicable requirements of the regulations and instructions under the Act.

(1) Equipment.

The applicant has and maintains suitable grain handling equipment and accurate scales as required in Part 802 of the regulations (7 CFR Part 802 et seq.) and Chapter 3 of the Weighing Handbook.

(2) Personnel.

The applicant permits only competent, approved weighers to operate the scales and handle grain in connection with Class Y weighing.

(3) Procedures.

The applicant requires approved weighers to operate the scale(s) in accordance with regulations and instructions issued under the Act and requires each lot of grain be delivered from the carrier to the scale or from the scale to the carrier in its entirety without avoidable waste or loss.

b. Facility Approval by Official Personnel.

Prior to commencement of Class Y weighing services, the scale and grain handling system as it pertains to the Class Y weighing service must be approved by official personnel. Upon applicant request, official personnel provide Form FGIS-1001, which requests facility information and requires the facility management’s list of competent weighers trained to operate the weighing systems under regulations and instructions issued under the Act. Official personnel must perform a site visit to determine that the equipment and personnel requirements for providing Class Y weighing services have been met.

c. Form FGIS-964, “Supervision of Grain Weight Certificate.

The Class Y weighing certificate, form FGIS-964, shows “Class Y Weighing” screened across the front. Printed on the certificate are statements indicating the conditions under which the service is performed. Applicants may request that “special design” Class Y weighing certificates be printed at their expense. Requests are handled according to existing regulations and instructions.

(1) Official Personnel Responsibilities.

(a) Supply Chapters 1, 2, and 3 of the Weighing Handbook to the facility operator.

(b) Maintain accountability records for all certificates provided.

(c) Monitor certificate accuracy.

(2) Grain Facility Operator Responsibilities.

(a) Issue certificates sequentially.

(b) Inform official personnel of missing certificate numbers.

(c) Maintain a copy of each certificate issued for review by official personnel.

(d) Ensure only approved weighers perform Class Y weighing and official personnel have a current list of approved weighers.

d. Class Y Weighing Documentation.

Facility managers must retain copies of Class Y certificates, original scale tapes or tickets, and other supporting documents for 5 years. Scale tapes and tickets, in addition to the recorded weights, must show the date, the approved weighers name or initials, carrier identification, kind of grain, and scale number. Whenever a certificate is voided, mark the original “VOID” and retain at the facility, and destroy copies of voided certificates.

e. Approved Weighers.

Only approved weighers listed on the form FGIS-1001 may perform and certificate Class Y weighing services. If the facility’s personnel fluctuates because personnel are hired from employment pools, such as longshore personnel, the individuals who directly supervise these individuals (facility) or “key” longshore personnel are listed.

Approved weighers must obtain accurate weights on all grain weighed; certify that weights are obtained according to the Weighing Handbook; and document following procedures in the Weighing Handbook any unusual events that occur during the weighing operation (i.e., power failures, scale malfunctions, spills, and other events pertinent to the weighing operation). Prior to Class Y weighing, the applicant must notify the supervising office following established procedures.

f. Supervision Method.

The supervising office establishes with the applicant a notification process for Class Y weighing activity. Official personnel must supervise a minimum of 25 percent of Class Y weighing or more as determined by the supervising agency. Support increased supervision with adequate documentation.

(1) Export Location Supervision Official personnel stationed at the facility providing inspection and Class X weighing services normally supervise the Class Y weighing. Where there is a large physical distance between the Class X and Class Y weighing operations, extra personnel may be required. GIPSA charges a tonnage fee for Class Y weighing when this is the only service being provided on the grain.

(2) Interior Location Supervision. Supervision is provided by official personnel stationed at the facility providing inspection and/or Class X weighing services or by periodic trips to the facility.

g. Official Personnel Responsibilities.

Official supervision personnel must observe the approved weighers doing their duties. The entire weighing process, including scale operations and grain weight certification, must be supervised.

(1) Question Whether Grain Handling System Monitored for Spills. Determine that the grain handling system is adequately monitored for spills and leaks.

(2) Determine proper documentation by approved weighers of; 1) leaking or damaged carriers; 2) grain left in the carrier; 3) spills; and 4) any other situation affecting the certificated weight. Ensure this information is recorded on the scale tape or ticket for the carrier (or on a supplemental information sheet attached to the scale tape or ticket) and initialed by the approved weigher.

1.8 SPECIAL PROCEDURES

a. Information Requested by Interested Persons.

(1) Definition of “Interested Person”.

As defined in the Act, the term “interested person” means any person having a contract or other financial interest in grain as the owner, seller, purchaser, warehouseman, carrier, or otherwise. Persons who are employed by or represent carriers in the capacity of investigating claims against the carrier regarding the weight are considered “interested persons.” When a properly identified interested person requests information pertaining to the official weighing of a carrier or other information routinely recorded on logs, tapes, and certificates, provide this information.

(2) Deny Blanket Requests.

Do not honor blanket requests such as requests for information on all carriers weighed over a period of time. A request must identify the specific carrier(s) involved.

b. Facility Handbook Requirements.

Field offices and agencies must maintain an up-to-date elevator Facility Handbook for each location where official personnel provide Class X or Class Y weighing services. The length and scope of the handbook depends upon the complexity of the facility and the extent of the agency or field office involvement in providing official weighing service.

Facility handbooks are used in conjunction with and as a supplement to the Weighing Handbook. Up-to-date copies of the handbook are kept at the inspection laboratory and at the scale floor or control room of the referenced grain elevator for use by official personnel. Keep the original of each handbook in the office of the issuing agency. AM’s must forward copies of each Facility Handbook and subsequent revised handbooks to their respective field office. FOM’s must send a copy of each handbook and subsequent revised handbooks to the Policies, Procedures, and Market Analysis Branch.

(1) Safety Requirements.

This includes specific elevator safety rules; minimum information requirements follow.

(a) Location of smoking and non-smoking areas.

(b) Location of hardhat areas.

(c) Diagrams of emergency evacuation routes.

(d) Emergency evacuation phone numbers for reporting fires, explosions, hazardous conditions, and missing personnel. (See 29 CFR 1910.272 (d) (e).)

(2) General Elevator Layout Description.

(a) Describe the elevator's entire grain handling system: the location of the dock, elevator, headhouse, and FGIS and/or agency office space.

(b) Illustrate the elevator layout using detailed, labeled diagrams of all floors in the facility. (The floors may be illustrated separately or collectively as a cross section of the facility).

(c) At facilities where official weighing activities are limited, only the description or illustration of official weighing areas is required.

(3) Grain Flow System Descriptions.

(a) Specify weighing procedures and official personnel responsibilities at the facility i.e., procedures and frequency for checking shipping bin indicators are outlined in Program Directive 9160.4, Grain Handling System Testing.

(b) Provide grain flow diagrams and/or photographs that identify all diversion and seal points. (Grain flow diagrams and elevator layout diagrams may be illustrated together). Include a description of security measures and surveillance procedures for ensuring the integrity of the grain flow.

(c) Describe all weighing systems (include scale capacities, minimum divisions, and model numbers), printers (with the type of information they record), auxiliary power scale accessories, sealed or locked limited access areas of the scales and their accessories, and any other pertinent information to aid in recognizing scale and printer malfunctions.

(d) Describe the elevator's control panel(s)/monitor(s) that bear official services, and explain terminology used if the controls have customized programming.

(4) Certification and Documentation Requirements.

(a) Include copies of locally generated documentation and examples of correct documentation procedures.

(b) A checklist of the critical diversion points, shipping bin permissives, and all critical monitoring points must be submitted annually. This verification may take a period of time to complete, during that time the checklist shall be maintained at the facility along with any other documentation needed. If new points are added, include these checklists as attachments. At the end of each cycle, the completed checklists are to be filed in the field office. Delegated States will file their records and forward a copy to the supervising field office. Field offices will provide the Policy, Procedures, and Market Analysis Branch with an annual summary that notes that each export weighing within their circuit and the date the check was completed. (See Directive 9160.4, Grain Handling System Testing for more information). Include a checklist or means of documenting required periodic checks of grain flow security, (e.g., carrier clean out, and the pre-weighing and postweighing checks).

(5) Specialized Equipment Standard Operation Procedures.

Attach or include standard operating procedures for closed-circuit television systems or automated weighing systems used in official weighing systems.

(6) Unusual Procedure Explanations.

Explain any procedures seemingly contradictory to normal handbook instructions, but approved by scale officials, managers, or area chiefs, such as unusual precycling requirements and also procedures unique to that facility.

c. Bulk Commodity Certification.

Service personnel may officially weigh bulk commodities for certification under the Agricultural Marketing Act of 1946 (AMA).

(1) Bulk Defined.

"Bulk" commodities are those commodities contained in other than primary containers such as bags, boxes, barrels, etc.

(2) Where Procedures Found.

See Chapter 2 for instructions on certifying bulk commodities.

(3) Cooperator's Authority.

Federal cooperators may certify the weight of commodities under the AMA if authorized by FGIS and licensed under the AMA.

d. Review of Weighing Service.

A review of weighing service is a formal review of weighing documentation pertaining to a specific weight certificate. The review includes a detailed evaluation of weight logs, scale tapes, scale history, and other documentation and, if necessary, consultation with individuals involved with the actual weighing. A scale testing official does this review if possible.

The review of weighing service, as covered in this section, is performed when requested by an interested person on domestic shipments. Forward export weight inquiries to the Office of Departmental Initiatives and International Affairs.

(1) Request for Review of Weighing.

(a) Requests must be filed within 90 days after the date of the Class X or Class Y weighing service with the FGIS field office or agency that conducted the original service.

(b) The request is considered filed when the oral or written request is received by the field office or agency.

(c) The review of weighing is conducted by the office that performed the official service.

(2) Application Requirements.

(a) When required by FOM, use Form FGIS-907, "Application for Inspection and Weighing Services."

(b) When required by AM, a customized application form which includes the following may be used.

1 Name and mailing address of applicant.

2 Name(s) and address (es) of interested persons.

3 Carrier identification, quantity, and the official service location.

4 Copy of original weight certificate.

5 Any additional pertinent information required by the field office or agency to complete the review.

(3) Required Review Information.

(a) Review all pertinent documentation, such as certificates, logs, and scale test reports.

(b) Identify the kind (hopper, vehicle, or railway track) and type (mechanical, dial, or full electronic) of scale.

(c) Analyze other available information, such as scale history and past facility weight performance history.

(d) Thoroughly review the scale tests before and after the time under review.

(e) Additional scale test and travel to the facility for onsite review may be required.

(4) Methods and Content of Response.

(a) If the review of weighing service indicates that the results of the original weighing service were correct, notify the applicant in writing.

1 Explain the review process for tapes, logs, and scale tests, or any other documentation and the results.

2 Detail the observation of weight quantities of lots loaded/unloaded before and after the carrier(s) in question.

3 State the grain handling system security used.

(b) If the review of weighing service indicated that the results of the original weighing service were incorrect, issue a corrected certificate.

(5) Guidelines for Handling Service Requests.

(a) Only one review of weighing service is allowed on any original Class X or Class Y weighing service.

(b) Report any additional inquiries to the Policies and Procedures Branch.

(c) Notify headquarters through appropriate channels of any review of weighing that has the potential for 1) resulting in Congressional inquiries; 2) causing adverse action by trade groups; 3) setting a trend; or 4) requiring action by FGIS headquarters.

(d) Send a copy of all requests for review of weighing service and the response to the Policies, Procedures, and Market Analysis Branch through the appropriate channels.

e. Official and Unofficial Weighing.

Official and unofficial weighing may not be performed concurrently by official weighing agencies at an elevator within its assigned area of responsibility. For the purposes of this section, each mode of conveyance for carriers is considered separately in the facility's weighing approval (i.e., rail, vehicle, and barge).

If a facility wishes an agency to change from official to unofficial service, the supervising office must receive written notification from the facility to terminate its official weighing status. Facilities must reapply to the responsible agency to resume official service by completing Form FGIS-1001, "Application for Approval to Operate as a Weighing Facility." (See Chapter 2 for instructions.) The supervising field office must reevaluate the request for changes in the weighing system before allowing official service to resume. Field offices must notify the Compliance Division of changes in approved weighing facilities status so that the agency's designation documents (Appendix B) are kept current.

1.9 APPROVAL AND USE OF OFFICIAL MONITORING AND CONTROL SYSTEMS

Responsible officials must follow proper procedures in handling proposals for elevator-provided electronic control and monitoring systems. This assures official supervision is properly maintained when automating a system to change functions normally performed by official personnel.

a. Field Management Division (FMD) Responsibilities.

(1) Maintain Standards.

Provide parameters for use as guidelines in developing automation systems proposals.

(2) Review Policy.

Review automation proposals from the grain industry.

(3) Accept or Reject Proposal.

Approve/disapprove initial automation proposals.

(4) Notify Field Offices On Applicant's Plans.

Provide official personnel with information on the intentions of the grain industry to automate elevators within their area.

(5) Keep Current on Technology and Methods.

Update the automation parameters to reflect changes in technology and industry practices.

(6) Oversee Installation.

Oversee installations and provide technical guidance to facilitate the installation, approval, and operation of automated weighing and material handling systems.

(7) Appraise Fraud Potential in Practice.

Provide security guidance for automated weighing and material handling systems and update security measures in response to changes in technology and industry practices.

(8) Help Draft SOPs.

Provide an outline for Standard Operating Procedures (SOP) and assist in developing these procedures.

(9) Evaluate Changes.

Approve/disapprove revisions and/or modifications to already approved automated systems.

b. <u>FGIS Field Offices and Agency Manager Responsibilities</u>.

(1) <u>Make Initial Survey</u>.

Make initial survey of automated weighing sites and evaluate official equipment and staffing needs.

(2) <u>Notify Bargaining Unit</u>.

Inform employee representatives of industry and agency intentions regarding use of automation.

(3) <u>Select Project Lead</u>.

Designate an "Automation Project Leader" whose duties include but are not limited to the, following functions.

(a) Provide liaison between the Policies, Procedures, and Market Analysis Branch (PPMAB), field office, and the elevator during the installation of automated equipment.

(b) Write and publish a SOP using the outline provided by PPMAB's engineering staff.

(c) Assist in developing training aids for field office personnel and perform approval testing of equipment and software.

(d) Provide training in the operation of automated systems with technical assistance from PPMAB's engineering staff.

(e) Offer suggestions to improve the installation, operation, or security of automated official equipment.

(4) <u>Check and Maintain Security of the Systems</u>.

Including but not limited to:

(a) hardware locks and seals;

(b) software modifications;

(c) password security and revisions; and

(d) approve, document, and monitor any changes made to the scales or material handling systems.

5) Periodically Check.

Perform periodic system tests to assure system integrity, security, and correct operation (6 month check).

(6) Confirmed Project Finished.

Provide final approval that the automated system meets the needs of the field office for providing official service.

c. Facility Responsibilities.

(1) Make Proposal.

Provide FGIS with a detailed initial automation proposal.

(2) Supply Control Design Specifications.

Provide FGIS with a complete hardware and software design specification.

(3) Supply Documentation.

Provide complete documentation on any changes to hardware, software, and operations from the original proposal.

(4) Check Compliance.

Assure all automation hardware and software complies with FGIS requirements.

(5) Turnover Final Listing.

Provide FGIS with a complete final hardware and final software design specification.

(6) Assist in Training.

Provide assistance in training of official personnel by making the system and all necessary equipment available for initial and ongoing training as determined by FGIS.

d. Recommended Project Outline for Automation Approval.

(1) Official Proposal from Elevator.

(a) Initial contact made with local field office.

(b) Review and evaluation by PPMAB.

(c) Written approval/disapproval of proposal from PPMAB.

(d) Information to field office from PPMAB.

(2) Technical Oversight Provided by PPMAB.

(a) Checks of proposed security measures.

(b) Instruction to field office on system parameters.

(c) Guidance to facility on system installation (aided by field office).

(d) Initial system inspections (aided by field office).

(3) Hardware and Software Installation by Elevator.

(4) Final Testing and Approval by Field Office and PPMAB.

(a) Six-month evaluation testing monitored by field office.

(b) Training of FGIS inspectors provided by field office and PPMAB.

(c) Errors in the system recorded and reported by field office.

(d) All reported system problems corrected by elevator.

(e) System approval given by field office and PPMAB.

(f) Final approval for official weighing given by FOM.

(g) Written final acceptance from FMD to elevator.

(5) Completion of All Documentation.

(a) Necessary documentation from all parties - elevator, field office, and PPMAB.

(b) For future use in evaluation and testing.

CHAPTER 2
DOCUMENTATION OF OFFICIAL WEIGHING SERVICES

Contents

2.1 GENERAL CERTIFICATE INFORMATION

a. Authority.

Section 7A (g) of the U.S. Grain Standards Act, as amended, states when official weighing service results in the issuance of an official weight certificate that all courts in the United States receive this certificate as prima facie evidence of the truth of the facts (weights) stated. Official personnel certify that all information furnished on the certificate and all supporting fact documents corroborate each certificate.

b. Approval of Certificate Forms and Supporting Fact Documents.

The Policies, Procedures, and Market Analysis Branch approves supporting fact documents used by FGIS and Official Service Providers (OSP) (including locally generated forms). For instructions on ordering see the FGIS Forms Catalog.

Field Office Managers review and make final approval on certificates designed by or printed for grain merchandising firms, and provide direction to delegated State agencies, or designated weighing agencies when called for.

OSP managers are responsible for printing certificates following Sections 800.161and 800.165 of the regulations, the instructions in Chapter 3 of the Grain Inspection Handbook, and this Handbook. Any omissions or errors in printing are the responsibility of the designated official service provider to correct.

c. Disposition of Official Weight Certificates.

The issuing agency retains one copy of each certificate and all supporting fact documents for 5 years from the date of issuance.

(1) Export. For export grain, the applicant receives the original and a minimum of three copies.

(2) Nonexport. For nonexport grain, the applicant receives the original and at least one copy of each certificate on the date of service. If the applicant does not need immediate delivery, then deliver the certificates following their instructions. In the case of inbound trucklot grain, the driver of the truck or the person who owns the grain at the time of delivery also receives one copy of the certificate.

d. Accountability for Official Certificates.

Protect preprinted certificates against loss or misuse.

(1) Security.

Keep preprinted certificates locked in a secure place or in the physical possession of official personnel.

(2) Records of Unused Certificates.

Maintain records of unused preprinted prenumbered certificates showing : (1) the blocks of numbers of official certificates as shown on the invoice at delivery; (2) any missing numbers that are specified by the printer; and (3) signed receipts showing the blocks of numbers, or the numbers of individual certificates furnished to subordinate designated weighing points or official personnel.

(3) Records of Completed Certificates.

Records of completed certificates issued include: (1) a copy of each certificate with copies of all documentation supporting the certificate; (2) filling in either numerical or subject order; and (3) all voided certificates.

To void a certificate, write or stamp “Void” and the reason for voiding (if it is not obvious) across the face of the certificate, and file the original. Destroy other copies of the original certificate. Applicants may, for recording keeping purposes only, receive a copy of a clearly marked voided certificate.

(4) Protection of Negatives for Printing.

Protect the negatives used in the production of official certificates against misuse, including the negatives used by grain companies or commodity firms in the printing of special designed weight certificates.

When issuing electronically generated certificate numbers, GIPSA field offices and OSP have assigned alpha characters to precede the number of the certificate that the program assigns automatically. The Agency alpha characters are listed in Chapter 3 of the Grain Inspection Handbook, for GIPSA field offices, the alpha characters are usually generated the first two letters of the field office name.

e. Ordering Certificates for Weighing Services.

(1) Field Offices.

Field offices order all preprinted certificates from the Field Operations Support Staff. When the field office supply gets down to 3 months, order another 6-month supply of certificates.

(2) Official Service Providers.

OSP's supply their own preprinted nonexport grain, nonexport commodity, and supervision of weighing certificates. Field offices or Compliance Division, Review Branch, verify proper accountability and sufficient security of certificates during reviews.

(3) Special Design Certificates.

Facilities wanting certificates designed to meet special marketing needs, purchase their own certificates once after the field office manager has approved the design. Local FGIS field offices and OSP's take delivery of these certificates for accountability and control.

When there is a 3-4 month supply of the special design certificates the field office or OSP's responsible contacts the facility to supply more certificates. Calculate the number of certificates needed and decide on the renumbering sequence. This is the best time for the facility to request any changes to the certificate. The field office manger or OSP manger can then approve the certificate for reprinting, or review the amended certificate before final printing has begun. When the firm is ready to reorder, the responsible OSP returns the retained negatives to the printer for additional printing. See section 2.2 for information on filling out special design certificates.

f. Preparation of Official Weight Certificates.

(1) Information Entry.

The facility weigher may enter all information on a certificate except the handwritten gross, tare, or net weight. Only official personnel enter handwritten gross, tare, or net weight amounts. Verify all information on the certificate as true and accurate before signing it. Line through any blocks not used for the net weight.

(2) Export Certificates.

Type all preprinted export certificates, except those issued for rail or truck shipments to Canada or Mexico, which may be legibly handwritten in black ink when the use of an electronic means is not feasible. On the original, show both the printed name and the signature of the person who issues the export certificate. Signatures must be in blue ink for rail and truck shipments to Mexico. Do not use abbreviations on export certificates.

(3) Other than Export Certificates.

Other preprinted certificates may be type, handwritten in ink, or printed using automatic printing equipment. Write clearly and legibly when handwriting certificates.

(4) Signature.

The licensed or authorized person is in the best position to know whether the final determinations of the final weighing are accurate and true issue the certificate. When an authorized agent, other than the official weigher, affixes a name or signature keep on file at the field office or service providers headquarters a document appointing the agent as the power of attorney to affix signature(s). Export certificates must be signed. On export computer-generated certificates, the licensed or authorized person signs the original. Record FGIS weighers' or licensed person's full names on certificates.

g. Mistakes on Official Weight Certificates.

(1) Export Certificates.

Each export certificate must be free of errors, typographical corrections, or abbreviations.

(2) Nonexport Certificates.

Prepare another certificate is any errors are made in the identification of the carrier or container, or if any weight information (gross, tare, or net weight) is incorrect. Otherwise corrections are allowed if: (1) the corrections are neat and legible; (2) the authorized person correcting the certificate initials the correction; (3) the corrections and initials appear on the original and all copies of the certificate.

(3) Custom Designed Certificates.

Most operations using custom designed certificates allow the use of next consecutively numbered certificate when a void is necessary. In systems where a custom designed certificate cannot replace a voided one, use a standard Official Grain Weight Certificate FGIS-960 or Commodity Weight Certificate FGIS-7, to correct the voided certificate. In either case, clearly mark the original and all copies "VOID". The issuing agency retains the original. The elevator may keep as many copies as necessary for accounting purposes. Destroy all other copies.

h. Corrected Official Weight Certificates.

To correct errors found after the delivery of a certificate, collect the original and all copies, if possible, and replace with a corrected copy (refer to section 2.4).

Exhibit A. FGIS-960, Official Grain Weight Certificate

3 FORM FGIS-960 JAN 07

1 UNITED STATES DEPARTMENT OF AGRICULTURE

FEDERAL GRAIN INSPECTION SERVICE

2 U.S. GRAIN STANDARDS ACT

4 OFFICIAL GRAIN WEIGHT CERTIFICATE

US CLASS X WEIGHTS

EXAMPLE ONLY – NOT FOR OFFICIAL USE

5 ORIGINAL

11 US-NOFO-1-01088

6 NOT NEGOTIABLE

8 IDENTIFICATION: M/V GRAND VOYAGE

18 ISSUED AT: DESTREHAN, LA

7 LOCATION: Elevator B New Orleans, LA

10 DATE OF SERVICE: January 13, 2009

13 NET WEIGHT: 11,456,370 Pounds

9 TYPE OF MOVEMENT: Export

14 START DATE: January 13, 2009

15 START TIME: 7:00

16 FINISH TIME: 11:00

12 KIND: Corn

17 FEDERAL GRAIN INSPECTION SERVICE • U.S. DEPARTMENT OF AGRICULTURE •

REMARKS: Stowage: Holds 1 & 2

19

23 I CERTIFY THAT THE SERVICES SPECIFIED ABOVE WERE PERFORMED WITH THE RESULTS STATED.

NAME OR SIGNATURE: Diane K Palecek

20 APPLICANT NAME: A & B Exporters

21 ISSUING OFFICE: FGIS - New Orleans Field Office

22 EXAMPLE ONLY – NOT FOR OFFICIAL USE

i. Information Required on Official Weight Certificates.

FGIS requires that certificates contain the following information within its written or printed terms.

(1) Caption “United States Department of Agriculture.” Designated OSP’s omit and replace with issuing service provider.

(2) Caption “Federal Grain Inspection Service” or, issuing official service provider (on official service provider non export certificates only; otherwise use FGIS certificates.

(3) Official agency seal (for USDA, the emblem) embossed on all copies.

(4) Applicable form title “Official Grain Weight Certificate.”

(5) Original or copy.

(6) Caption “Not negotiable.”

(7) Location of grain.

(8) Identification of the grain (Carrier Identification).

(9) Type of movement (check only one block).

(10) Date of Service.

(11) Consecutive number of the certificate together with the lettered prefix assigned to the official service provider. Alphanumeric identifiers are listed in the Grain Inspection Handbook, Book IV.

(12) Type of grain or commodity covered by the certificate.

(13) Net Weight (pounds or metric tons, as applicable).

(14) Date loading started.

(15) Time loading started.

(16) Time loading was completed.

(17) FGIS Logo, optional for designated official service providers. Print logo with 10 percent solid black color in 133 line screen in the center of the certificate on the original and all copies. The logo has a 3-inch diameter.

(18) Field office, official service provider, or specified service point location where issued.

(19) Remarks, Permissive statements and information may be shown on OSP or FGIS letterhead stationery instead of official certificates if: (1) space does not permit showing statements or information on the official certificate or letterhead stationery is found by the OSP or field office to be more suitable than a certificate; (2) the identification of the corresponding certificate is referred on the letterhead stationery; and (3) the letterhead stationery is distributed with each copy of the certificate in accordance with section 2.1 (C).

(20) Applicant for weighing service.

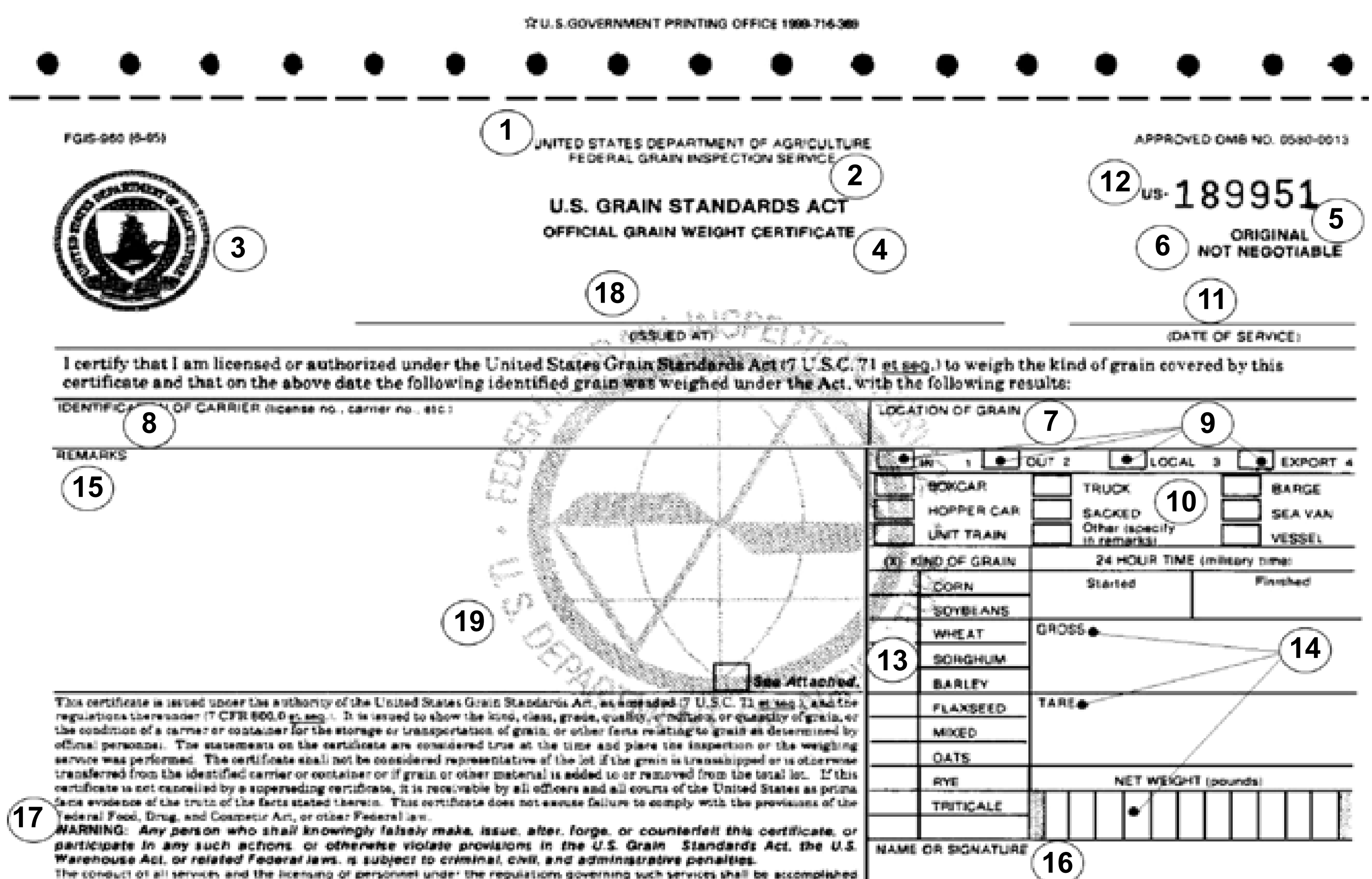
(21) Office where the weight certificate was issued.

(22) Mandatory statements required by the regulations (see section 2.2).

(23) Signature of the weigher or the authorized representative who is officially certifying the weighing service performed.

In addition, the certificate may include any information known to be true and not inconsistent with the Act or other regulations, having a direct bearing on the certificate issued. At the request of the applicant, show load order numbers; purchase authorization numbers; preference numbers; contract numbers; numerical grade, kind, and class of grain officially inspected; or their identifications. Do not include bushel conversions on a certificate.

Exhibit B. FGIS-960, Official Grain Weight Certificate



j. <u>Information Required on Official Weight Certificates</u>.

FGIS requires that certificates contain the following information within its written or printed terms.

(1) Caption “United States Department of Agriculture.” Designated OSP’s omit and replace with issuing service provider.

(2) Caption “Federal Grain Inspection Service” or, issuing official service provider (on official service provider non export certificates only; otherwise use FGIS certificates.

(3) Official agency seal (for USDA, the emblem) embossed on all copies.

(4) Applicable form title “Official Grain Weight Certificate.”

(5) Original or copy.

(6) Caption “Not negotiable.”

(7) Location of grain.

(8) Identification of the grain (Carrier Identification).

(9) Type of movement (check only one block).

(10) Type of carrier.

(11) Date of Service.

(12) Consecutive number of the certificate together with the lettered prefix assigned to the official service provider. Alphanumeric identifiers are listed in the Grain Inspection Handbook, Book IV.

(13) Type of grain or commodity covered by the certificate.

(14) Gross, Tare, and Net Weight (pounds or metric tons, as applicable). Slashes in the net weight block are not required.

(15) Remarks.

(16) Signature of the weigher or the authorized representative who is officially certifying the weighing service performed.

(17) Mandatory statements required by the regulations (see section 2.2).

(18) Field office, official service provider, or specified service point location where issued.

(19) FGIS Logo, optional for designated official service providers. Print logo with 10 percent solid black color in 133 line screen in the center of the certificate on the original and all copies. The logo has a 3-inch diameter.

(20) Permissive statements and information may be shown on OSP or FGIS letterhead stationery instead of official certificates if: (1) space does not permit showing statements or information on the official certificate or letterhead stationery is found by the OSP or field office to be more suitable than a certificate; (2) the identification of the corresponding certificate is referred on the letterhead stationery; and (3) the letterhead stationery is distributed with each copy of the certificate in accordance with section 2.1 (C).

(21) In addition, the certificate may include any information known to be true and not inconsistent with the Act or other regulations, having a direct bearing on the certificate issued. At the request of the applicant, show load order numbers; purchase authorization numbers; preference numbers; contract numbers; numerical grade, kind, and class of grain officially inspected; or their identifications. Do not include bushel conversions on a certificate.

2.2 CERTIFICATES

This section of Chapter 2 displays types of available certificates. Table 1 at the end of this section shows the required certificate statements. Use these examples to approve special design certificates and make official service provider certificates. For the approved statements to place on certificates in various weighing situations, see “Approved Statements,” Section 2.4.

Exhibit C1. Form FGIS-960, Official Grain Weight Certificate

UNITED STATES DEPARTMENT OF AGRICULTURE
FEDERAL GRAIN INSPECTION SERVICE
U.S. GRAIN STANDARDS ACT

OFFICIAL GRAIN WEIGHT CERTIFICATE

US CLASS X WEIGHTS

EXAMPLE ONLY – NOT FOR OFFICIAL USE

ORIGINAL
US-NOFO-1-01088
NOT NEGOTIABLE

ISSUED AT: DESTREHAN, LA

DATE OF SERVICE: January 13, 2009

IDENTIFICATION: M/V GRAND VOYAGE

LOCATION: Elevator B, New Orleans, LA

NET WEIGHT: 11,456,370 Pounds

TYPE OF MOVEMENT: Export

START DATE: January 13, 2009

START TIME: 7:00

FINISH TIME: 11:00

KIND: Corn

REMARKS: Stowage: Holds 1 & 2

APPLICANT NAME: A & B Exporters

NAME OR SIGNATURE: Diane K Palecek

ISSUING OFFICE: FGIS - New Orleans Field Office

EXAMPLE ONLY – NOT FOR OFFICIAL USE

Exhibit C2. Form FGIS-960, Official Grain Weight Certificate

☆U.S.GOVERNMENT PRINTING OFFICE 1999-716-369

FGIS-960 (6-95)

UNITED STATES DEPARTMENT OF AGRICULTURE
FEDERAL GRAIN INSPECTION SERVICE

U.S. GRAIN STANDARDS ACT
OFFICIAL GRAIN WEIGHT CERTIFICATE

APPROVED OMB NO. 0580-0013

US-189951

ORIGINAL
NOT NEGOTIABLE

(ISSUED AT) (DATE OF SERVICE)

I certify that I am licensed or authorized under the United States Grain Standards Act (7 U.S.C. 71 et seq.) to weigh the kind of grain covered by this certificate and that on the above date the following identified grain was weighed under the Act, with the following results:

IDENTIFICATION OF CARRIER (license no., carrier no., etc.)

LOCATION OF GRAIN

REMARKS

☐ See Attached.

☐ IN 1 ☐ OUT 2 ☐ LOCAL 3 ☐ EXPORT 4

☐ BOXCAR ☐ TRUCK ☐ BARGE
☐ HOPPER CAR ☐ SACKED ☐ SEA VAN
☐ UNIT TRAIN ☐ Other (specify in remarks) ☐ VESSEL

(X) KIND OF GRAIN: CORN, SOYBEANS, WHEAT, SORGHUM, BARLEY, FLAXSEED, MIXED, OATS, RYE, TRITICALE

24 HOUR TIME (military time): Started / Finished

GROSS

TARE

NET WEIGHT (pounds)

NAME OR SIGNATURE

This certificate is issued under the authority of the United States Grain Standards Act, as amended (7 U.S.C. 71 et seq.), and the regulations thereunder (7 CFR 800.0 et seq.). It is issued to show the kind, class, grade, quality, condition, or quantity of grain, or the condition of a carrier or container for the storage or transportation of grain; or other facts relating to grain as determined by official personnel. The statements on the certificate are considered true at the time and place the inspection or the weighing service was performed. The certificate shall not be considered representative of the lot if the grain is transshipped or is otherwise transferred from the identified carrier or container or if grain or other material is added to or removed from the total lot. If this certificate is not cancelled by a superseding certificate, it is receivable by all officers and all courts of the United States as prima facie evidence of the truth of the facts stated therein. This certificate does not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act, or other Federal law.

WARNING: *Any person who shall knowingly falsely make, issue, alter, forge, or counterfeit this certificate, or participate in any such actions, or otherwise violate provisions in the U.S. Grain Standards Act, the U.S. Warehouse Act, or related Federal laws, is subject to criminal, civil, and administrative penalties.*

The conduct of all services and the licensing of personnel under the regulations governing such services shall be accomplished without discrimination as to race, color, religion, sex, national origin, age, or handicap.

a. <u>Form FGIS-960 Official Grain Weight Certificate (Exhibit C1-C2)</u>.

The Form FGIS-960 is a white, general purpose official grain weight certificate. It may be used for all inbound, out bound, local transfers, grain dust, grain screenings, and export lots of grain weighed under Class X requirements. This certificate may also be used when combining lots (e.g., certification of several barges on one certificate or certification of a unit train on one certificate). Refer to section 2.4. For mandatory statements required by the regulations, see Table 1, page 2-15.

Exhibit D. Form FGIS-964, Supervision of Grain Weight Certificate

FORM FGIS-964
JAN 07

UNITED STATES DEPARTMENT OF AGRICULTURE
FEDERAL GRAIN INSPECTION SERVICE
U.S. GRAIN STANDARDS ACT

Approved OMB No. 0580-0013

SUPERVISION OF GRAIN WEIGHT CERTIFICATE

ORIGINAL
US-NOFO-1-01092
NOT NEGOTIABLE

US CLASS Y WEIGHTS

EXAMPLE ONLY – NOT FOR OFFICIAL USE

	ISSUED AT: DESTREHAN, LA	**DATE OF SERVICE:** January 13, 2009
IDENTIFICATION: SEE REMARKS	**LOCATION:** Elevator C, New Orleans, LA	**NET WEIGHT:** 800,000 Pounds
TYPE OF MOVEMENT: In		
START DATE: January 13, 2009	**START TIME:** 7:00	**FINISH TIME:** 7:30

CLASS Y WEIGHING

KIND: Corn

REMARKS:
TRNX3345, ABCS4545, BSBS0101, TRNX5050

FEDERAL GRAIN INSPECTION SERVICE • U.S. DEPARTMENT OF AGRICULTURE •

I CERTIFY THAT THE SERVICES SPECIFIED ABOVE WERE PERFORMED WITH THE RESULTS STATED.

APPLICANT NAME: Bulk Weighing Facility

NAME OR SIGNATURE: Diane K Palecek

SUPERVISING OFFICE: FGIS - New Orleans Field Office

THE CLASS Y GRAIN WEIGHTS INDICATED ON THIS CERTIFICATE WAS DETERMINED BY PERSONS EMPLOYED BY OR AT THE IDENTIFIED FACILITY WHO ARE OCCASIONALLY SUPERVISED BY THE SUPERVISING AGENCY. THE SUPERVISING AGENCY DO NOT DETERMINE THE WEIGHT OF GRAIN IDENTIFIED ON THIS CERTIFICATE.

EXAMPLE ONLY – NOT FOR OFFICIAL USE

b. <u>Form FGIS-964, Supervision of Grain Weight Certificate (Exhibit D)</u>.

The Supervision of Grain Weight Certificate (Form FGIS-964) is used for certifying all movements covered under an applicant's request for Class Y weighing service. The facility authorized to weigh keeps the original scale tape or scale tickets for all Class Y weighing completed. The supervising field office or official may request that facilities surrender all tapes and file copies of issued certificates for filing. Elevator weighers issue a Supervision of Grain Weight Certificate (Form FGIS-964) for each carrier under the agreement with the supervising agency. See the Class Y section of Chapter 1, section 1.6 of the Weighing Handbook for procedures.

Exhibit E. Form FGIS-7, Commodity Weight Certificate

FORM FGIS-7
JAN 02

UNITED STATES DEPARTMENT OF AGRICULTURE
FEDERAL GRAIN INSPECTION SERVICE
AGRICULTURAL MARKETING ACT OF 1946

COMMODITY WEIGHT CERTIFICATE

ORIGINAL
US-STFO-1-00321
NOT NEGOTIABLE

EXAMPLE ONLY – NOT FOR OFFICIAL USE

ISSUED AT: STUTTGART, AR
DATE OF SERVICE: January 13, 2009

IDENTIFICATION: OX 63638
LOCATION: Stuttgart, AR
NET WEIGHT: 42,000 Pounds

TYPE OF MOVEMENT: Out

START DATE: January 13, 2009
START TIME: 8:00
FINISH TIME: 9:00

COMMODITY: Milled Rice

REMARKS:

FEDERAL GRAIN INSPECTION SERVICE • U.S. DEPARTMENT OF AGRICULTURE •

I CERTIFY THAT THE SERVICES SPECIFIED ABOVE WERE PERFORMED WITH THE RESULTS STATED.

APPLICANT NAME: A & B Rice Mill
NAME OR SIGNATURE: Diane K Palecek

ISSUING OFFICE: FGIS - Stuttgart Field Office

EXAMPLE ONLY – NOT FOR OFFICIAL USE

c. <u>Form FGIS-7, Commodity Weight Certificate (Exhibit E)</u>.

Use this certificate when bulk weighing export commodities covered by the Agricultural Marketing Act. See Chapter 6 of the Processed Commodities Handbook for additional procedures for certifying checkweighing results on the certificate.

TABLE 1. STATEMENTS FOR OFFICIAL GRAIN WEIGHT CERTIFICATES UNDER THE USGSA

FORM	STATEMENT
Form FGIS-960	"I certify that I am licensed or authorized under the United States Grain Standards Act (7 U.S.C. 71 et seq.) to weigh the kind of grain covered by this certificate, and that on the above date the following identified grain was weighed under the Act, with the following results:"
Form FGIS-964	"I certify that I am EMPLOYED by or at the IDENTIFIED FACILITY and approved to weigh the kind of grain covered by this certificate, and that on the above date the following identified grain was weighed with the following results:"
Form FGIS-960	WARNING: Any person who shall knowingly falsely make, issue, alter, forge, or counterfeit this certificate, or participate in any such actions, or otherwise violate provisions in the U.S. Grain Standards Act, the U.S. Warehouse Act, or related Federal laws, is subject to criminal, civil, and administrative penalties."
Form FGIS-960	"This certificate is issued under the authority of the United States Grain Standards Act, as amended (7 U.S.C. 71 et seq) and the regulations thereunder (7 CFR 800.0) It is issued to show the kind, class, grade, quality, condition or quantity of grain; or the condition of a carrier or container for the storage or transportation of grain; or other facts relating to grain as determined by official personnel. The statements on the certificate are considered Form FGIS-960, true at the time and place the inspection and weighing was performed. The certificate shall not be considered representative of the lot if the grain is transshipped or is otherwise transferred from the identified carrier or container or if grain or other material is added to or removed from the total lot. If this certificate is not canceled by a superseding certificate, it is receivable by all officers and all courts of the United States as prima facie evidence of the truth of the facts stated therein. This certificate does not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act, or other Federal law.
All	According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB controls for this information collection is ________. The time required to complete this information collection is estimated to average ________ minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information
All	The conduct of all services and the licensing of personnel under the regulations governing such services shall be accomplished without discrimination as to race, color, religion, sex, national origin, age, or handicap.
Form FGIS-964	"THE CLASS Y WEIGHT INDICATED ON THIS CERTIFICATE WAS DETERMINED BY PERSONS EMPLOYED BY OR AT THE IDENTIFIED FACILITY WHO ARE OCCASION-ALLY SUPERVISED BY THE SUPERVISING AGENCY. THE SUPERVISING AGENCY DID NOT DETERMINE THE WEIGHT OF THE GRAIN IDENTIFIED ON THIS CERTIFICATE. "This certificate is issued under the authority of the United States Grain Standards Act, as amended (7 U.S.C. 71 et seq.), and the regulations thereunder (7 CFR 800.0 et seq.) to show the weight of grain at the time and place of weighing. It may not represent the weight at a different date or place. The statements on the certificate are considered true at the time and place the weighing was performed. If this certificate is not canceled by a superseding certificate, it is receivable by all officers and all courts of the United States as prima facie evidence of the truth of the facts stated therein. This certificate does not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act, or other Federal law.
*Place the statements above on the original and all copies of the official grain weight certificates. Place the statements on the certificates listed on the corresponding column of the statements. ** U.S. Government Certificates only*	

2.3 DOCUMENTATION

This section of Chapter 2 deals with documentation of grain weight and grain flow integrity. This information provides a backup for official and supervision of grain weight certificates. The logs, tapes and tickets are admissible as prima facie court evidence and will be used as proof that certificates are correct. Therefore, it is important that the weigher enter as much clear, concise, and accurate information as possible. Information or unusual events that might relate to the grain weight (e.g., light loads, open hatch covers, appearances of pilferage, etc.) should be documented on the appropriate scale tape/ticket, or on a sheet of paper attached to the scale tape ticket when logs are not used. Supervisors are responsible to assure logs are correctly used and those official personnel record all necessary information.

a. Scale Tapes/Tickets.

Scale tapes. Scale tapes/tickets are supporting fact documents to the log and certificate. The gross and tare weights are recorded on the tapes/tickets as the grain is weighed. Official personnel should record the following information on each tape/ticket if the scale does not preprint the information (required): gross weight(s), tare weight(s), total net weight, kind of grain, date, time, sublot number, scale number, carrier identification, tape identification, and authorized or licensed weigher's initials or signature. Rubber stamps with labeled spaces for this information may be used to assure that it is included on the tape/ticket. Scale tape/ticket identification may be numbered consecutively or numerically alphabetized. Retain the original tape with the certificate or log for 5 years. Do not allow manual manipulation of the printer's scale tape/ticket weight, except for those devices controlled and supervised by licensed or authorized personnel. Additions or subtractions to the printed total to account for spills may be entered by hand. Official personnel should initial all notations or changes to scale tapes, next to the change. If weighing stops (e.g., lunchtime), either subtotal and initial the tape, or total and remove the tape from the printer. When weighing resumes, subtotal the tape and verify that the weight matches before resuming using either method.

(1) Electronic Scale Tape Verification.

Verify weight display values with printed weight values on each weight entry when elevator scales are manually operated. Periodically verify the draft weight display value to the printout to assure proper system operation when electronic scales operate in the automatic mode, and to assure proper system operation and detect printer malfunctions promptly.

(2) Multiple Weight Displays and Printers (Home and Remote).

Use the tape from the official printer (designated by the field office manager or scale specialists) for certification and record keeping purposes. About three to four times per shift, crosscheck agreement of printed weight values from all printers with one another. Stop weighing at once if there are differences. Differences between the printers could indicate possible printer problems.

Promptly inform the scale specialist of the problem and document the occurrence in the FGIS-963, Scale Record Log.

When supervising the weighing of export shiplots, document the scale tapes in one of the following ways:

(a) Sublot Method.

At the end of a sublot, total or subtotal the tape(s). Place the sublot number and your initials next to the total or subtotal. If the tape's weight is a subtotal, manually calculate the weight the tape represents of the sublot, and place on the tape with all the other required information. Do not splice tapes with adhesive tape. Number the tape parts and identify the parts on the Weight Loading Log. Check the scale tape(s) for errors before transferring to the FGIS-968.

(b) Subtotal Method.

Subtotal the tape and place the weight of the subtotal on the FGIS-968, Weight Loading Log. Check the scale tape for errors, initial it and if not printed, record the time for the subtotal on the tape. Section 2.3 (B) (2), How to Complete the Weight Loading Log gives instructions on how to determine which method to use.

b. Certificates as Source Documents.

Record the scale number or designate on the certificate when the certificate or special design certificate is used to record weight impressions from printers (e.g., on some inbound truck scales).

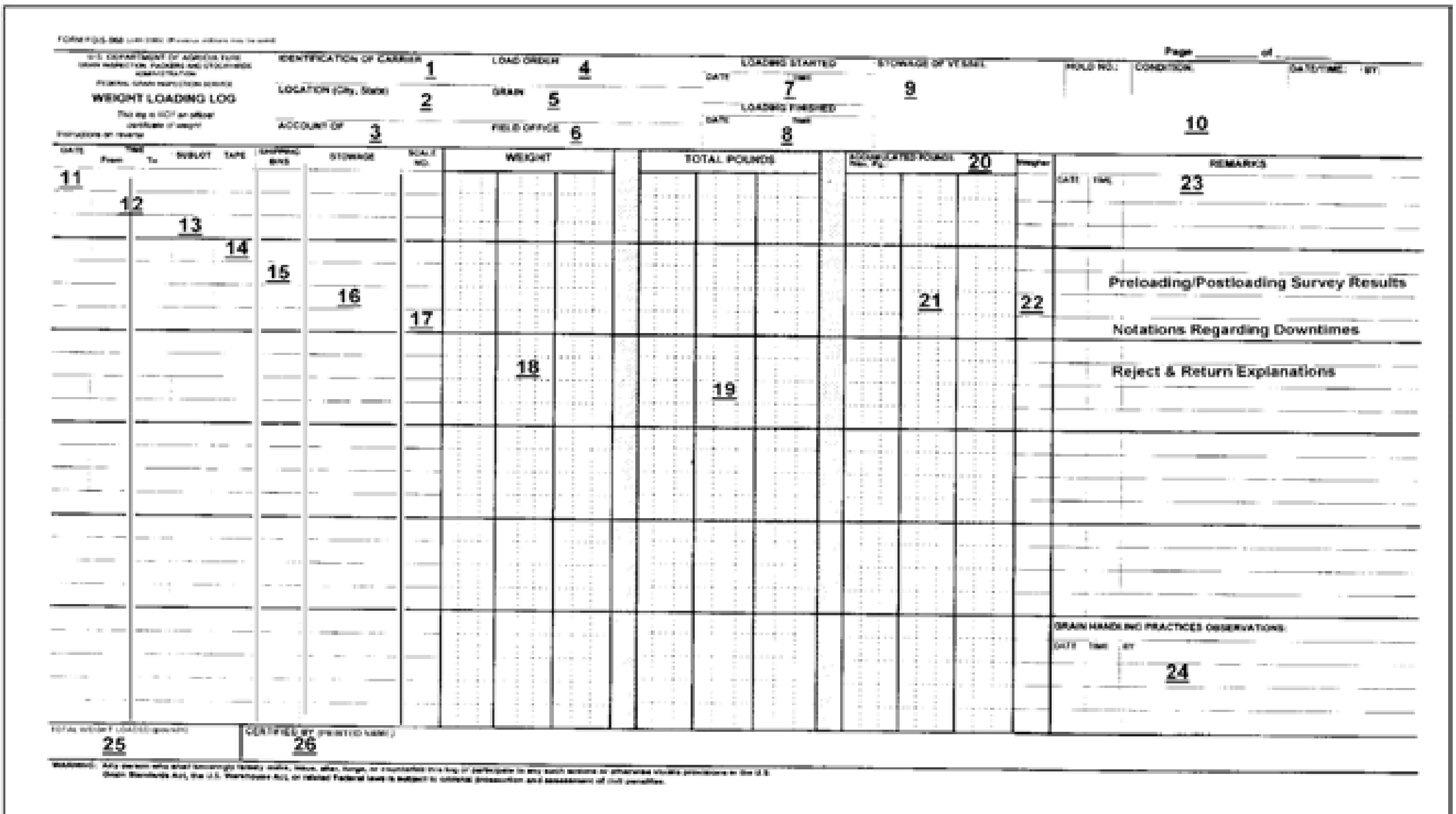
c. FGIS-968, Weight Loading Log.

Use the Weight Loading Log, FGIS-968, for documenting events as they occur when weighing shiplot grain. It adapts to shipping bin and continuous loading systems. All agencies and field offices are required to use the Weight Loading Log (FGIS-968) for export shiplot grain, unless otherwise approved by the Policies, Procedures, and Market Analysis Branch.

(1) Use as Documentation.

Use the weight loading log to document the exact loading history of shiplot grain. It is the primary support document to the Official Grain Weight Certificate. Use it to document the grain flow by using shipping bin numbers, stowage, remarks, etc. The entries must be accurate and neat to reconstruct the events that occur during the weighing and loading of a ship.

Exhibit F. FGIS-968 Weight Loading Log



FGIS-968, Weight Loading Log Instructions

(1) Identification of Carrier - Name of ship, number, etc.

(2) Location (City and State) - Location of grain facility.

(3) Account of - The name of the grain facility (e.g., Cargill Irving Elevator). If the elevator is not the owner of the grain, record the elevator and the owner (e.g., Public Elevator/ Concourse Grain Company).

(4) Load Order - Contract load order number for the lot. Entry optional.

(5) Grain - Kind of grain.

(6) Field Office - The field office that has jurisdiction over the grain facility. This entry may also include State jurisdiction (e.g., NOFO/State of Alabama).

(7) Loading Started - Time and date the first grain was loaded aboard the vessel. Record in Military time.

(8) Loading Finished - Time and date all the grain was properly stowed aboard the vessel. Record in Military time.

(9) Stowage of Vessel - List the holds into which the grain was loaded and notation on the type of ship, i.e., tanker, ‘tween decker, etc. When the stowage is identical to inspection, this entry may be omitted. Write “See Inspection Log” in the stowage space.

(10) Hold No. – Condition, date, time, and initials of inspector for PRIOR-TO-LOADING STOWAGE RESULTS. This entry may be omitted. See “STOWAGE OF VESSEL”.

(11) Date - Date of sublot/subtotal cutoff.

(12) Time - Start and finish time for the sublot or subtotal. This entry may not be on an individual tape basis. Record in Military time.

(13) Sublot - This entry will correspond to the inspection sublot number. This may not be applicable at elevators that are using the subtotal method.

(14) Tape – The number of the scale tape corresponding to the subtotal or sublot entry.

(15) Shipping Bins – If the elevator has a shipping bin system, record bin numbers here to ensure grain flow integrity. If the elevator does not use shipping bins, leave this column blank.

(16) Stowage – Record stowage for the sublot or subtotal. This entry is optional when inspection stowage is identical. If the entry is omitted, write "See Inspection Log" in the stowage column.

(17) Scale No. - Number of scale used for the corresponding entry.

(18) Weight - Record the amount of grain weighed on the corresponding scale.

(19) Total Pounds - Record the total amount of grain weighed for the sublot or subtotal. If the elevator uses more than one scale, add all weights for the scales used and record that amount in this column.

(20) Accumulated Pounds Prev. Pg. - Use this space to record the total accumulated pounds from the previous page.

(21) Accumulated Pounds - Use this column to keep a running total of pounds for the ship.

(22) Weigher – Initials of the weigher responsible for this line of the log.

(23) Remarks – This column will be used to record anything associated with, or unusual to, the weighing operation and certification of the shiplot. Date and time columns are provided for recording when these events occur.

- stowage examination results;
- results of the preloading survey;
- notations regarding downtimes in the weighing or loading operation (e.g., lunch,
- weather, overnight, etc.);
- notations on scale malfunctions;
- weighback weights and explanations for the weighbacks;
- rejected and returned (R&R) explanations;
- notations regarding periodic verification of control board indicators and actual house setting;
- results of the postloading survey;
- cutoff weights and times;
- final corrections for spills;

(24) Grain Handling Practices Observations – Date, time, and inspector's initials making tours of facilities following Grain Handling Practices instructions.

(25) Total Net Weight Loaded – The total amount of grain officially weighed.

(26) Certified By (signature) – Signature of the weigher who finished the ship, the last weigher to work the log.

(2) How to Complete the Weight Loading Log.

Keep the log as neat and legible as possible. Cross out, with one red line, rejected and returned shipping bins. Explain in the “Remarks” column or “Stowage” block why the bin was returned, and adjust the accumulated pounds to the correct weight if necessary. Record the amount adjusted (total pounds column) in red. Log all grain weighed, rejected, or voluntarily returned on the weight loading log. If the elevator voluntarily returns weighed grain, write “The elevator elected to return.” Be sure to document the delivery system cleanout verification when lots change or finish (e.g., shipping bins, belts, etc.).

Do not use “white out” on the Weight Loading Log. Draw a line through any mistakes and initial the new entry. Obtain the final total for spills at the end of the ship. If the elevator elects to have the spilled amount subtracted, enter the time and amount in the “Remarks” section and adjust the accumulated pounds. If the elevator elects to replace the spilled amount with a like amount of grain, record the amount, time, and the scale used in the remarks section of the FGIS-968. Retain the FGIS-968 with the scale tapes for 5 years.

Of the two methods of completing the FGIS-968, sublot and subtotal, use the sublot method whenever possible.

(a) Sublot Method.

Use the sublot method when the sublot weight correlates with the official grain sample.

1 When the sublot completes, total or subtotal the tape(s) on the FGIS-968, Weight Loading Log.

2 Record the weight for each scale in the weight column (18) “Weight” corresponding with the scale and tape numbers in columns (14) “Tape” and (17) “Scale No.” Record the tape’s sublot net weight only in column (18) “Weight”, not tape subtotals.

3 Place the total weight for the sublot, the sum of all tapes for the sublot in column (19), adjacent to the last tape entered for the sublot.

4 Add the total for the sublot to the previous accumulated pounds total column (21).

Any other pertinent information concerning the sublot goes in the “Remarks” area. Notify the inspector when the sublot completes and give the inspector the start/finish times and weight.

(b) Subtotal Method.

Use the subtotal method when the weighed grain from the scales does not correlate with the official grain sample (e.g., surge or shipping bins located between scales and D/T mechanical samplers).

1 Subtotal each scale and place the subtotal for each scale in the weight column (18) “Weight” and the corresponding scale number in the scale column (17) “Scale No.” at shipping interruptions such as lunch, shift changes, or at any other interval the field office manager deems appropriate.

2 Place the total of the weights in the “Total Pounds” column (19).

3 Add the total pounds to the previous accumulated weight and place the new accumulated weight of the vessel in the accumulated pounds column (21).

d. Automated Weighing System Documentation.

An automated weighing monitoring system is a computerized system intended to run without continual monitoring by an inspection/weighing team. These systems, evaluated and approved by GIPSA, must perform as many of the weigher tasks as possible automatically. An inspector or supervisor must perform any tasks not performed automatically. All entries into logs are automatic, other than remarks and spill log entries. Spill corrections are automatically calculated on the weight loading log.

(1) Weight log.

Official record of an export weighing operation which automatically allows reconstruction of a weighing operation in case of problem or complaint. Print the loading log when the vessel completes and retain 5 years.

(a) Header.

Places for identification of the carrier, elevator, field office, load order, type of grain, start and stop times for loading. The start and stop times refer to actual grain loading, not inspections before or after.

GIPSA has developed a system for automating the cusum inspection procedure. In connection with that, a 15-digit GIPSA Lot ID Number will be required on the header as that system comes on-line.

(b) Line Entries.

Each line on the Weight Log corresponds to a sequence of drafts going from one shipping bin. The scale should be totaled at the end of the sequence.

1 **Date and Times**: The times of the first and last drafts included in the line of the weight log. These times must correspond to the times printed for those drafts on the scale tape, as scales tapes will no longer be cut, stamped, and given an ID number when the scale is totaled. The starting and ending times for the line in the weight log are critical to identifying the section scale tape, which corresponds to that line.

2 **Scale and Shipping Bin ID Numbers**: A scale should be totaled before its connection to a shipping bin is broken, and two scales are not normally allowed to feed the same at one time. A line entry should have only one scale number and one shipping bin number.

3 **Weight**: The total weight of the sequence of drafts represented by the line entry.

4 **Sublot Number**: The sublot to which the grain represented by the scale tape was assigned. This number may have to be changed if a sublot is sent back to the house.

5 **Total Pounds**: This is the total weight in the sublot. It should be entered on the last line assigned to the sublot in question. Other lines for that sublot should have this entry blank.

6 **Accumulated Pounds**: Total weight of all sublots before and including the one represented by the line entry in question. It should be entered on the last line assigned to this sublot. Other lines for this sublot should have this entry blank. The computer should be able to make corrections to the accumulated pounds for spills and sublots returned to the house.

7 **Stowage**: The destination of the grain (hold number, or returned to elevator).

8 **Weigher's Initials**: This should show the initials of the person who acknowledged the "OK to Weigh" at the beginning of the tape or the "Pull Sample" at the end of the tape.

9 **Remarks**: These do not correspond to the figures on the line to their left. Some remarks are filled in before loading begins.

(2) Event log.

The event log does not have a form to be printed on. Event logs are detailed, supplemental information that the field offices and agencies keep, aiding in reconstructing a weighing operation. Event logs are normally printed, but can also be stored on computer disks. The Policies and Procedures Branch decides when and whether computer disks can replace hard copies. Retain event logs for 3 years.

Typical List of Events Logged

- Log-in or log-out of Official personnel
- Permissive issued
- Messages issued by the system
- Acknowledgement of messages by Official personnel
- Diagnostic checks performed
- Scale tests performed (lifting weights)
- Alarms, with description
- Corrective action taken for an alarm (manual entry)
- Other manual entries
- (Any other event of interest to FGIS)

(3) Video tapes/Digital Video Recording (DVR).

Video tapes or DVRs used in time-lapse recording of closed-circuit television installations. Retain for 90 days.

Exhibit G. FGIS-9601 Repair /Modification Notice

OMB Approval No.:0580-0013
Expiration Date: 6-30-94

U.S. DEPARTMENT OF AGRICULTURE
FEDERAL GRAIN INSPECTION SERVICE
FIELD MANAGEMENT DIVISION

REPAIR/MODIFICATION NOTICE

SERIAL NUMBER (Optional)

NAME AND LOCATION OF FACILITY

DATE | TIME ☐ A.M. ☐ P.M.

REQUESTED BY

PERSON NOTIFIED

SIGNATURE OF PERSON NOTIFIED

☐ EMERGENCY BREAKDOWN

☐ NON-EMERGENCY BREAKDOWN

MALFUNCTION NOTED

☐ HANDLING/DELIVERY SYSTEM

☐ SCALE(S) SYSTEM

☐ GRAIN SPILL(S)

REMARKS:

ACTION TO BE TAKEN BY FGIS

UNTIL REPAIR OR MODIFICATION IS COMPLETED, WEIGHT CERTIFICATION:

☐ WILL BE DISCONTINUED

☐ WILL CONTINUE

☐ WILL CONTINUE UNDER THE FOLLOWING CONDITIONS:

REPAIR/MODIFICATION COMPLETED

DATE | TIME ☐ A.M. ☐ P.M.

(Signature of Official Personnel)

FGIS-9601 (9 92) (Replaces Form WH 13 which may be used)

Part 1 - ELEVATOR

e. When to use the FGIS-9601, Repair /Modification Notice.

Use the Repair/ Modification Notice (FGIS-9601) to inform the facility of a needed repair or operational change. Use the Repair/Modification Notice only to request repairs needed to ensure grain flow integrity, accurate weights, safety, or to report noncompliance activity of prohibited grain handling practices. Retain for 5 years.

(1) Instructions for Use.

To complete the Repair/Modification Notice, enter the following information:

(a) Serial number – optional.
(b) Name and location of facility.
(c) Date the form was prepared.
(d) Name of official personnel (Supervisor or Scales Specialist) requesting repair or modification.
(e) Name of facility person notified.
(f) Signature of person notified.
(g) Check block – emergency breakdown or nonemergency breakdown.
(h) Check block to fit malfunction and explain in remarks what the malfunction is and its location.
(i) Check appropriate block and explain any condition.
(j) Date of the completion of repair/modification.
(k) Explain what was done and any other pertinent information.
(l) Time the modification was completed.
(m) Signature of official inspection personnel who observed the completion of the repair/modification.

(2) Distribution.

Complete the notice up to, and including, the “Action To Be Taken By FGIS” section. Give the person notified of the necessary repairs, or modifications the “Part - 1 Elevator” copy of the notice. After the repairs or changes are made, complete the “Repair/Modification Completed” section of the notice and send part 2 to the field office.

Exhibit H. FGIS-966, Seal Log (Book Form)

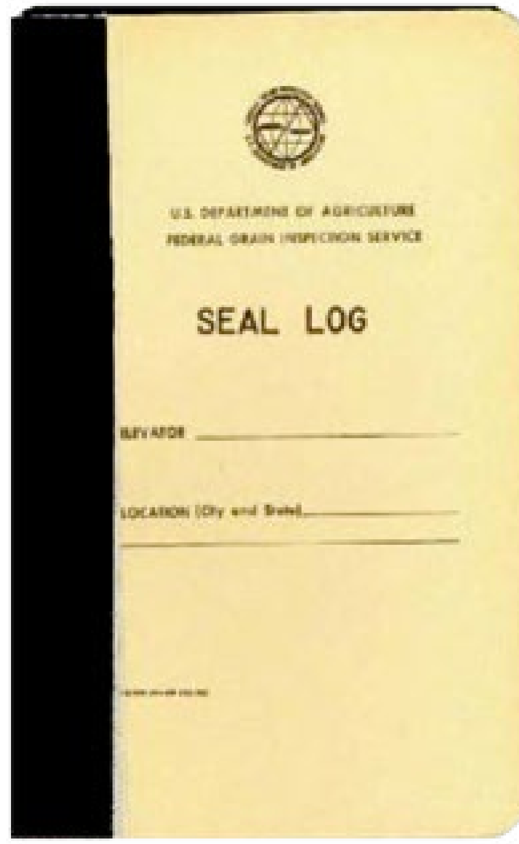
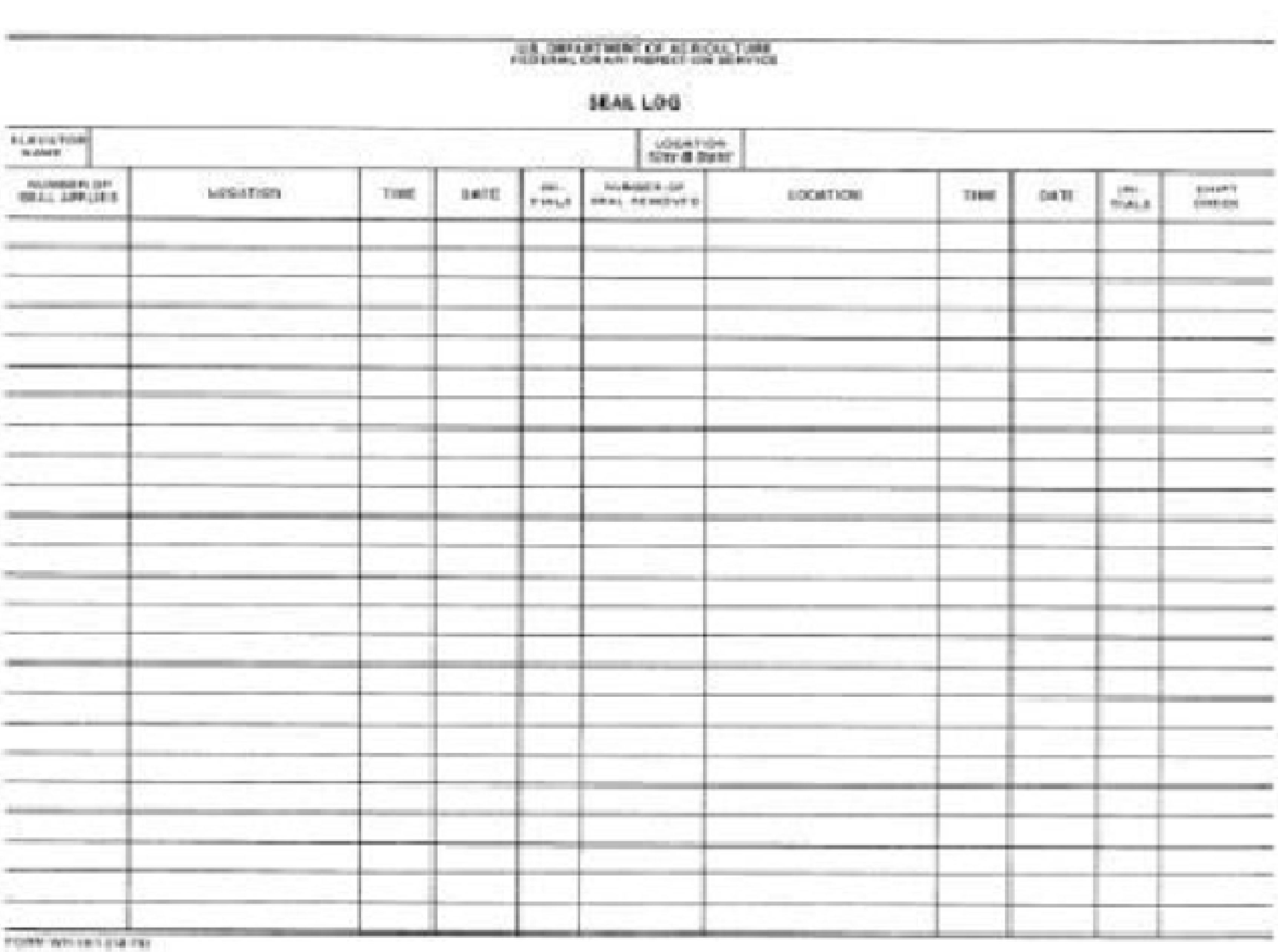


Exhibit I. FGIS-966, Seal Log (Pad Form)



U.S. DEPARTMENT OF AGRICULTURE
FEDERAL GRAIN INSPECTION SERVICE

SEAL LOG

NUMBER OF SEAL APPLIED	LOCATION	TIME	DATE	INITIALS	NUMBER OF SEAL REMOVED	LOCATION	TIME	DATE	INITIALS	CHART CHECK

f. FGIS-966, Seal Log.

Use the Seal Log, FGIS-966 (book form) or WH-14-1 (pad form), to record the application or removal of security locks or seals. Enter the seal number or lock serial number and the location of the control point on the log. Record the opening and closing of locks to verify the grain flow. Weigher's need not record seal and lock numbers of the FGIS-968, Weight Loading Log.

Check the locks and seals periodically during the shift. If the lock or seal has been broken or tampered with, contact the supervisor immediately. Determine the cause, time frame, and resulting impact for possible action. See section 1.5 (B) Chapter 1 of this Handbook for seal or lock application procedures.

Use the pad form of Seal Log (WH-14-1) when carbon copies are required or if the form is filed separately with other carrier documents. Retain the seal log for 5 years.

Seal Log Instructions. Use the Seal Log to record the following information:

(1) Identify the number of the lock or seal applied.

(2) The control points where the seal or lock was applied. Describe the exact location, and use the reference number where applicable.

(3) Military time the seal or lock is applied.

(4) The month, day, and year that the seal or lock is applied.

(5) The initials of the official personnel applying the seal or lock.

(6) The identifying number of the seal or lock removed. This should correspond to the number that was applied. If it does not, or the seal or lock has been tampered with, contact the supervisor.

(7) The locations where the seal or lock was removed.

Exhibit J. Form FGIS-967 Correction Log for Spills

U.S. DEPARTMENT OF AGRICULTURE
FEDERAL GRAIN INSPECTION SERVICE

CORRECTION LOG FOR GRAIN SPILLS

(see instructions on reverse)

NAME OF CARRIER

NAME OF ELEVATOR

LOCATION (City and State)

DATE OF SPILL	LOCATION	AMOUNT (Lbs.)	TIME	NAME OF OFFICIAL NOTIFIED	ACTION TAKEN	TIME RECTIFIED	REMARKS	INITIALS

FORM FGIS-967 (11-85)

g. <u>FGIS-967, Correction Log for Grain Spills</u>.

Use the Correction Log for Grain Spills to record all spills, regardless of whether or not they are returned to the grain flow. Record all grain spills because there is often a delay in returning the grain to the flow and constant monitoring is not always possible. On export, fill out a spill log on each vessel, even if there are no spills.

Check inbound grain spill areas often, so that the proper inbound carrier is credited with the spill. The elevator may return spills to the flow of the grain, at their option.

Visually inspect outbound grain spills to determine if the grain may be returned to the flow. Contaminated spills (as determined by qualified personnel) cannot be returned to the grain flow.

Monitor all spills, as practicable, until they are returned or replaced. If a spill is returned or removed without the supervision of official personnel, subtract the weight from outbound carriers or credit the weight to inbound carriers using the approved statements. Only the final spill adjustment at the end of the loading of a vessel needs to be entered on the weight loading log.

Retain the Correction Log for Grain Spills for 5 years.

How to Use the FGIS-967.

Use the Correction Log for Spills to record the following information:

(1) The identification of the carrier (lot number, container ID, etc.).

(2) Note the month, day.

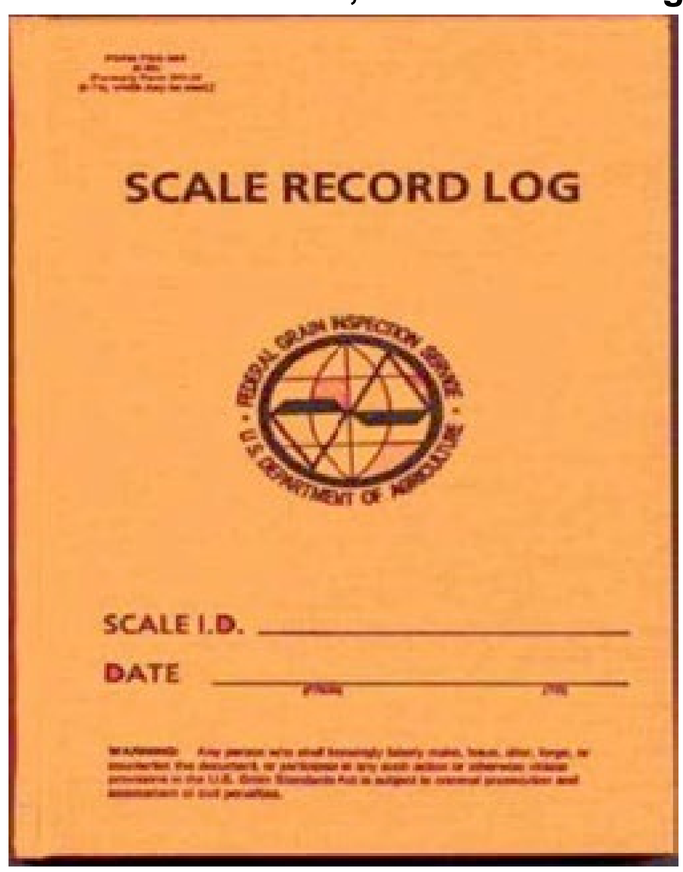
(3) Location of spill.

(4) The estimated amount of spilled grain.

(5) Reported time of spill.

(6) The name of the facility official notified of the spill.

Exhibit K. FGIS-963, Scale Record Log



h. FGIS-963, Scale Record Log.

Official personnel must keep and maintain, near the indicating element or weight display of each scale, a Scale Record[1]. The log is an official record so its accuracy must be carefully maintained. The log should provide historical data on each scale, including, but not limited to:

(1) scale tests, dates, times an comments; (2) scale and related equipment malfunctions; (3) scale console sealing dates and data; and (4) any additional information by field office manager.

[1] **Most indicating elements are in facility controlled areas – this is acceptable.**

Exhibit L. FGIS- 991, General Service Worksheet

GENERAL SERVICE WORKSHEET USDA-FGIS

(Reverse may be used for continuation of remarks, seals, and identification of carrier)

FIELD OFFICE: (2) Corpus Christi

PAGE (3) 1 of 1

NAME AND ADDRESS OF APPLICANT: (1) Corpus Christi Public Elevator
P.O. Box 2229
Corpus Christi, TX 78402

LOCATION OF COMMODITY: (4) Berth # 1
Corpus Christi, TX

COMMODITY: (5) CORN

TYPE OF MOVEMENT (6): ☐ IN ☐ OUT ☒ EXPORT ☐ LOCAL TRANSFER

ID NO. (7) LOT # 1

CONTRACT NO. (8) P.O. 894277689

IDENTIFICATION OF CARRIER (9) M/V Jacinto Challenger

SEALS (10) N/A

GROSS WEIGHT OF FILLED CONTAINERS (11)

110.6	111.0		
111.0	110.9		
110.8	110.8		
111.0	110.7		
110.6	110.9		
110.7	111.0		
111.0	111.0		
111.1	110.9		
110.9	111.1		
110.9	110.9		
111.1	110.8		
110.8	111.1		
111.0	110.9		
110.8	111.0		
110.7			
110.9			
111.0			
110.9			
111.1			
110.6			
110.8			
111.1			

WEIGHT OF EMPTY OUTER CONTAINERS (14) 20 sacks

TOTAL (15) 14.4 lbs.

WEIGHT OF EMPTY INNER CONTAINERS (16) N/A

TOTAL (17) N/A

TOTAL GROSS WT. (18) 3992.4

NUMBER AND KIND OF CONTAINERS (12) 8900 – 50 KILO BURLAP SACKS
Marks: Wonder Corn/Product of The/United States
Located in area B-7.

(13) SAMPLER	DATE	TIME START	TIME STOP	HOURS WORKED	SERVICE PERFORMED
Eddie Brown	8-2-00	0800	1630	8*	Weighing
Eddie Brown	8-2-00	1630	1930	3	Checkloading
			TOTAL HOURS	11	

REMARKS (24) * ½ hr. lunch
Hold No. 3 examined and found to be clean, dry, and free of infestation at 1600 hrs.
2 sacks broken, not replaced, deduct net avg./sack x (2) from net weight.

(19) WEIGHT PER CONTAINER

GROSS (20) 110.90 | TARE (21) 0.72 | NET (22) 110.18

CONDITION OF CONTAINER (23) N/A

CONDITION OF COMMODITY N/A

CONDITION OF CARRIER (see remarks)

COMMODITY FUMIGATED WITH N/A

SCALE INFORMATION (25)

SCALE ID	DATE	TIME	CONDITION	WEIGHER
003	8-2-00	0800	OK, clean	EBrown
"	"	1030	" , "	"
"	"	1230	" , "	"
"	"	1430	" , "	"

ESTIMATED WEIGHT OF LOT

GROSS (26) 987,010 | TARE (27) 6,408 | NET (28) 980,382

WARNING: Any person who shall knowingly falsely make, issue, alter, forge, or counterfeit this report, or participate in any such actions, or otherwise violate provisions in the U.S. Grain Standards Act, Agricultural Marketing Act of 1946, U.S. Warehouse Act, or related Federal laws is subject to criminal prosecution and assessment of civil penalties.

SIGNATURE (29) Eddie Brown

FORM FGIS-991 (7-88) (Combines Forms FGIS-991 (6-87) and WH-25 (4-79), which may be used.) OVER →

i. FGIS-991, General Services Worksheet.

Use the FGIS-991, General Service Worksheet, to compute and document the official weight when checkweighing sacked grain, rice, and pulses. Retain the General Service Worksheet for 5 years.

Instruction for Use.

Use the General Service Worksheet for recording the following information:

(1) The name and mailing address of applicant.

(2) The field office covering the facility's area.

(3) Page number of form (and total) used to determine the certified weight.

(4) Location where service is provided.

(5) Type of commodity.

(6) Indicate the type movement as either IN, OUT, EXPORT, or LOCAL.

(7) ID No. of the lot.

(8) Contract No. if applicable.

(9) Indicate the proper carrier as a barge, boxcar, hopper car, sea van, truck, unit train, or vessel. State the name, initials numbers, etc.

(10) Place any pertinent seal information; seals broken, applied, etc.

(11) Record the individual gross weight of each container sampled.

(12) Record the lot size and complete description of the containers, including any unique identifying marks, numbers, and symbols. If the grain must be confined to a specific area of a storage facility to preserve its identity before loading, record the specific area.

(13) Service performed areas; name of sampler, date, time started, time finished, and indicate weighing services performed, e.g., weight sampling, checkloading etc.

(14) Record the number of empty outer containers weighed.

(15) Weight of empty outer containers.

(16) Record the number of empty inner containers weighed.

(17) Weight of empty inner containers.

(18) Total Gross Wt.; sum of all filled containers weighed by official weigher.

(19) Weight per Container.

(20) Gross – calculate by taking Total Gross Wt. (18) divided by number of samples in (18). Round the result to the nearest hundredth percent.

(21) Tare – divide total Empty Outer Containers (14) by number of samples weighed. Do the same for the inner containers, and if applicable, add to outer tare. Round the result to the nearest hundredth percent.

(22) Net – Gross per Container (20) minus Tare per Container (sum 14 and 17). Carry to the hundredth unit.

(23) Condition blocks, condition of container, commodity, carrier, type of fumigation used, if applicable.

(24) Remarks, stowage examination statements, seal application, or removal, etc.

(25) Scale information, document balance, and strain tests for the shift in the spaces provided for scale information area.

(26) Gross; multiply lot size by average gross per container. Round the result to the nearest pound.

(27) Tare; multiply lot size by average tare weight per container. Round the result to the nearest pound.

(28) Net; subtract the estimated total tare weight from the estimated total gross. The sum should be a whole number. Place this number in the net weight block of the certificate.

(29) Signature of employee completing the form.

Exhibit M. FGIS- 1001 Application For Approval to Operate as a Weighing Facility (obverse)

U.S. DEPARTMENT OF AGRICULTURE
GRAIN INSPECTION, PACKERS AND STOCKYARDS ADMINISTRATION
FEDERAL GRAIN INSPECTION SERVICE

APPLICATION FOR APPROVAL TO OPERATE AS A WEIGHING FACILITY

FORM APPROVED: OMB NO. 0580-0013

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0580-0013. The time required to complete this information collection is estimated to average 8 minutes per response and 1 minute of recordkeeping, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

This application form must be completed and approved before operating as a weighing facility (7U.S.C.7A (f).) *See reverse for additional information required.*

1. NAME OF FACILITY (Where The Weighing Equipment Is Located):

ADDRESS (Street, City, State, and Zip Code):

OWNER OF FACILITY:

2. NAME:

ADDRESS (Street, City, State, and Zip Code):

OPERATOR OF FACILITY

3. Contact Person	Telephone Number	Email

4. The following named persons are employed at this facility as weighers. Each individual has demonstrated the technical ability to operate grain weighing equipment and has a reputation for honesty and integrity *(fill-out additional forms if necessary).*

5. NAME AND SIGNATURE OF OPERATOR AND DATE

FORM FGIS-1001 (01/08) (Replaces Form FGIS-1001 (07/04) which is obsolete.)

Exhibit M. FGIS- 1001 Application For Approval to Operate as a Weighing Facility (reverse)

Page ____ of ____

SCALE SYSTEM TO BE USED OFFICIALLY (Fill out additional sheets for each scale system differing in design or use; answer questions 6-13 only if this is for the initial test)

6. Type Scale	*7. Load-Receiving Element*
☐ Railway Track ☐ Vehicle Platform ☐ Automatic Bulk Weighing System	☐ Platform ☐ Hopper

8. Load-Sensing	*9. Type of Movement (may check more than one)*
☐ Full-electronic (2 or more load cells) ☐ Lever-tronic (1 load cell) ☐ Mechanical	☐ Inbound ☐ Outbound ☐ Export

10. WEIGHING ELEMENT MANUFACTURER (Scale):	*MODEL:*
11. CERTIFICATE OF CONFORMANCE NUMBER:	

12. DIGITAL WEIGHT INDICATOR MANUFACTURER:	*MODEL:*
CERTIFICATE OF CONFORMANCE NUMBER:	

13. LOAD CELL MANUFACTURER:	*MODEL:*
CERTIFICATE OF CONFORMANCE NUMBER:	

COMMENTS:

Form FGIS-1001 (Reverse)

j. Form FGIS-1001, Application for Approval to Operate as a Weighing Facility.

The U.S. Grain Standards Act and regulations require facilities to submit information showing that the weighing facility and the elevator personnel operating weighing equipment at that facility meet the conditions necessary to have official weighing. Facilities are required to provide this information when service is first established, and annually afterwards.[2] Facilities fill out the Form FGIS-1001, "Application For Approval To Operate As A Weighing Facility", to document that their facility complies with these conditions.

Field offices, delegated, and designated agencies are responsible to see that this information is submitted annually. Agencies may obtain this form from their supervising field office, or direct applicants to this website. After agency managers receive and review the form FGIS-1001 and supporting attachments from the facility, they should send two copies of the form FGIS-1001 and supporting attachments to their supervising field office.

Field offices can use this form's annual completion as a cue to evaluate if the office's and agency's facility handbook(s) is in need of updating. The information required on this form is similar to the information required to compile facility handbooks. After field office managers know the information on the FGIS-1001 is accurate, send a copy of each FGIS-1001, for each facility in the field office's jurisdiction, to the Policies, Procedures, and Market Analysis Branch.

Instructions for Use.

(1) Name of the facility, mailing and street address.

(2) Owner's name and address.

(3) Name of person or company who actually operates the weighing facility.

(4) Names of persons employed at the facility that operate the facility's scales as weighers. By listing employees here, the facility is stating that these individuals can demonstrate a technical ability to operate grain weighing equipment and have a reputation for honesty and integrity. If the facility's personnel fluctuates because personnel are hired from employment pools, such as longshore personnel, the individuals who directly supervise these individuals (facility) or "key" longshore personnel can be listed. These blanks do not require the signature of the individual.

[2] The agency or field office may already have all the information shown on the back of the FGIS-1001, especially if the facility has been prompt in notifying official personnel of conditions affecting official weighing (official personnel should always be notified of changes affecting weighing). If this is the case, it is not necessary to submit the attachments with the FGIS-1001 again.

(5) Operator's signature with date (usually the plant superintendent or manager).

(6) Owner's or corporate officer's signature with date.

(7) Type scale - check box whether the scale is a railway track, vehicle platform, or automatic bulk weighing system.

(8) Load-receiving element -- Check "Platform" if the vehicle or railway track car carriers are placed on the weighing element, check "hopper" if the weighing element is a tank or hopper for an automatic bulk weighing system or hopper scale.

(9) Load-Sensing -- a full-electronic is an electronic scale with two or more load cells which directly support the load-receiving element; a lever-tronic is a mechanical scale by inserting a load cell into the lever system; mechanical means a scale which operates purely on a lever system, or any other non-electrical balance system.

(10) Inbound or outbound movements, grain unloaded or loaded respectively into or out of carriers; outbound is also defined as grain leaving the facility where the grain is weighed; export means grain exported or moved outside the boundaries of the United States.

(11) Certificate of Conformance. A document issued by the National Institute of Standards and Technology based on testing by a Participating Laboratory, said document constituting evidence of conformance of a type with the requirements of the national Institute of Standards and Technology Handbooks 44, 105-1.

CONTACT INFORMATION:

Contact the field office responsible for the geographic area in which the service will be provided. Details for these locations can be found on the GIPSA website.

The signed form should also be mailed to this location.

For further information on the "Application For Approval To Operate As A Weighing Facility".

Policies, Procedures, and Market Analysis Branch
Field Management Division
10383 N. Ambassador Drive
Kansas City, MO 64153

Exhibit N. Controlled Point Caution Label

Exhibit O. Controlled Point Caution Tag

k. Form FGIS-999, Controlled Point Caution Label and Tag.

Unauthorized seal breakage or lock removal can cause increased costs to industry because of the time and cost of retesting equipment when its integrity has been lost. To aid in avoiding accidental seal breakage, a controlled point caution label or tag may be used. The label (Exhibit V) serves only as a caution notice and is self sticking. The tag (exhibit W) version has space on the back for documenting checks of equipment, and has a plastic grommet so that it allows attachment by lock, wire seal, railcar seal, or plastic tie wrap. Both are bright orange in color.

Use the caution label/tag only in conjunction with a numbered railroad seal, lock, or pressure seal. Do not use the label itself as a sealing device. Follow applicable program area handbook requirements for seal record keeping information. Examples of proper placement for the labels/tags are on:

(1) Diverter sampler inspection doors;

(2) Interface panels from input/output devices (I/O's) to programmable logic controllers (PC's) or central processing units (CPU's) (as associated with automated weighing systems); and

(3) Scale external interfacing and control -- optical (opto) isolator boxes (as applicable).

Examples where not to use the labels: (1) load cell junction boxes; (2) supply cabinets; (3) sealing carriers; (4) sample containers; (5) moisture meters; (6) trailer doors; and (7) bins.

Official agencies may use the label or tags (Forms FGIS-999). Agencies order them from a local field office or contact the Policies, Procedures, and Market Analysis Branch to order the Form FGIS-999.

2.4 APPROVED STATEMENTS

Use the statements and procedures provided in this section to address the most common situations that occur during weighing operations. The mandatory use of these statements does not preclude adding factual; information pertaining to the certificate into the remarks section.

The Policies, Procedures, and Market Analysis Branch is the final approving authority for procedures, certification, and statements for situations not covered within Section 2.4. Contact the Policies, Procedures, and Market Analysis Branch to assure accurate and uniform application of the decisions.

NOTE: Where statements use "an estimated (______) pounds" and the grain has been officially weighed, the word "estimated" may be deleted (e.g., a spill containerized and weighed on a vehicle scale).

a. General Statements.

(1) Weighing Grain Without Official Supervision – Export.

When export grain is weighed out of an export port location with-out official supervision, use the following procedure:

Immediately report all incidents to your field office manager. Submit a written report through the field office manager to the Director of the Compliance Division with copies forwarded to the Assistant Director Policies, Procedures and Market Analysis Branch.

Only certify grain that was officially weighed. Enter appropriate remarks in the supporting logs and note the circumstances on the scale tape(s). Do not alter any official figures.

Approved Statement.

"The net weight does not include the weight of grain claimed to have been loaded in the absence of official personnel."

(2) Weighing Grain Without Official Supervision – Inbound (Class X).

Partial Supervision. When intercompany barge grain is delivered into an export elevator at an export port location without the total supervision of official personnel and only part of the grain from the barge is officially weighed, use the following procedure.

Immediately report all incidents to your field office manager by telephone. Submit a written report through the field office manager to the director of the Compliance Division, with copies forwarded to the Assistant Director Policies, Procedures, and Market Analysis Branch.

If authorized, certify only grain which was officially weighed. Enter the approved statement in the remarks section of the certificate. Enter appropriate remarks in the supporting logs and note the circumstances on the scale tape(s). Do not alter any original figures. Do not put origin weights on the certificate.

Approved Statement.

"The net weight does not include the weight of grain unloaded in the absence of official personnel."

No Supervision. When intercompany barge grain is delivered into an elevator without the total supervision of official personnel and none of the grain from the barge was officially weighed, use the following procedure:

Immediately report all incidents to the field office manager by telephone. Submit a written report through the field office manger to the Director of the Compliance Division, with copies forwarded to the Assistant Director Policies, Procedures, and Market Analysis Branch.

Do not issue a certificate for the barge from which the grain was officially weighed. Enter appropriate remarks in the supporting logs, or in a memo to the files.

Approved Statement.

No approved statement.

(3) Corrected Certificates.

When one or more errors are found after issuance, use the following procedures:

Issue a certificate. Record the identical information and statements that were shown on the incorrect certificate, and the following additional information: (1) the correct statement or information instead of the incorrect or omitted information; (2) the term "Corrected Original" on the corrected certificate, and "Corrected Copy" on the copies; and (3) the new serial number and enter the applicable statement(s) in the remarks section of the corrected certificate. Mark the original (or one copy if the original is not returned) of the incorrect certificate VOID in a clear and conspicuous manner; enter the corrected certificate number and issue date. File the corrected copy and destroy all other copies. To prevent the fraudulent and unauthorized use of the superseded certificate, use other precautions as necessary.

If the incorrect certificate and all copies are in the custody of the issuing agency, enter statements (1) and (2) in the remarks section.

Approved Statements.

(a) "This certificate is corrected as to _______ and supersedes certificate No. US _________."

(b) "The superseded certificate identified herein has not been surrendered."

Limitations. Do not issue corrected certificates:

1 when a certificate has been superseded by another certificate;

2 when more than 1 year after the date of issuance of the incorrect certificate; or

3 in any manner other than as prescribed in the regulations.

(4) Duplicate-Original Certificates.

When an official certificate has been lost or destroyed and has not been superseded, and the applicant for the service requests a duplicate-original certificate, use the following procedure:

Issue a duplicate-original certificate only after receiving a written request. Show the same information and statements that were shown on the lost or destroyed certificate and place the following information on the duplicate-original certificate: (1) on the original of the duplicate certificate show the term "Duplicate Original;" (2) on the copies of the duplicate certificate the term "Duplicate Copy;" (3) cross out the number on the duplicate-original certificate and replace below it in the number of the lost or destroyed certificate; and (4) show the approved statement on the original and all copies.

Approved Statement.

"This duplicate certificate is issued in lieu of a (lost) (destroyed) certificate."

(5) Official Grain Weight Certificate (Divided).

When an applicant requests, in writing, a divided-lot certificate on an export shipment of grain within 5 business days after the latest date on the certificate, use the following procedure:

Issue an official grain weight certificate (FGIS-960) for the divided lot of grain. The certificate to be divided must: (1) be in the custody of the agency of FGIS; (2) have identical statements in the remarks section; and (3) have the same serial number as shown on the suspended certificate, except when hyphenated and chronologically numbered (e.g., 1764-1, 1764-2, 1764-3, etc).

Approved Statements.

Show on the superseded official grain weight certificate (FGIS- 960):

"Void-Surrendered for divided-lot certificates (Number) thru (Number), inclusively."

Limitations. Never show on a divided-lot certificate, individually or in the aggregate, a quantity of grain different from the quantity shown on the superseded certificate. There will be no combining of further dividing of divided-lot certificates, except as provided in special cases by the Administrator.

NOTE: Upon the request of the applicant , different load numbers may be shown on the divided-lot certificates.

(6) Official Commodity Weight Certificate (Divided).

Issue a divided-lot certificate for bulk commodities after the applicant has applied in writing, and has applied within 5 business days from the original certificate's issuance (FGIS-7, see page 2-16 for an example). Use the following procedure:

Issue an official commodity weight certificate (FGIS-7) for the following undivided lot of commodity. The certificate to be divided must: (1) be in the custody of the agency or FGIS; (2) not have been superseded; (3) contain the required statements; and (4) show the identification of the divided-lot certificates.

Show on all official commodity weight certificates (Divided) (FGIS-7): (1) identical information that was shown on the official commodity weight certificate (FGIS-7), except show the net divided weights as the applicant requested; (2) identical statements in the remarks sections; and (3) the same serial number as shown on the superseded certificate, except that each divided-lot certificate has added serially numbered suffix (e.g., 1764-1, 1764-2, 1764-3, etc.).

Approved Statement.

Show on the supersede official commodity weight certificate (FGIS-7), see page 2-16 for an example):

"Void-Surrendered for divided –lot certificate (Number) thru (Number), inclusively."

Limitations. Never show on divided-lot certificates, individually or in the aggregate, a quantity of grain (commodity) different from the quantity of grain (commodity) shown on the superseded certificate. There will be no combining or further dividing of the divided-lot certificates, except in special cases by the Administrator.

NOTE: Upon the request of the applicant, different load numbers may be shown on the divided-lot certificates.

Metric Conversion Data.

When an applicant requests that the certified net weight be expressed in kilograms or metric tons, use the following procedure.[3]

In the approved statement, limit metric data expressions to kilograms or metric tons. When converting to metric tons, round to the nearest thousandths (.001).

To express pounds in kilograms:

Net weight in pounds x 0.45359237 = kg

To express kilograms in Metric Tons:

kilograms ÷ 1000 = metric tons

To express pounds in Metric Tons:

Net Weight in Pounds ÷ 2204.623 = Metric Tons

Approved Statements.

(a) "The net weight is approximately equivalent to ________ (kilograms) or (metric tons). The scale equipment used for official weighing was not calibrated in metric units."

(b) "Using the applicant supplied conversion factor of _____________. The net weight is approximately equivalent to ____________ metric tons. The scale equipment used for official weighing was not calibrated in metric units."

[3]When certifying the weight of U.S. grain weighed in Canada within the "Approved Statement" the "measuring units" reverse (the word pounds is replaced with metric units). However, because the scales are calibrated in metric units, the net weight can be certified in metric units with no qualifying remarks, use the "Approved Statement" only if the applicant wants the net weight certified in pounds.

(7) Grain Additives Certification.

When additives are applied before weighing for inbound receipts and after weighing for outbound shipments, show on the weight certificate:

(a) The actual weight of the grain after the application of the additive for inbound grain; or

(b) The weight of the grain before the application of the additive for outbound grain; and

(c) The approved statement in the remarks section of the official grain weight certificate.

Approved Statement (Required).

“Applicant states (type of additive) applied to grain (before or after) weighing to (purpose of the application).”

When additives are applied after weighing for inbound receipts or before weighing for outbound shipments, no weight adjustment of special additive statement is required.

(8) Not Standardized Grain Certificate.

Certify officially weighed grain dust and grain screenings on the FGIS-960, Official Grain Weight Certificate. Use the following procedures to certify these products:

Mark the blank block on the certificate, under the kind of grain section then write-in/type “other”. Place the approved statement in the remarks section.

Approved statement (Required).

“Not standardized grain, (name of product).”

(9) Grain Handling Practices Documentation – Export.

While performing other weighing and inspection duties around export elevators, official personnel should observe the handling of grain and dust to determine compliance with prohibited practices requirements listed in the regulations.

After making a tour of the elevator, document the time, observer’s name, and date on the FGIS-968, Weight Loading Log or on the FGIS-921, Inspection Log in the remarks section.

Report noncompliance activity not affecting grain going to the ship, on Form FGIS-9601, Repair/Modification Notice, or on a locally generated report rather than on the inspection or weighing log. Send a copy of every noncompliance report to your respective field office manager.

Approved Statement (as applicable).

"Grain handling practices observed (time, observer, date)."

(10) Continuous Loading/Unloading Statement.

If grain is officially weighed in a reasonably continuous operation, on request, the applicant may have placed on the certificate a statement showing the grain was weighed continuously.

If grain in combined lots are weighed in one location which does not include inactive intervals in excess of 88 consecutive hours, place the following statement in the remarks section of the certificate, on request from the applicant.

Approved Statement.

"(Loaded/Unloaded) under continuous official weighing."

b. Scale Related Situations.

(1) Scale and Equipment Malfunctions – Export.

When the scale system malfunctions during the weighing process and the weighing results of particular drafts are questionable, use the following procedure:

Issue one clear certificate for the amount that can be verified by scale tape documentation. Enter appropriate remarks in the supporting logs and note the circumstances on the scale tape(s). Do not alter any original figures.

Approved Statement.

Upon request of the applicant and the approval of the Policies and Procedures Branch, use the following statement on export certificates:

"During the weighing operation a malfunction occurred such that grain in excess of the net weight certified herein may have been delivered to the carrier."

(2) Scale and Equipment Malfunctions – Domestic.

When the scale system malfunctions during the weighing process and the weighing results of a specific draft(s) is questionable, use the following procedure:

Issue one certificate for all drafts verified as accurate. Please the approved statement in the remarks section of the certificate. Enter appropriate remarks in the supporting logs and note the circumstances on the scale tape(s). Do not alter any original figures. Never use origin weights on the certificate.

Approved Statements.

Inbound – “The net weight does not include the weight of grain that could not be verified during a malfunction in the weighing system.”

Outbound – “During the weighing operation a malfunction occurred allowing grain in excess of the certified net weight to be delivered to the carrier.”

(3) Auto-printing Equipment Malfunctions.

When automatic printing equipment malfunctions during automatic-mode operations, use the following procedures:

General Procedures.

When a printing failure occurs (e.g., tape jammed in printer) during automatic mode operations, stop official weighing immediately and do not use the scale(s) related to that printer until repaired. In high-speed operations, it is possible that several drafts could pass through the scale system before the failure is detected.

Report such equipment malfunctions by telephone to the scale specialist responsible for the scale at that facility. For all equipment malfunctions, note the circumstances on the weight loading log (FGIS-968), the scale tapes and the scale record log (FGIS-963). Never alter or deface the original printed numbers on the scale tape.

Special Procedure – 1 to 3 Drafts.

When automatic printing equipment fails to print, misprints, or the printed weights cannot be read for 1 to 3 consecutive drafts, issue an unqualified certificate using the following procedures, after consulting the field office manager and/or scale specialist. Use these procedures only when the weigher can verify the grain flow was running during the malfunction.

(a) Use the accumulated weight if it can be determined that the weight of the draft(s) in question was entered into the accumulator. If the missing or misprinted draft weight(s) was verified by official personnel on the weight display indicator, official personnel may hand write weight display values viewed, and initial the entries. Certify the entry(s) as part of the accumulated weight.

(b) If it is determined that the missing or misprinted draft(s) were entered into the accumulator and were not verified by official personnel, determine the amount accumulated but not printed, and enter the average draft(s) sizes to attain the correct amount.

(c) When drafts are not entered in the accumulator, and official personnel did not visually verify the weight display values(s) as the grain passed through the scale, estimate the size of the drafts in question by averaging a minimum of six normal drafts taken either immediately before or after the questionable drafts.

<u>Special Procedure – More than three Drafts</u>.

When the automatic printing equipment fails to print more than three drafts in succession, or the number of drafts not printed is not known, immediately stop the weighing operation. Notify your field office manager and scales specialist, they should decide how certification will be handled.

(4) <u>Exceeding the Scale Capacity</u>.

When a scale is loaded beyond its certified capacity, and it is not practical or feasible to reweigh the grain; use the following procedure:

Issue one certificate with the approved statement for domestic certification purposes. Only certify the weight up to the certified capacity when supported by scale tape documentation or visual verification by official personnel. If multiple drafts exceed the certified capacity, only certify the weight of each draft up to the certified capacity.

<u>For Domestic Shipments</u>.

Place the approved statement on the certificate and note the circumstances on the scale tapes and related logs.

<u>For Export Shipments</u>.

Place the approved statement on the proper logs and note the circumstances on the scale tapes. Upon request of the applicant, the approved statement may be placed on the certificate.

“The net weight does not include the weight of grain delivered to the scale in excess of the certified capacity from (no. of drafts) drafts of grain.”

c. <u>Carrier Related Situations</u>.

(1) <u>Started and Finished Times</u>.

When the applicant requests “Started” and/or “Finished” times on the certificate, use the following procedure:

(a) <u>Inbound</u>. The started time is when the movement of grain from the carrier to the scales(s) began. The finished time is when the last amount of grain is removed from the carrier.

(b) <u>Outbound</u>. The started time is when grain is first delivered to the carrier. The finished time is when all grain has been properly stowed.

(2) <u>Combined Lot Certification</u>.

When an applicant requests that grain loaded into or discharged from two or more carriers be certified as one lot, before the weighing operation, use the following procedure:

Record the identification of each carrier unloaded for the combined lot. Show on the certificate: (1) the identification of the “combined lot” and the number and kind of carriers unloaded (e.g., Unit Train 30-12, 88 railcars unloaded); and (2) at the request of the applicant, the identification of each carrier in the combined lot may be placed in the remarks section. If there is not enough room to list all carriers in the remark section, make an attachment on letterhead stationery. Attach copies of the letterhead stationery or supplements to each copy of the official certificate. Mark the “see attached” box on the certificate, when either is used.

NOTE: Where individual carrier weights are officially weighed, record the individual carrier identifications corresponding to the official weight on the scale tape.

Delegated States use FGIS letterhead stationery when issuing letterhead statements or information for export grain or export carriers.

(3) <u>Combined Lot – Recertification</u>.

When a request for a combined lot weighing service is filed after the grain in the single lots have been weighed and certified, regardless of uniformity or nonuniformity of quality, use the following procedure:

Place on the combined lot weighing certificate: (1) the latest date of weighing on the components in the combined lot; (2) the name of elevator or warehouse where the weighing service was provided; (3) the total of the combined net weights; and (4) the identification of the “combined lot” or, at the request of the applicant, the identification of each carrier in the combined lot.

Approved Statement.

“This combined lot certificate supersedes certificate Nos. _____ dated_____”.

If, at the time of issuing the combined lot certificate, the superseded certificates are not in the custody of the agency of field office, show the following approved statement in the space provided for remarks beneath the statement identifying the superseded certificates:

“The superseded certificates identified herein have not been surrendered.”

Limitations.

(a) The grain in each single lot has been weighed in one location.

(b) The official personnel who performed the weighing service for the single lots and the official personnel who are to recertificate the grain as a combined lot believe that the weight of the grain in the lots has not since changed (e.g., verifying the seal records on the containers) and, in the case of sacked grain, that the weight samples used as a basis for weighing the single lots were representative at the time of weighing.

(c) The combined lot certificate equals the total weight of the component lots.

(d) The original weight certificates issued for the single lots have been or will be surrendered to the appropriate agency of field office.

(e) The request is filed within 2 business days after the latest weighing date of the single lots.

(4) Certificating Grain Discharged From a Vessel.

When grain has been discharged from a vessel, use the following procedure:

Reweigh all discharged grain. Deduct the reweighed amount on the weight loading log. At the request of the applicant, certify the reweighed amounts as a LOCAL movement and place the approved statement in the remarks section of the certificate. When another carrier is used to transport the grain back to the house, preserve the identity of the grain and place the carrier identification in the identification section of the certificate.

Approved Statement.

“The net weight represents grain discharged from (name of carrier).”

NOTE: If grain is placed on the deck of the ship, treat the amount of grain as a spill (e.g., estimate the amount of grain on the deck of the ship and subtract it from the net weight of the carrier on the weight loading log). See also section 2.4 (g), Improper Loading of Carriers.

(5) Certifying Grain Returned from Shipping Bins.

On request of the applicant, certify grain weighed for a vessel but not loaded (e.g., material portions, cutoffs, etc., returned from shipping bins). Certify the amount as a LOCAL movement. Reweigh the grain if the shipping bin was not verified empty before filling, or if a partial return is made. Deduct and explain the return or reweigh on the weight loading log.

(6) Certifying an Exact Contract Weight.

When grain is loaded aboard a carrier beyond the exact contract weight and the applicant requests the exact contract weight be certified, the applicant may either: (1) discharge the excess amount from the carrier to the exact weight; (2) request divided certificates; one for the exact contract weight, and one for the remaining weight of grain above the exact contract weight; or (3) the exact amount be certified for the contracted amount of Form FGIS-960. A second certificate is then issued for the amount loaded aboard over the exact or maximum weight. The contracted amount certificate is issued without qualifying remarks. Place the following statement on the certificate for the amount that exceeds the contract. Place the option selected by the applicant in the remarks section of Form FGIS-960, Weight Loading Log.

Approved Statement.

“The net weight reflects the amount of grain which exceeds the (exact/ maximum) contract amount, and was loaded aboard with that lot without separation in Hold No(s). The weight of that lot was (___________) pounds and was certified as US (certificate number), dated (date).”

(7) Numbering of Sublots With Multiple Weighlots and One Inspection Lot.

When applicants ask for multiple export weighlots with only one inspection lot (e.g., a separate weight certificate for each hold or separation). As the vessel loads, number the sublots on the weight loading log so that they correspond with the sublot number on the inspection log. The sublots numbers on the weightlots will not always be in consecutive order. This practice simplifies comparison between the inspection lot and weighlot.

d. Unloading of Carriers.

(1) Commingled Carriers.

When grain is commingled from two or more inbound carriers before they are officially weighed as separate lots, use one of the following procedures:

(a) One Certificate for Both Carriers. Issue one certificate for the combined weight of the carriers. Place the total net weight of grain from the commingled carriers in the net weight blocks, record “See Remarks” in the identification of grain (carrier identification) section, and place the approved statement in the remarks section of the certificate.

Approved Statement.

“Grain from (carrier identification) and (carrier identification) was commingled, resulting in the total net weight stated herein.”

(b) One Certificate for Each Carrier. At the request of the applicant, issue a certificate for each of the commingled carriers with the net weight blocks crossed out or left blank (if using Form FGIS-960 dated Jan 2007) and place the following qualifying statement with the total net weight and identification of the commingled carriers in the remarks section of each of the certificates.

Approved Statement.

“Grain from the carrier identified above was commingled with grain from [carrier identification(s)] on certificate(s) US_____. The total net weight of the commingled grain from the (# of commingled carriers) carriers was ____ pounds.”

(2) Commingled Inbound Carrier – House Grain.

When an inbound shipment is mixed with grain from another source other than another carrier, use the following procedure:

Enter appropriate remarks in the supporting logs and note the circumstances on the scale tape(s). Do not alter any original figures. Cross out the net weight blocks or do not enter any weight in the quantity section depending on the certificate being used, place the weights in the remarks section, along with the approved qualifying statement.

Approved Statement.

“During the weighing operation a slide in the grain flow system was opened (or other specific remarks to fit the circumstances), allowing grain from other sources to commingle with this shipment. The weight of the grain delivered to the scale was ______ pounds.”

(3) Grain Lost in Handling System.

When an undetermined amount of grain is lost in the grain handling system from an inbound carrier as it is unloaded, use the following procedure: Note the circumstances on the scale tape and place the approved statement in the remarks area of the certificate.

Approved Statement.

"The net weight does not include the weight of grain that was lost in the grain handling system."

(4) Part-Lots.

When a lot of inbound grain is partially unloaded and grain is either left in the carrier or was removed before unloading, use one of the following procedures:

One Lot.

The grain may be certified as one lot on an unqualified certificate, provided that the identity of the lot is preserved and is unloaded in a reasonably continuous operation (inactive intervals not to exceed 88 consecutive hours, as provided in the regulations).

If a carrier arrives with a compartment (or hold) empty or loaded substantially less than normal and has not been previously certified as a part-lot, issue a certificate for that carrier as an original lot and note any empty compartments in the remarks section. (Note "Light loads" on the scale tapes).

Separate Lots.

Consider grain removed and the grain remaining in the carrier as separate lots if the conditions shown above for one lot cannot be met. To certify the lot separately use the following procedures:

(a) Show the identification of the carrier and the hold, compartment, or area unloaded. Show the weight of the grain unloaded in the Net Weight blocks and place statement 1 in the remarks section.

(b) If the grain that is left in the carrier (or removed prior to unloading) is determined to be out of condition (heating, musty, or sour) by qualified official personnel, show statements 1 and 3 in the remarks section of the certificate.

(c) If it is known that a carrier was previously unloaded an certified as a part-lot, cross-reference the second part-lot certificate to the previously issued part-lot certificate. In this case, show statements 1 and 2 in the remarks section.

(d) If part-lot certificates are issued for one inbound carrier and the carrier is completely unloaded, place statements 2 and 4 in the remarks section of the part-lot certificate.

Approved Statements.

1 "Part-lot: The net weight stated herein reflects a partial unload."

2 "See certificate US ____ dated ____ for information concerning previously removed grain."

3 "The net weight does not include an estimated ____ pounds of out-of-condition grain which was (left in the carrier or removed prior to unloading)."

4 "Part-lot: The net weight stated herein is the final partial unload for this carrier.

NOTE: In the case of unit trains, the applicant may request either a part-lot certificate or an individual lot certificate for each group of railcars in the unit train that is unloaded and weighed.

(5) Barge Checked Empty.

Total supervision of carrier cleanout is required on inbound barge movements. After an inbound barge had completed unloading and has been confirmed empty by official personnel, place the approved statement in the remarks section of the certificate.

Approved Statement.

"The barge was checked and found to be empty by (initials) at (time and date)."

(6) Barges not Inspected for Cleanout.

If barges are removed before official personnel verify cleanout, use the following procedure:

Note the circumstances on the scale tapes for not examining the barge, and place the approved statement in the remarks area of the certificate.

Approved Statement.

"The above carrier was not available for cleanout examination by official personnel."

(7) Carriers Not Accessible for Cleanout Examinations.

When it is not possible to examine carriers for cleanout because the access was of openings were blocked (e.g., frozen or broken carrier lids), use the following procedure:

Note the circumstances on the scale tapes for not examining the carrier and place the approved statement in the remarks area of the certificate.

Approved Statement.

"The above carrier was not examined for cleanout because unable to open (lids, access ways, etc.)."

(8) Checking Carrier Cleanout During Hazardous Conditions.

When you are unable to check a carrier's cleanout because unsafe conditions exist, use the following procedure:

Do not check a carrier for cleanout when there are unsafe conditions. Note the circumstances on the scale tape and place the approved statement in the remarks section of the certificate.

Approved Statement.

"The above carrier was not inspected for cleanout due to hazardous conditions."

(9) Grain Left in Carrier.

When sound grain is left in an inbound carrier and elevator personnel could have removed the grain with a reasonable effort using accepted work practices, use the following procedures:

(a) When an Estimate is Possible. In the net weight blocks of the certificate, place only the weight of the grain delivered to the scale for which a printed tape is obtained. Estimate the weight of the remaining grain and place the approved statement in the remarks section of the certificate.

Approved statement.

"The net weight does not include an estimated _____ pounds of sound grain left in the carrier."

(b) When an Estimate is Not Possible. On carriers where an accurate estimate cannot be made (e.g., V-bottomed barges, because of safety reasons), use the approved statement when it is determined there is grain left in the carrier.

Approved Statement.

"The net weight does not include an undetermined quantity of grain, quality unknown, left in the carrier."

(10) Grain Unloaded Before Weighing (Vehicle, Railroad Track Scales).

When a railcar or truck is unloaded before obtaining a gross weight, use the following procedure:

Place the officially weighed amount from the carrier in the net weight section and the approved statement in the remarks section of the certificate.

Approved Statement.

"The net weight does not include the weight of grain that was unloaded before obtaining a gross weight."

(11) Grain Not Uniform in Quality.

If a portion of the grain in an inbound carrier is found to be not uniform in quality and the grain is unloaded in separate portions during one unloading process, use the following procedure:

Weigh the grain in each portion as a separate lot but certificate the separate lots on one weight certificate. Show the net weight of each quality portion and its location in the carrier or container. The net weight is the combined total of the separate lot net weights. Place the following approved statement in the remarks section of the certificate. Upon the request of the applicant and where the grain has been officially inspected, place the grade information for each lot in the remarks section of the certificate.

Approved Statement.

"The net weight was weighed in (no. of lots) separate lots as follows: (record the location and net weight of each separate lot)."

(12) Spills.

When grain is spilled during the unloading operation and is not delivered to the scale, use the following procedure:

In the net weight blocks of the certificate, place only the weight of the grain actually delivered to the scale for which a printed tape is obtained. Estimate the weight of the spill and place the approved statement in the remarks section of the certificate.

Approved Statement.

"The net weight does not include an estimated _____ pounds of grain that was spilled and not recovered during the unloading."

(13) Bulkhead Lots.

On request, grain from a carrier offered for official inspection as a bulkhead lot(s) may be weighed similarly if the grain is separated by bulkheads or partitions (e.g., in railcar, truck, and barge compartments). Combined lots other than export grain cannot be certified separately (e.g., grain weighed from the same compartment).

Describe the location from where the grain was removed in the identification area/block of the official grain weight certificate and place the approved statement in the remarks.

Approved Statement.

"Bulkhead lot."

e. Excess Grain Sample.

When grain in excess of the amount needed for an official sample[3] is removed from the flow of grain after the grain has been weighed, use one of the following procedures, at the option of the applicant:

Do not change the net weight figure or place a statement on the certificate. Place appropriate remarks on the net weight loading log. At the applicant's option, adjust the weight of the excess grain sample in one of the following ways:

(1) The excess grain from the sample may be returned to the flow of grain.

(2) A like amount of grain may be weighed and delivered to the carrier.

(3) The net weight may be reduced by the amount of excess grain that was not delivered to the carrier.

[3] **For the purposes of this subsection, an excess sample cannot exceed the amount required for an official sample and an official file sample, as provide in the FGIS Grain Inspection Handbook, plus a like amount for quality control.**

f. Stowage.

Stowage information must be shown on all certificates for grain loaded into ships, or similar carrier. Use the following procedures, as appropriate.

Stowage information must specify the location where the lot being certified was stowed. The wording of the stowage statement shown on all weight certificates and divided-original weight certificates pertaining to the same lot shall be identical.

(1) The Stowage Statement.

Include in the identity of a stowage, in the following order: (1) the type of stowage area (Hold, Tank, Wing Tank, etc.); the "word number(s)" abbreviated as "No(s)."; (3) the stowage area's identifying number (1, 2, 3, etc., as described in ships's master plan); (40 when applicable, the terms Port, Starboard, or Port and Starboard; and when applicable, (5) information related to common stowage. See examples.

(a) Describing Like Stowage Areas.

Group stowage areas together when the lot loads in stowage areas of the same type. List each stowage area's identifying number, separated by commas after the type of stowage area and the abbreviation "No(s))." Avoid using the term "and".

Examples: Hold Nos. 1, 2, 3, 4, 5, 6.

Lower Holds and Tween Deck Nos. 1, 2, 3, 4.

(b) Describing Unlike Stowage Areas.

When a lot is loaded into different types of stowage areas, or the same type but with different common stowages or separations, group those areas which are identical in all respects. Identify and separate each group by semicolons when shown on the certificate.

Example: Hold Nos. 1, 2, 3; Wing Tank Nos. 1, 2, Port and Starboard; Hold No. 4 above burlap separation.

NOTE: Do not use baseless phrases such as "loaded in bulk" or bulk all over." However, if the terms of the contract require that the stowage be shown in a manner other than stated in this section, this may be done if the information is accurate.

(2) Common Stowage Requirements.

When all or a portion of the lot being certified is loaded aboard with a previously loaded lot of grain or commodity (common stowage), show its location in relation to the other lots in the stowage statement. This requirement applies only to the second lots' stowage, unless it has been loaded, in whole or in part, before the first lots' certificate is issued.

(a) Separated Lots – Description Requirements.

If a separation is laid between the lots, show in the stowage statement the kind of material used and its location in relation to the other lot(s).

Examples: Hold No. 6 between burlap separation.

Hold Nos. 1, 2, 3, under plywood separation.

Hold Nos. 1, 2, 3; Hold No. 4 on top of polypropylene separation.

(b) Unseparated Lots – Description Requirements.

On the certificate, when a lot loads aboard with another grain or commodity without separation, show the kind and the location of the adjacent grain or commodity.

Examples: Hold Nos. 1, 2, 3; Hold Nos. 4, 5 loaded aboard with other corn without separation.

Hold Nos. 1, 2, 3: Hold Nos. 4, 5 loaded aboard with other U.S. No. 3 Yellow corn without separation.

(3) Nonuniform Lots.

When official inspection personnel find grain loaded aboard a ship not uniform in quality, certify the net weight on the certificate as 1 lot. Upon request of the applicant, personnel may show the official grade of the grain loaded aboard the ship and, where known, the exact amount of grain found not uniform in quality.

(a) Nonuniform Lots – Quality Not Known.

Show the official grade in the remarks section where the quantity of the grain found not uniform in quality is not known.

Examples: Hold Nos. 1, 2, 3, 4 loaded aboard with 69,440,000 pounds of U.S. No. 2 Western white wheat, dockage 0.5 % with Hold Nos. 1, 3 loaded aboard with 2,800,000 pounds of U.S. No. 2 Soft white wheat dockage 0.6 % without separation.

(b) Nonuniform Lots – Quality Known.

Show the official grade in the remarks where the quantity of the grain found not uniform in quality is known.

Examples: Hold Nos. 1, 2, 3, 4 loaded aboard with U.S. No. 2 Yellow corn with Hold Nos. 1, 3 loaded aboard with U.S. No. 3 Yellow corn without separation.

(4) Stowage Statement for Outbound Land Carrier.

Approval of stowage space is required for any weighing services performed on outbound land carriers.

Examine outbound land carriers following the instructions in Program Directive 9180.48. Place the approved statement in the remarks area of the official grain/commodity weight certificate when the applicant requests the information be shown.

Approved Statement.

"Stowage area examined."

(5) Stowage Examination Waivers.

Section 800.75 (f)(20 of the regulations under the USGSA and FGIS instructions require stowage examinations of carriers when export and domestic grain shipments are officially sampled and inspected, or weighed, at the time of loading. Due to trade requests and safety considerations, FGIS established stowage examination waivers for domestic shipments when:

(a) Applicants for the weighing service (all interested persons) must submit written statements attesting that a stowage exam is not needed and why.

(b) The Official certificates must show the approved statement in the remarks area of the official grain/commodity weight certificate when the applicants submit the information needed for the waiver:

(c) Hazardous conditions (e.g. ice/snow on top of railcar) or an existing unsafe condition can not be eliminated be eliminated then official personnel must dismiss performing the stowage examination. When the stowage area is not examined because of a hazardous condition(s), show the reason for the dismissal only on the work record.

Approved Statement.

"Stowage area not examined."

g. Improper Loading Carriers.

When grain is lost or improperly stowed after weighing, use one of the following procedures:

(1) Lost or Improperly Stowed Grain Replaced.

Enter appropriate remarks in the supporting logs and note the circumstances on the scale tape(s). Do not alter any original figures or use qualifying statements on the certificate. At the request of the applicant, a separate certificate (out) may be issued to account for the replacement grain, with remarks concerning the circumstances and reason for issuance.
Approved Statement for the Weight Loading Log.

"The net weight includes _____ pounds of grain replaced by the applicant for grain that was (improperly stowed, e.g., discharged into the river, spilled on the deck, spilled on the dock)."

(2) Carrier Leaking After Loading Completed.

When a carrier is observed to be leaking after loading has been completed, place one of the approved statements below in the remarks section of the certificate, depending on whether or not the leak is repaired.

Approved Statements.

(a) The leak is repaired before shipment: "An estimated ____ pounds of grain leaked from the carrier before the leak was repaired."

b) The leak is not repaired before shipment: "At the time of loading the carrier was observed to be leaking grain from (terms to specifically describe location)."

NOTE: In both (a) and (b) above, in the net weight block on the certificate, record the actual weight at the time of loading.

(3) Lost or Improperly Stowed Grain Not Replaced.

When grain is lost or improperly stowed after weighing and is not replaced by the loading facility, use the following procedures, at the option of the applicant:

Option # 1.

Estimate the amount of grain lost or improperly stowed. If the applicant elects to have an export certificate without qualifying statement, subtract the estimated amount of grain from the total net weight. Enter appropriate remarks in the supporting logs and note the circumstances on the scale tape(s). Do not alter any original figures or place a qualifying statement on the certificate.

At the request of the applicant, issue a separate certificate (out) to account for the grain not properly stowed, with remarks concerning the circumstances and the reason for issuance.

Approved Statement on Weight Loading Log.

“The net weight does not include an estimated (______) pounds of grain that was (not properly stowed, e.g., discharged into the river, spilled on the deck).”

NOTE: For domestic movements, the statements above can be used on the certificate.

Option # 2.

Estimate the amount of grain improperly stowed. Enter appropriate remarks in the supporting logs and note the circumstances on the scale tape(s). Do not alter any original figures.

If the applicant elects to have an export certificate for all the grain officially weighed, place the following approved statement in the remarks section of the certificate.

Approved Statement on Official Grain Weight Certificate.

“The net weight includes an estimated ____ pounds that was not properly stowed.”

h. Sacked Grain.

If a lot of sacked grain is offered for official checkweighing, sacks selected by official personnel must be weighed.

Determine the gross weight, tare weight, and net weight and enter them in the appropriate blocks of the certificate. Chapter 4, Checkweighing, details procedures on sample size, and methods of selection.

If requested by the applicant, determine and show the average net weight per sack.

Approved Statement.

Required: “There are (number) sacks in the above identified lot. The estimated net weight is based on the average weight of a random sample of filled containers.”

If Applicant Requests: “The average net weight per sack is (pounds).”

i. Sacked Grain Weighed After Filling on a Vehicle or Platform Scale.

Sometimes, applicants have need of an Official weight certificate for lots already filled in sacks (e.g., sacked grain being loaded into a container, then weighed on a vehicle scale). This is acceptable if qualifying remarks are made concerning the weight of the material weighed, other than grain. The word “estimated” may be omitted if the material other than grain is weighed.

Approved Statement.

“There are (number) sacks in the lot identified in this carrier. An estimated (number) pounds included in the net weight, is the estimated weight of the empty sacks, pallets, and shipping dunnage (or applicable).”

Exhibit P. Filled Sack Weighing

FORM FGIS-900
JAN 07

UNITED STATES DEPARTMENT OF AGRICULTURE
FEDERAL GRAIN INSPECTION SERVICE
U.S. GRAIN STANDARDS ACT

Approved OMB No. 0580-0013

OFFICIAL GRAIN WEIGHT CERTIFICATE

ORIGINAL

US-CRFO-1-00004
NOT NEGOTIABLE

US CLASS X WEIGHTS

EXAMPLE ONLY – NOT FOR OFFICIAL USE

ISSUED AT: CEDAR RAPIDS, IA

DATE OF SERVICE: October 01, 2009

IDENTIFICATION: KMTU 2010773

LOCATION: Tri-County Stockdale
Joliet, IL

NET WEIGHT: 45,480 Pounds

TYPE OF MOVEMENT: Out

START DATE: October 01, 2009

START TIME: 06:30

FINISH TIME: 14:30

KIND: Soybeans

REMARKS:

Gross Weight: 73,420 Pounds
Tare Weight: 27,940 Pounds

There are 682 sacks in the lot identified in this carrier. An estimated 112 pounds included in the net weight is the estimated weight of the empty sacks, pallets, and shipping dunnage.

Seals applied: USDA,FGIS 192104, 192110

FEDERAL GRAIN INSPECTION SERVICE • U.S. DEPARTMENT OF AGRICULTURE •

I CERTIFY THAT THE SERVICES SPECIFIED ABOVE WERE PERFORMED WITH THE RESULTS STATED.

APPLICANT NAME: Tri-County Stockdale

NAME OR SIGNATURE: William E Bates

ISSUING OFFICE: FGIS - Cedar Rapids Field Office

This certificate is issued under the authority of the United States Grain Standards Act, as amended (7 U.S.C. 71 et seq.), and the regulations thereunder (7 CFR 800.0 et seq.). It is issued to show the kind, class, grade, quality, condition, or quantity of grain; or the condition of a carrier or container for the storage or transportation of grain; or other facts relating to grain as determined by official personnel. The statements on the certificate are considered true at the time and place the inspection or weighing service was performed. [illegible]

WARNING: *Any person who shall knowingly falsely* [illegible] *in the U.S. Grain Standards Act, the U.S. Warehouse Act, or related Federal laws is subject to criminal,* [illegible] *governing such services shall be accomplished without discrimination as to race, color, religion, sex, national origin, age, or handicap.*

EXAMPLE ONLY – NOT FOR OFFICIAL USE

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information is 0580-0013. The time required to disclose this recordkeeping requirement is to average 3.74 hours per recordkeeper annually, including the time to retain such records, and to notify, disclose, and report to third parties such recordkeeping requirements.

CHAPTER 3
SPECIFICATIONS, TOLERANCES, AND OTHER TECHNICAL REQUIREMENTS FOR TESTING AND CERTIFYING OFFICIAL GRAIN WEIGHING DEVICES

Contents

3.1 GENERAL

a. Purpose.

The purpose of this chapter is to establish procedures for ensuring the accuracy of scales and weighing systems used to officially weigh and inspect grain and to provide uniformity in the inspection and testing of weighing devices used for that purpose.

b. Authority for Testing of Equipment.

Section 7B (a) of the United States Grain Standards Act (Act), as amended, states: "The Secretary shall provide for the testing of all equipment used in the sampling, grading, inspection, and weighing for the purpose of official inspection, official weighing, or supervision of weighing of grain located at all grain elevators, warehouses, or other storage or handling facilities at which official inspection or weighing services are provided under this Act, to be made on a random and periodic basis, but at least annually and under such regulations as the Secretary may prescribe as he deems necessary to assure the accuracy and integrity of such equipment."

Section 7B (b) states: "The Secretary is authorized to cause such testing provided for in subsection (a) to be performed (1) by personnel employed by the Service, or (2) by States, political subdivisions thereof, or persons under the supervision of the Secretary, under such regulations as the Secretary may prescribe."

Section 7B (c) states: "Notwithstanding any other provision of law, no person shall use for the purposes of this Act any such equipment not approved by the Secretary."

c. Fundamental Considerations.

(1) General Observations on Accurate Weighing Enforcement.

(a) National Grain Weighing Program.

In accordance with the Act, the Federal Grain Inspection Service (FGIS), of the Grain Inspection, Packers and Stockyards Administration has established a nationwide weighing program. This program includes the certification of grain weight and the testing and certification of the scales and weighing systems used for official grain weighing and inspection. FGIS, delegated, and designated States must test all grain scales at facilities that request official weight certification.

(b) Safety Procedures.

All procedures outlined in this section of the Handbook shall be performed in accordance with the applicable Occupational Safety and Health Administration (OSHA), Department of Agriculture, and FGIS safety standards.

(2) Acceptance or Rejection of Official Weighing Equipment.

Acceptance or rejection of official weighing equipment shall be based on the ability of this equipment to meet the specifications, tolerances, and performance requirements outlined in this chapter. These requirements are derived primarily from applicable sections of the General Code, the Scale Codes, the Automatic Bulk Weighing System Code, and the Weights Code of the 2008 edition of National Institute of Standards and Technology (NIST) Handbook 44, "Specifications, Tolerances and Other Technical Requirements for Weighing and Measuring Devices" (Handbook 44); and NIST Handbook 105-1, "Specifications and Tolerances for Reference Standards and Field Standard Weights and Measures" (Handbook 105-1), 1990 Revision.

(3) Request for Approval of New Installation or Modification to an Existing System.

All new scale installations and/or modifications to systems must be approved prior to use for official weight certification. Prior to testing a new installation or modification, the local scale official shall send the following information to the FGIS Policies, Procedures, and Market Analysis Branch (PPMAB) and a copy to the field office manager in charge: (1) facility name, address, and contact; (2) scale type, model, kind, dimensions, capacity, divisions, and manufacturer; (3) number and capacity of load cells; (4) statement of scale usage; (5) number, weight, and type of test weights; (6) description and reason for modification, and proposed dates for modification and initial testing; and (7) prototype evaluation information. (H-44, 2008 UR.4. in part)

(4) Security Seals.

All weighing devices shall be provided with sealing access adjustable components. (Nose-irons and other lever adjustments need not be sealed.) Access points shall be sealed with pre-numbered seals. Unauthorized breakage of a seal will require recertification of the scale. Crimpers used to fasten lead wire seals and pre-numbered seals shall be kept in a secure place. Application or removal of a seal shall be recorded on the "Scale Test Report" forms (FGIS-965, FGIS-965-1, FGIS-965-2) and the "Scale Record Log" (FGIS-963) with appropriate explanations.

(5) Prohibited Practices.

Coupled-in-motion weighing on railway track scales and weighing on belt conveyor scales is not permitted for official weight certification due to the relative inaccuracy of such devices and methods.

d. Documentation.

(1) General.

All scale tests performed by FGIS, delegated States, or designated States shall be properly documented on FGIS forms and entered into the Equipment Capability Testing (ECT) section of FGIS online web application. FGIS shall supply access to scale testing forms, approved labels for inspected machineries, and scale record logs necessary for official scale testing purposes.

(2) Approved Label for Inspected Machinery (Form FGIS-93I).

An approval label shall be applied on each scale upon completion of an official test, if the scale has been approved for official weight certification. The approval label shall be placed so that it is visible during normal scale operation. The official certifying the scale shall sign and date the approval label in the appropriate space and write the certified capacity on the label. Each label also has a space for the serial number of the piece of instrumentation tested. FILL IT IN. The “Scale Record Log” must be updated to note that the scale was tested and a new label was applied. The approval label shall be removed from scales that are rejected or exceed the specified test schedule by more than 8 weeks.

(3) Rejected Tag (Form WH-11).

A Rejected Tag shall be placed on each weighing system when determination is made that the scale exceeds acceptable limits and cannot be used for official weight certification. The Rejected Tag should be secured to the scale in such a position that it will be readily apparent that the scale has been rejected for official use. The official personnel rejecting the scale shall sign and date the Rejected Tag in the appropriate spaces. The Rejected Tag number should be recorded on the Scale Record Log and in the appropriate block on the “Scale Test Report.” The Approved Label for Inspected Machinery shall be removed from scales that are rejected or taken out of service. A “Repair or Modification Notice,” form FGIS-9601, should be issued when repair and/or modification is needed.

(4) Scale Record Log (Form FGIS-963).

The Scale Record Log is an official record which when maintained carefully and accurately will provide important historical data on all scales under the jurisdiction of FGIS. One per scale is required.

(a) Required Information. In addition to descriptive specifications on each scale, the Scale Record Log shall include, but not be limited to, the following information:

1 Scale test dates, times, results, and comments.

2 The next test due date, one of the following; 180, 90, 45, or 30 days, see "e." of this section to determine the next due date.

3 Scale and associated equipment mal-function information and dates.

4 Scale sealing points, seal numbers, and dates. Chapter 2, Section 2.3 details additional information weighers are required to show in the log.

5 Date, time, and initials when recording the results of an audit trail event count.

(b) Placement and Maintenance.

The Scale Record Log shall be placed at or near each scale that is under the jurisdiction of FGIS and maintained by the shift supervisors, weighers, and scale officials. Completed logs shall be kept on file as official documentation.

(5) Scale Test Report.

The Scale Test Report shall be used for recording data obtained during an official scale test.

(a) Statistical Data.

The top third of the form should be filled out before starting the inspection or testing of the scale.

(b) Test Results.

These are recorded during the test and are used to determine compliance with testing instructions and regulations. Results are recorded in the center of the form.

(c) Other Data.

Appropriate comments on repairs, adjustments or recommendations, tolerances applied, and necessary signatures are recorded at the bottom of the form. The "as found" condition of the scale shall be noted on the form.

(d) Identification of Forms.

The "Scale Test Reports" are identified in the upper left-hand corner and are to be used as follows:

1 FGIS-965 - Scale Test Report -- Grain Hopper (Attachment l).

2 FGIS 965-1 - Scale Test Report -- Railroad Track (Attachment 2).

3 FGIS 965-2 - Scale Test Report -- Vehicle (or portable platform) (Attachment 3).

4 Instructions for Completing Scale Test Reports (Attachment 4).

(e) Distribution of "Scale Test Reports.

The "Scale Test Reports" shall be distributed as follows:

1 Original shall be retained in a separate file or electronically at the office (FGIS or State) to which the responsibility for the scale is assigned. The hard copy printed record of the test indications shall be attached to the original.

2 A copy shall be given or sent to the owner/operator of the scale for their information and records.

3 A copy shall be sent to the FGIS field office, which is responsible for the area in which the scale is located if the sale is not tested by the field office scale specialist or the Test Report Number (TRN) from ECT should be provided.

4 A copy if needed can be provided for an interested party (e.g., State Weights and Measures supervisor or scale service company).

e. Scale Testing Frequency.

(1) Semiannual Official Tests.

Scale installations under the jurisdiction of FGIS shall be tested twice a year at approximately 6-month intervals. Ascale that has been previously tested and found to be in compliance with the instructions regarding accuracy is expected to maintain its accuracy under normal operating conditions from one semiannual test to the next. Whenever possible, scales should be tested "as found" to at least the normal use range. When the scale has been adjusted before testing, the scale shall be considered not maintaining its accuracy and shall be put on an increased frequency-testing schedule (see 4 below).

(2) Development of Historical Data.

An accurate and thorough history of test results must be maintained so there can be no doubt in justifying why a scale is being rejected and removed from official weighing service due to its inability to maintain accuracy. This historical record should include, but not be limited to, “Scale Test Reports,” “Repair/ Modification Notices,” and “Scale Record Logs,” indicating dates, times, and nature of problem occurrences.

(3) First Official Test on Existing Weighing Devices.

An existing weighing device receiving its first official test may be allowed for official use even though it does not comply with all FGIS requirements provided the accuracy specifications of this chapter are met. The owner or operator shall be notified in writing that noncompliance items shall be corrected prior to the next official test. Equipment placed in official service for the first time is to be tested again within 30 days.

(4) Increased Frequency Testing.

It is important that every scale is tested uniformly, correctly, and without bias. A scale that is found incapable of maintaining its accuracy from one semiannual test to the next should be tested on an increased frequency. The following information is a guideline for increased frequency testing. Time intervals may vary according to circumstances. However, in no case shall a scale that is found to be continually incapable of maintaining its accuracy from one official test to the next be allowed to stay in official service.

(a) Semiannual.

When a semiannual test is performed and the test results are found to exceed the allowable tolerance, the scale shall be removed from official service until corrective action is taken to bring the scale within allowable tolerance and as close to zero error as practicable. Notify the scale owner or operator in writing that the scale must be tested again in 90 days. (Notification can be made on the Scale Test Report, which is provided, to the scale owner or operator.) Problems such as binds, which can cause scales to test out of tolerance, do not necessarily warrant increased frequency testing. If the results of the 90-day test are found acceptable, the owner or operator shall be notified in writing that the scale is to be tested again in 6 months.

(b) Ninety-day.

If a 90-day test is performed and the results exceed the allowable tolerance, the scale shall be removed from official service until corrective action is taken to bring the scale within allowable tolerance and as close to zero error as practicable. Notify the scale owner or operator in writing that the scale must be tested again in 45 days. If the results of the 45-day test are found acceptable, the owner or operator shall be notified in writing that the scale is to be tested again in 90 days.

(c) Forty-five-day.

If a 45-day test is performed on a scale and the results exceed the allowable tolerance, the scale shall be removed from official service. A scale that has failed a 45-day test shall not be retested until the owner or operator notifies the scale testing official that all repairs or modifications have been performed to correct the problem. If a new test of the scale is performed following these repairs or modifications and the results are within allowable tolerances, the scale shall be returned to official service. The owner or operator shall be notified in writing that the scale is to be tested again in 45 days.

f. Type Evaluation Program.

FGIS shall, in conjunction with the National Type Evaluation Program (NTEP), of the National Conference on Weights and Measures (NCWM) conduct evaluations of automatic bulk weighing systems, and weighing load receiving elements, to determine compliance with FGIS regulations and the applicable NTEP type evaluation examination criteria. Only those scales presently approved; and Class II, III, and III L scales that have been evaluated by FGIS or an NTEP authorized laboratory and approved under NTEP may be used for official weighing and inspection purposes.

(1) Purpose.

The purpose of this program is to establish the policy of an evaluation program administered by the NCWM. Type evaluation is the process whereby weighing and measuring devices are examined to determine if the performance, operating characteristics, features and options of a particular device complies with the applicable requirements of the National Institute of Standards and Technology (NIST) Handbook 44.

(2) Responsibilities.

(a) FGIS, Policies, Procedures, and Market Analysis Branch.

1 Develop and maintain a list of automatic bulk weighing systems.

2 Observe NCMW Publication 14 “Weighing Devices” type evaluation procedures to maintain NTEP accreditation.

3 Coordinate requests for NTEP evaluations.

4 Establish a program to ensure that officially used weighing equipment complies with FGIS regulations and applicable NTEP requirements before and after installation.

(b) Scale Officials.

Ensure that only FGIS approved equipment is installed for official use.

1 Ensure that approved equipment complies with the performance and procedural requirements of FGIS regulations.

2 Ensure that FGIS approved equipment is properly installed, operated, and maintained according to instructions supplied by the manufacturer and FGIS.

3 Ensure that any modifications to officially used scales and weighing systems, which may affect performance, reliability, or integrity, are approved by the Policies, Procedures, and Market Analysis Branch (PPMAB) before implementation.

(c) Procedures for Requesting a Type Evaluation.

All weighing equipment must be approved by FGIS before being allowed for official use. A completed application with the related fees must be submitted to the NCWM. The NTEP Administrator will review the submission and determine if testing is necessary. If so, the device will be assigned a Control Number (CN) and a laboratory.
You will receive notification of the CN and the assigned laboratory via email from NCWM. NTEP Certification | NCWM (d) A copy of the written request should also be sent to:

NCWM
1135 M Street
Suite 110
Lincoln, NE 68508

(3) Conducting a Type Evaluation.

(a) Under Laboratory Conditions.

1 Environmental factors must be minimized during certain evaluation tests. Thus, the testing of electronic scale instrumentation is usually performed under controlled laboratory conditions.

2 A manufacturer, whose device is evaluated by FGIS and found to comply with the applicable requirements, is issued a satisfactory Certificate of Conformance (CC) under NTEP administrated by the National Conference on Weights and Measures (NCWM).

a When a device has undergone type evaluation and been found not to be in compliance with all FGIS regulations and NTEP requirements, a letter of nonconformance shall be issued indicating the reason the device does not comply with specific FGIS requirements or NTEP requirements.

b If the manufacturer makes the necessary correction, the device may be resubmitted for evaluation. This evaluation process may be repeated three times until the device complies with all FGIS and NTEP requirements. The manufacturer may withdraw a request for FGIS type evaluation at any time during the process.

(b) Under Field Conditions.

An onsite evaluation of the weighing system(s) is to be performed by the scale specialist during official inspection of the scale to ensure compliance with the performance and procedural requirements of FGIS and NTEP regulations prior to any official testing.

1 The scale specialist shall ensure that equipment is approved and has been issued an NTEP CC. Using the CC and the manufacturer's technical literature, the scale specialist shall determine that the equipment is a replica of that which is described in the CC. Only those features and options evaluated and described therein are permitted.

2 The scale specialist shall ensure that the equipment is properly installed, operated, and maintained according to instructions supplied by the manufacturer and FGIS/NTEP. Any modifications to an officially approved device or system affecting accuracy, reliability, or integrity must be approved by the manufacturer, the NTEP Administrator and the FGIS PPMAB before implementation.

(4) Other Factors.

Radio frequency interference (RFI), adverse effects from other grain handling equipment, and environmental influences may adversely affect the performance of a scale. Tests to determine the effects of these factors shall be conducted with equipment and under conditions, which are usual and customary with respect to the location and use of the scale. These tests shall be conducted for each new installation or whenever the scale official suspects that performance may be affected by any of the aforementioned factors. (See the Test Procedures Section 3.5 of this chapter for specific procedures).

Attachment 1: Scale Test Report -- Grain Hopper

U.S. DEPARTMENT OF AGRICULTURE
GRAIN INSPECTION, PACKERS AND STOCKYARDS ADMINISTRATION
FEDERAL GRAIN INSPECTION SERVICE
FIELD MANAGEMENT DIVISION

SCALE TEST REPORT - GRAIN HOPPER

LAST DATE TESTED 5	TEST DATE 6	PAGE OF / TEST NO. 7
MANUFACTURER 8	MODEL OF SCALE 9	SCALE CODE NO. 10
SCALE CAPACITY 11	MINIMUM DIVISION 12	SERIAL NO. 13
SCALE TYPE ☐ FULL ELEC. ☐ LEVER TR. ☐ MECH. FCB ☐ MECH. CPB 14		SCALE NO. 15

TESTING AGENCY *(Inspector's Name, Address)* 1

INSPECTOR

TELEPHONE

FIELD OFFICE LOCATION 2

SCALE OWNER 3

SCALE LOCATION *(ADDRESS)* 4

Test Weight Information

☐ PERMANENT WEIGHTS	☐ PORTABLE ELEVATOR WTS. 22	☐ SERVICE CO. OR STATE WEIGHTS
TYPE AND MFG. 21		NUMBER OF WEIGHTS 26
LAST REVERIFICATION DATE 24		TOTAL WEIGHT 23

TEST RESULTS

SENSITIVITY ZERO 27 CAP.	DISCRIMINATION ZERO CAP. 28	SCALE CONDITION AS FOUND 29	ZERO BALANCE AS FOUND 30

CORNER TEST

BALANCE	TEST WEIGHT	WEIGHT INDICATION	ERROR WTS. lb	ERROR
Corner 1				
Corner 2				
Corner 3				
Corner 4				

INCREASING LOAD TEST

GRAIN	BAL WTS.	TEST WEIGHTS	WEIGHT INDICATION	ERROR WTS lb	ERROR

INCREASING LOAD TEST (CONT'D) 40

GRAIN	BAL WTS.	TEST WEIGHTS	WEIGHT INDICATION	ERROR WTS. lb	ERROR

ZERO BALANCE CHANGE DURING TEST: lb

THE ERRORS IN THIS SCALE AS INDICATED ABOVE ☐ ARE ☐ ARE NOT WITHIN THE ACCURACY REQUIREMENTS 31
PRESCRIBED BY THE FEDERAL GRAIN INSPECTION SERVICE

REPAIRS, ADJUSTMENTS, MODIFICATIONS OR RECOMMENDATIONS MADE AT THIS TIME:

32

Return completed form to the above Field Office.

NEXT TEST IN: ☐ 30 DAYS ☐ 45 DAYS ☐ 60 DAYS 33 ☐ 90 DAYS ☐ 180 DAYS

APPLICABLE TOLERANCE ("✓" one) ☐ Acceptance 34 ☐ Maintenance	APPROVAL SEAL APPLIED BY: 35	DATE: 36	REJECTION TAG NO. 37
RECEIPT OF REPORT ACKNOWLEDGED *(Signature)* 38	FGIS WITNESS *(Signature)* 39		

FORM FGIS-985 10/02
Edition dated (5/96) may be used.

FORM APPROVED OMB NO. 0580-0013: According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0580-0013. The time required to complete this information collection is estimated to average 2 hours per response and 1 minute of recordkeeping, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Attachment 2: Scale Test Report -- Railroad Track

U.S. DEPARTMENT OF AGRICULTURE
GRAIN INSPECTION, PACKERS AND STOCKYARDS ADMINISTRATION
FEDERAL GRAIN INSPECTION SERVICE
FIELD MANAGEMENT DIVISION

SCALE TEST REPORT - R.R. TRACK

LAST DATE TESTED 5	TEST DATE 6	PAGE OF / TEST NO. 7
MANUFACTURER 8	MODEL OF SCALE 9	SCALE CODE NO. 10
SCALE CAPACITY 11	MINIMUM DIVISION 12	SERIAL NO. 13
SCALE LENGTH 18	SECTIONAL CAPACITY 16	SCALE NO. 15
SCALE TYPE 14 ☐ FULL ELEC. ☐ MECH ☐ LEVER TR. ☐ OTHER		SECTIONAL TEST LOAD 20

TESTING AGENCY (INSPECTOR'S NAME, ADDRESS) 1
INSPECTOR
TELEPHONE

FIELD OFFICE LOCATION 2

SCALE OWNER 3

SCALE LOCATION (ADDRESS) 4

TEST WEIGHT INFORMATION 25

TEST CAR OWNER 22	I.D. NUMBER	TYPE 21 ☐ COMPOSITE ☐ L.W.B. ☐ L.W.B. w/j ☐ FGIS CAR
LAST REVERIFICATION DATE 24	WEIGHT 23	

TEST RESULTS

SENSITIVITY ZERO CAP. 27	DISCRIMINATION ZERO CAP. 28	SCALE CONDITION AS FOUND 29	ZERO BALANCE AS FOUND 30

TEST DIRECTION	BAL.	SEC. 1R	SEC. 2L	SEC. 2R	SEC. 3L	SEC. 3R	SEC. 4L	SEC. 4R	SEC. 5L	BAL.
					40					

SUBSTITUTION STRAIN TEST				PRETEST INSPECTION 41	
LOAD	CAL. TEST LOAD	INDICATION	ERROR	ENVIRONMENTAL PROTECTION	
				CONDITION OF PIT	
				CONDITION OF APPROACHES	
				CONDITION OF PLATFORM	
				APPROACH & LIVE RAIL GAP	
				KIND OF DRAINAGE	
				ZERO BALANCE CHANGE DURING TEST	lb

THE ERRORS IN THIS SCALE AS INDICATED ABOVE ☐ ARE ☐ ARE NOT WITHIN THE ACCURACY REQUIREMENTS 31
PRESCRIBED BY THE FEDERAL GRAIN INSPECTION SERVICE.

REPAIRS, ADJUSTMENTS, MODIFICATIONS OR RECOMMENDATIONS MADE AT THIS TIME: 32

Return completed form to the above Field Office.

NEXT TEST IN: ☐ 30 DAYS ☐ 45 DAYS ☐ 60 DAYS ☐ 90 DAYS ☐ 180 DAYS 33

APPLICABLE TOLERANCE ("X" one) 34 ☐ ACCEPTANCE ☐ MAINTENANCE	APPROVAL SEAL APPLIED BY 35	DATE 36	REJECTION TAG NO. 37

RECEIPT OF REPORT ACKNOWLEDGED (Signature) 38	FGIS WITNESS (Signature) 39

FORM FGIS-955-1 (10/02)
Edition dated (12/84) may be used.

FORM APPROVED OMB NO. 0580-0013: According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0580-0013. The time required to complete this information collection is estimated to average 1 hours per response and 1 minute of recordkeeping, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Attachment 3: Scale Test Report -- Vehicle

U.S. DEPARTMENT OF AGRICULTURE
GRAIN INSPECTION, PACKERS AND STOCKYARDS ADMINISTRATION
FEDERAL GRAIN INSPECTION SERVICE
FIELD MANAGEMENT DIVISION

SCALE TEST REPORT - VEHICLE

LAST DATE TESTED 5	TEST DATE 6	PAGE OF / TEST NO. 7
MANUFACTURER 8	MODEL OF SCALE 9	SCALE CODE NO. 10
SCALE CAPACITY 11	MINIMUM DIVISION 12	SERIAL NO. 13
PLATFORM SIZE 17	CLC 16	SCALE NO. 15
SCALE TYPE ☐ FULL ELEC. ☐ ELEC. DIAL ☐ LEVER TR. ☐ MECH. DIAL 14		LOAD CELL CAPAC. 19

TESTING AGENCY (INSPECTOR'S NAME, ADDRESS) 1

INSPECTOR
TELEPHONE

FIELD OFFICE LOCATION 2

SCALE OWNER 3

SCALE LOCATION (ADDRESS) 4

TEST WEIGHT INFORMATION

TEST WEIGHT OWNER 22	TYPE AND MFG. 21
TOTAL WEIGHT 23	LAST REVERIFICATION DATE 24

TEST RESULTS

SENSITIVITY ZERO CAP. 27	DISCRIMINATION ZERO CAP. 28	SCALE CONDITION AS FOUND 29	ZERO BALANCE AS FOUND 30

SHIFT TEST DIRECTION	BAL.	SEC. 1	SEC. 2	SEC. 3	SEC. 4	SEC. 5	SEC. 6	BAL.
SECTION TEST								

INCREASING LOAD TEST 40

LOAD	TEST WEIGHT	WEIGHT INDICATION	ERROR WEIGHT	ERROR

STRAIN LOAD TEST

FACTORS	TEST NO. 1	TEST NO. 2
EMPTY TRUCK WEIGHT		
TEST WEIGHT ADDED		
TRUCK AND WEIGHT INDICATION		
ERROR ON WEIGHT ADDED		

CONDITION OF PIT
CONDITION OF APPROACHES 41
CONDITION OF PLATFORM
KIND OF DRAINAGE

RECORD BALANCE CHANGE lb

THE ERRORS IN THIS SCALE AS INDICATED ABOVE 31 ☐ ARE ☐ ARE NOT WITHIN THE ACCURACY REQUIREMENTS PRESCRIBED BY THE FEDERAL GRAIN INSPECTION SERVICE

REPAIRS, ADJUSTMENTS, MODIFICATIONS OR RECOMMENDATIONS MADE AT THIS TIME: 32

Return completed form to the above Field Office.

NEXT TEST IN ☐ 30 DAYS ☐ 45 DAYS ☐ 60 DAYS 33 ☐ 90 DAYS ☐ 180 DAYS

APPLICABLE TOLERANCE ("X" one) 34 ☐ ACCEPTANCE ☐ MAINTENANCE	APPROVAL SEAL APPLIED BY 35	DATE 36	REJECTION TAG NO. 37

RECEIPT OF REPORT ACKNOWLEDGED (Signature) 38	FGIS WITNESS (Signature) 39

FORM FGIS-965-2 10/02
Edition dated (10/84) may be used

FORM APPROVED OMB NO. 0580-0013: According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0580-0013. The time required to complete this information collection is estimated to average 2 hours per response and 1 minute of recordkeeping, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Attachment 4: Instructions for Completing Scale Test Reports

1. Testing Agency. The name of the organization, name of the person testing, address, and telephone number.

2. Field Office Location. The city and state of the field office which has jurisdiction for the scale being tested.

3. Scale Owner. Facility name and designation; i.e., Mid-South Grain, House A.

4. Scale Location. The street address of the elevator.

5. Last Date Tested. Date of the last test.

6 Test Date. The month, day, and year of the test.

7. Test No. Inspector's assigned serial number, plus consecutive test number for the fiscal year. Cary Brown's assigned serial (which is 1000), the first test of FY 2004, would be: "1001-04", the second would "1002-04", and so forth. In order of testing, regardless whether a hopper, vehicle, or railway track scale test.

8. Manufacturer. The name of the company, corporation, person, etc., who manufactured the indicating element.

9. Model of scale. The model name, number, or designation which has been assigned by the manufacturer.

10. Scale Code No. The code number of the scale which was assigned by the FGIS Policies and Procedures Branch for use in the ADP Scale Test Monitoring System.

11. Scale Capacity. The maximum gross load that can be accepted for official weight certification as determined by an official scale inspector.

12. Minimum Division. The value of the smallest unit that can be indicated on the primary indicating element during normal weighing.

13. Serial No. The nonrepetitive number which was assigned by the manufacturer and affixed to the indicating element or beam.

14. Scale Type. Check the appropriate box to indicate whether the scale is full electronic, levertronic, a full capacity beam (FCB) mechanical scale, or a counterpoise (CPB) mechanical scale.

15. Scale No. The number assigned to the scale by the owner which usually includes S and/ or R designations to differentiate between shipping and receiving.

16. Sectional Capacity. The maximum gross load that can be applied to any one section of the scale without causing structural deflections affecting the accuracy of the scale.

17. Platform Size. The length and width of the vehicle scale platform.

18. Scale Length. The length of the live track on a railroad track scale.

19. Load Cell Capacity. The manufacturer's rated capacity of one of the load cells in the scale system.

20. Sectional Test Load. The maximum amount of test standards applied to any one section of a railroad track or vehicle scale.

21. Type and Mfg. For vehicle and hopper scales indicate the type of test weights; i.e., fab, basket, cast, etc., and the manufacturer. For railroad track scales check the appropriate box.

22. Test Weight Owner. Indicate the test weight owner.

23. Total Weight. The total amount of the test weights combined.

24. Last Reverification Date. Indicate the month and year of the latest test weight reverification.

25. I.D. No. The identification of the test car.

26. Number of Weights. The total number of individual weights.

27. Sensitivity. The results of the sensitivity check in number of divisions at zero and at capacity.

28. Discrimination. The results of the discrimination check in number of divisions at ZERO and at CAPACITY.

29. Scale Condition as Found. Indicate the condition of the scale as found. (i.e., water in pit, dirty platform, etc.)

30. Zero Balance as Found. The weight indication on the primary indicating element with no load on the load receiving element at the time of starting the official inspection and test.

31. Results. Check appropriate box; /x/ ARE-for scales that are within tolerance or have been adjusted to be within tolerance, /x/ ARE NOT-for a scale that cannot be used for official weight certification because it cannot be adjusted or fixed and is consequently REJECTED.

32. Remarks. Indicate any repairs, adjustments, modifications, or recommendations. (i.e., scale serviced before test, load cell #2 replaced, A/D converter replaced.)

33. Next Test In. Check the appropriate box to indicate approximately when the next test is due.

34. Applicable Tolerance. ("X" one.) Indicate which tolerance is to be applied.

35. Approval Seal Applied. Indicate the name of the inspector who applied the FGIS Approved Label for Inspected Machinery. If the person is the same as the FGIS witness, just initial.

36. Date. Indicate the date of approval.

37. Rejection Tag No. Indicate the number of the rejection tag, if applicable.

38. Receipt of Report Acknowledged. Signature of the scale owner's representative.

39. FGIS Witness. FGIS or delegated official who observed the testing and approval of the scale.

40. Test Procedures. See test procedures for appropriate type scales in Section 3.5 Test Procedures in this Chapter.

41. Pretest Inspection. Make appropriate comments for listed scale conditions for vehicle and railroad track scales (No pretest inspection area (41) on Grain Hopper, Attachment 1).

42. Type of scale test procedure used.

43. Automatically generated next test date based on calculations from date of test and the next test selected in number of days block that was selected.

3.2 FIELD STANDARDS AND COUNTERPOISE WEIGHTS

a. General.

Field standards and counterpoise weights shall include, but not be limited to, on-site block weights, portable block weights, and test weight kits; and shall conform to the specifications and tolerances established by the National Institute of Standards and Technology (NIST) Handbook 105-1 (1990 edition), for field standard weights.

b. Class F Tolerances for Field Standard Weights.

The tolerances are one part in 10 000 for weights 1 kg (2 lb) and larger, 70 mg for weights between 1 kg and 300 g, and one part in 5000 for weights 300 g down to and including 10 g. Tolerances for weights below 10 g are determined from the equation:

$$T(W) \text{ in mg} = 0.9\ W^{0.31795}$$

Where W is the nominal value in grams. Tolerances in the table on the following page have been rounded to two significant digits.

For weight denominations smaller than 1 kg (2 lb), intermediate between those values listed in the tables, the tolerance for the lower denomination shall be applied.

The prescribed tolerances shall be applied equally to errors in excess and errors in deficiency.

c. Field Standard Values and Identification.

(1) Railway Test Cars under FGIS Jurisdiction.

The stenciled weight of a test car or monitor car shall be in 100 pound intervals.

(2) Vehicle and Hopper Scales.

Field standard weights for vehicle and hopper scales shall be sealed to not less than a 50 - pound interval.

(3) Numbering Field Standards.

Field standards used in the testing of hopper, vehicle, and railway track scales shall be numbered so they may be properly identified.

Class F Tolerances for Field Standard Weights

Avoirdupois					Metric	
Denomination	Tolerance		Denomination	Tolerance	Denomination	Tolerance
10 000 lb	1.0 lb	450g	8 oz	45 mg	500 kg	50 g
5 000	0.50	230	4	23	300	30
3 000	0.30	140	2	11	200	20
2 500	0.25	110	1	5.4	100	10
2 000	0.20	91	0.5 (½)	2.8	50	5.0
1 000	0.10	45	0.3	1.8	30	3.0
500	0.050	23	0.25 (¼)	1.7	20	2.0
100	0.010	4.5	0.2	1.6	10	1.0
50	0.0050	2.3	0.125 (1/8)	1.3	5	.50
30	0.0030	1.4	0.1	1.3	3	.30
25	0.0025	1.1	0.0625 (1/16)	1.1	2	.20
20	0.0020	0.91	0.05	1.0	1	.10
10	0.0010	0.45	0.03125 (1/32)	0.87	500 g	70 mg
5	500 µlb	230 mg	0.03	0.85	300	60
3	300	140	0.02	0.75	200	40
2	200	91	0.015625 (1/64)	0.69	100	20
1	150	70	0.01	0.60	50	10
0.5	100	45			30	6.0
0.3	60	27			20	4.0
0.2	40	18			10	2.0
0.1	20	9.1			5	1.5
0.05	10	4.5			3	1.3
0.03	6.0	2.7			2	1.1
0.02	4.0	1.8			1	0.90
0.01	3.2	1.5			500 mg	0.72
0.005	2.6	1.2			300	0.61
0.003	2.2	0.99			200	0.54
0.002	1.9	0.87			100	0.43
0.001	1.5	0.70			50	0.35
					30	0.30
					20	0.26
					10	0.21
					5	0.17
					3	0.14
					2	0.12
					1	0.10

d. Care of Standards.

(1) Covers.

Standards exposed to the elements shall be kept covered or stored in a reasonably dry environment when not in use. Covers shall be required for weights that in the opinion of the Service are not being kept clean.

(2) Damage or Abuse.

Any evidence of damage or abuse to the standard itself or the sealing cavity shall necessitate reverification of the standard.

NOTE: The sealing cavity shall be clearly marked with the date of reverification. Standards shall be repainted after "as found" data has been determined and before adjustments are made.

(3) Contact with Floors.

Provisions shall be made so that field standard weights shall not have direct contact with a solid floor (i.e., by use of steel grating).

e. Reverification Frequency.

(1) Field Standards.

When reverifying large field standards, the approved laboratory shall clearly and conspicuously stamp the seal of the adjustment cavity with the year reverified and, upon request, provide appropriate documentation to the Service. Field standards approved by State Weights and Measures authorities must have an accompanying Report of Test (ROT) (Attachment 14) on file in order to be recognized as official standards.

(2) Basket Weights.

Open baskets shall be sealed to a 50-pound multiple and shall be tolerance tested and treated as a normal standard. Closed baskets shall be sealed as an integral part of composite summation. The closed basket shall be designed in such a manner to incorporate a fitted cover plate that shall be locked during calibration. A pre-numbered seal shall be included as part of the weight value. Once tested, the basket shall be sealed with the pre-numbered seal and the number shall be recorded in the Scale Record Log (FGIS-963).

(3) Onsite Block Weights and Closed Basket Weights Without Casters.

These weights shall be reverified every 3 years. This category shall include large one-piece standards and sealed baskets containing weights.

(4) Counterpoise Weights, Field Standard Weights up to and Including 50 Pounds, and Sealed Baskets with Casters.

These weights shall be reverified each 3 years.

(5) Portable Block Weights.

These weights shall be reverified at least every 3 years. Portable block weights shall be construed to mean one piece standards utilized by approved testing agencies. Documentation of the reverification date shall be supplied to FGIS upon request.

(6) Railway Track Scale Test Cars.

Test cars utilized in the testing of railroad track scales under the jurisdiction of FGIS shall be reverified at least annually. Documentation indicating date and location of last reverification shall be supplied to FGIS upon request.

(7) Chains, Hangers, and Baskets.

Any chains or hangers utilized for suspending test weights, when balanced as part of the zero-load of the scale, need not be reverified.

(8) Fabricated Field Standards.

In cooperation with the National Institute of Standards and Technology, FGIS has determined that fabricated (filled shell) and laminated weight designs are no longer acceptable. These types of weights have not shown the necessary stability for maintaining tolerances during test cycles.

(a) No New Fabricated Weights.

No new fabricated weight shall be placed into service.

(b) Fabricated Weights In Service.

A fabricated weight in service, that has maintained Class F tolerances between verification tests, shall continue to be acceptable. These weights shall be tested every 3 years.

(c) Removing From Service.

Fabricated weights found to be out of tolerance at the time of a verification test shall be adjusted as close as possible to zero error, and allowed to remain in service for 1 year. During the 1 year period, the owner must arrange to replace the weight, since it will be condemned and removed from service on the anniversary date of the test.

(d) Notification Letter.

A letter will make notification of official rejection of test weights from the Director of the FGIS, Field Management Division to the manager of the elevator after a thorough review of the data.

(9) FGIS-Owned Field Standard Weights and Counterbalance Weights.

These weights shall be reverified each 3 years. Official agencies are required to have their standard weights and counterbalance weights reverified in a similar manner.

NOTE: Reverification should be performed by NIST certified State Weights and Measures Metrology Laboratories, when practicable. If not practicable, contact the FGIS, PPMAB to make other arrangements.

Type	Reverification Frequency	Tolerance
1. Field Standard Weights		
a. Commodity weights (1, 2, 5, 10, 25, and 50 pounds)	3 years	NIST Class F
b. Metric weight kits: 1) Class P Brass[1] 2). All other kits	 3 years 3 years	 NIST Class P **NIST Class F**
c. Pounds per bushel weights	3 years	
2. Laboratory Counterbalance Weights [2]	3 years	NIST Class F

[1] Used only for testing weighing devices. FGIS discourages the purchase of weights other than Class F. Other classes may be used if a State metrology laboratory has certified them. The same applies to old NBS circular Class S-1 weights. In addition, Class S-1 weights shall be reverified annually. Class S-1 weights have accuracy tolerances so small that they must be handled by wooden or ivory forceps, chamois skin, or special lifters so grease cannot be left on, or damage the weights.

[2] Counterbalance weights are those used with a weighing device to make weight determination; e.g. Shadograph weights, stainless steel metric weights, and Toledo scale weights.

f. <u>Test Weight Reverification (TWR)</u>.

(1) <u>General</u>.

The FGIS TWR program is a NIST, Weights and Measures Division recognized program, which is accepted by most states having official grain scales. The TWR service is provided by FGIS to facilities that cannot easily remove the weights from the scale area. The service entails a procedure for checking facility test weights at the facility, adjusting the weights, and providing a ROT.

(2) <u>TWR Equipment Setup</u>.

A location for TWR must be selected such that reverification of the test weights can be performed with minimal effects from environment and elevator operations. The following conditions are necessary for accurate use of the TWR equipment.

(a) <u>Test Location</u>.

The test station should be located in a place convenient for moving the weights to and from the scales.

(b) <u>Traffic</u>.

Walk by traffic should be minimized.

(c) <u>Drafts</u>.

There should be no heating sources or drafts in the immediate area.

(d) <u>Sunlight</u>.

There should be no direct sunlight on the TWR equipment.

(e) <u>Equipment and Labor</u>.

The facility must provide one or more handling carts and labor to move the weights from the scale to the test station and back.

(f) Equipment Suspension.

The reverification load cells are designed to be suspended under a structural steel “I” beam similar to the drawing shown in Attachment 6.

1 The elevator must provide a structural steel bridge anchored in such a manner to support loads at least four times as great as the largest test weight to be applied.

2 The structural steel bridge “I” beam must measure 10 inches deep by 6 inches wide flange or conform to the drawing if the bridge is constructed by bolting two 10 inch channel beams back-to-back.

(g) Other Suspension Criteria.

The supporting steel shall be level and a minimum of 10 feet in length if free standing or set perpendicular to a wall; or a minimum of 15 feet if set diagonally on a corner angle.

1 A minimum clearance of 48 inches is required between the closest wall and center line of the steel bridge.

2 The height of the structural steel bridge, as measured from the bottom flange to the concrete floor, should be 96 inches or more.

(h) Test Equipment Documentation.

The basket, channels, and 50-pound weights must have been calibrated by an approved weights and measures laboratory. The correction weights need a ROT or calibration report. At the test station, the summation is adjusted using the correction weights to bring it to the required nominal value. The Summation Standard is usually slightly less than the nominal value of the group of elevator test weights to be calibrated, so the correction weights are carried on the summation standards for a particular weight group. If the summation standard is more than the nominal weight value the correction weights are placed on the elevator test weight being calibrated and removed after the calibration is complete.

(3) TWR Procedure - Electronic Mass Comparator.

(a) Comparator Parts.

The comparator is composed of three main parts: the lifting linkage, measuring instrument, and load cell. The lifting linkage has a hydraulic cylinder with clevis eye, rod end bearings, and clevis. The assembly of the linkage, connectors, and hooks must be carefully examined. Do not use any equipment that shows signs of fatigue or wear. The linkage must be assembled as shown in Attachment 7. Chains should not be used.

(b) Load Cells.

Load cells that are sufficiently sensitive and repeatable for metrological laboratory applications should be used.

(c) Instrument Setup.

The electronic instrument is not explosion proof; however, it is suitable for use in most areas of the grain elevator, if facility management approval is obtained. It must be set up according to manufacturer's instructions.

1 Warm up the instrument for at least ½ hour. Keep the dust-tight case closed to stabilize the temperature, if applicable.

2 Calibrate the instrument with the heaviest elevator weight available and set the capacity to 100 pounds above that of the heaviest weight value.

3 Set the division size to the lowest value available that is stable enough to provide repeatability of indications, but never to exceed .01 pounds for 500 pound weights, .02 pounds for weights from 1 000 to 2 000 pounds, .05 pounds for weights from 2 500 pounds to 3 000 pounds, and 0.1 pounds for weights from 4 000 to 5 000 pounds.

(d) Check sensitivity.

First exercise the cell by lifting and lowering a weight until the readings appear stable. The instrument reading should change an amount equal to the sensitivity weight added to the weight. The sensitivity weight should be equal to twice the allowable tolerance for the test weight being reverified. Example: For a 2500-pound test weight, use a 0.5-pound sensitivity weight.

(e) Load Standard.

Load the standard with correction weights, if applicable. Raise it gently with the hydraulic cylinder. During the test procedures do not shock the load cell or treat it roughly since this is a possible source of shift. The instrument indication should be completely stable within 45 seconds. Record the indication; note that it will not indicate the correct weight of the standard because this is not a direct reading scale -- it is used to compare differences in mass.

(f) Move Standard.

Lower the standard to a cart with casters that is used for temporary storage during the test cycle.

(g) Initial House Weight.

Load the first house weight. Raise it gently with the hydraulic cylinder. The instrument indication should be completely stable after approximately 45 seconds. Record the indication. Lower the weight.

(h) Repeat Cycle.

Repeat items (e) and (f). This provides the third instrument reading necessary to determine a value for the house weight. Three readings are needed to compensate for the slow drift that is normal for the instrument. The standard value must not change by an amount greater than the tolerance applied for the size weight being tested. Normally, the comparator will perform much more consistently than this limit.

(i) Calculate Difference.

Calculate the difference between the standard and the house weight. Use the modified substitution equation:

$$d = O_2 - \frac{(O_1 + O_3)}{2}$$

Where d = difference between the weights in pounds
O_1 = First reading for the Standard
O_2 = Reading for the House weight
O_3 = Second reading for the Standard

Example: 3000-pound weight

Observation O_1 Standard = 2998.90

Observation O_2 House Weight = 2999.05

Observation O_3 Standard = 2999.00

Observation O_1 Plus Observation O_3 = 2999.00 = 5997.90

Divided by 2 = 2998.95

Observation O_2 House Weight 2999.05 - 2998.95 = 0.10 lb

In Tolerance (Tolerance for a 3 000 pound weight is 0.3 pounds)

(j) Adjustments.

If the house weight observation (O_2) is different than the average of the two standard readings (O_1 + O_3 / 2) more than ± one-half the value of the tolerance for the weight then refer to item (4) below for adjustment procedures. After adjustment the series of three observations must be repeated in its entirety.

NOTE: Obtain permission from the elevator manager to adjust the weight. This first elevator house weight will be used as a control standard to be compared periodically against the summation standard.

(k) Analyze Data.

If the operator feels that the data indicates a system change, the control standard may be used to verify the change. The control standard is the first house weight that was tested and adjusted, if necessary, and placed near the comparator to be used to ensure repeatability of the system.

(l) Lead Seal Stamp.

Update the lead seals of all weights approved by flattening the seal, as necessary, with a drift and stamping “FGIS-MO/YR.” The same technique applies to adjusted weights where new seals are made. Record this final action.

(4) Adjusting Procedure.

(a) Remove Seal. Carefully remove the lead seal with a small chisel. If it is damaged, cut a new one from a sheet of lead and discard the damaged one before proceeding.

(b) Remove Cavity Backing Plate and Plug. Remove the seal backing plate and plug.

(c) Remove Adjusting Material. Remove adjusting material if the weight is too heavy. Use grabbers or a spoon-type scoop and remove larger pieces first. Be sure you remove slightly more than enough material indicated by the instrument. Place the pieces and shot in a light paper cup.

(d) Reload House Weight. Reload the house weight on the comparator. Put the cup, plug, backing plate, and good lead seal, on top of the weight.

(e) Adjust Weight. Adjust to achieve zero error condition by adding or removing lead shot.

(f) Test Adjusted Weight Again. Test the weight after adjustment by performing the series of three observations.

(g) Reseal The Weight. Insert the adjustment material into the cavity, replace all parts of the adjustment cavity; use a punch to flatten the lead seal. Imprint “FGIS-MO/YR” on the seal.

(5) <u>Documentation of Results</u>.

TWR readings, the amounts of error weights, the amount of correction weights, and amount of sensitivity weights applied to the standard or the weight being re-verified must be recorded.

(a) Cover and Information Sheet. This sheet is used to document the following historical information. (See Attachment 8).

<u>1</u> Name of manager or superintendent.
<u>2</u> Name of company (elevator name) and date.
<u>3</u> Complete mailing address, including zip code.
<u>4</u> Code numbers for each group of weights.
<u>5</u> Size.
<u>6</u> Type of weights - cast, fabricated, other.
<u>7</u> Name of test weight manufacturer.
<u>8</u> Last re-verification date (from weight seal).
<u>9</u> Dimensions, size, and location of adjusting cavity should be indicated on the drawings.

(b) Test Weight Re-verification Data and Calibration Report.

This report is used as a worksheet for recording observations and computing error while performing the re-verification (See Attachment 9). The following information is shown on the report.

1 Elevator: Elevator name.

2 Location: City and state.

3 Temperature: Approximate temperature near TWR equipment.

4 Correction: Enter the correction weight and color code for the summation standard being used.

5 Sheet No.: Maintain numbering sequence.

6 Date(s): Date(s).

7 Observer: TWR personnel name.

8 Comparator Number: TWR equipment designation.

9 Description of Load: Enter the designation of the load, FGIS weight code number, or FGIS 50-pound standards and the amount of any correction weights. Use the word “ditto” to indicate the same description of load as previously indicated. The initials S.W. should be used to indicate when a sensitivity weight is applied. The amount of the weight must follow the S.W.

10 Observations: Enter the display value for the standard. If a control standard reading is being taken, write the words, CONTROL STD.

11 Computations: The results of the sensitivity check, the amount of error found in an elevator weight and any other notations pertinent to the reverification procedure are placed in this column.

12 Remarks: Note whether a house weight was left with error and in tolerance or whether the weight was adjusted. Any other pertinent remarks may be placed in this column.

(c) TWR Summary Report. This report is used to summarize the results of all the weights at a particular elevator. The following information is used to update the computer records at headquarters (See Attachment 10).

1 Elevator: Elevator name.

2 Location: City and state.

3 Date(s): Date(s) of TWR.

4 FGIS Weight Code Number: The assigned identification number for each weight tested.

5 Type of Weight: Indicate whether the weight is cast (CA) or fabricated (FAB).

6 Weight Value: The nominal weight of the house weight in pounds.

7 Pounds of Error: Indicate the amount that the house weight is light (-) or heavy (+).

8 Adjustment (N/A = Not Adjusted): Indicate the error in the weight after adjustment.

9 House Weight Identification Number.

10 Scale Number.

g. Calibration of Test Car Test Weights.

(1) Purpose and Background.

(a) Test cars.

Each of FGIS' three railway track scale test cars (FGWX 100000, FGWX 300000, and FGWX 600000) are equipped with either nine or ten, 10 000-pound block weights and one 10 000-pound cart. These are used for railway scale testing, calibration of master scales, and field calibration of railway scale test cars.

(b) FGIS Master Scale.

FGIS maintains standard weights traceable to NIST at the Master Scale Depot, Chicago, Illinois. They are used with a 5-ton comparator to calibrate the test car weights and the test cart, which is considered to be a test weight.

(c) Frequency.

Test weights must be recalibrated once a year.

(2) Preliminary Setup.

(a) Inspect the Weights.

The weights and cart must be clean and free of corrosion or peeling paint. If necessary, they must be stripped and repainted. Use a zinc chromate primer and an aluminum spray finish.

(b) Check the Cart.

Make any needed repairs. Fill the hydraulic fluid reservoir to the line on the visual gage.

(c) Visually Check the 5-ton Comparator.

The platform and other moving parts must not bind. Examine bolts, connectors, chains and hooks. Do not use equipment that shows signs of wear or fatigue.

(d) Place the Weight Cradle on the Scale Platform.

Put rubber pads on the ends to cushion the weights.

(e) Position the Weights.

Place the standard and the weight to be calibrated at either side of the comparator. The overhead crane should not need to be positioned; only the traversing trolley needs to be moved during the calibration.

(f) Check Recent Report.

Check the most recent report of calibration for the standards. Ensure that the corrections for apparent mass are used in your calculations.

(g) Check the Tare Weights (trim).

A recent ROT to Class F tolerances is required.

(h) Prepare Data Sheets.

Fill in the heading of the data sheet with the date, operator, standard I.D., check standard I.D., test weight identification, and environmental data.

(3) Procedure (Double Substitution Standard Operating Procedure (SOP) 4).

(a) Safety.

For safety, two people must be present when moving or testing weights at the Master Scale Depot.

(b) Counterpoise Weights.

Place counterpoise weights equal to 10 000 pounds on the tip end of the beam.

(c) First Weight Indication (Reading) of Standard (SS1).

Place the standard 10 000 pound-weight (SS1) on the platform. Avoid shock loading.

1 Add 2.0 pounds of tare, release the beam, and balance the scale. The tare is carried on the scale platform in case a test weight (X) is found too heavy to be determine the error via turning point.

2 Read the turning points of the beam. The sum should be near to 20 divisions. If necessary, adjust the fractional poise until the proper sum is obtained.

3 Arrest the beam. Remove the standard (SS1).

(d) Weight Indication (Reading) of Test Weight (X).

Place the test weight to be calibrated (X) on the platform.

1 Release the beam. Observe the turning points; add or remove tare as necessary to bring the turning point sum close enough to 20 divisions to ensure that the test weight is within ± .1 lbs.

2 After any adjustments reread the turning points and record them.

(e) Sensitivity Weight.

Add a 0.1-pound sensitivity weight to X (and tare). Read and record the turning points. Arrest the beam.

(f) Remove All.

Remove the X weight, and sensitivity weight.

(g) Second Reading of Standard (SS1).

Place the Standard weight on the platform. Add a 0.1-pound sensitivity weight to SS1. Read and record the turning points. Arrest the beam.

(h) Remove All.

Remove the Standard weight, and sensitivity weight. Once the calculations indicate the test weight (X) is within ± .1 lb. of the average of the Standard (SS1) reading the test weight (X) can be sealed, and the seal stamped with "FGIS MO/YR".

(i) Uncertainty Check.

After every second test weight (X) perform steps a through h substituting standard (SS2) instead of (X) using the appropriate correction on SS2 such that SS1 and SS2 are equal. Any variation between SS1 and SS2 should be within established uncertainty limits for continued use of the comparator.

(4) Calculations.

Worksheet. Use the “SOP 4 Weighing Sheet” (Attachment 11).

(a) Turning Points.

Sum the turning points for the comparisons of the Standard and X. They will be 01, 02, 03, and 04, respectively.

(b) Calculate d (d = difference between S and X) = S – X

$$S - X = d = \frac{O_1 - O_2 - O_3 + O_4}{2} \ X \ \frac{0.1}{O_3 - O_2} - t_s + t_x$$

S = Standard weight

X = Test weight

0_1 through 0_4 = Sums

t_S = tare with S

t_x = tare with X

NOTE: If the tare carried with S changed during the observations, use the average tare. If X tare changed, average it, also. Tare weights are usually not needed since the S and X weights usually very close. Adjust the X weight if it is different from the S weight by more than ± 0.1 pound and retest.

(c) Issue Report.

Issue a “Report of Calibration” (Attachment 12) showing all X corrections and uncertainties. The sum of corrections for each weight and cart are used as the correction for the entire 100 000 pound load.

h. Railway Track Scale Test Car Calibration.

(1) Specifications.

Association of American Railroads (AAR) specifications for railway track scale test cars are contained in the current edition of the AAR, Engineering Division, “Scale Handbook”. These are general requirements for the construction of the various types of test cars such as, self-contained composite, standard railcar, and self-propelled.

Test cars must be properly cleaned and painted and all repairs completed before arrival at the master scale.

Annual calibration of all railway track scale test cars is required.

(2) Tolerances.

AAR, Engineering Division, “Scale Handbook”, Section 1.4.1, requires that test cars meet Class F tolerances.

(3) Test Instrumentation.

Test cars will be calibrated only on approved master railway track scales. Requirements for these scales are found in the AAR Scale Handbook, Section 4.0.

(a) Beam Sensitivity.

Beam sensitivity must not be greater than 2 lb per chart division.

(b) Testing Frequency.

Annual testing under the AAR/FGIS master railway track scale testing program.

(c) Protected.

Protected from environment.

(4) Test Standards and Traceability to NIST.

FGIS maintains mass standards of 10 000-pounds each, used in summation for testing master railway track scales and for use with other scales when performing field calibrations.

(5) Procedure.

(a) Set Up.

1 Clean the test car.

2 Check for loose parts, etc.

3 Check any available records.

4 A self-propelled car must have its fuel tank filled prior to calibration.

5 Visually inspect the scale.

6 If using error weights, there should be 20 pounds available, with the smallest weight being 1 pound. They must have a current ROT.

(b) Readings.

1 Set up the scale with no load, no drop-weights or counterpoise weights, and the sliding poise set at 50.0 pounds. Balance the scale. This is the zero reference for all future weighings on the scale. Arrest the beam, release, and repeat the reading to show repeatability.

2 Apply the drop-weights or counterpoise weights to the beam in an amount appropriate for the size of the test car to be calibrated (e.g., 100 000 pounds).

3 Position the test car on the center of the scale.

4 Move the sliding poise to attain equilibrium of the beam, and indicate the weight value of the test car. Use a correction for the known error in the scale.

5 Arrest the beam. Release and repeat reading.

6 Adjust the test car by adding or removing stable, metal adjusting material.

7 Remove the test car and recheck zero. Arrest, release, and repeat.

8 Reposition the test car on the center of the scale and move the sliding poise to attain equilibrium of the beam. This reading determines the “as released” error. Arrest, release, and repeat.

9 Remove the test car and recheck zero. Arrest, release, and repeat.

(c) Marking Requirements.

1 Stencil the nominal value of the test car, the date and location of calibration. Test cars under FGIS jurisdiction shall be stenciled in 1000-pound increments.

2 The value as released must equal nominal stenciled value +/- Class F tolerance (1 part in 10 000). For a 100 000-pound car, this tolerance is 10 pounds.

(6) Documentation.

(a) Traceability Records Required. FGIS maintains the following records that serve to document the traceability of the test car calibration to national standards. The records also document the level of accuracy in the program.

1 Report of Calibration - FGIS Primary Standards.

2 Report of Calibration - FGIS Field Standards.

3 Measurement Assurance Program Records.

4 Master scale test record.

5 Test Car calibration work sheet.

6 Report of Railway Track Scale Test Car Calibration.

(b) Report Format.

Each test car calibration is recorded by issuance of a Report of Railway Track Scale Test Car Calibration (Attachment 13).

i. Field Calibration of Test Cars or Monitor Cars.

The FGIS Field Calibration Program is a NIST recognized program, which is accepted by most States. The field calibration service is provided by FGIS to the railroads that do not have access to a Master Scale, or they have a captive car. [A captive car is a test car that cannot be moved out of its location or terminal because of its equipment limitations.] The service involves a procedure for calibrating the cars on location; adjusting the cars, and providing a report of test. This procedure is based on NIST HB 145, SOP 4, Double Substitution, with some modifications. These modifications are needed since the FGIS test cart is compared to a test car or monitor car with a longer wheel base.

(1) Test Scale before Calibration.

Check scale and test as performed during a routine scale test.

(2) Install Pointer and Chart.

Install the pointer and chart on the beam and trig loop so the swings can be clearly read. Be sure that the chart is installed so at balance the pointer swings equidistant above and below the center mark of the chart. The turning point sum should increase when a sensitivity weight is applied. (If not, reverse the chart or chart numbers so the sum will increase.)

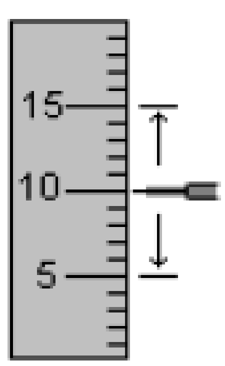
(3) Check Sensitivity.

Check the sensitivity of the beam under load by loading the FGIS Test Cart and weights with a load equivalent to the nominal value of the test car or monitor car to be calibrated or 100 000 pounds whichever is less and add 100 pounds of tare weight to the cart. Set the main poise to the weight of the cart and move the cart on to the section with the best repeatability as determined in Step 1. Balance the beam using the balance ball so that the swings are equidistant above and below the center mark of the chart. The turning point sum should equal about 20. Then add 5 pounds to the rail to see if the scale is sensitive enough to increase the sum of the turning points. If it does not, then raise the balance ball and try again. Mark the position of the balance ball support brackets before raising the ball. Raising the ball helps to increase sensitivity to a point. Raising it too high will cause the beam to be too sensitive such that the beam will swing too far and fast to effectively be able to read the turning points. Find the best sensitivity you can (lowest number of pounds that will cause an increase in the sum of the turning points). Do not use the scale for field calibration if a 5-pound sensitivity weight added to the test cart will not cause the sum of the turning points to increase at least by 2.5 divisions. After adding the 5-pound sensitivity weight, average the two low readings and add the one high reading. Disregard the first high reading that is taken (see the following example).

READING TURNING POINTS TO ESTABLISH SENSITIVITY

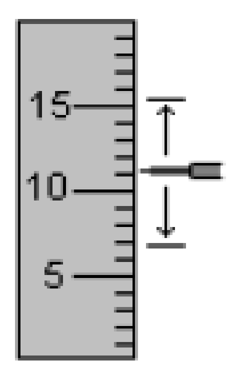
If the sum of the turning points does not increase at least by 2.5 when a 5 lb. sensitivity weight is placed on the load receiving element, then the scale is not sensitive enough to use for a field test car or monitor car calibration.

Turning Points at balance



LOW	HIGH	
5.0	**~~15.0~~**	**= 19.9**
5.2	**14.8**	

Turning Points change when sensitivity weight is added to the load receiving element.



LOW	HIGH	
6.8	**~~15.6~~**	**= 22.4**
7.2	**15.4**	

(4) Select Best Position.

Select the section position with the best repeatability and mark the rail at the section load bearing point and at a distance from the load bearing point mark equal to the distance from the center of the outside wheels of the test car or monitor car. (Mark the rail to show the position of the trucks of the test car or monitor car.)

(5) Test Car Condition.

Make sure the test car or monitor car to be tested is clean and that it complies with AAR requirements. Record the condition of the car. If the test car is a self-propelled car with a fuel tank, be sure that the fuel tank is full.

(6) Test Cars Weighing More Than Test Cart.

If the test car or monitor car nominal weight is more than the loaded FGIS test cart, then you must use tip weights to make up the difference between the loaded FGIS test cart and the nominal weight of the test car or monitor car. See instructions in Step 15 for further explanation on how to determine the lever system ratio and the amount of tip weights to use before going on to the next step.

(7) Poise and Tare Weight.

The poise and tare weight should be set with the cart on the scale from Step 3. Move the cart to the left side mark over the load bearing point, Position 1. Balance the beam using the balance ball so that the swings are equidistant above and below the center mark of the chart. The turning point sum should be about 20. You probably can't get an exact 20 but try to get as close as possible. Using the Field Calibration worksheet, record the swing (**O_1a**) readings (turning points) and the 100 pounds of tare. (DO NOT REBALANCE THE SCALE (BALANCE BALL) OR CHANGE THE POISE POSITION(S) ANY MORE AFTER THIS STEP.)

(8) Move to Position 2.

Move the loaded FGIS test cart and 100 pounds of tare to the second mark, Position 2. Adjust the tare weights, if necessary to bring the beam swings within range, and record the (O_1b) turning points and tare weight amount. Then remove the loaded FGIS test cart.

(9) Tip Weights.

If tip weights are needed place the calculated amount on the tip hanger. Move the test car or monitor car to be tested (with 100 pounds of tare on it) on to the scale spotting it directly over the marks and add or remove tare until you can obtain readings as close to a total of 20 as possible. Record the tare weight amount and the (O2) turning points. If the test car or monitor car is too heavy to obtain balance after removing all the tare weights then you must restart the test from Step 7 using more tare weight. The poises can never be used to adjust tare.

(10) Read Turning Points.

DO NOT MOVE THE CAR OR CHANGE THE TARE WEIGHTS. Add the sensitivity weight (SW) and record the (O_3) turning points. Adding a sensitivity weight must cause the sum of the turning points to be greater than the sum from the O_2 reading at least by 2.5 divisions, similar to the sensitivity findings from Step 3. If not, then restart from Step 9. Remove the car.

(11) Move Test Cart, Adjust Tare.

Remove tip weights, if applicable. Move the loaded FGIS test cart on to the scale spotting the left wheel exactly on the left mark, Position 1. Place the tare weight on the cart equal to the tare in O_1a and adjust the tare weight, if necessary, to bring the beam swings within a readable range. Add the 5-pound sensitivity weight. Record the sensitivity and tare weight amounts. Record the (O_4a) turning points. The tare amount should repeat respectively for Position 1 and 2 as observed in readings O_1a and O_1b. If the tare changes greater than 5 lb for either position, the calibration process should be restarted from step 7.

(12) Position 2 Right.

Move the loaded FGIS test cart with the tare and sensitivity weights spotting the right wheel exactly on the right mark, Position 2. Adjust the tare weight if necessary to bring the beam swings within a readable range and record tare and sensitivity weight amounts. Record the (O_4b) turning points.

(13) Calculate Error.

Complete the error calculations as described in the “CALCULATION” section and adjust the test car or monitor car as follows:

(a) Add or remove the error amount to or from the car such that the adjustment will result in the car weighing the amount of the nominal weight stenciled on the car. Use a small scale use as a comparator to compare known standards to the scrap metal that will be added to or removed from the car as the case may be.

(b) If you don’t have a small scale to use as a comparator, place the test or monitor car on the scale at the marked positions, without moving the poise, and with tip weights, if applicable, and add tare weight equal to the Ts value (Avg. of the Tare Weight amounts from blocks O_1a, O_1b, O_4a and O_4b) to the car. Then, add or remove weight from the adjustment cavity of the car until an equidistant swing above and below the center mark of the chart is achieved. Remove the test or monitor car from the scale and perform the entire calibration process starting from Step 7.

(14) Stencil Weight.

Complete all documents and make sure that the correct weight is stenciled on the car and that the date of calibration is stenciled on the car.

(15) Calculations.

Calculate the error in the test car or monitor car by using the following procedures: average the O_1a and O_1b readings and record as the O_1avg. Do the same for the O_4a and O_4b readings and record as the O_4avg. Find the difference between the loaded FGIS test cart readings and the test car or monitor car readings by plugging in the readings and SW value in the following formula:

$$d = \frac{(-O_1 avg. + O_2 - O_4 avg. + O_3)}{2} X \frac{(SW)}{O_3 - O_2}$$

Next, determine the error in the test car or monitor car (X corr) by using the difference (d) in the following formula with the other factors as given below:

X corr = d + S corr + Ts - Tx + S nom - X nom + TipX - TipS

d is the difference between the X and S readings calculated above. S corr is the correction that is given on the last test report for that specific test car. Ts is the average amount of tare weight on the loaded FGIS test cart. Add the tares in steps 7 (O1a), 8 (O1b), 11 (O4a) and 12 (O4b) and divide by 4. Tx is the amount of tare on the test car or monitor car in step 9 (O2). S nom is the nominal weight of the loaded FGIS test car. X nom is the nominal weight of the monitor car. TipX is the amount of weight balanced out by the use of tip weights for the test car or monitor car which usually equals the difference between the nominal value of the loaded FGIS test cart and the nominal value of the test car or monitor car. If the tip weights used are not equivalent to the amount calculated from the determined ratio of the lever system then you must calculate the amount of weight that the tip weights that you are using will counter balance and use that figure in the formula. TipS is the amount of weight balanced out by the use of tip weights used with the loaded FGIS test cart, which is “0”.

In determining the lever system ratio and the amount of tip weights to use, the inspector must establish the ratio of the lever system. This can be simply done by balancing the beam at zero load so to achieve equidistant pointer swings above and below the center mark, locking the beam, just before you do Step 7, move the loaded FGIS test cart without tare weights on to the scale, slowly unlock the beam with the poises at zero and add tip weights until a correct balance is achieved as observed when the pointer swings equidistant above and below the center mark. Achieve balance to the nearest .001 since .001 lb can represent from about 7 to 14 pounds of load on the rail depending on the ratio of the scale. Calculate the ratio by dividing the nominal value of the loaded FGIS test cart by the amount of tip weights needed to balance the beam. (Example; 100 000 lb. cart divided by 10 lb of tip weights = 10 000 to 1 ratio).

Now, to find the amount of tip weights in pounds needed to counterbalance the test car or monitor car with the poise set at the nominal value of the loaded FGIS test cart divide the difference between the nominal value of the test car or monitor car and the nominal value of the loaded FGIS test cart by the calculated ratio. This is a more precise method for determining the ratio of the lever system which can easily be incorporated into the test procedure. (Example: 175 000 lb monitor car minus the 100 000 lb. FGIS test cart = 75 000 lb. Then 75 000 divided by the ratio of 10 000 lb = 7.5 lb of tip weights is needed to counter balance 75 000 lb. Of course the other 100 000 lb is balanced out by the poise set at 100 000 lb. So, with the poise at 100 000 lb and 7.5 lb of tip weights on the tip of the beam the entire weight of the monitor car, 175 000 lb, is balanced.) On the following page a sample field calibration worksheet is exhibited (Attachment 5).

Attachment 5: TEST CAR & MONITOR CAR FIELD CALIBRATION WORKSHEET

TEST CAR & MONITOR CAR FIELD CALIBRATION WORKSHEET

Scale owner _______________ Location ____________ Type ____________ Cap. ____________ Div. ____
Scale model ___________ S/N _____________ Weather _________ Scale Ratio _____________
Test or Monitor Car ID _______________ **X nom**: Nominal Wt. Value __________ Tip Wts Used ____ lbs.
Calibration Official _______________ Date ______________ FGWX __________________

Description of Load	Observations		Sum	Remarks / Calculations
	Low	High		
O1a – Position 1 (left alignment) **S nom** GIPSA test cart Tare Weight Amount _____________				
O1b – Position 2 (right alignment) **S nom** GIPSA cart Tare Weight Amount _____________				O1avg = $\frac{O1a + O1b}{2}$ = _________
O2 – Position 1 & 2 (full alignment) **X** Car **nominal** weight. ___________ Tare Weight Amount _____________ **TipX**, Tip Weight Amount ________				**O2 =**
O3 Position 1 & 2 (full alignment) **X** Car **Do not move car or change tare** Add sensitivity weight: ___________				**O3 =** **note: O3 should be at least 2.5 divisions greater than O2**
O4a – Position 1 (left alignment) **S nom** - GIPSA cart Tare Weight Amount _____________ Sensitivity Wt. Amount ___________				**note: with the sensitivity weight on the cart, adjust the tare, if necessary, to bring the beam swings within a readable range.**
O4b – Position 2 (right alignment) **S nom** - GIPSA cart Tare Weight Amount _____________ Sensitivity Wt. Amount ___________				**note: same as above** O4avg = $\frac{O4a + O4b}{2}$ = _________

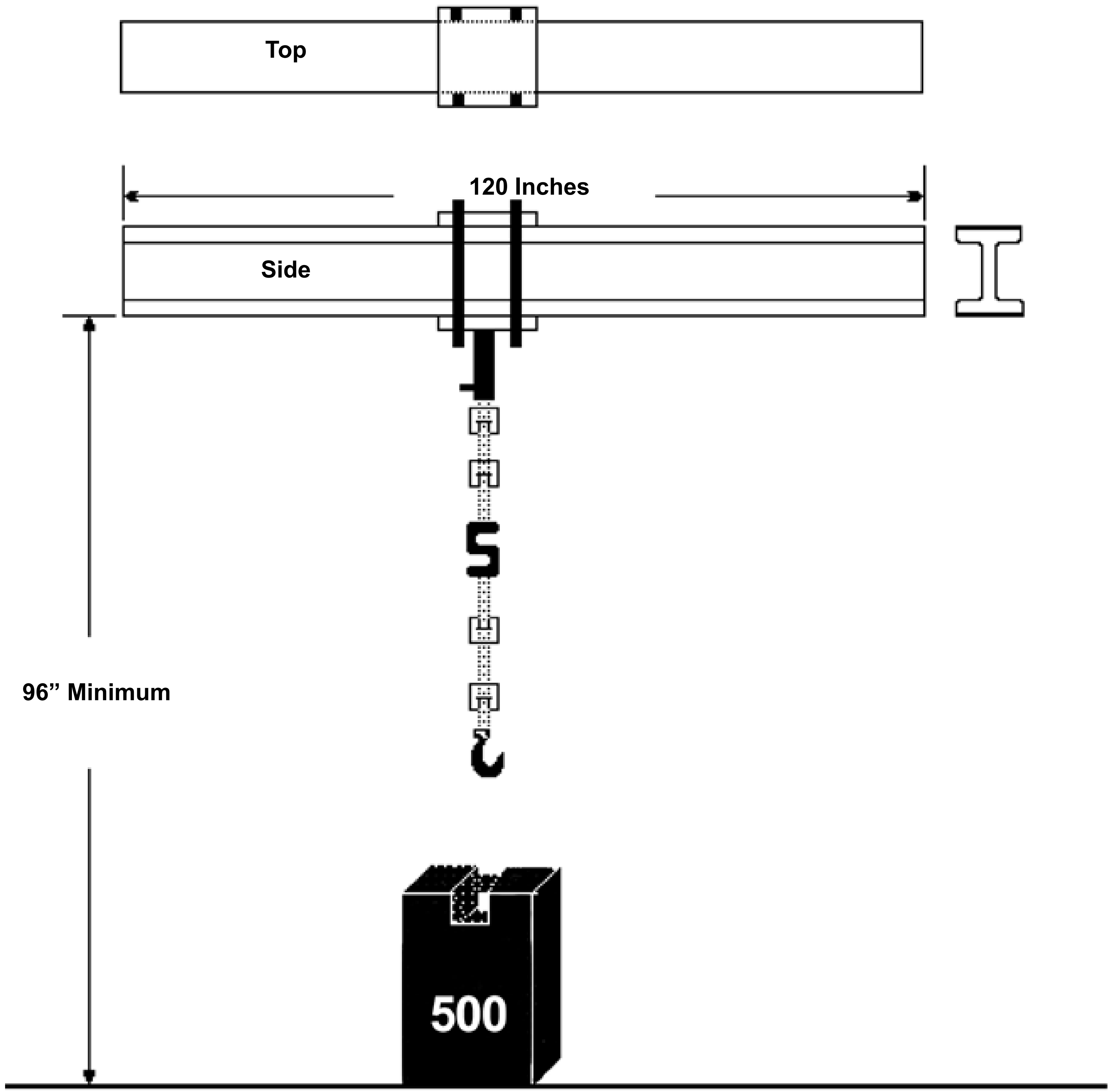
$$d = \left(\frac{-O1avg + O2 - O4avg + O3}{2}\right) \times \left(\frac{SW}{O3 - O2}\right)$$

Ts = Avg. of Tare Weight Amounts from blocks O1a, O1b, O4a and O4b.
Tx = Tare Weight Amounts from blocks O2.
Scorr = Sum of weight corrections from latest cal report.

X correction = d + S corr + Ts – Tx + S nom – X nom + TipX – TipS = __________ lbs. error as found

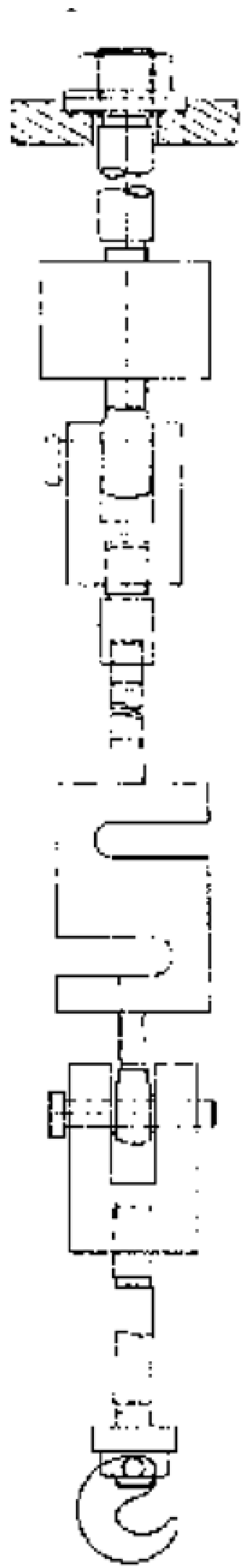
Test or Monitor Car No. ______________ **Error as left** ___________ **lbs.**

Attachment 6: TWR Setup



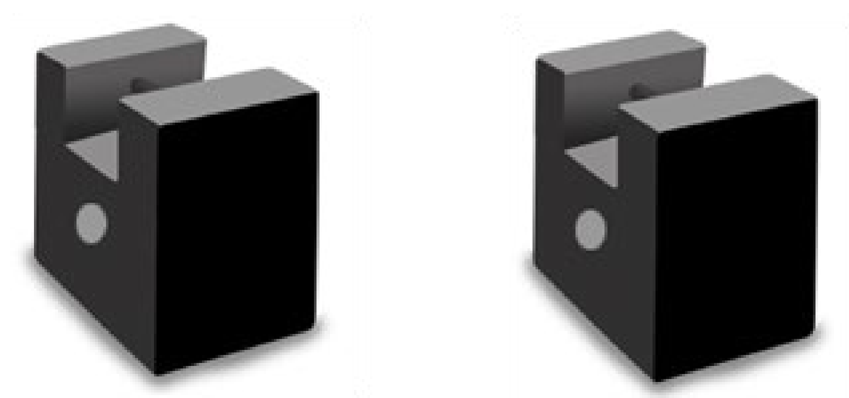
Minimum of 48 inches clearance needed on all sides.

Attachment 7: Electronic Mass Comparator Linkage Assembly



Attachment 8: Calibration Certificate

Cover and Information Sheet				
MANAGER				
COMPANY				
STREET LINE 1				
STREET LINE 2				
CITY, STATE ZIP				
CODE	**SIZE**	**TYPE**	**MFG**	**LAST DONE**



DESIGN: Show dimensions, location of adjustment cavity, etc.
Mark CAST, FAB or OTHER under the weight to indicate its type.

GIPSA Metrologist ____

Attachment 9: Modified Substitution Tolerance Testing Worksheet

GIPSA – Test Weight Reverification Program
Modified Substitution Tolerance Testing Worksheet Sheet #______

Company________________ Location____________________________________ Date: ____________

Temperature (F) ________ RH (%) ______Balance _________________ Observer ________________

Standard description: ____

Description of Load	Test Weight Identification	Cast / Fab	Weight Indications	Comparison result X - (O1 + O2) / 2	Remarks
Standard O1					Use first house weight as a control check at beginning and end of series of house weight cals.
X					
Standard O2					
Standard O1					
X					
Standard O2					
Standard O1					
X					
Standard O2					
Standard O1					
X					
Standard O2					
Standard O1					
X					
Standard O2					
Standard O1					
X					
Standard O2					

GIPSA – Master Scale Calibration Program
SOP 4 : Calibration of 10,000 Railroad Test Car Field Standards

Test Car No. FGWX ______________ Date: ____________ Sheet No. ___________

Temperature (F) ________ RH (%) ________ Expanded uncertainty ______0.059 lb.______

*(If the control check result is not within LWL - .370 and UWL - .445 the previous 2 weights must be recalibrated)

Description of Load	Observations (Turning Points)		Results from computer program computations		Remarks
SS1 (Standard)			O1	*Control check result:	SS1 corr = +.993 lb. SS2 corr = +.417 lb.
SS2 + .576 (Control)			O2		
SS2 + .576 + .1 sw			O3		
SS1 +.1 sw			O4		
SS1 (Standard)			O1	X correction:	X wt. ID: ______
X + .993			O2		
X + .993 +.1 sw			O3		
SS1 +.1 sw			O4		
SS1 (Standard)			O1	X correction:	X wt. ID: ______
X + .993			O2		
X + .993 +.1 sw			O3		
SS1 +.1 sw			O4		

GIPSA – Master Scale Calibration Program
SOP 4 : Calibration of 10,000 Railroad Test Car Field Standards

Test Car No. FGWX ______________ Date: ____________ Sheet No. ___________

Temperature (F) ________ RH (%) ________ Expanded uncertainty ______0.059 lb.______

*(If the control check result is not within LWL - .370 and UWL - .445 the previous 2 weights must be recalibrated)

Description of Load	Observations (Turning Points)		Results from computer program computations		Remarks
SS1 (Standard)			O1	*Control check result:	SS1 corr = +.993 lb. SS2 corr = +.417 lb.
SS2 + .576 (Control)			O2		
SS2 + .576 + .1 sw			O3		
SS1 +.1 sw			O4		
SS1 (Standard)			O1	X correction:	X wt. ID: ______
X + .993			O2		
X + .993 +.1 sw			O3		
SS1 +.1 sw			O4		
SS1 (Standard)			O1	X correction:	X wt. ID: ______
X + .993			O2		
X + .993 +.1 sw			O3		
SS1 +.1 sw			O4		

USDA

United States Department of Agriculture

Grain Inspection, Packers and Stockyards Administration

Stop 3630
1400 Independence Ave., SW
Washington, DC 20250-3630

Test No.: CM10-01
October 29, 2009
Page 1 of 2

Calibration Certificate

Ten Mass Standards
for Testing Master Railway Track Scales
I.D.: FGWX 300,000
"C" series Weights

Submitted by: United States Department of Agriculture
GIPSA, FGIS
Chicago, Illinois

The items identified above have been compared by double substitution procedures (NISTIR HB 6969 SOP 4) to the standards of the Federal Grain Inspection Service, Master Scale Depot, 5800 W. 69th Street, Chicago, Illinois 60638. Calibration of these standards is traceable to the National Institute of Standards and Technology through test 822/267776-02.

They comply with the specifications of Class F as specified by NIST Handbook 105-1, 1990, and were found within tolerance. The weights are in good condition and are appropriate for the intended use for a period of one year from the date of test.

Date of Test: October 2-6, 2009
Test Conducted by: Al Rupert, Industrial Specialist
Byron School, Industrial Specialist

Byron School, Technical Manager
Washington, DC

cc: MSD

Test No.: CM10-01
October 29, 2009
Page 2 of 2

Item	I.D.:	As left (lb)	As left condition	NIST Class F Tolerance (lb)	Expanded Uncertainty (lb)
10,000-lb. Test Cart:	Cart	-0.015	IN TOLERANCE	1.00	0.059
10,000-lb. Test Weight:	C1	-0.056	IN TOLERANCE	1.00	0.059
10,000-lb. Test Weight:	C2	0.026	IN TOLERANCE	1.00	0.059
10,000-lb. Test Weight:	C3	0.017	IN TOLERANCE	1.00	0.059
10,000-lb. Test Weight:	C4	0.021	IN TOLERANCE	1.00	0.059
10,000-lb. Test Weight:	C5	0.008	IN TOLERANCE	1.00	0.059
10,000-lb. Test Weight:	C6	0.018	IN TOLERANCE	1.00	0.059
10,000-lb. Test Weight:	C7	0.000	IN TOLERANCE	1.00	0.059
10,000-lb. Test Weight:	C8	-0.006	IN TOLERANCE	1.00	0.059
10,000-lb. Test Weight:	C9,C10	0.031	IN TOLERANCE	1.00	0.059
100,000 lb. Nominal Sum Correction		+0.044			

Note: Test Weights C9 and C10 are 5,000 pound weights that must be used together as a single 10,000 Test Weight. Stickers have been placed on the weights indicating as such.

This report relates only to the items listed in the report at the time of test. This report may not be used to claim endorsement by NIST, OWM, NVLAP or any agency or the U.S. Government. This report shall not be reproduced except in full without the written approval of this laboratory.

* All mass values provided in this report are Conventional Mass values (formerly referred to as Apparent Mass vs 8.0 g/cm^3.). The mass as weighed in air as determined at 20 °C, in air having a density of 0.0012 g/cm^3, against standards having a reference density of 8.0 g/cm^3.

** The reported expanded uncertainty given here is in compliance with NIST Technical Note 1297 ("Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results") with a coverage factor of two (2) through using SOP29 (NISTIR 6969-2003).

USDA

United States Department of Agriculture

Grain Inspection, Packers and Stockyards Administration

STOP 3630 Room 2409-N
1400 Independence Ave., SW
Washington, DC 20250-3630

July 7, 2009
Test No. CM09-018
Page 1 of 1

Report of Test

Scale Test Cart
FGWX 500000

Submitted by: USDA, GIPSA, FGIS, FM, PPB
STOP 3630, Room 2409-N
1400 Independence Avenue, S. W.
Washington, DC 20250-3630

The railway track scale test cart was calibrated at the Grain Inspection, Packers and Stockyards Administration, Master Scale, 5800 W. 69th Street, Chicago, Illinois. This scale was previously tested with standards, which are traceable to the National Institute of Standards and Technology through tests CM09-006, CM09-007, and 822/267776-02.

Test Cart Number	Nominal Weight (Pounds)	Error as Received (Pounds)	Error as Released (Pounds)
FGWX 500000	**90,100**	**0**	**0**

Date of Test: July 1, 2009
Test conducted by: Cary Brown and Al Rupert, Industrial Specialists

Notes: Master Scale No. 8 was calibrated on March 4, 2009. The test cart is in good condition.

This report shall not be reproduced without the written approval of this laboratory.

Byron C. School
GIPSA Railroad Track Scale Testing Program Manager

cc: Rafael Jimenez, AAR
Cary Brown, GIPSA

bcc: Sandra Metheny

3.3 CLASSIFICATION OF REQUIREMENTS

a. Applicability.

The requirements set forth in this section describe procedures, specifications, and other technical requirements for grain weighing equipment and related grain handling systems used in performing Class X or Class Y weighing services and inspection services under the Act.

b. General Requirements.

(1) Identification.

All equipment, except weights, shall be clearly and permanently marked for the purposes of identification with the following information:

(a) Brand.

The name, initials, or trademark of the manufacturer or distributor;

(b) Model.

A model designation that positively identifies the pattern or design of the device;

(c) Model Mark Rules.

The model designation shall be prefaced by the term “Model,” “Type,” or “Pattern.” These terms may be followed by the term “Number” or an abbreviation of that word. The abbreviation for the word “Number” shall, as a minimum, begin with the letter “N” (e.g., No or No.);

[*Nonretroactive January 1, 2003*] [Note: Prefix lettering may be initial capitals, all capitals or all lower case.]

(d) Serial Number.

Except for equipment with no moving or electronic component parts, a nonrepetitive serial number;

[*Nonretroactive as of January 1, 1968*]

(e) Serial Number Prefix.

The serial number shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required serial number; and

[*Nonretroactive as of January 1, 1986*]

(f) Serial Number Convention.

The serial number shall be prefaced by the words “Serial Number” or an abbreviation of that term. Abbreviations for the word “Serial” shall, as a minimum, begin with the letter “S,” and abbreviations for the word “Number” shall, as a minimum, begin with the letter “N” (e.g., S/N, SN, Ser. No, and S No.).

[*Nonretroactive as of January 1, 2001*]

The required information shall be so located that it is readily observable without the necessity of the disassembly of a part requiring the use of any means separate from the device. (H-44, 2008, G-S.1.)

(2) <u>Official Testing and Certification</u>.

All official testing shall be performed according to the instructions. Official certification and application of an “Approved Label for Inspected Machinery” (Approval Seal) shall be made only by FGIS, authorized delegated or designated State, or approved scale testing organization.

(3) <u>Facilitation of Fraud</u>.

All equipment and all mechanisms and devices attached thereto, or used in connection therewith, shall be so constructed, assembled, and installed for use that they do not facilitate the perpetration of fraud. (H-44, 2008, G-S.2.)

(4) <u>Permanence</u>.

All equipment shall be of such materials, design, and construction as to make it probable that, under normal service conditions:

(a) <u>Maintain Accuracy</u>.

Accuracy will be maintained;

(b) <u>Function as Intended</u>.

Operating parts will continue to function as intended; and

(c) <u>Limited Adjustments</u>.

Adjustments will remain reasonably permanent. Undue stresses, deflections, or distortions of parts shall not occur to the extent that accuracy or permanence is detrimentally affected. (H-44, 2008, G-S.3.)

(5) Abnormal Performance.

Unstable indications or other abnormal equipment performance observed during operation shall be brought to the attention of the equipment's owner or owner's representative. If immediate correction cannot be made, the scale shall be taken out of service until corrective action is taken and the accuracy of the scale recertified. (H-44, 2008, G-UR.4.2. in part)

(6) Use of Adjustments.

Weighing elements and measuring elements that are adjustable shall be adjusted only to correct those conditions that such elements are designed to control and shall not be adjusted to compensate for defective or abnormal installation or accessories or for badly worn or otherwise defective parts of the assembly. Any faulty installation conditions shall be corrected, and any defective parts shall be renewed or suitably repaired, before adjustments are undertaken. Whenever equipment is adjusted, the adjustments shall be so made as to bring performance errors as close as practicable to zero value. (H-44, 2008, G-UR.4.3.)

(7) Suitability of Equipment.

Official grain weighing equipment shall be suitable for the application for which it is to be used, and shall conform to the requirements of these regulations as being correct with respect to elements of its design, including but not limited to its weighing capacity, its computing capability, the character, number, size, and location of its indicating or recording elements, and the value of its smallest division. (H-44, 2008, G-UR.1.1. in part)

(8) Environment.

Equipment shall be suitable for the environment in which it is used including, but not limited to, the effects of wind, weather and radio frequency interference (RFI). (H-44, 2008, G-UR.1.2.)

(9) Interchange or Reversal of Parts.

Parts of a device that may readily be interchanged or reversed in the course of field assembly or of normal usage shall be:

(a) Interchangeable Construction.

So constructed that their interchange or reversal will not affect the performance of the device, or

(b) Marked to Show Position.

So marked as to show their proper positions. (H-44, 2008, G-S.4.)

(10) Installation.

A device shall be installed in accordance with the manufacturer's instructions, including any instructions marked on the device. A device installed in a fixed location shall be so installed that neither its operation nor its performance will be adversely affected by any characteristic of the foundation, supports, or any other detail of the installation. (H-44, 2008, G-UR.2.1.)

(11) Installation of Indicating and Recording Elements.

A device shall be installed so that there is no obstruction between a primary indicating and recording element and the load receiving element; otherwise there shall be convenient and permanently installed means for direct communication, oral or visual, between an individual located at a primary indicating or recording element and an individual located at the load-receiving element. Radios are considered direct communication and are acceptable providing they are at all times available for use. (H-44, 2008, G-UR.2.2. in part)

(12) Method of Operation.

Equipment shall be operated only in the manner that is obviously indicated by its construction or that is indicated by instructions on the equipment. Manufacturers are required to supply complete detailed operating instructions with the equipment and to FGIS. (H- 44, 2008, G-UR.3.1. in part)

(13) Associated and Nonassociated Equipment.

A device shall meet all performance requirements when associated or nonassociated equipment is operated in its usual and customary manner and location. (H-44, 2008, G-UR.3.2.; G-N.2.)

(14) Maintenance of Equipment.

All equipment in service and all mechanisms and devices attached thereto or used in connection therewith shall be continuously maintained in proper operating condition throughout the period of such service. Equipment in service at a single place of business found to be in error predominately in a direction favorable to the device user shall not be considered "maintained in a proper operating condition." (H-44, 2008, G-UR.4.1.)

c. Design of Indicating and Recording Elements and of Recorded Representations.

(1) General.

All weighing devices shall be provided with indicating or recording elements appropriate in design and adequate in amount. Primary indications and recorded representations shall be clear, definite, accurate, and easily read under any conditions of normal operation of the device. (H-44, 2008, G-S.5.1.)

(2) Weight-Recording Device.

Each grain scale, except portable platform scales, shall be equipped with a weight-recording device.

(3) Value of the Indicated and Recorded Scale Division.

The value of the scale division as recorded shall be the same as the division value indicated. (H-44, 2008, UR.1.3.)

(4) Permanence.

Graduations, indications, or recorded representations and their defining figures, words, and symbols shall be of such character that they will not tend easily to become obliterated or illegible. (H-44, 2008, G-S.5.2.5.)

(5) Provisions for Sealing.

(a) Except on Class I scales, provision shall be made for applying a security seal in a manner that requires the security seal to be broken before an adjustment can be made to any component affecting the performance of an electronic device.

(b) Except on Class I scales, a device shall be designed with provision(s) for applying a security seal that must be broken, or for using other approved means of providing security (e.g., data change audit trail available at the time of inspection), before any change that affects the metrological integrity of the device can be made to any electronic mechanism. (H-44 2008, S.1.11.; GS. 8., and S.1.6. ABWS in part)

(c) Except on Class I scales, audit trails shall use the format set forth in the following table. (H-44 2008, S.1.11.; G-S.8., and S.1.6. ABWS in part)

Categories of Device and Methods of Sealing	
Categories of Device	**Method of Sealing**
Category 1: No remote configuration Capability	Seal by physical seal or two event counters: one for calibration parameters and one for configuration parameters.
Category 2: Remote configuration capability, but access is controlled by physical hardware Device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode.	The hardware enabling access for remote communication must be at the device and sealed using a physical seal or two event counters: one for calibration parameters and one for configuration parameters.
Category 3: Remote configuration capability access may be unlimited or controlled through a software with (e.g., password)	An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. A printed copy of the information must be available through the device or through another on-site device. The event logger shall have a capacity to retain records equal to ten times the number of sealable parameters in the device, but no more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)

[*Nonretroactive and enforceable as of January 1, 1995*]

(6) Digital Indication and Representation.

Digital elements shall be so designed that:

(a) Digital Value Conformity.

All digital values of like value in a system agree with one another;

(b) Digital and Analog Values Correspond.

A digital value coincides with its associated analog value to the nearest minimum graduation;

(c) Rounding.

A digital value "rounds off" to the nearest minimumunit that can be indicated or recorded.

(d) Digital Zero.

A digital zero indication includes the display of a zero for all places that are displayed to the right of the decimal point and at least one place to the left. When no decimal values are displayed, a zero shall be displayed for each place of the displayed scale division. (H-44, 2008, G-S.5.2.2.)

(7) Recording Sequence.

Provision shall be made so that all weight values are indicated until the completion of the recording of the indicated value. (H-44, 2008, S.1.5. ABWS Code)

(8) Recorded Weight Identification.

Gross weight, tare weight, net weight, subtotal, and total printed representations shall either be identified by a symbol clearly and accurately identifying the type weight printed, (e.g., G-Gross, T-Tare, N-Net, ST-Subtotal, TO-Total) or shall be identified as such on the ticket or tape on which they are printed.

(9) Change in Mode of Operation.

All grain weighing automatic hopper scales shall be designed so that the mode of operation and each change in mode of operation is indicated on the printed record by a symbol, number, or word which clearly designates the mode in which the scale is operated; i.e., A-automatic, M-manual, SA-semiautomatic; 1-automatic, 2-manual, 3-semiautomatic.

(10) Capacity Indication, Weight Ranges, and Unit Weights.

An indicating or recording element shall not display nor record any values when the gross load or platform (not counting the initial dead load that has been canceled by an initial zero-setting device) is:

(a) Showing Overcapacity.

In excess of 105% of scale capacity. (H-44, 2008, S.1.7., ABWS Code, S.1.3. in part)

(b) Recording Overcapacity.

The recording element shall not record gross loads in excess of 105 percent of capacity unless the recorded representation clearly indicates that the system is in an overload condition; i.e., “overload.”

The total value of weight ranges and of unit weights in effect or in place at any time shall automatically be accounted for on the reading face and on any recorded representation.

This requirement does not apply to: (1) single-revolution dial scales, (2) multi revolution dial scales not equipped with unit weights, (3) scales equipped with two or more weighbeams, nor (4) devices that indicate mathematically-derived totalized values.

(11) Size and Character.

In any series of graduations, indications, or recorded representations, corresponding graduations and units shall be uniform in size and character. Graduations, indications, or recorded representations which are subordinate to or of a lesser value than others with which they are associated shall be appropriately portrayed or designated. (H-44, 2008, G-S.5.2.3.)

(12) Values.

If graduations, indications, or recorded representations are intended to have specific values, these shall be adequately defined by a sufficient number of figures, words, symbols, or combinations thereof, uniformly placed with reference to the graduations, indications, or recorded representations and as close thereto as practicable, but not so positioned as to interfere with the accuracy of reading. (H-44, 2008, G-S.5.2.4.)

(13) Dual Indications.

On equipment designed to indicate or record in more than one unit of measurement, the values indicated or recorded shall be identified with an appropriate word, symbol, or abbreviation. (H-44, 2008, G-S.5.3.1. in part)

(14) Weight Entries to Recording Devices.

The displayed weight on electronic or levertronic scales shall be entered into automatic recording devices only electronically and directly from the related weighing instrument.

(15) Size of Graduated Intervals or Increments.

In any series of graduations, indications, or recorded representations, the values of the graduated intervals or increments shall be uniform throughout the series. (H-44, 2008, G-S.5.3.)

(16) Repeatability of Indications.

A device shall be capable of repeating within prescribed tolerances its indications and recorded representations. This requirement shall be met irrespective of repeated manipulation of any element of the device in a manner approximating normal usage (including displacement of the indicating elements to the full extent allowed by the construction of the device and repeated operation of a locking or relieving mechanism) and of the repeated performance of steps or operations that are embraced in the testing procedure. (H-44, 2008, G-S.5.4.)

(17) Recorded Representations.

Insofar as they are appropriate, the requirements for indicating and recording elements shall be applicable also to recorded representations. All recorded values shall be printed digitally. (H-44, 2008, G-S.5.6.)

(18) Tape Printers.

Tape printers on automatic-indicating scales shall be designed to produce a minimum of an original and one copy of the printed record.

(19) Ticket Printers.

Ticket printers on automatic-indicating scales shall be designed to produce an original and five copies of the printed record. Ticket printers on nonautomatic-indicating scales shall be designed to produce an original and one copy of the printed record.

(20) Multiple Indications and Recorded Representations.

All indications and recorded representations shall be clear, definite, accurate, and easily read under any conditions of normal operation of the device and shall agree with primary indications.

(21) Marking Operational Controls, Indications, and Features.

All operational controls, indications, and features, including switches, lights, displays, pushbuttons, and other means shall be clearly and definitely identified. The use of approved pictograms or symbols shall be acceptable. (H- 44, 2008, G-S.6.)

(22) Gate Position.

Provisions shall be made to clearly indicate to the operator the position of the gates leading directly to and from the weigh hopper. (H-44, 2008, S.3.1. ABWS Code)

(23) Interlocks.

Each automatic bulk weighing system shall have operating interlocks to provide for the following:

(a) Recording Element Disconnected.

Product cannot be cycled and weighed if the weight recording element is disconnected or subjected to a power loss; and

(b) Weigh Hopper Gate Open.

The recording element cannot print a weight if either of the gates leading directly to or from the weigh hopper is open; and

(c) Low Paper.

A "low paper" sensor, when provided, is activated; and

(d) Proper Sequence.

The system will operate only in the proper sequence in all modes of operation; and (e) Overfill. When an overfill alarm is activated, the system shall indicate and record an overfill condition.
(H-44, 2008, S.3.2. ABWS Code)

(24) Overfill Sensor.

(a) Weighing Inhibit Weigh Hopper.

The weigh hopper shall be equipped with an overfill sensor which will cause the feed gate to close, activate an alarm, and inhibit weighing until the overfill condition has been corrected.

(b) Weighing Inhibit Lower Garner.

If the system is equipped with a lower garner or surge bin, that garner shall be equipped with an overfill sensor which will be cause the gate of the weigh hopper to remain open, activate an alarm, and inhibit weighing until the overfill condition has been corrected. (H-44, 2008, S.3.3. ABWS Code)

[*Nonretroactive as of January 1, 1998*]

(25) Weighing Sequence.

(a) Printing Order In or Out.

For automatic bulk weighing systems used to receive (weigh in), the no-load reference value shall be determined and recorded only at the beginning of each weighing cycle. For automatic bulk weighing systems used to deliver (weigh out), the no-load reference value shall be determined and recorded only after the gross load reference value for each weighing cycle has been indicated and recorded. (H-44, 2008, S.1.4. ABWS Code)

(b) Printing Order One Draft Manual Hopper.

On a single draft manually operated receiving hopper scale installed below grade, used to receive grain, and utilizing a no-load reference value, provision shall be made to indicate and record the no-load reference value prior to the gross load value. (H-44, 2008, S.1.1.2.)

(26) Zero Indication for Automatic Bulk Weighing and Other Systems.

Provisions shall be made to indicate and record a no-load reference value and if the no-load reference value is a zero indication, to indicate and record an out-of-balance condition on both sides of zero. (H-44, 2008, S.1.1., ABWS Code in part)

(27) Zero Indication - Digital Indicating Elements.

(a) Zero-Value Range.

A digital zero indication shall represent a balance condition that is within ± ½ the value of the scale division.

(b) Center-of-Zero Value Range.

A digital indicating device shall either automatically maintain a "center-of-zero" condition to ±¼ scale division or less, or have an auxiliary or supplemental "center- of -zero" indicator that defines a zero-balance condition to ±¼ of a scale division or less. (H-44, 2008, S.1.1.1.)

[*Nonretroactive as of January 1993*]

(28) Length of Graduations.

Graduations shall be so varied in length that they may be conveniently read. (H-44, 2008, S.1.3.1.)

(29) Width of Graduations.

In any series of graduations, the width of a graduation shall in no case be greater than the width of the minimum clear interval between graduations and the width of main graduations shall be not more than 50 percent greater than the width of subordinate graduations. Graduations shall not be less than 0.008 inch in width. (H-44, 2008, S.1.3.2.)

(30) Clear Space Between Graduations.

The clear space between graduations shall be not less than 0.03 inch. If the graduations are not parallel, the measurement shall be made:

(a) Along the Length of Movement.

Along the line of relative movement between the graduations and the end of the indicator; or,

(b) Continuous Indicators.

If the indicator is continuous, at the point of widest separation of the graduations. (H-44, 2008, S.1.3.3.)

(31) Symmetry of Indicators.

The index of an indicator shall be symmetrical with respect to the graduations with which it is associated and at least throughout that portion of its length that is associated with the graduations. (H-44, 2008, S.1.4.1.)

(32) Dial Indicator Length.

The index of an indicator shall reach to the finest graduations with which it is used, unless the indicator and the graduations are in the same plane, in which case the distance between the end of the indicator and the ends of the graduations, measured along the line of the graduations, shall be not more than 0.04 inch. (H-44, 2008, S.1.4.2.)

(33) Dial Indicator Width.

The width of the index of an indicator in relation to the series of graduations with which it is used shall be not greater than:

(a) Width of Narrowest Graduation.

The width of the narrowest graduation, and

[Nonretroative as of January 1, 2001]

(b) Width of Clear Space Between.

The width of the clear space between weight graduations.

(c) Indexes.

When the index of an indicator extends along the entire length of a graduation, that portion of the index of the indicator that may be brought into coincidence with the graduation shall be of the same width throughout the length of the index that coincides with the graduation. (H-44, 2008, S.1.4.3.)

(34) Dial Indicator Clearance.

The clearance between the index of an indicator and the graduations shall in no case be more than 0.06 inch. (H-44, 2008, S.1.4.4.)

(35) Parallax.

Parallax effects shall be reduced to the practicable minimum. (H-44, 2008, S.1.4.5.)

(36) Dial Weight Ranges and Unit Weights.

The total value of weight ranges and of unit weights in effect or in place at any time shall automatically be accounted for on the reading face and on any recorded representation. (H- 44, 2008, S.1.7., in part)

d. Design of Balance, Tare, and Damping, and Arresting Mechanisms.

(1) Zero-Load – General.

The weighing system shall be equipped with manual or semiautomatic means by which the zero-load balance or no-load reference value indication may be adjusted. An automatic zero-setting mechanism is prohibited on hopper scales. (H-44, 2008, S.2.1. ABWS Code in part)

(2) Zero-Load Adjustment.

(a) Manual.

A manual zero-load or no-load reference value setting mechanism shall be operable or accessible only by a tool outside of or entirely separate from this mechanism or enclosed in a cabinet.

(b) Semiautomatic.

A semiautomatic zero-load or no-load reference value setting mechanism (push-button zero) shall be operable only when:

1 Automatic Bulk Weighing Systems.

a The indication is stable within ± 3 scale divisions, and

b It cannot be operated during a weighing operation. (H-44, 2008, S.2.1.1., S.2.1.2 ABWS Code in part)

2 Other Scales.

a The indication is stable within ± 3 scale divisions for scales of more than 5000 pound capacity in service prior to January 1, 1981, and all railway track and vehicle scales, and

b Plus or minus l scale division for all other scales. (H-44, 2008, S.2.1.2. in part)

(c) Zero-Load Adjustment on Mechanical Scales.

Any loose material used to adjust the zero-load balance on a mechanical scale shall be so enclosed that it cannot shift in position and alter the balance condition of the scale. A balance ball shall not itself be rotatable unless it is automatic in operation or is enclosed in a cabinet. (H-44, 2008, S.2.1.1., and S.2.1.2. in part)

(d) Scales Equipped with an Automatic Zero-setting Mechanism (AZSM).

Under normal operating conditions the maximum load that can be "rezeroed" when all at once either placed on or removed from the platform shall be:

1 For vehicle and railway track scales ± 3.0 scale divisions, and

2 For all other scales except automatic bulk weighing scales ± 1 scale division. (H-44, 2008, S.2.1.3. in part)

3 For Class III L devices equipped with AZSM manufactured after January 1, 2001, shall have sealable means to allow the automatic zero-setting to be disabled during the inspection and test of the device. (H-44, 2008, S.2.1.3.1.)

(e) Tare.

On any scale, the value of the tare division shall be equal to the value of the scale division. The tare mechanism shall operate only in a backward direction (that is, in a direction of underregistration) with respect to the zero-load balance condition of the scale. On a device designed to automatically clear any tare value entered, means shall be provided to prevent the clearing of tare until a complete transaction has been indicated. (H- 44, 2008, S.2.3. in part)

(f) Balance Indicator.

On a balance indicator consisting of two indicating edges, lines, or points, the ends of the indicators shall be sharply defined. When the scale is in balance, the ends shall be separated by not more than 0.04 inch. A mechanical grain-test scale shall be equipped with a balance indicator. If this consists of an indicator and a graduated scale that are not in the same plane, the clearance between the indicator and the graduations shall be not more than 0.04 inch. (H-44, 2008, S.2.2. and S.2.2.2. in part)

(g) Damping Means.

An automatic-indicating scale and a balance indicator shall be equipped with effective means to damp oscillations and to bring the indicating elements quickly to rest. (H-44, 2008, S.2.5.)

(h) Motion Detection.

Digital indicating elements equipped with recording elements shall be equipped with effective means to permit the recording of weight values only when the indication is stable within:

1 Plus or minus 3 scale divisions for scales of more than 2000 kg (5000 lb) capacity in service prior to January 1, 1981, hopper (other than grain hopper) scales with a capacity exceeding 22 000 kg (50 000 lb), and for all vehicle and railway track scales.

2 Plus or minus l scale division for all other scales. The values recorded shall be within applicable tolerances. (H-44, 2008, S.2.5.1.)

(i) Motion Detection for Automatic Bulk Weighing Systems.

Effective means shall be provided to permit the recording of weight values only when the indication is stable within ± 3 scale divisions for devices with 10 000 scale divisions, or ± l division for devices with less than 10 000 scale divisions. (H-44, 2008, S.2.2. ABWS Code in part)

(j) Level-Indicating Means.

A portable scale shall be equipped with level-indicating means if its weighing performance is changed by an amount greater than the appropriate acceptance tolerance when it is moved from a level position and rebalanced in a position that is out of level in any upright direction by 5 percent (approximately 3 degrees). The level-indicating means shall be readable without removing any scale parts requiring a tool. (H-44, 2008, S.2.4. in part)

e. Design of Weighing Elements.

(1) Antifriction Means.

Frictional effects shall be reduced to a minimum by suitable antifriction elements. Opposing surfaces and points shall be properly shaped, finished, and hardened. A platform scale having a frame around the platform shall be equipped with means to prevent interference between platform and frame. (H-44, 2008, S.4.1.)

(2) Adjustable Components.

An adjustable component such as a nose-iron, pendulum, spring, or potentiometer shall be held securely in adjustment and except for the level-adjusting and zero-load balance mechanisms shall not be adjustable from the outside of the scale. The position of a nose-iron on a scale of more than 2000-lb capacity, as determined by the factory adjustment, shall be accurately, clearly, and permanently defined. (H-44, 2008, S.4.2.)

(3) Multiple Load-Receiving Elements.

A system with a single indicating or recording element, or a combination indicating-recording element, that is coupled to two or more load-receiving elements with independent weighing systems, shall be provided with means to prohibit the activation of any load-receiving element (or elements) not in use, and shall be provided with automatic means to indicate clearly and definitely which load-receiving element (or elements) is in use. (H-44, 2008, S.4.3.)

(4) Designation and Parameters for Accuracy Class on Scales Manufactured After January 1, 1986.

Scales are divided into accuracy classes and shall be designated as II, III, or III L. The accuracy class of scales is designated by the manufacturer and shall comply with parameters shown in the table in this section under “i., 5.” (H-44, 2008, S.5.1., S.5.2. in part)

(5) Multi-Interval and Multiple Range Scales, Division Value.

On a multiinterval scale and multiple range scale, the value of “e” shall be equal to the value of “d.” (H-44, 2008, S.5.3.)

f. Design of Weighbeams and Poises.

(1) Normal Balance Position.

The normal balance position of the weighbeam of a beam scale shall be horizontal. (H-44, 2008, S.1.5.1.)

(2) Travel of Pans of Equal-Arm Scale.

The travel between limiting stops of the pans of a nonautomatic-indicating equal-arm scale not equipped with a balance indicator shall be not less than the minimum travel shown in Tables 1 and 2: (H-44, 2008, S.3.1.)

Table 1. Minimum Travel of Pans of Nonautomatic Indicating Equal Arm Scale Without Balance Indicator

Nominal capacity (kilograms)	Minimum travel of pans (millimeters)
2 or less	9
2+ to 5 inclusive	13
5+ to 12, inclusive	19
Over 12	25

(3) Drainage.

A load-receiving element intended to receive wet commodities shall be so constructed as to drain effectively. (H-44, 2008, S.3.2.)

(4) Travel.

The weighbeam of a beam scale shall have equal travel above and below the horizontal. The total travel of the weighbeam of a beam scale in a trig loop or between other limiting stops near the weighbeam tip shall be not less than the minimum travel shown in table I. When such limiting stops are not provided, the total travel at the weighbeam tip shall be not less than 8 percent of the distance from the weighbeam fulcrum to the weighbeam tip. (H-44, 2008, S.1.5.2.)

Table 2. Minimum Travel of Weighbeam of Beam Scale Between Limiting Stops

Distance from weighbeam fulcrum to limiting stops (inches)	Minimum travel between limiting stops (inch)
12 or less	0.4
12+ to 20, inclusive	0.5
20+ to 40, inclusive	0.7
Over 40	0.9

(5) Subdivision.

A subdivided weighbeam bar shall be subdivided by scale division graduations, notches, or a combination of both. Graduations on a particular bar shall be of uniform width and perpendicular to the top edge of the bar. Notches on a particular bar shall be uniform in shape and dimensions, and perpendicular to the face of the bar. When a combination of graduations and notches is employed, the graduations shall be positioned, in relation to the notches, to indicate notch values clearly and accurately. (H-44, 2008, S.1.5.3.)

(6) Readability.

A subdivided weighbeam bar shall be so subdivided and marked, and a weigh beam poise shall be so constructed, that the weight corresponding to any normal poise position can easily and accurately be read directly from the beam, whether or not provision is made for the optional recording of representations of weight. (H-44, 2008, S.1.5.4.)

(7) Poise Stop.

Except on a steelyard with no zero graduation, a shoulder or stop shall be provided on each weighbeam bar to prevent a poise from traveling and remaining back of the zero graduation. (H-44, 2008, S.1.5.6.)

(8) Poises.

No part of a poise shall be readily detachable. A locking screw shall be perpendicular to the longitudinal axis of the weighbeam and shall not be removable. Except on a steelyard with no zero graduation, a poise shall not be readily removable from a weighbeam. The knife edge of a hanging poise shall be hard and sharp and so constructed as to allow the poise to swing freely on the bearing surfaces in the weighbeam notches. (H-44, 2008, S.1.6.1.)

(9) Poise Adjusting Material.

The adjusting material in a poise shall be securely enclosed and firmly fixed in position and if softer than brass, it shall not be in contact with the weighbeam. (H-44, 2008, S.1.6.2.)

(10) Poise Pawl.

A poise, other than a hanging poise, on a notched weighbeam bar shall have a pawl that will seat the poise in a definite and correct position in any notch, wherever in the notch the pawl is placed, and hold it there firmly and without appreciable movement. The dimension of the tip of the pawl that is transverse to the longitudinal axis of the weighbeam shall be at least equal to the corresponding dimension of the notches. (H- 44, 2008, S.1.6.3.)

(11) Reading Edge or Indicator.

The reading edge or indicator of a poise shall be sharply defined, and a reading edge shall be parallel to the graduations on the weighbeam. (H-44, 2008, S.1.6.4.)

g. Marking Requirements. [See also Section 3.3 b. (1), (9), c. (21)]

(1) Capacity and Value of the Scale Division for Automatic Bulk Weighing Scales.

The capacity of the weighing system and the value of the scale division shall be clearly and conspicuously marked on the indicating element near the weight value indications. (H-44, 2008, S.5.1. ABWS Code)

(2) Location of Marking Information.

Scales that are not permanently attached to an indicating element, and for which the load-receiving element is the only part of the weighing/load-receiving element visible after installation, may have the marking information required in 3.3 b. (1) and Table 3 (following) located in an area that is accessible only through the use of a tool; provided that the information is easily accessible (e.g., the information may appear on the junction box under an access plate). The identification information for these scales shall be located on the weighbridge (load-receiving element) near the point where the signal leaves the weighing element or beneath the nearest access cover. (H-44. 2008, S.6.2.)

(3) Scales, Main Elements, and Components of Scales or Weighing Systems.

Scales, main elements of scales when not contained in a single enclosure for the entire scale, load cells for which Certificates of Conformance (CC) have been issued under the National Type Evaluation Program, and other equipment necessary to a weighing system, but having no metrological effect on the weighing system, shall be marked as specified in Table 3 and explained in the accompanying notes (Table 4). (H-44, 2008, S.6.3.)

(4) Railway Track Scales.

A railway track scale shall be marked with the maximum capacity of each section of the load-receiving element of the scale. Such marking shall be accurately and conspicuously presented on or adjacent to the identification or nomenclature plate that is attached to the indicating element of the scale. The nominal capacity of a scale with more than two sections shall not exceed twice its rated section capacity. The nominal capacity of a two-section scale shall not exceed its rated section capacity.
[*Nonretroactive as of January 1, 2002.*] (H-44, 2008, S.6.4.)

Table 3. Marking Requirements					
Weighing Equipment To Be Marked With	**Weighing, loadreceiving, and indicating element in same housing**	**Indicating Element not permanently attached to weighing and load-receiving element**	**Weighing and load-receiving element not permanently attached to indicating element**	**Load Cell with CC (11)**	**Other Equipment or Device (10)**
Manufacturer's ID (1)	x	x	x	x	x
Model Designation and Prefix (1)	x	x	x	x	x
Serial Number and Prefix (2)	x	x	x	x	x (16)
Certificate of Conformance Number (CC) (23)	x	x	x	x	x (23)
Accuracy Class (17)	x	x (8)	x (19)	x	
Nominal Capacity (3) (18) (20)	x	x	x		
Value of Scale Division (d) (3)	x	x			
Value of "e" (4)	x	x			
Temperature Limits (5)	x	x	x	x	
Concentrated Load Capacity (12) (20) (22)		x	x (9)		
Special Application (13)	x	x	x		
Maximum Number of Scale Divisions (nmax) (6)		x (8)	x (19)	x	
Minimum Verification Scale Division (emin)			x (19)		
"S" or "M" (7)				x	
Direction of Loading (15)				x	
Minimum Dead Load				x	
Maximum Capacity				x	
Safe Load Limit				x	
Load Cell Verification Interval (vmin) (21)				x	
Section Capacity (14) (20) (22) (24)		x	x		

Table 4. Marking Requirement Notes
1. Manufacturer's identification and model designation and model designation prefix*. *[Nonretroactive as of January 1, 2003.] [Prefix lettering may be intial capitals, all capitals or all lower case.] (H-44, 2002 G-S.1)
2. Serial number [Nonretroactive as of January 1, 1968] and prefix [*Nonretroactive as of January 1, 1986*] (H-44, 2002 G-S.1)
3. The device shall be marked with the nominal capacity. The nominal capacity and value of the scale division shall be shown together (e.g., 100 000 x 10 lb or 30 x 0.01 lb) in a clear and conspicuous manner and be readily apparent when viewing the reading face of the scale indicator unless already apparent by the design of the device. Each scale division value or weight unit shall be marked on multi range or multi-interval.[*Nonretroactive as of January 1, 1983*] (*Amended 2005*)
4. Required only if different from "d." [*Nonretroactive as of January 1, 1986*]
5. Required only on class III, III L and IIII devices if the temperature range on the NTEP CC is narrower than and within 14 F to 104 F (-10 to 40 C). [*Nonretroactive as of January 1, 1986*]. (*Amended 1999*)
6. This value may be stated on load cells in units of 1000; e.g., n: 10 is 10 000 divisions. [*Nonretroactive as of January 1, 1988*]
7. Denotes compliance for single or multiple load cell applications.
8. An indicating element not permanently attached to a weighing element shall be clearly and permanently marked with the accuracy Class of II, III, III L as appropriate, and the maximum number of scale divisions, nmax, for which the indicator complies with the applicable requirement. Indicating elements that qualify for use in both class III and III L applications may be marked III/III L and shall be marked with the maximum number of scale divisions for which the device complies with the applicable requirements for each accuracy class. [*Nonretroactive as of January 1, 1988*]
9. For vehicle scales only. Markings must be added at the time of modification to any scale not previously marked. [*Nonretroactive as of January 1, 1989*]
10. Necessary to the weighing system but having no metrological effect, e.g., auxiliary remote display, keyboard, etc.
11. The markings may be either on the load cell or in an accompanying document; except that, if an accompanying document is provided, the serial number shall appear both on the load cell and in the document. The manufacturer's name or trademark, the model designation, and identifying symbol for the serial number shall also be marked both on the load cell and in any accompanying document. *[Nonretroactive as of January 1, 1991*]
12. Required on the indicating element and the loadreceiving element of vehicle, axle load, and livestock scales; may be abbreviated "CLC"*. [*Nonretroactive as of January 1, 1989*]
13. A scale designed for a special application rather than general use shall be conspicuously marked with suitable words visible to the operator and customer restricting its use to that application, e.g., postal scale, prepack scale, weight classifier, etc. [*Nonretroactive as of January 1, 1986*]
14. Required on the indicating element of railway track scales only. When marked on vehicle scales manufactured before January 1, 1989, it may be used as the CLC
15. Required if the direction of loading the load cell is not obvious. [*Nonretroactive as of January 1, 1988*]
16. Serial number [as of January 1, 1968] and prefix [as of January 1, 1986]. (See G-S.1.) Modules without "intelligence" on a modular system (e.g., printer, keyboard module) are not required to have
17. The accuracy Class of a device shall be marked on the device with the appropriate designation as I, II, III, III L, or IIII.
18. The nominal capacity shall be conspicuously marked as follows: (a) on any scale equipped with unit weights or weight ranges; (b) on any scale with which counterpoise or equal-arm weights are intended to used; (c) on any automatic-indicating or recording scale so constructed that the capacity of the indicating or recording element, or elements, is not immediately apparent; (d) on any scale with a nominal capacity less than the sum of the reading elements; and (e) on the load-receiving element (weigh-bridge) of a vehicle. [*Nonretroactive as of January 1, 1989*]
19. [*Nonretroactive as of January 1, 1988*]
20. Combination vehicle/railway track scales must be marked with both the nominal capacity and CLC for vehicle weighing and the nominal capacity and section capacity for railway weighing. All other requirements relating to these markings will apply. [*Nonretroactive as of January 1, 2000*]
21. The value of the load cell verification interval (vmin) must be stated in mass units. In addition to this information, a device may be marked with supplemental representations of vmin. [*Nonretroactive January 1, 2001*]
22. Combination vehicle/livestock scales must be marked with both the CLC for vehicle weighing and the section capacity for livestock weighing. All other requirements relative to these markings will apply. [*Nonretroactive a of January 1, 2003*]. (*Amended 2002 and 2003*)
23. Required only if a CC has been issued for the device or equipment. [*Nonretroactive as of January 1, 2003*.]
24. The section capacity shall be prefaced by the words "Section Capacity" or an abbreviation of that term. Abbreviations shall be "Sec Cap' or Sec C". All capital letters and periods may be used. [*Nonretroactive as of January 1, 2005*] (*Amended 2004)*

(5) Weighing Elements.

On a weighing element not permanently attached to an indicating element, there shall be clearly and permanently marked for the purposes of identification the name, initials, or trademark of the manufacturer, the manufacturer's designation that positively identifies the pattern or design, and the nominal capacity. (H-44, 2008, S.5.2., ABWS Code)

(6) Accuracy Class for Scales Manufactured After January 1, 1986.

The accuracy class of a device shall be marked on the device with the appropriate designation as II, III, or III L. (H-44, 2008, S.5.1. in part)

(7) Temperature Limits for Scales Marked with an Accuracy Class for Class III and III L Devices.

Unless the temperature range is -10 °C to + 40 °C (14 °F to 104 °F), the temperature range shall be marked on the device. (H-44, 2008, S.5.3. ABWS)

h. Installation Requirements.

(1) Protection from Environmental Factors.

The indicating elements, the lever system or load cells, the load-receiving element, and test weights shall be adequately protected from environmental factors such as wind, weather, and radio frequency interference that may adversely affect the operation or performance of the system. (H-44, 2008, UR.2.1. ABWS Code in part)

(2) Foundation, Supports, and Clearance.

The foundation and supports of any system shall be such as to provide strength, rigidity, and permanence of all components, and clearance shall be provided around all live parts so that no contact can result before or during operation of the system. On vehicle scales, the clearance between the load-receiving elements and the coping at the bottom edge of the platform shall be greater than at the top edge of the platform. (H-44, 2008, UR.2.2. ABWS Code in part)

(3) Access to Weighing Elements.

Adequate provision shall be made for ready access to the pit of a vehicle or railroad track scale for purposes of inspection and maintenance. Any of these scales without a pit shall be installed with adequate means for inspection and maintenance of the weighing elements. Provisions shall be provided to lock or securely seal all accesses to the pit. (H-44, 2008, UR.2.5. in part)

(4) Approaches to Vehicle Scales.

On the entrance and exit ends of a vehicle scale installed in any one location for a period of 6 months or more, there shall be a straight approach as follows:

(a) Width.

At least the width of the platform; and

(b) Length.

The length at least one-half the length of the platform but not required to be more than 12 m (40 ft); and

(c) Adjacent Construction.

Not less than 3 m (10 ft) of any approach adjacent to the platform shall be constructed of concrete or similar durable material to ensure that this portion remains smooth and level and in the same plane as the platform. However, grating of sufficient strength to withstand all loads equal to the concentrated load capacity of the scale may be installed in this portion. Any slope in the remaining portion of the approach shall insure: (1) ease of vehicle access; (2) ease for testing purposes; and (3) drainage away from the scale. (H-44, 2008, UR.2.6.1.); and

(5) Hoists.

On motor vehicle and railway track scales equipped with means for raising the load-receiving element from the weighing element for vehicle unloading, means shall be provided so that it is readily apparent to the weigher when the load-receiving element is in its designed weighing position. The printer shall not be operable until the load-receiving element is in its designed weighing position. (H-44, 2008, UR.2.8. in part)

i. User Requirements.

(1) Balance Condition.

The zero-load adjustment of a scale shall be maintained so that, with no load on the load-receiving element and with all load-counterbalancing elements of the scale such as poises, drop weights, or counterbalance weights set to zero, the scale shall indicate or record a zero-balance condition. A scale not equipped to indicate or record a zero- load balance shall be maintained in balance under any no-load condition. (H-44, 2008, UR.4.1.)

(2) Scale Modifications.

The length, nor the width, nor the height of the load-receiving element of a scale shall be increased beyond the manufacturer's design dimension; nor shall the capacity of a scale be increased beyond its design capacity by replacing or modifying the original primary indicating or recording element with one of a higher capacity; nor shall any other modification be made, except when the modification has been approved by a competent engineering authority, preferably that of the engineering department of the manufacturer of the scale and by FGIS. (H- 44, 2008, UR.4.3. in part)

(3) Scale Division Selection Requirements for Official Automatic Bulk Weighing Systems.

The number of scale divisions of a weighing system used to weigh grain shall not be less than 2000 nor greater than 10 000 divisions.

[*Nonretroactive and enforceable as of January 1, 1984*.]
(H-44, 2008, ABWS, UR.1.1., Amended 1986 and 1992)

(4) Grain Hopper Scales Division Selection Requirement.

The minimum number of scale divisions for a Class III Hopper Scale used for weighing grain shall be 2000. (H-44, 2008, UR.1.2.)

Table 5. Examples of Capacity and Scale Division

System capacity (Pounds)	Value of Scale division (Pounds)	Number of scale divisions in system
20 000	2	10 000
20 000	5	4 000
20 000	10	2 000
40 000	5	8 000
40 000	10	4 000
60 000	10	6 000
100 000	10	10 000
100 000	20	5 000
120 000	20	6 000
200 000	20	6 000
200 000	50	4 000

(5) Scale Division Selection Requirements for Scales Marked With An Accuracy Class Other Than Automatic Bulk Weighing Scales.

The accuracy class of a weighing device designated by the manufacturer and shall comply with the parameters shown in Table 6. (H-44, 2008, S.5.2.)

Table 6. Parameters for Accuracy Class

Class	Value of the verification scale division (d or e[1])	Number of scale[4] divisions (n)	
		Minimum	Maximum
SI Units			
II	1 to 50 mg, inclusive	100	100 000
	equal to or greater than 100 mg	5 000	100 000
III[2]	0.1 to 2 g, inclusive	100	10 000
	equal to or greater than 5 g	500	10 000
III L[3]	equal to or greater than 2 kg	2 000	10 000
INCH-POUND			
III	0.0002 lb to 0.005 lb, inclusive	100	10 000
	0.005 oz to 0.125 oz, inclusive	100	10 000
	equal to or greater than 0.01 lb	500	10 000
	equal to or greater than 0.25 oz	500	10 000
III L[3]	equal to or greater than 5 lb	2 000	10 000

[1] For Class I and II devices equipped with auxiliary reading means (i.e., a rider, a vernier, or a least significant decimal differentiated by size, shape, or color), the value of the verification scale division "e" is the value of the scale division immediately preceding the auxiliary means.

[2] A scale marked "For prescription weighing only" may have a scale division not less than 0.01 g. (Added 1986)

[3] The value of a scale division for crane and hopper (other than grain hopper) scales shall be not less than 0.2 kg (0.5 lb). The minimum number of scale divisions shall be not less than 1000.

[4] On a multiple range or multi-interval scale the number of divisions for each range independently shall not exceed the maximum specified for the accuracy class. The number of scale divisions, n, for each weighing range is determined by dividing the scale capacity for each range by the verification scale division, e, for each range. On a scale system with multiple load receiving elements and multiple indications, each element considered shall not independently exceed the maximum specified for the accuracy class. If the system has a summing indicator, the nmax for the summed indication shall not exceed the maximum specified for the accuracy class.

(6) Scale Division Selection Requirements for Scales Not Marked With an Accuracy Class Other Than Automatic Bulk Weighing Scales.

Use the division size indicated for the type of scale shown in Table 7, other than automatic bulk weighing scales.

Table 7. Applicable to Devices Not Marked with a Class Designation	
Scale Type or Design	**Maximum Value of d**
Grain Hopper Scales	
Capacity up to and incl. 50 000 lb	10 pounds (but not greater than 0.05 percent of capacity)
Capacity over 50 000 lb	20 pounds
Vehicle Scales	
Capacity up to and including 200 000 lb	20 pounds
Capacity over 200 000 lb	50 pounds
Railway Track Scales	
With weighbeam	20 pounds
Automatic indicating	100 pounds
Scales with capacities greater than 500 lb except otherwise specified	0.1 percent capacity (but not greater than 50 lb)

(7) Scale Division Selection Requirements for Grain Test Scales According To Application.

The verification scale division (e) for grain-test scales shall not exceed 0.1 g for separations from loads through 500 g, and shall not exceed 1 g for separations from loads above 500 g through 1000 g. For scales used to weigh separations from loads of 100 g and less, d shall be less than or equal to 0.01 g, but may use expanded resolution.[3]

[3] (1) The value of "d" is the smallest division shown on the scale display. (2) The value of "e" is the verification scale division. It represents the stated accuracy of a scale when the scale display has extra units added in order to expand the resolution. The verification scale division (e) may be larger than the displayed scale division (d) for some devices. (3) Some expanded resolution scales have cross-hatching/highlighting over the least significant digit on the display. The last digit is ignored when testing the scale, but should be used when weighing grain work portions or separations.

Table 8. Scale Division Selection Requirements for Grain Test Scales According To Application		
Work Portion [4]	Accuracy Class	Division Requirement
$\leq$ 100 g	II (expanded resolution)	e $\leq$ 0.1 g d $\leq$ 0.01 g
> 100 g	II or III	e $\leq$ 0.1 g d $\leq$ 0.1 g
> 500 g	II or III	e $\leq$ 1 g d $\leq$ 1 g
[4] The division size shall be based on the work portion size, and both the work portion and the separation shall be weighed using a scale with the same (or better) maximum division size.		

(8) Value of Scale Division (d) and Weight Units.

The value of the scale division expressed in a unit of weight shall be equal to 1, 2, or 5, or a decimal multiple or sub multiple of 1, 2, or 5. Examples: Scale division may be .01, .02, or .05; .1, .2, or .5; 1, 2, or 5; 10, 20, or 50. (H-44, 2008, S.1.2., S.1.1. in part)

(9) Split or Double Draft Static Weighing.

A vehicle or a coupled vehicle combination or a railroad car shall be officially weighed statically on a vehicle or railway track scale only as a single draft. That is, the total weight of such a vehicle or combination shall not be determined by adding together the results obtained by separately and not simultaneously weighing each end of such vehicle or individual elements of such coupled combination.

(a) Weighing Separately and Adding Components.

The weight of a coupled combination may be determined by uncoupling the various elements (tractor, semi-trailer, trailer), statically weighing each unit separately as a single draft, and adding together the results; or

(b) Multiple Platforms.

The weight of a vehicle or coupled-vehicle combination may be determined by adding together the weights obtained while all individual elements are resting simultaneously on more than one scale platform. (H-44, 2008, UR.3.3. in part)

(10) Supports.

A scale that is portable and that is being used on a counter or table or on the floor shall be so positioned that it is firmly and securely supported. (H-44, 2008, UR.2.1.)

(11) Level Condition.

If a scale is equipped with a level-condition indicator, the scale shall be maintained in level. (H-44, 2008, UR.4.2.)

(12) Railway Track Scales; Alignment of Dead and Weighing Rails.

Dead rails should be provided for all scales where designed capacity does not correspond with the greatest combined load likely to run over scale rails. Weighing rails should be on the offset line and the dead rails should be straight unless a large portion of the cars is to be weighed.

(13) Standing of Equipment and Keeping Scales Under Load.

Equipment shall not be allowed to stand on the platform of a vehicle or railway track scale except when being weighed and, in the case of hopper scales, grain shall not normally be retained on the weighing element for periods longer than a normal weighing cycle.

(14) Altering Poises and Counterpoise Weights.

After a poise or counterpoise weight has been sealed, no material shall be added or removed without the approval of FGIS and an official test shall be conducted to recertify the scale.

(15) Hopper Scale Venting.

All weighing systems shall be vented so that any internal or external pressure will not affect the accuracy or operation of the system. (H-44, 2008, S.4.4. ABWS Code)

(16) Minimum Test Weight Load for Automatic Bulk Weighing Scales.

The minimum amount of certified test weight required for testing shall be 10 percent of scale capacity. (An increasing-load test using bulk material shall be conducted in increments not greater than the total value of the official test weights; the test shall be conducted to the official capacity of the weighing system.) (H-44, 2008, N.1. ABWS Code in part)

(17) Minimum Test Weight Load for Railway Track Scales.

In the test of a railway track scale, the test weight load shall be not less than 80 000 pounds.

(18) Minimum Test Weights and Test Loads for Scales Other Than Automatic Bulk Weighing and Railway Track Scales.

The minimum test weights and test loads for in-service tests are shown below.

Table 9. Minimum Test Weights and Test Loads

Device capacity (pounds)	Minimums (in terms of device capacity)		Recommended** (where practicable)
	Test weights (greater of)	Test loads*	
0 to 100	105%		
101 to 1 000	50% or 100 lb	105%	
1 001 to 40 000	25% or 500 lb	50%	Test weights to dial face capacity, 1000 d or test load to used capacity, if greater than minimums specified
40 000 +	12.5% or 10 000 lb	25%	

*The term “test load” means the sum of the combination of field standard test weights and any other applied load used in the conduct of a test using substitution or build-up test methods. (H-44, 20082, N.3. in part)

(19) Assistance in Testing.

If the design construction, or location of any scale is such as to require a testing procedure involving special equipment, accessories, or an abnormal amount of labor, the equipment, accessories, and labor shall be supplied by the owner or operator of the device. Test weights calibrated to service specifications shall be supplied by the scale owner or operator. (H-44, 2008, G-UR.4.4. in part)

(20) Minimum Loading Requirement for an Automatic Bulk Weighing Scale.

A system shall not be used to weigh drafts less than 40 percent of the weighing capacity of the system except for a final partial draft. (H-44, 2008, UR.3.1. ABWS Code in part)

(21) Minimum Load for a Vehicle Scale.

A vehicle scale shall not be used for weighing net loads smaller than 50 d. (H-44, 2008, UR.3.7.)

(22) Maximum Load.

A scale shall not be used to weigh a load more than the nominal capacity of the scale. (H-44, 2008, U.R.3.2.)

j. Railway Track Scales; Additional Requirement Guidelines.

(1) Sectional and Load Cell Capacity.

The rated sectional capacity of a full load cell scale should be one of those shown in Table 10 and shall employ load cells in capacities as shown.

The rated sectional capacity should be in no case exceed the actual sectional capacity. (Association of American Railroads, Engineering Division, Scale Handbook (AAR Handbook, 2008, 2.2.2.)

Table 10. Rated Sectional Capacity Rated Capacity of Full Load Cell Scale

Sectional capacity (tons)	Each loadcell rated capacity (pounds)
Track scale:	
35	50 000
85	100 000
180	200 000
270	300 000

(2) Construction Approval.

Servicing railroads engineering departments are typically responsible for approving the construction of railway track scales, see the latest edition of the AAR Scale Handbook in force for railway track scale construction specifications for such items as: nose-iron guides, leveling lugs, marking of levers, pivots and bearings; material design and manufacture and placement or position. Design placement of bearings, nose-iron design, adjustment screw and bolt material, nose-iron retaining devices material, weighbeam material and support, weighbridge support, girders and bearings, stress limits, weighing rail length and weight, clearance along weighing rails, miter joints in motion weighing scales, clearance of fixed beams or deck supports, location of foundation, approach walls static scales, support piers and footings for load cells, footings or piers for lever stands, anchor bolts for load cell plates, bearing pressure specifications for foundation footings for soil concrete etc.

3.4 TOLERANCES

a. General.

The tolerances listed in this section shall be applied to all scales under the jurisdiction of the Service.

(1) Theory.

It is understood that exact or errorless performance of weighing devices is unattainable. Uniform tolerances are therefore prescribed to allow permissible errors small enough to satisfy both buyer and seller and large enough so that both manufacturing and maintenance costs are not disproportionate. FGIS provides two sets of tolerances where necessary: "Acceptance" and "Maintenance" tolerances. Acceptance tolerances shall be applied to new installations and to installations where adjustments and/or modifications have taken place after official rejection or exceeding applicable tolerances. Maintenance tolerances provide an added range of "inaccuracy" (twice the value of acceptance tolerances) allowing for a limited amount of deterioration.

(2) Adjustments and Tolerances.

When adjustments are made to scale systems they shall be made to bring the system as close to zero error as possible. Owners, operators, or repair persons shall not be allowed to adjust scale systems toward tolerance limits.

(3) Application and Uniformity.

A weighing system may have errors in excess and/or deficiency. By application of "Approval Seals,"(FGIS-931, Approved Label for Inspected Machinery) the scale official certifies that the weighing system is accurate and errors, if any, are within acceptable tolerance limits.

(4) Design.

The tolerance for a weighing device is a performance requirement independent of the design principle used. (H-44, 2008, T.N.1.1.)

(5) Accuracy Classes.

Weighing devices are divided into accuracy classes according to the number of scale divisions (n) and the value of each scale division (d).
(H-44, 2008, T.N.1.2.

(6) Scale Division.

The tolerance of a weighing device is related to the scale division (d) or the value of the verification division (e) and is generally expressed in terms of d or e. (H-44, 2008, T.N.1.3.)

b. Tolerance Application.

(1) General.

The tolerance values are positive (+) and negative (-) with the weighing device adjusted to zero at no load. When tare is in use, the tolerance values are applied from the tare zero reference; the tolerance values apply to certified test loads only. (H-44, 2008, T.N.2.1.)

(2) Multi-Range (Variable Division-Value) Scales.

For multi-range devices, the tolerance values are based on the value of the scale division of the range in use. (H-44, 2008, T.N.2.4.)

c. Basic and Minimum Tolerance.

(1) General.

The basic tolerance includes both acceptance and maintenance tolerances. Where these tolerances provide an allowable error too small to be applicable, the minimum tolerance value shall apply. The minimum tolerance is the smallest allowable error that can be applied to any scale or weighing system.

(2) Minimum Tolerance for Scales that are not Under a Class Tolerance Application.

When not otherwise specified the minimum tolerance to be applied shall be 0.05 percent (1/2000) of scale capacity or one-half “d” whichever is less. (H-44, 2008, T.1.1.3.)

(3) Minimum Tolerance for Automatic Bulk Weighing Scales.

The minimum tolerance value shall not be less than half the value of the scale division. (H-44, 2008, T.2. ABWS Code)

(4) Tolerances for Scales not Marked with an Accuracy Class, Except for Automatic Bulk Weighing Scales, and Grain Test Scales.

Paragraphs d. (4); e. (3) (a); e. (6) (a), (b), (c); and, e. (10) of this section also apply. (H-44, 2008, T.1.1. in part)

Table 11. Tolerances for Unmarked Scales					
Type of Device	**Subcategory**	**Min. Tol.**	**Accept Tol.**	**Maint. Tol.**	**Decreasing Load Multiplier[5]**
Vehicle, railway track (weighing statically)		Maint. Tol. as shown in Table 13, Accept. Tol ½ values in Table 13.			1.0
All other scales	n > 5 000	0.5 d or 0.05% of scale capacity, whichever is less	0.05% of test load	0.1 % of test load	1.5
	n ≤ 5 000	Maint. Tol. as shown in Table 13, Accept. Tol ½ values in Table 13.			1.0

[5] The decreasing load test applies only to automatic indicating scales.

(5) Tolerances for Grain Test Scales that are not Marked with an Accuracy Class According to Specific Use.

Table 12. Tolerances for Unmarked Grain Test Scales					
Type	**Usage**	**Maximum d**	**Tolerance**	**Sensitivity Requirement**	**Shift Tolerance**
Precision	Samples less than equal to 100 g	0.01 g	0.02 g	.01 g	.02 g
Moisture	Work portions greater than 100 g or moisture portions	0.1 g	0.2 g	.1 g	.2 g
General	Work portions greater than 500 g	1 g	1 g	1 g	1 g

(6) Tolerances for Scales Marked with an Accuracy Class, Except for Automatic Bulk Weighing Scales.

(a) Maintenance Tolerances.

Use Table 13 to calculate the maintenance tolerance sometimes also called “as found or user’s tolerance.” Find the number of divisions to correlate to the “Tolerance in Scale Divisions” by dividing the division size of the scale into the applied load (Test Load) at each test interval.

Table 13. Tolerances for Scales Marked with an Accuracy Class				
Maintenance Tolerances (All values in this table are in scale divisions)				
Tolerance in scale divisions				
Class	**±1**	**±2**	**±3**	**±5**
	Test Load			
II	0 - 5 000	5 001 - 20 000	20 001 +	
III	0 - 500	501 - 2 000	2 001 - 4 000	4 001 +
III L	0 - 500	501 - 1 000	(Add 1d for each additional 500d or fraction thereof)	

(H-44, 2008, T.N.3.1. in part)

(b) Acceptance Tolerance Values.

The acceptance tolerance values shall be one-half the maintenance tolerance values. (H-44, 2008, T.N.3.2.)

(7) Tolerances for Automatic Bulk Weighing Scales.

The basic maintenance tolerance shall be one pound per 1000 pounds of test load (0.1 percent). The basic acceptance tolerance shall be one-half the basic maintenance tolerance. (H-44, 2008, T.3. ABWS Code, in part)

(8) Accumulated Error During Increasing Load Tests on Automatic Bulk Weighing Scales.

The buildup test on electronic/levertronic hopper scales shall involve the substitution of material (grain) for known test weights in increments not to exceed the value of the test weights. At each step the error shall not exceed the applicable tolerance applied to the known test weights and the accumulated error shall not exceed the applicable tolerance applied to the total load (grain + test weights). The accumulated error shall be determined by the addition (algebraic sum) of individual step errors.

(9) Tolerances for All Vehicle and Railway Track Scales.

The maintenance and acceptance tolerances shall be those for Class III L scales as listed in Item (6) (Table 13). (H-44, 2008, T.N.3.1., T.N.3.2.)

d. Sensitivity and Discrimination Requirements.

(1) Sensitivity Requirement (SR) for Nonautomatic-Indicating Scales not Marked with an Accuracy Class.

(a) Application.

The sensitivity requirement (SR) is applicable to all nonautomatic-indicating scales not marked II, III, or III L, and is the same whether acceptance or maintenance tolerances apply. (H-44, 2008, T.2.1. in part)

(b) SR for Hopper Scales and Commodity Scales.

2d, 0.2 percent of the scale capacity, or 40 pounds, whichever is least. (H-44, 2008, T.2.2. in part)

(c) SR for Grain Test Scales.

1d or 0.2 percent of the scale capacity, whichever is less. (H-44, 2008, T.2.6.)

(d) SR for Vehicle Scales.

1 Equipped with balance indicators - 1d.

2 Not equipped with balance indicators: 2d or 0.2 percent of the scale capacity, whichever is less. (H-44, 2008, T.2.7.)

(e) SR for Railway Track Scales.

3d or 100 pounds, whichever is less. (H-44, 2008, T.2.8.)

(f) Sensitivity Requirements, Equilibrium Change Required.

The minimum change on weighbeam indicator's trig loops, or balance indicators on types and capacities as indicated shall be:

1 The position of rest of the weighbeam shall change from the center of the trig loop to the top or bottom, as the case may be on a scale with a trig loop but without a balance indicator.

2 The position of rest of a single indicator on a scale having a nominal capacity of less than 250 kg (500 lb) shall change 1.0 mm (0.04 in) or at least one division on the graduated scale, whichever is greater on a scale with a single balance indicator and having a nominal capacity of less than 250 kg (500 lb).

3 The position of rest of a single indicator on a scale having a nominal capacity of 500 pounds or greater shall change 6.4 mm (0.25 in) or one division on the graduated scale or the width of the central target area, whichever is greater. However, the indicator on a batching scale shall change 3.2 mm (0.125 in) or one division on the graduated scale, whichever is greater on a scale with a single balance indicator and having a nominal capacity of 250 kg (500 lb) or greater.

4 The position of rest of the two indicators moving in opposite directions shall change 1.0 mm (0.04 in) with respect to each other on a scale with two opposite-moving balance indicators. 5 The position of rest of the weighbeam or lever system shallchange from the horizontal, or midway between limiting stops, to either limit of motion on a scale with neither a trig loop nor a balance indicator. (H-44, 2008, T.3. in part)

(2) Test Load for Nonautomatic-Indicating Scales Marked With Accuracy Class.

This subsection is applicable to nonautomatic-indicating scales marked II, III, or III L.

(a) Sensitivity with Balance Indicators.

The test load for sensitivity for nonautomatic-indicating vehicle scales shall be 1d for scales equipped with balance indicators, and 2d or 0.2 percent of the scale capacity, whichever is less, for scales not equipped with balance indicators.

(b) Sensitivity All Others.

For all other nonautomatic-indicating scales, the test load for sensitivity shall be 1d at zero and 2d at maximum test load. (H-44, 2008, T.N.6.1. in part)

(3) Minimum Change of Indications for Nonautomatic-Indicating Scales Marked With Accuracy Class.

This subsection is applicable to nonautomatic- indicating scales marked II, III, or III L. The addition or removal of the test load for sensitivity shall cause a minimum permanent change as follows.

(a) With Trig Loop.

For a scale with trig loop but without a balance indicator, the position of the weighbeam shall change from the center to the outer limit of the trig loop.

(b) With Balance Indicator.

For a scale with a balance indicator, the position of the indicator shall change one division on the graduated scale, the width of the central target area, or the value as follows, whichever is greater.

1 Class II scale: 1 mm (0.04 inch).

2 Class III scale with a maximum capacity of 30 kg (70 lb) or less: 2 mm (0.08 inch).

3 Class III or III L scales with a maximum capacity of more than 30 kg (70 lb): 5 mm (0.20 in).

(c) Without Either.

For a scale without a trig loop or balance indicator, the position of rest of the weighbeam or lever system shall change from the horizontal or midway between limiting stops to either limit of motion. (H-44, 2008, T.N.6.2. in part)

(4) Discrimination Requirement for Digital Automatic-Indicating Weighing Scales.

A test load equivalent to 1.4d shall cause a change in the indicated or recorded value of at least two divisions. This requires that the zone of uncertainty shall not be greater than 0.3 times the value of the scale division. (H-44, 2008, T.N.7.2.)

(5) Discrimination Requirement for Analog Automatic-Indicating Scales (i.e., Weighing Device with Dial, Drum, Fan, etc.).

A test load equivalent to 1.4d shall cause a change in the indication of at least 1.0d. (H-44, 2008, T.N.7.1. in part)

(6) Separate Main Element Requirement for Scales Marked with an Accuracy Class: Load Transmitting Element, Indicating Element, etc.

If a main element separate from a weighing device is submitted for type evaluation, the tolerance for the element is no more than 0.7 times that for the complete weighing device. This fraction includes the tolerance attributable to the testing devices used. (H-44, 2008, T.N.3.5.)

e. Tolerance Applications.

(1) Acceptance Tolerance.

Acceptance tolerances shall be applied as follows.

(a) First Official Use.

To any equipment about to be put into official use for the first time.

(b) First Test.

To equipment that has been placed in official service within the preceding 30 days and is being officially tested for the first time.

(c) After Official Rejection.

To equipment that has been returned to official service following official rejection for failure to conform to performance requirements and is being officially tested for the first time within 30 days after corrective service.

(d) After Renovation.

To equipment being officially tested for the first time within 30 days after major reconditioning or overhaul.

(e) Type Evaluation.

To equipment undergoing type evaluation. (H-44, 2008, G-T.1.)

(2) Maintenance Tolerance.

Maintenance tolerances shall apply to equipment in actual use, except as provided for under "Acceptance Tolerance." (H-44, 2008, G-T.2. in part)

(3) Repeatability of Test Load Indications.

(a) Static Conditions.

The results obtained under reasonably static test conditions, by several weighings of the same load, shall agree within the absolute value of the maintenance tolerance for that load, and shall be within applicable tolerances. (H-44, 2008, T.N.5.)

(b) Zero-load Balance Change.

A zero-load balance change test shall be conducted on all scales after the removal of any test load. The zero-load balance should not change by more than the minimum tolerance applicable. (H-44, 2008, N.1.9.)

(4) Excess and Deficiency.

Tolerances "in excess" and tolerances "in deficiency" shall apply to errors in excess and to errors in deficiency, respectively. (H-44, 2008, G-T.3. in part)

(5) Scales that are not Marked With an Accuracy Class Involving Digital Indications or Representations.

To the tolerances that would otherwise be applied, there shall be added an amount equal to one-half the minimum value that can be indicated or recorded. This does not apply to digital indications or recorded representations that have been corrected for rounding error using error weights. (H-44, 2008 T.1.1.2)

(6) Agreement of Indications.

(a) Multiple Indicating/Recording Elements.

In the case of a scale or weighing system equipped with more than one indicating element or indicating element and recording element combination, where the indicators or indicator/recorder combination are intended to be used independently of one another, tolerances shall be applied independently to each indicator or indicator/ recorder combination. (H-44, 2008, T.N.4.1.)

(b) <u>Single Indicating/Recording Element</u>.

In the case of a scale or weighing system with a single indicating element or an indicating/ recording element combination, and equipped with component parts such as unit weights, weighbeam and weights, or multiple weighbeams that can be used in combination to indicate a weight, the difference in weight value indications of any load shall not be greater than the absolute value of the applicable tolerance for that load, and shall be within tolerance limits. (H-44, 2008, T.N.4.2.)

(c) <u>Single Indicating Element/Multiple Indications</u>.

In the case of an analog indicating element equipped with two or more indicating means within the same element, the difference in weight indications for any load other than zero shall not be greater than one-half the value of the scale division (d) and be within tolerance limits. (H-44, 2008, T.N.4.3.)

(7) <u>Time Dependence</u>.

At constant test conditions, the indication 20 seconds after the application of a load, and the indication after 1 hour shall not differ by more than:

(a) <u>Class III L Devices</u>.

One half of the absolute value of the applicable tolerance for the applied load for class III L devices; and

(b) <u>All Other Devices</u>.

The absolute value of the applicable tolerance for the applied load for all other devices. (H-44, 2008, T.N.4.5.)

(8) <u>Shift or Section Tests</u>.

The range of the results obtained during the conduct of a shift test or a section test shall not exceed the absolute value of the maintenance tolerance applicable and each test shall be within applicable tolerances. (H-44, 2008, T.N.4.4.)

(9) <u>Ratio Tests</u>.

For ratio tests the tolerance values are .75 of the applicable tolerances. (H-44, 2008, T.N.2.5. in part)

(10) Railway Track Scales Weighing Uncoupled-in-Motion Cars.

The basic maintenance and acceptance tolerance shall be the same as the static weighing basic tolerances for railway track scales.

f. Influence Factors.

(1) Applicability.

The following factors are applicable to tests conducted under controlled conditions only, provided that:

(a) Manufactured Before January 1, 1986.

Types of devices approved prior to January 1, 1986, and manufactured prior to January 1, 1988, need not meet the requirements of this section, and

(b) Manufactured After January 1, 1986.

New types of devices submitted for approval after January 1, 1986, shall comply with the requirements of this section, and

(c) Manufactured After January 1, 1988.

All devices manufactured after January 1, 1988, shall comply with the requirements of this section. (H-44, 2008, T.N.8.)

(2) Temperature.

Devices shall satisfy the tolerance requirements under the following temperature conditions.

(a) Not Specified.

If not specified in the operating instructions for Class II scales, or if not marked on the device for Class III or III L scales, the temperature limits shall be: -10 °C to 40 °C (14 °F to 104 °F) (H-44, 2008, T.N.8.1.1)

(b) Specified.

If temperature limits are specified for the device, the range shall be at least:

Temperature Range by Class	
Class	**Temperature Range**
II	**15 °C (27 °F)**
III, IIIL	**30 °C (54 °F)**

(H-44, 2008, T.N.8.1.2.)

(c) Zero-load Indication Change.

The zero-load indication shall not vary by more than 1 division per 5 °C (9 °F) change in temperature. (H-44, 2008, T.N.8.1.3.)

(d) No Display or Record Until Operating Temperature Attained Exception.

Except for Class II devices, an indicating or recording element shall not display or record any usable values until the operating temperature necessary for accurate weighing and a stable zero balance condition has been attained. (H-44, 2008, T.N.8.1.4.)

(e) No Display or Record Until Operating Temperature Attained.

An indicating or recording element shall not display or record any usable values until the operating temperature necessary for accurate weighing and a stable zero balance condition has been attained. (H-44, 2008, T.5.)

(3) Electric Power Supply.

(a) Power Supply, Voltage, and Frequency.

1 Alternating Current Devices.

Weighing devices that operate using alternating current must perform within the established conditions inclusive over the line voltage range of 100 - l30 volts or 200-250 volts rms as appropriate and over the frequency range of 59.5 to 60.5 Hz.

2 Battery Operated Devices.

Battery operated instruments shall not indicate or record values outside the applicable tolerance limits when battery power output is excessive or deficient. (H-44, 2008, T.N.8.3.1.)

(b) Power Interruption.

A power interruption shall not cause an indicating or recording element to display or record any values outside the applicable tolerance limits. (H-44, 2008, T.N.8.3.2.)

(4) Barometric Pressure.

The zero indication shall not vary by more than 1 scale division for a change in barometric pressure of 1 kilopascal over the total barometric pressure range of 95 to 105 kilopascals (28 to 3l inches of Hg.). (H-44, 2008, T.N.8.2. in part)

(5) RFI Susceptibility Tests, Field Evaluation.

An RFI test shall be conducted at a given installation when the presence of RFI has been verified and characterized if those conditions are considered "usual and customary." (H-44, 2008, N.1.6.)

3.5 TEST PROCEDURES

a. General.

(1) Scale Installation Requirements.

Scale installations shall conform to the requirements in this chapter. Once a scale installation has been approved and has been tested for RFI, motion detection, and associated or non-associated equipment interference, the scale may be tested for accuracy performance.

(2) Error and Tolerance Scale Accuracy Tests.

The recommended scale test procedure for determining scale accuracy is the error testing method outlined in this section. The error testing method uses error (balance) weights to provide for error determination to two-tenths of a scale division. This method shall be used for the initial testing of new or modified installations, and whenever conditions make it possible. A second testing method, tolerance testing, may be used on electronic scales if circumstances, such as wind, make it impractical to use the error testing method.

(3) "As Found" Testing Requirements.

Each scale shall be tested without adjustment to determine the "as found" condition and the results recorded on the test report. A printed weight record shall be made at each test load and compared with the scale indication. This printed record shall be attached to and filed with the original of the "Scale Test Report." (See section 3.1, d., (5), (d))

b. Pretest Examinations.

(1) Purpose.

This examination allows the authorized official to determine whether or not the design and construction of the scale conforms to the specifications and requirements of FGIS.

(2) Pretest Examination Steps.

The following steps should be completed prior to performing a scale test.

(a) Analysis of GIPSA Requirements.

Determine whether the scale meets all the requirements as addressed in this chapter.

(b) Review Previous Reports.

Review the scale log and the previous test reports to familiarize you with the scale's history. Check the scale serial and seal numbers.

(c) Observe Indicator.

Observe the scale indicator (beam movement or electronic display) for any obvious abnormalities.

(d) Run Built-in checks.

Perform any built-in checks; such as, span reference display, printer check, and display check.

(e) Check Load-receiving Element.

Inspect the load-receiving elements for potential problems; e.g., worn bearing, cracked load cell cable, check rod binds, dirty conditions, or inadequate clearance around scale parts.

(f) Review Test Weight Information and Equipment.

Check the test standards to ensure that they are currently certified and that the lifting apparatus will not interfere with the scale balance when the test weights are in the down position.

c. Radio Frequency Interference (RFI) and Electromagnetic Interference (EMI) Test.

This test is required for new or modified installations or whenever the scale official deems it necessary. This field test procedure applies to all electronic scales including analog and digital types. The test will determine whether or not the electronic scale equipment will perform satisfactorily while in the presence of EMI/RFI signals. EMI and RFI may originate from sources such as mobile communications equipment, commercial AM, FM, and TV broadcast transmitters. The result of such interference may cause weight indications to display inaccurately, printer devices to print erroneous information, and data transmission or processing equipment to malfunction.

(1) Test Distances.

At a distance not nearer than 1 meter to the equipment under test, and with the scale in a no-load condition and at any test load, operate the following equipment by alternately activating and deactivating the transmitter key under the specified conditions.

Table 14. Conditions for Testing RFI		
Frequency	**Field Strength**	**Modulation**
26-MHZ 5-watt hand held communicator	**Not to exceed 3 V/m**	**50% Amplitude, 1 kHz Sinewave**
460-MHZ 4-watt handheld	**Not to exceed 3 V/m**	**50% Amplitude, 1 kHz Sinewave**

(2) Allowed Variation.

The difference between the weight indication due to the disturbance and the weight indication without the disturbance shall not exceed one scale division (d). Or, the weight indication shall meet one of the following requirements.

(a) Goes Blank.

When the disturbance causes the indication to exceed one scale division it goes blank;

(b) Provides an Error Message.

When the disturbance exceeds one scale division, the indicator provides an error message; or,

(c) Not Interpreted or Transmitted.

The indication shall be so completely unstable that it could not be interpreted, or transmitted into memory or to a recording element, as a correct measurement value.

This variation is to be applied independently of other tolerances. For example, if indications are at allowable basic error limits when the disturbance occurs, then it is acceptable for the indication to exceed the applicable basic tolerances during the disturbance. (H-44, 2008, T.N.9.)

d. Associated, Nonassociated Equipment Test.

A weighing device shall meet all performance requirements when associated or non-associated equipment is operated in its usual and customary manner and location. This test is required for new or modified installations or whenever the scale official deems it necessary. (H-44, 2008, G-UR.3.2 in part)

(1) Strain Test.

During the test of the scale, apply a load equivalent to the normal weight applied to the scale and allow the scale to stabilize.

(2) EMI Test.

Operate each electrical device, one at a time, if possible, in the vicinity of the scale and evaluate the scale performance. The following is a list of common devices that should be evaluated: lighting systems, office equipment, appliances, vending machines, stock handling equipment, elevators, hoists, relay switching equipment, motors, industrial controls, generators, brush type motors, electric tools, communications equipment, elevating legs, and belt conveyors.

(3) Source Interference Verification.

If performance of the scale appears to be affected by any of the devices, the suspected interfering device should be turned on and off to verify it as the source of the problem. Note all findings on the test report.

(4) Scale Approval.

Scales that fail to perform to the requirements of this section shall be rejected.

e. Motion Detection Test.

(1) General.

This test is required for new or modified installations or whenever the scale official deems it necessary. Electronic scales shall have motion detection capability which restricts printing of a weight value whenever the displayed weight is not stable within ± 1 division.

NOTE: The motion detection test shall be performed whenever a floating rig hopper scale is tested.

(2) Testing Procedures.

(a) Manual Mode.

Place the scale in manual mode.

(b) Apply Load.

Apply a test load, or in the case of hopper scales, fill the scale with an amount of grain equal to a normal draft amount.

(c) Stabilize.

Allow the scale to stabilize.

(d) Move Load-Receiving Element.

Physically move the load receiving element to produce approximately a 10 division weight fluctuation while the print button is depressed.

(e) Activate and Maintain Print.

Stop moving the load receiving element and keep the print button depressed until a weight is printed.

(f) Recording Error Acceptance.

The printed weight must be within ± 1 division from the original weight.

(g) Repeat.

Keeping the load on the scale, repeat several times starting with step (c).

f. Printer Tests.

(1) General.

Weight recording device(s) for electronic scales shall be tested, whenever deemed necessary, for accuracy in converting the displayed weight to a printed weight.

(2) Scales With a Built-in Printer Test.

If the scale incorporates a built-in printer check, observe it in operation.

(3) Test Procedures for Scales Not Having a Built-in Printer Test.

(a) Use Zero Adjustment.

Use zero adjustment to display and print all digits 0-9 in the tens, hundreds, and thousands columns as high as the adjustment will allow.

(b) Strain in Combination with Zero Adjustment.

In many electronic scales the zero adjustment only reaches to 2 or 3000 pounds, after which the rest of the digits within the thousands, ten thousands, and hundred thousands pound columns can be displayed by filling the hopper with grain. This can be accomplished during the buildup test, or in the case of vehicle or track scales, several different test loads can be used to check the printer in higher ranges.

g. Sensitivity Tests.

(1) General.

A sensitivity test shall be conducted on non-automatic-indicating scales only. The test shall be conducted with the weighing device in equilibrium at zero-load and at maximum test load by increasing or decreasing the test load in an amount equal to the applicable value indicated below.

If the device is tested with a balance indicator, it shall only be operated with a balance indicator. If the device is tested without a balance indicator, it shall be operated without a balance indicator. (H-44, 2008, N.1.4., T.N.6., in part)

(2) Test Load Requirements.

(a) Vehicle Non-automatic-Indicating With and Without Balance Indicators.

The test load for sensitivity for non-automatic-indicating vehicle scales shall be 1d equipped with balance indicators, and 2d or 0.2 percent of the scale capacity, whichever is less, for scales not equipped with balance indicators.

(b) Nonautomatic-Indicating Scales.

For all non-automatic-indicating scales, the test load for sensitivity shall be 1d at zero and 2d at maximum test load.

(c) Other Scales.

The sensitivity requirement (SR) for all other scales is listed in the tolerance section of this chapter.

(3) Test Procedures.

(a) Error Weight Intervals.

Add to or remove from the load-receiving element error/balance weights in intervals equal to 0.2 the minimum division.

(b) Showing Sensitivity.

Sensitivity is determined by the amount of weight needed to bring the weigh-beam from a condition of equilibrium in the center of the trig loop to a stable condition at the bottom or top of the trig loop, whichever the case may be. Record the actual sensitivity in pounds on the “Scale Test Report.”

h. Discrimination Test for Electronic Scales.

(1) General.

A discrimination test shall be conducted on digital automatic- indicating scales with the weighing device in equilibrium at zero-load and at maximum test load and under controlled conditions in which environmental factors are reduced to the extent that they will not affect the results obtained. Electronic grain test scales require this test only during National Type Evaluation Program approval. (H-44, 2008, N.1.5., T.N.7. in part)

(2) Test Procedure.

Conduct this test from just below the lower edge of the zone of uncertainty for increasing-load tests, or from just above the upper edge of the zone of uncertainty for decreasing-load tests. Set the digital indication at the lower edge or just above the edge of the zone of uncertainty as follows. (H-44, 2008, N.1.5.1.)

(a) Stabilize.

Set the digital indication to a stable indication using the tare adjustment or error/balance weights.

(b) Add 0.1d Increments.

Add error/balance weights in increments of 0.1d to the load-receiving element until the weight indication flashes to the next higher division.

(c) Lower Edge.

Remove 0.1d and the weight indication should be stable at the lower value. This is the leading edge of the zone of uncertainty.

(d) Upper Edge.

The indication can be set to just above the zone of uncertainty by adding error/balance weights until the flashing stops and the weight indication is stable at the next higher division. This point is established for use in decreasing-load tests.

(e) Correct Discrimination.

Add the equivalent of 1.4d to the load-receiving element. The weight indication shall change at least 2d from the starting value. (H-44, 2008, T.N.7.2. in part)

i. Weighbeam Test.

(1) Fractional Poise Test Using Known Test Weights.

This test should be performed when sufficient test standards are available to apply to the load-receiving element.

(a) Balance Beam at Zero.

Balance the beam at zero with error/ balance weights equal to the minimum division applied to the load-receiving element.

(b) Apply Test Weights.

Apply test weights equal to approximately one-half and full capacity of the fractional poise to the load-receiving element.

(c) Move Fractional Poise.

Move the fractional poise to the graduation equal to the test load applied and observe the beam for balance.

(d) Find Error.

To determine error, add or subtract error/balance weights until the beam balances, and record results on “Scale Test Report.”

(e) Tolerance.

The fractional poise indication must be within the applicable tolerance (minimum tolerance). Proper seating of the poise on the beam is a critical factor for the accuracy of beam operation.

(2) Fractional Poise Test Utilizing Butt Ratio Weight Kits (Optional).

This test eliminates indications of error that may be present in the lever system and uses the known weigh-beam butt ratio.

(a) Balance At Zero.

Balance the beam with the poise at zero and with a hanger pan connected to the beam rod or beam rod containing butt ratio weights equal to at least the minimum division.

(b) Find Ratio.

Determine the weigh-beam nominal butt ratio by placing l pound on the beam rod hanger pan and bringing the beam to balance by moving the poise. The poise indication is the butt ratio.

(c) Simulate Load.

Apply butt ratio weights proportional to one-half and full capacity of the fractional poise (using the beam ratio).

(d) Calculate Error.

Determine equivalent error in poise by noting the discrepancy in poise indication and calculated indication.

(e) Tolerance.

The fractional poise must be within applicable tolerance (minimum tolerance). Proper seating of the poise on the beam is a critical factor for the accuracy of beam operation.

(3) Ratio Test for Scales with CP Beams (Counter-poise Weighbeams).

A ratio test shall be conducted on scales employing counterpoise weights. Ratio tests determine if the actual system ratio between counterpoise weights and applied load meets specific tolerances with respect to the standard ratio for the weighing device (usually 1000 to 1). (H-44, 2008, N.1.7. in part)

NOTE: The facility's counterpoise weights shall not be used in this test. As these counterpoise weights are required to conform to their own standards, any error in these weights would detract from the purpose of the ratio test. Standard slotted weights from the test weight kits shall be used to counterbalance the known test load applied. To adequately perform this test, a sufficient known test load (10 percent of scale capacity) must be available.

(a) Find Tip Ratio.

Determine weighbeam tip ratio (e.g., 1000 to 1).

(b) Apply Error Weights.

Apply error/balance weights to the load-receiving element equal to the tolerance of the known test load.

(c) Balance At Zero.

Balance the beam with the poise set at zero and with no weight on the counterpoise stem.

(d) Apply Ratio Weights To Tip Hanger.

By using the ratio of the system, apply ratio weights to the counterpoise tip hanger equivalent to the applied load on the weigh hopper.

(e) Find Error.

Determine the actual error -- the amount of error/ balance weights needed to be subtracted from or added to the load-receiving element to bring the beam to a balance condition.

j. Hopper Scale Buildup Test.

A buildup test using bulk material shall be conducted in increments not to exceed the total value of the official test weights; the test shall be conducted to the certified capacity of the weighing system. The applicable tolerance shall apply to the known test load at each step. (H-44, 2008, N.1.1. ABWS Code in part)

(1) Corner Test.

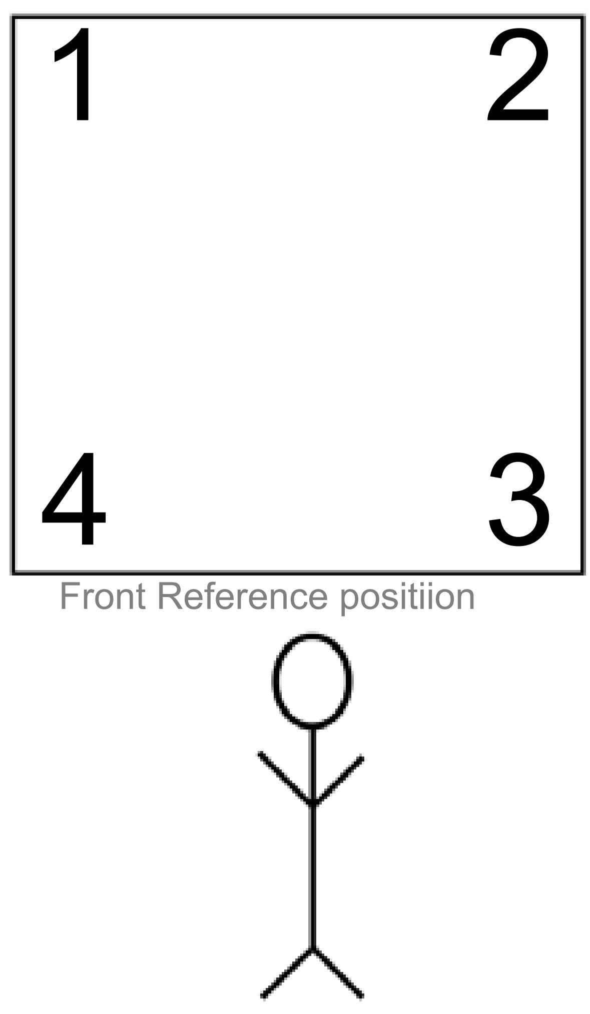
A corner test shall be performed whenever possible before the buildup test begins. This test helps to indicate that no errors or binds exist in any of the levers or that load cell output is approximately the same from each load cell. The indication of each corner must be within ± 1 division.

(a) Balance At Zero.

Balance the scale at zero load.

(b) Lift One Corner's Weights.

Lift one-quarter of total test weight(s) (one corner).



(c) Repeat With Each Corner.

Record indicated or displayed weight value, repeat for each corner. Number the corners as indicated above.

(2) Mechanical Hopper Scales Test.

(a) Apply Error Weights.

Apply error/balance weights to the load-receiving element equal to at least the applicable tolerance (usually one scale division.)

(b) Balance At Zero.

Balance the scale (weigh hopper empty) at zero.

(c) Apply Test Weights.

Apply the known test load to the weigh hopper (at least 12.5 percent of scale capacity).

(d) Move Poise.

Move poise to appropriate position on beam (position equal to the applied load).

(e) Find Error.

Determine error by the amount of error/balance weights added to or subtracted from the load-receiving element needed to bring the beam to balance.

(f) Record.

Record the test weight applied and error (print ticket).

(g) Observe and Record Zero Change.

Remove test weights and record any zero balance change. (Balance should return to within the minimum applicable tolerance.)

(h) Add Grain.

Add grain to weigh hopper not exceeding the amount of the test weight that had been previously applied and determine a balance reference point (using error/balance weight if needed).

(i) Add Test Weights.

Add test weights, add or remove error/ balance weights to balance beam and record error (print ticket). Continue the buildup test to the scale capacity.

(j) Return Error Weights.

Upon the completion of the buildup test, the test weights should be removed from the device and the grain dumped from the hopper. All original error/balance weights shall be returned to the load-receiving element.

(k) Record Zero Balance Change.

Zero balance change shall be recorded after all grain and test weights are removed from the scale and can be determined by adding or removing error/ balance weights. Zero balance shall not change more than the applicable tolerance. If zero balance change is out of tolerance, empty the scale, reload the scale with grain, empty and check the balance change again.

(l) Zero Balance Weighbeam.

The weighbeam shall be returned to a zero balance condition before being put into official weighing operation.

(3) Levertronic or Full Electronic Hopper Scale Test.

(a) Error Test Method.

This procedure shall be used for initial tests on new installations or whenever the scale official deems it necessary. To minimize misinterpretation of displayed weight representations and to increase the accuracy of test data, the test shall be conducted from the leading edge of the zone of uncertainty.

1 Apply error/balance weights to the load-receiving element equal in amount to the minimum division.

2 Apply error/balance weights in intervals equal to 0.2 the minimum division to the load-receiving element until the indicator just begins to flash between the zero-balance weight and the next division. Record on Scale Test Report the total amount of pounds of error/ balance weights on the load-receiving element.

3 Apply the known test weights to the load-receiving element and observe the indicated weight.

4 Add to or subtract from the load-receiving element error/ balance weights until the indicator displays the appropriate weight. (Example: zero reference 0/10 when 10 000 pounds applied, indicator should read 10 000/10 010.) Record the total amount of error weights on the load-receiving element.

5 Error shall be determined by the amount of error/balance weights added to or subtracted from the load- receiving element to achieve the desired or correct reading. Record error.

6 Remove test weights. Return original amount error/balance weights and record zero balance.

7 Continue alternately filling with grain and applying test load until scale is tested to capacity.

8 At each step the error shall not exceed the applicable tolerance applied to the known test weights and the accumulated error shall not exceed the applicable tolerance applied to the total load (grain + test weights).

The accumulated error shall be determined by the addition (algebraic sum) of individual step errors.

9 Remove test weights and empty the hopper. Check and record zero balance with respect to original error/balance weights.

10 The applicable tolerance shall apply only to the known test load at each step.

(b) Tolerance Test Method.

The buildup test on electronic/ levertronic hopper scales shall involve the substitution of material (grain) for known test weights.

1 Record the no load indication in the grain column of the “Scale Test Report.”

2 Apply test weights and observe indication. Record on the Scale Test Report both test weights applied and indication under the test weight column and scale indication column respectively.

3 When recording weight indications during a tolerance test, the indication may be at the breakpoint between two indications, which frequently causes the indication to change by 1 division. If this is the case, record both weight indications; e.g., 10 000/10 under the appropriate column.

4 Determine error by the difference between actual indication and the computed correct indication. Record error under the error column on the “Scale Test Report.” Error derived from a changing weight indication shall be recorded as one-half a division.

5 At each step the error shall not exceed the applicable tolerance applied to the known test weights and the accumulated error shall not exceed the applicable tolerance applied to the total load (grain + test weights).

6 The accumulated error shall be determined by the addition (algebraic sum) of individual step errors. Add to the tolerance that would otherwise apply (individual lifts and accumulated load) an amount equal to one-half the minimum value that can be indicated or recorded.

7 Remove test weights, record zero balance, and add grain to the hopper not exceeding the previous test point. Record indication under the grain column on the "Scale Test Report."

8 Apply test weights. Observe indication and determine error. Record test weights applied, indication, and error in the appropriate Scale Test Report columns. Check accumulated error, if any.

9 Continue alternately filling with grain and applying test weights until the scale is tested to capacity.

10 When scale is tested to capacity, discharge grain, remove test weights, check zero balance, and record on the bottom right-hand corner of the "Scale Test Report."

k. Associated Tests for Hopper Scales.

(1) Associated Test for Venting.

The effects of air pressure or vacuum on a scale can create erroneous weight representations on the indicating element. The following checks are examples of the type of testing that should be used to evaluate venting. Special situations may dictate additional evaluation on the part of the scale official.

(a) Testing Under Static or Dynamic Conditions.

1 Bring the indicating element to an exact balance condition.

2 With the upper garner empty, open the upper garner gate and observe any change in the balance indication.

3 With the upper garner empty, open the weigh hopper gate and observe any change in the balance condition. Repeat with the upper garner full.

4 Repeat step (3) with turn heads and spouting located in various positions to simulate normal operation.

5 Indication changes of ± 1 division are acceptable. Larger variations should be investigated and the cause documented on the “Scale Test Report.”

(b) Testing While Weighing Grain.

1 Make the following checks and observations during normal weighing operations.

2 Check for agreement between displayed and recorded weight value. As soon as the weight is printed and prior to the opening of the weigh hopper gates, press the “stop” or “hold” button or function that will stop the automatic cycle. The printed weight should then be compared to the displayed weight.

3 Check for agreement within ± 1 division between the displayed weight and recorded weight value at the time the tare weight is printed.

4 Observe tare weights printed during a series of drafts. Tare weights should be within plus or minus 1 division of each other. However, a slow change in recorded tare weight is acceptable if it is caused by buildup of grain on the scale or by long-term drift due to temperature changes.

(2) The Effects of Hysteresis and Creep Encountered During Testing Of Electronic/Levertronic Scales.

Hysteresis and creep, if encountered during testing of grain hopper scales, shall be recorded on the “Scale Test Report.”

(3) Time Dependence Requirements for Scales Manufactured After January 1, 1987.

At constant test conditions, the indication 20 seconds after the application of a load and the indication after 1 hour shall not differ by more than the absolute value of the applicable tolerance for the applied load. (H-44, 2008, T.4. ABWS Code)

(4) Determination of Allowable Time for Retention of Grain in a Weigh Hopper, For Scales Installed Prior to January 1, 1987.

Except for emergencies, trimming a load, and cleaning out of a carrier, grain shall not be retained in the scale hopper beyond the normal operating cycle time. An operational time limit for the length of time a scale can remain under load can be determined by the scale official using the following method.

(a) Establish Time Limit.

Establish the time limit for performing this test, which is the maximum amount of time that grain would be retained in the hopper (example: 2 hours).

(b) Starting Reference.

Carefully set zero balance to ensure a good starting reference point.

(c) Fill Scale.

Fill the scale to the normal operating weight range and record the indicated weight.

(d) Recording Intervals.

Record the indicated weight value every ½ hour until total time limit is reached (example: ½ hour, 1 hour, 1 ½ hours, 2 hours, etc.).

(e) Discharge.

Discharge all grain and make sure the scale is empty.

(f) Record Empty Weight.

Record empty weight of the scale.

(g) Tolerance.

If the total amount of weight change between the first and last recorded weights of the full scale does not exceed the allowable error at that weight (1 pound per thousand) and the scale returns to zero balance within plus or minus 1 division, the scale is approved to hold a load for up to the tested time limit (in this example: 2 hours).

NOTE: During operation it is important that the gross weight be printed immediately after filling for the most accurate weight.

(5) Floating Rig List Test.

The list test shall be performed as a part of new or modified installation certification requirements for floating rigs.

(a) List Measurement.

Ensure that an inclinometer readable in at least ½ degree intervals is mounted perpendicular to the longitudinal axis of the boat, ship, or barge and within easy reading distance of the weight indicating element. The use of this instrument in testing the scale sets parameters for the maximum degree of list allowed during official weight certification.

(b) Start Buildup Test.

Utilizing the inclinometer the rig shall be brought to a zero list and a buildup test to scale capacity performed.

(c) Fill To Used Draft Size.

The weigh hopper shall be filled to a normal draft size.

(d) Create List.

The rig operator shall list the rig to ½ degree by whatever means available. When ½ degree list is reached, the reference weight shall be observed.

(e) Increase List Incrementally.

This sequence shall continue at ½ degree intervals until the observed reference weight changes more than the applicable tolerance applied to that load and the rig cannot list any further.

(f) Tolerance.

The maximum degree of list determined during the performance of this test will set the parameters allowable during official weighing; i.e., if the scale is found to be outside the allowable tolerance limits at 2 ½ degree list, no official weight shall be allowed when the scale exceeds 2 degree list.

(6) Floating Rig Dynamic Test.

To simulate actual loading conditions and the effect of motion on the accuracy of the scale system, a dynamic test shall be conducted. The test shall be performed as part of the initial new or modified installation approval procedure.

(a) Fill To Used Draft Size.

Fill the scale to a normal draft size. Approximately three-quarters of scale capacity.

(b) Record Reference Weight.

Record the digital indication. This is the reference weight.

(c) Find Test Sample Size.

Calculate the number of prints to be recorded by dividing 50 000 bushels (or 2 800 000 pounds in the case of corn) by the reference weight and multiplying by 2.

(d) Find Test Cycle Time.

Determine print cycle time by dividing the normal draft cycle time by two. Normal draft cycle time is the time it takes the scale in normal operation to fill, print gross, discharge, and print tare.

(e) Print Cycle Time.

The print cycle time shall be the time between the previous printed weight data and the initiation of the next print cycle (i.e., depressing a print button). Due to effects of motion and settling time, there is a lapse between the actual initiation of a print cycle and the recording of the displayed weight.

(f) Cover Display.

Cover the weight display to prevent biased test results.

(g) Simulate Motion.

The rig operator shall begin simulating motion by using appropriate unloading mechanisms. If the rig is equipped with cranes, they will be required to swing a load approaching normal loading operations. This can be simulated by using the crane which will “scoop” water from the river, bay, etc. Discharge the water with the crane boom positioned at either end (bow or stern) of the rig.

(h) Initiate Print.

Initiate first print and wait until a weight is recorded.

(i) Pause and Print.

Pause for print cycle time and then initiate next print.

(j) Continue Cycles Until Complete.

Continue this print time sequence until the predetermined number of prints has been recorded. (Observe tapes for inaccurate weight representations.)

(k) Total.

Total the tape.

(l) Test Values.

Since interlocking mechanisms only allow a plus or minus printing sequence, totaling the tape at the end of the test will provide a total which represents an algebraic summation of all the weight deviations caused by rig motion. (The application of this test will ensure that mechanical favoritism towards either over or underregistration is not occurring.)

(m) Tolerance.

The total amount of error (tape total) incurred during dynamic testing shall not exceed 0.1 percent of the total simulated load. This is determined by multiplying the static reference load by the number of "drafts" simulated. For example: Reference load prior to dynamic testing on a 5-pound division scale is 15 000 pounds. To simulate 2 800 000 pounds, 187 drafts are needed.

187 x 15 000 = 2 805 000 x .1% = 2 805 pounds

Scale error shall not exceed 2 805 pounds.

I. Vehicle Scale Test.

(1) General.

(a) Test Standards.

The total amount of test standards must be at least 12.5 percent of the scale capacity or 4535.9 kg (10 000 lb) whichever is greater. Auto Zero-setting Mechanism (AZSM) should be disabled by means of electronic selection or by placing the equivalent of more than 3d of weight on the deck all at once to put the scale beyond the range of AZSM (3d). (H-44, 2008, N.3.)

(b) Test Capacities.

The scale shall be tested from zero to at least 12.5 percent of scale capacity using the known test standards and then to at least 25 percent of the scale capacity using either a substitution or strain load test that uses the 12.5 percent of test standards. Whenever practical, a strain load test should be conducted to the used capacity of the scale. When a strain load test is conducted, the tolerance applies only to the known test load. No more than three substitutions shall be used (see Section 3.3, Table 9, Minimum Test Weights and Test Loads). Full details are explained further in (i) (2), Accuracy Tests, in this section. (H-44, 2008, N.3.)

(c) Zero-Balance Condition.

Check the zero-load balance “as found”. If the scale is not found in a zero-load balance condition, the user should be advised how to adjust the scale to a proper zero-load balance and maintain the scale in proper balance condition. The scale must be able to indicate and record zero balance. Dial/printer and digital/printer scales must be able to record out-of-balance conditions. The scale deck should be free of debris that might adhere to test equipment or otherwise cause the balance to change during the test. (H-44, 2008, S.1.1., S.2.1.1., S.2.1.2., S.1.5.1., UR. 4.1.)

(d) Dial and Digital Scales.

1 On dial and digital scales, the indicator should display zero and the scale must also print the displayed zero. Dial scales will normally have a screwdriver adjustable balance ball that is enclosed within the cabinet for adjusting the indicator so it is directly in line with the zero defined on the dial face. Digital scales may have screwdriver, knob, or pushbutton zero adjustments. A push-button zero adjustment must be operated or accessible only by a tool or enclosed in a cabinet, unless a motion detect circuit prevents its operation within specified limits. This prevents the operator from changing the balance while a load is going onto the scale during weighing.

2 The digital scale may have an electronic circuit that automatically zeroes the scale. This is called an Automatic Zero- setting Mechanism (AZSM). AZSM' have a required range of not greater than (+/-) 3 divisions on vehicle scales. On a digital scale, zero is defined as (+/-) ¼ division if there is a center-of-zero indicator or (+/-) ½ division without a center-of-zero indicator. All digital scales manufactured after January 1, 1993, must automatically maintain a center-of-zero condition of (+/-) ¼ division or have an auxiliary center-of-zero indicator that defines a zero-balance condition to (+/-) ¼ division. All Class III L devices manufactured after January 1, 2001, shall be designed with a sealable means to allow the AZSM to be disabled during the inspection and test of the device. (H-44, 2008, S.1.1.1., S.2.1.3.1.)

(e) Beam Scales.

On beam scales, return all poises to the zero position. The poise should not be capable of going behind zero. The pawl should sit firmly in the zero notch and the notch should not be worn. The normal balance condition of a weighbeam, with a balance indicator, is when the tip of the indicator points to the zero position in the central target area and the beam is horizontal. On a beam scale without a balance indicator, a zero-load balance condition is when the beam is equidistant between the trig loop stops and the beam is horizontal. The scale must have a zero balance adjustment that cannot shift or alter the balance condition. A balance ball should not rotate by itself. It should require a tool, normally a screwdriver to adjust it. Requiring the use of a tool makes adjustments of zero obvious and prevents accidental changes to the zero-load balance reference. Any loose material used for adjusting zero-load balance must be enclosed so it cannot shift position or be removed. Tip and butt counterbalance weights should be free of loose nails, nuts, bolts, etc. (H-44, 2008, UR.4.1., in part)

(f) Indicating and Recording Elements.

1 Scale divisions must be in a unit of weight equal to 1, 2, or 5 for scale manufactured after January 1, 1986. They may be decimal multiples or sub-multiples of 1, 2, or 5 (for example: .1, .2, .5, 1, 2, 5, 10, 20, or 50 pounds). Vehicle scales normally have a 20 pound division. (H-44, 2008, S.1.2.)

2 Automatic indicating scales must be equipped with effective damping to bring the indicating elements quickly to rest (3 to 5 oscillations is desirable for dial and balance indicator type scales). Indicating and recording elements should be appropriate in design and adequate in amount. Primary indications and recorded representations shall be clear, definite, accurate, and easily read under normal conditions. They should not display or record values above 105 percent of the scales capacity. (H-44, 2008, S.2.5., S.1.7.)

3 Vehicle scales with digital displays (indicating elements) shall not print (record) unless stable within plus or minus 3 scale divisions. All vehicle scales approved Officially, shall have a weight-recording device. (H-44, 2008, S.2.5.1., in part)

4 The scale should be suitable for its intended uses. This includes, but is not limited to, its capacity, the number and value of scale divisions, and minimum load capacity.

5 Vehicle scales must have at least 2000 scale divisions and not more than 10 000 divisions. To determine the number (n) of scale divisions, divide the scale capacity by the value of the scale division (d).

$$\frac{\text{Scale Capacity}}{\text{Scale Division}} = \frac{120\ 000}{20} = 6000$$

6 H-44 recommends not using vehicle scales for weighing net loads of less than 50 scale divisions. This recommendation may be used to identify the need for another scale that may be more appropriate for the intended use.

7 On a vehicle scale the tare division must be the same as the scale division. The tare mechanism shall only operate in a backward direction from zero.

8 Graduations on beam scales must be uniform in size, shape, and arrangement. They must be easily and accurately readable. Notches should not be worn and the reading edge of the poise should be sharply defined and parallel to the beam's graduations. Material used for adjusting the weight of the poise must be contained and firmly fastened in place.

9 Parallax conditions on balance indicators and dials must be reduced to a practical minimum. The clearance between the index of the indicator and the graduations may not be more than 1.5 mm (0.06 inch).

10 Indications and recordings must agree with one another. In other words, the digital indicator must agree with the printed weight and remote indicators or computer interfaced generated records.

11 Manufacturers must mark all scales with the manufacturer's name, initial, or trademark and the model designation of the device. This information must be located so that it is readily observable without having to use a tool to disassemble a part of the scale. Scales manufactured after January 1, 1968, must be marked with a nonrepetitive serial number.

Those manufactured after January 1, 1977, should have all controls marked. The accuracy class, scale capacity, sectional capacity, and concentrated load capacity (CLC) must be marked on scales manufactured after January 1, 1986. The identification plate with this information should be permanently attached to the device. Rivets are acceptable but screws are not considered permanent. A pressuresensitive label is acceptable if it cannot be removed without being destroyed or distorted in appearance so that it cannot be reused.

<u>12</u> Adjustable components that can affect the performance of an electronic scale are required to be sealed with a security seal. These components should be located inside the housing of the scale indicator.

Audit trails are an alternative to mechanical sealing of electronic scales. Audit trails secure scale functions that affect the validity of measurements and changes to operational features after installation or inspection. They identify when incorrect or unsuitable features are used or made. E.g., span adjustments, linearity correction value changes, changes to division value sizes, number of scale divisions, motion detection, and so forth. The type (Category 1, 2, or 3, see section 3.3) and method of sealing (i.e., physical seal, event counter, or the capability of printing changes) depend on whether the scale has remote configuration capability or unrestricted access to those parameters (password protected). If you cannot print audit trail information, display and record the audit trail information in the scale record log or scale test report so changes can be identified. (H-44, 2008, S.1.11.)

<u>13</u> Listing all the inappropriate conditions for a scale is nearly impossible; you must be alert and sensitive to the application and intended use for each situation. Ask yourself: Does this scale make sense in this situation? Does the device meet the requirements of this use? Is the environment appropriate for this scale? Are these features needed to make accurate weighing results?

(g) <u>Installation</u>.

<u>1</u> The scale must be designed and installed in such a way that it is protected from environmental hazards. Foundations and supports of the scale must be installed according to the scale manufacturer's instructions and specifications. All elements and mechanisms should be installed and maintained in a plumb and level condition. They should be sufficiently strong, rigid, and permanent for the purpose. There must be adequate clearances between the scale and surrounding structures to prevent any contact between the two, either during weighing or when the platform is empty. (H-44, 2008, UR.2.1, UR.2.3, UR.2.4.)

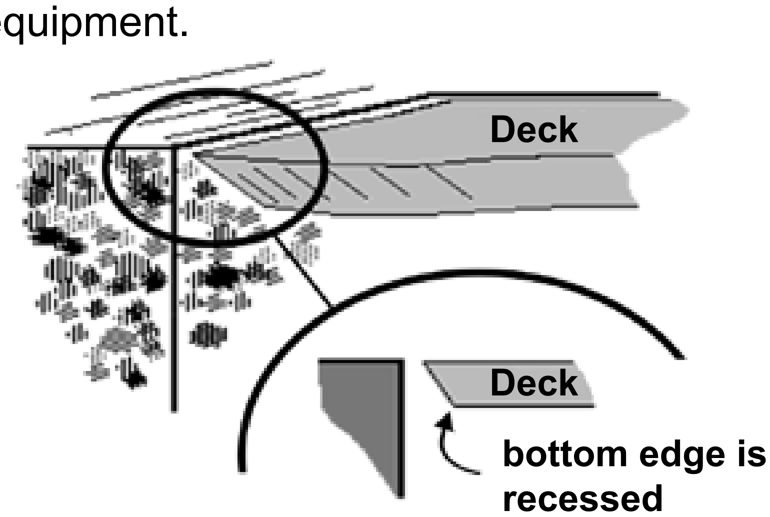
2 Load cells installed in the steelyard should be installed in the scale pit to protect it from environmental problems, such as being bumped, exposure to space heaters, etc. The load cell cable should be routed in the scale pit to the indicator so that is does not interfere with other backup weighing systems.

3 The ON/OFF approaches to a vehicle scale must be at least the width of the platform, at least one half the length of the platform and at least 3 meters (10 feet) of the approach adjacent to the platform must be level in the same plane of the platform and be constructed of concrete or similar durable material. (H-44, 2008, UR.2.6.1. in part)

4 The weigher should have a clear view of the indicator and scale platform. If the weigher's view is obstructed, there must be a convenient and permanent communication link between the weigher and the load-receiving element. A video surveillance camera and monitor may serve the purpose. (H-44, 2008, G-UR.2.2.)

5 Most vehicle scales are designed to have a pit underneath the scale deck that allows access to the weighing elements. A clearance height of at least 1.2 meters (48 inches) is recommended as the minimum for ready access. At least one electrical outlet should be in each pit, so that a light cord can be plugged in for inspection, repair, and cleaning. The depth of the pit may vary in those States with a Pit Law. (H-44, 2008, UR.2.5.)

6 Scale decks should have adequate clearance between the pit wall coping and the scale platform. The outside edges of the deck should be beveled downward toward the deck (undercut) to prevent debris from binding. The deck should be made of a suitable material, with a surface that provides appropriate traction; while considering the need to clean the deck as well as the ability to move test equipment.



Adequate provision shall be made for ready access to the pit or adequate means for inspection and maintenance of the weighing elements. (H-44, 2008, UR.2.4, UR.2.5.)

(h) Weighing Elements.

1 The weighing elements must be designed in a way that minimizes friction, and reduces the likelihood of parts being dislodged accidentally. Pivots should be sharpened to a knife edge and be of hardened steel, and each should be opposed by a bearing of suitable shape. The nose-iron must be held locked in place by a setscrew, bolt, or nut. On scales with a capacity over 1000 kg (2000 lb) the position of a nose-iron must be defined accurately, clearly, and permanently as determined by the factory adjustment. Adjustable parts must be securely held in adjustment. On electronic scales, this means that the potentiometer located in junction boxes or in the indicator must be secured so that its adjustment position cannot change easily in normal use. With total electronic scales the load cells should be installed so that they may be readily accessed for inspection, repair, or replacement. An electro-mechanical scale with the load cell in the steelyard should be installed in the scale pit. The load cell cable should be installed and routed in a manner to prevent it from interfering or binding with live parts such as levers, steelyards, etc.

2 Electronic vehicle scales are either total electronic or electro-mechanical systems. Load cells must be adequate for the intended use. NTEP load cells will be marked with a V_{min} value and "S" or "M" for single-cell or multiple-cell application. "S" cells can be used in both single-cell or multiple-cell applications, but multiple ("M") cells can be used only in multiple-cell applications.

The load cell is appropriate for use without levers if it meets the following formula:

$$V_{min} \leq \frac{d}{\sqrt{n}}$$

d = the scale division
n = the number of load cells

The load cell is appropriate for use with levertronic scales if it meets the following formula:

Vmin is less than or equal to d divided by the scale multiple

$$V_{min} \leq \frac{d}{scale\ multiple}$$

d = the scale division

Following in the example, is a manufacturer's V_{min} table for a load cell as typically shown on a certificate of conformance. The table shows the V_{min} or suitability of the load cell at differing scale divisions and number of load cells.

Table 15. Maximum Values of Multiple Load Cell Scales (Table values are in pounds.)							
	Scale Division						
Load Cells	1 lb	2 lb	5 lb	10 lb	20 lb	50 lb	100 lb
2	0.71	1.41	3.54	7.07	14.1	35	70
4	0.50	1.00	2.50	5.00	10.0	25	50
6	0.41	0.82	2.04	4.08	8.2	20.4	41
8	0.35	0.71	1.77	3.54	7.1	17.7	35
10	0.32	0.63	1.58	3.16	6.3	15.8	32
12	0.29	0.58	1.44	2.89	5.8	14.4	29
14	0.27	0.53	1.34	2.67	5.4	13.4	27

(H-44, 2008, S.6.3)

Load Cell Vmin Suitability Example
(See table above)

<u>Full electronic scale example</u>:

Example: For a vehicle scale with four sections (eight load cells) and a displayed scale division of 20 lb, the maximum value permitted for each load cell is 7.1 lb. The calculation is shown below. If the value marked on the load cell is less than or equal to the value computed for the V_{min} then the load cell is acceptable for the application.

$$V_{min} \leq \frac{d}{\sqrt{n}} = \frac{20\ lb}{\sqrt{8}} = \frac{20\ lb}{2.83} = 7.07 = 7.1\ lb$$

<u>Lever-tronic scale example</u>:

Example: Calculate the multiple of the lever system from the ratios marked on the levers. Suppose the multiple for a vehicle scale is 400:1 and that the scale has a scale division of 20 lb. Then the maximum value for the Vmin of the load cell is 0.05 lb. The calculation is shown below. If the load cell is marked with Vmin less than or equal to the calculated value, then the load cell is acceptable for the application.

$$V_{min} \leq \frac{d}{scale\ multiple} = \frac{20\ lb}{400} = 0.05\ lb$$

(i) Maintenance, Use, and Environmental Factors.

1 Verify that the scale is being maintained in proper operating condition and is operated only in the manner for which it is designed. None of the design or operational features of the scale should facilitate the perpetration of fraud. The scale should be used only for its intended use and adequately protected from the effects of environmental factors.

2 The installation should be according to the manufacturer's specification. The scale system should be kept clean. Faulty or worn parts must be replaced and the scale should always be maintained in proper operating condition. The scale should not be modified in a manner different than recommended by the manufacturer or other competent engineering authority. (H-44, 2008, G-S.2, G-UR.1.2., G-UR.3.1., G-UR.4.1., GUR. 4.2, G-UR.4.3.)

(2) Accuracy Tests.

Accuracy testing verifies that the scale complies with performance requirements. The following test procedures have been developed based on critical areas where scales have frequently failed to yield accurate weights or perform as intended. Additionally, these procedures correspond to scale repair calibration procedures; for example, all sections must have the same error before making any other adjustments to the scale.

The following procedures are the minimum necessary to meet the requirements of a proper test:

(a) Zero-Load Balance Test.

Every time a test load is removed from the scale platform, the zero-load balance should not change by more than the minimum tolerance for this scale. Repeatability is important at all test points. Checking zero balance is particularly important because zero is the reference point from which all measurements and adjustments are made. Conduct a balance test at the beginning with a zero load, after the shift test, and at the end of the scale test. Regardless of the type of scale being tested, balance weights equal to or greater than the maximum tolerance that may be applied are placed on the scale and the scale is balanced to zero. These balance weights will be used for the sensitivity test or the discrimination test at zero-load and at the maximum test load. The balance weights are necessary to determine the amount of under-registration at zero-load or the amount of over-registration at maximum load on automatic indicating scales. They are used to determine the actual amount of error on beam scales.

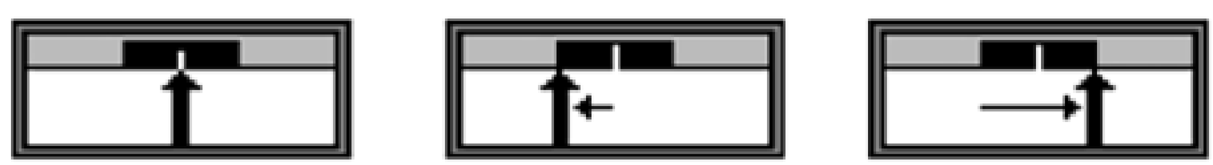
(b) Sensitivity Test.

Conduct on beam scales only. This test is conducted at zero-load balance and maximum test load. The sensitivity requirement (SR) is the load that will produce a specified minimum change in the position of the indicating element (weighbeam or balance indicator). It displays the sensitivity of the scale. A scale that is too sensitive is difficult, if not impossible, to weigh vehicles on. A scale that is not sensitive may not weigh to its minimum scale division. The test is conducted with the scale in a balanced condition.

On scales without a balance indicator, balance weights are added or removed to bring the beam to rest at the top or bottom of the trig loop. A maximum of two divisions of test weight should produce the required change.

On scales with a balance indicator, as balance weights equal to one division are added or removed from the scale platform, the indicator should move to the opposite edge from one end to the other of the central target area or move one division on a graduated scale. (H-44, 2008, N.1.4.)

Sensitivity Test
for a beam with a balance indicator

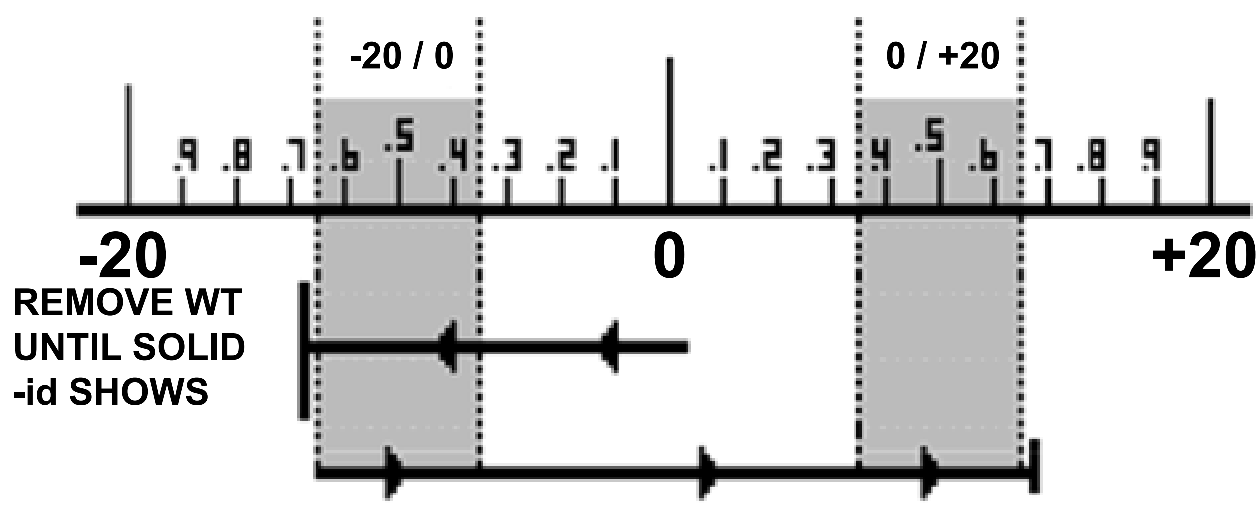


(c) Discrimination Test.

Discrimination testing is to dial and digital scales as SR is to beam scales. This test establishes the amount of load change required for the indication to change from one division to another. Discrimination testing shows “rounding” capability, and verifies the “Zone-of-Uncertainty”. Automatic indicating scales manufactured after January 1, 1986, require this test. Conduct the test when environmental conditions such as wind and weather will not affect the results obtained.

Conduct the discrimination test on digital scales below the edge of the zone-of-uncertainty for increasing load tests or above the zone-of- uncertainty for decreasing load tests. Conduct at zero-load balance and at maximum test load. Small-denomination weights are added or removed until the displayed weight changes and is stable; the scale is now at the upper or lower edge of the Zone-of- Uncertainty. A load of 1.4 divisions, either added or removed respectively, should cause a change in the indicated weight by two divisions. This is an important test to determine suitability for weighing vehicles to the nearest scale division. (H-44, 2008, N.1.5., N.1.5.1.)

Descrimination Test Procedure
zone of uncertainty is shaded



Adding 1.4 d in test weights, starting from the lower edge of the zone of uncertainty at a stable -20 # indication, should change the weight indication to a solid + 20 lbs.

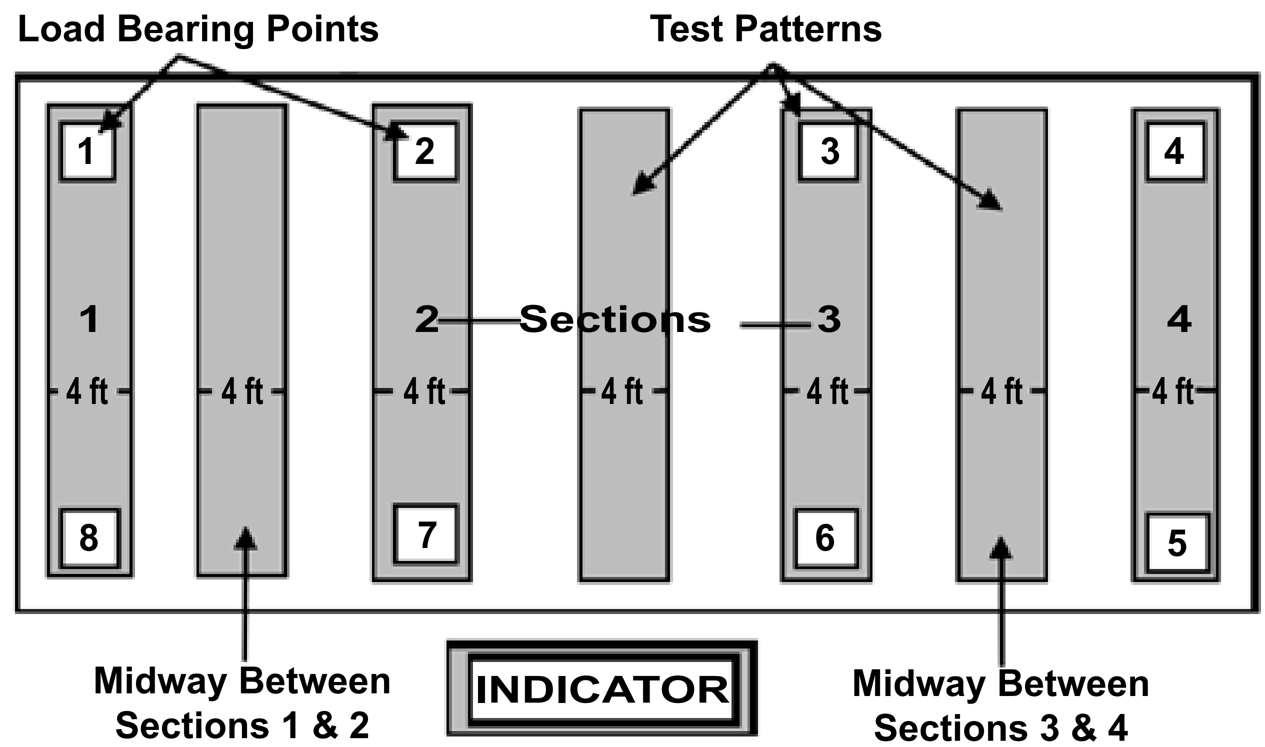
(d) Shift Test.

Shift tests verify the weighing performance of a scale under off-center loading conditions. At least one shift test shall be conducted with a minimum test load of 12.5 percent of scale capacity and may be performed anywhere on the scale using the patterns and maximum loads specified in the following section. (H-44, 2008, N.1.3.4.)

(e) Section Tests.

Place test weights on each section to find whether the weight indication of each section is within applicable tolerances, since, the placement of a vehicle can vary over the sections.

Four Section Vehicle Scale



Each section is tested with two different test loads, preferably ½ concentrated load capacity (CLC) and full CLC. The test load is distributed in an area at least 1.2 m (4 ft) long and the width of the platform over each section. The maximum test load applied to each test pattern shall not exceed the CLC of the scale. When loading the scale for testing, one side of the test pattern shall be loaded to no more than half of the concentrated load capacity or test load before loading the other side. The area covered by the test load may be less than 1.2 m (4 ft) x [times] the width of the scale; for test patterns less than 1.2 m (4 ft) in length the maximum loading shall meet the formula: [(wheel base of test cart or length of test load divided by 48 in) x 0.9 x CLC]. When the test pattern exceeds 1.2 m (4 ft), the maximum test load applied shall not exceed the concentrated load capacity times the largest “r” factor. Table 16 (page after next), calculates the area allowed for the test pattern to cover, based on the number of axles on the test vehicle used. Test load should not exceed the marked sectional capacity on scales installed before January 1, 1989. Methods of performing a section test may vary slightly depending upon the type of test equipment available. (H-44, 2008, N.1.1., S.6.1.)

(f) Increasing Load Test.

Increasing load test is conducted on all scales with the test load centered. The scale should be tested to at least the maximum load to which the scale will be used. In any event the total amount of test weights used cannot be less than 12.5 percent of scale capacity.

1 Beam scales: Begin by testing the fractional poise at zero, then at ½ capacity and at full capacity. Test the main poise by reading and recording the balance of the scale as each test load is applied until all the test weights are loaded on the test cart or platform. Wherever possible, it is recommended to test notches that are most frequently used which are subject to the most wear. Then conduct a substitution or strain load test.

2 Dial scales: The test should be made each quarter of the dial face. Tare bars should be tested at zero, ½ capacity and full capacity. Each unit weight should be tested, with the unit weight engaged, by placing an amount of test weights on the platform equal to the unit weight.

3 Digital scales: Observe and record digital indications as the test weights are loaded on the platform until all the test weights are loaded on the platform. Then conduct a substitution or strain load test.

Table 16. Span Maximum Load

Distance in feet between the extremes of any group of 2 or more consecutive axles	Ratio of CLC to maximum load ("r" factor) carried on any group of 2 or more consecutive axles							
	2 axles	3 axles	4 axles	5 axles	6 axles	7 axles	8 axles	9 axles
4[1]	1.000							
5[1]	1.000							
6[1]	1.000							
7[1]	1.000							
8 and less[1]	1.000	1.000						
More than 8[1]	1.118	1.235						
9	1.147	1.257						
10	1.176	1.279						
11	1.206	1.301						
12	1.235	1.324	1.471	1.632				
13	1.265	1.346	1.490	1.651				
14	1.294	1.368	1.510	1.669				
1 5	1.324	1.390	1.529	1.688	1.853			
16	1.353	1.412	1.549	1.706	1.871			
17	1.382	1.434	1.569	1.724	1.888			
18	1.412	1.456	1.588	1.743	1.906			
19	1.441	1.478	1.608	1.761	1.924			
20	1.471	1.500	1.627	1.779	1.941			
21	1.500	1.522	1.647	1.798	1.959			
22	1.529	1.544	1.667	1.816	1.976			
23	1.559	1.566	1.686	1.835	1.994			
24	1.588	1.588	1.706	1.853	2.012	2.176		
25	1.618	1.610	1.725	1.871	2.029	2.194		
26		1.632	1.745	1.890	2.047	2.211		
27		1.654	1.765	1.908	2.065	2.228		
28		1.676	1.784	1.926	2.082	2.245	2.412	
29		1.699	1.804	1.945	2.100	2.262	2.429	
30		1.721	1.824	1.963	2.118	2.279	2.445	
31		1.743	1.843	1.982	2.135	2.297	2.462	
32		1.765	1.863	2.000	2.153	2.314	2.479	2.647
33			1.882	2.018	2.171	2.331	2.496	2.664
34			1.902	2.037	2.188	2.348	2.513	2.680
35			1.922	2.055	2.206	2.365	2.529	2.697
36			2.000[2]	2.074	2.224	2.382	2.546	2.713
37			2.000[2]	2.092	2.241	2.400	2.563	2.730
38			2.000[2]	2.110	2.259	2.417	2.580	2.746
39			2.000	2.129	2.276	2.434	2.597	2.763
40			2.020	2.147	2.294	2.451	2.613	2.779

INSTRUCTIONS:

1. Determine the scale's CLC.
2. Count the number of axles on the vehicle in a given span and determine the distance in feet between the first and last axle in the span.
3. Multiply the CLC by the corresponding multiplier in the table*.
4. The resulting number is the scale's maximum concentrated load for a single span based on the vehicle configuration.

*See note and formula at bottom of table on the next page.

Table 16. Span Maximum Load								
Distance in feet between the extremes of any group of 2 or more consecutive axles	Ratio of CLC to maximum load ("r" factor) carried on any group of 2 or more consecutive axles							
	2 axles	3 axles	4 axles	5 axles	6 axles	7 axles	8 axles	9 axles
41			2.039	2.165	2.312	2.468	2.630	2.796
42			2.059	2.184	2.329	2.485	2.647	2.813
43			2.078	2.202	2.347	2.502	2.664	2.829
44			2.098	2.221	2.365	2.520	2.681	2.846
45			2.118	2.239	2.382	2.537	2.697	2.862
46			2.137	2.257	2.400	2.554	2.714	2.879
47			2.157	2.276	2.418	2.571	2.731	2.895
48			2.176	2.294	2.435	2.588	2.748	2.912
49			2.196	2.313	2.453	2.605	2.765	2.928
50			2.216	2.331	2.471	2.623	2.782	2.945
51			2.235	2.349	2.488	2.640	2.798	2.961
52			2.255	2.368	2.506	2.657	2.815	2.978
53			2.275	2.386	2.524	2.674	2.832	2.994
54			2.294	2.404	2.541	2.691	2.849	3.011
55			2.314	2.423	2.559	2.708	2.866	3.028
56			2.333	2.441	2.576	2.725	2.882	3.044
57			2.353[3]	2.460	2.594	2.742	2.899	3.061
58				2.478	2.612	2.760	2.916	3.077
59				2.496	2.629	2.777	2.933	3.094
60				2.515	2.647	2.794	2.950	3.110

***Note: This table was developed based upon the following formula. Values may be rounded in some cases for ease of use.**

$$W = r \times 500 \left[\left(\frac{LN}{N - 1} \right) + 12N + 36 \right]$$

---

[1] Tandem Axle Weight.

[2] These values in the third column correspond to the maximum loads in which the inner bridge dimensions of 36, 37, and 38 feet are considered to be equivalent to 39 feet. This allows a weight of 68 000 lb on axles 2 through 5.

[3] Corresponds to the Interstate Gross Weight Limit.

(g) Substitution Test and Strain Load Tests.

When there are not enough standard test weights to test large capacity scales to used capacity; objects of unknown weight are used with standard test weights to test the scale beyond the amount of test weights available.

The substitution test or build-up test uses standard test weights and objects of unknown weight for the purpose of testing the performance of the scale at higher levels.

1 Standard test weights are applied and the weight indications are noted from the beam, dial or digital indicator.

2 The standard test weights are removed and objects of unknown weight are applied to the scale until the previously noted indication is duplicated regardless of any errors.

3 The test weights are again applied with the objects to reach a higher total known load.

4 This substitution or build-up procedure maybe used not more than three times.

5 The tolerance is applied to the total load, each time a reading is taken.

Example: 22 500 lb of test weight standards and a 19 540 lb empty truck, totaling 42 040 lb.

a Test the scale to 22 500 lb with the test weights. Note the reading at 20 000 lb load.

b Take readings at 1000, 2000, 5000, 7000, 10 000, 15 000, 20 000 and 22 500 lb.

c Remove the test weights, drive the empty truck on the scale and adjust the truck's weight to read the same as when you used the 20 000 lb of test weights. If 20 000 lb of test weights displayed as 19 980 then the truck with adjustment weights or objects must show the same, 19 980.

d Next, apply loads in increments of 5000 lb until all the test weights are loaded on the scale. Be careful not to exceed the CLC over any section.

e Apply the tolerance at 1000, 2000, 5000, 7000, 10 000, 15 000, 20 000, 22 500, 25 000, 30 000, 35 000, 40 000 and 42 000 lb.

(h) Strain Load Test.

This test uses a relatively large load of unknown weight as a “strain load” and then adds standard tests weights to the “strain load” to test large capacity scales. (This method of testing should not be confused with a substitution or build-up test)

1 Test the scale with all the available standard test weights.

2 Remove the standard test weights.

3 Load the scale with the strain load, and

4 Add all the available standard test weights with the strain load.

5 Only apply tolerances to the amount of standard test weights on the scale during steps numbers 1 and 4. Do not apply the tolerance to the combined weight of test weights plus the strain load.

Example: 20 000 lb Standard Test Weights and a 27 500 lb empty truck.

a Test the scale to 20 000 lb with the test weights.

b Remove the weights and load the empty truck on the scale. The scale indicates 27 480 lb.

c Next, apply test weights to the scale in 5000 lb increments until all the test standards are loaded on the scale.

d Apply the tolerance only to the amount of test standards applied each time. Do not apply the tolerance to the combined weight of the empty truck and applied test standards.

(i) Decreasing Load Test.

Complete a decreasing load test on all dial and digital scales; center the test load on the scale platform. This test shows the accuracy of the scale when the scale’s load is partially removed, and is recorded before returning to zero load. The test is conducted by removing one-half of the maximum test load applied during the increasing load test and recording the weight.

(j) Radio Frequency Interference Test (RFI).

RFI testing determines if radio frequency signals will adversely affect weighing accuracy. This test is usually conducted only if radiotransmitting units are used in the proximity of the scale. Conduct the test by using a radio transmitter normally used in the proximity of the scale. With the scale stabilized either empty or loaded, key the transmitter at various distances (1 to 10 meters from the indicating unit) while simultaneously observing the scale display for any abnormal changes in the indicated weight. Conduct additional tests to check if electro-magnetic interference (EMI) signals from motors starting or other power surges affect the weight display. Switching on and off motors and other equipment in the proximity of the scale or equipment that is powered easily checks this on a common circuit as that of the scale. (H-44, 2008, N.1.6., T.4, T.N.9.)

(k) Motion-Detection Test.

This test finds if the range of motion detection is within prescribed limits and that its operation is suitable for the intended use. After putting a known weight on the load-receiving element, have someone thrust (step on/off) on the scale causing the load-receiving element to move while trying to activate the printer. This may take more than one person because the scale display should be affected as close to 15 d as practical. The recording element should not print or record until the display is stable within ± 3d. (H-44, 2008, S.2.5.1.)

(l) Automatic Zero-setting Mechanism (AZSM).

Conduct an AZSM test to find if the range is set within the required parameter of ± 3d. Zero the weight indication and place an amount of test weights equivalent to more than 3d on the scale deck all at once. Be careful not to step on the deck while placing the weights on the deck. If the indication tracks to zero then the AZSM is set incorrectly. H-44 stipulates that the device can track off up to 3d when placed on the load-receiving element all at once. AZSM should also be checked in the negative direction by zeroing the scale with more than 3d on the scale and then removing the weights all at once. If the indication tracks to zero then AZSM is set incorrectly. Scales manufactured after January 1, 2001, shall be designed with a sealable means to allow the AZSM to be disabled during the inspection and test of the device. (H-44, 2008, S.2.1.3., S.2.1.3.1.)

m. Track Scale Test.

(1) General.

Railway track scales used for official grain weight certification must be tested semiannually. To accomplish these tests, FGIS uses three test cars, each of which consists of a specially fitted boxcar containing at least 100 000 pounds of test standards in 10 000-pound blocks and one calibrated electric truck (5 feet wheel base) to carry and move the block standards. Other test cars (including two FGIS 90 000 pound test carts) may be used for official testing purposes provided the cars have been certified on an approved master scale within the period of 1 year and are at least 30 000 pounds. (H-44, 2008, N.3.1. in part)

(2) Section Test.

(a) General.

1 The section test on railway track scales shall be performed bidirectionally; that is, from one direction then repeating in the opposite direction.

2 The test involves the placement of a test car on a prescribed test point, recording the weight, and repeating on succeeding sections. The sections of a railway track scale are numbered 1, 2, 3, etc., from left to right when standing at the weighbeam or indicator, and facing the scale.

a Normal positions of a test car are designated in order from left to right as: 1R, 2L, 2R, 3L, 3R, 4L, etc. The numbers representing the sections and the letters, when affixed, indicates that the body of the car lies to the left or right of the section with one pair of wheels directly over the section.

b In the case of a two section scale, an additional position is used with the center of the car midway between the sections. This position is designated as “center” (C).

c Do not position a test car beyond the load bearing points of a box car unloading scale due to the danger of tipping the scale.

3 The indications of each section must be within the applicable tolerance applied to the known test standards.

4 The maximum deviation between indicated values on the test standards applied to individual sections shall not be greater than the absolute value of the maintenance tolerance.

(b) Procedures.

1 Balance the beam at the zero poise setting using the balance ball. Set the dial to zero or adjust the digital indicator to a stable zero. If error/balance weights will be used to determine error, balance out weights on the load-receiving element equal to the tolerance allowed for the amount of test standards to be applied.

2 Apply the test standards to section 1.

NOTE: Prior to moving the standards, examine the bolts, connectors, chains, and hooks. Do not use any equipment that shows signs of wear or fatigue.

3 Move the poise to the graduation equivalent to the amount of test weights. If the beam balances, record error as zero. If it does not balance, then add or remove error/balance weights until the beam balances.

4 Record the number of divisions of error/balance weights added or removed. Record the reading on the dial or digital indicator and record the error.

5 Continue testing all sections in one direction. Then remove the test standards and check zero balance.

(3) Strain Test.

(a) With One Test Car.

When only one test car is available, a light car or empty general service type car can be used in combination with the test car for testing the scales to higher weight ranges.

(b) Lower Weight Value Requirement.

The weight value of the light weight car (empty) should not exceed the weight value of the test standards. The length of the light car has to be considered as there must be room to place both cars on the scale simultaneously.

(c) Move Light Car.

Move the light car onto the weighing rails and record indication.

(d) Move Test Car.

Move the test car onto the weighing rails with the light car and record the indication. Utilize error/balance weights to determine error on the weighbeam scale. The applicable tolerance shall only apply to the test car weight value.

(e) Remove Both. Remove both test car and light car and check zero balance and record.

(4) Standard Graduated Test.

A standard graduated test is one made when two test cars are available. Positions and placements coincide with the section test listed previously.

(a) Spot First.

Spot one test car (preferably the light car) on one of the predetermined positions and record sectional indications and error.

(b) Spot Both.

Spot both test cars on the weighing rails simultaneously, the center lines of the test cars separated by approximately the same distance as would result between the center line of the trucks when weighing a freight car. Record the positions, indications, and scale error.

(5) Decreasing-Load Test.

A decreasing-load test shall be conducted on automatic-indicating scales.

n. Platform Scale Test.

(1) General.

(a) Platform Scale Definition.

For the purpose of this instruction, “platform scales” are portable, low capacity bench-type scales that are used for checkweighing, Class X weighing or Class Y weighing of sacked grain, rice and other commodities.

(b) Test Frequency.

Platform scales shall be tested twice a year at approximately a 6-month interval by FGIS or a State Weights and Measures Official.

(c) Test Standards.

A complete set of Class F weights is required to perform the platform scale tests. The weight set should contain at least the following weights: 50 lb (2), 10 lb (2), 5 lb, 2 lb (2), 1 lb, .5 lb, .2 lb (2), .1 lb, .05 lb, .02 lb (2), .01 lb, .005 lb, .002 lb (2), and .001 lb.

(d) Test Order.

Conduct the tests in the following order: sensitivity test, shift test, increasing-load test, (and when applicable, decreasing- load test) zero balance shift test, and dial test.

(2) Tolerances.

(a) Unmarked FGIS Scales.

FGIS-Owned,

Unmarked[6] Mechanical Scales (Capacity greater than 100 lb), such as the Accuweigh TDX 301. See Tables 11 and 13 of this chapter for scales where n > 5000.

(b) All Other Scales.

See the applicable type scale in Section 3.4 of this Chapter.

(3) Sensitivity Test.

(a) Unmarked FGIS Scales.

FGIS-Owned, Unmarked Mechanical Scales (Capacity greater than 100 lb), such as the Accuweigh TDX 301.

1 Balance the scale with a zero-load.

2 Place .1-pound test weight on the scale and note the scale's response.

3 If the weighbeam comes to rest at the limiting stop, the scale meets the sensitivity requirement (SR) and is acceptable.

4 Record the results on Form FGIS-965-2, Scale Test Report -Vehicle.

[6] Unmarked scales are those manufactured prior to January 1, 1986, that are not marked with a National Institute of Standards and Technology, Handbook 44 accuracy class designation; i.e., II, III, or III L.

(b) All Other Scales.

1 See Section g., of this section for procedures for conducting a sensitivity test.

2 See Section 3.4, d., of this Chapter for the sensitivity requirements for all other scales.

(4) Shift Test.

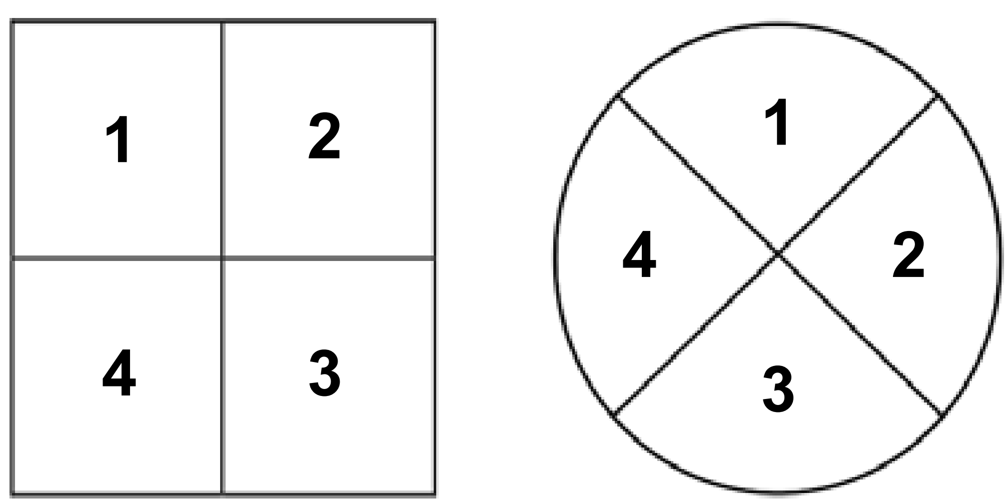
The shift test is used to determine scale accuracy when off-center loads are applied to the platform.

(a) Test Load.

Place a test load equivalent to at least one- third nominal capacity of the scale successively in the center of each quadrant of the load-receiving element defined as test weight in amounts of at least 30 percent of the scale capacity not to exceed 35 percent of scale capacity). Do not place the test load at the extreme edge of the platform.

(b) Numbering Quadrants.

The quadrants are numbered as follows:



If the weight indicated by the scale is within the applicable tolerance see Tables 11 and 13 for the test load applied, the scale's shift test response is acceptable.

For example:

Where the tested or certified capacity is 110 pounds on the Accuweigh TDX 301.

$$\frac{\text{1/3 capacity}}{\text{(d)}} = \frac{\text{35 lb}}{.1} = \textit{350d} = \pm\textit{2d (from table 13)} = \pm\textit{.2 lb}$$

(c) Record the results on Form FGIS-965-2, Scale Test Report – Vehicle.

(5) Beam-Type Scale Increasing Load Test.

This test is used to determine scale accuracy at various loads up to maximum scale capacity.

(a) Balance Scale.

Balance the scale at zero-load.

(b) Apply Test Load.

Apply the test load to the center of the load receiving element. Test each secondary poise at one-half and full capacity (maximum weight marked on the beam being tested); test the primary poise at one-half and at the maximum- used capacity. Note and record the results on Form FGIS-965-2, Scale Test Report - Vehicle.

(c) Tolerance.

If the scale indications are in tolerance (according to Tables 11 and 13 for maintenance tolerances in this Chapter where n > 5000 d) for all test loads applied, the scale meets the increasing-load requirement.

(d) Record Zero Balance Change.

Upon completion of the increasing- load test, remove the weights from the scale and perform a zero balance shift test (does the scale return to zero?). Note and record the results on Form FGIS-965-2, Scale Test Report - Vehicle (see Attachment 3)

Example: Platform Scale Tests Performed on an Accuweigh TDX 301.

Step 1. Balance the scale with no load (no weights) on the platform. Place a .1 lb class F test weight on the center of the platform. If the beam comes to rest at the limiting stop, the scale is acceptable (Sensitivity Test).

Step 2. Place a total of 100 lb of class F test weights on center of the upper left hand quarter of the scale platform. If the scale indicates 100 lb, ± .2 lb, the scale is acceptable. Repeat this test on the other three quarters of the scale platform (Shift Test).

Step 3. Determine the capacity and division size of each beam:

Secondary Poise A has a capacity of 2 pounds X .01 pound. (On this scale the .01 lb poise shall not be used officially.)

Secondary Poise B has a capacity of 5 pounds X .1 pound.

The Primary Poise has a capacity of 300 pounds X 5 pounds, but in this example the scale is only used to weigh products up to 110 pounds.

Step 4. For each beam, place test weights centered on the scale approximately equal to the beam's half-capacity and full capacity (or up to the used capacity - 110 lb), and record this weight on the test form. Note that we apply a minimum tolerance of ½ d or .05 lb (Increasing Load Test)

Table 17. Tolerance on Beams for the Accuweigh TDX 301

Poise	Test Load	Indication	Error	Maintenance Tolerance	Result
A	(Do Not Test)				
B	2.5	2.5	.0	± .1	(In Tolerance)
B	5	5.1	.1	± .1	(In Tolerance)
Primary	50	50.1	.1	± .1	(In Tolerance)
Primary	110	110.3	.3	± .2	(Exceeds Tolerance)

Step 5. Remove the weights from the platform and note the scale response with no load applied (zero balance shift test). In order to be acceptable, the scale should indicate "0", plus or minus 1d or .1 lb.

(6) Digital Scale Increasing Load Test.

(a) Zero.

Zero the scale at zero-load.

(b) Apply Test Load.

Apply the test load to the center of the load receiving element. Test the scale at one-half and full capacity. Note and record the results on Form FGIS-965-2, Scale Test Report - Vehicle.

(c) Tolerance.

If the scale indications are in tolerance [see (2)] for all test loads applied, the scale meets the increasing-load requirement.

(d) Start Decreasing-Load Test.

Upon completion of the increasing- load test, remove the weights from the scale and perform a decreasing-load test and a zero balance shift test (does the scale return to zero?). Note and record the results on Form FGIS-965-2, Scale Test Report - Vehicle.

Example: Platform Scale Tests Performed on an Ohaus PL 150. (150 lb x .1 lb)

Step 1. Zero the scale with no load (no weights) on the platform. Turn off automatic-zero tracking. The center of zero indicator must be on, indicating that the scale is within .3 divisions from zero. (If automatic-zero tracking cannot be turned off, conduct the test outside the range of auto zero by applying approximately 1 lb to the platform.) Place .14 lb of class F test weight on the center of the platform. If the indicator changes by at least 1 division, the scale is acceptable.

Step 2. Place a total of 50 lb of class F test weights on center of the upper left hand quarter of the scale platform. If the scale indicates 50 lb ±.2, the scale is acceptable. Repeat this test on the other three quarters of the scale platform. (Shift Test)

Step 3. Determine the capacity that the scale will be tested to: The scale has a capacity of 150 pounds X .1 pound, but in this example the scale is only used to weigh products up to 100 pounds. Place test weights centered on the scale equal to half-capacity and full capacity (up to the used capacity - 100 lb), and record this weight on the test form. (Increasing Load Test)

Table 18. Increasing Load Test Error

Test Load	Indication	Error	Maintenance Tolerance	Acceptance Tolerance
50	50.1	.1	.1	.05
100	100.1	.1	.2	.1

Step 4. Remove the weights from the platform to decrease the load to one-half capacity (50 lb) and note the indication is 50 ± .1 lb (Decreasing Load Test)

Step 5. Remove the weights from the platform and note the scale response with no load applied (zero balance shift test). The scale should indicate 0 ± .1 lb.

(7) Decreasing-Load Test.

A decreasing-load test shall be conducted on automatic- indicating scales only. Test the scale with a test load equal to one-half of maximum-used capacity of the scale, centered on the load-receiving element of the scale.

(8) Dial Test.

Test the dial at no less than four points on the reading face, including all possible quarters of the reading face capacity. Test all unit weights, if so equipped.

o. Testing and Calibration Procedure for Master Railway Track Scales.

(1) Visual Inspection.

(a) Check for Binds.

Inspect the scale deck and check for binds between the weighing rail and the approach rail.

(b) Measure Rail Gap.

Measure the gap between the weighing rail and the approach rail. If this distance is less than 1/8 inch or more than 3/8 inch, the owner must make adjustments prior to the test.

(c) Inspect Lever System.

Inspect all mechanical connections of the lever system. While performing this inspection, put the blade edge of a screw driver between lever and the side of the clevis at the pivot point; adjust so there is equal distance on both sides between the clevis and the lever.

(d) Inspect Weighbeam.

Inspect the weighbeam, poise, butt connections, and counterpoise tip loop connections. Use the same procedure as employed in the inspection of the lever system.

(2) Preliminary Setup.

(a) Attach Pointer.

Attach the pointer that is found in the butt-ratio weight kit to the trig loop.

(b) Attach Chart.

Attach a chart from the butt-ratio kit to the weighbeam as close as possible to the tip clevis assembly.

(c) Avoid Parallax.

Set up a magnifying glass so that while reading the turning points there will not be a parallax between the pointer and the graduated divisions on the chart.

(d) Mark Starting and Ending Test Cart Positions.

Facing the rail from the weighbeam side measure 6 inches from the left end of the scale rail and mark position 1. Measure 6 inches from the right end of the scale rail and mark the position. Measure 5 ½ feet (length of the FGIS test cart) to the left from right end mark and mark position 5.

(e) Calculate and Mark Remaining Test Cart Positions.

Divide that distance between the two marks (position 1 and 5) into four parts and place 3 marks. Number the marks 2, 3, and 4 from left to right.

(3) Test Procedure.

The method for determining error in the testing of a railway master scale is by applying error weights to the test load, reading turning points of the beam and comparing the amount of error weights that were used on the scale rail at zero balance. The differences in these weight values are identified as plus or minus errors.

(a) Add Error Weights.

Place 10-pounds of error weights on the weighing rail without any counterbalance weight on the tip dish. Adjust the balance ball until the beam swings equidistant above and below the center mark of the chart. The sum of the divisions of swing above and below the center mark should be as close to 20 as possible. The center mark is considered 10. Five divisions above the center mark is 15 and five divisions below the center mark is 5 on non-plate fulcrum master scales. Plate fulcrum master scales read the opposite, 5 divisions above is 5, 5 divisions below is 15. So, an equal swing 5 above and 5 below the center mark totals 20. After the beam is released, lightly dampen the beam with your hand to make it stop on the upswing at 15. The first high turning point would then be 15. Record the turning points for zero load as described in Attachments 15 and 16.

(b) Find Sensitivity.

Determine sensitivity (SR) by adding one pound to the scale rail. Record the turnings points and calculate the SR as shown on Attachment 15, item 28.

(c) Load Test Cart.

Load the test cart to the amount to be used for the first test run.

NOTE: Prior to moving the standards, examine all the bolts, connectors, chains, and hooks. Do not use any equipment that shows signs of wear or fatigue.

(d) Add Counterbalance Weights to Tip Dish.

Place enough 10-pound counterbalance weights onto the tip dish at the end of the weighbeam to counter balance the weight of the test cart.

(e) Move Error Weights.

Remove the error weights from the scale rail and place them on the test cart.

(f) Position Test Cart on Scale.

Move the test cart on to the scale so that the left wheel is centered over the first position mark on the left end of the scale rail.

(g) Remove Cable.

Remove the electrical cable from the test cart.

(h) Find Turning Points.

Unlock the weighbeam. Lightly dampen the upward movement of the beam with your hand to cause the pointer to stop as close to 15 as possible. The downward movement of the beam should stop close to 5, so the total is 20. The up and down movements are opposite on a plate fulcrum master scale; up is 5, down is 15. If the swing is too high or too low, remove or add error weights from or to the test cart in 1-pound increments until a swing total as close to 20 as possible is acquired. The amount of error weight left on the test cart is recorded on the test record. Record the turning points of the beam from the weighbeam chart on the test record to the nearest 0.2 division.

(i) Find Sensitivity.

Determine sensitivity by adding a 1-pound error weight to the test cart and record the turning points and compute. Record the amount of error weights on the test cart.

(j) Advance Test Cart.

Dampen the beam gently to the bottom of the trig loop and lock. Connect the electrical cable to the test cart and move to position mark number 2. Remove electrical cable from the test cart and repeat step (h). Sensitivity is not taken at this position. Sensitivity is taken at zero loads, position 1, 3, and 5 when moving left to right, positions 2 and 4 when moving right to left.

(k) Continue Right Until Complete.

Continue this procedure until all five test positions have been completed. Lock the beam when moving to the next position.

(l) Remove Test Cart Right.

Remove the test cart from the scale off the right end unless there is not enough clearance. If that be the case, the test cart must be reversed and removed from the left end.

(m) Find Balance Change.

Remove the counterweights from the tip dish at the end of the weighbeam. Remove the error weights from the test cart and place them on the scale rail. Determine the balance change of the scale that occurred during the test. The beam should only be rebalanced using the balance ball as described in step (a) after a test load has been run to completion in both directions and before a new test load is started.

(n) Replace Counterbalance Weights to Tip Dish.

Replace the 10-pound counterpoise weights on the tip dish at the end of the weighbeam, remove the error weights from the scale rail and place them on the test cart.

(o) Repeat Test Right to Left.

Repeat steps (h) through (k) in the opposite direction moving right to left starting at position number 5 from the right end of the scale. However, in those cases where there is not enough clearance on the right end of the scale, the test cart must be moved onto the scale from the left end to position number 5. The testing positions are reversed with the sensitivity being taken at positions 2 and 4 until all 5 positions have been tested.

(p) Find Balance Change Again.

When all positions have been tested, remove the test cart from the scale, unload the tip dish, remove the error weights from the test cart and determine balance change as described in step (m).

(q) Load Test Cart to Scale Capacity.

Complete the "as found" portion of the test by loading the test cart to scale capacity, which is either 100 000 or 110 000 pounds and add the counter balance weights to the tip dish accordingly.

(r) Test Marked Points at Capacity.

Continue testing as previously described in both directions.

(s) Calculate and Apply Tolerance.

The next step is to determine if the amount of error, which has been calculated and entered in column 27 (ERROR) of the test record, is within the tolerance prescribed for railway master scales listed in Table 19.

Table 19. Tolerances for Master Railway Track Scale Test

LOAD IN POUNDS	TOLERANCE IN POUNDS
80 000	6.0
90 000	6.4
100 000	6.7
110 000	7.1

(t) Before Adjustment Procedure.

If the errors exceed these established tolerances and an adjustment is necessary, inform the owner of the scale of which test position or positions the scale exceeded tolerance and have the owner adjust the scale.

(u) Adjustment Retest.

After the adjustments have been made, the scale must be tested again using the same test procedures as previously described.

(v) After Adjustment Test Load Procedure.

When the results of the test data from the initial and capacity test loads indicate the scale meets the tolerance requirements at those loads, the remainder of the test loads may be applied to the scale using the same testing sequence and procedure.

(w) Distribute Test Report. Distribute the “Master Scale Test Record” as follows.

1 White copy to the Policies, Procedures, and Market Analysis Branch, Washington, D.C.

2 Yellow copy to the owner to be retained at the master scale site.

3 Pink copy to the State Weights and Measures authority in which the scale is located if requested.

Master Scale Test Record

U.S. DEPARTMENT OF AGRICULTURE
FEDERAL GRAIN INSPECTION SERVICE

MASTER SCALE TEST RECORD

DATE 4	PAGE 6	TEST NUMBER 5	TEST CAR NUMBER 7
BY 8			
PLACE 1	OWNER 2	MANUFACTURER 3	
WEATHER 9	WIND 10	TYPE OF LEVER 11	TEMPERATURE 12

TIME	OBS. NO.	CTP. WTS. ON END OF BEAM	SCALE READINGS Low	High	Sum	20 – SUM	S.R.	CORR.	LOAD Pos.	T + W	24 B.	25 B. + CORR. (1) Zero Load	(2) Test Load	ERROR (1) - (2)	28 DIFF
	0		4.8 5.0	15.0 14.8	19.7	.3	× .53 =	.1		+	10 =	10.1	26		1 Lb. = 1.9 DIV 1 DIV = 1/1.9 = .53 Lb
	Do		6.2 6.6	15.8 15.2	21.6				22	23	11			27	
13	14	15	16	17	18	19	20	21							
	1	30 M	4.2 4.6	15.0 15.0	19.4	.6	.55	.3			10		10.3	–.4	1 Lb = 1.8 DIV 1 DIV = .55 Lb
	Do		5.0 5.4	16.2 16.0	21.2						11				
	2		5.0 5.6	15.0 14.8	20.1	–.1	MEAN .58	0			10	MEAN	10.0	–.1	
	3		3.0 3.6	15.0 14.8	18.1	1.9	.62	1.1			10	9.9	11.1	–1.2	1 Lb = 1.6 DIV 1 DIV = .62 Lb
	Do		4.8 5.0	15.0 14.8	19.7						11				
	4		3.0 3.4	15.0 14.8	18.0	2.0	MEAN .60	1.2			10		11.2	–1.3	
	5		3.8 4.0	15.0 14.8	18.7	1.3	.58	.7			10		10.7	–.8	1 Lb = 1.7 DIV 1 DIV = .58 Lb
	Do		5.2 5.6	15.2 15.0	20.4						11				
	0		5.8 6.0	15.2 15.0	20.9	–.9	.38	–.3			10	9.7			1 Lb = 2.6 DIV 1 DIV = .38 Lb
	Do		7.0 7.2	16.8 16.4	23.5						11				

REMARKS

NOTE: WHEN CALCULATING AN SR MEAN, NEVER USE AN SR FROM ZERO LOAD.

CARRY THIS ZERO LOAD VALUE OVER TO 2ND RUN SHEET

FORM FGIS-9600 (3-00) ☆ U.S. Government Printing Office 1996-718-828/86043

This example shows only half the test, the five testing positions from left to right. Inspectors complete another sheet to show the five testing positions right to left. “Do” readings [nomenclature in column 14] shows the 1 lb SR weights added to the cart before moving the cart to the next testing position.

Instructions for Completing Master Scale Test Record

1. Place. The city and state of the scale’s location.

2. Owner. Indicate the owner of the scale.

3. Manufacturer. The name of the company who manufactured the scale.

4. Date. The month, day, and year of the test.

5. Test No. Enter the assigned test number.

6. Page. Enter the page number.

7. Test Car Number. Enter the number of the FGIS test car.

8. By. Enter the initials of the person or persons testing the scale.

9. Weather. Enter the weather condition outside the building ; i.e., warm, cold, snow, rain, etc.

10. Wind. Enter wind condition and direction.

11. Type of Lever. Enter “G”, strait lever, “S”, or plate fulcrum.

12. Temperature. Enter the temperature at the scale.

13. Time. Enter the time.

14. Obs. No. Enter the position of the test cart.

15. CB Wts. on End of Beam. Enter the weight value on counterbalance weights on the end of the beam.

16. Low. Enter the low reading of the beam swing according to the pointer scale division relationship.

17. High. Enter the high reading of the beam swing according to the pointer scale division relationship. A line must be drawn under the first reading after the beam has been released and dampened.

18. Sum. Enter the sum of the readings. Average the two low and add to the one high reading. Disregard the first high reading that was underlined.

19. 20 - Sum. Enter the divisional difference of the sum in column 18 and the number 20 (e.g., 20-19.7 = 0.3, 20-20.3 = -0.3).

20. S.R. Enter the sensitivity requirement in pounds. To determine the S.R., subtract the initial sum, without a sensitivity weight on the rail from the next sum which is derived with a 1-pound sensitivity weight on the rail. Enter the difference of the sums in column 28 and divide that number into l.0 pound. The result is the S.R. for that section.

21. Corr. Enter the correction. To determine correction, multiply the number in column l9 by the SR in column 20 and round to the nearest 0.1 lb using conventional rounding. Assign + value the same as column l9.

22. Pos. Enter the position of the test cart on the scale rail, sections l thru 5. If you are checking zero with the test cart off the scale, enter 0 in this column.

23. T + W. Enter the value of the test load on the scale. If checking balance with no load, enter 0 in this column.

24. B. Enter the value of the error weights that are added to the test load or rail to bring the sum of the turning points to as close to zero as possible.

25. Zero Load. When no test load is on the scale, enter the amount of error weights in column 24 plus or minus the correction as recorded in column 21.

26. Test Load. When a test load is on the scale, enter the value of the error weights in column 24 plus or minus the correction in column 21.

27. Error. Enter the difference of the entries in column 26 and the mean of the two entries in column 25. The mean will be the average of the top and bottom entries in column 25. The second page column 25, opposite direction run, uses the second zero load value from the first page and the final zero load value from the second page to determine the zero load mean for the second page. Place that mean midway between the two and use the word "mean" over the entry.

28. Column 28 is used to compute S.R. Use the divisional change for a 1-pound weight being placed on or taken off the scale rail or the test load.

3.6 DEFINITIONS

Words used in the singular form in this subpart shall be considered to imply the plural and vice versa, as appropriate.

Absolute Value. The absolute value of a number is the magnitude of that number without considering the positive or negative sign.

Accurate. A piece of equipment is “accurate” when its performance or value -- that is, its indications, its deliveries, its recorded representation, or its capacity or actual value, etc., as determined by tests made with suitable standards -- conforms to the standard within the applicable tolerances and other performance requirements. Equipment that fails to conform is “inaccurate.” (See also correct.)

Analog Type. A system of indication or recording in which values are presented as a series of graduations in combination with an indicator, or in which the most sensitive element of an indicating system moves continuously during the operation of the scale. Anti-friction Point. A sharp slight projection formed on the knife-edge line of a pivot or inserted in or attached to a lever for contacting a thrust plate.

Applied Load. The force of weight on a load receiving element of a scale beyond that required to maintain the zero-load balance. Sometimes also called “live load.”

Approach Rail. One of the rails of track approaching a scale.

Approval Label. A label indicating official approval of a scale. (See Security Seal.)

Automatic Bulk Weighing System. A weighing system adapted to the automatic weighing of bulk commodities in successive drafts of predetermined amounts, automatically recording the no-load and loaded weight values and accumulating the net weight of each draft.

Automatic Hopper Scale. One adapted to the automatic weighing of bulk commodity in successive drafts of predetermined amounts. (This is not necessarily an “Automatic-indicating scale” defined below.)

Automatic-Indicating Scale. One on which the weights of applied loads of various magnitudes are automatically indicated throughout all or a portion of the weighing range of the scale. (A scale that automatically weighs out commodity in predetermined drafts, such as an automatic hopper scale, and the like, is not an automatic- indicating scale).

Automatic Zero-setting Mechanism. Automatic means provided to maintain zero balance indication without the intervention of an operator, also known as automatic zero-maintenance (AZSM).

Automatic Zero Reset. A means or circuit to return an indicator to zero from any reading within the nominal capacity of the scale.

Auxiliary Indicator. Any indicator other than the master weight totalizer that indicates the weight of material determined by the scale.

Avoirdupois Weight. A unit of weight based on the pound of 16 ounces (7000 grains) commonly used in the United States for official weighing of all commodities, except precious stones, precious metals, and drugs.

Balance Indicator. A combination of elements, one or both of which will oscillate with respect to the other, for indicating the balance condition of a nonautomatic- indicating scale. The combination may consist of two indicating edges, lines, or points, or a single edge, line or point and a graduated scale.

Balance, Zero-load. See zero-load balance.

Balancing Mechanism. A mechanism (including a balance ball) that is designed for adjusting a scale to an accurate zero-load balance condition.

Basic Tolerances. Basic tolerances are those tolerances on underregistration and on over-registration, or in excess and in deficiency, that are established for a particular scale under all normal tests, whether maintenance or acceptance. Basic tolerances include minimum tolerance values when these are specified. Special tolerances, identified as such and pertaining to special tests, are not basic tolerances.

Beam. See weighbeam.

Beam Scale. One on which the weights of loads of various magnitudes are indicated solely by means of one or more weighbeam bars either alone or in combination with counterpoise weights.

Bench Scale. (See counter scale).

Binary Submultiples. Fractional parts obtained by successively dividing by the number 2. Thus, one-half, one-fourth, one-eighth, one-sixteenth, and so on, are binary submultiples.

Certificate of Conformance. A document issued by the National Conference on Weights and Measures based on testing by a Participating Laboratory, said document constituting evidence of conformance of a type with the requirements of National Institute of Standards and Technology Handbooks 44, 105-1. (See also Participating Laboratory.)

Certified Capacity. The maximum weight limit that has been approved by the Service for a scale for weighing under the Act. It is posted on the approved label for inspected machinery or scale test forms.

Checkweighing Scale. One used to verify predetermined weight within prescribed limits.

Clear Interval Between Graduations. The distance between adjacent edges of successive graduations in a series of graduations. If the graduations are "staggered," the interval shall be measured, if necessary, between a graduation and an extension of the adjacent graduation.

Concentrated Load Capacity (CLC). CLC is the capacity rating of a vehicle scale specified by the manufacturer, defining the maximum load concentration for which the weighbridge is designed on any area of the scale deck four feet in length by the width of the platform. The purpose of the CLC rating is to provide a uniform means of defining the limits of test load application on a particular scale to prevent injury, overloading and or damage to the device.

Correct. A piece of equipment is "correct" when, in addition to being accurate, it meets all applicable specifications requirements. Equipment that fails to meet any of the requirements for correct equipment is "incorrect." (See also accurate.)

Counterbalance Weight. An adjusted, removable (usually) slotted weight, intended to counterpoise an applied load of designed weight value. Sometimes also colloquially called "counterweight". Also, one intended for application near the butt of a weighbeam for zero-load balancing purposes.

Counterpoise Weight. A slotted or "hanger" weight intended for application near the tip of the weighbeam of a scale having a multiple greater than 1.

Creep. The change in load cell output occurring with time while under load and with all environmental conditions and other variables remaining constant.

Creep Recovery. The change in no-load output occurring with time after a removal of a load which had been applied for a specific period of time.

Damping Device. A device for arresting an oscillation by progressively diminishing its amplitude.

Dead Rail. Either rail of the independent track provided over a railway track scale for the movement of locomotives and cars not to be weighed.

Decreasing-Load Test. A test for automatic-indicating scales only, wherein the performance of the scale is tested as the load is reduced.

Deficiency. See excess and deficiency.

Digital Type. A system of indication or recording of the selector type or one that advances intermittently in which all values are presented digitally, or in numbers. In a digital indicating or recording element, or in digital representation, there are no graduations.

Discrimination (of an Automatic-Indicating Scale). The value of the test load on the load-receiving element of the scale that will produce a specified minimum change of the indicated or recorded value on the scale.

Discrimination Test. A test conducted to determine sensitivity on all digital automatic-indicating scales with the weighing device in equilibrium at zero-load and under controlled conditions in which environmental factors are reduced to the extent that they will not affect the results obtained.

Drift. A random change in output under constant load conditions.

Electromagnetic Interference (EMI). External electrical disturbances which propagate into electronic and electrical circuits and cause deviations from the normally expected performance. The frequency range of the disturbance covers the entire electromagnetic spectrum.

Electronic Scale. Any scale in which the restoring force is a transducer which converts force into an electrical signal proportional to weight and presents the information in digital or analog form.

e_{min} (minimum verification scale division). The smallest scale division for which a weighing element complies with the applicable requirements.

Error. The algebraic difference between the indicated and true value of the load being measured.

Equal-Arm Scale. A scale having only a single lever with equal arms (that is, with a multiple of one), equipped with two similar or dissimilar load-receiving elements (pan, plate, platter, scoop, or the like), one intended to receive material being weighed and the other intended to receive weights. There may or may not be a weighbeam ("side bar").

Excess and Deficiency. When an instrument or device is of such a character that it has a value of its own that can be determined, its error is said to be "in excess" or "in deficiency," depending upon whether its actual value is, respectively, greater or less than its nominal value. Examples of instruments having errors "in excess" are: A linear measure that is too long, a liquid measure that is too large, and a weight that is "heavy." Examples of instruments having errors "in deficiency" are: A lubricating-oil bottle that is too small, a vehicle-tank compartment that is too small, and a weight that is "light."

Floating Rig. A waterborne grain handling and weighing system used to remove and weigh grain from barges directly to other waterborne carriers.

Fractional Bar. A weighbeam bar of relatively small capacity, for obtaining indications intermediate between notches or graduations on a main or tare bar.

Graduated Interval. The distance from the center of one graduation to the center of the next graduation of a series of graduations. (See also value of minimum graduated interval.)

Graduation. A defining line, or one of the lines defining the subdivisions of a graduated series. The term includes such special forms as raised or indented or scored reference “lines” and special characters such as dots. (See also main graduation, subordinate graduation.)

Grain Handling System. The physical arrangement including equipment, devices, and structures whereby grain is weighed with one or more scales and delivered or conveyed to a carrier or container, or unloaded from a carrier or container and delivered to one or more scales to be weighed.

Grain Hopper Scale. One adapted to the weighing of individual loads of varying amounts of grain.

Hysteresis. The maximum difference between load cell output readings for the same applied load; one reading obtained by increasing the load from zero and the other by decreasing the load from rated output.

Grain-Test Scale. A scale adapted to weighing grain samples used in determining moisture content, dockage, weight per unit volume, etc.

Hopper Scale. A scale designed for the weighing bulk commodities whose load-receiving element is a tank, box, or hopper mounted on a weighing element. See also automatic hopper scale and grain hopper scale.

Inclinometer. An instrument for indicating the inclination to the horizontal of an axis of a ship.

Increasing-Load Test. The normal basic performance test for a scale in which observations are made as increments of test load are successively added to the load-receiving element of the scale.

Increment. The value of the smallest change in value that can be indicated or recorded by a digital scale in normal operation.

Index of an Indicator. The particular portion of an indicator that is directly used in making a reading.

Indicator, Balance. See balance indicator.

Indicating Element. An element incorporated in a scale by means of which its performance relative to quantity is “read” from the scale itself as, for example, an index-and-graduated-scale combination, a weighbeam and poise combination, a digital indicator, and the like. (See also primary indicating or recording element.)

Interlock. A mechanism designed to prevent an action or indicate the presence of an occurrence in a scale system or a grain handling system.

Interval, Clear, Between Graduations. See clear interval between graduations.

Interval, Graduated. See graduated interval.

Levertronic Scale. A scale in which the indicating and the recording devices can be activated either manually or electronically and which generally has one load cell mounted in the lever system.

List. To lean to one side, e.g. a barge, because grain is being loaded/unloaded all from one side and not the other.

Live Load. The load to be weighed (see applied load).

Load. The weight or force applied to a scale.

Load Cell. A device, whether electric, hydraulic, or pneumatic, that produces a signal proportional to the load applied.

Load Cell Verification Interval (v). The load cell interval, expressed in units of mass, used in the test of the load cell for accuracy classification.

Load-Receiving Element. That element of a scale that is designed to receive the load to be weighed; for example, platform, deck, rail, hopper, platter, plate, scoop.

Main Bar. A principal weighbeam bar, usually of relatively large capacity as compared with other bars of the same weighbeam. (On an automatic-indicating scale equipped with a weighbeam, the main weighbeam bar is frequently called the "capacity" bar.)

Main Graduation. A graduation defining the primary or principal subdivisions of a graduated series. (See also graduation.)

Maintenance Tolerance. A tolerance for application under test conditions to a scale in service; usually applied to errors "as found." This is also called "users" tolerance.

Main-Weighbeam Elements. The combination of a main bar and its fractional bar, or a main bar alone if this has no fractional bar associated with it.

Manual Scale. A scale in which the weight-indicating and the weight-recording devices are activated by hand.

Manual Zero-setting Mechanism. Nonautomatic means provided to attain a zero balance indication by the direct operation of a control.

Metric Weight. A unit system of weight based on the kilogram of l, 000 grams.

Minimum Division. The value of the smallest unit that can be indicated or recorded by a digital device in normal operations.

Minimum Test Load. The minimum allowable weight used for testing the accuracy of a scale.

Minimum Tolerances. Minimum tolerances are the smallest values that can be applied to a scale. Minimum tolerances are determined on the basis of the value of the minimum graduated interval or the nominal or reading capacity of the scale.

Motion Detection. The process of sensing a rate of change of applied load to determine when a given weighing system has reached a state of equilibrium.

Multiple Cell Application Load Cell. A load cell intended for use in a weighing system which incorporates more than one load cell. A multiple cell application load cell is designated with the letter "M" or the term "Multiple." (See also "single cell application load cell")

Multiple of a Scale. In general, the multiplying power of the entire system of levers or other basic weighing elements. (On a beam scale, the multiple of the scale is the number of pounds on the load-receiving element that will be counterpoised by l pound applied to the tip pivot of the weighbeam.)

Multi-interval scale. A scale having one weighing range which is divided into partial weighing ranges, each with different scale intervals, with the weighing range determined automatically according to the load applied, both on increasing and decreasing loads.

Multiple range scale. A scale having two or more weighing ranges with different maximum capacities and different scale intervals for the same load receptor, each range extending from zero to its maximum capacity.

Multi-Revolution Scale. An automatic-indicating scale having a nominal capacity that is a multiple of the reading-face capacity and that is achieved by more than one complete revolution of the indicator.

National Type Evaluation Program. A program of cooperation between the National Institute of Standards and Technology, the National Conference on Weights and Measures, the States, and the private sector for determining, on a uniform basis, conformance of a type with the relevant provisions of: National Institute of Standards and Technology Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Device;" and National Institute of Standards and Technology Handbook 105-1, "Specifications and Tolerances for Reference Standards and Field Standard Weights and Measures, Specifications and Tolerances for Field Standard Weights (NIST Class F)."

No-Load Reference Value. A positive weight value indication with no load in the load-receiving element (hopper) of the scale. (Used with automatic bulk weighing systems and certain single-draft, manually-operated receiving hopper scales installed below grade and used to receive grain.)

n_{max} (maximum number of scale divisions). The maximum number of scale divisions for which a main element or load cell complies with the applicable requirements. The maximum number of scale divisions permitted for an installation is limited to the lowest n_{max} marked on the scale indicating element, weighing element, or load cell.

Nominal. Refers to “intended” or “named” or “stated,” as opposed to “actual.” For example, the nominal value of something is the value that it is supposed or intended to have, the value that it is claimed or stated to have, or the value by which it is commonly known. Thus, 1-pound weight, 1-gallon measure, 1-yard indication, and 500-pound scale are statements of nominal values; corresponding actual values may differ from these by greater or lesser amounts.

Nominal Capacity. The nominal capacity of a scale is (a) the largest weight indication that can be obtained by the use of all of the reading or recording elements in combination, including the amount represented by any removable weights furnished or ordinarily furnished with the scale, but excluding the amount represented by any extra removable weights not ordinarily furnished with the scale, and excluding also the capacity of any auxiliary weighing attachment not contemplated by the original design of the scale, and excluding any fractional bar with a capacity less than 2½ percent of the sum of the capacities of the remaining reading elements, or (b) the capacity marked on the scale by the manufacturer, whichever is less. (See also nominal capacity, hopper scale.)

Nominal Capacity, Hopper Scale. The nominal capacity of a hopper scale is the capacity as marked on the scale by the scale manufacturer, or the product of the volume of the hopper in bushels or cubic feet times the maximum weight per bushel or cubic foot, as the case may be, of the commodity normally weighed, whichever is less.

Nonretroactive. “Nonretroactive” requirements are enforceable after the effective date for:

1. scales manufactured within a State after the effective date;
2. both new and used scales brought into a State after the effective date; and
3. scales that have been used in noncommercial applications and are then being placed into commercial use after the effective date.

Nonretroactive requirements are not enforceable with respect to scales that are in commercial service in the State as of the effective date or to new equipment in the stock of a manufacturer or a dealer in the State as of the effective date. (H-44, 2008, G-A.6. in part)

Nose-iron. A slidable-mounted, manually- adjustable pivot assembly for changing the multiple of a lever.

Official Grain Weighing Equipment or Device. Any scale system used in weighing grain under the USGSA.

Out-of-zero Balance. A weight indication or weight representation other than zero when there is no load on the scale load-receiving element.

Over-and-Under Indicator. An automatic- indicating element incorporated in or attached to a scale comprising an indicator and a graduated scale with a central or intermediate "zero" graduation and a limited range of weight graduations on either side of the zero graduation, for indicating weights greater than and less than the predetermined values for which other elements of the scale may be set. (A scale having an over-and-under indicator is classed as an automatic-indicating scale.)

Overregistration and Underregistration. When an instrument or device is of such a character that it indicates or records values as a result of its operation, its error is said to be in the direction of overregistration or underregistration, depending upon whether the indications are, respectively, greater or less than they should be. Examples of devices having errors of "overregistration" are: A fabric-measuring device that indicates more than the true length of material passed through it; and a liquid-measuring device that indicates more than the true amount of the liquid delivered by the device. Examples of devices having error of "underregistration" are: A meter that indicates less than the true amount of product that it delivers; and a weighing scale that indicates or records less than the true weight of the applied load.

Parallax. The apparent displacement or apparent difference in height or width, of a graduation or other object with respect to a fixed reference, as viewed from different points.

Participating Laboratory. A Federal or a State Measurement Laboratory authorized by the National Institute of Standards and Technology, in accordance with its program for the Certification of Capability of State Measurement Laboratories, to conduct a type evaluation under the National Type Evaluation Program. (FGIS is a Participating Laboratory.)

Pendulum. In general, a body suspended from a fixed point so as to swing freely to and fro or in an spatially restricted sense; and with respect to certain types of scales, an element consisting of a mass and a rigid arm connecting the mass to an axis of rotation.

Performance Requirements. Performance requirements include all tolerance requirements and, in the case nonautomatic-indicating scales, sensitivity requirements (SR).

Platform Scale. A scale whose load-receiving element is a platform.

Poise. A movable weight mounted upon or suspended from a weighbeam bar and used in combination with graduations, and frequently with notches, on the bar to indicate weight values. (A suspended poise is commonly called a "hanging" poise.)

Potentiometer. A resistance unit having a variable or sliding contact which is positioned by the rotation or sliding of a shaft.

Primary Indicating or Recording Element. The term “primary” is applied to those principal indicating (visual) elements and recording elements that are designed to, or may, be used by the operator in the normal commercial use of a device. (Examples of primary elements are the visual indicators for scales not equipped with ticket printers or other recording elements and both the visual indicators and the ticket printers or other recording elements for scales so equipped.)

Exception. The term “primary” is not applied to an auxiliary element as, for example, the ability to produce a running record of successive weighing operations, this element being supplementary to one that determines individual weights. (See indicating element, recording element.)

Radio Frequency Interference (RFI). Radio frequency interference is a type of electrical disturbance that, when introduced into electronic and electrical circuits, may cause deviations from the normally expected performance.

Railway Track Scale. A scale especially designed for weighing railway cars.

Ranges, Weight. See weight ranges.

Rated Scale Capacity. That value representing the weight that can be delivered by the device in one hour.

Ratio Test. A test to determine the accuracy with which the actual multiple of a scale agrees with its designed multiple. This test is used for scales employing counterpoise weights and is made with standard test weights substituted in all cases for the weights commercially used on the scale. (It is appropriate to use this test for some scales not employing counterpoise weights.

Reading Edge. With respect to certain forms of poises, the edge intended as the index.

Reading-Face. That portion of an automatic-indicating scale that gives a visible indication of the quantity weighed or measured. A reading-face may; include an indicator and a series of graduations or present values digitally.

Reading-Face Capacity. The largest value that may be indicated on the reading- face, exclusive of the application or addition of any supplemental or accessory elements.

Recorded Representations. The printed, embossed or other representation that is recorded as a quantity by a weighing or measuring device.

Recording Element. An element incorporated in a weighing or measuring device by means of which its performance relative to quantity or money value is permanently recorded on a tape, ticket, card, or the like, in the form of a printed, stamped, punched, or perforated representation.

Repeatability. The degree of reproducibility among several independent measurements of the same test load under specified conditions.

Retroactive Requirement. "Retroactive" requirements, when used in this Handbook and the National Institute of Standards and Technology Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Device" are enforceable with respect to all equipment. (H-44, 2008, G-A.5.)

Scale. (See specific type of scale.)

Scale Division, Value of (d). The value of the scale division expressed in units of mass is the smallest subdivision of the scale for analog indication (d) or the difference between two consecutively indicated or printed values for digital indication or printing. (See also verification scale division.)

Scale Division, Number of (n). Quotient of the capacity divided by the value of the scale division. n = Cap / d

Scale Section. A part of a vehicle scale consisting of two main load supports usually transverse to the direction in which the load is applied.

Scale System. A system for weighing grain, including the scale and all parts of the scale, and all equipment and structures that are immediately associated with, related to, or are an integral part of the system whereby grain is delivered to the scale, is weighed, and is removed from the scale.

Seal. See approval label or security seal.

Sectional Capacity. The greatest live load which may be divided equally on the load pivots or load cells of a section without inducing stresses in any member in excess of the working stresses allowed for the load cells or levers and materials involved.

Section Test. A test in which the test load is applied over individual sections. This test is conducted to disclose the weighing performance of individual sections, since scale capacity test loads are not always available and loads weighed are not always distributed evenly over all main load supports.

Security Seal. A lead-and-wire seal, a pressure-sensitive seal sufficiently permanent to indicate its removal, or similar device attached to a weighing or measuring device for protection against or to indicate access to adjustment. (See also approval label.)
Selector-Type. Refers to a system of indication or recording in which the mechanism selects, by means of a ratchet-and-pawl combination or by other means, one or the other of any two successive values that can be indicated or recorded.

Semi-automatic Zero-setting Mechanism. Automatic means provided to attain a direct zero balance indication requiring a single initiation by an operator.

Sensitivity (of a Nonautomatic-Indicating Scale). The value of the test load-receiving element of the scale that will produce a specified minimum change in the position of rest of the indicating element or elements of the scale.

Sensitivity Requirement (SR). A performance requirement for a nonautomatic- indicating scale; specifically, the minimum change in the position of rest of the indicating element or elements of the scale in response to the increase or decrease, by a specified amount, of the test load on the load-receiving element of the scale.

Shift Test. A test intended to disclose the weighing performance of a scale under off-center loading.

Single Cell Application Load Cell. A load cell intended for use in a weighing system which incorporates one or more load cells. A single cell application load cell is designated with the letter “S” or the term “Single.” (See also “multiple cell application load cell”)

Span (structural). The distance between adjoining sections of a scale.

Specification. A requirement usually dealing with the design, construction, or marking of a weighing or measuring device. Specifications are primarily directed to the manufacturers of devices.

Strain-load Test. The test of a scale beginning with the scale under load and applying known test weights to determine accuracy over a portion of the weighing range. The scale errors for a strain-load test are the errors observed for the known test loads only. The tolerances to be applied are based on the known test load used for each error that is determined.

Subordinate Graduation. Any graduation other than a main graduation. (See also graduation.)

Substitution Load Test. A test using a load that has been adjusted to weigh exactly the amount of test standards used in a particular test. The load is used as a substitute for the test standards in conjunction with the test standards to test a scale to a higher weight. Tolerances are applied to the total weight value of the substituted load plus the test standards.

Summation Standard (S). A standard that consists of a conglomerate of smaller standards.

Tare Mechanism. A mechanism (including a tare bar) that is designed for determining or balancing out the weight of packaging material, containers, vehicles, or other materials that are not intended to be included in net-weight determinations.

Tare-Weighbeam Elements. The combination of a tare bar and its fractional bar, or a tare bar alone if this has no fractional bar associated with it.

Tolerance. A value fixing the limit of allowable error or departure from true performance or value. (See also basic tolerances.)

Trig Loop. The fixture through which the tip of the weight beam projects in usual construction, designed to restrict vertical angular motion of the weighbeam to designed limits.

Type. The term “type” shall be construed to mean a model or models of a particular measurement system, instrument, element, or a field standard that positively identifies the design. A specific type may vary in its measurement ranges, size, performance, and operating characteristics.

Type Evaluation. A process for the testing, examination, and/or evaluation of a type by a Participating Laboratory under the National Type Evaluation Program.

Underregistration. See overregistration and underregistration.

Unit Train. A unit train is defined as a number of contiguous cars carrying a single commodity from one consignor to one consignee. The number of cars is determined by agreement among consignor, consignee, and the operating railroad.

Unit Weight. One contained within the housing of an automatic-indicating scale and mechanically applied to and removed from the mechanism. The application of a unit weight will increase the range of automatic indication, normally in increments equal to the reading-face capacity.

User Requirement. A requirement dealing with the selection, installation, use, or maintenance of a weighing device. User requirements are primarily directed to the users of devices.

Usual and Customary. Commonly or ordinarily found in practice or in the normal course of events and in accordance with established practices.

Value of Minimum Graduated Interval. The value represented by the interval from the center of one graduation to the center of the succeeding graduation. Also, the increment between successive recorded values. (Also see graduated interval.)

Variable Division-Unit Scale. A scale so designed that the unit of weight of the scale division is selectable by the operator (e.g., gram, troy ounce, and pennyweight).

Variable Division-Value Scale. A scale so designed that the value of the scale division, in the same unit of weight, increases at certain load values within the weighing range of the scale (e.g., 0 load to 5 pounds in 0.005-pound scale divisions, 5 pounds plus to 20 pounds in 0.010-pound scale divisions).

Vehicle Scale. A scale adapted to weighing highway, farm, or other large industrial vehicles (except railroad freight cars), loaded or unloaded. A scale, which incorporates a load-receiving element consisting of a ground level platform, used for weighing vehicles. Verification Scale Division, value of (e). A value, expressed in units of weight and specified by the manufacturer of a device, by which the tolerance values and the accuracy class applicable to the device are determined. The verification scale division is applied to ungraduated devices and certain other devices used for weight classifying or weighing in predetermined amounts, and certain other Class I and II scales.

v_{min} (minimum load cell verification interval). The smallest load cell verification interval, expressed in units of mass* into which the load cell measuring range can be divided. [*Nonretroactive as of January 1, 2001]

Weighbridge. In a large-capacity scale, the structural frame carried by the main bearings which supports the load-receiving element.

Weighing Element. That portion of a scale that supports the load-receiving element and transmits to the indicating element a signal or force resulting from the load applied to the load-receiving element.

Weighment. A single complete weighing operation.

Weight. (a) The force with which a mass is attracted toward the center of the earth by gravity. The true weight of an object is its weight as determined in a vacuum. The apparent weight in air of an object is its weight determined in air, and is less than the true weight by an amount equal to the true weight of the air displaced by the object, (b) an object, usually of metal, having a definite mass, that is designed for weighing or testing purposes, or as a counterpoise weight or a test weight.

Weight Ranges. Electrical or electro-mechanical elements incorporated in an automatic-indicating scale through the application of which the range of automatic indication of the scale is increased, normally in increments equal to the reading- face capacity.

Weight, Unit. See unit weight.

Zero-Load Balance. A correct weight indication or representation of zero when there is no load on the load-receiving element. (See also zero-load balance for an automatic-indicating scale, zero-load balance for a nonautomatic-indicating scale, zero-load balance for a recording scale.)

Zero-Load Balance for an Automatic-Indicating Scale. A condition in which the indicator is at rest at or oscillates through approximately equal arcs on either side of the zero graduation.

Zero-Load Balance for a Nonautomatic-Indicating Scale. A condition in which (a) the weighbeam is at rest at or oscillates through approximately equal arcs above and below the center of a trig loop, (b) the weighbeam or lever system is at rest at or oscillates through approximately equal arcs above and below a horizontal position or a position midway between limiting stops, or (c) the indicator of a balance indicator is at rest at or oscillates through approximately equal arcs on either side of the zero graduation.

Zero-Load Balance for a Recording Scale. A condition in which the scale will record a representation of zero-load.

Zero-Setting Mechanism. Means provided to attain a zero balance indication with no load on the load receiving element. Three types of these mechanisms are:

a. Manual zero-setting mechanism. Nonautomatic means provided to attain a zero balance indication by the direct operation of a control.

b. Semi-automatic zero-setting mechanism. Automatic means provided to attain a direct zero balance indication requiring a single initiation by an operator.

c. Automatic zero-setting-mechanism. Automatic means provided to maintain zero balance indication without the intervention of an operator.

Zone of Uncertainty. The zone between adjacent increments on a digital device in which the value of either of the adjacent increments may be displayed.

CHAPTER 4
CHECKWEIGHING

Contents

4.1 INTRODUCTION

Checkweighing is a service provided under the United States Grain Standards Act as amended (USGSA), or the Agricultural Marketing Act of 1946 (AMA). Official personnel weigh a specified number of commodity-filled containers taken from a lot of grain, rice, or other commodity and determine the estimated total gross, tare, and net weight of the lot or the estimated average gross or net weight of each container.

4.2 DEFINITIONS

Agency. Any State or official agency or any person designated by the Administrator to conduct official inspection and/or Class X or Class Y weighing services.

Average Gross Weight. The average weight of one unit of the commodity including the container(s).

Average Net Weight. The average weight of one unit of the commodity excluding the container(s).

Average Tare Weight. The average weight of one empty container or containers if the commodity is packaged as several primary containers within a secondary container.

Commodity. Any grain, rice, hops, pulses, or processed product inspected or weighed by the Federal Grain Inspection Service (FGIS) under the USGSA or AMA.

Container. An empty bag, package, box, sack, or receptacle used to hold a commodity.

Cooperator. An agency or department of the Federal Government which has an interagency agreement or State Agency or other entity which has an agreement with the Service.

Estimated Total Gross Weight. The estimated weight of the entire lot including the weight of the containers.

Estimated Total Net Weight. The estimated weight of the entire lot excluding the weight of the containers.

Estimated Total Tare Weight. The estimated weight of all the containers in an entire lot.

Gross Product Target Weight. The expected weight of one unit of the commodity including the container(s).

Lot. An identified quantity of commodity.

Marked Scale. Designated accuracy class, according to specific use (e.g., II, III, IIIL).

Maximum Allowable Variance (MAV). A value that limits negative deviations in individual unit weights to a specified range.

Scale. An approved device with a Certificate of Conformance (CC) from the National Type Evaluation Program (NTEP) of the National Conference on Weights and Measures (NCWM) used to weigh commodities and containers.

Scale Division. The smallest indicated value on a beam scale or the difference between two consecutively indicated or printed values on a digital scale.

Sublot. A predetermined portion of an overall lot.

Test Weight. A National Institute of Standards and Technology (NIST) - Class F weight that has been tested and certified by a State Weights and Measures metrology laboratory, FGIS or an FGIS approved metrology laboratory and is used to verify the accuracy of scales.

Unmarked Scale. Scale not marked with an accuracy class designation.

Unit. A filled container (or containers if the commodity is packaged in several primary containers within a secondary container).

4.3 REQUIREMENTS FOR SERVICE

a. Work Area.

The applicant must provide adequate workspace including a suitable table or bench on which to place the scale.

b. Accessibility.

The applicant must make all units of the lot accessible.

(1) For Grain.

If the lot cannot be made fully accessible, dismiss the service.

(2) For All Other Commodities.

If the lot cannot be made fully accessible record “partial inspection” in the “Remarks” section of the certificate.

c. Movement of Selected Units.

(1) Labor.

When the scale cannot be located in the same area as the units to be weighed, the applicant must provide transportation and labor to move selected units from the production line or storage area to the scale.

(2) Official Lifting Requirement.

Official personnel are responsible for lifting units weighing 25 kilograms (55 pounds) net or less from the production line or pallet to the scale. The applicant may provide all or any part of this labor but is not required to do so.

(3) Applicant Lifting Requirement.

The applicant is responsible for lifting units weighing more than 25 kilograms (55 pounds) net from the production-line or pallet to the scale. Official personnel may provide all or any part of this labor but are not required to do so.

d. Scales.

(1) Applicant's Scales.

The applicant shall furnish scales for checkweighing sacked grain lots and for checkweighing other commodities when the unit size exceeds 50-kilograms. The applicant may also furnish scales for weighing commodities that weigh 50-kilograms or less but is not required to do so.

(2) Official Scales.

Official personnel shall furnish scales for checkweighing all sacked commodity lots, other than grain, provided the unit size is less than or equal to 50-kilograms.

4.4 SCALE SPECIFICATIONS AND TESTS

a. Specifications.

(1) National Type Evaluation Program (NTEP) Approval.

Scales used for checkweighing must be NTEP approved.

(2) Maximum Allowable Division Sizes.

Scales used for checkweighing must have the proper division size for the product being weighed. Table 1 (Below) provides the maximum allowable division sizes for various gross product target weight ranges. For example, if the gross product target weight is 110 pounds, then the scale must have a division size no larger than 0.1 pound.

(3) Special Contract Requirements.

If the contract specifies a maximum allowable variance (MAV) for the product, then the smallest division on the scale shall not exceed half of the MAV. For example, if a contract specifies an MAV of - .1 pound, the scale division shall not exceed 0.05 pound.

TABLE 1. DIVISION SIZE SELECTION

Gross Product Target Weight Range			Maximum Allowable Division Size			
Pounds			lb	kg	oz	G
0.5	or	less	-	-	-	0.5
> 0.5	≤	2	-	-	1/16	1
> 2	≤	5	-	-	1/8	2
> 5	≤	10	.01	-	1/4	5
> 10	≤	35	.02	.01	1/2	10
> 35	≤	45	.05	.02	1	20
> 45	≤	120	.1	.05	2	50
> 120	≤	200	.2	.1	4	100
> 200	≤	500	.5	.2	8	200
> = greater than ≤ = less than or equal to						

b. Semiannual Tests.

(1) Frequency.

Test scales at least twice a year (approximately every 6 months) according to the procedures in Chapter 3 of this handbook.

(a) Authorized FGIS personnel shall test FGIS-owned scales.

(b) Industry-owned scales shall be tested by a State weights and measures agency, State-approved scale testing service, or authorized FGIS personnel.

(2) Increased Frequency.

Scales found to be incapable of maintaining accuracy over a 6-month period should be tested more frequently to ensure accuracy or removed from service.

(3) Records.

Maintain scale test records in the Equipment Capability Testing (ECT) online recordkeeping application section of FGIS OnLine.

(a) Entering test records into ECT. Once you are logged onto the system.

1 Select – Create new checktest from the dropdown menu; then select the Form FGIS-965-2.

2 Select – Add equipment, enter the Specified Service Point Code for the scale location.

3 Select – Equipment type from the dropdown menu, select Commodity Scale.

4 Complete the appropriate sections of the test form. Record the Test Report Number (TRN) that is automatically generated by the system for your records for future reference.

5 After completely entering all of the test results into ECT, review the test report for accuracy, select “Submit”, then select “Save” to save the scale test results into the database.

NOTE: For automatic sacking scales, contact the Policies, Procedures, and Market Analysis Branch, Field Management Division, for applicable specifications and test procedures.

c. Daily Checks.

(1) Frequency.

Balance and check the scales:

(a) At the beginning of each work shift and at least one other time during each work shift,

(b) Each time the scale is moved to a new location, and

(c) When the scale is left unattended and the results or balance is questionable.

(2) Procedures.

(a) Setting Zero.

1 Mechanical Scales.

Move all poises to zero and adjust the balance so that the beam swings an equal distance above and below the center mark on the indicator or the center of the trig loop.

2 Digital Scales.

Adjust the zero adjustment until the scale indication is a stable zero.

(b) Sensitivity at Zero.

1 Mechanical Scales.

Balance the beam at zero. Move the poise two scale divisions. The beam should move to the bottom of the trig loop or balance indicator. If it does not, do not use the scale.

NOTE: For FGIS-owned, unmarked (manufactured prior to January l, 1986) mechanical scales that have a capacity equal to or greater than 100 pounds, balance the scale at zero and then move the poise to .2 pound. The beam should move to the bottom of the trig loop or balance indicator. If it does not, do not use the scale.

2 Digital Scales.

Place a test weight(s) equal to two scale divisions in the center of the platform. The digital display should read one or two scale divisions above zero. If it does not, do not use the scale.

(c) Strain Test.

1 Mechanical Scales.

Balance the beam at zero and lock the beam. Place a test weight(s) that is approximately equal to the weight of the commodity to be weighed in the center of the platform. Move the poise(s) to the value of the weight and unlock the beam.

Use the poises to balance the beam so the beam moves an equal distance up and down. Read the weight from the beam. If the scale indication for the test load applied is within tolerance the scale may be used.

NOTE: For FGIS-owned, unmarked (manufactured prior to January 1, 1986) mechanical scales that have a capacity equal to or greater than 100 pounds, the tolerance allowed is: ± .05 pound for test loads 0 - 50 pounds and ± .1 percent of the test load for all test loads over 50 pounds.

2 Digital Scales.

Set the indicator at zero and place a test weight(s) that is approximately equal to the weight of the commodity to be weighed in the center of the platform. Read the indicator and print the weight if applicable. Indications flashing between two divisions will be considered one-half a division. If the scale indication for the test load applied is within tolerance the scale may be used.

Table 2a. MAINTENANCE TOLERANCES FOR MARKED DEVICES

<table>
<tr><th colspan="5">Tolerances are in Scale Divisions for Marked Devices</th></tr>
<tr><th>Class</th><th>±1</th><th>±2</th><th>±3</th><th>±4</th></tr>
<tr><td>II</td><td>0 – 5 000</td><td>5 001 – 20 000</td><td>20 001 +</td><td></td></tr>
<tr><td>III</td><td>0 – 500</td><td>501 – 2 000</td><td rowspan="2">2 001 – 4 000 (Add 1d for each additional 500d or fraction thereof)</td><td rowspan="2">4 001 + (Add 1d for each additional 500d or fraction thereof)</td></tr>
<tr><td>III L</td><td>0 – 500</td><td>501 – 1 000</td></tr>
</table>

Table 2b. MAINTENANCE TOLERANCES FOR UNMARKED DEVICES

Tolerances for Unmarked Devices	
Scale Divisions	**Tolerance**
n > 5 000	0.1 percent of test load
n ≤ 5 000	as shown in the table above

4.5 TARE WEIGHT

a. General.

Determine the average tare weight once for each contract, unless the containers are made by more than one manufacturer or a new shipment of containers is used for a portion of the contract.

b. How to Find Single-Container Unit Tares.

(1) Number.

Determine the average tare weight by averaging the weight of at least 10 empty containers selected at random.

(2) Containers Weight Less Than Minimum Tare.

If the combined weight of 10 containers is less than the minimum weight for tare determination (see Table 3), add empty containers to the scale until the total weight is equal to or greater than the minimum weight for tare determination.

(3) Average.

Divide the total weight of the containers by the total number of containers weighed to determine the average tare weight of one empty container.

TABLE 3. TARE WEIGHT REQUIREMENTS

Scale Division Size			Minimum Weight for Tare Determination		
lb	**oz**	**g**	**lb**	**oz**	**g**
-	-	.05	-	-	2.5
-	1/16	1	-	3	50
-	1/8	2	-	6	100
.01	1/4	5	.5	12	250
.02	1/2	10	1.0	25	500
.05	1	20	2.5	50	1 000
.1	2	50	5.0	100	2 500
.2	4	100	10.0	200	5 000
.5	8	200	25.0	400	10 000

c. How to Find Multiple-Container Unit Tares.

(1) Number.

Determine the average tare weight by averaging the weight of at least 10 empty primary (inner) containers selected at random and by averaging the weight of at least 10 empty secondary (outer) containers selected at random.

(2) Container Weight Less Than Minimum Tare.

If, for either the primary or secondary containers, the combined weight of 10 containers is less than the minimum weight for tare determination (see Table 2), add empty containers to the scale until the total weight is equal to or greater than the minimum weight for tare determination.

(3) Average Primary.

Divide the total weight of the primary containers by the total number of primary containers weighed to determine the average tare weight of one empty primary container.

(4) Average Secondary.

Divide the total weight of the secondary containers by the total number of secondary containers weighed to determine the average tare weight of one empty secondary container.

(5) Finding Average Tare.

Multiply the average tare weight of one empty primary container by the number of primary containers in one unit. Add this total to the average tare weight of one empty secondary container to determine the average tare weight of one unit.

d. Very Light Containers.

(1) Division Size.

If a large number of containers are needed to determine the tare weight, use a scale with a small scale division to weigh the containers.

(2) Shrink-Wrap.

Determine the average tare weight of stretch-wrap and shrink-wrap plastic balers (secondary containers) once for each shipment of the baler material.

e. Warehouse Lots.

(1) Earlier Established Tare Weights.

If empty containers are not available for determining tare weight and the lot was previously checkweighed (e.g., at origin), use the previously determined tare weight.

(2) Finding Empty Container Tare Values.

If empty containers are not available for determining tare weight and the lot is not known to have been previously checkweighed, use the following table to determine the tare weight.

TABLE 4. SPECIAL TARE WEIGHTS

Type of Sack	Net Weight	Tare Weight
Single polypropylene	100 lb net	0.25 lb
Single polypropylene	50 kg net	0.27 lb
Single burlap	100 lb net	0.70 lb
Single burlap	50 kg net	0.75 lb
Double burlap	100 lb net	1.20 lb
Double burlap	50 kg net	1.40 lb

4.6 SAMPLE SIZE AND METHOD SELECTION

a. Sample Size.

(1) Minimum.

Checkweigh no less than minimum number of units required per sublot or lot. (See Table 5)

(2) Increased Number.

Checkweigh additional units if sample manipulation or gross packing inconsistency is suspected.

(3) Type Container.

When one lot consists of two different types of sacks (for example, polypropylene and burlap) with the same net weight, weigh the lot as two separate lots by type of sack and complete a worksheet for each. Use table 5 to determine the number of sacks of each type to weigh. Upon request, certificate the lots on one certificate.

(4) Special Contracts.

If a contract or agreement specifies that a greater number of units be check weighed than is specified in Table 5, the sample size shall be as specified by the contract or agreement.

TABLE 5. SAMPLE SIZE

Number of Units in Sublot or Lot	Minimum Number of Units Check weighed
0 – 1 500	12
1 501 – 3 000	20
3 001 – over	36

b. Selection Methods.

When units are selected off the production line, use either the time method, the portion method, the random numbers method, or any other comparable method. In all other situations, use the random numbers method.

(1) Time Method.

(a) Determine the normal number of hours or minutes it takes to pack the lot or sublot.

(b) Determine the sample size.

(c) Divide the number of hours or minutes it takes to pack the lot or sublot by the sample size.

(d) Randomly select a unit(s)[1] at approximately the specified interval. Do not set a pattern of selecting units at any one particular time (e.g. every 15 minutes). If more than one line is operating, alternate selecting units between lines.

Example: The applicant is sacking a sublot of 8 100 50-kilogram sacks of corn over an 8-hour shift. The sample size is 36 sacks. To determine sample time intervals as follows: 8 hours (time required to pack the lot) ÷ 36 (sample size) = .22 hours per sack = 13 minutes per sack (.22 hrs X 60 min/hr = 13.2 minutes). Therefore, checkweigh 1 unit during every 13-minute interval.

[1]When a dual-scale, double-sided packer is used (e.g., a packer that alternately weighs and fills pairs of containers); weigh matched pairs of filled containers.

(2) Portion Method.

(a) Determine the sample size (see Table 5).

(b) Divide the number of units in the lot or sublot by the sample size.

(c) Randomly select a unit(s) [2] at the specified interval; e.g., Checkweigh 1 unit for every 100 units that are packed. Do not set a pattern of selecting units at a preset frequency. If more than one line is operating, alternate selecting units between lines.

(3) Random Numbers Method.

(a) Determine the sample size (see Table 5).

(b) Use the attached random numbers table (Attachment 2) to determine which units to select.

NOTE: A random number may (1) designate the number of the selected unit or (2) designate the pallet from which a unit will be selected. When a random number is used to designate the number of the pallet from which a unit is selected, official personnel should randomly select one unit from the pallet.

1 Starting Point.

Determine the starting point in the random numbers table. When the table is used for the first time, the starting point will be the upper left-hand block of numbers on the first page. When using the table on subsequent occasions, the starting point will be the row of numbers immediately following the last row of numbers used.

2 Number Selection.

Begin at the left of the first row of numbers used. Combine as many consecutive digits in the number as needed to coincide with the number of containers in the sublot or lot. For example, for lot sizes of 10 to 99, combine 2 digits to form a single number; for lot sizes of 100 to 999, combine 3 digits to form a single number; etc.

[2] When a dual-scale, double-sided packer is used (e.g., a packer that alternately weighs and fills pairs of containers); weigh matched pairs of filled containers.

3 Reading Digits.

Begin reading digits from the starting point to the bottom of the page. When the end of a column is reached, continue to the top of the next column to the right. When the end of the page is reached, proceed to the beginning of the next page. When the end of the last page is reached, go back to the first page.

4 Consecutive Digits.

Discard groups of consecutive digits that are larger than the sublot or lot size and continue to the next row of digits.

5 Repeated Digits.

Discard groups of consecutive digits that are repeated.

6 List of Numbers.

Record the usable groups of consecutive digits until the appropriate number of groups have been identified.

7 Numerical Order.

List the numbers in numerical order on the worksheet.

(c) Determine which units or pallets comprise each sublot or lot.

(d) Select the units or pallets that correspond to each random number.

NOTE: If the commodity is packaged in containers within containers, such as polyethylene package inside paper bales, obtain the random sample by selecting an equal number of the outer containers from each portion and weigh the outer containers together with their contents.

4.7 WEIGHING AND CERTIFICATION METHOD

a. Weighing Procedures.

Obtain the proper number of units (see Table 5) from the production line or pallets as applicable, using the proper selection method.

(1) Selecting.

Select and weigh units that are representative of the lot. Do not weigh torn or leaking units.

(2) Weighing.

Weigh selected units individually or in convenient multiples.

(3) Worksheet Forms.

Record the results of each weighing and the number of units in each weighing, when weighed in multiples, on the worksheet Form FGIS-991, "General Services Worksheet," for rice, pulses, and grain; See Exhibit T, Chapter 2, or a Form FGIS-992, "Services Performed Report," for processed products). See Example Worksheet – Attachment 1.

(4) Recording.

Record the results of each weighing on the worksheet to the proper division size for the product.

b. Weight Information.

Compute the results and record your findings on the appropriate worksheet. See Example Worksheet - Attachment 1.

(1) Average Gross Weight.

Add the gross weights of all the units weighed, then divide the total by the number of units weighed. Round the result to the nearest hundredth unit.

(2) Average Tare Weight.

Add the weights of all the containers weighed, then divide the total by the number of containers weighed. Round the result to the nearest hundredth unit.

(3) Average Net Weight.

Subtract the average tare weight from the average gross weight. Round the result to the nearest hundredth unit.

(4) Estimated Total Gross Weight.

Multiply the average gross weight by the total number of units in the lot. Round the result to the nearest kilogram or pound.

(5) Estimated Total Tare Weight.

Multiply the average individual tare weight by the total number of units in the lot. Round the result to the nearest kilogram or pound.

(6) Estimated Total Net Weight.

Subtract the estimated total tare weight from the estimated total gross weight. Round the result to the nearest kilogram or pound.

NOTE: Refer to the Processed Commodities Handbook, Chapter 2, Attachment, Number 28, for reporting instructions as there are different procedures for reporting the net weight.

c. Certification.

(1) Select Applicable Program Handbook.

Issue a certificate following the procedures in the applicable handbook for each lot checkweighed.

(2) Information to Show.

Show the following information, as applicable, on each certificate.

(a) Identification.

The identification of the sublots or lot and, when applicable, the seal numbers.

(b) Date.

The date(s) packing of the sublots or lot was completed.

(c) Number.

The number of units in the sublot(s) or lot.

(d) Markings.

A description of the bag markings.

(e) Estimated Weights.

The estimated or average total gross, tare, and net weight of the lot.

(f) Other Information.

Other related information.

Attachment 1. EXAMPLE WORKSHEET

Form Approved: OMB 0580-0013

UNITED STATES DEPARTMENT OF AGRICULTURE
GRAIN INSPECTION, PACKERS AND
STOCKYARDS ADMINISTRATION
FEDERAL GRAIN INSPECTION SERVICE

SERVICE PERFORMED REPORT

1. Field Office: Domestic Inspection Operations Office

Instructions: Send original to the field office, one copy to the testing laboratory and retain one copy

2. Sample Type (Check one)
☒ FSA ☐ DSCP ☐ VA ☐ Submitted ☐ Supervision ☐ Other(Specify)

3. Contract No.	4. Sample or Lot No.	5. Date Sampled	6. Commodity Code	7. Location Code	8. Applicant No.
VEPE 06789	J1010	05/01/11	CBLE10		

9. Name and Address of Applicant
ABC Milling
Cedar Rapids, Iowa

10. Commodity: Corn Soy Blend ☐ Domestic ☒ Export

11. Location of Commodity: ABC Milling Wiley, MO

12. Identification of Carrier	13. Seal Numbers	14. Inspection Point	15. Destination
		Wiley, MO	

16. Number and Kind of Containers/ Laboratory Instructions → Vendors Count

2,800 – 25 Kilogram – Multiwall Paper Bags with Polyliner

17. Gross Weight

56.20	56.40
58.05	58.10
58.15	53.90
57.40	57.90
57.10	59.70
55.55	55.75
58.95	56.85
54.55	56.80
54.90	56.75
56.30	56.60

Tare Weight

19. Empty Outer Containers	21. Empty Inner Containers
10 =	
7.30	

29. Sampler	30. Date	31. Time Start	32. Time Stop	33. Hours Worked	34. Activity
J. Smith	5/1/11	0600	1200	6.0	S, CW, COC

35. Total Hours → 6.0

36. Comments of Sampler

Scale No. 1JK27460 checked OK @ 0600 = 75.0 lb, 0800 = 75.0 lb, & 1130 = 75.0 lb by JS.

Follow Chapter2 of this handbook for sacked grain and rice certification, and the Processed Commodities Handbook for other certification requirements.

18. Total Gross Wt	20. Total	22. Total
1135.90	7.30	

37. Name(s): Joe Smith

Weight Per Container

23. Gross	24. Tare	25. Net
56.80	0.73	56.02

Estimated Weight of Lot

26. Gross	27. Tare	28. Net

38. Sample Mailed	39. Results Received	40. Vendor Called	41. Cert. Mailed

Warning: Sec 203(h) of the Agricultural Marketing Act of 1946 (7 U.S.C. 1622 (h)) provides that anyone causing a false certificate to be issued shall be subject to a $1,000 fine or imprisonment for not more than 1 year, or both. 18 U.S.C. provides for a fine of not more than $10,000 or imprisonment for not more than 5 years, or both for false or fraudulent statements made to an agency of the United States.

Form Approved OMB NO. 0580-0013 According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0580-0013. The time required to complete this information collection is estimated to average 2 minutes per response and 2 minutes of recordkeeping, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Expires January 2015.

Attachment 2. TABLE OF RANDOM NUMBERS

RANDOM NUMBERS					
659156	034646	425055	010152	471312	479957
339770	290314	882310	900136	808662	029405
652044	207095	557383	209444	005589	652115
611444	708280	902471	456209	867789	111985
110968	687516	617250	234214	665892	523446
111915	611507	624434	913875	645892	523443
031763	601487	607081	055478	938287	603723
312603	487608	508546	696647	750773	803659
910928	632377	687231	699795	593444	254968
708789	468824	505992	089389	844746	641044
977532	858191	837708	528063	651814	493198
154913	000563	361080	840178	474332	782525
712659	006378	146925	689428	695586	981411
974906	082998	126328	656166	237092	098055
815580	373563	282399	521379	864980	783019
406945	320181	469445	085552	888670	856524
024917	961097	295247	724030	569060	701093
479160	840407	238605	698412	758672	429641
366848	524205	121358	296023	746741	658875
718939	753183	857051	023170	970834	529912
172506	823446	420751	945808	095292	788706
147017	197887	676053	407507	317664	523339
758053	896357	123844	178871	061284	126141
055691	907814	127083	224626	064547	118183
886394	285272	564562	259292	050288	516333
198537	119943	099727	626665	313260	956242
909340	461582	268809	564682	660389	495991
734114	695511	711673	934654	741440	577086
837743	347749	329985	779050	580398	953156
192991	714852	382392	331828	514719	396086
678301	169027	348318	966446	349957	219455
510366	268175	916299	129340	623209	972180
576601	153946	531371	193021	153068	862977
531854	201051	624313	197608	507127	687524
313452	847637	433267	029847	306942	433778
935693	246704	072701	314715	990109	599242
220263	923131	103841	501740	033904	448129
182199	559087	473263	437440	993213	804412
020073	367236	278179	623975	641953	247844
388061	458061	335694	334583	677684	562455
523659	223003	751716	479298	967099	218435
185725	294664	139472	905566	836680	541922
443459	084450	029116	478545	529271	578744
803529	612472	648763	320273	888245	578715
268571	269342	332049	404283	530621	023923
590482	091185	559806	328155	873070	073638
162143	877403	715811	024770	713007	370581
770488	104891	512963	815067	173726	059667

RANDOM NUMBERS					
117765	906701	425055	010152	471312	479957
136075	775006	882310	900136	808662	029405
314872	503938	557383	209444	005589	652115
619896	875875	902471	456209	867789	111985
024860	226692	617250	234214	665892	523446
982363	025912	624434	913875	645892	523443
031763	601487	607081	055478	938287	603723
312603	487608	508546	696647	750773	803659
910928	632377	687231	699795	593444	254968
708789	468824	505992	089389	844746	641044
977532	858191	837708	528063	651814	493198
154913	000563	361080	840178	474332	782525
712659	006378	146925	689428	695586	981411
974906	082998	126328	656166	237092	098055
815580	373563	282399	521379	864980	783019
406945	320181	469445	085552	888670	856524
024917	961097	295247	724030	569060	701093
479160	840407	238605	698412	758672	429641
366848	524205	121358	296023	746741	658875
718939	753183	857051	023170	970834	529912
172506	823446	420751	945808	095292	788706
147017	197887	676053	407507	317664	523339
758053	896357	123844	178871	061284	126141
055691	907814	127083	224626	064547	118183
886394	285272	564562	259292	050288	516333
198537	119943	099727	626665	313260	956242
909340	461582	268809	564682	660389	495991
734114	695511	711673	934654	741440	577086
837743	347749	329985	779050	580398	953156
192991	714852	382392	331828	514719	396086
678301	169027	348318	966446	349957	219455
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576601	153946	531371	193021	153068	862977
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313452	847637	433267	029847	306942	433778
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220263	923131	103841	501740	033904	448129
182199	559087	473263	437440	993213	804412
020073	367236	278179	623975	641953	247844
388061	458061	335694	334583	677684	562455
523659	223003	751716	479298	967099	218435
185725	294664	139472	905566	836680	541922
443459	084450	029116	478545	529271	578744
803529	612472	648763	320273	888245	578715
268571	269342	332049	404283	530621	023923
590482	091185	559806	328155	873070	073638
162143	877403	715811	024770	713007	370581
770488	104891	512963	815067	173726	059667

CHAPTER 5
REVISION HISTORY

Contents

Change No: 29 August 22, 2011

A new example of Form FGIS -992 “Services Performed” was inserted. Instructions were inserted on entering scale test results in FGIS online, Equipment Capability Testing. The definitions for “Cooperator” and “Scale” were revised. The requirement for applying an approval label to the scale was removed along with other minor editorial changes.

Change No: 28 December 27, 2010

The Forward, Table of Contents, and Chapter 3 were revised.

Change No: 27 July 5, 2010

The Policies, Procedures, and Market Analysis Branch was inserted to replace the Weighing and Equipment Branch as the FGIS unit responsible for the weighing program. The term Policies, Procedures, and Market Analysis Branch has replaced the term Standards and Procedures Branch. New FGIS online certificates have replaced all old certificate examples. A new example of Form FGIS-1001 “Application to Operate as a Weighing Facility has been inserted, along with minor editorial changes.

Change No: 26 July 5, 2010

All references to mechanical scale weighing procedures are eliminated. PPB has been inserted to replace the Weighing and Equipment Branch as the FGIS unit responsible for the weighing pro-gram. The volumetric grain spill estimation tables Appendix A has been replaced with a software calculator.

Change No: 25 March 28, 2005

Pages 2-22 thru32 were changed to revise the signature requirements and to remove the reviewer block from Form FGIS-968, Weight Loading Log.

Change No: 24 November 1, 2004

Chapter 4 was revised to delete the footnote from Page 4-10. The footnote is no longer applicable to rice and grain weighed online.

Change No: 23 April 30, 2004

The Forward, Table of Contents, and Chapter 3 were revised.

Change No: 22 September 1, 2003

Chapter 4 was revised to show agency name changes, updated tables, and that FGIS now allows approved metrology laboratories to recertify test weights.