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Procedure Use & Adherence

Revision 0

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FOREWORD

The Institute of Nuclear Power Operations (INPO), as part of an industry task force, started work in June 2007 to develop an industry standard for the scope of a procedure use and adherence document. This task force was composed of representatives from INPO and Nuclear Information Management Strategic Leadership (NIMSL), as well as industry subject-matter experts.

This document describes components of procedure use and adherence to assist the nuclear utility industry in the operation and support of nuclear plants. For a utility, effective implementation of sound procedure use and adherence methods is tied directly to human error reduction, event prevention, and safety and is an integral part of sound revenue generation and maintaining shareholder value.

Appendix B lists the individual contributors to this document.

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1.0 PURPOSE/SCOPE

The purposes of this procedure use and adherence document are as follows:

- Provide an industry guideline based on the experience and knowledge of nuclear industry peers, factoring in the best available human performance strategies.
- Provide procedure use guidance based on the types of procedures.
- Provide guidance for adherence to procedures by establishing principles, guidelines, and rules. This will help ensure safe, effective application and use of procedures in the administration and performance of activities at nuclear power stations.

Although most stations differentiate between procedures and work instructions, part of the guidance provided herein can be applied to work instructions.

This guidance does not apply to the use of emergency and abnormal operating procedures. Each owners group provides standard guidance for its procedure set.

INPO 09-004 is intended to be used by nuclear plant owners and operators as part of their procedure use and adherence programs. Each facility is encouraged to assess its own procedure-writing process and to adapt this information as appropriate to best meet its unique needs. The intent of this guideline is to identify standard elements that should be considered, not to provide an all-inclusive list.

2.0 PROCEDURE ADHERENCE PRINCIPLES

- 2.1 Procedure adherence means understanding a procedure's purpose, scope, and intent and following its direction. The user performs all actions as written in the sequence specified by the procedure. However, if the procedure cannot be used as written, then the activity is stopped and the issue is resolved before the user continues.
- 2.2 Procedures are followed as written, and users do not deviate from procedures except when specifically allowed by the procedure or by approved processes.
- 2.3 Procedures are reviewed prior to use to ensure that potential adherence problems are resolved.
- 2.4 Personnel are trained/qualified or are under the direct control of a trained/qualified individual when performing procedure steps.

3.0 ROLES AND RESPONSIBILITIES

- 3.1 Station management has overall responsibility to provide procedures of sufficient quality to accomplish intended tasks. Responsibility also includes the development,

implementation, and verified effectiveness of procedure use and adherence policies and requirements. Station management is responsible to ensure the following:

- Personnel are trained on the procedure use and adherence process requirements.
- Personnel are trained/qualified to perform assigned procedures.
- Personnel meet the procedure use and adherence process requirements.

3.2 All personnel who use procedures abide by the following:

- Procedures are used and adhered to as described in the appropriate utility and site documents.
- Individuals understand the impact of their actions on personnel and/or equipment before taking the actions.
- Procedure users STOP if they have any questions regarding expected results, and they obtain resolution before proceeding.

4.0 LEVEL OF USE DESIGNATIONS

NOTE: Appendix C provides an example Level of Use Determination Flowchart.

4.1 Procedures are classified as continuous use, reference use, information use, or multiple use. As per NEI document AP-907-005, *Procedure Writers Manual*, the cover page (or first page) of the procedure designates the level of use. For procedures designated as multiple use, a specific level of use designation is provided on the first page of each section.

4.2 Continuous use of a procedure is required for complex or infrequent work activities for which the consequences of an improper action could have an immediate, possibly irreversible adverse impact on safety, production, or reliability. The performer applies the following when using a continuous use procedure:

- Have a copy of the procedure or applicable pages within view, or be in direct communication with someone who has a copy.
- Review and understand the procedure before performing any steps.
- Use a placekeeping method in accordance with Section 7 of this document.
- Read and understand each step before performing it.
- Perform the step as written in the sequence specified, except when the procedure or approved processes specifically allow deviation.
- Review the document at the completion of the task to verify that all appropriate steps are performed and documented.

Technical procedures are considered as continuous use unless otherwise designated within the procedure.

4.3 Reference use of a procedure is allowed for activities for which the consequences of an improper action are not immediate and are not irreversible. The following apply for reference use:

- Review and understand the procedure before performing any steps.
- Have a copy of the procedure or applicable pages/sections available at the work site.
- Use a placekeeping method in accordance with Section 7 of this document.
- If any portion of the procedure is performed from memory, do so in the sequence specified in the procedure. Perform each step as written, except when the procedure or approved processes specifically allow deviation.
- Refer to the procedure at least once and as often as required to complete the task in accordance with the procedure requirements.
- Review the document at the completion of the task to verify that all appropriate steps are performed and documented.

4.4 Information use of a procedure is allowed for activities—usually administrative in nature—that do not involve direct contact with plant equipment, are performed frequently, have no immediate consequences if performed improperly, and are within the knowledge and skills of experienced individuals. For information use procedures, the following apply:

- The performer reviews the procedure, as needed, before using it to perform the task.
- The procedure user may complete the task from memory. However, the user is responsible for performing the activity in accordance with the procedure.
- Information use procedures that contain a specific process order are performed in the given order unless otherwise specified within the procedure.

Administrative procedures are considered as information use unless otherwise designated within the procedure.

4.5 Procedures in which sections or subsections designate different levels of use may be classified as multiple use. Only one level of use can be designated for a procedure section or subsection. An example of this type of use would be a procedure in which one section is continuous use for removal of equipment from service; and once the equipment is removed from service, another section is reference use for work on the associated equipment.

5.0 GENERAL PROCEDURE USE

5.1 Verify procedure initial conditions prior to each performance.

5.2 Perform procedures in the following manner unless otherwise directed by the procedure.

- Numbered or lettered steps are performed in sequence.
- Bulleted or unnumbered steps may be performed in any order.

5.3 Place and use notes, cautions, and warnings.

- Notes, cautions, and warnings are placed on the same page and immediately before the step or sequence of steps to which they apply.
- The procedure user reads and understands these before performing the subsequent step or sequence of steps.

5.4 Perform critical steps.

- Critical steps for a procedure are identified during the task preview or prejob briefing.
- When preparing to execute a critical step, the performer stops to review the situation to ensure the following:
 - Current conditions match expected conditions. If job-site or system conditions are different than expected, the performer stops, contacts the supervisor, and resolves the difference prior to proceeding.
 - The expected results of step performance are understood.
 - The correct component is verified before the critical step is performed.
 - The focus is on the task at hand as each action is performed.
- The performer understands and uses the human performance tool(s) planned to accomplish the step or phase of work safely and correctly.
- The performer verifies that the results are as expected.

5.5 Branch, reference, and transition between procedures.

Site standards need to provide specific guidance for branching, referencing, and transitioning terms. The required action to be taken when these terms are encountered during procedure execution must be clearly defined.

Branching is used to transition to another document without returning to the current document. Use this practice sparingly. The term to indicate branching is specified in each plant's writer's guide. Typical branching terms include *go to* and *proceed to*.

Referencing is used to perform actions from another document or just a section in another set of written instructions and then return to the current document to complete the task/activity. The term to indicate referencing is specified in each plant's writer's guide. Typical referencing terms include *refer to*, *in accordance with*, *per*, *see*, *use*, and *repeat*.

If a document branches or references another document with a different use classification, the user must perform the activities from the branched-to or referenced document in accordance with the use classification assigned to that document, unless designated otherwise in the referencing document.

When a procedure requires transition to another document, the applicable precautions, limitations, prerequisites, and initial conditions of the new set of written instructions must be met.

6.0 PREPARATION FOR THE USE OF CONTINUOUS AND REFERENCE USE PROCEDURES

The following guidelines apply to the preparation for procedure performance. They are intended to ensure that personnel use the current procedure revision and abide by the prescribed use level during the task.

- Prior to starting the task, verify and document that the currently approved revision of the procedure, with approved changes, is being used. This verification may be electronic or by comparison to a controlled copy, as directed by site policy.
- When a task has been delayed, verify that the procedure is still the current approved revision with approved changes incorporated prior to resuming work.
- Review the procedure for applicability, adequacy, and completeness.
- Identify the level of use.
- Identify the sections of the procedure to be performed.
- Review the precautions and limitations.
- Review the prerequisites.
- Identify and discuss critical steps.

7.0 GUIDELINES FOR SIGNOFFS AND PLACEKEEPING DURING PROCEDURE USE

7.1 Placekeeping is used when a continuous use or reference use procedure is performed. It may also be used with other procedures.

7.1.1 If the procedure requires that an individual initials or signs steps, the signing or initialing of steps constitutes placekeeping.

7.1.2 If no placekeeping aids are provided, approved methods are used to placekeep, such as initial blocks or check boxes, check marks, circle-and-slash, or other means that clearly demonstrate what steps were completed.

- For continuous use procedures, each step is marked as completed before the user proceeds to the next step, except for certain circumstances as follows:
 - The approved procedure provides instructions for performing a step (or series of related steps) concurrently.
 - Concurrent actions are necessary for the operating procedures.
 - To complete the evolution successfully, the series must be completed in a timely manner.
 - ALARA, equipment, or personal safety may be compromised if step-by-step documentation of the procedure is performed during execution.
- When any of the exceptions to placekeeping listed above are met, the following apply:
 - The series of steps is clearly identified prior to performance.
 - All personnel involved in the evolution (performer, verifier or peer-checker, supervisor, and so forth) review and understand all steps in the series prior to performance.
 - The performer reviews and placekeeps the steps after completion to ensure the steps were performed correctly.
- For reference use procedures, steps shall be placekept as often as practical, after the action(s) in the step is complete.

7.2 If an action or condition called for by a step is found to already exist, perform the following:

- Evaluate any unexpected actions or conditions.
- If the condition is clearly understood and does not invalidate the intent or scope of the procedure, sign off on the step as being completed.

Otherwise, STOP and involve supervision, as described in Section 10 of this procedure.

7.3 Use multiple copies of procedures.

- When more than one copy of a continuous or reference use procedure is being used, designate one copy as the controlling copy.
- Maintain placekeeping of steps on the controlling copy.
- Use placekeeping during step execution on the procedure copy being used in execution of the step.

- If the procedure requires initials or signatures, the person with the controlling copy may initial for completion of steps by individuals remote from that person based on communication that the steps are complete. The controlling copy of the procedure is marked to indicate that the other individual completed the step. For instance, these steps could be noted as “Operator A for Operator B” and recorded.
- 7.4 To sign off a step, the performer initials or signs the step as being performed. The printed name of the performer is documented, along with his or her initials or signature.
- 7.5 When placing an in-progress procedure on hold, the performer documents the following:
- the reason for the work stoppage or previously incomplete steps—These would be noted in the page margin at the last step performed.
 - his or her initials, the date, and the time
 - any incomplete steps
- 7.6 When necessary, repeat steps to complete performance.

Note: Repeating steps should be done using care and forethought.

When it is necessary to perform a step more than once, use a method that placekeeps each step for each occurrence of the action. The following or a similar method may be used:

- When there is no signature or initial block, place a sequential number starting at one or a mark next to the step each time it is performed.
 - When a signature or initial is required, sign or initial the step each time it is performed, placing a sequential number starting at one next to the signature or initial.
 - Make copies of the pages containing steps to be repeated, number each page sequentially starting at one, and placekeep them normally.
- 7.7 Procedure steps that are written to be continuously performed during the duration of a specific task or period are continuous action steps. For continuous action steps, the following apply:
- In some cases, the step may become applicable only when it is encountered in the procedure step sequence. In other cases, it might become applicable from the time of procedure entry.
 - Tape flags or other methods may be used to highlight the requirements.
 - The procedure user continues with the procedure while these steps are being performed.

- Steps may be added to inform the user when the action is no longer required.
- Placekeeping of the step will be indicated when the action is complete.

8.0 READER-DOER

A reader-doer combination is essentially two people working as one. One person reads the procedure and communicates actions to the doer; a second person, the doer, performs the action. The doer is essentially the eyes, hands, and feet of the reader. The reader and the doer work together as one mind to perform the procedure. This work practice allows the use of both hands in the performance of an action that does not lend itself to the performer maintaining possession of the procedure. If concurrent verification or peer-checking is required for a step, the performer and the documenter will transition to a performer and verifier role.

A reader-doer combination requires additional verbal communication in the performance of a procedure, increasing the chance of error during performance. Effective three-way communication becomes critical to successful execution of the task. Placekeeping and self-checking are also important tools.

For planned work activities, a prejob briefing is conducted before the reader-doer work practice is used, to clarify roles and responsibilities. The reader and the doer must clearly understand what component(s) will be manipulated and when that will occur.

For each step of a procedure, the reader and the doer perform the following:

- Using three-way communication, the reader—using placekeeping—reads the appropriate step to the doer.
- Using self-checking, the doer identifies the component to be manipulated and repeats back the step with the appropriate detail to the reader. Equipment nomenclature is repeated back verbatim.
- The reader acknowledges the repeat back, comparing it with the step in the procedure.
- The reader states “Correct” if the repeat back information matches the step in the procedure. If the repeat back information is incorrect, the reader states “Wrong”; and the reader rereads the step, with the doer providing repeat backs. This is repeated until it is restated correctly.
- The doer performs the action.
- The reader and the doer verify that actual system response matches anticipated response.
- The reader marks the procedure step as completed.

9.0 USE OF *NOT APPLICABLE* AND *OUT OF SEQUENCE* IN CONTINUOUS AND REFERENCE USE PROCEDURES

At times, the user needs to modify limited aspects of the procedure for successful completion of a task. This need typically arises when plant conditions, components, or subsystems are not in the configuration assumed by the procedure. Typical methods of modifying such procedure aspects are as follows:

- identifying not applicable (*NA*) steps
- performing parts of procedures
- changing the sequence of steps

Use of *NA* on nonconditional steps and use of *out of sequence* is the exception, NOT the normal practice.

9.1 Use *NA* to identify steps that will not be performed.

Procedure steps that contain conditional statements or provide specific conditions for being marked as not applicable may be marked *NA* without additional written justification or supervisory approval.

IF no steps of a procedure section are performed, documentation of *NA* is not required.

NA is NOT to be used to bypass steps that are inadequately or improperly written or to be used in lieu of a procedure change.

Procedure steps without conditional statements or specified conditions may be marked *NA*, if ALL the following criteria are satisfied:

- The step is not needed for the current mode, condition, or configuration of the plant.
- The intent (method of operation or the results) of the procedure steps or sections does not change.
- An unsafe condition is not created.
- The initial conditions, precautions, or prerequisites sections are not violated.
- The method by which processes are performed that may have safety significance is not changed.

Document *NA* of nonconditional steps as follows prior to performing the procedure:

- Write *NA* and initial the step(s). To indicate that a consecutive group of steps is not applicable, place *NA* in the first step and last step and draw a vertical line

through the remaining steps involved. Careful attention to drawing this line is necessary to minimize the potential for inadvertently lining out a necessary step.

- Document the reason for a step being marked *NA* in the procedure.
- Supervisor responsibilities are as follows:

Note: The use of *NA* in procedures that are related to or that affect plant operations or technical specifications is to be approved by a licensed senior reactor operator.

- Be technically cognizant of the procedure or task, or obtain concurrence from an individual who is technically cognizant.
- Ensure the explanation for marking the step as *NA* is documented and appropriate.
- Document approval by initialing the explanation for the step being *NA*.

9.2 *Out of sequence* may apply in certain circumstances.

Note: See Step 5.2 for instructions on the normal sequence of step execution.

Numbered or lettered procedure steps may be performed out of sequence or concurrently when ALL of the following criteria are met:

- The procedure is not a periodic test or surveillance procedure, a special test, or an infrequently performed test or evolution.
- The intent (method of operation or the results) of the procedure steps or sections does not change.
- Personnel safety is not affected.
- Job performance is enhanced.

Prior to the implementation of the procedure, the responsible supervisor approves the technical procedure step/substep sequence change(s).

The responsible supervisor provides the basis for, documents, and initials the step/substep sequence change(s) in the Comments section or on the cover page of the procedure (if no Comments section is provided).

The responsible supervisor ensures that a permanent procedure revision is initiated when a permanent change for a procedure step/substep sequence is appropriate.

A senior reactor operator approves the performance of steps out of sequence in procedures that are related to or that affect plant operations or technical specifications.

10.0 CHALLENGES DURING PROCEDURE EXECUTION

10.1 In certain emergency and off-normal conditions, the operations shift manager is not bound by the provisions of this procedure and shall do the following:

- Authorize unanticipated actions needed to protect the health and safety of the general public and plant personnel.
- Authorize unanticipated actions needed to minimize personnel injury and/or damage to plant equipment.
- Authorize unanticipated actions to return the plant to a stable and safe condition.
- Document the actions taken after the fact, including any required procedure changes, in a condition report.

10.2 In some cases, a procedure cannot be performed as written for reasons such as the following:

- Unexpected results have occurred or could occur, such as equipment malfunction; plant, equipment, or personnel placed in an unsafe condition; or acceptance criteria not met.
- A step or procedure is incorrect, unclear, or inconsistent.
 - component identification errors
 - sequence problems
 - coordination problem
 - performer unsure of required action or response
 - procedure error that is nontechnical, administrative, or editorial in nature, such as punctuation, title, labeling, or referencing
- A distraction prevents safe performance.

In such cases, the performer does the following:

1. stops the activity

WARNING

The performer must be aware that attempting to undo an unexpected result could worsen the situation. Only when an immediate personnel hazard or risk of equipment damage exists should attempts be made to change the state of the system. For all other situations, the performer involves supervision or the control room supervisor prior to changing the state.

2. places the equipment and the job site in a safe condition

IF actions were taken or need to be taken that are outside the procedure, approved site processes are used to maintain configuration control.

3. contacts the responsible supervisor to resolve the document challenge—The responsible supervisor resolves the document challenge using one of the following methods:
 - a. Determine that the document can be performed as written, and the performer and supervisor agree that no problem exists with the document that requires immediate correction or enhancement.
 - b. Use the procedure modification process, the work management process, or the corrective action program, as appropriate for resolution.

Appendix A

Glossary of Terms and Definitions

adherence – understanding the procedure purpose, scope, and intent and following its direction

administrative procedure – a controlled document that specifies actions and processes necessary to implement a program

branching – methods used in procedure steps to send a user to a procedure step other than the next step in the current procedure—Procedure performance will continue in the procedure, procedure section, and step that the user has branched to. Examples of branching terms that are typically used are *go to*, *proceed to*, and *in accordance with*.

continuous action step – steps continuously performed during a specific task or time period—The procedure user continues with the procedure while these steps are being performed. Typically, these steps begin with the word *WHILE* or *IF at any time*.

conditional step – a step that begins with a conditional term such as *IF*, *WHEN*, or *WHILE* (as defined by the site or utility)

critical step – a procedure step, series of steps, or action that, if performed improperly, will cause irreversible harm to plant equipment or people or will significantly impact plant operation

intent – the overall objective or purpose of a procedure or procedure section

infrequently performed tests or evolutions – as defined by SOER 91-1, *Conduct of Infrequently Performed Tests or Evolutions*, these include the following:

- evolutions not specifically covered by existing normal or abnormal operating procedures
- evolutions that are seldom performed even though covered by existing normal or abnormal procedures (for example, plant startup after a prolonged outage or after any outage that involves significant changes to systems, equipment, or procedures related to the core, reactivity control, or reactor protection)
- special, infrequently performed surveillance testing that involves complicated sequencing or placing the plant in unusual configurations (for example, emergency core cooling system check valve leakage tests)
- evolutions that require the use of special test procedures in conjunction with existing procedures

level of use – a procedure classification that designates the minimum requirements for procedure use during an activity

not applicable (NA) – the designation used if a procedure step or group of procedure steps is not appropriate for the task or activity being performed

out of sequence – performance of steps in an order other than that specified in the procedure

placekeeping – physically marking steps in a procedure to prevent the omission or duplication of the steps to maintain an accounting of steps in progress, steps completed, steps not applicable, and steps not yet performed

procedure section or subsection – a group of steps that has its own heading and that is intended to be executed in a stand-alone manner

special test – a test, as described in SOER 87-1, *Core Damaging Accident Following an Improperly Conducted Test*, that includes any of the following attributes:

- involves unusual operation methods
- typically requires plant configurations and operations that have seldom, if ever, been performed at the plant
- has procedures that have not been as thoroughly verified by use as other normal plant procedures

referencing – methods used in procedure steps to refer a user to a procedure step or information other than the next step in the current procedure—Procedure performance will continue in the current or next step of the current procedure. Examples of referencing terms that are typically used are *refer to*, *in accordance with*, *per*, and *see*.

technical procedure – a controlled document that outlines a series of steps for the operation, maintenance, or testing of a system, structure, or component

Appendix B

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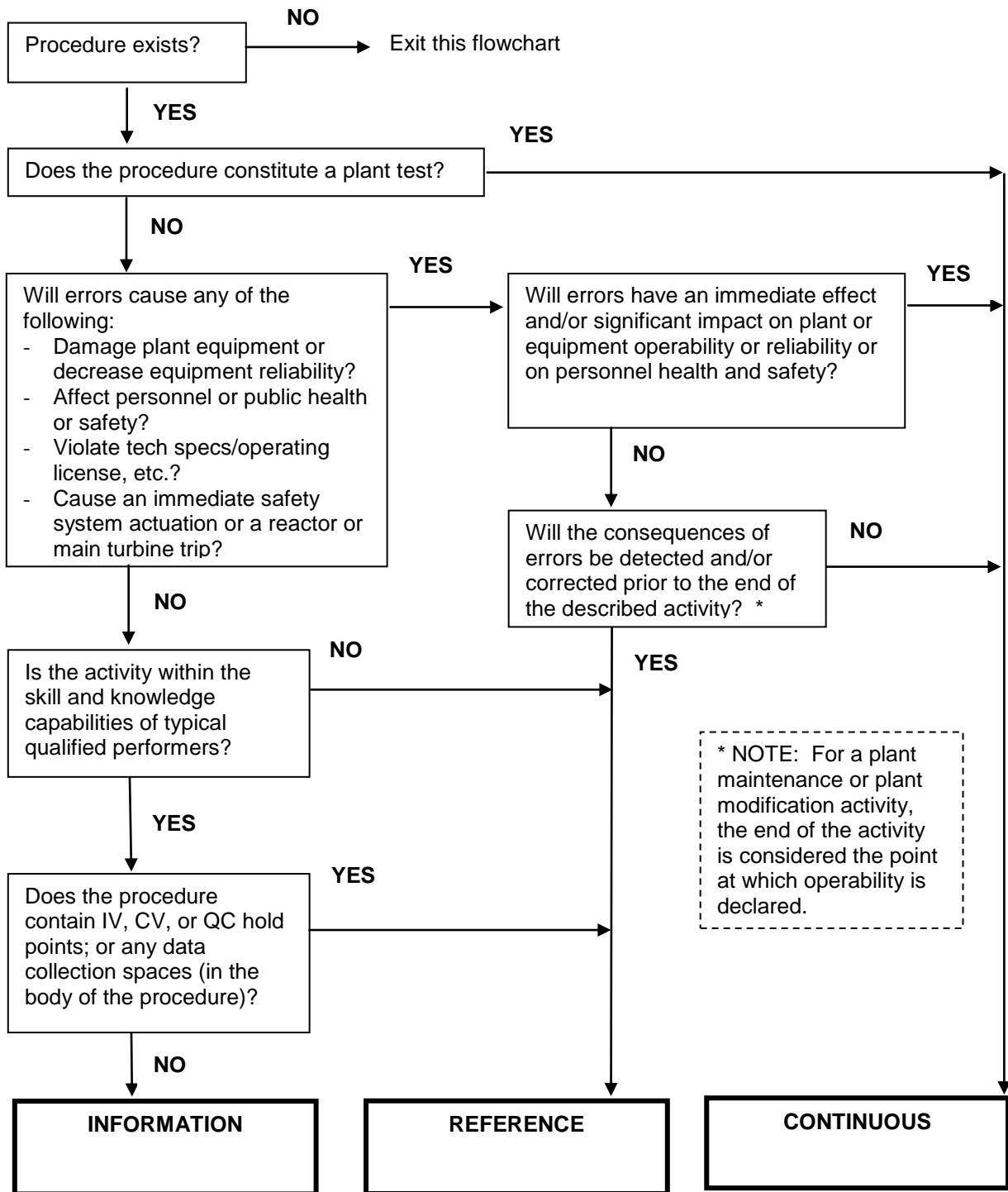
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Appendix C

Level of Use Determination Flowchart Example



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Appendix D

Reference and Cross-Reference List

The following documents and books were used as resource materials in the development of INPO 09-004.

ANSI N18.7-1976/ANS-3.2, *Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants*

ASME NQA-1, *Quality Assurance Requirements for Nuclear Facility Applications*

INPO 06-002, *Human Performance Tools for Workers*

INPO 06-003, *Human Performance Reference Manual*

NEI AP-907-001, *SS003 Sub-Process Procedure Process Description*

NEI AP-907-005, *Procedure Writers' Manual*

NRC Regulatory Guide 1.33, *Quality Assurance Program Requirements (Operation)*, Rev. 2, February 1978

NUREG-0737, Supplement 1, *Requirements For Emergency Response Capability*

SOER 87-1, *Core Damaging Accident Following an Improperly Conducted Test*

SOER 91-1, *Conduct of Infrequently Performed Tests or Evolutions*

Wieringa, D., C. Moore, and V. Barnes. *Procedure Writing: Principles and Practices*. 1998. Columbus, OH: Battelle Press.

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