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Mechanical Sampling Systems Handbook

United States Department of Agriculture
Grain Inspection, Packers and Stockyards Administration
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Program Handbook

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Mechanical Sampling Systems Handbook

Foreword

This handbook sets forth the policies and procedures regarding the equipment requirements, installation, authorization, examination, and testing of mechanical sampling systems used for official inspection purposes.

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CHAPTER 1
GENERAL INFORMATION

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1.1 PURPOSE

This handbook sets forth the policies and procedures regarding the equipment requirements, installation, authorization, examination, and testing of mechanical sampling systems used for official inspection purposes.

1.2 POLICY

Mechanical sampling systems must be examined, tested, approved, and authorized for official sampling purposes in accordance with the procedures stated in this handbook.

Mechanical sampling systems are composed of one or more automatic sampling devices. The most common system configurations consist of a primary diverter sampler with a powered secondary sampler. These systems capture representative samples of commodities in a variety of applications. To ensure the accuracy and integrity of official inspections, mechanical sampling systems used for official sampling purposes, including obtaining warehouseman's sample-lot inspection samples, shall meet the following criteria:

a. The major components of the system must be of a model and type approved by FGIS.

b. Installation of an official sampling system must be authorized by FGIS.

c. The sampling system must be maintained and, if necessary, repaired or modified to maintain accuracy and integrity in accordance with established procedures.

d. The system must operate at the prescribed interval and, after any repairs or modifications are completed, the system must be tested, examined, and certified to operate within established tolerances.

e. The system, when operating in an official sampling capacity, must be under the supervision of official personnel in accordance with the instructions for obtaining official samples.

1.3 AUTHORITIES

This handbook is issued pursuant to Section 16(a) of the United States Grain Standards Act, as amended and the Agricultural Marketing Act of 1946, as amended.

1.4 DEFINITIONS

a. Alterations-Modifications. Any changes made to a sampling system from the point in time the system was last approved for official use. This includes changes to the sampler position, parts, speed, wiring, dust collection, etc. It also includes changes to the grain handling system that affect the sampler, such as: increase in grain flow, change in belt speed, use of new shipping bins, etc.

b. Authorization. The Federal Grain Inspection Service, Field Management Division representative, or designated Field Office Manager authorizes use of the mechanical sampler by signing a FGIS-980, “Authorization to Use Mechanical Sampler for Sampling.” Without this authorization, the sampler may not be used officially.

c. Cancellation. The current authorization is permanently withdrawn (revoked). If the facility wishes to obtain a new authorization, they must begin the approval process again, as if it were a new installation. This would include submitting a new authorization package, including a system checktest requiring five lots of grain.

d. Commodities. Grain, rice, beans, peas, lentils, and processed grain products.

e. Controls.

(1) Auxiliary Controls. Any device that either duplicates or bypasses the operating controls. Also an override, a delay switch, dump counter, or a programmable controller that may interrupt your exclusive use of the sampling device.

(2) Operating Controls. Used by the sampling attendant for normal operation of the sampling system. The control panel includes an on/off switch, timer, indicator lights, and other switches controlling excess sample return, pneumatic sample delivery, etc.

(3) Lockout Controls. A lockout switch is a device that will disconnect the main power supply and bring the D/T sampler to a zero energy state for the purposes of condition examination. The lockout switch is the only power supply override both required and allowed.

f. Examination. An examination of the sampler is conducted by official personnel using FGIS-936, “Sampler Condition Report,” as a checklist and record.

The examination is a visual check that requires opening the sampler inspection access panels and examining the condition and operation of the sampler.

(1) Initial Examination. The first examination before the sampler can be used officially.

(2) Periodic Examination. On a regular schedule, such as every 6 months.

(3) Supplemental Examinations. Extra examinations required after repairs/ modifications have been made or anytime the accuracy or integrity of the sampling system is in question.

g. Monthly Sampler Checks. Sampler system condition checks done at export port locations by official personnel. Results are kept in a log book; FGIS-936 is not required.

h. Primary Sampler. The main sampler, normally a diverter-type sampler.

i. Secondary Sampler. A powered divider to reduce or split an officially obtained sample received from the primary sampler, while maintaining its representativeness. A Boerner cargo divider may be used also.

j. Suspension. A letter from an official agency or Field Office to temporarily withdraw an authorization. Records are kept on file, so the sampler can be easily reauthorized if requested. Suspension of the authorization can also be the first step in permanent cancellation of the authorization. A formal suspension is not always required if the sampler problems can be corrected immediately or before the sampler is used officially.

k. Check test. A test conducted by Official personnel to determine sampling system accuracy and integrity with the use of five lots of grain. Mechanical truck probes are tested using 20 trucks. Initial, supplemental, and periodic check tests have the same meanings as in item f, when they are used to describe a test.

CHAPTER 2
SPECIFICATIONS

Contents

2.1 DIVERTER-TYPE MECHANICAL SAMPLERS

a. General Requirements.

(1) The design, construction, and location of the sampling system and related equipment must suit the intended official use of the sampling system.

(2) FGIS must approve the model and type of primary (Figure 1) and secondary sampler used in the system prior to the systems approval.

(3) The FGIS Field Management Division (FMD), or designated Field Office manager, must authorize the system for official use based on the satisfactory results of a system examination and a system performance check test specified in Chapters 4 and 5.

(4) Official personnel shall maintain an accurate and up-to-date sampling system documentation package, including site drawings regarding system design, installation, and approved modifications. (in their official files).

(5) The sampling system must have adequate access for a full and safe visual examination.

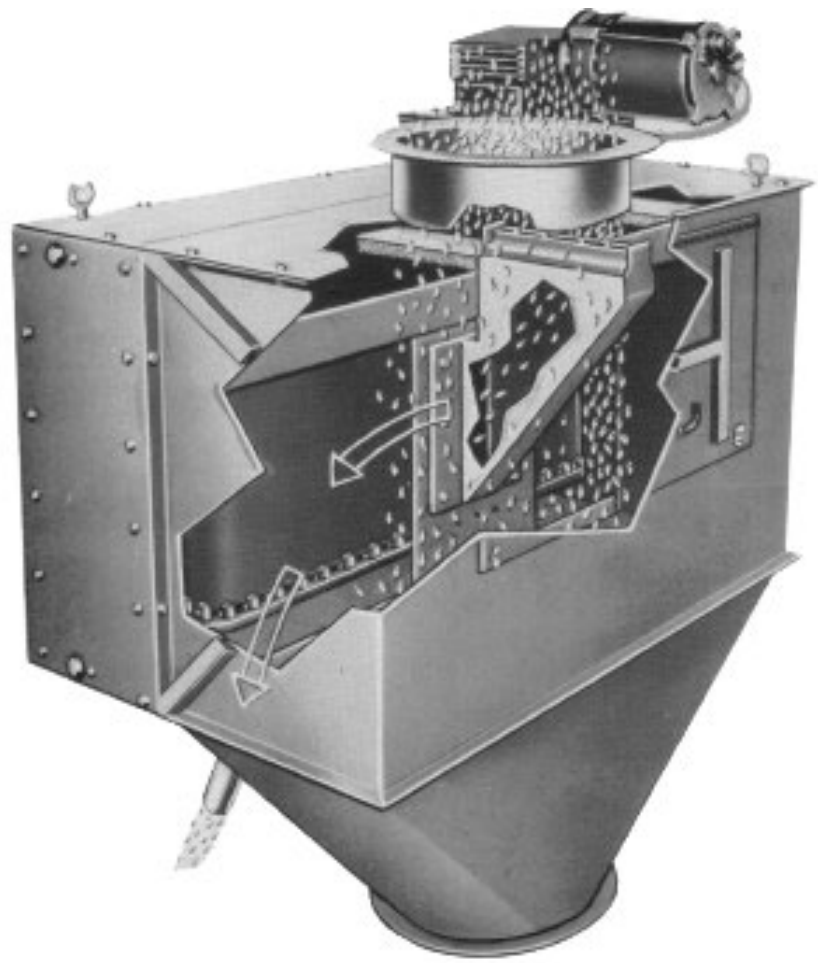

Figure 1. Diverter-Type Sampler (Primary)

b. Equipment Requirements.

(1) Overall dimensions of the primary sampler must be adequate for the volume and flowrate of the commodities being sampled. Primary samplers must:

(a) Allow all of the commodity presented for sampling to be accepted by the pelican as the pelican traverses through the commodity stream.

(b) Deliver all of the sampled commodity to the secondary sampler.

(2) The design, construction, materials, and quality of the equipment must be such that it can withstand normal use without loss of accuracy or reliability. Under normal operating conditions, operating parts will remain fully operable without the need for adjustment.

(3) The primary and secondary mechanical sampler manufacturer identification plates shall be permanently and conspicuously displayed to show their manufacturer, model designation, and serial number. Facility management must arrange for the manufacturer to supply (if needed) new I.D. plates for old, unmarked samplers, or in the event a sampling system identification marker becomes lost or damaged.

(4) The pelican (See Figure 1.) must traverse at an even speed, as close as possible to ½ meter (20 inches) per second.

(5) Power sources, valves, and switches must conform with the following requirements:

(a) Air supply for air-operated primary samplers must be uniform and maintain specified operating pressure. If scale operations or other air uses cause a loss of effective working pressure, a separate air supply system must be installed.

(b) Constant line voltage must be maintained to ensure correct operation of electrically-operated primary and secondary samplers.

(c) Valves, switches, solenoids, cylinders, motors, or other activating or operating mechanisms must be high quality, positive action devices that meet all OSHA and FGIS safety requirements and appropriate local codes.

c. Controls.

(1) Sampling system controls must be under the direct secured access or supervision of the assigned official inspection personnel or warehouseman sampler. Also, any auxiliary controls must be under the exclusive control of official personnel.

(2) For auxiliary control, any modification of a sampling system used for official purposes shall not compromise the representativeness of the sample. If a grain elevator elects to modify a D/T sampling system to control grain choke conditions, the following requirements must be met:

(a) Grain flow into the sampler must stop whenever the sampler is stopped.

(b) If already in motion, the D/T pelican must complete the traverse and come to the normal rest position.

(c) If the sampler is stopped the timer shall not reset. The timer may continue running with the pelican traverse disabled, or it may halt until the plugged condition is cleared. When the plugged condition has cleared, normal timer operation shall resume with the time that remained when the timer halted.

(d) The plug of grain that caused stoppage of the D/T must be cleared from the sampler before the sampler is restarted. Additionally, the D/T must be restarted before grain begins to flow into the sampler.

(e) An audible alarm must be activated whenever the D/T sampler is stopped by an auxiliary control.

(f) Auxiliary controls for D/T samplers must be under the full control of FGIS. The controls that stop the grain flow may be part of the plant control system. However, the controls that stop the D/T sampler and which activate the alarm must be independent of the plant control system and secured with seals or locks.

(g) Sampling systems that are modified with auxiliary controls after the issuance of this handbook must have the modifications approved by FGIS/Official Agency before they can be used for official purposes.

NOTE: A lockout switch is not considered an auxiliary control. Refer to Page 2-7 for information on lockout controls.

(3) Controls for mechanical samplers and related sample handling systems, including but not limited to push buttons and switches, and shall be conspicuously identified as to the equipment or activity controlled by the push button or switch.

d. Access.

(1) An inspection access panel with the ability to be locked or sealed by official personnel must be installed on each primary and secondary sampler to allow quick and easy examination of all moving parts. Access panels should be hinged and be equipped with sealable hasp. Official personnel should not have to use tools to remove the access panel.

(2) Access panels should be positioned to allow viewing of the entire length of the pelicans sampling stroke, and directly into the pelican opening, and also allow a complete view of the system's dust seals.

(3) Older, previously approved sampler installations must have inspection plates upgraded to meet the above requirements when repairs, modifications, or major maintenance is completed.

(4) Access to the sampling system and inspection panel must be free of hazards, with safe ingress and egress.

(5) Access panels are not required on rotary-type secondary samplers constructed of cast metal. This does not eliminate the need to open and examine the secondary during a condition examination.

e. Physical Requirements.

(1) Secondary samplers used for the reduction of the official samples obtained by the primary sampler must be appropriate for the type of facility and application in which they are installed:

(a) Facilities with a maximum flow rate of 10,000 bushels per hour or less (passing the sampling site either through a spout or carried on a belt) may use a powered secondary sampler or a gravity feed.

(b) Cargo divider. For cargo-types, sample feed must be directed to the center of the divider. If it plugs, clogs, or creates other problems, it must be replaced with a powered secondary sampler.

(c) Facilities with a maximum flow rate in excess of 10,000 bushels per hour (passing the sampling site either through a spout or carried on a belt) must use a powered secondary sampler.

(2) The entire diverter pelican opening must be at least ¾ inch (1.9 cm) but less than ⅞ inch (2.2 cm) wide. If required for structural strength, the manufacturer (or owner, if according to the manufacturer's drawings) may install small braces in the pelican opening.

(3) Secondary samplers must be large enough to reduce the quantity of sample delivered by the primary sampler without backing up. All secondary samplers, including those that use adjustable slot openings (ratio adjustment plate), must be set so the slots are not narrower than ¾ inch (1.9 cm). Any slot adjustment plates must be secured or sealed in position for testing and use.

(4) Sample return mechanisms must be designed to return excess sample to the lot from which the sample was taken from.

(5) Sample delivery tubing, flexible or rigid, must be physically secured (clamps, sealants, security seals, etc.) at all junctions that may allow the representativeness of the sample to be easily altered by adding or removing material.

(6) Air intake vents on pneumatic delivery systems must have a suitable screen or cover with the ability to be fixed in place and sealed to prevent the introduction of material into the official sample.

(7) All sample inspection access panels, operating controls, timers, air intake vents, and sample collection boxes must have the ability to be secured, locked, or sealed closed when official personnel are not located in the official inspection laboratory and/or are not continuously monitored by official inspection personnel or the warehouseman sampler.

(8) In the event the primary sampling system access panel security seals need to be broken by unofficial personnel, notice must be provided to the official service provider before the system is opened or tampered with. The official service provider must visually examine the sampling system and if the official service provider is satisfied that the integrity of the system has not been compromised, replace all broken seals and document seal numbers. If notice or a suitable explanation is not given as to why the sampler seals were found broken, the system may need to be reexamined (condition examination). The testing office may also require that the system to be check tested if the official service provider suspects the system's integrity may be in question.

(9) When application of security seals to a primary or secondary sampler will not provide an increased level of security, they are not required. For example, where access through the belt opening in the sampler hood cannot be eliminated (belt-end diverter sampler).

(10) The entire sampling system must be self-cleaning to prevent contamination of a commodity from one lot to another.

f. Installation and Site Requirements.

(1) Installation will be at a site approved by FGIS, and all sampling equipment will be installed according to the manufacturer's suggested installation instructions, so that neither the operation nor the performance of the equipment or system will be adversely affected by the foundation, supports, or any other characteristic of the installation.

(2) Primary samplers must be installed in such a location as to ensure the representativeness of the samples obtained.

(a) "Out" movement samplers. Primary samplers must be installed after the final elevation of the commodity, as close as physically practicable to the end of the loading spout. Final elevation is defined as the last elevation by bucket elevator, pneumatic sucker, drag, paddle, screw conveyor, or other devices. Inclined belts are not considered an elevation, since they will not cause grain breakage.

1 Primary samplers must not be installed in vertical spouts with long drops or sharp-angled turns.

2 The sampler must be located so that all of the grain sampled will be delivered to the carrier. This can be a problem when grain has been sampled, but then a small part of it will not fit in the carrier and is returned to the house or put in a different carrier. This renders the sample non-representative.

a For example, the sampler must not be located above an upper scale garner when loading rail cars. If so, it could result in some grain sampled (the grain in the garner) actually going to the next car in line.

b At barge loading sites the amount of grain retained in a garner or on a section of belt that is sampled but does not get loaded aboard the barge will need to be calculated. If significant, special procedures will need to be developed to clear the system or it cannot be approved.

c For ship sublots, the garner amount effect on the sample is usually insignificant.

(b) “In” movement samplers. Primary samplers should be installed before or immediately after the initial elevation of the commodity. Initial elevation is defined as the first elevation by bucket elevator, pneumatic sucker, drag, paddle, screw conveyor, or other devices. Elevation by marine leg at barge unloading sites is also considered an initial elevation.

(3) If screw or drag conveyors, swivel loaders, belt-type throwers, or air-blast throwers are used to propel the commodity after sampling for outbound inspection or before sampling for inbound inspection, the facility operator shall furnish evidence based on comparison testing that their use does not alter the condition of the commodity.

(4) The secondary sampler must be mounted in a vertical, reasonably-level position and be located as close to the primary sampler as possible. In facilities where this is not practical or in facilities where man lift would be the only means of transporting samples and personnel to and from the sampler, The secondary sampler may be installed at ground level. This does not eliminate the need for a safe means of access to the primary sampler for examination purposes.

(5) The facility primary and secondary sampler location must be free of hazards that may jeopardize the safety of official inspection personnel.

(6) Adequate floor space, as defined by official personnel, must be provided at the proposed sites.

(7) Protection and guards must be provided for floor and bin openings, low beams, spouts, moving belts, and chains.

(8) The sites must be kept clean and free of excessive dust, spilled commodities and refuse. Regular cleaning must be a part of the facility’s maintenance program.

(9) Lighting at the primary sampler installation site must be a minimum intensity of 30 foot-candles to allow thorough examinations of the primary sampler. Where artificial lighting is used, it should be permanently installed rather than portable.

(10) Safe access to the primary sampler site and the sampler shall be provided by passenger elevators, stairs, or approved ladders. Stairs and ladders must meet safety standards (29 CFR 1910.24, .27, etc.) Consult with the Field Office collateral duty safety and health officer (CDSHO) for assistance in applying these standards.

(11) Approved lockout switches must be installed within close physical proximity and visual line of sight to the primary sampling system, and approved lockout procedures shall be used to ensure the safety of personnel examining the primary and secondary sampling systems. Further information can be found in 29 CFR 1910.147, “The control of hazardous energy (lockout).”

(12) The lockout switch must be under the exclusive control of the person examining the equipme nt being locked out. The lockout device such as a padlock must have the ability to totally immobilize the power supply switch, bringing it to a zero energy state. This includes all mechanical, electrical, hydraulic, and pneumatic equipment that may cause the D/T to operate. (Lockout procedures are specified in Chapter 4)

g. Timer Requirements.

(1) Timers may be analog or digital. (Automated systems having timers that reside in programmable controller logic require special evaluation and approval from FGIS headquarters.)

(2) For official use, analog timers do not need and should not have a maximum dial setting greater than 5 minutes, since all required settings are 3 minutes or less. Timers with large maximum settings may have less accuracy in lower ranges.

(3) Precision timing is not required. However, a properly functioning timer must be accurate to approximately ± 1 division; e.g., an Eagle timer of 60 seconds maximum dial setting, marked in 1-second divisions must be accurate ± 1 second at any setting. If not, it must be repaired or replaced.

(4) When the commodity flow rate is 4,000 bushels or less per hour, set the timer at not more than 3 minutes.

(5) When the flow rate is more than 4,000 bushels per hour, set the timer so that the pelican traverses the sampling area each 200 bushels, unless the flow rate lends itself to a larger sampling interval as decided by the inspector in charge, using TableI 1.

(6) Actual flow rate past the sampler is not always equal to the facility estimated load out rate. Use the flow rate of the facility’s predominant grain to figure out the timer setting.

Example: *An elevator has one D/T sampler located under Scale No.1 used to load out hopper cars of corn. The scale holds about 170 bushels, and the discharge takes 15 seconds. This equals 40,000 bushels per hour (bu/hr) going past the sampler. The scale will take another 15 seconds to fill each scale draft, lessening the facility's load out rate to 20,000 bu/hr or less. If the facility is inefficient at moving cars, etc., it may not even load as fast as 20,000 bu/hr, but the timer setting would still be based on 40,000 bu/hr. Referring to Table 1, the timer setting could be either 18, 31 or 45 seconds.*

(7) If the recommended timer setting yields a larger than required, or an insufficient amount of sample in the sample collection box, it may be an indication that the secondary sampler does not offer the appropriate reduction. It may be necessary to repair, replace, or adjust the secondary in this situation.

(8) If needed, the timer can be set to take cuts more frequently than shown in the table, but this is not recommended. Turning up the timer may cause the secondary sampler to back up. Verify by examination that the secondary clears before the next pelican cut delivers more grain. Document the examination and the new timer settings in the file.

(9) Use one timer setting for both testing and official sampling. The system should be used "as tested" unless item (8) applies.

(10) Do not change timer settings for different grains or carriers except as approved and noted on FGIS-998.

(11) Do not change timer settings during official sampling. For example, if 5,000 grams represent the sample from one bin, another similar bin should be represented by 5,000 grams, too. When timer settings are changed, this proportional relationship is lost.

(12) Scale dump counters are not allowed on or in lieu of the timer circuit, due to the fact that a dump counter will not allow cuts to be taken randomly throughout the sampling of a lot.

(13) Energy to the timer circuit should not be interrupted by counters, gate interlocks, or programmable controllers, since the timer will reset to zero and the statistical randomness of sampler cuts will be lost. (Safety lockout switches must disconnect timer circuits and also sampler motor circuits.) Headquarters may grant an exception when circuit interrupts for the sampler motor are needed, if properly justified.

Table 1, Sampler Timer Settings

Flow Rate Past Sampler (bu/hr)	Sampling Rate (Seconds) One cut each:		
	200 bu	350 bu	500 bu
10,000	72		
15,000	48		
20,000	36		
25,000	28	**50**	
30,000	24	**42**	**60**
35,000	20	**36**	**51**
40,000	18	31	**45**
45,000	16	28	**40**
50,000	14	25	36
55,000	13	22	32
60,000	12	21	30
65,000		19	27
70,000		18	25
75,000		16	24
100,000			18
125,000			14
150,000			12
3,600 (s/hr) * 200 (bu) sampling rate / max flow (bu/hr) = timer setting (s)			

h. Mixing and Blending Requirements.

(1) Mixing and blending of the commodity to be sampled must be completed before the commodity reaches the primary sampler. If multiple samplers (more than one conveyor belt or spout) are used, the feed to each must be uniform in kind and quality.

(2) If a sample grade commodity is placed in the shipping bin, a procedure must be developed to ensure that the entire quantity of the sample grade commodity is returned to the facility. A multi-bottomed or windowed shipping bin may cause segregation of the commodity. Therefore, when a sample grade commodity has been loaded into one section, all of the commodity in the sections joined by windows must be returned to the facility.

(3) Lot Integrity Requirements. There must be no provision for adding material (except insecticides) or removing material from the commodity after it has passed the primary sampler. If there are feeders or diversion points between the sampler and the carrier, the points must be closed securely by using locks, seals, or electronic security measures that are under the complete control of the sampling attendant. When security measures include visual monitoring, the monitoring must be continuous-not intermittent.

2.2 POINT-TYPE MECHANICAL SAMPLING SYSTEMS

Point-type mechanical sampling systems are approved only for Group 3 powdered commodities. These commodities are more homogeneous than the other groups and have less particle segregation. They do not use a pelican to completely cross cut the stream of commodity through a spout. Instead, they often use a tube with a hole or slot and an auger delivery system. Specifications for point-type samplers are identical to those for diverter-type samplers except for pelican design and timer settings, which are not applicable.

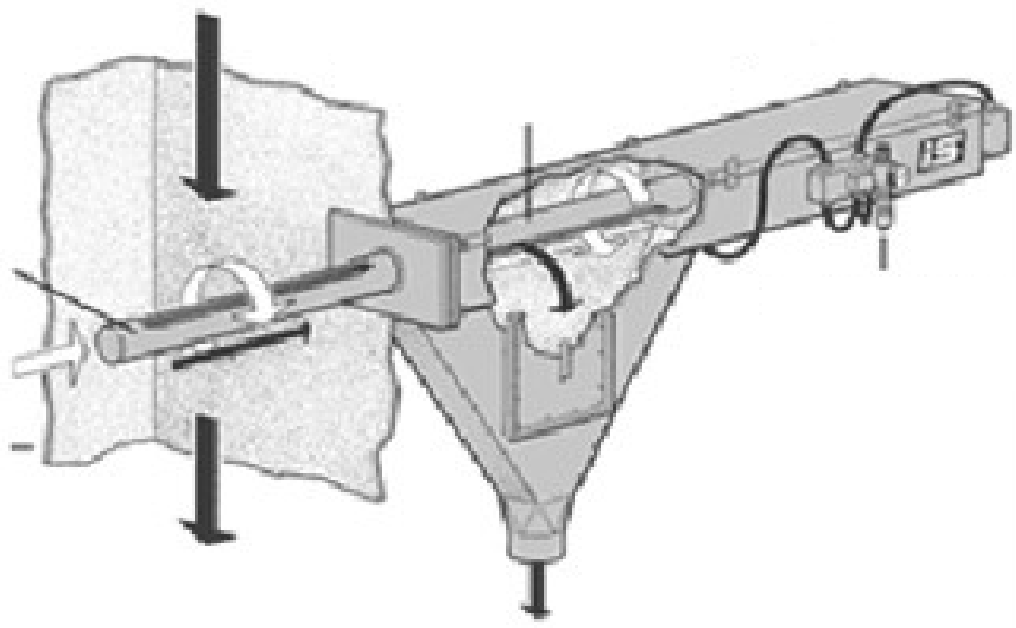

Figure 2. Point-Type Sampler

2.3 PROBE-TYPE MECHANICAL SAMPLERS (TRUCK PROBES)

a. General Requirements.

(1) The model and type of probe-type mechanical sampler must be approved by FGIS. Figure 3 shows the current designs, of which two are approved. In-load suction probes may not be tested or approved. They draw air through the load of grain and vacuum excessive amounts of fine foreign material into the sample.

(2) The system must be authorized for official use based on the tests and examinations specified in Chapter 5.

b. Installation and Site Requirements.

(1) The facility must be free of hazards that jeopardize the safety of official inspection personnel.

(2) The site must be kept clean and free of excessive dust, spilled commodities, and refuse.

(3) The reach of the probe must enable the operator to follow the standard probing patterns and procedures. Normally a truck would not need to be moved more than once to reach all areas of the load.

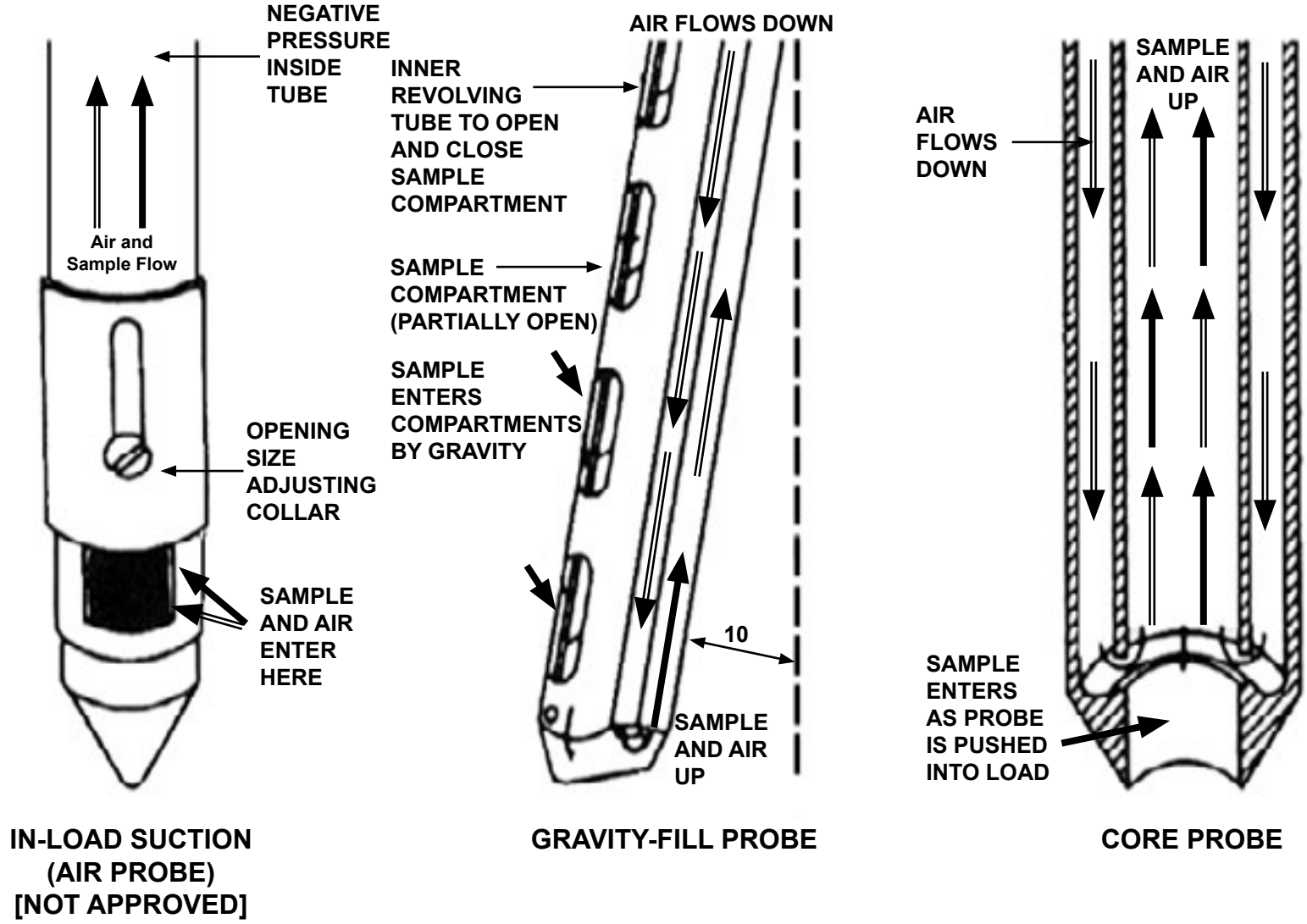

Figure 3. Probe-Type Samplers

(4) The length of the probe should enable the operator to reach the bottom of truck loads that are sampled.

(5) Lockout switches and/or devices must be installed.

c. Installation Procedures. Probe-type mechanical sampling systems must be installed according to the manufacturer's specifications. After testing, secure all adjustable components that affect air flow by use of covers, seals, locks, or electronic security measures.

CHAPTER 3
AUTHORIZATION

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TABLES

FIGURES

3.1 RESPONSIBILITIES

a. Facility Management. The operator of the facility that owns, leases, or operates the mechanical sampling system shall:

(1) Submit a written request letter for authorization of the system.

(2) Prepare and submit all applicable drawings for the proposed site needed for the authorization, photographs may also be accepted. (Figure 4).

(3) Install approved equipment in the correct manner as prescribed by the manufacturer.

(4) Cooperate in examining and testing the system.

(5) Maintain the system in the proper environment and in the proper manner.

(6) Repair the system, when needed.

(7) Sign the authorization indicating agreement with its requirements.

(8) Notify the testing office, in writing, (official agency or FGIS Field Office, as applicable) when:

(a) Any physical changes in equipment or facility operations (such as flow rate, added dust collection) occur that may affect the flow to, through, or after the sampling system.

(b) Alterations to the system are planned (any type).

(c) The system will no longer be used for official inspection work.

(d) The facility will not be operational for more than 6 months.

b. Testing Office. The official agency or FGIS Field Office that will use the mechanical sampling system for official inspection service must ensure that the system provides a representative sample. This is an essential function. These offices shall:

(1) Examine the proposed site and determine whether it conforms with the requirements for installation and use of the sampling system. Document problem areas and review them with the facility management.

(2) Complete FGIS-998, “Questionnaire for Proposed Diverter-Type Mechanical Sampler” (Figure 5) or provide a complete questionnaire on the proposed site and system including usage information, location, loading or unloading rate, name of owner, material to be sampled, etc.

(3) Review the site and installation drawings for accuracy. Sign and date the drawings if they accurately represent the system as installed.

(4) At export port locations, do monthly sampler checks (minimum frequency). See Chapter 4.

(5) Perform initial, periodic (minimum every 6 months), and supplemental examinations of the site and sampling system.

(6) Perform initial, periodic, and supplemental testing, as necessary, to determine system accuracy, when first installed or modified.

(7) Notify the FGIS Field Office of any condition that may warrant formal suspension of an authorization.

(8) Perform the following record keeping for each system:

(a) Prepare FGIS-936, “Sampler Condition Report” for each series of examinations and tests performed according to items 5 and 6, above.

(b) Forward the original copy of the written request, drawing, FGIS-998, and a copy of the FGIS-936 to the supervising FGIS Feld Office (when an FGIS Field Office is the testing office, this material shall be maintained in a permanent file.)

(c) Maintain the following records:

1 A copy of the request for authorization, drawings of the site and installation drawings provided by the manufacturer showing necessary dimensions, flow rates, belt speeds, etc.

2 A copy of the completed FGIS-998 for proposed diverter-type, probe-type, or point-type mechanical sampler installation.

3 A copy of the completed FGIS-980, “Authorization to Use Mechanical Sampler for Sampling.”

4 The original copy of all FGIS-936’s issued within the last 5 years.

c. FGIS Field Office. The FGIS Field Office that supervises the testing office (or sometimes is the testing office) shall:

(1) Provide supervision and assistance to the testing office.

(2) Provide data for the national database.

(3) Prepare and execute (or finalize) FGIS-980 after the initial, successful test of the sampler has been completed.

(4) Prepare and execute (or finalize) revised FGIS-980 for changes in ownership, equipment, agency, etc.

(5) Formally suspend or cancel authorizations, in writing, when warranted.

(6) Maintain the following records on each sampler in the Field Office's circuit:

(a) The original copy of the request for authorization, drawings of the site and installation drawings provided by the manufacturer showing necessary dimensions, flow rates, belt speeds, etc.

(b) The original copy of the completed FGIS-998 for proposed diverter-type, probe-type or point-type mechanical sampler installation.

(c) The original of the completed FGIS-980.

d. FGIS Headquarters or the designated Field Office in charge of the mechanical sampler testing program shall:

(1) Evaluate and grant or deny approval of prototype mechanical sampling equipment and systems.

(2) Provide technical support to FGIS Field Offices.

(3) Maintain a national database updated annually, showing basic information for each official mechanical sampling system, such as: SAMPLER MODEL IDENTIFICATION, ELEVATOR, LOCATION, AGENCY, FIELD OFFICE.

e. FGIS Technology and Science Division. The Technology and Science Division shall provide statistical analysis of mechanical truck probe testing data.

3.2 REQUEST FOR INFORMATION

Facility operators interested in installing a new, or updating/modifying an existing mechanical sampling system being used for official inspection purposes must contact the local FGIS Field Office for information and assistance. Inquiries should be made through the official agency when the area is served by an official agency.

3.3 REQUEST FOR AUTHORIZATION

a. Preparation of Request. The operator of the facility should request authorization of a proposed mechanical sampling system in writing and include a copy of the installation drawing(s) provided by the manufacturer and a complete description, by model and type of equipment, of the sampling system including a drawing or sketch of the proposed system. The drawing must show the proposed sampling system (See Figure 4.) in relation to the following items, as applicable (distances to be shown in feet or meters):

(1) Scales, scale hoppers and surge bins.

(2) Dump pits.

(3) Elevating legs and conveyors.

(4) Cleaning and shipping bins.

(5) Loading and/or receiving spouts and belts.

(6) Official inspection laboratory and/or sample collection box location.

(7) Dust collection near the sampler.

(8) Sampler access and lockout switch.

b. Distribution of Request. The facility must send the request, with drawings, to the official agency or FGIS Field Office that provides original inspection service to the specified service point in which the facility is located (the testing office).

c. Response to Request.

(1) Upon receipt of the request, the testing office shall promptly examine the site proposal for the sampling system to determine if the site and the arrangement of the sampling equipment conforms with the basic requirements for the installation of mechanical sampling systems. If they do not, the testing office must document and review the problem areas with the facility operator.

(2) Promptly after that, the testing office shall complete FGIS-998. Then, the testing office shall send to the FGIS Field Office manager, the written request, drawings and installation data, and the completed FGIS-998 showing needed changes. The testing office shall end a copy of the completed form to the facility operator.

(3) After reviewing the written request, the drawing and the completed FGIS-998, the FGIS Field Office in charge of the specified service point at which the sampling system is located shall determine if the system meets all requirements (See Chapter 2.) If so, FGIS shall direct the testing office to do an examination and test. When the system does not comply with all authorization requirements, the testing office will be instructed to review the problem areas with the facility management.

3.4 ISSUANCE OF AUTHORIZATION

a. Granting of Authorization. Upon completion of a successful check test, the FGIS Field Office shall prepare and issue (or finalize) FGIS-980, “Authorization to Use Mechanical Sampler for Sampling” (Figure 6).

(1) The authorization is an agreement among representatives of the facility where the sampling system is installed, the testing office, the FGIS Field Office, and any other persons or firms that may be directly involved.

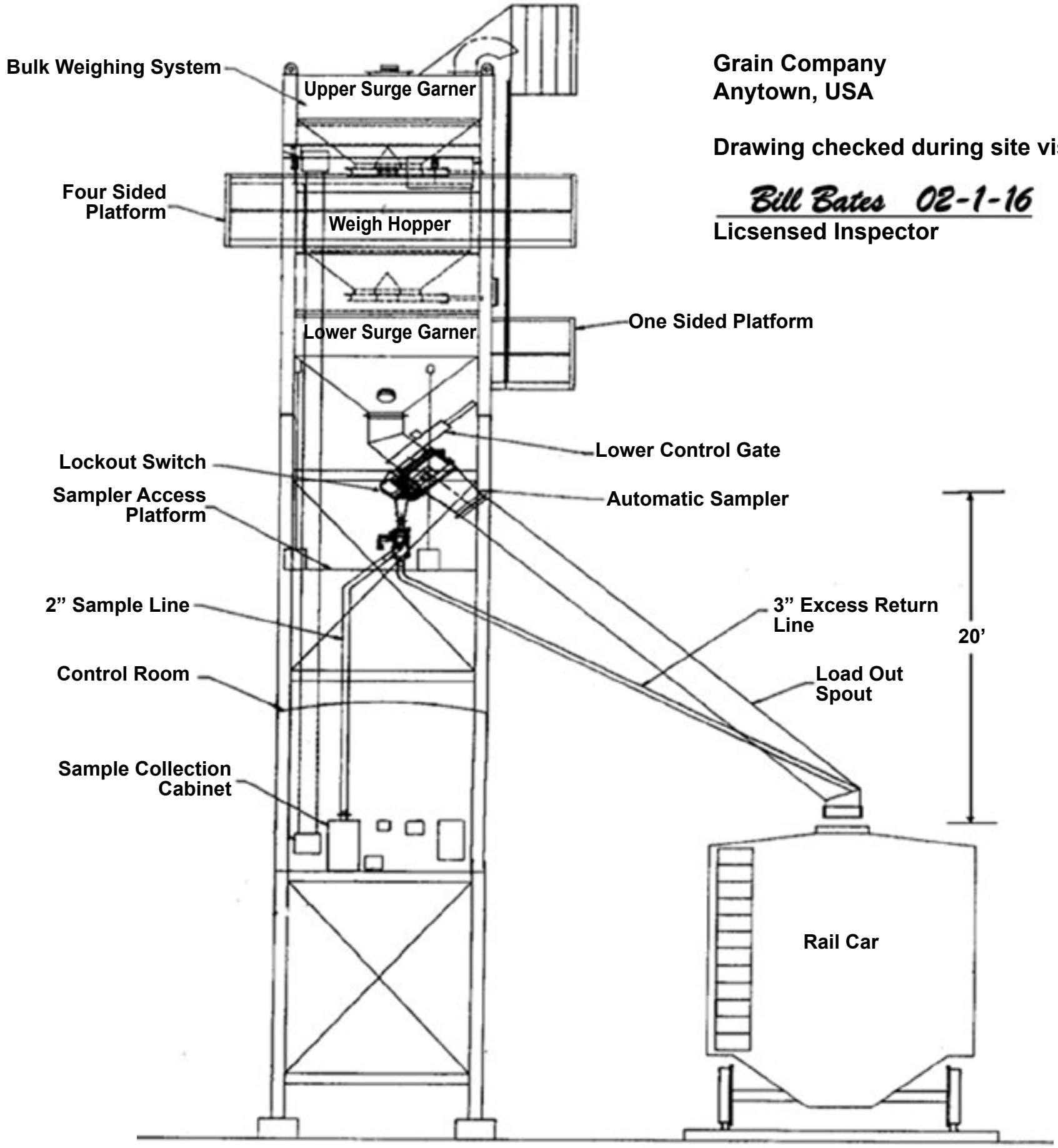
(2) The agreement says that the sampler shall be installed, serviced, operated, and maintained following existing regulations.

NOTE: D/T power supply lockout switch compliance requirements for sampling system authorization.

Within the official system there are D/T samplers authorized for use that do not meet the D/T sampler power supply lockout requirement of being within close physical proximity and visual line of site to the primary sampling system. FGIS will require elevators with those D/T samplers make the necessary modifications to be compliant.

FGIS realizes that elevators must be given an adequate amount of time to come into compliance. Accordingly, FGIS is requiring all D/T samplers within the official system to be compliant on or before January 1, 2020.

To verify compliance, official agency personnel will verify the accuracy of elevator sampling system site diagrams and verify the existence and the location of the power supply lockout device during the periodic examination of D/T samplers within their respective areas. If a D/T sampler is determined to be non-compliant the official agency will inform the elevator manager in writing. The elevator must ensure compliance by January 1, 2020. If not, FGIS will suspend authorization of the non-compliant D/T sampler.



Grain Company
Anytown, USA

Drawing checked during site visit

Bill Bates 02-1-16
Licsensed Inspector

FIGURE 3.1 - DIVERTER-TYPE SAMPLER SITE DRAWING

U.S. Department of Agriculture

Grain Inspection, Packers and Stockyards Administration

QUESTIONNAIRE FOR PROPOSED DIVERTER-TYPE MECHANICAL SAMPLER

OMB APPROVED NO. 0580-0013

Public reporting burden for this collection of information is estimated to average 1hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspects of this collection of information, including suggestions for reducing the burden, to Department of Agriculture, Clearance Officer, OIRM, AG Box 7630, Washington, DC 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20250-7630.

Facility Name, City, State 1

Field Office 2

Kind of Elevator ☐ Country ☐ Terminal 3 ☐ Export

Capacity 4

Authorization Code - Circle Appropriate Numbers

D Diverter N Non-diverter P Probe 0 All Grains 1 Small Grains 2 Coarse Grains - Nut Corn 5

3 In 4 Out 5 Cargo 6 Barges 7 Hopper Cars 8 Carlots 9 Trucks

D/T Make and Model 6	S/N 7	☐ Spout 8 ☐ Belt	Spout / Belt Size 9
General Location 10	Spout / Belt Name 11	Spout / Belt Angle 12	Belt Speed 13
Power: ☐ Air 14 ☐ Electric	Body Dimensions 15	Pelican Stroke 16	Pelican Opening L x W 17
Grain Drop Before Sampler 18 (ft)	Grain Drop After Sampler 19 (ft)	Access Safe ☐ Yes 20 ☐ No	Inspection Door OK? ☐ Yes 21 ☐ No
Verified No Auxiliary Controls ☐ Yes 22 ☐ No	Location of Lockout OK? ☐ Yes 23 ☐ No	Lights OK for Exams? ☐ Yes 24 ☐ No	
Is Pelican Movement Steady? ☐ Yes 25 ☐ No	Does Pressure Return Promptly? ☐ Yes 26 ☐ No	Air Pressure at Rest PSI 27	
Timer Make and Model 28	Grain Flow Rate Past Sampler 29	Calculated Timer Setting 30 (s)	
Secondary Make and Model 31	S/N 32	Delivery System ☐ Gravity 33 ☐ Pneumatic	Grams per Sample 34
Total No. of Samples 35	Quantity Adjustment Sealed? ☐ Yes 36 ☐ No	Delivery and Collection Box Secur ☐ Yes 37 ☐ No	Excess Returned to Lot? ☐ Yes 38 ☐ No

Dust Control Locations 39

Weights: ☐ GIPSA Class X 40 ☐ GIPSA Class Y ☐ Certified ☐ Other _____

Number of Shipping Bins: 41	Depth 42 (ft)	Graded ☐ Before or ☐ After Release? 43	Procedures to Stop Breakage: 44

Carrier I.D. by: 45 ☐ Radio ☐ Visual ☐ Other _____

Remarks/special restrictions when used to sample officially: 46

Signature of Official Personnel: 47 Date: 48

FORM FGIS-998 (11/94) *Previous Editions Obsolete*

Figure 3.2 - FGIS 998, 'QUESTIONNAIRE FOR PROPOSED DIVERTER-TYPE MECHANICAL SAMPLER"

DIRECTIONS FOR COMPLETING QUESTIONNAIRE

1. Facility name, city, and state.
2. Name of FGIS Field Office.
3. Check the box indicating kind of elevator.
4. Storage capacity of elevator.
5. Authorization Code-circle the numbers that apply to the intended sampler use.
6. Sampler Make & Model; e.g., Gamet 6800S.
7. Sampler Serial Number.
8. Is the sampler in a spout or on a belt end? For spout samplers-diameter or length x width cross sectional measurements.
9. Belt Size-width and depth of grain carried.
10. General location of sampler; e.g., Headhouse 6th Floor; or Gallery.
11. Spout/belt name; e.g., Scale #1 lower garner.
12. Spout angle-90_ is vertical. Belt Angle-0_ is horizontal. Show normal angle and max/min limits of travel, if angle can be varied.
13. Belt speed-measure with belt loaded.
14. Check the box showing type of power.
15. Body dimensions for the sampler.
16. Pelican stroke is the distance traveled from one side to the other.
17. Length and width of the pelican opening.
18. Distance in feet from release point.
19. Distance grain falls is used to estimate impact and breakage. For example, measure from sampler to bin bottom.
20. Is access to the sampler by approved ladder or stairs, and does the platform have an approved railing?
21. Are the inspection doors properly located on the sampler? Do they have appropriate seal hasps and hinges?
22. Check verified after you determine that the system controls have no bypasses, dump counters, timer interrupts, or programmable controllers.
23. Location of lockout ok-does the lockout provided meet FGIS requirements?
24. Light for examinations-can all exterior examination checks be made with lighting supplied?
25. For pneumatic/hydraulic samplers-is pressure sufficient to move the pelican across the stream of grain evenly, without lagging or slowing down.
26. For pneumatic/hydraulic samplers-pressure returns to maximum before next cut is initiated.
27. For pneumatic samplers-gauge pressure at rest. Maximum reached when no cuts are initiated.
28. Timer Make & Model; e.g., Eagle HP5 Model 9.
29. Flow past sampler should be figured out by timing a known amount, such as one scale draft, as it passes the sampler.
30. Calculate the timer setting in seconds based on grain flow rate past sampler. Also show whether this is based on a 200, 350, or 500 bushel sampling rate.
31. Secondary Sampler (divider) Make & Model; e.g., InterSystems MD300.
32. Secondary Sampler Serial Number.
33. Check box indicating type of sample delivery system.

34. Weight in grams received for the official sample.
35. Total number of samples needed for all interested parties.
36. Are the quantity adjustment features on secondary sampler fixed or sealed in place?
37. Is the sample delivery system secure from the air inlet to the collection box?
38. Is excess grain automatically returned from the secondary to the lot from which the sample was taken?
39. Location of dust collection ducts-are they located where they can affect the sample constituents? The measurements will serve as a record of approved duct work.
40. Weights-are weights official; i.e., supervised under the USGSA as Class X or Y-are weights “Certified”; i.e., supervised unofficially by a local organization-or are weights unofficial and not supervised, or not provided?
41. Shipping bins-number used.
42. Shipping bin depth(s).
43. Grading-will bin be held for grade or factor results before being released?
44. Procedures to stop breakage-will the bins require use of cushion level indicators, grain ladders, or baffles to reduce impact of grain and resulting breakage?
45. Carrier identification or stowage locations.
46. Special restrictions-any special procedural restrictions; e.g., weighback belt must be sealed, turnhead must be locked in position, cushion must be maintained in shipping bin, etc.
47. Name or signature of the official personnel who filled out the questionnaire.
48. Date information obtained.

b. Distribution of FGIS-980.

The FGIS Field Office will distribute copies of the FGIS-980 to each person who has signed the authorization. A certificate is not issued for the authorization of a sampling system.

TABLE 3.1 - SUMMARY OF DISTRIBUTION AND RECORD KEEPING

Office	Prepares	Files Original	Files Copy
Facility	Approval Request Letter and Site Drawings		
Testing Office[1]	FGIS–998 FGIS–936	FGIS–936 (except initial)	Request Letter Site Drawings FGIS–998 FGIS–936 (initial) FGIS–980
Field Office	FGIS–980	Request Letter Site Drawings FGIS–998 FGIS–936 (initial) FGIS–980	Final Approval
Headquarters			

[1] When the Field Office is also the testing office, retain all original records.

3.5 SUSPENSION OF AUTHORIZATION

a. Causes for Suspension. The sampling attendant or testing office must stop use of the mechanical sampling system when there are causes for suspension. If the causes are not corrected in a timely manner, notify the FGIS Field Office in charge so FGIS can suspend the authorization in writing. Suspend the authorization if the sampling system is:

(1) Out of repair;

(2) Found with security seals broken or locks removed without explanation[2];

(3) Altered, without being granted prior approval for the alteration;

(4) Not maintained according to the established procedures;

(5) Not able to be examined or tested when due;

[2] Unauthorized seal breakage or lock removal can cause increased cost to industry. A controlled point caution label or tag may be used on sampler inspection doors, but do not use the label itself as a sealing device. Use the caution label/tag only in conjunction with a metal seal or lock. See Figure 7 for examples of approved designs for "Controlled Point Caution Labels and Tags."

(6) Examined and found to have one or more unsatisfactory items;

(7) Tested and found out of tolerance; or

(8) Of questionable accuracy or representativeness for any reason, such as deficiencies noted by the sampling attendant.

b. Procedure for Suspending an Authorization. To suspend an authorization, FGIS notifies facility management in writing that their authorization is suspended (See Figure 8.) and prepares a written report of the action, including all pertinent facts. File and maintain the documentation with the system's FGIS-980.

c. Cause for Cancellation and Procedure for Canceling an Authorization. At the discretion of the FGIS Field Office in charge, an authorization may be canceled if the system has been suspended for more than 6 months. To cancel an authorization, FGIS notifies facility management in writing that their authorization is canceled and prepares a written report of the action, including all pertinent facts. File and maintain the report with the system's FGIS-980.

d. Reinstatement. FGIS shall reinstate suspended sampling systems upon satisfactory completion of all necessary repairs or reactivation of the facility and a satisfactory examination (or test) of the system by the testing office. The completed FGIS-936 will serve as a record of the reinstatement.

United States Department of Agriculture
Federal Grain Inspection Service

AUTHORIZATION TO USE MECHANICAL SAMPLER FOR SAMPLING

Installed in: (Name of facility)	Mechanical Sampler Make & Model	Serial Number
City and State	Secondary Sampler (Divider) Make & Model	Serial Number

Commodity to be sampled:

All Grains ☐ (Groups 1 & 2) Coarse Grains ☐ Except Corn Small Grains ☐ (Group 1) Powders ☐ (Group 3)

Subject to the conditions listed below, authorization is issued to official inspection personnel to use the mechanical sampler for the official sampling of the commodities as indicated above. All interested parties shall be notified by FGIS when the authorization has been suspended or cancelled.

1. Facility management shall service and maintain the mechanical samplers in accordance with existing regulations and instructions under the U.S. Grain Standards Act and the Agricultural Marketing Act of 1946.

2. Official personnel shall make daily or more frequent spot checks, when the samplers are in use for official sampling, to determine that the mechanical samplers are being serviced, operated, and maintained in an approved manner.

3. The mechanical samplers shall be secured or constantly manned by official personnel when they are used for official sampling.

4. All quantities in excess of the amounts required for the official inspection shall be returned to the carrier or the stream of grain or other commodity being sampled.

5. No changes in structure, accessories, location or operation of the mechanical samplers shall be made without specific written authorization from the FGIS Field Office Manager.

6. No manipulation of the commodities to be sampled or other efforts shall be made which would result in the above mechanical samplers failing to obtain and deliver a correct and representative sample.

7. The elevator manager acknowledges personal responsibility for the correct installation of the mechanical samplers.

8. This shall be signed by the manager or superintendent of the facility on behalf or the company that operates the elevator or plant in which the mechanical samplers are installed, and by the Agency or Field Office Manager whose personnel will attend the sampler.

9. The authorization shall be automatically suspended for noncompliance with any of the above conditions; but may be reinstated when corrective action has been taken and approved by the Field Office Manager.

_____ _____
Name of Facility Facility Manager Signature

_____ _____
Date Location

_____ _____
Official Agency Agency Manager Signature

_____ _____
Date Location Authorization Approved - USDA

_____ _____ _____
Date Field Office Location Field Office Manager Signature

Form FGIS-980 (4-94) Authorization Code: _____

FIGURE 3.3 - FGIS-980

FIGURE 3.4 - CONTROLLED POINT CAUTION LABEL AND TAG

United States
Department of
Agriculture

Grain Inspection,
Packers and Stockyards
Administration

104 Campus Drive, Suite 200
P.O. Box 640
Destrehan, LA 70047

March 1, 2016

Grain Company
Anytown, USA

Dear Sir:

According to information which this office recently received, your diverter-type mechanical sampler, serial № G-7335 was not examined on schedule by the official agency in your area, due to your facility being temporarily closed for maintenance.

Therefore, as of this date, the authorization to use the mechanical sampler identified above for official inspection purposes is suspended. If you need the authorization reinstated at a future date, please contact the official agency.

Sincerely,

Field Office Manager

cc: Official Agency

FIGURE 3.5 - EXAMPLE OF SUSPENSION LETTER

CHAPTER 4
EXAMINATIONS

Contents

4.1 MONTHLY CHECKS AT EXPORT PORT LOCATIONS

Once a month (at a minimum) Licensed or authorized personnel must do a general condition and security check of all diverter-type samplers at export locations.

a. Examine the site for unauthorized modifications, such as unauthorized diversion points or alterations to the dust collection equipment.

b. Stop the sampler with the pelican positioned so it can be inspected and gauged. This may be mid-spout or parked at the side, depending on the location of the inspection door.

c. Follow lockout procedures on Page 4-4.

d. Record seal or lock identification numbers. Open the primary and secondary sampler inspection doors.

e. Examine the pelican for damage. Use the go-no-go gauge to check for the correct pelican opening (¾ to ⅞ inch.) using all applicable safety protocols.

f. Check that the dust seals are undamaged.

g. Check for objects stuck in the pelican opening or body.

h. Check the secondary sampler and delivery tube for plugs and check the secondary sampler feed adjustment plates for any sign of tampering.

i. Release the equipment from lockout using procedures on Page 4-4.

j. Using the panel controls, energize the sampler to allow the pelican to come to rest under the left dust seal. Turn off power. Open the inspection door. Do not place your hands or any tools into the sampler.

k. Visually find out if the pelican fits against the dust seal. Repeat for the right dust seal.

l. Reseal or lock the inspection plates, record the seal or lock identification numbers. Record the results of the monthly check in a logbook; include the date and your name or initials. When a 6-month condition examination is performed instead of the monthly check, write, “See 6-month condition examination file for (month) check results.” in the logbook. Maintain the log book at the work site, under control of official personnel.

m. If physical or mechanical problems (e.g., torn dust seals, bent pelican) are observed, do not use the sampler until the problems have been corrected. Inform your supervisor and elevator management. Document the problem, repairs, and all subsequent activities.

4.2 INITIAL EXAMINATION

Immediately before the first test, thoroughly examine the sampling system and its immediate area and record the condition on the front page of FGIS-936, “Sampler Condition Report.” The examination shall encompass all items listed on the FGIS-936 and any other items deemed necessary by the testing office. Sampling systems found to have one or more unsatisfactory items shall not be authorized.

4.3 PERIODIC EXAMINATION

a. Periodically, examine the sampling system and its immediate area thoroughly and record the condition on FGIS-936. The examination shall encompass all items listed on the FGIS-936 and any other items deemed necessary by the testing office. A sampling system that fails a periodic examination may also be required to be retested before its authorization is reinstated. If a mechanical sampling system is not being used when it is due for examination or testing, it may be delayed until the system is again being used. Unless the facility is seasonal, a formal suspension may be required if necessary to ensure the system is not used officially.

b. Reexamine diverter-type, probe-type and point-type sampling systems at least once every 6 months, regardless of the type of facility where located. Calculate the period starting from the first day of the next calendar month after the examination.

4.4 SUPPLEMENTAL EXAMINATION

a. When official inspection personnel find auxiliary samples or other information that shows the sampling system to be of questionable accuracy, the testing office must examine and test the system (for example, noticeable variations between the quality of the grain and the sample, significant differences between samples of the same lot drawn at the same time by different primary samplers, or inexplicable variations between origin and destination inspections). When performing the test and the first test lot is found within tolerance, no additional tests are required. If the first test lot is not within tolerance, test four additional lots and average the results of the five test lots to learn if the system is in tolerance. When origin and destination are involved in grade differences that suggest sampling problems, headquarters must arrange to test both samplers.

b. If repairs are made, the testing office must examine the system and decide whether a test is necessary to ensure that the system’s accuracy has not been affected. A simple replacement of parts with equivalent pieces of equipment may require only an examination; a major repair or replacement of the primary or secondary sampler requires testing with five test lots.

c. After a system has been altered by addition, deletion, or relocation of primary samplers, secondary samplers, and/or sample delivery equipment, the testing office must test the system using five test lots.

d. Diverter-type sampling systems are designed to function at the maximum flow rate specified by the facility at the time of installation. Facilities increasing commodity flow rates, by changing the handling equipment, may exceed the capacity of the sampling system. When sampling systems are being used in locations where commodity flow rates have been increased after installation and original authorization, the testing office must examine and test the system using one test lot.

e. If a commodity handling system is upgraded by either the addition of dust collection units or by operating the existing dust collection units with increased airflow (on or near the mechanical sampler), the testing office must examine and test the system (one test lot).

4.5 LOCKOUT PROCEDURES

Each office must develop, document and utilize specific written lockout procedures for each mechanical sampler. The procedures should be based upon the requirements contained in 29 CFR 1910.147, the control of hazardous energy sources (lockout), and the following example.

NOTE: The lockout controls must be in close physical proximity and visual reference from the primary sampling system access panel. The lockout switch must also have the ability to be locked by official personnel when examining the system.

This procedure establishes minimum requirements for lockout of mechanical samplers before employees perform any inspection or maintenance activities where the unexpected energization, start-up, or release of stored energy could cause injury. Types and magnitudes of energy are mechanical movement of pelican, movement of grain, electricity-120/240 volts, and air pressure-100 psi.

Procedural Steps.

1. Notify facility management. Determine the types of energy to be controlled and their sources. Most primary samplers have a timer circuit and a separate motor circuit. Pneumatic or hydraulic sources may need to be disconnected.

2. Shutdown. Shut the system down using its operating controls. These are the controls we use on a daily basis such as the on-off switches located on the front panels, etc.

3. Isolation. Operate the energy isolating devices so that the equipment is isolated from its energy sources.

4. Lockout. Apply lock(s) and properly filled out tag.

5. Stored energy. Remove stored energy from the equipment. This may require bleeding down air pressure, blocking, or bracing parts, and closing gates.

6. Verification. Make sure that everyone is clear of the equipment. Try using the operating controls (on-off switch) to verify that the equipment has been successfully de-energized and locked out. Return the controls to "off."

Figure 9. Example of a Lockout Procedure

4.6 REMOVING LOCKOUT

a. Make sure the sampling equipment is in a safe operating condition.

b. Notify and make sure everyone is clear of the equipment.

c. Except in the case of an emergency, only the person who applied a lockout is authorized to remove it.

d. Follow the local facility safety protocols regarding the return of locks and tags.

OMB NO.: 0580-0013

U.S. DEPARTMENT OF AGRICULTURE (See reverse)
GRAIN INSPECTION, PACKERS AND STOCKYARDS ADMINISTRATION
FEDERAL GRAIN INSPECTION SERVICE

SAMPLER CONDITION REPORT

NAME OF ELEVATOR, CITY, AND STATE 1	DATE EXAMINED 2	FIELD OFFICE 3
	NAME OF OFFICIAL AGENCY 4	

*INSTRUCTIONS TO EXAMINER: For a six month examination fill out the front of this form. For a complete grain test, including initial sampler test, fill out both sides of this form and send the original to the FGIS Field Office. Explain "FAIL" items in detail. If the sampler is not being used, indicate that fact under "Remarks" and prepare a report before the sampler is put into use.

PRIMARY SAMPLER		SECONDARY SAMPLERS	
BRAND/MODEL 5	SERIAL NO. 6	BRAND/MODEL 7	SERIAL NO. 8
GRAIN FLOW RATE (Pneu. Samplers) 9	SAMPLING INTERVAL (Cycle Time) 10	BRAND/MODEL	SERIAL NO.

SAMPLER CODE: ☐ D - Diverter ☐ P - Probe ☐ 0 - All Grains ☐ 1 - Small Grains ☐ 2 - Coarse Grains-not corn ☐ 3 - IN Inspections
☐ 4 - OUT Inspections 11 ☐ 5 - Cargolets ☐ 6 - Bargelets ☐ 7 - Hopper Cablets ☐ 8 - Cablets ☐ 9 - Truddels

SECTION 1 — ALL SAMPLERS			SECTION 2 — DVT SAMPLERS		
ITEMS EXAMINED	PASS	FAIL	ITEMS EXAMINED	PASS	FAIL
Lighting around sampler 12	☐	☐	Pelican speed approx. 0.5 m/s 27	☐	☐
Safe access to areas 13	☐	☐	Pelican dust seals (interior) 28	☐	☐
Safe access to inside of devices 14	☐	☐	Pelican go-no-go gauge 29	☐	☐
Lockouts (safety switches) 15	☐	☐	Pelican cuts entire grain stream 30	☐	☐
Cleanliness of area 16	☐	☐	Condition of excess sample return leg / belt 31	☐	☐
Cleanliness of device 17	☐	☐	Timer set correctly 32	☐	☐
Lubrication (if required) 18	☐	☐	SECTION 3 — TRUCK PROBES		
Panel board indicator lights 19	☐	☐	ITEMS EXAMINED	PASS	FAIL
Air or hydraulic pressure 20	☐	☐	Tip not bent/damaged 33	☐	☐
Delivery tube secure 21	☐	☐	Tip vacuum check with paper 34	☐	☐
Delivery tube air inlet secure 22	☐	☐	Hydraulic oil level OK 35	☐	☐
Collection box secure 23	☐	☐	Vacuum adjustments sealed 36	☐	☐
Collection box screen clean 24	☐	☐	Sample size 37	☐	☐
Sampler not modified or repaired 25	☐	☐	Collection box seal 38	☐	☐
Seals/padlocks in place 26	☐	☐	Delivery tube condition 39	☐	☐
Inspected By: (LI or ACC) 41			Vacuum pressure if known: 40		
Reviewed By: (ACG) 42					

Form FGIS-936 (5-03) Previous editions are obsolete.

Figure 10. FGIS-936, "Sampler Condition Report," (Front)

INSTRUCTIONS FOR COMPLETING FGIS-936 "SAMPLER CONDITION REPORT", (Front)[3]

1. Name of the elevator, city, and state.
2. Date examination was done.
3. Name of FGIS Field Office in charge of the circuit.
4. Name of the official agency that does original inspections at the facility.
5. Brand name and type of primary (diverter-type sampler) or probe-type sampler being examined and tested. Are they of a type approved by FGIS?
6. Serial number of primary diverter-type or probe-type sampler.
7. Brand name of secondary sampler.
8. Serial number of secondary sampler.
9. Calculate the maximum flow of spout or belt on which the sampler is installed.
10. Sampling Interval-Read from the timer.
11. Type of carriers or lots the system will sample.

Section 1 – All Samplers

12. Lighting should be approximately 30 footcandle power (general task lighting).
13. Safe access includes approved stairs, fixed ladders, platforms, and railings.
14. Safe access to the inside of the housing or hood without endangering the examiner.
15. Lockout switches must be present and meet requirements.
16. Cleanliness of the area-overhead, floor, stairs.
17. Cleanliness/condition of primary-check for plugs, leaks, dust, sprouted grain, broken hasps/hinges, wiring.
18. Lubrication-Grease or oil leaks.
19. Panel lights-Use radio or phone (if needed) to ensure that the power and traverse lights work properly. Have any changes been made in the wiring?
20. Air or hydraulic pressure-Is there enough? Record the gage pressure, if available.
21. Delivery tube must be secure from loss or introduction of material.
22. Delivery tube-Pneumatic systems must have a guard over the air supply inlet.
23. Collection box-If not continuously attended, must be secure at inlet and outlet.
24. Collection boxes that have a screen must be maintained in a clean condition.
25. Sampler not Modified-For this check, good installation records are essential.
26. Seals-Were the security seals on inspection doors found intact? Was the delivery tube found secure?

[3] **The reverse of FGIS-936 is used for performing a test (grain test). Instructions for completing the reverseare contained in Chapter 5, Tests.**

Section 2 – D/T Samplers

27. Pelican speed must be consistent and without hesitation (Speed can be estimated).
28. Pelican dust seals-Must be present, without damage, and must completely seal-the opening of the pelican, without the presence of any air gaps.
29. Pelican Go-no-go Gauge-Use it to ensure the opening is between 3/4 and 7/8 inch wide along its entire length.
30. Pelican must cut through the entire grain stream-If practical, observe a cut to see that the pelican is sampling the entire stream, and that it does not back up from excess grain.
31. Condition of excess sample return-Check if it is leaking, infested, or backing up.
32. Timer-Does the timer setting match the documented setting (required). Use a stopwatch or read the timer; do not rely on posted signs or old records.

Section 3 – Truck Probes

33. Probe tip must be in good condition.
34. For core-type probes, a small piece of paper is placed over the tip to check the air supply/vacuum balance. The paper should not fall off or be sucked into the tip.
35. Check levels if possible.
36. After adjustment, air supply/vacuum balance should not be changed. If it is possible to seal them or record settings, this provides assurance that they remain correctly adjusted.
37. Is the sample size adequate? Has it changed?
38. If the collection box has a gasket, is it in good condition with no air leaks.
39. Is the delivery tube in good condition.
40. If an air pressure gage reading is available, it can indicate leaks or the need for adjustment.

Name of Inspector

41. Show the name of the inspector who completed the examination. If any item is unsatisfactory, the sampler is not acceptable. Keep the not acceptable FGIS-936 as a record. Even if the facility brings the sampler into compliance immediately, complete another form.
42. An ACG should review the forms for accuracy when possible. Any questionable information or remarks must be verified to be accurate.

CHAPTER 5
TESTS

Contents

TABLES

FIGURES

5.1 DIVERTER-TYPE SAMPLER TESTS

a. General. Examine[4] and test[5] a new diverter-type sampling system before issuing an authorization for official use. Thereafter, test all systems after any major repairs and alterations, and before an authorization suspended more than 6 months for non-use is reinstated. Perform all tests and examinations according to the procedures established in this chapter.

b. Test Theory. We assume a mechanical sampler examined visually and functioning properly will obtain a representative sample. Therefore, the test is not an accuracy test for the sampler, but a performance test of the entire mechanical sampling system together with the material handling system. The test shows:

(1) Is there grain breakage after the sampler location, as it passes through scales, garners, or bins?

(2) What is the quantity of sample obtained?

(3) Does the sampler cut the entire grain stream?

(4) Is the grain flow past the sampler smooth?

(5) Does the secondary back up at the required timer setting?

(6) Is pressure venting adequate for spouting?

(7) Is dust collection needed and is air flow properly balanced?

c. Initial Test. Examine and test the sampling system before issuing FGIS-980, “Authorization to Use Mechanical Sampler for Sampling.” Sample five test lots of the commodity(ies) using the sampling system and using the standard sampling method. When possible, test systems as used. Evaluate the different flow rates, belt angles, belt speeds, bins, and other variable features of the grain handling system and, if necessary, do grain comparison tests to ensure that the system is accurate when various features are used.

[4] By visually checking the condition of various aspects of the system.

[5] By comparing samples drawn by the mechanical sampling system to samples drawn from the same lot(s) by a “standard” system.

(1) Group 1 and 2 Approval.

(a) Unlimited Approval. The sampling system may be authorized for all commodities in groups 1 and 2 (See Table III) without further testing, if satisfactory results are obtained by testing the system with corn. Use corn containing a maximum 15.5 percent moisture and from 2.0 to 5.0 percent broken corn and foreign material (BCFM) for testing purposes. FGIS Field Office managers have the authority to allow more or less BCFM in the test lots, for good reason only, documented on the test form.

(b) Limited Approval. If unlimited approval is not needed, the system may be authorized for either group 1 and/or group 2 commodities, except corn, by obtaining satisfactory results with one grain in each group:

1 Use a commodity containing a machine-separable factor such as, thin kernels, shrunken and broken kernels, broken kernels (milled rice or brown rice for processing), foreign material, or dockage in quantities more than 0.5 for testing the system.

2 If, at a later date, corn becomes available and will be offered for inspection, test the sampling system using corn before it is authorized to sample corn.

(2) Group 3 approvals will be handled on a case-by-case basis, but normally do not require check testing of the sampling system, only a visual examination.

TABLE 5.1 COMMODITY GROUPS

Group 1 Small Commodities		Group 2 Coarse Commodities	Group 3 Powders
Barley	Wheat	Soybeans	Flour
Flaxseed	Rice	Corn	Corn Meal
Rye	Lentils	Peas	Soybean Meal
Sorghum	Bulgur	Edible Beans	Other Meals
Oats	Rolled Oats	Sunflower Seed	Powdered Milk
Canola	Minor Oilseeds		Corn Soy Blend

d. Periodic Tests. There is no requirement to test samplers with grain on a periodic basis.

e. Supplemental Tests. Supplemental tests are required based on the same criteria for questioning system accuracy as in Chapter 4 instructions covering supplemental examinations, page 4-3.

f. Test Procedures-Diverter-Type Samplers.

(1) Outbound Movement Systems.

(a) All facilities.

Test sampling systems used for securing official samples of outbound commodities with a pelican sampler at the end of the loading spout. At the discretion of the testing office, use a loading spout other than the normal spout if the additional routing does not increase or decrease breakage and is more feasible. The testing office may also consider using an alternative sampling method other than the pelican at the end of the loading spout if a representative sample cannot be obtained with the pelican or the use of the pelican causes a safety concern. Consider the testing option alternatives listed below:

1 Use of a “standard” diverter-type (primary) sampler.

Except as noted on the authorization, use this standard only to test other diverter-type systems.

2 Drop sample test option.

To ensure the drop sample test is completed in a safe and accurate manner FGIS and official agency personnel will enlist the services of elevator facility personnel for activities such as transporting samples, providing safe access to sampling systems, moving grain to and from the location of the secondary sampler and the inspection lab, etc.

(b) Operational Verification. This step is designed to clear the system of contaminants, to determine if there may be a leak in the sampling delivery system, and also to determine the size of the Drop Sample needed to yield a minimum Test unit of 1250 grams in the delivery sample collection box.

1 Introduce 25 lbs. (weighed by approved scale) of clean corn into the secondary sampling system.

2 Collect and account for all grain introduced into the system (both the collection box and the grain return line).

3 Reweigh the recovered grain and enter the weight in the Operational Verification (Weight Out box). Calculate the percent loss, if any, and report a loss greater than 0.5% (excluding spilled grain) to the manager. Place results in the “remarks” of FGIS-936 in and specify if the operational verification Tolerance results were IN/OUT?

NOTE: To calculate the size in pounds of the Drop Sample to be prepared, divide 1250 by the number of grams recovered in the collection box, and multiply that value by 25.

(c) Standard Unit. This step is designed to prepare the Drop Sample and determine the percent of Broken Corn and Foreign Material (BCFM) in the Drop Sample. After calculating the size of the Drop Sample (from the Operational Verification Step):

1 Evenly distribute naturally occurring machine separable foreign material, in an amount sufficient to yield 2.5-5.0 percent BCFM, into the drop sample containers.

2 Thoroughly mix the drop test samples using approved equipment identified in Figure 10 (Test Sample Mixing Diagram). Cut the sample down to 1000-1050 grams using an approved Boerner/ Gamet Divider. Weigh the sample and record the weight on the FGIS 936 in the 1000 grams column next to Std. Unit.

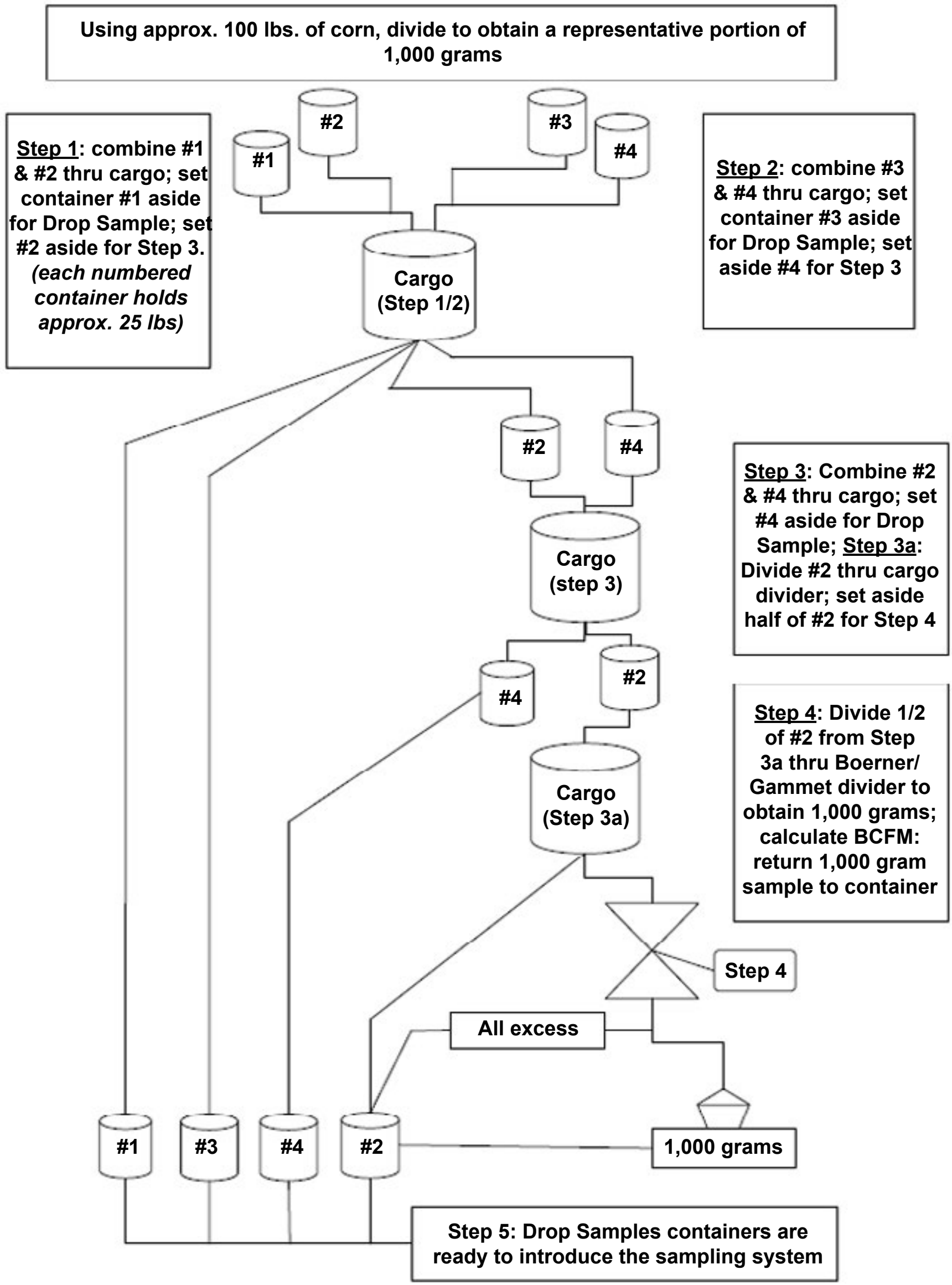
3 To obtain the Standard Value of BCFM for the Drop Sample, use an approved Carter-Day dockage tester equipped with a 12/64, #3 machine sieve to separate the sample. Record the weight of machine separable material from the bottom pan on FGIS 936 next to the Std. Unit row in the BCFM column. Calculate the percent BCFM and record the percent to the nearest tenth of a percent in the percent BCFM column.

4 After the BCFM result for the Standard unit sample is calculated and recorded combine the 1000-1050 gram Standard Value Sample back with the Drop Sample.

(d) Drop Testing. Introduce the entire Drop Sample prepared (per figure 10) into the highest exit point of the primary sampler leading into the secondary sampler as possible and in a manner that will not result in loss or spillage of the sample.

Typically, a large funnel with tubing/piping is used to deliver the sample with minimal spillage.

FIGURE 5.1 - TEST SAMPLE MIXING DIAGRAM



(e) Test Unit. Once the entire Drop Sample is introduced into the system, and the Test Unit portion has been delivered to the collection box, retrieve and weigh the Test Unit portion to verify the drop sample yielded at least 1,000-1,050 grams at the collection box.

1 If you receive greater than 1,050 grams, divide the sample down to 1,000-1,050 grams (with approved Boerner/Gamet Divider). Record the Test Unit weight on FGIS- 936 in the Test Unit row (1000 grams column).

2 Machine separate the Test Unit portion using an approved Carter-Day dockage tester (preferably the same dockage tester used to determine the Standard Unit BCFM value). Record the weight of machine separable material in the bottom pan on FGIS-936 in the Test Unit row of the BCFM column. Calculate the percent BCFM and record the percent to the nearest tenth of a percent in the percent BCFM column.

3 Calculate the difference between the Standard Unit percent BCFM and the Test Unit percent BCFM and record the calculation in the difference row of the percent BCFM column.

4 If the first drop test yields a result within the specified tolerance the sampling system passes, if the first drop test does not yield a result within the specified tolerance, a second drop test must be performed. Repeat sections (c), (d), and (e) above. If the second drop test does not yield results within the specified tolerance, then the DT sampling system fails. If the second drop test does yield a result within the specified tolerance, a third drop test must be performed by repeating the steps in sections (c), (d), and (e) above.

The DT sampling system passes provided the second, and third drop sample yield results that are within the specified tolerance, and the test average of the first, second, and third drop test results are within the specified tolerance of ± 10 percent of the standard unit average.

Example of Modified Drop Sample Testing Method:

1 1st Drop Test (within tolerance) = System Passes

2 1st Drop Test (outside tolerance) + 2nd Drop Test (outside tolerance) = System Fails

3 1st Drop Test (outside tolerance) + 2nd Drop Test (inside tolerance) + 3rd Drop Test (inside tolerance) = System Passes provided the test average results of the 1st, 2nd and 3rd drop tests average within the specified tolerance of ± 10 percent of the standard unit average.

EQUIPMENT & MATERIALS

- 100-600 lbs. of Corn (weight may vary depending on your ability to recapture the entire Drop Sample)
- Any necessary equipment to introduce samples into system (funnel, tubing, piping etc.)
- Any necessary equipment to transport and collect samples (buckets, bags etc.)
- Approved Carter-Day dockage tester (12/64, #3 machine sieve)
- Approved calibrated laboratory scale
- Approved dividers – Cargo and Boerner/Gamet

(3) Probe Sampling.

Only railcar probe samples will be permitted for diverter type sampler authorizations, and will also is applicable to domestic railcar loading facilities which include the following types of domestic sampler installations: new diverter type sampling systems, existing sampling systems that have undergone major repairs or alterations, and systems that have had their authorization suspended for more than 6 months without use.

NOTE: Refer to Grain inspection Handbook, Book I, Chapter 2, Probe sampling, subchapter 2.4, c. Sampling Patterns for Hopper Cars.

(a) Procedure.

When standard samples are obtained by probing railcars, each test lot shall consist of a completely filled railcar.

In order for the D/T system to pass, the average difference obtained by subtracting the standard results from the railcar test results must be within an allowable tolerance of +10 percent to -15 percent of the standard result mean.

The larger negative tolerance is to correct for a historical tendency of probe derived samples yielding higher estimates of machine separable factors such as broken corn and foreign material.

On the test FGIS-936, record both of the + and – tolerances (e.g., if the average standard result is 0.8, record the tolerance as +0.08/-0.12). The allowable tolerance remains ±10 percent when standard samples are obtained by other methods.

(b) Shipping Bin Houses.

Physically verify the shipping bins are clean before and after testing. Run the test lot(s) into a closed shipping bin(s) at the facility's normal loading rate. When the entire test lot is in the shipping bin, open the bin slide to provide a maximum flow of 15,000 bushels per hour. Take the standard sample after the grain has left the bin. A test lot should consist of a complete bin. At the discretion of the testing office, a test lot may be composed of a part bin of one normal component sample; however, the reasons for the variance shall be substantial and must be documented on the test form.

(c) Direct Load Houses.

1 Facilities not using shipping bins must discharge the test lots at a maximum flow rate of 15,000 bushels per hour so the sample may be obtained at the end of the loading spout with the pelican sampler. When reduced flow rates are required to accomplish the testing, observe the system during operation at the facility's normal flow rate to see if it is accepting all the commodity.

2 A test lot should be at least equal to one sublot, but may, at the discretion of the testing office, be equal to one component sample; however, the reasons for the variance shall be substantial and must be documented on the test form.

3 At facilities where the commodity is loaded directly through bins without holding for grading, the commodity sometimes breaks up, causing the mechanical sampling system results to disagree with the standard results. If this occurs, a cushion of sufficient depth shall be maintained whenever the system is tested or being used. (Note this fact on the FGIS-980 and the sample collection container). In order for official inspection personnel to ensure that the cushion is present during loading, facilities shall install a continuous bin depth indicator system where inspection personnel are located.

(4) Inbound Movement Systems.

(a) Test sampling systems installed to secure official samples of inbound commodities using the pelican or Ellis cup samplers. Obtain test samples before the initial elevation or immediately afterward, if necessary.

(b) Facility management must control the flow rate of the test lots to ease pelican or Ellis cup sampling. Where reduced flow rates are required to accomplish the testing, observe the sampler at the facility's normal flow rate to see if the sampler is accepting all the commodity.

(c) Analyzing Test Results and Completing the Test Form for Diverter-Type Samplers.

1 Determination of Factor Results.

a Analyze the test samples for the appropriate machine-separable factor but do not hand adjust for cobs, for pieces of foreign material, etc. Record the factor results on the reverse of FGIS-936, “Sampler Condition Report” (Figure 11) and compare the factor results or averages. Percentages should be rounded to 2 decimal places.

b When evaluating a sampler based on broken kernels in rice, offices may eliminate hand adjusting. This can save a considerable amount of time, and may improve consistency of results. However, this procedure is acceptable only if all samples are being run at the same office, on the same shaker, the same plate, and the same sieve. This “side-by-side” test is required because not all of the rice sizers, plates and sieves have been comparison tested.

2 Determine whether the system is within the allowable tolerance of ± 10 percent of the standard result mean and notify the facility management of the test results. If the sampling system appears to be causing an unjustifiable deterioration to the sample or sample components on being delivered through the system, do not issue an approval.

3 For out-of-tolerance equipment, document all pertinent facts and action taken on the FGIS-936. This includes adjustments, retests, and follow-up action.

4 File the original FGIS-936 after all tests are completed and the results recorded. Do not send copies of the form to FGIS Headquarters.

5 If testing is completed by an official agency for initial authorization of the system send the FGIS-936 to the FGIS Field Office for review. The FGIS Field Office will review the testing results acceptable limits, authorize the sampling system for use in obtaining official samples.

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 45 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

GRAIN TEST DATA

SAMPLING METHOD USED FOR STANDARD: ☐ PELICAN 1 ☐ CUP ☐ OTHER _____

COMMODITY: ☐ SMALL GRAIN 2 ☐ COARSE GRAIN ☐ OTHER _____

REMARKS:

3

Date	Sample No.	Type	DKG	BCFM	
4	1	Test Unit		5	
		Standard			
Difference 6					
Tolerance 7					
Result - One test lot 8			☐ IN ☐ OUT	☐ IN ☐ OUT	☐ IN ☐ OUT

9

Date	Sample No.	Type	DKG	BCFM	
	2	Test Unit			
		Standard			
	3	Test Unit			
		Standard			
	4	Test Unit			
		Standard			
	5	Test Unit			
		Standard			
Test Unit MDS*					
Tolerance					
Result - Five test lots			☐ IN ☐ OUT	☐ IN ☐ OUT	☐ IN ☐ OUT

*Mean Deviation from Standard

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for Mechanical Truck Probes only

Date	Sample No.	Type	DKG	BCFM	
	6	Test Unit			
		Standard			
		HP			
	7	Test Unit			
		Standard			
		HP			
	8	Test Unit			
		Standard			
		HP			
	9	Test Unit			
		Standard			
		HP			
	10	Test Unit			
		Standard			
		HP			
	11	Test Unit			
		Standard			
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	16	Test Unit			
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	17	Test Unit			
		Standard			
		HP			
	18	Test Unit			
		Standard			
		HP			
	19	Test Unit			
		Standard			
		HP			
	20	Test Unit			
		Standard			
		HP			
Test Unit MDS*					
Hand Probe MDS*					
Regression or T-test 11			☐ IN ☐ OUT	☐ IN ☐ OUT	☐ IN ☐ OUT

Form FGIS-936 (5-03) Previous editions are obsolete.

FIGURE 5.2 - FGIS-936, "SAMPLER CONDITION REPORT," (REVERSE)

INSTRUCTIONS FOR COMPLETING
FGIS-936, “SAMPLER CONDITION REPORT,”
(REVERSE)

Use the reverse of FGIS-936 for testing (grain test). Always precede a test with an examination, documented on the front of the form. If the examination and the test are not recorded on the same sheet, properly identify the test by filling in the Name of Elevator, etc., Items 1 through 11, 41 and 42 on the front as described in Chapter 4, Examinations.

1. Method of testing. If a special location or alternative testing procedure was used, explain in remarks.

2. Specify grain.

3. Remarks-Summary of important observations on the sampling system and testing information. Was the test run at normal load-out speed, air pressure, belt depth, etc.? Was dust collection turned on? Shipping bins checked?

4. Enter date sampled.

5. One factor is required, but additional factors may be tested. If necessary, the Field Office manager shall decide the appropriate factors. Test weight is not to be used as the only factor. Report percentages to 2 decimal places.

6. Mathematical average of the mechanical sampler results, average of the standard results, average of other results. Round percentages to 2 places.

7. Tolerance or allowable deviation = 0.10 x (standard average).

8. Mark the appropriate box for each factor tested. If more than one factor was tested, each of them must be within tolerance for a pass. A factor is considered within tolerance when the mean deviation from the standard is less than or equal to the allowable deviation for the applicable factor.

9. If 5 test lots are to be evaluated, continue entering sample data.

10. If testing a mechanical truck probe, continue entering sample data for 20 test lots.

11. Truck probe performance is evaluated against a standard and a hand probe, using either a regression or a T-test. The Technology and Science Division provides support for the analysis.

5.2 PROBE-TYPE SAMPLER TESTS

a. A probe-type sampling system (mechanical truck probe) test requires the sampling of 20 bobtail (farm) or other trucks by:

(1) Hand probe (trier).

(2) Mechanical truck probe.

(3) Pelican sampler.

b. Examine a mechanical truck probe at least each 6 months (visual). Calculate the period starting from the first day of the next calendar month after the examination or test.

c. The pelican sampler results serve as the standard results for the approval. In the event that a representative pelican sample cannot be obtained, the testing office may use an Ellis cup or a diverter-type sampler. The basis for the decision should be documented on the FGIS-936.

d. The probe may be authorized for all commodities in groups 1 and 2 without further testing if satisfactory results are obtained by testing the probe with corn. If unlimited approval is not needed, the probe may be authorized for either group 1 and/or group 2 commodities, except corn, by obtaining satisfactory results with one grain in each group. Make every effort to select test lots of corn with a wide range of test weight per bushel (TW) and broken corn and foreign material (BCFM) from the truck lots available at the testing site. For other grains, use TW and a machine-separable factor such as:

(1) Flaxseed -Dockage.

(2) Sorghum -Broken kernels and foreign material.

(3) Soybeans -Foreign material.

(4) Sunflower seed -Machine separated FM.

(5) Rough rice -Total rice or whole kernels or dockage, no TW.

e. For either outbound or inbound truck lots, use a hand trier of approximately the same length as the mechanical probe and in the same sampling pattern normally used for official sampling to draw the trier sample. Usually this will be the 7-probe truck pattern.

f. Pelican sampling will employ tailgate sampling of the grain while the grain is being discharged into the truck pit. Any type of truck is acceptable, as long as the flow of grain can be controlled so a representative cut can be taken with the pelican. Exercise care in pelican sampling to ensure that the pelican does not fill and overflow before the grain stream is traversed. This can best be accomplished by restricting the flow of the grain from each truck. Restrict grain flow so a minimum of 10 pelican samples can be drawn, at regular intervals, from each load before the truck empties.

g. Officially inspect all samples for the necessary factors, retaining file samples until the approval process is completed. For corn BCFM, combine machine and handpicked portions.

h. Analyzing Test Results and Completing the Test Form for Probe Systems.

(1) Factor Results. Record the factor results on the reverse of FGIS-936, “Sampler Condition Report,” but do not compare the factor averages directly. Instead, test to see that the mechanical probe does not deviate from the pelican to a greater extent (absolute value) than the hand trier deviates from the pelican. To accomplish this, TSD analyzes the data using a T-test or regression analysis.

(2) Out-of-Tolerance Equipment. For out-of-tolerance equipment, document all pertinent facts and action taken on the FGIS-936. This includes adjustments, retests, and follow-up action.

5.3 TEST OR EXAMINATION FAILURE

a. General. The best time to test a sampler is as use during normal loading or unloading operations. To encourage as used testing at export locations, the following procedures assure facilities that there will be no unwarranted qualifying statements on the official certificate.

b. Export Grain Loading Situation. If a mechanical sampling system fails a test and/or examination during the sampling of an export cargo grain shipment and there is no alternate diverter-type sampling system available, sample the remainder of the shipment using either a pelican or Ellis cup sampler. Use the sample obtained by the alternate method for official purposes, not the sample obtained by the failed system.

(1) The FGIS Field Office will suspend authorization of the sampler, in writing, if the problem is not corrected immediately.

(2) Whatever the amount of grain to be loaded or the time it takes to complete loading, do not show a special statement on the inspection certificate of the shipment being loaded at the time of the failure.

c. On all future shipments until the diverter-type mechanical sampler passes a test, show the type of sampling method actually used.

d. Domestic Grain Loading Situation. If a diverter-type mechanical sampling system fails a test or examination during the sampling of a domestic lot of grain, stop using the sampler and implement an alternate sampling method. Show the actual sampling method(s) used on the inspection certificate regardless of the amount of time or volume of grain loaded using the alternate method. No special statement is required.

5.4 REINSTATEMENT

To reinstate the authorization of a sampling system that fails an examination or test, the applicant must furnish data or make adjustments that suggest the system will pass a succeeding examination and test. If the system fails a test, the succeeding test(s) must consist of five test lots preceded by a complete examination, the same as required for an initial authorization. If the system fails an examination, the system must be completely reexamined and, at the discretion of the testing office, the system may be retested with either one or five test lots.

CHAPTER 6
MAINTENANCE, REPAIR, AND ALTERATION

Contents

6.1 MAINTENANCE

a. General. The facility management shall install and maintain each mechanical sampling system according to the guidelines established by FGIS and the manufacturer of the equipment used in the system.

b. Official personnel are not responsible for preventive maintenance inspections.

c. Facility personnel must perform preventive maintenance inspections and service on mechanical sampling systems regularly.

d. Repeated incidence of failure to perform maintenance of the mechanical sampling system or the material load-out system will result in an increased frequency of supplemental examinations and supplemental tests.

6.2 REPAIR

a. General. Mechanical sampling systems must be repaired as necessary in a timely manner and according to the manufacturer's guidelines.

b. Suspension of Authorization. FGIS will suspend authorization of sampling systems that do not or cannot function properly until appropriate repairs are made and the accuracy of the sampler is confirmed by the testing office. If the testing office decides the repairs are sufficiently extensive, the sampling system must be tested on five test lots before the authorization is released. Replacing a component of the sampling system with a new, or updated version of the previous component will usually only require an examination of the system. If the new component is of a different size or is otherwise different, or changes the delivery system, the repair may alter the way the sampling system delivers the commodity being sampled, possibly causing a condition issue. In this case, the testing office is required to checktest the system before releasing authorization.

(1) Export Grain Loading Situation (Diverter-Type Sampling System Only).

(a) If a diverter-type sampling system breaks down during the sampling of an export cargo grain shipment and there is no alternate diverter-type sampling system available, sample the remainder of the shipment using either a pelican or Ellis cup sampler. Show the actual sampling method(s) used on the inspection certificate.

(b) However, the method may be indicated as diverter sampler if:

1 At least 50 percent of the entire lot was sampled by the diverter-type sampling system; and

2 The loading of the lot is completed within 8 working hours using the alternate sampling method.

(2) Domestic Grain Loading Situation. If a diverter-type sampling system breaks during the sampling of a domestic lot of grain, show the actual sampling method(s) used on the inspection certificate regardless of time used or volume of grain loaded under the alternate method. No special statement is required, under any circumstances.

6.3 ALTERATION

a. General. When alteration work begins, immediately suspend the authorization of the affected sampling system until the alteration is completed, and the system can be check tested and approved for use, using an approved check test method. A minor alteration usually requires only an examination before reinstating the authorization.

b. Temporary Pelican Modification (Diverter-Type Sampling System Only). The primary sampler's pelican may be temporarily modified to sample meal without affecting the authorization of the sampler, if one of the following methods is used and the pelican is returned to its proper configuration before being used to sample whole kernel commodities. The approved modification methods are:

(1) Inserting a block of wood or similar material in the opening of the pelican;

(2) Adjusting the air pressure or speed control valve; and

(3) Adjusting the cutting edge of the pelican.

c. An auxiliary sampler control can be installed that uses a "plugged-flow switch" in the spout to trigger the D/T system to stop in a safe state, and to control the flow of grain. However, these auxiliary controls can also affect the representativeness of the sample if they reset the D/T timer or stop the sampler while grain is still flowing.

(1) Auxiliary control modifications apply to new installations; to existing sampling systems modified after their approval. The D/T sampler authorization submitted by the grain facility must address auxiliary controls included in any new installation. Sampling systems that are modified with auxiliary controls must have the modifications approved by official service providers before using them for official purposes.

(2) Any modification of a sampling system used for official purposes must not compromise the representativeness of the sample. A grain elevator must conform to the following requirements if the grain elevator elects to modify a D/T sampling system to control grain choke conditions:

a. Grain flow into the sampler must stop whenever the sampler is stopped.

b. An audible alarm must activate whenever the D/T sampler is stopped by an auxiliary control.

c. If already in motion, the D/T pelican must complete the traverse and come to the normal rest position.

d. If the sampler is stopped the timer shall not reset. The timer may continue running with the pelican traverse disabled, or it may halt until the plugged condition is cleared. When the plugged condition has cleared, normal timer operation shall resume with the time that remained when the timer halted.

e. The plug of grain that caused stoppage of the D/T must be cleared from the sampler before the sampler is restarted. Additionally, the D/T must be restarted before grain begins to flow into the sampler.

f. Official inspection personnel must maintain full control of auxiliary controls for D/T samplers. The facility control system may stop the grain flow. However, the controls that stop the D/T sampler and which activate the alarm must remain independent of the plant control system and utilize seals or locks to assure security of the controls.

CHAPTER 7
REVISION HISTORY

Contents

Change No: 4 April 18, 2017

Chapter 3, page 3-6 Added language confirming requirements for D-T sampling system authorization

Chapter 5, page 5-7 Revised the drop sample testing method

Change No: 3 September 13, 2016

Revisions weremade to include the following Program Notices:

Chapter 2, Equipment Requirements, Controls
Chapter 6, Maintenance, Repair, and Alteration

FGIS-PN-08-05 Requirements For Auxiliary Control Modifications Of Diverter Type Mechanical Sampling Systems

Chapter 5, Outbound Movement Systems

FGIS PN-08-09 Use Of Probe Samples As An Alternate Standard Reference For Testing Diverter Type Sampling Systems

FGIS PN-12-02 Check Testing Of Diverter-Type (D/T) Samplers-Drop Sample Test Option

Chapter 5, section 5.2

Revisions were also made to the language regarding sampling system inspection safety, specifically pertaining to a primary sampling systems power supply cutoff switches and the coinciding physical distance and visual reference of the cutoff switch to the primary sampler.

Change No: 2 November 7, 2003

The Mechanical Sampling Systems Handbook has been revised to reflect a change in the FGIS-936, Sampler Condition Report. The form now includes appropriate sections for testing mechanical truck probes. Editorial and policy memorandum changes from prior years are incorporated.