INSPECTION PROCEDURE 88020

# OPERATIONAL SAFETY

PROGRAM APPLICABILITY: 2600 and 2630

## 88020-01 INSPECTION OBJECTIVES

The objectives of the Operational Safety inspection procedure are to determine whether:

01.01 The licensee or certificate holder operates the plant safely and in accordance with regulations, the license or certificate, the Safety Analysis Report (SAR), the Integrated Safety Analysis (ISA), and licensee or certificate holder policies and procedures.

01.02 The material condition and "as-found" configuration of the site, structures, equipment, documentation, personnel, and items relied on for safety (IROFS), conform to regulations and license/certificate requirements and are appropriate to protect worker and public safety during normal, off-normal, and accident conditions.

01.03 The licensee or certificate holder implements effective safety controls over facility and process operations that affect licensed or certificated material.

## 88020-02 INSPECTION REQUIREMENTS

**NOTE:** The inspection requirements of this procedure are those tasks that must be performed to complete the inspection. Inspection planning is a key element of performing a thorough and meaningful inspection. Inspection plans must be developed and approved prior to the start of the inspection and must consider the safety significance of the items to be inspected. Deviation from the approved inspection plan must be discussed with the inspection supervisor as soon as practicable. Guidance on inspection planning can be found in Inspection Manual Chapter (IMC) 2600, "Fuel Cycle Facility Operational Safety and Safeguards Inspection Program."

The inspection requirements for this procedure are as follows:

02.01 Identification of Safety Controls and Related Programs. Determine if the licensee or certificate holder has properly identified and documented safety controls.

a. For each inspection, select one or more specific process areas for detailed, in-depth inspection based on inspection planning criteria (safety/risk significance,

past performance, significant changes, etc.).

b. Review the current ISA Summary, safety analyses, and/or licensee general safety policies/procedures for the selected area(s) to determine the existing process safety controls.

c. Review documentation for establishing management measures or other required programs to ensure that safety controls will be available and reliable to function when needed.

02.02 Implementation of Safety Controls. Determine if safety controls identified for review in 02.01(a) are being properly communicated and implemented.

a. During each inspection, confirm that engineered controls are present and are capable of performing their intended safety function(s).

b. Review the operating procedures for the process areas chosen in 02.01(a) to determine if administrative controls have been established and properly communicated to workers.

c. Evaluate selected controls to determine if they are functioning correctly.

02.03 Safety Control Support Programs. Determine if the management measures or other required programs that have been established for keeping the controls available and reliable are being properly implemented.

a. Verify that preventive maintenance, calibration, and periodic surveillance, as required by the ISA Summary or safety evaluation for the selected safety controls, are being adequately conducted.

b. Verify that operators have been adequately trained to properly implement or respond to the selected safety controls.

c. Verify that the documentation support and quality assurance functions for the selected controls are being properly implemented.

88020-03 INSPECTION GUIDANCE

03.01 Identification of Safety Controls and Related Programs.

Requirement: For each inspection, select one or more specific process areas for detailed, in-depth inspection based on inspection planning criteria (safety/risk significance, past performance, significant changes, etc.).

a. The inspector should follow any guidance in IMC 2600 and other office instructions to prepare for the inspection. The inspectors should determine the areas and systems of dominant safety risk during the inspection planning process by reviewing the operational history, previous inspection reports, or by drawing upon the inspector's previous experience and knowledge of safety-significant routine or

off-normal events (e.g., event notifications, internal problem reports) that may have occurred in the subject facility or at similar facilities. In the planning process, the inspectors should consult the regional project inspector to determine the risk-significant operations, any safety equipment availability or reliability problems (such as recurring failures or failures resulting in reportable events), and any recent significant changes to the facility operation. Other sources of information may include the branch chief, the Headquarters Licensing Project Manager, and if applicable for the site, the resident inspection staff.

The inspector should review, where applicable, the ISA Summary, SAR, or safety analyses to be familiar with the hazards and safety controls for the areas to be inspected. However, due to the dynamic nature of the ISA Summary and safety analyses, the inspector should also note that licensees are only required to submit these documents periodically and the NRC may not have the most recent version. The inspector should obtain further operational insights for inspection items from the licensee or certificate holder via phone when announcing the inspection, at the entrance meeting, during plant tours after arriving on site, by observation of operations, and by discussions with the operations staff.

The conduct of this inspection should include a look at the criticality safety, radiation safety, fire safety, and chemical safety aspects of operations. Generally, the inspection effort should be mainly focused on the areas, operations, and controls at the facility associated with the greatest risk significance. Less risk-significant areas, operations, and controls may also be inspected as authorized on the approved inspection plan, but the inspection effort of each area/operation/control should be in approximate proportion to its risk significance.

The inspectors can often obtain further insights about dominant risk contributors by discussions with licensee or certificate holder personnel at the entrance meeting. This information should be used to supplement that obtained during the inspection planning process. The inspectors should determine if any infrequently performed tests or evolutions will occur during the course of the inspection. If safety-significant tests or evolutions are identified, the inspector should attempt to observe them in-progress, as well as any related pre-job briefings and coordination meetings.

The inspectors should conduct a general plant tour promptly after arriving on site. The tour would generally be performed after the entrance meeting; however, it can also be performed prior to the entrance meeting if conditions warrant. The primary purpose of the general tour is to determine plant status and equipment condition. The inspector should tour each major plant operating area (e.g., chemical conversion, ceramic production, assembly, shipping, scrap processing, waste handling, etc.), with particular attention to areas identified in the inspection plan for emphasis. Observe the routine and non-routine plant operations where possible. Observe housekeeping during the general plant tour and throughout the inspection to evaluate the licensee's commitment to safety, contamination control, and emergency preparedness. See the supplemental information on housekeeping (at the end of Section 03.03).

During plant tours the inspector should be cognizant of the communication of

safety issues throughout the plant. This could include observation/review of shift turnovers, control room communications, coordination of operational activities with maintenance and surveillance activities, and resolution of problems affecting plant

operation with the appropriate disciplines. Problems in these types of areas can be indicators of inattention to detail by licensee management or staff that could lead to inadequate implementation of safety controls.

The inspector may also be able to attend the licensee's or certificate holder's plan of the day meeting or equivalent, or other meetings conducted during the inspection as appropriate to obtain the overall status of the plant and of the licensee's or certificate holder's activities that are planned or in progress. Select areas of the plant to inspect in detail based on plant activities, risk, and operational history as noted above.

Determine whether changes to the inspection plan may be warranted based on the observations made during the plant tour(s) and on information received during meetings with the licensee and/or document reviews. If additional focus areas are identified, the inspector should contact the applicable NRC management for approval, and communicate this to the licensee or certificate holder as necessary.

Requirement: Review the current ISA Summary, safety analyses, and/or licensee general safety policies/procedures for the selected area(s) to determine the existing process safety controls.

b. Review the current version of the ISA Summary and/or safety analyses for each area to be inspected. The review of documentation to determine current safety controls should encompass enough information to get an understanding of how the licensee is ensuring safety with respect to criticality, radiation, fire, and chemical hazards. Guidance for review of each of these safety disciplines is described below.

1. Criticality Safety Controls. Take note of the operational engineered and administrative controls identified to prevent a criticality accident. Since a criticality accident would be considered a high consequence event, verification of criticality controls and their support programs should be given high priority.

2. Chemical Safety Controls. Take note of the operational engineered and administrative controls identified to prevent hazardous chemical releases, interactions, and exposures. Controls preventing or mitigating chemical accidents that would be considered high consequence events should be given high priority. The inspector should also be aware of controls or practices used to prevent or mitigate other chemical hazards, but they should be given a lower priority for specific review during the inspection. However, the inspector should be alert to potential improper chemical safety practices observed during the inspection.

3. Fire Safety Controls. Take note of the operational engineered and administrative controls identified to prevent or mitigate a fire or explosion.

Controls preventing or mitigating fires or explosions that would be considered high consequence events should be given high priority. The inspector should also be aware of controls or practices used to prevent or mitigate other fire hazards, but they should be given a lower priority for specific review during the inspection. However, the inspector should be alert to potential improper fire safety practices observed during the inspection.

4. Radiation Safety Controls. Take note of the operational engineered and administrative controls or practices for preventing/limiting radiation exposures to workers and releases of radiation to the public/environment. Since most radiation hazards (except for a criticality) at fuel facilities can not readily result in a high consequence event, these controls are typically given lower priority in an operations inspection. However, the inspector should be familiar with the controls and practices used to prevent the spread of contamination and airborne radioactivity within the areas to be inspected, and should be alert to potential improper implementation of these controls and practices.

Requirement: Review documentation for establishing management measures or other required programs to ensure that safety controls will be available and reliable to function when needed.

c. Review the licensee's program(s) for ensuring that safety controls are available and reliable when called upon to perform their intended functions. This would typically include programs for maintenance, surveillance, and testing of the controls; training of workers to properly implement or respond to the controls; and the conduct of licensee self-audits. For licensees required to perform an ISA, controls for preventing or mitigating high and intermediate consequence events (IROFS) must have a system of management measures described in their ISA Summary. The inspector should ensure that each IROFS in the areas being inspected has the set of management measures identified with it as described in the ISA Summary.

Process Safety Information should be inspected which includes information pertaining to the hazards of the materials used or produced in the process, information pertaining to the technology of the process, and information pertaining to the equipment in the process.

03.02 Implementation of Safety Controls. Once the safety controls in the areas to be inspected have been identified, the inspector should determine if safety controls identified for review in 02.01(a) are being properly communicated and implemented. Select the operations related to the more risk-significant activities to focus the most effort on during the inspection. The inspector should determine whether the licensee or certificate holder is operating safely and in compliance with requirements. The inspectors should use judgement as to which aspects of the inspection focus areas may require more in-depth reviews. The inspectors should use a balanced approach by selecting documents, records, logs, and procedures for review; observing the performance of selected activities; interviewing operators; and checking the accuracy of measurements or calculations. Consider inspecting each plant operating shift (1st, 2nd, 3rd) either through direct observation/interviews or records reviews.

Closely observe operations which are being modified during the inspection, or have been recently modified. Interview operators in the area where modifications were made, or are in progress, to determine if they understand the basis for the modification and have received training appropriate to the modification. If the inspectors identify any modifications that potentially would require an in-depth, such as modifications that would require an amendment prior to use, review per Inspection Procedure (IP) 88070, "Plant Safety Modifications," then the applicable Branch Chief and Project Inspector should be informed during the inspection debrief.

In performing the following inspection activities, it is important for the inspector to avoid adversely affecting the performance of operations in such a way that the safety of the operation or the facility would be compromised. In addition, inspections should minimize the impact on operations in general.

Requirement: During each inspection, confirm that engineered controls are present and are capable of performing their intended safety function(s).

a. The inspector should observe each engineered control within the specific process areas selected for review in 02.01(a) and confirm that they appear likely to perform their intended safety function(s). This effort includes:

1. Verifying the physical presence of passive and active engineered safety controls as described in the safety analyses;

2. Evaluating the safety controls to determine if they are capable of providing the safety function as described in the safety analyses;

3. Evaluating the condition of the safety controls to determine operability; and

4. Verify that potential accident scenarios are covered.

Examples include: ensuring drain holes (or tubes) are not plugged; electrical switches or sensors are not corroded; safety valves are not bypassed or inactivated; the overall condition of systems, structures, and equipment poses no challenges to their operability and availability.

Work-arounds or compensatory measures that have been put in place to provide the essential function(s) of a non-functioning safety control should be reviewed to ensure that the safety of the system remains within acceptable limits. This would include the system being able to respond to an upset condition that could affect safety. Determine whether operator work-arounds are incorporated into temporary operating inspections, postings, etc.

Requirement: Review the operating procedures for the process areas chosen in 02.01(a) to determine if administrative controls have been established and properly communicated to workers.

b. Determine whether administrative controls such as procedures and postings are being properly implemented and communicated.

Determine whether required actions identified in the ISA Summary or safety analyses have been correctly transcribed into written operating procedures and these are available to operators. Verify that limits needed to assure safety for selected controlled parameters are described in the procedures. The inspectors should evaluate the procedures' contents with respect to process operating limits, operator responses for upset conditions, safety systems and functions, precautions, and warnings. The inspectors should evaluate whether procedures adequately address various operations aspects, including startup, temporary operation, and shutdown as required by license condition or licensee policy/procedure. Instructions and criteria for shutdown and actions to be taken during abnormal operations should be specified, including the limits selected for a commitment to action. Requirements should be documented for measurement control. Measurement techniques employed should be identified and the technical basis for their validity verified.

Determine whether operators and technicians are adequately implementing safety controls in selected procedures. Observe operators' performance to determine they are adhering to applicable safety procedures, particularly with regard to the adequacy of precautions taken for radiological, chemical, toxicological, fire protection, and control of nuclear material. The inspector should also be alert to note any conditions that are unsafe, whether or not they are being performed in accordance with approved procedures, regulatory requirements, or license/certificate commitments. For example, the inspector may determine that a procedure is inadequate, or that the wrong procedure is being used, or that additional procedures or operator qualifications/training are needed.

Determine whether postings and other operator aids are current, reflect safety controls, and are followed by operators and technicians.

Determine whether observed deviations from procedures and unforeseen process changes affecting nuclear criticality, chemical, radiological, and fire safety are reported to management, are documented, and are investigated promptly. Also, evaluate any corrective actions performed.

The inspector should be aware of recent generic lessons learned from events at other facilities, and be alert to observe if they were considered at the subject site, or whether the site is vulnerable to the same generic precursor conditions found at other sites where recent events have occurred. The inspector should review with the licensee or certificate holder relevant event reports, NRC bulletins, Generic Letters, and Information Notices related to any identified generic issues.

Observe whether personnel monitoring devices, protective clothing, and respiratory protection equipment are being used in conformance with Radiation Work Permits (or other similar safety requirement documentation, for a specified task).

Examination of equipment and facilities should determine whether limits and controls identified in the safety evaluation are in existence and are being used. Operating procedures should be reviewed to determine whether safety limits on controlled parameters and safety control systems are contained in the procedures.

In the process areas, observe the presence, condition, and availability of: (1) passive engineering controls (take measurements, etc.); (2) active engineering controls (observe activation, if possible, from process floor or control room); (3) administrative controls (determine operators are following procedures/instrumentation); and (4) enhanced administrative controls and operator reaction to signals and alarms as safety controls.

Observation of, and discussions with operators should determine whether operators know and understand process conditions, safety limits on controlled parameters and safety controls, and have the skill to follow the procedures.

Operators Trained in Operating Procedures: The primary methods to determine if operators are adequately trained are the observation of procedure implementation and discussions with operators. If these give an indication that there could be a training problem, further review of the training should be done to identify the causes of the training problem. The following should be considered to identify the causes of training problems. The inspector should determine whether operators are adequately trained on safety-related procedures with regard to radiological, chemical, toxicological, fire protection, and control of nuclear material. Supervisors are expected to provide training and require that personnel under their supervision have an understanding of the expected procedures and safety considerations to perform their functions without undue risk. Records of training activities and verification of operators' skills are expected to be maintained.

Requirement: Evaluate selected controls to determine if they are functioning correctly.

c. Examine structures and equipment and site areas to determine if applicable safety controls, IROFS, limits from the ISAs and other safety analyses, and limiting condition for operations (LCOs) are adhered to with regard to radiological, chemical, toxicological, fire protection, and control of nuclear material. For example, examine combustible gas monitoring equipment and results, conductivity or pH monitors, liquid-level instrumentation, etc. Determine whether safety devices are operative and within specified safe ranges.

One way to determine if safety controls are functioning correctly is to identify whether significant plant parameters and indications are at expected values for current plant conditions; whether any significant trends exist; and whether the safety and risk significant systems including their support systems are appropriately aligned and operable. This could be performed as part of a control room panel review or observation of process area instrumentation.

The following question may be pertinent during this phase of the inspection and/or after/during the process area observation phase.

Do the controls in place appear to adequately perform the function for which they are intended?

03.03 Safety Control Support Programs. Determine if the management measures or other required programs that have been established for keeping the controls available and

reliable are being properly implemented.

Requirement: Verify that preventive maintenance, calibration, and periodic surveillance as required by the ISA Summary or safety evaluation for the selected safety controls are being adequately conducted.

a. Verify that the requirements/commitments for the maintenance of safety controls are being properly implemented as required by the vendor specifications.

1. Periodic functional testing or surveillances.

2. Preventive maintenance.

3. Post-maintenance verifications.

4. Calibrations.

5 Pre-operational audits or tests.

Do the functional tests/surveillances performed actually test the proper aspect of the safety control or parameter?

Requirement: Verify that operators have been adequately trained to properly implement or respond to the selected safety controls.

b. Determine whether operators and supervisors are trained on and understand new procedures before the procedures are put into use. The inspectors should evaluate the operations staff's knowledge of normal conditions, conformance with the operating procedures, and response to operational difficulties. Discussions with the operating crews can be used to confirm that training has been conducted and is effective.

Determine whether operators know the safety controls for activities selected for review. For more difficult or complex tasks, or where there is a known history of safety-significant events at the subject site, or at similar NRC-regulated sites (e.g., filling or moving liquid-filled uranium hexafluoride cylinders), determine the operator's training, qualifications, and job-specific knowledge and skills pertinent to the operation being performed. In addition, evaluate the operator's awareness of the safety aspects of the operation, and their understanding and use of the written procedures applicable to operations being performed. (If a performance deficiency is noted, then the inspector should contact NRC management about performing a more detailed evaluation in conjunction with the implementation of IP 88010, "Operator Training/Retraining").

Requirement: Determine if the documentation support and quality assurance functions for the selected controls are being properly implemented.

c. Determine whether selected operating procedures being implemented during the inspection have been reviewed by the appropriate safety disciplines and are

current versions.

Confirm that drawings are accurate to include safety controls as required.

Confirm that replacement parts for safety controls systems are controlled and have been approved for use in the safety analyses.

Supplemental Information for Housekeeping.

During the review of operations, observe any stored combustibles, such as solvents and paints, or any refuse containers containing rags or paper that may be located in areas where hazardous materials are located, especially in those posted as moderation-controlled areas (for criticality prevention) to determine whether the licensee or certificate holder's actions are appropriate. Waste oil, solvents, etc., should be kept in approved flammable storage cabinets.

Examine process areas and equipment to determine if the licensee or certificate holder is appropriately monitoring and limiting excessive buildup of hazardous material that may accumulate as loose material in process equipment (e.g., fume hoods, glove boxes, or uranium dioxide powder-handling equipment). Ascertain that controls exist for continuous or periodic inventory, cleanup, or recovery of such material.

The inspector should be alert to recognize areas where "hot-work" is in progress (i.e., where the use of welding equipment or other special activities are being conducted that temporarily may significantly increase the potential for a fire or explosion). This is important for the sake of the inspector's own safety as well as plant safety. In such areas, determine whether the immediate area is free of combustible material, a fire watch is posted, the appropriate "hot work" permit is posted, and individuals are aware of any hazardous materials in the area.

Observe whether cleanup operations are performed when needed (e.g., cleanup of loose feed material) for purposes of limiting contamination and minimizing radiological and toxicological exposure (e.g., as part of a commitment to make the exposures as low as reasonably achievable (ALARA)).

Observe control of containers that may contain hazardous substances, release of which could affect the safety of workers or the safe control of nearby nuclear material. Observe the separation of incompatible chemicals: acids and bases, oxidizers and organics, etc. Determine whether operators understand and adhere to procedures for the safe handling and storage of nearby nuclear or hazardous material (other than nuclear material), and understand how its involvement in a fire or explosion could threaten the safe handling of nearby nuclear material. The inspectors should observe whether any ignition sources (e.g., cigarette smoking, welding) could potentially affect the safe control of hazardous liquid or gaseous chemicals.

For general housekeeping, observe the safety controls for hazardous or combustible material stored and not in process outside of designated storage

areas (e.g., toxic materials, such as acids, located outside of proper storage locations; leakage of acids or other toxic material, such as hydrogen fluoride, from process areas, structures, or equipment). Observe any scrap material or containers found outside of designated areas, such as metal, wood, etc., that could adversely affect emergency ingress or egress, or the operation of fire fighting equipment, if located within areas designated as safe routes. Ignition sources need to be evaluated against the potential combustion sources in the immediate vicinity (i.e., accumulations of cardboard or plastic that has been dropped off to become an unofficial “trash collection area”).

Determine whether emergency egress routes are unblocked by storage of materials. Also, observe that toxic materials are in proper storage.

88020-04 RESOURCE ESTIMATE

An inspection performed using this inspection procedure is estimated to require 60 hours of inspector resources. This estimate is only for the direct inspection effort and does not include preparation for and documentation of the inspection.

END

ATTACHMENT 1

Revision History for IP 88020

| Commitment Tracking Number | Issue Date | Description of Change | Training Needed | Training Completion Date | Comment Resolution Accession Number |
|---|---|---|---|---|---|
| | 09/05/06<br>CN 06-020 | This document has been revised to: (1) emphasize the risk-informed, performance-based approach to inspection, (2) impose changes to the core inspection program based on operating experience, and (3) remove completed or obsolete MCs and incorporate other fuel cycle MCs into a central location. | None | N/A | ML061940282 |
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