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Author(s): Forney, Dale Edward

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Name	Organization	Date	Signature
<b>Originator</b>			
Dale E. Forney	OS-RTS	2/18/15	<i>Dale E. Forney</i>
<b>Subject Matter Expert (SME):</b>			
Arthur D. Carroll	OS-RTS	2/18/15	<i>Arthur D. Carroll</i>
<b>Document Owner:</b>			
James W. Angelo, Division Leader	OS-DO	2/25/15	<i>James W. Angelo</i>
<b>Responsible Line Manager Approval:</b>			
Cheryl D. Cabbil, Associate Director	AD-NHHO	2/27/15	<i>Cheryl D. Cabbil</i>

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## 1.0 INTRODUCTION

### 1.1 Purpose

This document provides requirements and guidance on the process for developing technical procedures at the Los Alamos National Laboratory (LANL), their structure, and the format of action steps to meet various procedure logic needs. The document implements the technical procedure content requirements of Attachment 16, *Local Procedures*, of P315, *Conduct of Operations Manual*, and incorporates the technical procedure structures of Department of Energy (DOE) standard DOE-STD-1029-92, Change 1, *Writer's Guide for Technical Procedures*.

This document incorporates mandatory, conditional, and optional requirements and format. This document is divided into the following four (4) basic parts: 1) procedure development considerations (see Section 3.0, *Planning and Development*); 2) procedure structure and format considerations (see Section 4.0, *Procedure Format*); 3) methods for procedure logic and action structure (see Section 5.0, *Writing Action Steps*); and 4) standard methods for highlighting key information and steps (see Section 6.0, *Key Information/Steps*).

Part 1 – This part deals with the planning and development of a technical procedure and is intended purely as guidance, intended to provide the inexperienced Procedure Writer with guidance on issues that may not be readily apparent, such as identifying records resulting from the execution of a procedure.

Part 2 – This part deals with the structure and format of procedures and is intended to satisfy the DOE Order 422.1, *Conduct of Operations*, requirement for the establishment of format standards (see requirement 2.p.[3]). Some of the technical procedure sections and sub-sections described in this part are mandatory, some are conditional, and some are optional. Each individual section in this part describes one of the various technical procedure sections and subsections and begins with a statement indicating if that section or subsection is mandatory, conditional, or optional. If conditional, this lead-in statement describes the condition that would require the section. The remaining information in these sections provides guidance the Procedure Writer should use to ensure that the associated technical procedure meets its intended purpose. Any specific requirements within this part will clearly be identified and will reference back to the requirement in P315, *Conduct of Operations Manual*.

Part 3 – This part deals with the format of the various technical procedure action step used to convey to the Performer the correct logic flow associated with the work activity the technical procedure is describing. Which of these action steps to be use, is at the discretion of the Procedure Writer based on the need of the logic flow. Each of the individual sections of this part describes a different action step and provides requirements and guidance to help select the best one and to ensure that the action step chosen meets its intended purpose. Any specific requirements within this part will clearly be identified and have its reference back to the requirement in P315, *Conduct of Operations Manual*.

Part 4 – This part deals with standard methods to highlight within the technical procedure key information and action steps in order to satisfy the DOE Order 422.1, *Conduct of Operations*, requirement (see detailed attribute 2.p.[3].o). Currently, this part only addresses Safety Basis and Nuclear Criticality Safety, but may be expanded to address other issues of information/step highlighting that may arise. The direction of this part is considered mandatory. Each of the individual section of this part provides requirements to ensure that the key information is properly highlighted.

### 1.2 Scope and Applicability

This document is applicable to all LANL technical procedures written to the standards established in Attachment 16, *Local Procedures*, of P315, *Conduct of Operations Manual*, and is to be used by all LANL employees, contractors, and subcontractors to the extent required in their contract.

## 1.2 Scope and Applicability (continued)

Although this document only provides guidance for the writing of technical procedures, it may be used by the Procedure Writer and the Responsible Line Manager (RLM) for writing other types procedures (e.g., administrative procedures and emergency and alarm response procedures).

This administrative procedure (functional series document) is issued as part of the Conduct of Operations (CoO) Program implemented at the LANL. This document derives from P315, *Conduct of Operations Manual*.

- Issuing Authority (IA): Associate Director for Nuclear and High Hazard Operations (ADNHHO)
- Responsible Manager (RM): Operations Support (OS) Division Leader
- Responsible Office (RO): Operations Support – Readiness and Technical Support (OS-RTS)

## 2.0 BACKGROUND

A primary objective throughout the DOE complex is that operations be conducted in a safe, deliberate, and controlled manner. In addition to training or day-to-day supervision, providing sound procedures and requiring workers to use them are among the most formal, direct, and effective methods available to managers to ensure that their operations meet DOE's objective. Procedures provide managers with a critical management tool to communicate detailed expectations for how individual workers are to perform specific tasks.

To be effective management tools, the procedures that workers use must present the best knowledge available of how to integrate the policies, principles, rules, parameters, processes, controls, products, culture, physical facilities, equipment, material, and people necessary to operate a facility or perform the work activity safely. In addition, procedures must be technically and operationally accurate, up-to-date, and easy to follow. Ensuring that facility procedures meet these criteria is a complex job.

Attachment 16, *Local Procedures*, of P315, *Conduct of Operations*, acknowledges that many types of procedures are required to operate a facility and, therefore, fall under its requirements. These include: 1) administrative procedures; 2) technical procedures; and 3) emergency and alarm response procedures.

Technical procedures are known by many names depending upon the specific use or the organization. These include operating procedures (OPs), detailed operating procedures (DOPs), standard operating procedures (SOPs), surveillance requirement (SR) procedures, and in-service inspection (ISI) procedures to name a few. For purposes of this Writer's Manual, any procedure that provides "*a formalized approach or set of instructions required to execute a specific work activity, which includes operation of equipment or systems, controls the design basis and configuration of the facility and its equipment or systems, and the management of the facility within its safety, security, and environmental envelope*" (see P315, *Conduct of Operations Manual*, Attachment 16, *Technical Procedures*, Section 16.4, *Definitions and Terms*).

## 3.0 PLANNING AND DEVELOPMENT

The subsections of this section address various topics that may be encountered during the procedure development process, providing guidance for each. The use of these subsections is at the discretion of the Procedure Writer, but it is recommended that all of these subsections be read and considered for each procedure.

### 3.1 Identifying the Design Bases

The bases of procedures is a compilation of information such as the Documented Safety Analysis (DSA) or Safety Analysis Document (SAD) for an accelerator, Technical Safety Requirements (TSRs), operational "lessons learned," facility configuration and conditions during performance, and the engineering design. The technical bases documentation is needed to describe the technical parameters and boundaries within which the process is performed. The management control bases of procedures contain information such as institutional administrative processes, facility administrative requirements, and relevant plans and programs. The design bases of procedures include the design criteria, vendors, and engineering standards drawings and specifications that were used in the design and construction of the facility.

**NOTE:** The Document History File (DHF) is the hard copy or electronic file that documents the development, review, concurrence, and approval of a procedure. The specific content of the DHF is subjective and the guidance provided within this document are recommendations unless noted otherwise. The minimum requirements are detailed in P315, *Conduct of Operations Manual*, Attachment 16, *Local Procedures*, Section 16.5.1.k, *Document History File*.

The bases are living documents, subject to change, and the revisions used are documented in the DHF to allow for review of the current revision's DHF when a revision to a technical procedure is required. The DHF is a compilation of all pertinent information used to develop the procedure and any subsequent revisions. The bases are used to analyze the requirements that must be included in procedures or revision. The contents of the bases may be revised during procedure preparation to ensure that the final product contains accurate and relevant information.

### 3.2 Identifying Source Documents

In addition to design basis documents, requirements from other sources (such as DOE orders) must also be implemented by the procedure. Collectively, these requirements are called source requirements and provide the technical basis for the procedure.

- Identify the DOE rules and orders, TSRs, DSA or SAD, and other requirements and commitments directly implemented by the procedure (e.g., industry codes and standards).
- Identify the specific requirements within the source requirements documents that are implemented by the procedure.
- Ensure that the currently authorized versions of the source requirement documents are used (e.g., the codes and standards in effect when the facility was designed, not the most recent versions, normally apply unless a modification, commitment, or technical safety requirement change invokes a more current version).
- Identify the source documents in the DHF or in the Reference section (see Section 4.5.13, *References*) of the procedure.
- If more than one type of source requirement document exists, the DHF should use subheadings to list them; e.g.,
  - DOE rules and orders;
  - TSRs and safety analysis reports; and
  - Industry codes and standards.
- The DHF should identify the location within the procedure that implements each source document requirement.

### 3.3 Capturing Data

The execution of some procedures may require the capture of data. The data may be required to meet a regulatory or contract requirement, meet an expectation of our clients, or provide supporting data for the LANL performing organization.

- Review the source documents (see Section 3.2, *Identifying Source Documents*) for any mandatory data collection requirements. Potential drivers for mandatory data collection include:
  - When required to verify compliance with a law, regulation, rule or other compliance requirement or commitment.
  - When required by quality requirements [e.g., LANL Quality Assurance Plan (QAP), Weapons Program QAP, etc.].
  - When data is required by the work activity's client.
- Coordinate with the responsible line manager (RLM) for the procedure and subject matter experts (SMEs) to determine any additional data collection needs. The RLM makes the final decision regarding what, if any, additional data is to be collected by the procedure. Potential reasons for data collection include:
  - When data is required by Engineering, the Facility Operations Director (FOD), or the operating organization to provide historical data on the work activity.
- Document any data collection requirements (mandatory or optional) and the justification in the DHF.

### 3.4 Identifying Records

Records generated by procedures are maintained to document various conditions, such as the tasks completed by performing the procedure or conditions identified during the performance of the procedure. Administrative controls establish requirements for, and control of, records (see Section 4.5.12, *Records*).

The need for records may be to meet a regulatory or contract requirement, meet an expectation of our clients, or support LANL, facility, or organization operations. Records as a result of a procedure performance are not mandatory. These records may be driven by federal, state, or local law or regulation, a requirement from our customers, a Quality Assurance (QA) requirement, or requirements of LANL, project, or facility management.

- Review the source documents (see Section 3.2, *Identifying Source Documents*) for any mandatory requirements for creation of records.
- Review the project, facility, or LANL QAP for any mandatory requirements for the creation of records.
- Coordinate with the RLM for the procedure and SMEs to determine any additional records generation needs. The RLM makes the final decision regarding what, if any, additional records are generated by the procedure.
- Coordinate with the local Records Management Point of Contact (RM-POC) to review the list of identified records within the proposed procedure and identify the specific storage, retention, and disposition requirements.
- Document any records requirements (mandatory or optional) and the justification in the DHF.

### 3.5 Consistency

One of the most important principles in writing effective technical procedures is to maintain consistency in style, format, and organization, both within and among procedures. Inconsistencies can result in users attributing differences in meaning to differences in presentation. Consistency allows users to move through documents without having to waste effort interpreting the style of presentation for each section they encounter. This facilitates comprehension and allows users to concentrate on the actual performance of the instructions. When employing the guidelines discussed in this document, maintain consistency!

### 3.6 Writing Style

Narrative prose and paragraph style are inappropriate for writing procedures. Users of procedures will likely be working under difficult, sometimes stressful conditions, and thus procedures should be written so that users can grasp the intended meaning quickly and easily. The guidance provided in Section 5.0, *Writing Action Steps*, incorporates this concept.

### 3.7 Defining Work Steps

Although Section 5.0, *Writing Action Steps*, provides guidance on how to write the individual action step, the process for identifying the steps within the process is different. If steps, especially those responding to an unexpected condition, are not included in the procedure then delays in execution, upset conditions, or injury to workers may result.

- Develop the basic process as a team with the SME and operator(s) for the activity.
- Engage other SMEs (e.g., Radiation Protection, Safety Basis, and safety personnel) as required during this process.
- Write the basic activity steps as described by the SME and operator(s).
- Read through the individual activity steps asking “What can go wrong?” Avoid making the procedure excessively complex by addressing only those issues that have a reasonable likelihood of occurring. Issues that, although possible, are not likely to occur can be addressed through the Pause/Stop Work process. Add additional conditional action steps (see Section 5.2, *Conditional Steps*) as required when issues are identified.
- When the team can iterate through the individual activity steps without identifying any new “What can go wrong?” issues, then the process is well defined. At this point in the process the team should apply the appropriate level of detail as described in Section 3.8, *Determining Level of Detail*.

### 3.8 Determining Level of Detail

Writing at the appropriate level of detail is the key to successful communication with procedure users. For ease of use and to reduce distraction and confusion, include only information in the procedure that relates directly to completing the task.

- Provide a level of detail that considers the following variables:
  - Qualification level of the users. As qualification level increases, the level of detail can decrease on tasks that are simple or are frequently performed.
  - Complexity of the task. As the task’s complexity increases, the level of detail can increase.

### **3.8 Determining Level of Detail (continued)**

- Frequency of task performance. As the task's frequency of performance increases, the level of detail can decrease.
- Degree of standardization desired. The level of detail varies directly with the degree of standardization desired. The more standardized the performance, the more detailed the procedure will be.
- Write procedures to a level of detail consistent with the qualifications and training of the expected users. Job task analyses and training records provide information useful in assessing the level of detail requirements. When in doubt, write to the lowest common denominator.
- Determine whether the amount and kind of information provided are adequate for intended users by answering the following questions:
  - Can the procedure be performed in the sequence in which it is written?
  - Can the users locate and identify all equipment referred to in the procedure?
  - Can the users explain in detail how to perform general instructions?
  - Can the users perform the procedure without obtaining additional information from persons or procedures not specified by the procedure?
  - Can the users perform the procedure without obtaining direct assistance from persons not specified by the procedure?
- Ensure that the decision making required in the procedure is consistent with the user's qualifications and level of authority. This approach permits tasks to be performed with minimum supervision.
- Exclude information that is useful only to reviewers or other persons not involved in performing the procedure.

## **4.0 PROCEDURE FORMAT**

The subsections of this section describe the various sections that could be included in a procedure. These potential procedure sections could be mandatory, conditional (if situation requires), or optional. Each subsection will note how the associated procedure section must be applied when developing a procedure.

### **4.1 Page Headers, Footers and Numbering**

The inclusion of page headers, footers and numbering in technical procedures is mandatory.

Each page of the procedure must include a page header that fits at the top of the page and that includes a unique identifier (i.e., procedure number) for the procedure. The unique identifier for procedures may include the building number, system, and/or equipment to which it applies to make it easier for personnel to identify the use of the procedure.

- Place the page header at the top of every procedure page.
- Do not include a page header on the coversheet.

#### 4.1 Page Headers, Footers and Numbering (continued)

- Ensure that margins are adequate on all sides so that information is not lost during duplication. Surrounding the text area with a box is one method to ensure that information is not lost.
- Include the following information in the page header (see Example 4-1, *Page Header*):
  - Procedure Title
  - Procedure Number and Revision Number
  - Page Number and Total Number of Pages
  - Classification Markings, as applicable, in accordance with P204-2, *Classified Matter Protection and Control Handbook*.
  - Procedure Usage Level (see P315, *Conduct of Operations Manual*, Attachment 16, *Technical Procedures*, Section 16.4.1, *Usage Levels*)

<b>Example 4-1</b> Page Header		
Reservoir Plug Welding		SOP-618-4, Rev. 0
UET	UCNI	Page 16 of 16

- Place the page footer at the bottom of every procedure page (see Example 4-2, *Page Footer*).

<b>Example 4-2</b> Page Footer		
UCNI		

- Do not include a page footer on the coversheet.
- Include in the page footer any Classification Markings required by P204-2, *Classified Matter Protection and Control Handbook*.
- Number pages consecutively. Begin with the coversheet (which is page 1) and continue to the end.
- For an appendix or an attachment, maintain the page numbering sequence and use an internal page number (see Example 4-3, *Appendix or Attachment Page Header*).

#### 4.1 Page Headers, Footers and Numbering (continued)

<b>Example 4-3</b>		
Appendix or Attachment Page Header		
Reservoir Plug Welding		SOP-618-4, Rev. 0
UET	UCNI	Page 16 of 16
APPENDIX A -- Check Sheet/Data Sheet (Page 1 of 1)		

#### 4.2 Procedure Titles

The inclusion of a procedure title in technical procedures is mandatory.

Procedure titles provide the users with a very concise understanding of the purpose and scope of the procedure in a very concise form.

- Write procedure titles that are concise, clear, and descriptive of the system, equipment, process, or activity.
- Write procedure titles to permit the users to easily identify the procedure and activity to which the procedure applies.
- Write unique procedure titles to assist the users in identifying the correct procedure.

#### 4.3 Section Headings

The inclusion of section headings in technical procedures is mandatory.

Section headings break the text of the procedure into sections by grouping related action steps or information. Section headings help users locate information in the procedure, break up long series of action steps into more manageable groups, and track their progress through the procedure, especially when branching to other sections.

- Give each major activity in the Work Steps section(s) of the procedure a unique and descriptive heading.

**NOTE:** The need for more than three heading levels may indicate that the scope of the procedure is too large and that multiple procedures with smaller scopes may be required.

- Limit the number of heading levels to three (e.g., 1.0, 1.1, and 1.1.1) if possible. Excessive levels result in complex section numbers (see Example 4-4, *Section Headings*).

#### 4.3 Section Headings (continued)

### Example 4-4 Section Headings

#### 1.0 FIRST LEVEL HEADING

#### 1.1 Second-Level Heading

##### 1.1.1 *Third-Level Heading*

[1] First-level action step

[2] First-level action step with two second-level action steps

[a] Second-level action step

[b] Second-level action step

- Identify first-, second-, and third-level headings by a decimal numbering system.
- Begin first-, second-, and third-level headings at the left margin of the text block.
- Identify first-level headings with all capital letters and **bold** type.
- Identify second--level headings with initial capital letters of important words and **bold** type.
- Identify third-level headings with initial capital letters of important words and *italic* type.
- Use topics for second- and third-level headings (e.g., Cooling Water Pumps).
- Use a list to organize material other than action steps under headings and action steps.
- Designate listed items with indented upper-case letters.
- If it is necessary to continue a section on subsequent pages, repeat the heading on subsequent pages with an indication that the page is a continuation (see Example 4-5, *Section Heading Continuation*).

### Example 4-5 Section Heading Continuation

#### 3.2 Special Tools, Equipment, Parts and Supplies (continued).

#### 4.4 Step Numbering

The use of action step numbering in technical procedures is mandatory.

Action steps reduce a task or activity to a discrete set of instructions. Action step numbering identifies individual action steps and their sequence (see Example 4-6, *First-Level Action Step with Second-level Action Steps*).

#### 4.4 Step Numbering (continued)

##### **Example 4-6**

##### First-Level Action Step with Second-level Action Steps

- [3] Prepare compressed gas cylinders.
- [a] Select compressed gas cylinders with current in-service dated gas certification.
  - [b] Verify that each cylinder regulator will maintain 35 psig (30 to 40).

- Make action steps readily distinguishable by the users.
- Limit the number of action step levels to two whenever possible.
- Identify first-level action steps with bracketed numbers.
- Identify second-level action steps with bracketed lower-case letters.
- Restart the step numbering for each heading or sub-heading.
- Step numbering is not affected by having multiple performers.

#### 4.5 Procedure Organization

Procedures are organized to provide users with all the information needed to accomplish an activity. Procedures include the following elements:

- Coversheet
- Revision Status
- Table of Contents (conditional)
- Introduction
- Precautions and Limitations
- Prerequisite Actions
- Acceptance Criteria (conditional)
- Work Steps
- Post-Performance Activity (optional)
- Definitions and Acronyms (optional)
- Responsibilities (optional)
- Records

#### 4.5 Procedure Organization (continued)

- References (optional)
- Appendices (conditional)
- Attachments (conditional)

Not all procedures require each of these sections and/or subsections (e.g., not every procedure has an appendix or an attachment). If the procedure does not need an element, do not include it. The contents and format for each of these procedure elements are discussed in the following sections.

##### 4.5.1 Coversheet

The inclusion of a Coversheet in technical procedures is mandatory.

The Coversheet provides a means for the users to verify that the procedure is appropriate for the task at hand.

- Include the following minimum information (see Figure 4-1, *Sample Coversheet*):
  - Procedure Number and Revision
  - Procedure Title
  - Effective Date
  - Approval Signatures (e.g., RLM, FOD, and SMEs) – These must include the printed name, signature, and date. The organization and Z# are recommended.
  - Classification Review – This must include the printed name, signature, date, and the classification results. The organization and Z# are recommended.
  - Hazard Grading (i.e., Low, Moderate, or High/Complex) (see P315, *Conduct of Operations Manual*, Attachment 16, *Technical Procedures*, Section 16.5.1.f, *Hazard Grading*)
  - Procedure Usage Level (see P315, *Conduct of Operations Manual*, Attachment 16, *Technical Procedures*, Section 16.4.1, *Usage Levels*)
- The following information is optional:
  - Reviewers – These must include the printed name, signature, and date. The organization and Z# are recommended.
  - Next Review Date – This is based upon the criteria of P315, *Conduct of Operations Manual*, Attachment 16, *Local Procedures*, Section 16.7.1, *Frequency*.
  - Expiration Date – This is based upon the criteria of P315, *Conduct of Operations Manual*, Attachment 16, *Local Procedures*, Section 16.7.1, *Frequency*.
  - Procedure Type [e.g., Operating Procedures (OPs), Administrative Procedures (APs), Alarm Response Procedures (ARPs), and Emergency Operating Procedures (EOPs).] – This is typically part of the procedure's unique identifier (i.e., procedure number).
  - Procedure Status (e.g., New or Revised)

4.5.1 Coversheet (continued)

- Superseded Procedure(s) – This identifies other procedures that are being superseded by the issuance of this procedure.
- Safety Basis-related Information [e.g., Unreviewed Safety Question (USQ) evaluation number]

**Figure 4-1**  
Sample Coversheet

SOP-618-4, Revision 0

**Reservoir Plug Welding**

Effective Date: 10/22/13  
 Expiration Date: 10/22/16  
 Supersedes: SOP-611-14, Rev.4  
 Next Review Date: 10/22/16

Hazard Grading:  Low  Moderate  High/Complex  
 Usage Mode:  Reference  UET UET Sections: \_\_\_\_\_  
 Status:  New  Major Revision  Minor Revision  
 Review w/No Changes  Other: \_\_\_\_\_  
 Safety Basis:  N/A  USQ  USI  
 No.: LANL-14-001-D Rev.: 0 Date: 09/25/2013

**Originator**  
 Procedure Writer, Facility Operations  
David T. Thompson 313131 SIGNATURE ON FILE 10/19/13  
 Name Z# Signature Date

**Reviewers**

Function	Name, Z#	Signature	Date
Safety Basis	Jennifer S. Brown, 212121	SIGNATURE ON FILE	10/20/13
Crit. Safety	John R. Tanner, 424242	SIGNATURE ON FILE	10/19/13
Rad. Protect.	Bill J. Turner, 123242	SIGNATURE ON FILE	10/19/13
Engineering	Frank A. Thomas, 222333	SIGNATURE ON FILE	10/21/13
Operations	Bill D. Smith, 232300	SIGNATURE ON FILE	10/20/13

**Approvals**  
 Responsible Line Manager, Facility Operations  
John W. Smith 111111 SIGNATURE ON FILE 10/22/13  
 Name Z# Signature Date

**Classification Review**  
 Unclassified  UCNII  Classified  
Mary C. Brown 333333 SIGNATURE ON FILE 10/20/13  
 Name Z# Signature Date

- Provide a simple descriptive title that identifies the system, equipment, process, or activity described in the procedure.
- Include other information, as needed, to differentiate the procedure from other procedures (e.g., specific conditions or activities that the procedure controls).

#### 4.5.2 Revision History

The inclusion of a Revision History section in technical procedures is mandatory.

It is essential that users follow the most current versions of procedures. Document Control ensures that only the most recent versions are available.

Identify changes (additions, corrections, and/or deletions) made in the procedure. If the changes are not extensive, such as a total rewrite, mark the changes with vertical lines in the margin. Only the marks for the most recent revision are to appear in the revision.

- Include the following information in a table format:
  - Procedure Number and Revision
  - Effective Date
  - Action Type [e.g., New, Major or Minor Revision, Immediate Procedure Change (IPC), or Periodic Review.]
  - Description of Change (Brief summary of the modifications. Use as much space as needed to communicate important changes to the procedure users.)
- At a minimum the Revision History section must contain the current revision.
- Older revisions may be dropped if their inclusion would result in the table exceeding one page.

#### 4.5.3 Table of Contents

The inclusion of a Table of Contents section in technical procedures is conditional, based on the size and organizational complexity of the procedure.

The Table of Contents helps users locate the portions of the procedure they need for a specific operation and is useful for locating appendices.

- List the procedure section and subsection headings and the titles of appendices exactly as they appear in the procedure (see Figure 4-2, *Sample Table of Contents*).
- List third-level subsection headings in the table of contents when required by the length and complexity of the procedure (i.e., listing third-level headings is optional).
- In the table of contents, identify at the right margin, the page number on which the heading or title first appears.
- List the procedure appendices and attachments after listing all procedure sections.

#### 4.5.3 Table of Contents (continued)

**Figure 4-2**  
Sample Table of Contents

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#### 4.5.4 Introduction

The inclusion of an Introduction section in technical procedures is mandatory.

The Introduction section addresses the purpose, scope, and applicability of the procedure.

##### 4.5.4.a Purpose

The inclusion of a Purpose section in procedures is mandatory.

- Provide a clear, concise description of the goal to be achieved by performing the procedure. Avoid purpose statements that repeat the procedure title and headings of the table of contents (see Example 4-7, *Purpose Statement*).

4.5.4.a Purpose (continued)

**Example 4-7**  
Purpose Statement

**1.1 Purpose**

This procedure provides instructions for setup, performance of HEPA filter testing to ensure compliance with Surveillance Requirement (SR) 4.8.1.

- Identify the driver(s) (e.g., laws, regulations, standards and TSRs), as appropriate, that are the basis for the procedure.

4.5.4.b Scope

The inclusion of a Scope section in procedures is mandatory.

1. Describe the activities covered by the procedure (see Example 4-8, *Scope Statement*).

**Example 4-8**  
Scope Statement

**1.2 Scope**

This procedure addresses the actions necessary to plug weld reservoirs, to decontaminate them, and to store them. This procedure does not include the receipt and unpackaging of reservoirs, nor does it address the reworking of improperly welded reservoirs.

- If necessary, address the limitations of the procedure (i.e., what the procedure does not cover).
- Optionally, identify the personnel performing the work activity, the location where the procedure is applicable, and other implementation requirements.

4.5.4.c Applicability

The inclusion of an Applicability section in procedures is optional. If a separate stand-alone Applicability section is not used, then the applicability statement must be included as part of the Scope section.

- Specify the conditions that require procedure use in the applicability statement (e.g., in a surveillance test procedure the applicability statement might be that the test has been requested by a manager).

#### 4.5.5 Precautions and Limitations

The inclusion of a Precautions and Limitations section in technical procedures is mandatory.

Failure to include precautions and limitations within the procedure can cause a severe injury to, or the death of, the procedure users and/or serious damage to equipment or the environment.

- Write precautions and limitations to inform users of hazardous conditions and their potential effects (see Example 4-9, *Precaution Statements*, and Example 4-10, *Limitation Statement*).

### **Example 4-9** Precaution Statements

#### **2.0 PRECAUTIONS AND LIMITATIONS**

- 2.1 Vapor pressure thermometer capillary tubing can be damaged if rolled up to less than 8 inches in diameter.
- 2.2 The instrument terminals may carry hazardous electrical currents. You may receive a severe or fatal electric shock if you touch these terminals without protection.

### **Example 4-10** Limitation Statement

#### **2.0 PRECAUTIONS AND LIMITATIONS**

- 2.1 The unavailability of the standby motor generator during power operations may exceed a technical safety requirements limiting condition of operation.

- Do not include user actions in the precautions and limitations section.
- If user actions are required to respond to the precaution or limitation, provide action step(s) at the appropriate location in the procedure and use a conditional action step to define the conditions that require an action.
- Avoid generic precautions that are part of a job description or inherent in the task.
- Include hazards and controls that exist during the entire procedure or occur at more than one point in the procedure. Follow the requirements of Section 4.5.8, *Work Steps*, when addressing hazards that apply to individual action steps.
- Ensure that all of the task and area hazards identified in the associated hazard analysis are considered for inclusion.

#### 4.5.5 Precautions and Limitations (continued)

- Ensure that the source of the precaution or limitation is clearly identified (e.g., if an electrical shock hazard is identified, determine the equipment that is the source of the potential electrical shock).
- Address the following in precautions and limitations as appropriate.
  - Identify and address potential hazards to personnel, the public, or the environment; e.g.,
    - Radiation or contamination
    - High-temperature or high-pressure fluids
    - Hazardous substances
    - Electrical shocks
    - Excessive noise levels
    - Confined space hazards
    - Falls
    - Moving equipment or parts of equipment
    - Fire hazards.
  - Identify and address the protection of equipment and material from
    - Inadvertent, incorrect, or omitted actions that may cause facility shutdown
    - Inadvertent, incorrect, or omitted actions that may result in limiting conditions for operation as defined in the technical safety requirements
    - Limitations identified in approved vendor information
    - Limitations identified in applicable design documents
    - Unusual alarms affecting facility availability that may occur or are expected to occur as a result of performing the procedure
    - Mechanical or electrical bypasses (lifted leads, inhibits, jumpers, and fuse removals) used in performing the procedure
    - Electrical and mechanical interlocks involved in performing the procedure
    - Actions resulting in emergency response or automatic incident response
    - Undesirable consequences of violating each precaution or limitation statement.
  - Advise the users that the procedure contains TSR-related or nuclear criticality safety step(s).

#### 4.5.5 Precautions and Limitations (continued)

- Include a statement regarding the users' authority to exercise the LANL Pause/Stop Work process, which is recommended, but not required.
- In the Work Steps section, write as warnings or cautions (see Section 5.10, *Warning, Caution, and Note Steps*) any hazardous conditions that apply to individual action steps.

#### 4.5.6 Prerequisite Actions

The inclusion of a Prerequisite Actions section in technical procedures is mandatory.

The prerequisite actions section identifies actions that must be completed by the users, requirements that must be met, and notifications and authorizations that must be completed before the users continues with the procedure.

- Include the following subsections in the prerequisite actions section:
  - Planning and Coordination
  - Performance Documents (conditional)
  - Special tools, Equipment, Parts, and Supplies (conditional)
  - Field Preparations (conditional)
  - Approvals and Notifications (conditional)
  - Initial Conditions (conditional).
- Vary the sequence of procedure subsections as appropriate; the sequence of subsections should be determined by the sequence of the actions to be performed (e.g., an approval might be needed before a field preparation is performed).
- Arrange action steps in an order ensuring that all required permissions and notifications are obtained before any facility equipment is manipulated.
- If the procedure is generic, include only those prerequisite actions that apply to all uses of the procedure. Application-specific prerequisite actions, including data sheets, are contained in separate procedures.
- Include provisions for recording data, sign-offs, and remarks discussed in the following subsections as needed.

##### 4.5.6.a Planning and Coordination

The inclusion of a Planning and Coordination section in technical procedures is mandatory.

The planning and coordination section includes information on activities that must be undertaken to plan and coordinate the performance of the procedure. These actions may include, but are not limited to, the following:

#### 4.5.6.a Planning Coordination (continued)

- Include instructions for a pre-job planning meeting [e.g., plan-of-the-day/plan-of-the-week (POD/POW) or pre-job brief (PJB).] with the participants as appropriate (e.g., a pre-job meeting may include coordinating activities at several locations, planning detailed measurements to be taken by several persons or groups, or other aspects of performing a complex procedure).
- Provide administrative requirements, such as verification that the procedure to be used is the current revision.
- Provide action steps to ensure that needed information is obtained and recorded. These action steps may involve:
  - Identifying the principal personnel involved by functional title (e.g., Operations Manager, etc.) or responsibility (e.g., performer or independent verifier).
  - Recording the facility condition at the start and end of the procedures and the date and time the procedure is started.
  - Justifying and identifying portions of the procedure that are used.
  - Obtaining needed permits (e.g., excavation or penetration).
- Address any special system conditions and hold orders required to perform the work.

#### 4.5.6.b Performance Documents

The inclusion of a Performance Documents section in technical procedures is conditional, based on the need for documents other than the procedure itself to execute the procedure.

The performance documents section identifies those documents required to be in hand or readily available at the work site, such as permits, drawings, vendor manuals, logbooks, and/or other documents referenced by the base procedure.

- List all other documents required to perform the procedure, such as drawings, approved vendor manuals, and other procedures that may be referenced in the base procedure.
- Where feasible, include such material in the procedure to lessen the number of references to which the users must refer.
- Do not include reference documents used to create the procedure.

#### 4.5.6.c Special Tools, Equipment, Parts, and Supplies

The inclusion of a Special Tools, Equipment, Parts, and Supplies section in technical procedures is conditional, based on the need for these items to execute the procedure.

The special tools, equipment, parts, and supplies section (see Example 4-11, *Table Identifying Required Parts*) identifies the tools and supplies that may require staging, calibration, or verification of availability in order to execute the procedure.

**Example 4-11**  
Table Identifying Required Parts

[3] Obtain the following parts:

Description	Part Number	TIIC No.	Quantity	Class
Gasket	3	XX-XX-XX	1	EQ
Piston	5	YY-YY-YY	1	EQ
Nut	6	ZZ-ZZ-ZZ	2	NA

- One option is to break out the listing of these items into separate, stand-alone subsections if the number of entries justifies it. If separate, stand-alone subsections are to be used, then these should be titled
  - Special Tools and Equipment
  - Tools and Fixtures
  - Measuring and Test Equipment
  - Consumables
- List special tools, measuring and test equipment, parts, and supplies required to perform the procedure (see Example 4-12, *Measuring and Test Equipment Identification*). Strict attention to the completeness and correctness of this section is extremely important (e.g., failure to specify a necessary item could result in costly equipment downtime, or the use of a substitute for a specialized tool could damage equipment). It may be appropriate to provide some of this information in tables.
- If required to support customer, records, or other requirement, include a sign-off space (see Section 5.13.2, *Sign-offs*) to document the verification of the calibration or other information regarding the special tools, measuring and test equipment, parts and supplies.
- Identify certified or qualified parts and equipment needed for the activities.
- Provide guidelines for selecting and assembling special tools, measuring and test equipment, parts, and supplies.
- Provide separate action steps for the different categories such as parts, supplies, or measuring and test equipment.
- Identify specific equipment (e.g., screwdriver, radio, chain hoist, etc.) necessary to perform procedures.

**Example 4-12**

**Measuring and Test Equipment Identification**

[3] Obtain two stopwatches (calibrated and approved by Standards and Calibration Lab), and complete Table 4-2.

Table 4-2		
M&TE No.	Expiration Date	Performer Initials
		_____
		_____

- Specify alternative tools and equipment if applicable.
- Avoid using the statement “or equivalent” when specifying equipment, if possible.
- Do not specify ordinary craft tools such as standard pliers and wrenches.
- If the procedure has a generic application, do not include instrument-specific information such as the serial number or calibration date. This information is included in application-specific procedures.
- Provide clear specifications for verifying the adequacy of test equipment. Specifications include ranges, accuracies, and compliance with calibration standards.
- Ensure that the range and accuracy of measuring equipment are consistent with the expected values to be measured.
- Determine when data concerning test equipment (e.g., serial numbers or calibration dates) must be recorded. Provide space in the procedure or in an attachment to record the data before the users encounter action steps that use the test equipment for critical measurements.
- Specify verification and performance checks or special controls required before the equipment is used. If the performance check is done just before use, include the check in the body of the procedure rather than in the prerequisite actions section.
- Identify unique software, approved in accordance with P1040, *Software Quality Assurance*.

4.5.6.d Field Preparations

The inclusion of a Field Preparations section in technical procedures is conditional, based on the need for field conditions to be established prior to execution of the procedure.

4.5.6.d Field Preparations (continued)

- Provide instructions for preparatory field activities that must be completed before continuing with the procedure. Examples of these activities are listed below.
  - Ensure site accessibility.
  - Perform lock-out/tag out of equipment (see Example 4.5-13, *Tag Out Action Step*).

**Example 4-13**  
Tag Out Action Step

[4] Ensure that the GM Diesel unit to be inspected has been tagged out.

- Unlock valves or rooms.
- Record the as-found condition of the structure, system, or component.
- Verify if systems and components are in use before removing them from service (e.g., redundant safety system or indicator lights).
- Confirm the correct system or equipment configuration (see Example 4-14, *Field Preparations*).

**Example 4-14**  
Field Preparations

[4] Verify that the halon fire protection system is in service for each GM Diesel room.

[5] Ensure that the following tests have been completed on the GM Diesel unit to be tested:

[a] SP-EG-100 series.

[b] SP-EG-1.

- Establish system or equipment alignment and power supply.
- Identify actions to cope with potential hazards such as fire, radioactive spills, or exposure to radiation.
- Install portable communications equipment and prepare special test equipment.
- Ensure that needed support services, such as craft personnel to remove a relay cover, are available.

4.5.6.d Field Preparations (continued)

- Ensure the availability of performance documents before continuing with the procedure.
- Provide specifications and tolerances that determine whether the results of the prerequisite action steps are acceptable.
- Obtain required permits such as radiation work, electrical work, or confined space work permits. Ensure that appropriate sign-offs and approvals are obtained.

4.5.6.e Approvals and Notifications

The inclusion of an Approvals and Notifications section in technical procedures is conditional, based on the need for the notification and/or approval of key personnel prior to execution of the procedure.

The approvals and notifications section identifies approvals and notifications that must occur before the actions in the procedure begin. Approvals and notifications related to specific action steps in the procedure are placed adjacent to the affected action step (see Example 4-15, *Approval to Begin a Procedure*).

- Provide instructions to ensure that all necessary approvals are obtained and all required notifications are made before initiating the procedure. Approvals and notifications may involve responsible individuals such as the
  - Operations Manager (OM)
  - RLM
  - Control Room Operator
  - Cognizant System Engineer (CSE) or Plant System Engineer (PSE)
  - Support, Quality Control, Regulatory, and Audit Personnel
  - Safeguards or Security Personnel
  - Radiological Control Technicians (RCTs).

**Example 4-15**

Approval to Begin a Procedure

**3.3 Approvals**

[1] Consult with, and obtain permission from, your supervisor before beginning performance of this procedure.

\_\_\_\_\_  
Supervisor Initials

4.5.6.e Approvals and Notifications (continued)

- If an integrated work document (IWD) encompasses activities performed in procedures does not include instructions to obtain permits before performing the activity, provide instructions for obtaining the required permits [e.g., radiation work permits (RWPs) or confined space entry permits].
- Identify any required notification requirements in the event of a delay in the procedure execution (see Example 4-16, *Notification in Case of Delay*).

**Example 4-16**  
Notifications in Case of Delay

[2] IF the test is delayed until a later shift,  
THEN obtain approvals to begin or continue the test from the following individuals:

Position	Signature	Date	Time
Shift Manager			
Central Control Room Operator			
Shift Technical Engineer			

4.5.6.f Initial Conditions

The inclusion of an Initial Conditions section in technical procedures is conditional, based on the need for field conditions to be established prior to execution of the procedure.

- Identify the expected initial field conditions required to start the work activity.
- Include the required status (e.g., operating or shutdown) of any supporting equipment and/or systems.
- Identify any process parameter that must be achieved before the work activity begins.

4.5.7 Acceptance Criteria

The inclusion of an Acceptance Criteria section in technical procedures is conditional, based on the need for the overall results of the procedure to meet specific criteria to be considered successful.

Acceptance criteria provide a basis for determining the success or failure of an activity. Each criterion should be associated with the action step where the verifying action is performed and recorded. This section may be used to summarize the acceptance criteria or to state where the acceptance criteria are located in the procedure itself or in referenced procedures or datasheets.

#### 4.5.8 Work Steps

The inclusion of one or more Work Steps sections in technical procedures is mandatory.

The Work Steps sections contain the action steps that prescribe the principal tasks and subtasks of the procedure.

- Organize activities in the order in which they will be performed.
- If required, divide the Work Steps sections into individual sections (e.g., 5.0, 6.0, etc.) or subsections (e.g., 5.1, 5.2, etc.) that are grouped into logically related activities, such as those established in the design basis (see Section 3.1, *Identifying the Design Basis*) and source documents (see Section 3.2, *Identifying Source Documents*).
- Use headings for each subsection that reflect the activity rather than a generic title (e.g., “Removing the Actuator,” rather than “Actuator”).
- The individual action steps within the Work Steps sections are written in accordance with Section 5.0, *Writing Action Steps*, of this document.
- State only one action (or closely related actions) per step.
- It is recommended that each first-level section heading be started on a new page.
- Include only the information pertinent to the performance of the procedure.
- Use consistent, precise, easy-to-understand terminology.
- Avoid acronyms and abbreviations, other than commonly understood terms.
- If the procedure applies to more than one user, indicate the performer's functional title before to the step statement(s) occur (see Example 4-17, *Identification of Performer*).

#### **Example 4-17**

##### Identification of Performer

[2] Torque head bolts with torque wrench set at 90 foot-pounds.

#### **QA Inspector**

[3] Verify that head bolts are torqued to 90-foot pounds. \_\_\_\_\_

- Include hazards and controls that apply to individual action steps. Follow the requirements of Section 4.5.5, *Precautions and Limitations*, when addressing hazards that apply to the entire procedure or occur at more than one point in the procedure. This information is conveyed in the form of a Warning or a Caution (see Section 5.10.1, *Warnings and Cautions*). Consult the Hazard Analysis, if one was performed, to ensure that required hazard information is appropriately communicated and, as much as possible, incorporated into the procedure.
- Include independent verification (IV) instructions as designated by the FOD or RLM (see P315, *Conduct of Operations Manual*, Attachment 10, *Independent Verification*).

#### 4.5.8 *Work Steps (continued)*

- Instrument readings are to include the tolerance and must conform to both the instrument scale and the readability of the field instrument.
- Instructions include explicit parameters and do not require mental arithmetic. If calculations are required, they must be clearly explained and space provided to document the calculation.
- If the scope of the action steps required to respond to an abnormal event is simplistic, instead of developing a stand-alone Abnormal Operating Procedure (AOP) include these action steps as a separate performance subsection.

#### 4.5.9 *Post-Performance Activity*

The inclusion of a Post-Performance Activity section in technical procedures is conditional, based on the need for any of its subsections.

The post-performance activity section stipulates actions needed to close out the procedure performance. This section includes, but is not limited to, the following elements

- ◇ Testing (conditional)
- ◇ Restoration (conditional)
- ◇ Results (conditional)
- ◇ Independent Verification (optional)
- The creation of separate subsections listing the various post-performance activities is optional.

##### 4.5.9.a Testing

The inclusion of a Testing section in technical procedures is conditional.

- If the operability of equipment has been affected while performing procedures and where operability must be verified before returning the equipment to service, include action steps that specify these tests.
- The actions steps to perform testing of a system or equipment may be included in the Work Steps section (see Section 4.5.8, *Work Steps*) as individual action steps, or a separate subsection, or a separate procedure.

##### 4.5.9.b Restoration

The inclusion of a Restoration section in technical procedures is conditional, based on the need to return the system or process to a predetermined configuration following execution of the procedure.

- Provide action steps to return of affected structures, systems, and components (SSCs) to the desired configuration.

#### 4.5.9.b Restoration (continued)

- Include instructions for
  - Required restoration adjustments, storage, or maintenance of laboratory and process equipment
  - The return of tools and equipment
  - The proper disposal or storage of consumables such as test samples or chemicals not used in the process.
  - The proper disposal of waste.
- Provide space for recording the notification of appropriate personnel that the SSC has been returned to service, if required.
- Include provisions for the close out of any permits (such as confined entry permits) that were required to perform the procedure.
- Provide verification of appropriate SSC restoration action steps, if required.
- The actions steps to return a SSC to service may be included in the Work Steps section (see Section 4.5.8, *Work Steps*) as individual action steps or a separate subsection.

#### 4.5.9.c Results

The inclusion of a Results section in technical procedures is conditional.

This section may include, but is not limited to, the following elements:

- Provide instructions to summarize the results of the procedure, including
  - Listings of facility conditions
  - Date and time of test start and test completion
  - Participants
  - Reasons for the test
- Provide instructions to state whether
  - Problems or delays were encountered
  - Corrective action(s) were performed
  - Authorization signatures were obtained.
- Provide instructions to state whether acceptance criteria were satisfied, a nonconformance report was initiated, and/or a limited condition for operation was exceeded.
- Provide an action step to review the entire completed procedure and associated documentation, if any, for completion and to review and approve test results.

#### 4.5.9.c Results (continued)

If the procedure is an “IWD-equivalent” procedure for a Moderate Hazard or High Hazard/Complex work activity as defined in P300, *Integrated Work Management*, an action step to perform a Post-Job Review must be added.

#### 4.5.9.d Independent Verification

The inclusion of an Independent Verification section in technical procedures is optional.

- List the IV requirements as designated by the FOD or RLM.
- The actions steps to perform IV may be included in the Work Steps section (see Section 4.5.8, *Work Steps*) as individual action steps.

#### 4.5.10 Definitions and Acronyms

The inclusion of a Definitions and Acronyms section in technical procedures is conditional, based on the need to define terms, acronyms, and/or abbreviations not found in the LANL Policy Office webpage list of definitions and acronyms.

The procedure should be written so that the users understand each step without having to refer to any supplemental information. If the clarification of terms, acronyms, and abbreviations is required, then the following apply:

- To the extent possible, Procedure Writers should avoid using terms, acronyms, and abbreviations that are not commonly known or defined in a LANL or facility-specific glossary of terms, acronyms, and abbreviations.
- LANL or facility-specific glossaries of terms, definitions, acronyms, and abbreviations should be maintained and used to ensure the consistent use of these elements and consistent interpretation by the users.
- Users should be adequately trained and familiar with the terms used in the procedure.
- If the Procedure Writer determines that a term needs amplification in a specific procedure, the preferred method is to add the amplification as a note preceding the affected action step or be incorporated in the action step.
- If multiple terms, acronyms, and abbreviations not commonly known or documented in a LANL or facility-specific glossary of terms, acronyms, and abbreviations are used, a separate procedure section or a stand-alone attachment may be used.

#### 4.5.11 Responsibilities

The inclusion of a Responsibilities section in technical procedures is conditional, if the responsibilities are not readily apparent from the action steps within the procedure.

The procedure should be written such that the responsibilities are explicit in each action step. More complex procedures involving multiple performers may require a summary of responsibilities to help coordinate of resources.

- Provide a summary of the activities performed by each functional position involved in the execution of the procedure. Do not repeat the actual actions. Do not add actions not addressed in the procedure.

#### 4.5.11 Responsibilities (continued)

- List those functional positions that are directly relevant to the procedure and are not called out in the Work Steps section(s). Examples include support personnel, such as RCTs or Operations Center Personnel.
  - Do not list generic responsibilities defined in institutional documents. For example, basic radiation support, such as the performance of smears or surveys, which are part of the general control of contamination, is not listed. In this example, the general responsibility is within the scope of the Radiation Protection Program itself. These situations typically do not require the inclusion of a specific action step in the procedure.
  - List generic responsibility if it is critical to the successful execution of the procedure. For example, the performance radiation protection smears during the un-packaging of potentially contamination containers must be performed at critical points in the process and specific action steps are included in the procedure at these critical points in the process.
- Use bullets to list the individual responsibilities for each functional position.

#### 4.5.12 Records

The inclusion of a Records section in technical procedures is mandatory.

Records generated by procedures, if any, are maintained for a variety of reasons, including to document the tasks completed by performing the procedure, document the status of equipment or process parameters, or provide an operational history. Administrative controls establish requirements for, and control of, records.

- Identify the records generated as a result of performing the procedure (e.g., forms, data sheets, checklists, and documentation of as-found conditions). Coordinate with the RLM and the RM-POC.
- Classify the records generated as appropriate to the LANL and facility records management process and indicate the appropriate storage, retention, and disposition requirements of the records.
- Specify the governing document for managing records; specifically identify P1020-1, *Laboratory Records Management*, and any local procedure.
- If no records are generated, state this.
- Use a table to identify the records and identify the associated records processing requirements (recommended) (see Example 4-18, *Records Table*).

#### 4.5.12 Records (continued)

### Example 4-18 Records Table

<b>Records Identification</b>	<b>Record / Non-Record</b>	<b>Protection/Storage Methods</b>	<b>Processing Instructions</b>
Attachment A	Record	Supervision must implement a reasonable level of protection to prevent loss and degradation. Records must be maintained in a metal file cabinet when not in use.	When the records are ready for final disposition, the record is transferred to Records Management in accordance with procedure AP-515-1, <i>Records Processing</i> .
Criticality Safety (CS) Worksheet	Non-Record	None	Destroy when no longer needed.

#### 4.5.13 References

The inclusion of a Reference section in technical procedures is optional.

- List the documents specifically referenced in the procedure. All other source documents will be captured in the DHF.
- List the DOE rules and orders, TSRs, DSA or SAD, and other documents (e.g., industry codes and standards) whose requirements and commitments are directly implemented by the procedure.
- Do not include broad, programmatic documents unless a specific purpose for the reference exists.
- Do not include documents listed as performance documents (see Section 4.5.6, *Prerequisite Action*).

#### 4.5.14 Appendices

The inclusion of an Appendices section in technical procedures is conditional, based on if the procedures include appendices.

Appendices are part of the procedure; number the pages to show that they are a continuation of the main body of the procedures. In addition, number the individual appendix pages independently to ensure that all pages are available if the appendix is detached from the main body of the procedure.

Appendices are supplemental information added to the procedure that is obtained from an outside source. Examples of items that may be placed in an appendix are tables, figures, and graphs. Appendices do not contain any action steps.

- Provide a separate, stand-alone section listing the procedure appendices.

#### 4.5.14 Appendices (continued)

- A separate, stand-alone section may be omitted if the table of contents lists the individual appendices.
- Reference appendices within the text of the procedure.
- Assign to each appendix a unique identifier, specifically an Arabic number (e.g., 1, 2, or 3) that are assigned sequentially.
- Include the text “Appendix X,” where X is the appendix’s unique identifier, in the header for each appendix. Also identify the appendix page and total number of pages as part of the appendix header (see Example 4-19, *Appendix Page Header*).

<b>Example 4-19</b> Appendix Page Header		
Reservoir Plug Welding		SOP-618-4, Rev. 0
UET	UCNI	Page 16 of 16
Appendix 1 (Page 1 of 3)		

- Avoid using vendor information as appendices.
  - Integrate approved vendor information into the body of the procedure, when possible, rather than referencing the information.
  - Refer to administrative requirements for processing and using vendor information.

#### 4.5.15 Attachments

The inclusion of an Attachments section in procedures is conditional, based on if the procedures include attachments.

Attachments are part of the procedure; number pages to show that they are a continuation of the main body of the procedures. In addition, number the individual attachment pages independently to ensure that all pages are available if the attachment is detached from the main body of the procedure.

Attachments are supplemental information added to the procedure that is part of the procedure itself. Examples of items that may be placed in an attachment are tables, figures, and graphs that are too large to incorporate in the body of the procedure or data sheets to capture data. Attachments may contain action steps.

- Provide a separate, stand-alone section listing the procedure attachments.
- A separate, stand-alone section may be omitted if the table of contents lists the individual attachments.
- Reference attachments within the text of the procedure.

4.5.15 Attachments (continued)

- Assign to each attachment a unique identifier, specifically a capital letter (e.g., A, B, or C) that are assigned sequentially.
- Include the text “Attachment X,” where X is the attachment’s unique identifier, in the header for each attachment. Also identify the attachment page and total pages as part of the header (see Example 4-20, Attachment Page Header).

**Example 4-20**  
Attachment Page Header

Reservoir Plug Welding		SOP-618-4, Rev. 0
UET	UCNI	Page 16 of 16
Attachment A		
(Page 1 of 1)		

- Include in the attachments any information that would be more conveniently located outside the main body of procedures (see Example 4-21, Valve Alignment Checklist).

**Example 4-21**  
Valve Alignment Checklist

SHIELD HX CW				SP-SHS-1-K Rev. 0 Page 19 of 23
APPENDIX D SHIELD SYSTEM HX COOLING WATER SUPPLY & VALVE ALIGNMENT CHECKLIST (Page 1 of 2)				
Component Noun Name	Description (Location)	Valve Number	Required Position	Initials
Bypass Effluent to HX		CWS-V-272D	OPEN	_____ IV
Flow Pressure Tap		CWS-V-1513	OPEN	_____

## 5.0 WRITING ACTION STEPS

The basic element of an action step (see Example 5-1, *Basic Action Step*) is an imperative sentence — a command to perform a specific action. An action step answers the question “what is to be done?” Additional elements, such as cautions and condition statements, add precision to instructions.

The subsections of this section describe the individual types of action steps that are used in procedures. The Procedure Writer must determine which of these types of action steps are required for a given procedure, but will use the guidance provided in these subsections for those types of actions steps chosen. Therefore, the Procedure Writer determines which subsections are used and the sequence they are used.

### Example 5-1 Basic Action Step

[1] Label the actuator disposal can with Identification Tag Form 45.

#### 5.1 Basic Steps

- Start the basic action step with a singular present tense action verb (see Attachment A, *Action Verb List*) such as “open.” Attachment A of this document provides a list of suggested action verbs (see Example 5-2, *Basic Action Step Breakdown*).
- Describe the direct object of the verb (see Example 5-2, *Basic Action Step breakdown*).
  - Identify equipment precisely as it is labeled in the field, including the unique identifier and the noun name.
  - For switches and pushbuttons, use the position term should be in all upper-case letters match the term found in the field. For example, don't use START if the position in the field is RUN.
  - If the equipment is not labeled in the field, use equipment nomenclature precisely as it appears in the basis or other source documentation.
  - Avoid using acronyms and abbreviations when writing action steps, particularly for short, simple words and terms. If an acronym or abbreviation is used, it must (1) be easily understood by the users and (2) have a standardized and unique meaning for the users.
  - Use only those acronyms and abbreviations that are included in an approved LANL or facility-specific list or that are defined in the procedure.
- Complete the basic action step with supportive information about the action verb and the direct object. Supportive information includes further description of the object and the recipient of the object (see Example 5-2, *Basic Action Step Breakdown*).

## 5.1 Basic Steps (continued)

### Example 5-2

#### Basic Action Step Breakdown

	<u>Action Verb</u>	<u>Direct Object</u>	<u>Supportive Information</u>
[1]	Label	the actuator disposal can	with Identification Tag Form 45.

- Identify each action step and action sub-step within a section or subsection with a unique step number, as established in Section 4.4, *Step Numbering*, to distinguish the action steps from each other and from topical headings and explanations (see Example 5-3, *Action Step Numbering*).

### Example 5-3

#### Action Steps Numbering

- [3] Prepare compressed gas cylinders as follows:
- [a] Select compressed gas cylinders with current in-service dated gas certification.
  - [b] Verify that each cylinder regulator is adjusted to 35 psig (30 to 40 psig).

- Write action steps using words that are easily understandable by the users. Where a word is used that requires a definition, include the definition as (1) part of that action step or (2) as a note that immediately precedes the action step.
- Restructure the actions as needed to avoid using action sub-sub-steps. Break one section into two or more sections to simplify the action step structure if necessary.
- Place three or more objects of the verb in a separate table or listing with appropriate checkoff boxes or sign-off blanks.
- Consider combining multiple verbs with the same object in a single action statement (see Example 5-4, *Multiple Actions Verbs in a Single Action Step*).

### Example 5-4

#### Multiple Action Verbs in a Single Action Step

- [12] Sign, date, and transmit completed form to Records Management.

- If someone other than the primary procedure user is responsible for performing an action step, identify the person to perform the task directly above the affected action step (see Example 5-5, *Identification of Performer*).

## 5.1 Basic Steps (continued)

### Example 5-5 Identification of Performer

[2] Torque head bolts with torque wrench set at 90 foot-pounds.

#### QA Inspector

[3] Verify that head bolts are torqued to 90-foot pounds.

\_\_\_\_\_  
Initials/Z#

- Use emphasis techniques (e.g., **bold**, *italics*, and underlining) to highlight important information, with the following constraints: (1) do not use all capital letters for blocks of text, (2) do not capitalize the first letter of any words unless they are formal, proper nouns in accordance with standard American English usage or they are the first word of a sentence, and (3) avoid the overuse of multiple emphasis techniques (see Section 6.0, *Key Information/Steps*).
- Specify numbers in the procedures with the same precision than can be read from the instruments.
- Avoid requiring users to make conversions from one unit of measure to another whenever possible. Provide an aid for the users if conversions are essential. Do not require mental calculations.
- Use consistent vocabulary, syntax, and punctuation
  - Include articles (a, an, the) when referring to a general item; omit the article when referring to specific items (e.g., “Open the door” or “Open door DW-9”).
  - Use punctuation in accordance with standard American English.
  - Present action steps, including associated action sub-steps and lists, with a minimum of interruption (e.g., page breaks).
  - Follow standard grammatical principles.
  - Use words consistently within and among procedures.
  - Use short, simple words.
  - Avoid ambiguous or vague adverbs.
- Use main action steps to allow users to comprehend the purpose of the action step quickly. Use action sub-steps to provide specific details for performance. Both main action steps and action sub-steps use the same basic action step form.
- Avoid formatting an action step so that it continues onto the next page.
- Present numerical information in Arabic numbers (as opposed to Roman numerals). Use spelled-out numbers only when one number without a specified unit of measure is followed directly by one with a unit of measure (see Example 5-6, *Spelled-out Number Use*) or when a number, typically a single digit number, is emphasized (see Example 5-7, *Emphasized Numbers*).

## 5.1 Basic Steps (continued)

### Example 5-6 Spelled-out Number Use

[4] Verify that two 6-gallon buckets are available.

### Example 5-7 Emphasized Numbers

[7] Verify that only one cooling water pump is in the RUN position.

- All time reference must be in made in 24-hour time (e.g., 0823 for 8:23 A.M., 1956 for 7:56 P.M., etc.) (see P315, *Conduct of Operations Manual, Attachment 2, Shift Routines and Operating Practices, Section 2.1, Facility Operating Practices*).

## 5.2 Conditional Steps

Conditional action steps are used when a procedure's execution is based on a condition or a combination of conditions. The use of conditional action steps is extremely important in technical procedures because they provide the logic for the decisions required by the operator.

Conditional action steps use the following logic terms:

- IF or WHEN to present the condition to the users
- THEN to present the action
- OR or AND to present more complex conditions
- NOT to negate the condition

Other words (e.g., except, unless, but, and only) should not be used to present conditional information.

- Describe the condition first and then the action to be taken if that condition applies (see Example 5-8, *Basic Conditional Statement*).

### Example 5-8 Basic Conditional Statement

[6] IF the plug piece is NOT clean,  
THEN wipe the cone base off with an alcohol moistened cotton swab.

- The conditional term(s) should be in all upper-case letters and underlined in the action step. Additionally, white space must be used to add emphasis in conditional statements, specifically by starting each new conditional term on a new line (see Example 5-8, *Basic Conditional Statement*).

## 5.2 Conditional Steps (continued)

- If two or more conditions are required and all must be met, then place the conditional term AND between the conditions. Begin a new line when presenting the second condition and begin a new line with THEN and the action (see Example 5-9, *Multiple Condition Statements*). An alternative would be to make a single conditional statement that all of the following conditions must be met and then provide a bulleted list of the conditions before presenting the action on a separate line (see Example 5-10, *Alternate Multiple Condition Statement*).

### Example 5-9

#### Multiple Conditional Statements

[6] IF Condition 1,  
AND Condition 2,  
AND Condition 3,  
THEN open CWS-HMOV-290, ECW pump discharge valve.

### Example 5-10

#### Alternate Multiple Conditional Statements

[6] IF all of the following conditions exist,  
• Condition 1  
• Condition 2  
• Condition 3  
THEN open CWS-HMOV-290, ECW pump discharge valve.

- If two conditions are involved and one or both of these conditions must be met before the action is taken, place the conditional term OR in underlined capital letters between the conditions. Begin a new line when presenting the second condition and begin a new line with THEN and the action (see Examples 5-11, *Conditional OR Statements*, and 5-12, *Conditional AND Statement*).

### Example 5-11

#### Conditional OR Statements

[6] IF Condition 1,  
OR Condition 2,  
THEN open CWS-HMOV-290, ECW pump discharge valve.

## 5.2 Conditional Steps (continued)

### Example 5-12 Conditional AND Statements

[6] IF Condition 1,  
AND Condition 2,  
THEN open CWS-HMOV-290, ECW pump discharge valve.

- If three or more conditions are described, consider using a decision table or a listing format.
- Avoid, if possible, using the logical connectors AND and OR in the same conditional statement as the resulting logic can be **ambiguous and difficult to understand** (see Example 5-13, *Avoid Using AND and OR in the Same Statement*).

### Example 5-13 Avoid Using AND and OR in the Same Statement

Do not use a single, ambiguous action step:

[8] IF Condition A OR Condition B AND Condition C,  
THEN open valve D.

Use two or more simple, unambiguous action steps:

[8] Verify that only one of the following conditions is met:

- Condition A
- Condition B

[9] IF Condition C,  
THEN open valve D.

- Use only the logical connectors AND and OR to join conditions that include both a subject and a predicate. If two subjects apply to the same predicate (e.g., “IF the temperature and pressure are stable, ...”) or one subject takes two predicates (e.g., “IF the level is stable or falling, ...”) use the un-emphasized conjunctions “and” or “or” rather than the special emphasized logical connectors (see Example 5-14, *Two Subjects with One Predicate*).

### Example 5-14 Two Subjects with One Predicate

[5] WHEN cooling water pump and pump discharge pressure have stabilized,  
THEN close CWS-V-3351-1 bypass isolation valve.

## 5.2 Conditional Steps (continued)

- For a negative condition, use the conditional term NOT. Avoid using NOT if a single word can be used and the condition can be stated in a positive manner (e.g., “IF the valve is open, ...” is preferable to “IF the valve is NOT closed, ...”).

## 5.3 Non-sequential Steps

Procedure users must perform the action steps in the order they are written unless the procedure specifically directs the users to perform action steps in another order. When the objectives of the action steps will be met regardless of the sequence in which they are performed, then:

- Sequence the action steps according to usability criteria, such as according to equipment or control board layout, to reduce opportunities for error.
- Identify non-sequential steps in one of three methods: (1) provide a note preceding the non-sequential action steps, (2) present the non-sequential action steps as bullets in lieu of step numbering, or (3) present a condition that result in performing action steps non-sequentially.
- If the note method is used, place the note before the sequence of action steps that can be performed non-sequentially (see Example 5-15, *Note Announcing Non-sequential Action Steps*).

### Example 5-15

#### Note Announcing Non-sequential Action Steps

**NOTE:** The activities in action steps [1] through [7] may be performed in any order.

- If the bulleted list method is used, then precede the list with a lead-in, numbered action step (see Example 5-16, *Bulleted List of Non-sequential Action Steps*).

### Example 5-16

#### Bulleted List of Non-sequential Action Steps

[1] Perform all of the following actions:

- Set switch S-7 to ON
- Set switch S-9 to ON

- If the performance of one or more action steps is dependent on a condition, then establish the condition in a note prior to the action step(s) that directs the performer to skip the steps if the condition is met. This is a variant of the action step structure described in Section 5.2, *Conditional Steps* (see Example 5-17, *Conditional Execution*).

### 5.3 Non-sequential Steps (continued)

#### Example 5-17 Conditional Execution

*NOTE:* If ISV pump is operating, the action steps [1] and [2] may be skipped.

- [1] Ensure that the ISV Pump A discharge valve (ISV-A-D2) is OPEN.
- [2] Set switch ISV-S-7 to the RUN position.

- Regardless of the method used, it is recommended that a checkoff box or sign-off line be added to every action in a series of non-sequential action steps to ensure that action steps are not omitted.

### 5.4 Equally Acceptable Steps

Equally acceptable alternative action steps are used when it is beneficial for users to be provided with more than one option. It is important to ensure that only one alternative is performed.

- Present alternative actions as items in a list within a single action step (see Example 5-18, *Equally Acceptable Action Steps*).

#### Example 5-18 Equally Acceptable Action Steps

- [1] Perform one of the following actions and check the action taken
  - Set switch S-7 to ON
  - Set switch S-9 to ON

- Use the word “one” in lower case and emphasize (e.g., underlined) to introduce the list of alternatives (e.g., “Perform one of the following actions”).
- A checkoff box (i.e., placekeeping) should be included for every action in a series of alternative action steps to ensure that action steps are not omitted and that redundant actions are not performed (see Section 5.13.1, *Placekeeping*).
- If placekeeping (e.g., checkoff box) is used, then specify that users checkoff only those action steps actually performed (see Section 5.13.1, *Placekeeping*).

### 5.5 Time-dependent Steps

Some action steps contain actions that impose time requirements on the users by specifying the duration of actions or actions that must be completed within a specific period of time.

- Place a note before the action steps to be timed in order to alert the users (see Example 5-19, *Time-dependent Action Steps with Note*).

### 5.5 Time-dependent Steps (continued)

- Begin the action steps with instructions for the users to record critical time information and provide the users with a place to record this information. Typically this information will be the time that “starts the clock,” and the time by which some action step or action must be completed.
- Include guidance to identify the actions to take in the event that the time dependent action step cannot be performed within the specified time.
- A note to advise users of time-dependent actions and instructions to record the time information are not required when the time requirement is an inherent part of the action step and misunderstanding is unlikely (see Example 5-20, *Time-dependent Action Step without Note*).

#### Example 5-19

##### Time-dependent Action Steps with Note

**NOTE:** The following action step starts a time-limited sequence. Action steps [2] through [5] are to be performed within 20 minutes.

- [1] Calculate the time by which action step [5] is to be completed with the following steps:
- |     |  |              |
|-----|--|--------------|
| [a] | Record the time that action step [2] is to be started.   | _____        |
| [b] | Add 20 minutes.  | + 20 minutes |
| [c] | Record the time that action step [5] is to be completed. | _____        |
- [2] Place the *INCIDENT ACTION* switch to TEST.
- [3] Verify the amber *ALARM TEST* light on the AIA graphic panel is LIT.
- \_\_\_\_\_
- IV Initials/Z#
- [4] Place the *INCIDENT ACTION* switch to OFF.
- [5] Push the *RESET* pushbutton on the AIA logic tester and record the time.
- [6] IF the time recorded in action step [5] is later than the time recorded in action step [1] [c],  
THEN repeat action steps [1] through [5].

#### Example 5-20

##### Time-dependent Action Step without Note

- [1] Push Generator Start pushbutton, and verify that the Generator started within 12 seconds.

_____	_____	_____
Time to Start	Initial/Z#	IV Initial/Z#

## 5.6 Concurrent Steps

Concurrent action steps contain actions that must be performed at the same time (e.g., parameters may have to be monitored or checked while the users accomplish another action, or two performers in different locations may have to execute actions simultaneously).

- If concurrent action steps are to be performed by one person, place those actions in one action step that describes precisely the relationship between the action steps (see Example 5-21, *Concurrent Actions Performed by a Single Performer*).

### Example 5-21

#### Concurrent Actions Performed by a Single Performer

[1] Add 100 gallons of water to tank TNK-001 while limiting the flow rate to less than 5 gpm.

- If concurrent action steps are to be performed by more than one person (see Example 5-22, *Concurrent Actions Performed by Multiple Performers*), place a note before the first concurrent action step, as appropriate, identifying the.
  - Concurrent action steps
  - Personnel needed to perform each concurrent action step
  - Locations where the action steps are performed
  - Means of communication between locations.

### Example 5-22

#### Concurrent Actions Performed by Multiple Performers

**NOTE:** The activity in action step [1] is performed by Operator #1 in room 601 concurrently with action step [2] performed by Operator #2 in room 610. Communications between operators is via channel 7 of the facility radio system.

#### Operator #1

[1] Ensure that the water transfer flow rate is less than 5 gpm.

#### Operator #2

[2] Add 100 gallons of water to tank TNK-001.

## 5.7 Continuous Steps

Continuous action steps are conditional action steps where the conditions they describe must be monitored throughout procedures or a portion of procedures (e.g., users may need to monitor a gauge and take a specific action if the gauge, at any point during the procedure, indicates a reading above or below a specific level).

## 5.7 Continuous Steps (continued)

- Place continuous action steps in the procedure at the point at which they first apply. Repeat the action steps periodically, as appropriate, on the facing pages of the procedure or in the body of the procedure.
- Format continuous action steps as conditional action steps and state the portion of the procedure during which they are applicable (see Example 5-23, *Continuous Action Step*).

### Example 5-23 Continuous Action Step

[7] IF at any time while performing action steps [9] through [17] the high level alarm sounds,  
THEN shut off the water to TNK-001.

- Notify the users when continuous action steps are to be discontinued.

## 5.8 Repeated Steps

Repeated action steps (see Example 5-24, *Repeated Action Steps*) are simple action steps that must be performed more than once during the execution of procedures.

### Example 5-24 Repeated Action Step

[8] Vary the input signal until switch SW-1-7 trips.

- If an action step must be repeated an indefinite number of times to achieve an objective, specify that the action step is to be repeated until the expected results are achieved. Only a single sign-off line is provided for this action step regardless of the number of times the action step is performed.
- If it is important to know the number of times the sequence is repeated, provide placekeeping (see Section 5.13, *Placekeeping and Sign-off Steps*).
- If an action must be performed repeatedly at timed intervals, place instructions in the procedure and provide suitable space to record the times that the action step is performed.
- If an action step is to be performed periodically throughout procedures or a portion of procedures (but not at specific timed intervals), place reminders as action steps in the body of the procedure.
- If a large group of repetitive actions is required and becomes cumbersome, address the actions in action steps that reference a table, list, or appendix (an example of a large group of repetitive actions is a series of valve alignments).
- Notify the performer when repeated action steps are to be discontinued.

## 5.9 Verification, Determination, Notification, and Data Recording Steps

Verification action steps ensure that a specific activity has occurred or that a stated condition exists (e.g., independent verification or quality control check). Determination action steps call for a comparison with stated requirements, and no manipulation by the users occurs. Notification action steps require reporting when given criteria are met. Data recording action steps ensure that desired data are recorded (see Example 5-25, *Data Recording with Sign-off by Initials*).

### Example 5-25

#### Data Recording with Sign-off by Initials

[10] Record cooling water flow to Cylinder 12 Cooling Jacket.

25 gpm

Required

\_\_\_\_\_

Actual

\_\_\_\_\_

Initials/Z# and date

- Provide appropriate space or tables for entering data (either in the procedure or in data sheets).
- If the condition to be verified or determined is not found, provide the appropriate actions to take.
- Include labeled lines in action steps as necessary for users to record required information.
- Specify the required independent verification and inspection action steps.
- Include directions for notifying other personnel as discrete action steps. Actions requiring notifications of others often include, but are not limited to the
  - System alignments to be performed.
  - Systems to be removed from or returned to service.
  - Alarms and alarm setpoints that may annunciate as a result of performing the procedure.
  - Equipment actuations that are expected to occur during performance of the procedure.
  - Actions with electrical or mechanical interlocks involved (e.g., interlocks to be honored or overridden).
  - Effects of precautions and limitations on the operating conditions, noting which equipment will be inoperative and which lights, alarms, or annunciators will react.
  - Changes or special conditions established by the procedure that could affect or appear to affect other equipment or systems [e.g., performing the procedure could involve mechanical or electrical bypass (lifted leads, inhibits, jumpers, and fuse removals) or other functional restrictions].
  - Methods and instructions for communication among multiple persons required to perform an action.
  - Inspection for degradation of qualified equipment (e.g., environmentally qualified or seismically qualified equipment).

## 5.9 Verification, Determination, Notification, and Data Recording Steps (continued)

- Identify parameters and acceptable ranges needed to perform the procedure.
  - Use the same units of measure in the procedure that users will read from the facility instrumentation.
  - If there is an acceptable range for a parameter, include the acceptable range rather than a point value.

## 5.10 Warnings, Cautions, and Notes

Warnings alert users to potential hazards to personnel. Cautions alert users to potential hazards to equipment, the environment, or the mission. Notes call attention to important supplemental information.

### 5.10.1 Warnings and Cautions

- Review all potential hazards with associated SMEs to determine warnings or cautions that need to be included (see P315, *Conduct of Operations Manual*, Attachment 16, *Technical Procedures*, Section 16.5.1.f, *Hazard Grading*) (see Example 5-26, *Warning Statement*, and Example 5-27, *Caution Statement*).

### EXAMPLE 5-26 Warning Statement

#### WARNING

Elevated work platforms and ladders are required. Elevated work platforms and ladders pose a fall hazard. When working on elevated platforms and ladders, use caution. Place the ladder on a solid, level surface.

- Determine those parts of the procedure where the addition of information is necessary.
- Review each action step and list the potential hazards in a warning or caution format.
- If the danger is present during the entire procedure, place the warning or caution in the precautions and limitations section (see Section 4.5.5, *Precautions and Limitations*).
- Position warnings and cautions so they are completely on one page and appear immediately before and on the same page as the action step(s) to which they apply.
- Place warnings ahead of cautions whenever more than one type is used at the same point in procedures.
- Write warnings and cautions as short, concise statements, rather than as commands to distinguish them from action steps (e.g., "Touching this wire will electrocute you!").

**Example 5-27**  
Caution Statement

**CAUTION**

Operating the generator system at speeds less than 700 rpm for longer than 10 minutes with the exciter regulator in operation may cause damage to the exciter regulator field.

- Do not embed action steps in warnings and cautions (e.g., do not rewrite the instruction “Shut the valve,” as “The valve should be shut”).
- Ensure that cautions and warnings provide (1) a description of the hazardous condition, (2) the consequences of failing to heed the warning or caution, and (3) critical time considerations.
- To ensure visual identification, present warnings within a double line box with the word “warning” in **bold**, UPPERCASE text centered over the warning statement text (see Example 5-26, *Warning Statement*).
- To ensure visual identification, present cautions within a single line box with the word “caution” in **bold**, UPPERCASE text centered over the warning statement text (see Example 5-27, *Caution Statement*).
- Include only one topic in each warning or caution.
- Number each warning or caution when more than one exists (see Example 5-28, *Numbered Cautions*).

**Example 5-28**  
Numbered Cautions

**CAUTION 1**

Operating the generator system at speeds less than 700 rpm for longer than 10 minutes with the exciter regulator in operation may cause damage to the exciter regulator field.

**CAUTION 2**

In the event of a power failure, emergency equipment will start and overload the diesel if the diesel is isolated on the emergency bus during testing.

### 5.10.1 Warnings and Cautions (continued)

- Avoid overusing warnings and cautions.

### 5.10.2 Notes

Notes call attention to important supplemental information. The information can be a reminder of preparatory information needed to perform the activities of a procedure or action step (see Example 5-29, *Note Statement*).

#### **EXAMPLE 5-29** Note Statement

**NOTE** The following action steps closes generator breaker G-1 and starts diesel DL-1.

- Use notes to present information that assists the users in making decisions or improving task performance.
- Position notes so they are completely on one page and appear immediately before and on the same page as the action step(s) to which they apply.
- Place warnings and cautions ahead of notes whenever more than one type is used at the same point in procedures.
- Include only one topic in each note.
- Write notes as short, concise statements, rather than as commands to distinguish them from action steps (e.g., “The following action step starts a timed duration.”).
- Do not embed action steps in notes. Embedded actions should be removed from the note and written as action steps (see Example 5-30, *Note Presentation*).

#### **Example 5-30** Note Presentation

Wrong Form - The note contains an embedded action step.

**NOTE:** A timed duration starts when fluid collection begins. Time is measured and fluid is collected from the end of the test hose (at the floor drain) into a graduated cylinder.

Correct Form - The note was rewritten to remove an embedded action step

**NOTE:** A timed duration starts when fluid collection begins in action step [12] below.

[12] Collect fluid from the end of the test hose (at the floor drain) into a graduated cylinder.

### 5.10.2 Notes (continued)

- Number the notes if more than one note is entered at the same location in a section or subsection (see Example 5-31, *Numbered Notes*).

#### **Example 5-31** Numbered Notes

**NOTE 1:** The following action step closes generator breaker G-1 and starts diesel DL-I.

**NOTE 2:** The following action step requires a time measurement starting at the initiation signal.

- Precede a note with the word “note” in **bold**, *italic*, UPPERCASE text followed by the note statement on the same line (see Example 5-29, *Note Statement*).
- Avoid overusing notes.

### 5.11 Branching and Referencing Steps

To perform a task, sometimes users must branch to or reference another procedure, section, or attachment. Branching routes the procedure users to other action steps or sections within the same procedure or to other procedures, and the users do not return to the original position. Referencing re-directs the procedure users to other action steps or sections within the procedure or to other procedures and then back to the original position in the base procedure.

Referencing and branching increases the potential for error with attendant safety and administrative consequences. Therefore, branching and referencing are highly discouraged. Use referencing and branching only when it is necessary to direct the users to information that is vital to the performance of the activity and when it is not appropriate to incorporate that information into the base procedure.

Data sheets are used exclusively for recording information, not for prescribing how action steps are to be completed. Therefore, the referencing and branching techniques of this section are not applicable to data sheets.

- Evaluate the following criteria to determine if referencing or branching is appropriate. If the answer to all of the following is "NO", then referencing or branching may be appropriate.
  - Can action steps be readily incorporated rather than referenced?
  - Will branching and referencing decrease the users' comprehension and ease of use?
  - Will users be directed to small, isolated sections, rather than whole procedures or appendices?
  - Will branching and referencing cause users to bypass prerequisites that affect the section to which they are being directed?
  - Will branching and referencing cause users to bypass precautions and limitations that affect the section to which they are being directed?

## 5.11 Branching and Referencing Steps (continued)

- If referencing or branching is appropriate, then use the following methods for referencing and branching:
  - Make it clear to the users that they are being directed to other action steps or sections within the procedure or to other procedures. Do not expect them to know implicitly that other action steps or sections within the procedure or to other procedures is being referenced.
  - Fully specify the location to which the users are to go when cross-referencing. If the users are being sent to another procedure, identify the procedure number, title, and section of the procedure (see Example 5-32, *Branching to another Procedure*). If the users are being sent to another location in the same procedure, identify the specific location in the procedure (see Example 5-33, *Branching within the Current Procedure*).

### EXAMPLE 5-32

#### Branching to another Procedure

[12] GO TO procedure SOP-618-5, *Bagout*, Section 5.0, *Performance*, to bagout the waste.

### EXAMPLE 5-33

#### Branching within the Current Procedure

[12] GO TO procedure Section 6.0, *Bagout Waste*, step [1] to bagout the waste.

- Use a consistent format for presenting cross-references. Emphasize key words consistently so that users can identify a cross-referenced action step. Use a term such as GO TO presented in all capital letters to indicate a departure from the base procedure.
- If referencing, use the term RETURN TO presented in all capital letters to indicate the reentry point into the base procedure.
- If referencing, use the terms GO TO and RETURN TO in the same action step (see Example 5-34, *Referencing and Returning Action Step*).

### EXAMPLE 5-34

#### Referencing and Returning Action Step

[12] GO TO procedure Section 6.0, *Bagout Waste*, step [1] to bagout the waste and RETURN TO step [13].

- Ensure that a reference or branch directs the users to all material needed as a prerequisite to the identified material (e.g., ensure that in executing a reference or branch, users do not bypass an applicable caution or prerequisite action step).

## 5.12 Acceptance Criteria Steps

Acceptance criteria provide a basis for determining the success or failure of an activity. Acceptance criteria may be qualitative (specify a given event that does or does not occur) or quantitative (specify a value or value range).

- Determine where specific acceptance criteria are to be presented in the procedure. Either or both of the following methods can be used.
  - State the location of acceptance criteria, whether located at individual action steps (used when criteria are satisfied at the time of performance), in a specific section (see Section 4.5.7, *Acceptance Criteria*), in data sheets, or in other procedures. When acceptance criteria are located in other procedures, link procedures using referencing techniques if the information cannot be included in the procedure (see Section 5.11, *Branching and Referencing Steps*).
- Include instructions for notifications to be made or actions to be taken immediately by the users, in the event that specified acceptance criteria are not met (see Example 5-35, *Acceptance Criteria Failure Notification*).
  - Place these instructions or actions in the body of the procedure.
  - Ensure that these actions are consistent with administrative instructions.
- Include subsequent notifications and actions, such as those to be taken by reviewers, with the acceptance criteria.

### Example 5-35

#### Acceptance Criteria Failure Notification

[14] IF specific acceptance criteria stated in action steps [15] through [19] are not met, THEN notify the Operations Manager as soon as practical after observing the nonconformance.

- Use acceptance criteria that consist of nominal values and, if available from the procedure basis, allowable ranges.

## 5.13 Placekeeping and Sign-off Steps

### 5.13.1 Placekeeping

Placekeeping helps users to keep track of their progress in procedures and reduces the probability of omitting or duplicating action steps. The placekeeping mechanism typically consists of checkoff boxes.

**NOTE:** The term “placekeeping” also refers to the technique for documenting unplanned interruptions in the execution of a procedure as described in P315, *Conduct of Operations Manual*, Attachment 16, *Technical Procedures*, Section 16.9.2.d, *Turning Over Procedures in Use*.

- Only required to be used for specific Usage Level procedures as defined in P315, *Conduct of Operations Manual*, Attachment 16, *Technical Procedures*, Section 16.4.1, *Usage Levels*.

### 5.13.1 Placekeeping (continued)

- May not be used for action steps with “equally acceptable” conditions as described in Section 5.4, *Equally Acceptable Steps*, as it doesn’t provide a positive indication of the chosen condition. In these cases use sign-offs as described in Section 5.13.2, *Sign-offs*, is recommended.
- May not be used for action steps involving the verification of any Safety Basis, regulatory, or other compliance condition or parameter, as it doesn’t provide a positive indication of the verification. In these cases use sign-offs as described in Section 5.13.2, *Sign-offs*, is recommended.
- May not be used for action steps involving the verification of any QA affecting condition or parameter, as it doesn’t provide a positive indication of the verification. In these cases use sign-offs as described in Section 5.13.2, *Sign-offs*, is recommended.
- May be used for action steps as directed by the operating organization, provided its use is not restricted for other reasons, such as Usage Level.
- May be used for actions steps when the procedure execution may cross over shifts, thereby, requiring the tracking of execution status.
- If initials or signatures are not required, provide a placekeeping checkoff box near the right margin of the page or the right side of a table (see Example 5-36, *Checkoff Box*).

#### Example 5-36 Checkoff Box

[8] Turn the transformer test switch to the TEST position.

- If placekeeping must be performed on a separate checklist, arrange the placekeeping items in the order in which the actions are to be performed and reference the associated action steps in the procedure on the checklist.

### 5.13.2 Sign-offs

Sign-offs are a form of placekeeping used when traceability back to the performer is required. A note should be added prior to any sign-off action steps defining the use of signatures, initials, check marks, or “N/A” for the sign-off. A sign-off action step includes one or more of the following elements:

- ◇ A blank line for verification, notification, or inspection signatures or initials, including Z number
- ◇ A blank line for sign-off, including Z number, by a person other than the users
- ◇ Blanks for recording data and the initials or signatures, including Z number, of persons recording the data.
- Only required to be used for specific Usage Level procedures as defined in P315, *Conduct of Operations Manual*, Attachment 16, *Technical Procedures*, Section 16.4.1, *Usage Levels*.
- May be used for action steps with “equally acceptable” conditions as described in Section 5.4, *Equally Acceptable Steps*.
- May be used for action steps involving the verification of any Safety Basis, regulatory, or other compliance condition or parameter.

5.13.2 *Sign-offs (continued)*

- May be used for action steps involving the verification of any QA affecting condition or parameter.
- May be used for action steps as directed by the operating organization, provided its use is not restricted for other reasons, such as Usage Level.
- May be used for actions steps when the procedure execution may cross over shifts, thereby, requiring the tracking of execution status.
- If procedures require that action steps be signed off, provide space for the sign-off of the action step (see Example 5-37, *Worker Sign-off*).

**Example 5-37**  
Worker Sign-off

[14] Verify that the ISV Pump A discharge valve (ISV-A-D2) is closed. \_\_\_\_\_  
Initials/Z#

- Provide a space for the date and/or time of a sign-off where such information is determined to be useful.
- Position a blank signature or initial line (for entering initials and Z number that identify the persons signing off on the action step) immediately following the affected action step, or on a separate data sheet or checklist, if necessary (see Example 5-38, *Worker and Second Party Sign-off by Initials*).

**Example 5-38**  
Worker and Second Party Sign-off of by Initials

[13] Verify that the safety system pneumatic valve (ISV-P-2)  
is CLOSED. \_\_\_\_\_ IV \_\_\_\_\_  
Initials/Z# Initials/Z#

- If the sign-off is located in one procedure and the action to be signed off is located in a referenced procedure, indicate in the base procedure action step that documentation occurs in the referenced procedure sign-off space.
- Use the following methods to differentiate between sign-offs required of the users and those required of other personnel.
  - If the action step is to be signed off by someone other than the principal user, place the title or function of the responsible person under the blank line.
  - If the action step is to be signed off by the users, do not place any identifying title or function under the blank line.
- Do not combine two closely related actions each requiring a sign-off into a single action step. Make two separate action steps with individual sign-offs.

5.13.2 *Sign-offs (continued)*

- If an independent witness or other second party sign-off is needed, provide an additional space for initials and identify that an IV sign-off or other specified signature is required (see Example 5-38, *Worker and Second Party Sign-off by Initials*).
- Identify action steps requiring a hold point (action steps that require inspection of the actions performed). Inspections of the results of an action step before initiating successive action steps are normally designated as hold points. Hold points may involve quality assurance, health physics, engineering, or other inspectors (see Example 5-39, *Hold Point Verification Sign-off*).

**Example 5-39**  
Hold Point Verification Sign-off

**Hold Point:**

[3] Torque head bolts with a torque wrench set at 90 foot-pounds. \_\_\_\_\_  
QA Inspector Initials/Z#

- Include places for entering initials or signatures to identify persons recording data when presenting action steps in tables (see Example 5-40, *Sign-off using a Table*).

**Example 5-40**  
Sign-off using a Table

Parameter	Tolerance	As Found	As Left	Initials/Z#
Pressure	290 psig (285 to 295)			_____ IV
Temperature	350EF (345 to 355)			_____ IV
Level	20 ft (19.5 to 20.5)			_____ IV

- Action steps that require a written response, such as action steps that require independent verification, inspection, data recording, or documentation of completion, can also be considered sign-off devices in lieu of adding a separate sign-off line.

5.13.3 *Sign-off or Checkoff of Conditional Action Steps*

In some instances, performing an action depends on a condition or combination of conditions. Conditional action steps are introduced by the words IF or WHEN and are followed by an action.

- Provide a space for the users to mark conditional action steps where a sign-off or checkoff is desired. Typical entries indicating that the appropriate action was taken are "N/A" if the condition does not occur or a check mark or initial if the condition does occur. Direct the users what to place in the space (see Example 5-41, *Conditional Action Step with a Sign-off*).

### Example 5-41

#### Conditional Action Step with a Sign-off

- [4] IF the outside temperature is less than or equal to 39°F,  
AND heated air is required,  
THEN place coils in service.

\_\_\_\_\_   
Enter N/A or Initials

## 6.0 Key Information/Steps

The DOE order requires that procedures consider “human factors,” of which highlighting critical action steps and/or information are one such consideration. What constitutes important information is subjective and dependent upon the activity and management expectations. This section and its subsections address some issues that LANL has determined to be critical action steps and/or information.

### 6.1 Safety Basis

Procedures are typically the implementing vehicle for many Safety Basis TSR requirements. Additionally, some operating procedures have the potential for adversely impacting a credited Safety Basis parameter. This implementation may take the form of information or specific action steps. Action steps may either directly implement a TSR requirement, such a surveillance requirement, or have the potential for impacting a safety basis-credited parameter.

- Information (e.g., the TSR citation) and action steps related to safety basis must be highlighted by the addition of a dollar sign (\$) to the first line of the text in the left hand margin. As an alternate, the dollar sign (\$) may precede the action step or information text, separated by a dash (see Example 6-1, *Safety Basis Information Highlighting*, and Example 6-2, *Safety Basis Step Highlighting*).

### Example 6-1

#### Safety Basis Information Highlighting

##### Format Option #1:

\$ This procedure is associated with the following Surveillance Requirements:  
SR 4.8.1 Verify that the differential pressure across the HEPA filter is  
≤ 9.5 psid.

##### Format Option #2:

\$ - This procedure is associated with the following Surveillance Requirements:  
SR 4.8.1 Verify that the differential pressure across the HEPA filter is  
≤ 9.5 psid.

## 6.1 Safety Basis (continued)

### Example 6-2 Safety Basis Step Highlighting

#### Format Option #1:

\$ [1] Verify that the differential pressure indicated on DPI-105 is  $\leq$  9.5 psid.  
[SR 4.8.1]

#### Format Option #2:

[1] \$ - Verify that the differential pressure indicated on DPI-105 is  $\leq$  9.5 psid.  
[SR 4.8.1]

- Provide a reference to the TSR requirement that the information is supporting (see Example 6-1, *Safety Basis Information Highlighting*).
- Highlight the TSR requirement number reference by using **bold** text (see Example 6-1, *Safety Basis Information Highlighting*, and Example 6-2, *Safety Basis Step Highlighting*).
- When writing an action step that implements a TSR requirement, add the TSR requirement number reference after the action step, enclosed in brackets (see Example 6-2, *Safety Basis Step Highlighting*) or parenthesis.
- Add a statement to the “Scope” statement of the Introduction section (see Section 4.5.4, *Introduction*) acknowledging that the procedure implements a TSR requirement.
- Add the TSR requirement to the Acceptance Criteria section (see Section 4.5.7, *Acceptance Criteria*) (see Example 6-1, *Safety Basis Information Highlighting*).
- Document in the DHF the background for any Safety Basis action step in accordance with Section 16.5.1.k, *Document History File*, in Attachment 16, *Local Procedures*, of P315, *Conduct of Operations Manual*.

## 6.2 Nuclear Criticality Safety

Because of the consequences of a criticality event, it is imperative that the worker maintain the Nuclear Criticality Safety (NCS) limits when performing a work activity.

**Note:** For procedure steps and/or information involving criticality safety, the use of a circle CS (ⒸS) is recommended because the asterisk (\*) could be confused with a footnote reference.

- Information (e.g., description of the CSED or CSLA control) and action steps related to NCS limits must be highlighted by the addition of an asterisk (\*) (see Example 6-3, *Nuclear Criticality Safety Information Highlighting with Asterisk*, and Example 6-4, *Nuclear Criticality Safety Step Highlighting with Asterisk*) or a circle CS (ⒸS) (see Example 6-5, *Nuclear Criticality Safety Information Highlighting with Circle CS*, and Example 6-6, *Nuclear Criticality Safety Step Highlighting with Circle CS*) to the first line of the text in the left margin. As an alternate, the asterisk (\*) or a bolded, upper case CS, may precede the action step or information text, separated by a dash.

6.2 Nuclear Criticality Safety (continued)

**Example 6-3**

Nuclear Criticality Safety Information Highlighting with Asterisk

**Format Option #1:**

**2.0 PRECAUTIONS AND LIMITATIONS**

- \* This procedure has the potential to violate the Nuclear Criticality Safety Limits.  
[CSLA #NCS-CSLA-14-986]

**Format Option #2:**

**2.0 PRECAUTIONS AND LIMITATIONS**

- \* – This procedure has the potential to violate the Nuclear Criticality Safety Limits.  
[CSLA #NCS-CSLA-14-986]

**Example 6-4**

Nuclear Criticality Safety Step Highlighting with Asterisk

**Format Option #1:**

- \* [11] Verify that the movement of the material from glovebox GB437 to glovebox GB438 will not violate the CSLA limits.  
[CSLA #NCS-CSLA-14-986]
- \* [12] Move the material from glovebox GB437 to glovebox GB438.  
[CSLA # NCS-CSLA-14-986]

**Format Option #2:**

- [11] \* – Verify that the movement of the material from glovebox GB437 to glovebox GB438 will not violate the CSLA limits.  
[CSLA #NCS-CSLA-14-986]
- [12] \* – Move the material from glovebox GB437 to glovebox GB438.  
[CSLA # NCS-CSLA-14-986]

6.2 Nuclear Criticality Safety (continued)

**Example 6-5**

Nuclear Criticality Safety Information Highlighting with Circle CS

**Format Option #1:**

2.0 PRECAUTIONS AND LIMITATIONS

- Ⓢ This procedure has the potential to violate the Nuclear Criticality Safety Limits.  
[CSLA # NCS-CSLA-14-986]

**Format Option #2:**

2.0 PRECAUTIONS AND LIMITATIONS

CS – This procedure has the potential to violate the Nuclear Criticality Safety Limits.  
[CSLA # NCS-CSLA-14-986]

**Example 6-6**

Nuclear Criticality Safety Step Highlighting with Circle CS

**Format Option #1:**

- Ⓢ [11] Verify that the movement of the material from glovebox GB437 to glovebox GB438 will not violate the CSLA limits.  
[CSLA # NCS-CSLA-14-986]
- Ⓢ [12] Move the material from glovebox GB437 to glovebox GB438.  
[CSLA # NCS-CSLA-14-986]

**Format Option #2:**

- [11] CS – Verify that the movement of the material from glovebox GB437 to glovebox GB438 will not violate the CSLA limits.  
[CSLA # NCS-CSLA-14-986]
- [12] CS – Move the material from glovebox GB437 to glovebox GB438.  
[CSLA # NCS-CSLA-14-986]

- Add a general statement that the procedure has the potential for exceeding NCS limits and a reference to the associated Criticality Safety Limit Approval (CSLA) or Criticality Safety Evaluation Documentation (CSED) document to the Precaution and Limitation section (see Section 4.5.5, *Precautions and Limitations*). Include the CSLA or CSED number in bracketed **bold** text following the information text.
- Add an action step to the Prerequisite Actions section (see Section 4.5.6.a, *Planning and Coordination*) to review the CSLA(s) or CSED(s) prior to executing the procedure. Include the CSLA or CSED number in bracketed, **bold** text following the step text.

## **6.2 Nuclear Criticality Safety (continued)**

- Add the CSLA(s) or CSED(s) to the Performance Documents section (see Section 4.5.6.b, *Performance Documents*) of the procedure with a notation that it may be located at the jobsite.
- Precede any action step that could result in exceeding a CSLA or CSED with another action step that verifies the execution of the following action step will not exceed the CSLA or CSED.
- The CSLA or CSED may be added to the procedure as an appendix (see Section 4.5.14, *Appendices*).
- Add the CSLA(s) or CSED(s) to the Reference section (see Section 4.5.13, *References*) of the procedure.
- Document in the DHF the background for any Nuclear Criticality Safety action step in accordance with Section 16.5.1.k, *Document History File*, in Attachment 16, *Local Procedures*, of P315, *Conduct of Operations Manual*.

## **7.0 RESPONSIBILITIES**

### **7.1 Operations Support Division Leader**

- Responsible for maintaining this document and implementing the CoO requirements into technical procedures.

### **7.2 Responsible Line Manager (RLM)**

- Responsible for the development and technical content of technical procedure.
- Makes the final determination regarding any data collection requirements for technical procedure generated in accordance with this document.
- In coordination with the FOD, identifies the IV requirements, if any, for technical procedure generated in accordance with this document.
- In coordination with the RM-POC, makes the final determination regarding records requirements for technical procedure generated in accordance with this document.
- Makes the final determination regarding records generated by the execution of this document.

### **7.3 Facility Operations Director (FOD)**

- In coordination with the RLM, identifies the IV requirements, if any, for technical procedure generated in accordance with this document.

### **7.4 Procedure Writer**

- Uses this document when writing technical procedures.
- Works closely with the RLM and the SMEs to ensure technical accuracy and to jointly reach decisions on such issues as basis documentation, level of detail, and comment resolution.

## 7.5 Subject Matter Expert (SME)

- Provides technical, system, process, and administrative information for writing the technical procedures generated in accordance with this document.
- In coordination with the RLM, determine data collection requirements for technical procedures generated in accordance with this document.
- In coordination with the RLM, determine records requirements for technical procedures generated in accordance with this document.
- In coordination with the RLM, determine the records generated by the execution of this document.

## 7.6 Records Management Point of Contact (RM-POC)

- Provide support to the RLM in determining records requirements for technical procedures generated in accordance with this document.
- Process records generated by the execution of this document.

## 8.0 IMPLEMENTATION

This document is subject to the USQ/Unreviewed Safety Issue (USI) Process as described in PD110, *Safety Basis*, [SBP112-3](#), *Unreviewed Safety Question (USQ) Process*, and [SBP113-3](#), *Unreviewed Safety Issue Process*. Because this document may impact the presumptions of a facility's safety analysis, the requirements in this document are effective forty-five (45) days after the effective date of this document. This provides additional time to complete the USQ/USI review and changes to any local implementing document. If the USQ/USI review cannot be completed within forty-five (45) days, one of two things may occur: (1) the Associate Director for Nuclear and High Hazard Operations (ADNHOO) will enter a Performance Feedback and Improvement Tracking System (PFITS) item, and track this review until completed; or (2) the FOD or his/her designee must seek and obtain an exception or variance from ADNHOO as described in Section 10.0, *Exception or Variance*, of this document.

The requirements in this document (see Section 1.1, *Purpose*) are expected to be implemented as follows:

- All new technical procedures approved after this document becomes effective in their facility as noted above, are expected to meet the requirements of this document.
- All existing technical procedures are expected to be updated to meet the requirements of this document upon their next major revision.

This document does not implement any new contractual requirements.

## 9.0 TRAINING

Procedure Writers must complete [U-Train course 27366](#), *OS-RTS ConOps*, *Technical Procedure Writer's Manual*. This course is recommended for RLMs and SMEs involved in the development of procedures.

It is recommended that Procedure Writers and RLMs complete [U-Train courses #SS 24668](#), *OS-RTS ConOps Briefing, Attachment 16, Technical Procedures*, and [#SS 24690](#), *OS-RTS: Use Every Time vs. Reference Procedures*.

## 10.0 EXCEPTION OR VARIANCE

Use LANL [Form 2121, Request for Alternate Implementation \(Formality of Operations\)](#), and the process described in Section 7.0, *Exception or Variance*, of P315-2, *Formality of Operations Change Control*, to obtain an exception or variance from this document.

## 11.0 DOCUMENTS AND RECORDS

The AP generates the following documents and records:

**NOTE:** The minimum contents of the DHF is defined in P315, *Conduct of Operations Manual*, Attachment 16, *Local Procedures*, Section 16.5.1.k, *Document History File*.

- The DHF contents generated by this document includes the following:
  - A listing of the bases documents used to develop the procedure in accordance with Section 3.1, *Identifying the Design Basis*.
  - A listing of the source documents used to develop the procedure in accordance with Section 3.2, *Identifying Source Documents*.
  - A listing of the data collection requirements in the procedure and their justification in accordance with Section 3.3, *Capturing Data*.
  - A listing of the records requirements resulting from execution of the procedure and their justification in accordance with Section 3.4, *Identifying Records*.

## 12.0 DEFINITIONS AND ACRONYMS

Refer to Attachment C, *Acronyms, and Abbreviations*.

## 13.0 HISTORY

Date	Revision	Description
MM/DD/YY	o	Initial Issuance

## 14.0 REFERENCES

Document Number	Title
DOE-O-422.1	Conduct of Operations
P315	Conduct of Operations Manual
DOE-STD-1029-92, Chg. 1	Writer's Guide for Technical Procedures
Institute of Nuclear Power Operations (INPO) 09-004	Procedure Use & Adherence, February 2009

## 15.0 FORMS AND TEMPLATES

[Technical Procedure Template](#) (located on the OS-RTS webpage)

## **16.0 ATTACHMENTS**

Attachment A, *Action Verb List*

Attachment B, *Glossary*

Attachment C, *Acronyms and Abbreviations*

## **17.0 CONTACT**

Operations Support – Readiness and Technical Support (OS-RTS)

Telephone: (505) 665-3154

Fax: (505) 667-9829

Location: TA-03-0030

Website: <https://int.lanl.gov/orgs/os/rts/>

E-mail: [osrts\\_conops@lanl.gov](mailto:osrts_conops@lanl.gov)

**Attachment A**  
(Page 1 of 6)  
**Action Verb List**

The following list of verbs is not intended to be comprehensive. Verbs are selected from this list where possible so that words have a meaning common to all potential performers.

Contact OS-RTS at [osrts\\_conops@lanl.gov](mailto:osrts_conops@lanl.gov) to add additional verbs to this list.

VERB	DEFINITION (as used in Action Steps)
Actuate	Place into a specific state of functional performance.
Add	Increase the size or quantity.
Adjust	Make an incremental change or series of changes to arrive at a desired condition.
Align	Arrange equipment into a specific configuration to permit a specific operation.
Allow	Permit the completion of a specific action.
Announce	Make known publicly.
Assemble	Put together what is required to provide an operational or functional capability.
Attach	Fasten one thing to another.
Balance	Adjust several parameters at the same time at certain points in a system to specified values.
Barricade	To shut in or keep out with an obstruction.
Begin	Start an action or activity.
Bleed	Remove fluid from a piece of equipment at a restricted flow rate.
Block	Inhibit a capability of a specific system or piece of equipment.
Bolt	Attach or fasten with bolts.
Bypass	Circumvent a safety circuit (unless a single device provides for bypassing, such as a bypass switch, identify specific actions to bypass).
Calculate	Determine by computation (computational method should also be identified).
Change	Make different in some particular way.
Charge	Load or fill (specific actions to charge should be included).
Check	Perform a comparison with stated requirements. No manipulation of equipment by the checker is involved.
Circle	Draw a circle around.
Clean	Rid of dirt, impurities, or extraneous matter.
Clear	Move people and/or objects away from something.
Close	Manipulate a device to allow the flow of electricity or to prevent the flow of fluids, other materials, or light.

**Attachment A**  
(Page 2 of 6)  
**Action Verb List**

VERB	DEFINITION (as used in Action Steps)
Collect	Cause the assembly of something in a fixed location or container.
Compare	Determine the relationship of the characteristics or values of different items, parameters, or conditions.
Complete	Fulfill or accomplish an instruction totally.
Consult	Ask for advice, to take counsel; to refer to.
Connect	Join, fasten, or fit to permit a desired capability
Continue	Maintain or resume the performance of an activity or condition.
Cool	Lower the temperature of equipment or an environment
Coordinate	Arrange for activity involving other personnel.
Correct	Alter to reestablish a desired activity or condition.
Count	A together.
Cover	Protect or shelter equipment.
Cycle	Cause repetition of an action or activity.
Declare	Make known formally.
Decrease	Produce a smaller value.
Deenergize	Remove the supply of electrical power to equipment.
Depress	Manipulate to effect a specific position of a device.
Depressurize	Release gas or fluid pressure from.
Determine	Find out; to ascertain.
Discharge	Give outlet or vent to a fluid or other contents.
Disconnect	Separate or detach.
Discontinue	Cease to operate, administer, use, produce, or take.
Dispose	Remove from a specific location.
Don	Put on clothing or an article of personal protective equipment (PPE).
Drain	Remove liquid from an enclosure or part of an enclosure, usually to empty.
Draw	Bring, take or pull out, as from a receptacle.
Energize	Provide equipment with electrical power.
Ensure	Confirm that an activity or condition has occurred in conformance with specified requirements (by action if necessary).
Enter	Make report of, set foot in.
Equalize	Make equal or uniform.
Establish	Bring about. Take necessary actions to cause a specified set of conditions to exist.
Estimate	Approximate the size, extent, or nature of a variable.

**Attachment A**  
(Page 3 of 6)  
**Action Verb List**

VERB	DEFINITION (as used in Action Steps)
Evacuate	Vacate.
Evaluate	Assess; to determine the importance, size, or nature of; to appraise; to give a value to based on collected data.
Exit	Leave or withdraw.
Expedite	Accelerate the process or progress of.
Fill	Add fluid to a system or equipment to a prescribed point.
Filter	Pass fluid through a sized medium to stop the passage of unwanted material in the effluent.
Flush	Remove or clean with a washing action of a liquid.
Follow	Comply with an instruction.
Go to	Depart from a position in a procedure and resume at a different location in the procedure or in a different procedure.
Ground	Provide an electrical path to a system at zero potential.
Guide	Manage or direct movement of.
Hold	Maintain a position for equipment, a place in a procedure, or an act of retention.
Identify	Determine or make known the parameter value or condition as related to a procedure.
Implement	Carry out; accomplish.
Increase	Produce a larger value.
Indicate	Make known an activity, parameter value, or condition.
Inflate	Blow full with air or gas.
Inform	Communicate knowledge.
Initiate	Begin a process, usually involving several action steps or actions.
Inject	Introduce a new element; drive a fluid.
Insert	Place or position into; move control rods into the reactor core.
Inspect	Examine; perform a critical visual observation or check for specific conditions; test the condition of.
Install	Fix or fit into equipment or a system.
Instruct	Direct or command.
Interchange	Substitute two items, one for another.
Investigate	Search or inquire into.
Isolate	Shut off or remove from service.
Jumper	Make a connection between two circuit points not normally connected.

**Attachment A**  
(Page 4 of 6)  
**Action Verb List**

VERB	DEFINITION (as used in Action Steps)
Label	Mark or identify.
Latch	Close or fasten.
Lift	Elevate to a higher level or remove, as in removing electrical leads or restrictions.
Limit	Restrict or impose bounds.
Locate	Determine or establish place or position.
Lock	Securely fasten, prevent capability to function.
Log	Enter into a record of operations or progress.
Lower	Cause to move down or decrease position or value.
Lubricate	Apply a lubricant to.
Maintain	Hold or keep in any particular state or condition, especially in a state of efficiency or validity.
Minimize	Reduce to the smallest amount or degree.
Mix	Intermingle ingredients uniformly.
Monitor	Observe an activity, parameter value, or condition (usually on a continuous basis) to meet an instruction requirement.
Notify	Contact, advise, or communicate to make someone aware of an impending or completed activity, parameter value, or condition.
Observe	Watch carefully.
Obtain	Get or attain.
Open	Manipulate a device to prevent the flow of electricity or to allow the flow of fluids, other materials, or light.
Operate	Cause equipment or system to perform designed functions.
Pass	Go by; move by.
Perform	Carry out specified actions or action steps.
Place	Put or set in a desired location or position.
Plot	Represent graphically.
Plug	Connect or become connected, as in electrical plug; to stop or insert something.
Press	Act upon through thrusting force exerted in contact; to push.
Pressurize	Apply pressure within by filling with gas or liquid.
Prevent	Keep from happening.
Proceed	Go on in an orderly, regulated way.
Pull	Exert force upon so as to cause or tend to cause motion toward the force.
Purge	Make free of an unwanted substance, such as an impurity or foreign material.

**Attachment A**  
(Page 5 of 6)  
**Action Verb List**

VERB	DEFINITION (as used in Action Steps)
Push	Press against.
Pump	Move a fluid in a piping system by the use of suction, pressure, or both.
Rack in	Insert a circuit breaker into its operating position.
Rack out	Withdraw a circuit breaker into its non-operating position.
Raise	Cause to move up or increase position or value.
Read	Obtain information visually.
Recirculate	Cause repetitive motion of a fluid in a system.
Reduce	Decrease a variable to meet a procedure requirement.
Refer to	Use specified information that is in another location or procedure.
Release	Set free from restraint or confinement.
Remove	Take off, move away, or eliminate.
Repair	Restore to a sound state.
Repeat	Do again.
Replace	Install an equivalent part or component.
Request	Ask.
Reset	Reestablish a piece of equipment, part, or component to a previous condition, parameter value, instrument set point, or mechanical position.
Resume	Begin again after cessation or interruption.
Return to	Go back to a previous action step in the procedure in effect.
Review	Examine with deliberation for confirmation or compliance to an instruction.
Rotate	Cause to turn on an axis.
Sample	Take a representative portion for the purpose of examination.
Secure	Fasten or make safe.
Select	Take by preference of fitness from a number or group; pick out; choose.
Send	Dispatch.
Separate	Move apart or detach.
Set	Adjust equipment to a specified value
Shake	Agitate.
Shut down	Remove from operational status.
Silence	Stop from making noise.
Sound	Order, signal, or indicate by a sound.
Stabilize	Become stable, firm, steady.

**Attachment A**  
(Page 6 of 6)  
**Action Verb List**

VERB	DEFINITION (as used in Action Steps)
Start	Originate the motion or function of an electrical or mechanical device.
Station	Assign a person to stand and remain at a certain place.
Stop	Halt movement or progress; hold back; halt.
Store	Place in reserve; hold for later use.
Stroke	Operate a valve over its full travel. The travel time may be measured.
Subtract	Perform a subtraction.
Tag	Identify with a prescribed label.
Throttle	Adjust a valve to an intermediate position to obtain a desired parameter value.
Torque	Cause to twist or turn, as about an axis.
Transfer	Cause to pass from one to another.
Transport	Transfer or convey from one place to another.
Trip	Manually activate a semiautomatic feature; cause to fail or stop.
Turn	Adjust with a force on an actuator that positions form a circular movement.
Unlock	Unfasten the lock of.
Unplug	Remove from a socket or receptacle.
Update	Revise to include latest information or data.
Use	Avail oneself of; to employ; to utilize.
Vent	Release a gas or liquid confined under pressure.
Verify	Confirm, substantiate, and ensure that a specific activity has occurred or that a stated condition exists.
Walk	Move along on foot.
Weigh	Measure the heaviness of as by a scale.
Withdraw	Remove.
Work	Perform a task.

**Attachment B**  
(Page 1 of 5)  
**Glossary**

TERM	DEFINITION
Acceptance Criteria	Criteria that provide a basis for determining whether an activity has succeeded or failed. May be qualitative or quantitative.
Action	Specific act performed to accomplish a task.
Action Step	Specific procedure performed to accomplish a task.
Action Sub-step	Detailed action that follows an upper-level action step. Performing all action sub-steps of an action step results in the action step being performed.
Activity	Group of related tasks performed to accomplish a goal.
Appendix	Supplementary material at the end of a procedure. An appendix includes information from external sources, such as a vendor manual, text book, or engineering drawing that provides supplemental information but that is not required for the performance of the procedure.
Approvals	Permission (OK) from the responsible person(s) that an action or activity may take place. Approvals are usually obtained in written form, by signature or initials.
Attachment	Supplementary material at the end of a procedure. Includes information more conveniently located after the main body of a procedure, such as forms, tables, figures, and graphs that is required for the performance of the procedure. This could also include data sheets to capture data during the procedure execution.
Base Procedure	The original procedure from which users may be branched or referenced.
Branching/Branches	Routes the procedure users to other action steps or sections within the procedure or to other procedures, where users do not return to the original location.
Caution	Alerts users to conditions, practices, or procedures that must be observed to avoid potential hazards involving products, equipment, and conditions adversely affecting site operations.
Check	The act of making a check mark (✓).
Checkoff	To check mark a box or line to indicate that the action step has been successfully accomplished.
Concurrent Action Steps	Two or more action steps that are performed at the same time.

**Attachment B**  
(Page 2 of 5)  
**Glossary**

TERM	DEFINITION
Conditional Action Step	An action step that is contingent on certain conditions or combinations of conditions. Instructions are performed if conditions warrant. Logic terms (e.g., IF, AND, and THEN) are used to present a conditional action steps.
Conditions Of Performance	The actual conditions under which the procedural activities are performed, including actual equipment location, lighting, ventilation, protective gear required, and temperature.
Content	Subjects, topics, and technical information in a procedure.
Continuous Action Steps	Action steps that apply for a period of time while the procedure is being executed.
Coversheet	The first page of the procedure, which includes, as a minimum, the procedure title and page header.
Data Point	A discrete item of information. Often quantitative, but may be qualitative, as well.
Data Recording	Writing down data points to obtain a written record of particular conditions at a given time. Data may be recorded for Quality Assurance (QA) purposes or for use in further calculations or verifications.
Decision Tables	A format for presenting algorithms in tables.
Determine	An action step that directs operators to see if a parameter has assumed a specified value or to see if a specific action has been carried out and, if it has not, to take the next action specified (e.g., notify supervisor).
Equally Acceptable Action Steps	Action steps that specify a number of equally acceptable alternative actions.
Facing Page	Either side of a two-page spread of a procedure.
Format	A plan or layout for the organization of pages in a document, including the size, style, typeface, and margins.
Headings	Words or short phrases that introduce a section.
Hold Point	Stopping point that requires users to wait until certain conditions exist or specific approvals or notifications have been made before continuing on in the procedure.
Independent Verification	IV is the act of checking an operation, the status of equipment, a calculation, or the position of a component to ensure that it conforms to established criteria by two qualified persons, separated by time and distance, to provide an extra measure of safety and reliability.

**Attachment B**  
(Page 3 of 5)  
**Glossary**

TERM	DEFINITION
Level of Detail	The level of technical detail presented in a procedure. Action steps that are written at a low level of detail include only general instructions and rely heavily on user training. Action steps that are written at a high level of detail precisely specify all actions.
Limitation	Define boundaries that are not to be exceeded.
Logic Term	One of the six words used in conditional action steps to structure the condition and relate it to the action: IF, WHEN, THEN, AND, OR, and NOT.
Non-sequential Action Steps	Action steps that appear where they are first required but that may need to be performed later in the sequence of actions. Include continuous action steps, time-dependent action steps, and repeated action steps.
Note	Provides important supplemental information to users. This information is explanation and contains no action or command.
Notification	Informs the appropriate personnel that an action or activity is about to occur or has already occurred.
Noun Name	A concise and meaningful verbal description of the function of an SSC (i.e., "XXXX Feed Pump" or "Bldg XXX Main Breaker") that is added to its label (see STD-342-100, <i>Engineering Standards Manual</i> , Chapter 1, <i>General</i> , Section 200, <i>Equipment Numbering and Labeling</i> ).
Page Header	Appears at the top of every page and presents the procedure title, procedure number, revision number, revision date, and page number.
Placekeeping	Used to assist users in knowing what action steps have been accomplished in a procedure. Checkoff boxes are used to indicate that an action has been accomplished.
Precaution	Hazards to personnel or equipment that can be encountered during the performance of the procedure. Can also describe abnormal conditions.
Procedure	Prescribes a process (a sequence of actions) to be performed to achieve a defined outcome.
Referencing/Reference	Referencing instructions direct the users to temporarily abandon their place in the base procedure to perform action steps elsewhere in that procedure or in another procedure. When executing a reference, users always returns to the base procedure action step after performing the referenced action step(s).
Repeated Action Steps	Action steps that are performed repeatedly at various times.

**Attachment B**  
(Page 4 of 5)  
**Glossary**

TERM	DEFINITION
Revision Log	Identifies the revision history of the procedure and its effective date.
Safety Envelope	Defines the conditions for which a facility has been designed, reviewed, evaluated, and determined to be capable of being safely operated. Determined by the facility design bases, design verification and functional test results, safety analyses, operating limits, surveillance requirements, and operating and maintenance procedures.
Sign-off	A set of initials or a signature that indicates that the responsible person has successfully accomplished the action step. May also be required of inspectors or other independent verification.
Source Requirements	Requirements implemented by the procedure that flow down from the design basis and other source documents.
Table	Graphic representation of information where the items are placed in a matrix created by columns and rows.
Table of Contents	A listing of sections, subsections, appendices, and attachments that helps in locating those portions of the procedure.
Task	A well-defined unit of work having an identifiable beginning and end and that is a measurable component of the duties and responsibilities of a specific job.
Task Analysis	The systematic process of examining a task to identify skills, knowledge, and/or abilities required for successful task performance.
Technical Basis	The technical background and information, as well as the documentation of the background and information needed as a basis for all technical content of a procedure.
Technical Procedure	Prescribe production, operation of equipment and facilities, and maintenance activities.
Technical Safety Requirements (TSR)	A requirement that defines the conditions, safe boundaries, and the management or administrative controls necessary to ensure the safe operation of a nuclear facility and to reduce the potential risk to the public and facility workers from uncontrolled releases of radioactive materials or from radiation exposures due to inadvertent criticality. Consists of safety limits, operating limits, surveillance requirements, administrative controls, use and application instructions, and the basis thereof.

**Attachment B**  
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**Glossary**

TERM	DEFINITION
Time-Dependent Action Steps	Action steps that impose time requirements on users by specifying the duration of an action or actions that must be completed within a specific period of time.
Usage Level	A term to describe the procedure usage designation that has been applied to the procedure. The specific Usage Levels are defined in P315, <i>Conduct of Operations Manual</i> , Attachment 16, <i>Local Procedures</i> , Section 16.4.1, <i>Usage Levels</i> .
User	The person(s) actually performing the procedure.
Verb	The part of speech used to indicate an action or state of being.
Verification	Action steps that direct users to see if a parameter has assumed a specified value or to see if a specific action has been carried out, and, if it has not, to take actions to make it so.
Walkdown	That segment of a walkthrough that consists of physically visiting and observing the location in which the activities are to be performed and the equipment that will be used. Performed to ensure that the equipment and environment are actually as envisioned and that the people involved can perform the required tasks.
Walkthrough	The cumulative, detailed check of the process and facility. Activities that may be used to complete walkthroughs include walkdowns, simulations or modeling.
Warning	Alerts users to conditions, practices, or procedures that must be observed to avoid loss of life or severe injury. Alerts users to potential hazards to personnel.

**Attachment C**  
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**Acronyms and Abbreviations**

ADNHHO	Associate Director for Nuclear and High Hazard Operations
AOP	Abnormal Operating Procedure
AP	Administrative Procedure
ARP	Alarm Response Procedure
BEP	Building Emergency Plan
CoO	Conduct of Operations
CSE	Cognizant System Engineer
CSED	Criticality Safety Evaluation Documentation
CSLA	Criticality Safety Limit Approval
DHF	Document History File
DOE	Department of Energy
DSA	Documented Safety Analysis
EOP	Emergency Operating Procedure
ERP	Emergency Response Procedure
FOD	Facility Operations Director
IA	Issuing Authority
IPC	Immediate Procedure Change
IV	Independent Verification
IWD	Integrated Work Document
LANL	Los Alamos National Laboratory
NCS	Nuclear Criticality Safety
OM	Operations Manager
OP	Operating Procedure
OS	Operations Support
OS-RTS	Operations Support – Readiness and Technical Support Group
PJB	Pre-Job Brief
POC	Point of Contact
POD	Plan of the Day
POW	Plan of the Week
PPE	Personal Protective Equipment

**Attachment C**  
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**Acronyms and Abbreviations**

PSE	Plant System Engineer
QA	Quality Assurance
QAP	Quality Assurance Plan
RCT	Radiological Control Technician
RLM	Responsible Line Manager
RM	Responsible Manager
RO	Responsible Organization
RWP	Radiation Work Permit
SAD	Safety Analysis Document
SEQ	Security and Emergency Operations Division
SME	Subject Matter Expert
TSR	Technical Safety Requirements
USI	Unreviewed Safety Issue
USQ	Unreviewed Safety Question