

Safety Controls Cornerstone

Objective

The objective of this cornerstone is to ensure the availability, reliability, and capability of items relied on for safety (IROFS), nuclear criticality safety (NCS) controls, or other safety controls.¹ These IROFS, NCS controls, and other safety controls prevent, limit the frequency of, or mitigate accident sequences that could lead to intermediate or high consequence events or a nuclear criticality.

Desired Results

Demonstration that there is reasonable assurance that intermediate consequence, high consequence, and nuclear criticality events will be prevented.

Key Attributes and Scope.

Those attributes of licensee performance that affect safety control systems are shown in Figure 1

1. Staff Performance
 - a. Staff Training and Qualification Scope – Inspection activities in this area focus on the effectiveness of the licensee's program for conducting plant staff initial training and qualification and requalification training on IROFS, NCS controls or other safety controls through observation of plant staff performance during operations and during walk-throughs conducted by inspectors. Any deficient performance is evaluated to determine if it results from deficient training and qualification.
 - b. Temporary Instruction Scope - Inspection activities in this area focus on plant staff actions taken because of equipment deficiencies, degradation, or unavailability. In these cases, operators would likely be using temporary procedure changes or instructions. Inspectors evaluate the impact on plant staff performance because of temporary instructions. Inspection activities focus on temporary instructions that have the potential to degrade IROFS, NCS controls, or other safety controls.
2. Procedure Quality

IROFS, NCS Control, and Other Safety Control Clarity Scope - Inspection activities in this area focus on the clarity of plant procedures with regard to IROFS, NCS controls, and other safety controls. Inspection activities include observation of plant staff performance during operations and during walk-throughs provided by inspectors. Inspectors evaluate any deficient performance to determine if it results from inadequate, deficient, or unclear procedures. While reviewing the use of procedures, inspectors also

¹ Other safety controls – NCS controls, chemical safety controls, or radiation safety controls at facilities not licensed under Part 70 that are identified in the license, technical safety requirements, license or certificate application, or safety analysis. For facilities licensed under Part 70, NCS controls, chemical safety controls, or radiation safety controls required by the license or described in the license application, ISA, or safety analysis that are not IROFS or NCS controls required by Part 70.

evaluate whether the procedure and activities observed result in compliance with regulations and license requirements. In addition, inspectors review selected changes to procedures to determine whether the procedures provide adequate guidance to plant staff to meet NRC requirements.

3. Facility and Equipment Performance

- a. Maintenance Effectiveness Scope – Inspection activities in this area review selected items to determine whether the licensee is assuring adequate IROFS, NCS controls, and other safety controls performance by applying this management measure appropriately, including reviewing selected IROFS' failure evaluation to determine the cause as required by 10 CFR 70.62(a). In addition, inspectors observe maintenance activities for IROFS, NCS controls, and other safety controls to evaluate work practices.
- b. Surveillance Testing Scope – Inspection activities focus on determining whether surveillance testing of IROFS, NCS controls, and other safety controls assures that they are capable of performing their intended safety functions. Inspectors determine whether IROFS, NCS controls, and other safety controls would perform within the design assumptions. Inspectors review surveillance test results for adequacy in meeting the requirements, observe ongoing testing to evaluate staff performance, and ensure that test acceptance criteria are in agreement with IROFS, NCS control, and other safety control specifications.
- c. Post-Maintenance Testing Scope – Inspection activities focus on determining whether the post maintenance test procedures and test activities are adequate to determine whether IROFS, NCS controls, and other safety controls would perform their intended function after the maintenance.
- d. Fire Protection Scope - The inspection is conducted to evaluate protection against fires within the facility. These inspections would be conducted in two phases. Phase one consists of annual assessment of conditions related to ignition sources, control of combustible materials, and fire protection systems and equipment. (For licensees with resident inspectors, Phase 1 is conducted at the frequency specified in resident inspection procedures.) Phase 2 is a periodic inspection that is a more in-depth review of fire protection of IROFS and NCS controls and other fire protection required by the license or included in the license application.
- e. Onsite Backup Power Reliability Scope – Inspection activities in this area focus on a licensee's actions to ensure the availability, reliability, and capability of onsite backup power such as batteries and emergency diesel generators.

4. Design

- a. IROFS, NCS Control, and Other Safety Control Design and Performance Capability Scope – Inspection activities in this area include review of the ISA Summary and ISA or safety analysis, as-built conditions, modifications, testing, and normal and emergency operation of risk-significant systems. This would be an in-depth review of a selected risk-significant system and support systems.
- b. Criticality Analysis Scope (Analytical Assumptions and Adequate Subcritical Margin) -

Inspection activities include reviews of new and changed criticality analysis to determine the adequacy of analytical assumptions and resulting subcritical margin. The inspection evaluates the overall adequacy of the criticality safety basis, resulting IROFS and controls, and the effect of changes on assumptions, conclusions and subcritical margin.

5. Configuration Control

- a. Permanent Plant Modifications Scope - Inspection activities in this area include the review of design, installation, configuration control, and post-modification testing for risk-significant permanent modifications potentially affecting IROFS, NCS controls, and other safety controls. Inspection activities include an in-depth review of selected changes to the initial licensed design, ISA and ISA Summary or safety analysis, management measures, and normal and emergency operating procedures. Inspectors determine whether the licensee's evaluations of the modifications meet the requirements of 10 CFR 70.72.
- b. Temporary Plant Modifications Scope - Inspection activities in this area include a review of design, installation, configuration control, and post-modification testing for selected potentially risk-significant temporary modifications that impact IROFS, NCS controls, and other safety controls. Inspectors determine whether the licensee's evaluations of the modifications meet the requirements of 10 CFR 70.72.
- c. Equipment Alignment Scope – Inspection activities determine whether equipment is aligned in accordance with procedures and the ISA or safety analysis and whether there are discrepancies that impact the IROFS, NCS controls, and other safety controls. This includes conducting partial walkdown inspections periodically to determine whether IROFS, NCS controls, and other safety controls are properly aligned. In addition, inspectors will perform a complete walkdown periodically.

6. Corrective Action Program (CAP)

CAP Scope (Audits/Audit Findings, Infraction Follow Up, Event Follow Up, and Other CAP Findings) - Inspection activities include reviews of selected IROFS, NCS controls, and other safety controls items in the licensee's CAP to determine whether the items were adequately identified and corrected. This inspection is to complement the periodic inspection of the CAP program that evaluates implementation of the overall CAP program. This process is a management measure for Part 70 licensees.

Metrics Used to Measure Key Attributes

Key Attribute	Area to Measure	Metric
Staff Performance	Staff training and qualification	Training adequate to assure effective procedure use
	Temporary instructions	Temporary changes evaluated per license and are adequately implemented
Procedure Quality	IROFS, NCS control, and other safety control clarity	Implement IROFS, NCS controls, and other safety controls per ISA, safety analysis, or license application
Facility and Equipment Performance	Maintenance effectiveness	Results in capable, available and reliable per Part 70 and ISA or safety analysis and license
	Surveillance testing	Results in capable, available and reliable per Part 70 and ISA or safety analysis and license
	Post-maintenance testing	Results in capable, available and reliable per Part 70 and ISA or safety analysis and license
	Fire protection	Licensee actions ensure availability and reliability of IROFS, NCS controls, and other safety controls per Part 70, ISA or safety analysis, license, and license application
Design	IROFS, NCS control, and other safety controls design and performance capability	Meet 70.61 and 70.72 and license requirements
	Criticality Analysis	Meet 70.61 and 70.72 and license requirements and/or in accordance with license and license application
Configuration Control	Permanent plant modifications	Meets 70.72, 70.61, and 70.62 or license
	Temporary plant	Meets 70.72, 70.61, and 70.62 or

	modifications	license
	Equipment alignment	Properly aligned in accordance with analysis and procedures
Corrective Action Program (CAP)	Audits/audit findings	Audits conducted as required by license or license application and results resolved adequately and in timely manner
	Infraction follow up	Follow up resolves issue, prevents reoccurrence and adequately considers extent of condition
	Event follow up	Follow up resolves issue, prevents reoccurrence and adequately considers extent of condition
	Other CAP findings	Other IROFS or Criticality Safety issues in CAP adequately resolved

Figure 1

