

## NUCLEAR CRITICALITY SAFETY

PROGRAM APPLICABILITY: 2600

### 88015-01 INSPECTION OBJECTIVES

Determine whether the licensee's<sup>1</sup> nuclear criticality safety (NCS) program is in accordance with 10 CFR Part 70 and license requirements<sup>2</sup> and provides for adequate protection of public health and safety.

### 88015-02 INSPECTION REQUIREMENTS AND GUIDANCE

Guidance in this inspection procedure is understood to be generic; individual licensees may use different terminology (e.g., for criticality analyses, audits and assessments), and may be subject to differing license requirements. In all cases, inspectors should be familiar with the licensee's specific license commitments and conditions, and should adapt the guidance in this procedure accordingly. Unless otherwise indicated, inspection requirements are to be performed every inspection.

#### 02.01 Criticality Analysis.

##### a. Inspection Requirements.

1. Identify selected Criticality Safety Evaluations (CSEs) for inspection from those newly issued or revised since the most recent NCS inspection.
2. Determine whether the selected CSEs adequately demonstrate subcriticality under normal and credible abnormal conditions, including identifying all credible pathways to criticality. Determine whether conditions dismissed as incredible are properly justified, in accordance with license criteria, and those that are credible are evaluated in accordance with license requirements, including with adequate subcritical margin.
3. Determine whether the selected CSEs adequately demonstrate compliance with the double contingency principle (DCP), including independence and unlikelihood of selected contingencies.

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<sup>1</sup> The term "licensee" as used herein may also apply to construction applicants.

<sup>2</sup> The term "license" or "license requirements" also generally includes a license application and any other documents incorporated into the license and/or application by reference, such as through a "tie-down" condition or commitment to follow an industry standard.

4. Determine whether the selected CSEs appropriately identify limits and controls on controlled parameters, whether limits are consistent with criticality calculations (or other approved means of demonstrating subcriticality), whether any such calculations are based on validated methods and are performed consistent with their validation (including being within their validated area of applicability and having adequate subcritical margin), and whether models are constructed in accordance with technical practices as specified by license requirements (in particular, the licensee's justification for its subcritical margin). Determine whether controls are described in sufficient detail to ensure that parameters will be controlled within specified limits.

b. Inspection Guidance.

1. Select CSEs for inspection from those newly issued or revised, and from those involved in recent reportable events or internal infractions. Determine whether properly reviewed and approved CSEs are in place prior to conduct of new or changed operations, are of sufficient detail and clarity to permit independent review by the inspectors and have been peer-reviewed by qualified NCS staff. The selection of CSEs should take into consideration factors such as risk-significance, complexity, unusually heavy reliance on administrative controls, the use of new technology or unusual control methods, and operating history. As time allows, older CSEs and those from less risk-significant areas should also be periodically sampled.

Historical experience demonstrates that areas of particular concern involve those where transfers of solution from favorable to unfavorable geometry can occur (e.g., from intended transfers as well as unintended backflow, spills, etc.) and where undetected accumulation of fissionable material in unfavorable geometry can occur.

2. Review selected scenarios from those CSEs to determine whether the CSEs systematically identify all credible abnormal conditions and whether they are evaluated based on the most reactive credible configurations. Methods for identifying credible abnormal conditions will be specified in the license and/or ISA Summary. These methods may include the What-If, Checklist, Hazard and Operability (HAZOP), Failure Modes and Effects Analysis (FMEA), Fault Tree, and Event Tree methods. These methods should be appropriate to the hazard and process considered.

Criteria for determining credibility will be specified in the license and/or Integrated Safety Analysis (ISA) Summary and may be elaborated on in procedures. Review the bases for selected events dismissed as incredible to determine whether the bases are consistent with license requirements (including definitions of credible and any limitations on what types of considerations may be relied on in making that determination), and are documented in sufficient detail to permit an independent assessment of credibility. Determine whether the bases rely on any items which should be identified as NCS controls or items relied on for safety (IROFS). Historical experience indicates that failure to anticipate or evaluate

credible conditions has been a recurring factor leading to accidents and other significant events.

Events that should be considered in CSEs include internal and external events such as natural phenomena (e.g., earthquakes, storms, flooding), fires, spills, maintenance activities, and loss of engineered or administrative controls.

Review selected scenarios to determine whether the CSEs adequately demonstrate subcriticality.<sup>3</sup> CSEs should clearly identify normal and credible abnormal conditions, especially when calculations are used to establish a safety limit (as opposed to parametric or sensitivity studies) and when they are subject to different  $k_{eff}$  limits. Calculations should be performed in accordance with the technical practices and subcritical margins specified in the license and applicable procedures. Calculations should be performed within their validated area(s) of applicability (AOA(s)) and should conform to any limitations specified in the documented validation report.

3. Review selected scenarios to determine whether the CSEs adhere to license commitments regarding the DCP. This includes ensuring the following:
  - (1) Whether assumptions, limits, and controls as specified in the CSEs are sufficiently robust to ensure that contingencies are *unlikely* to occur.<sup>4</sup> The inspectors should consider whether specified controls are reasonable and reasonably adhere to the preferred control hierarchy of passive over active engineered, engineered over administrative, favorable geometry over other parameters where practical, etc., whether limits incorporate adequate safety margin (relative to process variability, uncertainty, and system sensitivity), and whether adequate management measures are specified.
  - (2) Whether contingencies as specified in the CSEs are *independent* to the extent practical. By independent it is meant that the occurrence of one contingency must not reasonably be considered to cause, or increase the likelihood of, the second contingency. Identifying any credible common-mode failure necessarily means the DCP has not been met. Reliance on more than one controlled parameter is preferred to reduce the likelihood of unanticipated common-mode failures. In the event only one parameter is controlled, diversity is to be preferred over redundancy in selecting controls for the same reason. Processes relying only on redundant simple administrative controls to satisfy the DCP are therefore of particular concern.

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<sup>3</sup> This is to be based on approved methods, which may include the use of industry standards, handbooks, hand calculations, deterministic or probabilistic computer methods, or subcritical values specified in the license application. The discussion that follows generally assumes that safety limits are based on computer calculations, though it may be applied to other methods as appropriate.

<sup>4</sup> Use of the term “unlikely” must be understood in its proper context, which predates the issuance of the performance requirements in Subpart H of 10 CFR Part 70 by decades. This has no relation to the term as used in 10 CFR 70.61(c) and its use does not imply any quantitative standard of likelihood.

- (3) Whether provision is made for the timely detection and correction of contingencies, to reduce the vulnerability of the process to *concurrent* failures. Processes where undetected failures or slow accumulations can occur are therefore of particular concern.
4. Review applicable criticality code validation reports upon issuance and major changes, such as validation of a new computer code or expansion of the AOA(s). Requirements for performing validations and documenting results in validation reports will vary between licensees, but validation reports will generally include a specification of benchmark experiments, calculation and statistical analysis of the benchmarks, determination of the bias, bias uncertainty, and upper subcritical limit, and specification of the AOA(s) and any limitations on use of the code. Particular attention should be provided to the following considerations in reviewing validation reports—(1) whether selected experiments are applicable to calculations to be performed,<sup>5</sup> (2) whether statistical methods are used properly (e.g., assumptions regarding data normality and any trends adhered to, any rejected outliers appropriately justified, extrapolation or large interpolation of trends performed correctly and within appropriate limits), and (3) whether the AOA(s) are appropriately specified. The description of an AOA should include the range of composition of fissionable, moderating, reflecting, and absorbing materials, the neutron energy spectrum, computer code system hardware and software, nuclear data library, code options used, etc.

A process for computer code verification upon code system changes and periodically should be in place, and code systems should be placed under configuration control to prevent unintended changes.

Review the description of controlled parameters, controls, and limits in the CSEs to determine whether they are clear and unambiguous, described in sufficient detail to ensure they will perform their intended safety functions, and consistent with the results of calculations (or other methods to demonstrate subcriticality). In addition to establishing *subcritical limits* (limits on one or more parameters that ensure compliance with specified  $k_{\text{eff}}$  limits), licensees may establish *safety limits* (as specified in CSEs and/or other safety basis documents) and *routine operating limits* (as specified by line operations in procedures or work instructions) more conservatively to increase confidence that subcritical limits will not be exceeded. While specific terms and definitions vary between licensees, established limits should be sufficient to account for process variability and uncertainty (including manufacturing tolerances, measurement precision, instrument drift, etc.) and should render credible process deviations sufficiently unlikely to ensure that the performance requirements of 10 CFR 70.61 and the DCP are met. All attributes and components of controls needed to ensure that the performance requirements and DCP will be complied with should be described in appropriate detail.

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<sup>5</sup> Benchmark applicability is particularly sensitive to the specific nuclides present (including enrichment) and the neutron energy spectrum and the parameters that most affect the spectrum (moderation). The applicability of benchmarks should be justified based on accepted methods (screening criteria of NUREG/CR-6698, TSUNAMI, etc.).

(This inspection requirement should be completed on an as-needed basis, depending on whether there are any significant changes to validation.)

## 02.02 Criticality Implementation.

### a. Inspection Requirements.

1. Determine whether the existing plant configuration and plant operations are covered by, and consistent with, the process description and safety basis in CSEs (i.e., the CSE accurately or conservatively describes the operation as it actually exists, including whether assumptions used in the analysis are valid).
2. Determine whether engineered controls established in CSEs are appropriately included in process and system descriptions, specifications, drawings, piping and instrumentation diagrams, etc.
3. Determine whether administrative controls established in CSEs are appropriately included in written procedures, postings, training modules, etc.
4. Determine whether engineered and administrative controls (including equipment relied on to perform enhanced administrative controls) established in CSEs are subject to appropriate quality assurance and management measures, and whether any controls needed to meet the performance requirements of 10 CFR 70.61 are identified as IROFS.

### b. Inspection Guidance.

1. Determine whether CSEs adequately bound actual fissile material operations<sup>6</sup> in the facility, through review of documents, discussions with licensee staff, and walkdowns of selected operations, including temporary operations and those performed by functions such as radiological safety, MC&A, and maintenance. The amount, composition, and configuration of process materials and equipment as modeled in CSEs should be a realistic or conservative representation of actual plant conditions and should be maintained consistent with the current plant configuration.
2. Through observation of equipment, if practical, and through review of drawings, diagrams, specifications, etc., determine whether passive and active engineered controls have been constructed, installed, and operated as specified in CSEs. Equipment important for criticality safety should be clearly identified as such in accordance with the licensee's configuration control program. Examine the material condition of engineered controls for degradation that could impact their safety function.

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<sup>6</sup> The terms "fissile" and "fissionable" have different technical meanings, but here are used more or less interchangeably to refer to material of concern to NCS (mainly uranium enriched in <sup>235</sup>U and plutonium). While the preferred and broader term is "fissionable," terms that are historically used are retained.

3. Through observation of operations, if practical, and through review of operating procedures, postings, work instructions, etc., determine whether administrative controls are appropriately communicated to operators. Through discussion with operators, determine whether they understand the administrative controls in their procedures, postings, and instructions, and perform them as specified in CSEs. Procedures and posting should be written, and training conducted, so that operators clearly understand controls and know which procedural steps are important for criticality safety.
4. Review the ISA Summary and supporting ISA documentation for selected fissile material operations, to determine whether hazards and controls are treated in the ISA appropriately and consistently with the CSEs. Consistency does not mean that ISA documents and CSEs must analyze criticality hazards, sequences, and controls the same way. The purposes and methods of the ISA and CSEs are different, and the set of controls used to meet the performance requirements and DCP may be different. It must be recognized that other controls besides IROFS may be important for safety, and their significance does not necessarily correlate to whether they are designated as IROFS. Designating controls as IROFS is of primarily regulatory significance, affecting mainly a licensee's change process, event reporting, and designation and application of management measures, with relatively little impact on facility safety (provided appropriate management measures are still implemented). While the analyses of events and the discussion of controls may differ between the ISA documentation and the CSEs according to their respective approved methodologies, factual contradictions with regard to descriptions of the process or underlying assumptions should not occur.

The ISA Summary is a regulatory tool that may be useful in the identification of processes, sequences, and controls for detailed inspection. However, the CSEs are the primary source of information about the safety basis of facility operations and more closely tied to actual facility operations, and hence should be the main focus of the documentation review portion of the inspection.

## 02.03 Criticality Operational Oversight.

- a. Inspection Requirements.
  1. Determine whether operator training includes instruction in criticality hazards and control methods, and whether NCS staff is involved in the development of operator training.
  2. Determine whether NCS staff routinely inspect fissile material operations to ascertain that criticality requirements are being complied with, including both engineered and administrative controls. Determine whether all such areas are inspected before start-up and on a frequency specified by license requirements and with appropriate thoroughness.

3. Determine whether management measures applied to engineered controls (preventive and corrective maintenance, surveillance, functional testing) are sufficient to ensure the reliability and availability of NCS controls.
  4. Assess the conduct of activities for monitoring process conditions, in particular sampling and nondestructive assay to detect long-term accumulation.
- b. Inspection Guidance.
1. NCS training for fissile material operators and other relevant staff should address the consequences of criticality and the staff's appropriate response to evacuation alarms and off-normal conditions; should reinforce the licensee's stop work policy and stress the need for compliance with procedures, postings, and other written instructions; should discuss the phenomenon of nuclear criticality and the means of control (the controlled parameters and their effect on criticality safety), and should address the specific ways those means are controlled in the facility. NCS training should be commensurate with operators' specific responsibilities, and should include both general NCS training and job-specific training on controls and limits in their areas of responsibility. Training should not be overly theoretical or abstract. NCS staff should be actively involved in developing, reviewing, presenting, and overseeing NCS training for all staff requiring it.

The goal of NCS training is to ensure that fissile material operators understand the hazards and controls in their respective areas, including both prevention and emergency response. The inspectors should determine, through observation of operations and, if practical, discussion with operators, whether operators have an understanding of the hazards and controls in their areas. Ensuring that operators are knowledgeable about their responsibilities for safety, including response to off-normal conditions, should be the primary focus of this portion of the inspection, as opposed to reviewing training records.

(This inspection requirement should be completed once per year, unless significant changes warrant additional inspection.)

2. The inspectors should determine whether the licensee ensures that all fissile material operations are inspected by the NCS organization on a frequency as specified by license requirements, to ensure that NCS limits and controls are being complied with, and that process conditions have not changed so as to invalidate the basis for those controls and limits. NCS staff assigned to perform these inspections should be trained and qualified to perform those tasks and should maintain familiarity with operations and frequent communication with operators and operations management. Good rapport between the safety and operations organizations is essential, and analysts should be observed to be spending a considerable portion of their time in the field.

Performance of the licensee's inspections should rotate so all plant areas are inspected at a specified frequency. The frequency of inspections may be graded commensurate with risk-significance; however, no operations and areas that

affect NCS should be neglected. The inspectors should accompany NCS staff on these inspections, if practical, to observe their scope and depth and observe the interaction between NCS and operations staff. Ideally, NCS staff should observe operations in progress and discuss the limits and controls with operators, supervisors, and managers. NCS staff should bring any deviations from criticality requirements to the immediate attention of operations, document them in their inspection reports, and ensure they receive prompt and effective corrective action commensurate with their significance.

In addition to these periodic inspections, NCS staff should also inspect new or changed operations prior to start-up, with a scope and depth commensurate with their significance.

3. Maintenance, surveillance, and functional testing should be conducted in a manner and frequency sufficient to ensure that NCS controls will be available and reliable to perform their safety function, to the extent relied on to meet the performance requirements of 10 CFR 70.61 and the DCP. Records of failures should be maintained as required by 10 CFR 70.62(a)(3). These records should demonstrate, among other things, the adequacy of the licensee's management measures. Controls should be verified to be in place and working correctly upon installation and following maintenance activities, as well as on a specified periodicity. Surveillance may be credited both for reducing the probability of failure and for limiting its duration. Functional testing should thoroughly test all components of control systems needed to perform the intended safety function. Configuration and change control programs should ensure that new operations are not initiated until all controls are properly verified, and that proper control is maintained over any components taken out-of-service to ensure they are not returned to service unintentionally or without proper verification.
4. Process monitoring involving sampling and nondestructive assay are particularly susceptible to error, including common-mode failures. During CSE reviews and walkdowns, the inspectors should be on the lookout for any areas in which fissile material can accumulate or concentrate undetected or in inaccessible locations, such as in storage tanks, waste storage, long-run piping, or process ventilation. This is particularly important when material can accumulate in an unfavorable geometry, and during transfers from favorable to unfavorable geometry. Sampling and laboratory analysis methods should be carefully examined for any potential common-mode failure, particularly when relying on common operators, equipment, or methods. Laboratory analysis or nondestructive assay equipment should be calibrated using representative standards. Nondestructive assay for mass, concentration, or enrichment control should be based on assumptions appropriate to the process and have sufficient margin to account for uncertainties in material characterization, geometric configuration, and measurement error.

(This inspection requirement should be completed once per year, unless significant changes warrant additional inspection.)



## 02.04 Criticality Programmatic Oversight.

### a. Inspection Requirements.

1. Review new or changed administrative NCS Program procedures, to determine whether they adequately implement license requirements and whether the NCS Program is enacted in accordance with them.
2. Determine whether NCS staff reviews new or changed fissile material operations and procedures, including maintenance requests/plans, consistent with program procedures and at a level commensurate with their significance.
3. Determine whether CSEs are performed in accordance with NCS Program procedures and receive appropriate independent review and approval, including by NCS and operations management.
4. Determine whether NCS Program audits are conducted at a frequency specified by license requirements and with appropriate thoroughness. Determine whether audit observations and findings are communicated to licensee management and whether they are appropriately followed up on.
5. Determine whether NCS staff (including trainees, NCS Engineers, and Senior NCS Engineers<sup>7</sup>) are qualified in accordance with license requirements, and have the necessary education and experience to perform their duties. Determine whether activities performed by NCS staff are commensurate with their training and qualification (e.g., whether only qualified NCS engineers perform CSEs).

### b. Inspection Guidance.

1. NCS Program procedures should be adequate to implement the authority and responsibilities of the program as specified by license requirements. The NCS Manager should ensure the proper development and implementation of these procedures. Management and staff authority and qualifications should be commensurate with the assigned responsibilities. Procedures should cover all essential NCS Program elements, including evaluating new or changed fissile material operations in CSEs, establishing NCS limits and controls, providing advice to management and operations to support routine operations and during emergency response, participating in the training of fissile material operators, and inspecting operations to ensure compliance with NCS limits and controls.

(This inspection requirement should be completed on an as-needed basis, depending on whether there are any significant changes to program procedures.)

2. Requests for new operations or for changes to existing operations should be reviewed by NCS staff. The scope of the review may vary in accordance with

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<sup>7</sup> The exact titles of NCS staff, including the NCS Manager, and organization of the NCS Program within the licensee's management hierarchy, varies. Inspectors should ascertain who performs the required functions and apply the guidance accordingly.

license requirements and program procedures, but should be commensurate with the significance (e.g., risk-significance, complexity, novelty) of the request. The screening process to determine the level of NCS review is as important as the subsequent review itself, and should be documented in the change package along with the 70.72 evaluation. The inspectors should assess whether selected change requests are reviewed by other affected organizations, including other safety disciplines and operations, and whether operations has the opportunity to provide feedback on the feasibility of proposed limits and controls, prior to implementation.

3. Independent (peer) review of CSEs should be conducted by qualified senior staff, typically Senior NCS Engineers. CSEs should be documented at an appropriate level of detail, sufficient to permit independent verification of results, including a clear description of all assumptions, models, and analyses. The independent review must be performed and documented as required in program procedures.
4. The inspectors should review audit reports and discuss the resolution of audit observations and findings with licensee management. NCS Program audits should be performed periodically, and include personnel independent of the NCS Program function, as specified by license requirements. This may include contractors or other personnel external to the facility. Audit findings should be communicated to licensee management, who should ensure they receive appropriate corrective action commensurate with their significance.

(This inspection requirement should be completed on an as-needed basis, depending on whether any new audits have been performed.)

5. NCS engineers are expected to have education and experience commensurate with their assigned responsibilities. This should include not only technical experience in the principles of NCS, but also familiarity with facility operations and license requirements. Rather than make this a separate focus of the inspection, the inspectors should be able to obtain a good understanding of NCS staff qualifications through its routine interactions with the staff.

(This inspection requirement should be completed on an as-needed basis, depending on whether there is any new NCS staff.)

#### 02.05 Criticality Incident Response and Corrective Action.

##### a. Inspection Requirements.

1. Determine whether the licensee's criticality accident alarm system (CAAS) complies with regulatory requirements.
2. Determine whether the licensee maintains emergency response procedures that address response to CAAS evacuation alarms, protection of workers and the public from the consequences of accidental criticality, and reentry and recovery procedures.

3. Determine whether licensee management actively encourages licensee staff to report known or suspected violations of NCS requirements and any off-normal conditions. Determine whether NCS reviews and participates in the resolution of such occurrences. Determine whether the licensee has an adequate<sup>8</sup> program to track such occurrences, including internal infractions or reportable events, and to ensure prompt and effective corrective action to restore safety and compliance and prevent recurrence.
- b. Inspection Guidance.
1. The inspectors should assess the CAAS design characteristics, coverage, and operability. Design characteristics and coverage should be evaluated upon installation of a new CAAS or upon significant changes to the existing CAAS (e.g., upgrades to new technology, expansion to cover new areas). It is not expected the inspectors will reexamine those features unless such changes have occurred since the last NCS inspection, although facility changes that rearrange process areas or introduce additional shielding can affect the basis for coverage. CAAS operability should be evaluated once per year. Each of these areas is discussed in further detail below:
    - (1) The inspectors should determine whether the CAAS characteristics meet regulatory requirements and license commitments, including if so committed, ANSI/ANS-8.3. These include (1) whether the CAAS is designed and implemented so as to minimize false alarms (by coincidence or majority logic and setting detection thresholds sufficiently above background); (2) whether components are resistant to environmental conditions (heat, vibration, radiation, corrosive gases, etc.) and natural phenomena (lightning, thunder, flooding, earthquakes, etc.); (3) whether detector failure is self-announcing; and (4) whether there is adequate emergency power for detectors and electricity or air for horns to ensure the horns will continue to annunciate until manually reset. Specific design criteria may be specified in the license, license application, ISA Summary, ANSI/ANS-8.3, and/or internal procedures.
    - (2) The inspectors should examine the licensee's documentation demonstrating dual alarm coverage over all areas in which it is required, to determine if conservative assumptions about (1) the source strength and spectrum; (2) source location; and (3) the amount and location of intervening shielding have been made. Due to the large uncertainties inherent in such calculations, the calculated dose or dose rate normally exceeds the detection threshold by a substantial margin.

The inspectors should also examine whether alarm signals are audible within the areas required to be evacuated (often known as an immediate

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<sup>8</sup> For the purpose of this procedure, an "adequate program" entails implementation of a problem identification and resolution process that complies with license commitments and satisfactorily identifies, documents, and corrects issues. Compliance with RG 3.75, "Corrective Action Programs for Fuel Cycle Facilities" is not necessary for satisfactory performance in this inspection area.

evacuation zone), by review of analysis and drill/test records. Typically, the alarm signal should be loud enough to be heard over ambient noise—or supplemented by a visual alarm—but not so loud as to cause hearing damage.

- (3) The inspectors should determine whether CAAS detectors are maintained at the required level of operability, including (1) whether detectors are calibrated; (2) whether all components (including detectors, wiring, and associated electronics) are functionally tested; (3) whether alarm setpoints are set to promptly actuate upon detecting the minimum accident of concern; and (4) whether access to alarm setpoints is strictly controlled. Specific operability criteria may be specified in the license, license application, ISA Summary, ANSI/ANS-8.3, and/or internal procedures.

(This inspection requirement should be completed on an as-needed basis, depending on whether there are any significant changes the CAAS.)

2. Licensees should maintain emergency response capability, as established in documented emergency plans and procedures, and verified by means of drills and exercises. These may include an Emergency Plan and/or Pre-Fire Plan to address the use of moderating fire suppressants in moderation-controlled areas. If the use of such materials is allowed, their use should be accounted for in CSEs. If there are restrictions on such fire suppressants, they should be communicated appropriately to both onsite and offsite responders. The inspectors should assess whether qualified NCS staff are readily available to advise the licensee in an emergency and whether the licensee has the authority to overrule restrictions on the use of firefighting agents in order to reduce overall risk.

The inspectors should assess whether emergency procedures specify that personnel evacuate to accountability points in the event of a CAAS alarm, whether evacuation routes and accountability points are designed to minimize the potential for exposing evacuating personnel to radiation, whether evacuation drills are conducted as specified in the license and whether lessons learned are appropriately entered into the corrective action program. The inspectors should determine whether the licensee has monitoring instrumentation to promptly assess the dose to potentially exposed individuals and to aid in safe reentry and recovery, and whether provisions are in place for the prompt decontamination and medical treatment of exposed individuals. The inspectors should also assess whether reportable events are promptly and accurately (based on the best knowledge readily available at the time of the event) reported.

(This inspection requirement should be completed once per year, unless significant changes warrant additional inspection.)

3. The inspectors should evaluate the licensee's problem identification and resolution or corrective action program as applied to NCS off-normal conditions (both internal infractions and reportable events). Suspected or known violations

of criticality requirements and abnormal conditions should be promptly identified and entered into the program. Licensee management should foster a safety culture that reinforces procedural compliance, stop-work authority, and the responsibility to promptly report off-normal conditions. The inspectors should verify the efficacy of these policies by evaluating whether off-normal conditions are appropriately entered into the program, whether they receive an appropriate level of investigation (including, when appropriate, root cause investigation), whether proposed corrective actions are sufficiently broad (extent of condition), whether they are prioritized on a schedule commensurate with their significance, and whether they are completed as scheduled and are adequate to prevent recurrence. Licensees should also track and trend infractions to identify any performance that is being degraded and assess the efficacy of their corrective actions.

#### 88015-03      RESOURCE ESTIMATE

The resource estimate to perform this inspection procedure is 64 hours per year at a Cat III and 192 hours per year at a Cat I.

#### 88015-04      REFERENCES

10 CFR 70, "Domestic Licensing of Special Nuclear Material"

NUREG-1520, "Standard Review Plan for License Applications for Fuel Cycle Facilities"

Regulatory Guide 3.71, "Nuclear Criticality Safety Standards for Fuels and Material Facilities"

NUREG/CR-6698, "Guide for Validation of Nuclear Criticality Safety Calculational Methodology"

#### 88015-05      PROCEDURE COMPLETION

Performance of each applicable inspection requirement will constitute completion of this procedure, with the scope and breadth to be determined by the inspectors in accordance with the approved inspection plan.

END

Attachment:

Revision History for IP 88015

# ATTACHMENT

## Revision History for IP 88015

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment and Feedback Resolution Accession Number (Pre-Decisional, Non-Public Information)
	09/05/06 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	ML061940240
N/A	ML112720153 11/07/11 CN 11-027	Revised the resource estimates based on changes made to IP 88017.	None	ML112720159
N/A	ML15071A069 08/11/15 CN 15-015	Revised to combine IP 88015, 88016, and 88017 into one procedure, to streamline, simplify, and generalize it to be applicable to all fuel cycle facilities and to be consistent with licensing guidance, and to incorporate lessons learned from operating experience.	Seminar 12/31/2015	ML15139A425