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## ACTIVITY/PROJECT SPECIFIC PROCEDURE

### SP 5-1 ENGINEERING DRAWINGS Revision 2

Effective Date: 01/21/08

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(printed name) (signature) (date)

## 1.0 Purpose and Scope

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This procedure prescribes the Sandia National Laboratories (SNL) Waste Isolation Pilot Plant (WIPP) process for the preparation, review, approval, issuance, and change of WIPP engineering drawings.

This procedure applies to engineering drawings prepared by either SNL or contractor personnel in support of WIPP activities. Requirements for the preparation of drawings are specified in contracts with external contractors or in other controlling documents for WIPP work activities.

Graphical representations used in reports or papers to illustrate a design concept (such as a figure in a SAND report) and which are not intended to be constructed, are not subject to the requirements of this procedure.

Acronyms and definitions for terms used in this procedure may be found in the Glossary located at the Sandia National Laboratories (SNL) WIPP Online Documents web site.

## 2.0 Implementation Actions

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### 2.1 Initiation of Drawings

The individual with primary responsibility for the project or task, such as the Principal Investigator (PI), Project Lead, or Task Lead, determines when an engineering drawing is to be developed to define a design concept or detail, however, this procedure must be followed for engineering drawings related to structures and components that provide a quality related data function for WIPP related activities. These activities include structures and components defined in Test Plans and/or built to be used in support of laboratory or field activities which are data quality effecting.

### 2.2 Preparation of Drawings

2.2.1 General. Engineering drawings should be completed in accordance with the drafting standards specified in the current revision of American Society of Mechanical Engineers (ASME) Y14.2M (Line Conventions and Lettering), and shall contain technical detail as specified by the

individual with primary responsibility for the project or task. Engineering drawings shall be reviewed for adequacy, correctness, and completeness prior to approval and issuance.

Note: If the scope of work dictates, the functions of PI, Design Engineer, and Draftsperson may be performed by the same individual.

2.2.2 Safety. Design shall consider the need to minimize hazards to both the public and operational personnel, e.g., radiation exposure. Engineering drawings may incorporate these safety considerations by the use of text or flagged notes.

2.2.3 Drafting. Upon direction of the individual with primary responsibility for the project or task, the Design Engineer shall perform the design function and provide sufficient direction to the draftsperson for that individual to draft the engineering drawing (the design input may be in the form of a sketch, which results in an engineering drawing if properly drafted, reviewed and approved). Using the design input from the Design Engineer, the draftsperson prepares an engineering drawing which is circulated for review.

2.2.3.1 Drawing Identification. All engineering drawings shall contain a unique identifier (drawing number) and revision number to ensure the engineering drawing is controlled, and configuration control of revisions is maintained. The organization preparing the engineering drawing shall contact Document Control to obtain a unique drawing number, or if desired, obtain concurrence from Document Control that the external organization's assigned drawing number is authorized for use.

Each engineering drawing shall have a Title Block which contains the following:

- Sandia National Laboratories
- Drawing Title
- Drawing Number
- Effective Date
- Reference to the controlling document for the engineering drawing (if appropriate)

2.2.3.2 Signature Block. Each engineering drawing, or a cover page for multiple drawings, shall contain a Signature Block with the current revision number and effective date along with the printed name and dated signature of the following individuals:

- Draftsperson
- Checker
- Safety Reviewer
- QA Reviewer
- Design Engineer

2.2.3.3 Revision Block. Each engineering drawing, other than the cover page for a multiple drawing package, shall contain a Revision Block listing all revision numbers, description of the change, and the effective date of the revision. For multiple drawing packages, the Signature Block on the cover page contains this information.

## 2.3 Initial Review and Approval of Drawings

Engineering drawing reviews shall be conducted and documented using the process described in NP 6-1, Document Review Process. The responsible Design Engineer shall ensure all corrections have been made prior to approving the engineering drawing. The engineering drawing review responsibilities of the Checker, Safety, Quality Assurance, and the Design Engineer are listed below.

**Checker (Technical Reviewer):** Performs an independent technical review of the engineering drawing(s) to ensure that all information shown is correct, complete, and consistent. The Checker must be technically competent and experienced in the type of engineering being checked, and be an individual other than the Design Engineer. The Checker resolves any conflicts with the Design Engineer, and after necessary corrections to the drawing(s) have been made, signs and dates the signature block.

**Safety:** Reviews the engineering drawing(s) to ensure safety requirements and considerations are incorporated. The Safety reviewer resolves any conflicts with the Design Engineer, and after necessary corrections to the drawing(s) have been made, signs and dates the signature block.

**Quality Assurance:** Reviews the engineering drawing(s) to ensure the QA requirements of this and other appropriate procedures have been met. The QA Reviewer resolves any conflicts with the Design Engineer, and after necessary corrections to the drawing(s) have been made, signs and dates the signature block.

**Design Engineer:** Reviews the engineering drawing(s) for technical adequacy, accuracy, completeness, and to ensure compliance with contractual and other established requirements. The Design Engineer shall resolve the comments of all the other reviewers, and coordinate with the draftsman to ensure necessary corrections are made, and a final drawing(s) is/are produced. When the Design Engineer has completed all required actions, the Design Engineer shall approve the engineering drawing(s) by signing and dating the signature block.

## 2.4 Issuance and Control of WIPP Drawings

Engineering drawings shall be issued through Document Control. Document Control ensures configuration control by assigning/approving drawing numbers and drawing revision numbers.

After the Design Engineer has verified that all reviewers have signed and dated the Signature Block on the engineering drawing(s) or cover page to indicate their approval, the Design Engineer shall then approve the engineering drawing(s) by signing and dating the signature block. The Design Engineer shall forward two reproducible copies of the approved engineering drawing(s) to Document Control in accordance with NP 6-2 (Document Control Process). Document Control, with the concurrence of the Design Engineer, shall determine the effective date of the engineering drawing(s), and forward appropriate copies to the WIPP Records Center.

Note: When an approved engineering drawing is included as a figure in a SAND report or other document, the figure is controlled as a part of the report, independent from the original drawing.

## 2.5 Editorial Corrections to WIPP Drawings

Editorial corrections to engineering drawings require the approval of QA and the Design Engineer responsible for the engineering drawing. "Editorial Changes" are defined in the Glossary located at the SNL WIPP Online Documents web site.

## 2.6 Revising WIPP Drawings

2.6.1 General. Revisions to engineering drawings and/or cover pages shall follow the same review process as the original review of the engineering drawing defined in section 2.3 above, and in NP 6-1. The review shall be performed by either the same individuals, or other individuals performing the same function for the subject engineering drawing, i.e. Checker, Design Engineer, Safety, and QA.

If the revised drawing(s) is part of a multiple drawing package that includes a cover page that lists all the drawings of the package, the cover page must also be revised per sections 2.6.2 and 2.6.3 below.

**2.6.2 Revision Block.** When an engineering drawing(s) and/or cover page is revised, the Revision Block shall be updated to uniquely identify the revision. Revision Blocks shall contain as a minimum, the following:

- Revision Number (sequentially numbered starting with "00" for the original drawing)
- Effective Date of the Revision
- Brief Description of the Revision

**2.6.3 Signature Block.** Reviews and approvals of the revised drawing(s) and/or cover page shall be documented on the signature block by the following:

- Draftsperson's printed name and initials
- Checker's printed name and initials
- Safety Reviewer's printed name and initials
- QA Reviewer's printed name and initials
- Design Engineer's printed name and initials

## **2.7 Safety**

No unusual health and safety concerns are expected as part of activities conducted under this procedure. The tasks associated with this activity are expected to be performed under a normal office environment.

## **3.0 Records**

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The following QA records, generated through implementation of this procedure, shall be prepared and submitted to the WIPP Records Center in accordance with NP 17-1 (Records):

### QA Record

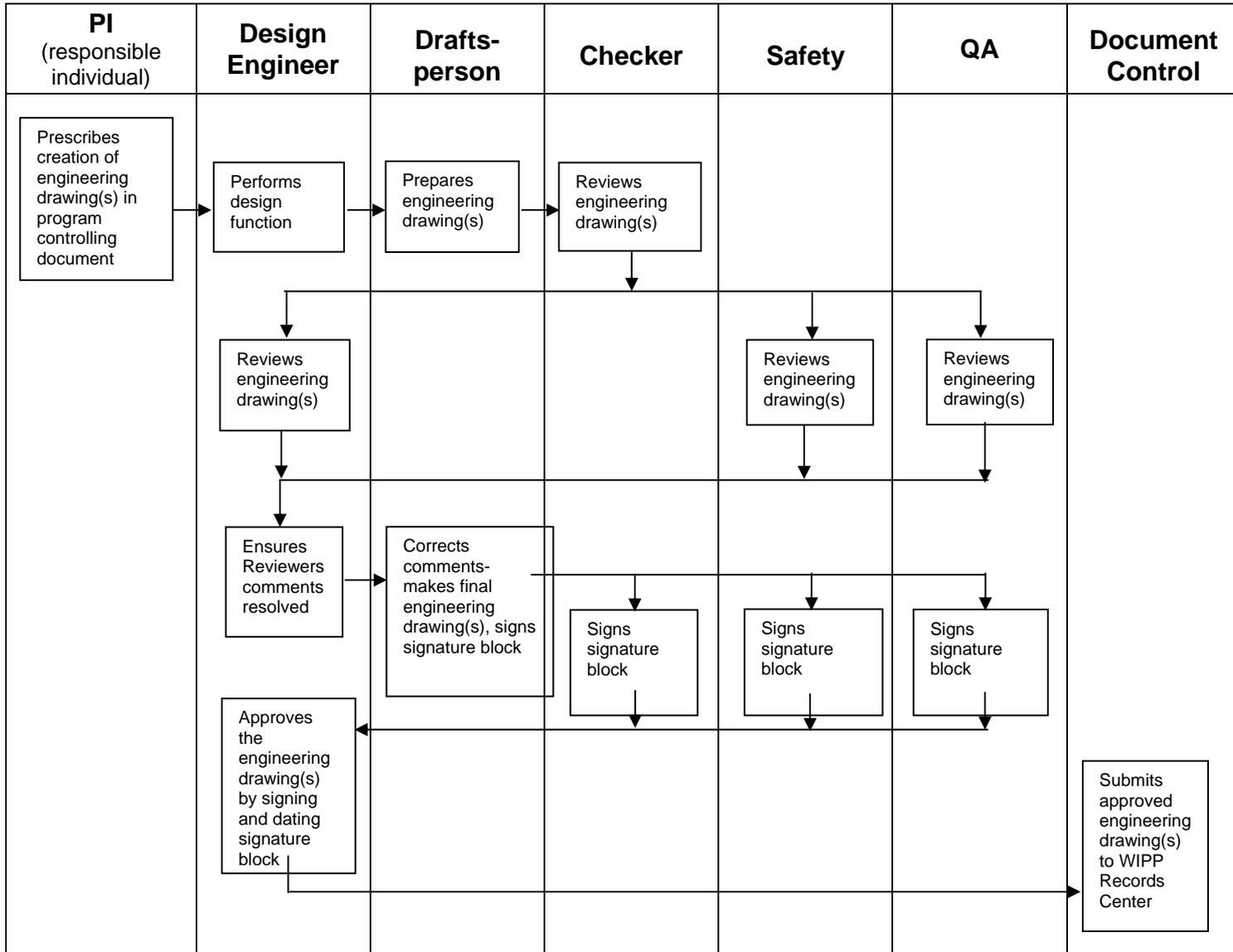
- Approved engineering drawing(s)
- DRC forms (if generated)

## **4.0 Appendices**

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Appendix A: SP 5-1 Process Flow Chart

### Appendix A SP 5-1 Engineering Drawing Process Flow Chart



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