



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

NRC INSPECTION MANUAL

HHFB

INSPECTION PROCEDURE 42700

PLANT PROCEDURES

PROGRAM APPLICABILITY: 2515

SALP FUNCTIONAL AREA: PLANT OPERATIONS (OPS)

42700-01 INSPECTION OBJECTIVES

01.01 To verify that plant procedures are reviewed and approved in accordance with technical specifications and regulatory requirements.

01.02 To verify that the technical adequacy of procedures is consistent with desired actions and modes of operation.

01.03 To verify the usability of procedure content and format by determining the degree to which accepted human factors principles have been incorporated.

01.04 To verify that temporary procedure changes were made in accordance with plant administrative procedures and technical specification requirements.

42700-02 INSPECTION REQUIREMENTS

02.01 Sample Selection. Select a sample of at least 15 procedures for review. The sample should reflect any instances where problems with procedures have been documented in LERs, NRC inspection reports, or licensee assessments or audits. Other significant activities that may also initiate a procedure review include major design modifications and procedure upgrade programs.

The procedures selected for review may focus on a single work group or procedure type. However, if problems are evident in several work groups, the sample should be selected from three or more of the following categories of procedures:

- a. General Plant Operating Procedures. Procedures identified in Regulatory Guide 1.33, Appendix A, Paragraph 2.
- b. Startup, Operation, and Shutdown of Safety-Related System Procedures. Startup, operation, or shutdown procedures identified in Regulatory Guide 1.33, Appendix A, Paragraphs 3 and 4 for PWRs and BWRs, respectively.
- c. Abnormal (Alarm) Condition Procedures. Abnormal condition procedures for alarms associated with the systems identified in category b, above.

- d. Emergency and Other Significant Event Procedures. Procedures identified in Regulatory Guide 1.33, Appendix A, Paragraph 6.
- e. Maintenance Procedures. Mechanical, electrical, or instrument and control maintenance procedures associated with the systems identified in category b, above.
- f. Administrative Procedures. Procedures identified in Regulatory Guide 1.33, Appendix A, Paragraph 1.

02.02 Process for Initial Review and Approval of Procedures. Examine the sample of procedures to verify that the review and approval of procedures are in accordance with technical specifications.

02.03 Adequacy of Procedures. Examine the sample of procedures to verify overall procedure content consistent with technical specification requirements.

- a. Technical Content of Procedures. Examine the technical content of the procedures selected and verify that they are adequate to control safety-related operations within applicable regulatory requirements.
- b. Procedure Maintenance. Verify that selected procedures and their related forms, attachments, and referenced documents in plant working files are current with respect to revision and temporary change.

02.04 Usability of Procedures. Review the sample of procedures to verify that procedures are usable by assessing the degree to which accepted human factors principles have been incorporated into each type of procedure.

02.05 Changes to Procedures. Review the sample of procedures to verify that procedure changes are made in accordance with the licensee's processes and regulatory requirements.

- a. Changes Due to Technical Specification or License Revision. Verify that procedure changes made within the last six months reflect technical specification or license revisions.
- b. Procedure Change Conformance to 10 CFR 50.59(a).
 - 1. Verify that changes made to procedures during the past year were in conformance with 10 CFR 50.59(a) requirements.
 - 2. Verify that records of changes in procedures made pursuant to 50.59(a) are maintained as described in 10 CFR 50.59(b).
- c. Temporary Procedures and Temporary Procedure Changes. Verify that temporary procedures written or temporary procedure changes made during the past year were properly approved and did not conflict with technical specifications requirements.
- d. Procedure Backlog. Verify that the backlog of procedure change requests has been evaluated to ensure that safety-significant changes are acted upon in a timely manner.

General Guidance

NRC Inspection Procedure (IP) 42001, "Emergency Operating Procedures," and the NUREGs referenced in it provide additional guidance for reviewing, developing, implementing, changing and maintaining emergency operating procedures. Observing procedures being performed is recommended. Observing walkthru simulations of procedures, either in the plant or the simulator may also be of value.

Personnel performance problems in the area of procedures may also reflect a corrective action program that does not deal effectively with procedure issues. A review of the corrective action program using IP 92720, "Corrective Action," may also be appropriate.

The Human Factors Assessment Branch (NRR/HHFB) is the technical lead for issues related to the development, maintenance, and usability of procedures. Any questions related to implementing this procedure should be referred to HHFB.

Specific Guidance

03.01 Sample Selection. No inspection guidance provided.

03.02 Process for Review and Approval of Procedures. If the titles of facility procedures do not conform exactly with titles noted in Regulatory Guide 1.33, relate specific facility procedures to the systems and the associated activities noted in the regulatory guide.

Documents, such as vendor manuals, equipment operating and maintenance instructions, or approved drawings with acceptance criteria, may by reference be part of a procedure. If these documents are so used, the documents (or applicable portions) require the same level of review and approval as the procedure that references it.

03.03 Adequacy of Procedures. Facility technical specifications may not have specific requirements with respect to overall procedure content. Nonetheless, the inspector should review selected procedures and compare them with ANSI 18.7-1976.

- a. Technical Content of Procedures. Determine whether the procedures will accomplish the activity within the design characteristics and the safety review considerations. During this evaluation, the review may include technical specifications, limiting condition for operation, FSAR descriptions, vendor manuals, design information, piping and instrumentation drawings (P&IDs), and instrumentation and electrical wiring and control diagrams.

Verify that appropriate technical specification and vendor or design operating limitations such as heatup/cooldown rates, pressure/temperature limits, reactivity limits, safety limits, LCOs, and limiting safety system settings have been incorporated into the procedures.

- b. Procedure Maintenance. Review a sufficient number of procedures (a sampling of 5-10 is suggested) to provide assurance that the procedures (including checklists, and related forms) in the plant working files are current. Plant working files are usually kept in the control room, and in mechanical, electrical, instrumentation, or radiochemistry offices. ANSI N18.7-1976, Section 5.2.15, states that administrative controls shall assure that documents are distributed in accordance with current

distribution lists and are used by those who perform the prescribed activity, and that administrative control must be provided to prevent the inappropriate use of outdated documents.

03.04 Usability of Procedures. Review and evaluate procedures to ensure that they are usable. Determine usability by evaluating the procedures against the writing style and format standards established in the licensee's Writer's Guide. Using the guidance in Attachment A, "Procedure Usability," to this procedure, determine the quality of the Writer's Guide. If a Writer's Guide is not available, evaluate the procedures directly against the characteristics listed in Attachment A to determine the degree to which accepted human factors principles have been incorporated to make the information in the procedure clear and understandable to users. If the procedures were not prepared according to the guidance in the Writer's Guide, or if several characteristics from Attachment A are not evident in the initial sample of procedures, select an additional sample of 5-10 procedures for further review to determine the degree to which usability may be an issue.

03.05 Changes to Procedures

- a. Changes Due to Technical Specification or License Revisions. Verify the adequacy of all procedure changes which resulted from recent (within the last year) license change or a revision to a technical specification.
- b. Procedure Change Conformance to 10 CFR 50.59(a)
 1. This item applies only to changes to procedures which are described or summarized in the FSAR, normally a small portion of the procedures in use at the facility. General guidance and contrasting examples relating to the procedure changes which can be made by the licensee are described in NRC Inspection Manual Part 9900, "Guidance on 10 CFR 50.59 -- Changes to Facilities, Procedures, and Tests (or Experiments)."
 2. Specific record requirements and retention periods are described in 10 CFR 50.59(b).
- c. Temporary Procedures and Temporary Procedure Changes. Review a sample of temporary procedures and temporary procedure changes issued during the past year to determine that the approval and subsequent review requirements of the technical specifications are being followed. Depending on the number of temporary procedure changes issued, a sampling of 10-20 is suggested. Determine whether the licensee has procedural limitations on how long a temporary procedure or a temporary procedure change can be in effect, and compare this with observed practices. Note that, according to technical specifications, temporary procedure changes cannot change the intent of the basic procedure. A "change in intent" means changing what is accomplished by the basic procedure or changing the method by which it is accomplished has safety significance.

Review the method by which the licensee incorporates temporary changes to emergency or significant event procedures. The method used should not be so complicated as to preclude proper and timely operator action during abnormal plant conditions. The NRC position concerning control of procedural adherence is described in NRC Inspection Manual Part 9900, "Technical Guidance, Operations -- Procedural Adherence."

42700-04 RESOURCE ESTIMATES

On the average, 24 hours of direct onsite inspection effort are required to perform a limited scope procedure review within any single work group. A more detailed review of procedures for any single work group requires approximately 40 hours.

42700-05 REFERENCES

10 CFR 50.59, "Changes, tests, and experiments."

Regulatory Guide 1.33, Rev. 2, "Quality Assurance Program Requirements," February 1978.

ANSI N18.7-1976, "Administrative Controls for Power Plants."

NUREG-1977, "Guidelines for Preparing Emergency Procedures for Nuclear Power Plants," April, 1981. (NUDOCS Fiche Address 08514/008)

NUREG/CR-4613, "Evaluation of Nuclear Power Plant Operating Procedures Classifications and Interfaces," February 29, 1987. (NUDOCS Fiche Address 39983 /256)

NUREG/CR-3632, "Methods for Implementing Revisions to Emergency Operating Procedures," May 1984. (NUDOCS Fiche Address 24534/208)

NUREG-0899, "Guidelines for the Preparation of Emergency Operating Procedures," August 1982. (NUDOCS Fiche Address 15513/286)

NUREG/CR-2005, Rev.1, "Checklist for Evaluation Emergency Operating Procedures Used in Nuclear Power Plants," April 1983. (NUDOCS Fiche Address 08790/355)

NUREG/CR-3177, Vols. 1, 2, and 3, "Methods for Review and Evaluation of Emergency Procedure Guidelines," March 1983. (NUDOCS Fiche Address 21119/138, 17863/033, and 17862/227)

NUREG/CR-5228, "Techniques for Preparing Flowchart-Format Emergency Operating Procedures," January 1989. (NUDOCS Fiche Address 49670/141)

END

ATTACHMENT A

PROCEDURE USABILITY

Incorporating accepted human factors principles about format and writing style into procedures increases the likelihood that the procedures will be easier to use and follow. Standards for format and writing style can usually be found in the licensee's writer's guide. Usability should be determined by evaluating the degree to which procedures follow the guidance outlined in the writer's guide.

When a writer's guide is not available or if the writer's guide is in question, procedure usability can be determined by evaluating the elements of writing style and format and organization. The bulleted list that follows each element describes characteristics that increase the likelihood that a procedure will be performed successfully.

WRITING STYLE The information in a procedure is presented in a manner that increases the likelihood that the task will be performed successfully.

Procedures are more likely to be performed successfully if

- Writing style is consistent among procedures within a department and within the same procedure type.
- Level of detail is appropriate for the complexity of the task and the expected ability of the users.
- Descriptions of actions to be taken are easy to understand and unambiguous.
 - Action instructions are written as separate and positive commands.
 - Short, simple sentences are used.
 - Multiple actions are written in order of sequence and clearly identify when actions must be completed in order of occurrence.
 - Acronyms and other abbreviations are used consistently and are defined explicitly.
 - Quantitative words are used in instructions.
- References to equipment or documents contain complete identification information, including plant unit applicability, and exactly match equipment labels.
- Numerical units used in procedures correspond to the units on the related instrumentation.
- Conditional statements are presented using the appropriate format.
 - IF and WHEN are used to present a condition.
 - THEN is used to present an action.
 - IF NOT is used in combination with THEN to present an alternative.
 - NOT is used to emphasize an opposite condition (NOT running).
 - AND is used to present all conditions that must be met before taking action.
 - OR is used to present one or more conditions that must be met before taking action.

PROCEDURE USABILITY

FORMAT AND ORGANIZATION

An uncluttered appearance and clear structure of the information in a procedure increase the likelihood that the task will be performed successfully.

Procedures are more likely to be performed successfully if

- Organization is hierarchical, logical, and consistent, and reveals the organization to users through the use of headings.
- Step numbering and structure is not overly complex.
- Appendices and attachments provide explicit guidance for their allowed use and present relevant information that would be difficult to integrate into the procedure.
- Figures and charts are explicitly and uniquely identified so they are easy to find within the procedure.
- Procedure identification information is adequate to ensure the procedure is complete and current.
- Procedure is legible in the worst expected conditions for use. Type is readable (1) at an expected distance within which the procedure is used, (2) after copying and (3) under degraded lighting.
- Aids are used to help users to track their progress through a procedure where appropriate.
- Warnings, cautions and notes (WCNs) are consistent within a department and within a procedure type.
 - WCNs are obvious and address a single topic.
 - WCNs are linked to the related procedure step.
 - WCNs contains no actions.
 - WCs identify the consequence of wrong action.
 - Ns supply only supplemental information.
- Procedure clearly indicates the final step.
- Checklist information reflects the sequence of information in the steps of the procedure.

END