



Procedure

Procedure Number: SNS-ASD-P01

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Title: Drawing Preparation/Control Process

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Purpose

This procedure defines the process and rules for preparing, reviewing, numbering, approving, and issuing drawings by Spallation Neutron Source (SNS) Accelerator Systems Division (ASD) engineers and scientists. This procedure implements parts of SNS-QA-P01, (“Design”).

Scope

This procedure describes the process for the preparation of drawings for ASD work in Work Breakdown Structure (WBS) 1.3, 1.4, 1.5, 1.9 and 1.10. Partner Labs follow their own procedures that comply with SNS project-level procedures and plans.

Responsibilities

- **ASD Division Director (or Designee):** 1) Approves Level 1 drawings by signature; 2) provides guidance to assure consistency, and conformance with requirements; 3) approves exceptions to this procedure, 4) designates the level of drawings.
- **ASD Group Leader:** 1) Approves drawing by signature, final approver of Level 2 drawings; 2) resolves interface problems; 3) responsible for preparation of drawings or models for the particular WBS element; 4) determines ES&H and QA/QC actions appropriate for grade of system, structure, component, process, or reliability consistent with PSAD, with assistance from ES&H Rep. and QA Rep. (QAR); 4) directs the preparation of drawings; 5) determines need for Discipline Check and consults with relevant safety committee.
- **Lead Engineer:** 1) Approves drawing by signature, final approver of Level 3 drawings; 2) responsible for preparation of drawings or models for a particular WBS level; 3) determines QA/QC actions appropriate for grade of system, structure, component, process, or reliability consistent with PSAD, with assistance from QA Rep. (QAR); 4) directs the preparation of drawings; 5) determines need for Discipline Check and consults with relevant safety committee. 6) designates drawing checker.
- **Engineering Designer (ED):** 1) Obtains drawing number; 2) prepares drawings with input from others; 3) signs drawing; 4) ensures proper input to DCC including verifying all signatures are in place.
- **Reviewers/Approvers/Verifiers:** 1) Approves drawings by signature when required; 2) reviews the drawing with respect to relevant codes, standards and orders.
- **Checker:** Checks drawings prepared by others.

Definitions

- **Discipline Check:** A discipline check is required on drawings that have the potential for safety concerns (e.g. radiation, cryogenic, or industrial), interdisciplinary interference problems, incompatibility of design, etc. (e.g. electrical conduit being run through an area where air conditioning ducts are to be located, or the omission of equipment foundations or electrical power for pumps and fans).
 1. Drawing format includes discipline check signature block; Lead Engineer indicates “N/A” on title block if the discipline check does not apply.
 2. The Lead Engineer assures that all interfacing design groups participate in checks
 3. Originating engineer resolves comments and has discipline check block signed
 4. Lead Engineer assures that discipline checks are completed properly when required



5. Group Leader/Division Office checks to ensure that discipline check has been appropriately executed.

Drawing Approval Guidelines

All ASD drawings will be classified as Level 1, 2 or 3, according to the SNS QA Plan. Level 1 drawings have the highest level of safety, cost, or schedule impact, and are approved by the ASD division office.

ASD will identify baseline (Level 1 and 2) drawings to be prepared.

The drawing approval sequence is as follows:

- Level 1 Drawing: Designer, Checker, Discipline Check, Lead Engineer, Group Leader, Division Office.
- Level 2 Drawing: Designer, Checker, Discipline Check, Lead Engineer, Group Leader
- Level 3 Drawing: Designer, Checker, Discipline Check, Lead Engineer

The discipline check for a Level 1 drawing typically includes relevant safety committees (radiation, cryogenic, electrical).

References

1. SNS Quality Assurance Plan, (SNS-QA-P01)
2. Preliminary Safety Assessment Document (PSAD), (#102030103-ES0003-R00)
3. Drawing Requirements Manual, Global Engineering Documents, Ninth Edition
4. Engineering Drawing and Document Number Formats, (#102020200-PR0001-R12)
5. SNS Document Control Procedure, (SNS-IO-P01)

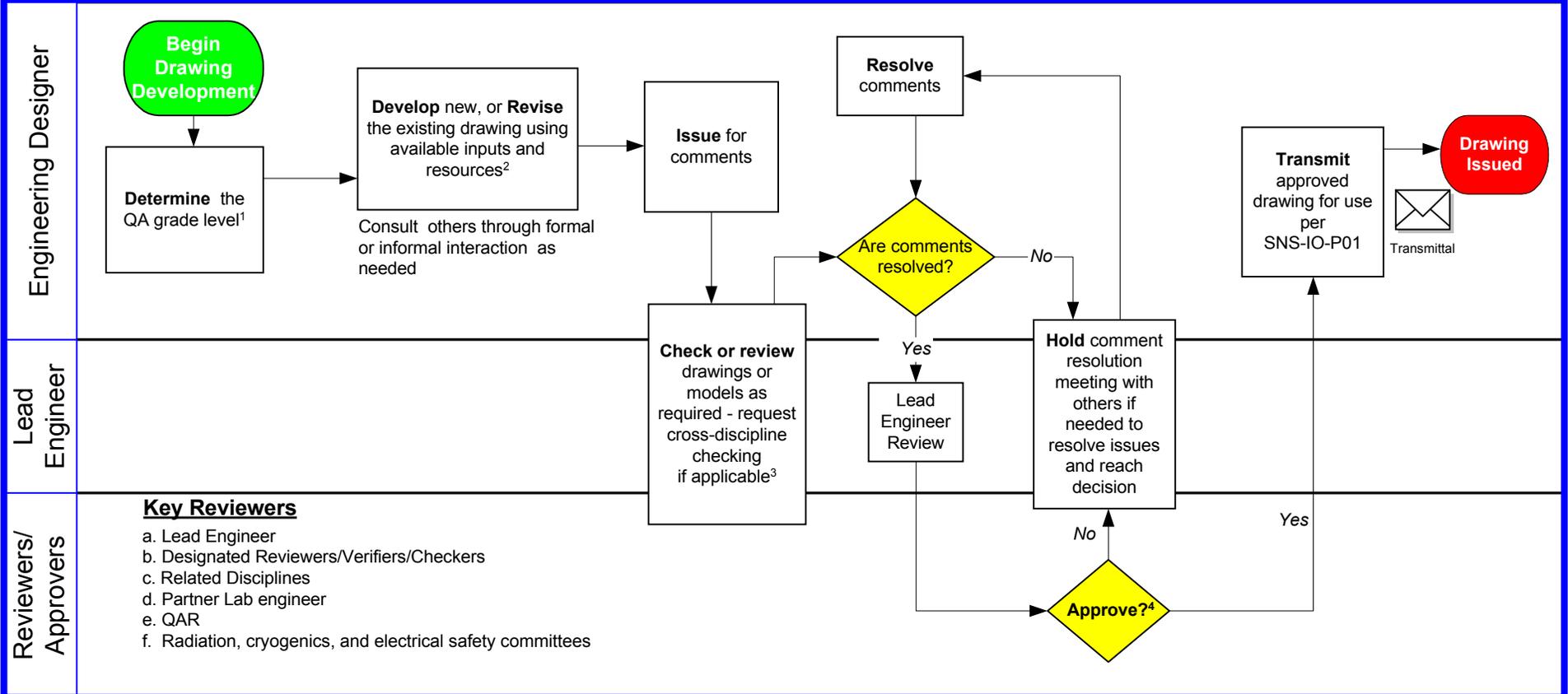
Appendix

- A. Drawing Preparation/Control Process
- B. Drawing Preparation Guidelines

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Appendix A Drawing Preparation/Control Process



¹Grading

- ASD Division designates level 1 and 2 drawings
- Grading determines level of review/verification required

- ²Use standards** for design, drawing formats and title blocks where applicable
Use EDIS-assigned drawing number

Key Drawing Elements

- a. Unique Numbers (DWG, EJM, etc.)
- b. Safety, Safeguards, Security Implications
- c. Standards (ASME, ASTM, IEEE, etc.)
- d. Discipline Check - Internal ASD Review
- e. Verification/Review
- f. Archiving Drawing Record

³Checker: Checks drawings prepared by others

- ⁴Approval signatures required:**
- Level 1 drawings: ASD Division Director (or Designee)
 - Level 2 drawings: ASD Group Leader
 - Level 3 drawings: Lead Engineer

Maintain drawing and comments in Project Files. Retention is determined by the SNS RIDS



Appendix B. Drawing Preparation Guidelines

- Mechanical equipment drawings should use the SNS Engineering Guides ES-3.1-1, -2, -3, -4, and -5 as guidelines. These Engineering standards were derived from the Drawing Requirements Manual that can also be used for guidance.
- ES-3.1-1 allows some latitude for using the standards based on limitations and advanced capabilities of the Computer Aided Design (CAD) software and users may elect to modify these standards accordingly. Users are encouraged to use the CAD system capabilities as intended (e.g. do not eliminate the ProEngineer repeat region capability in the parts list simply to obtain a personal preference appearance or to comply with an arbitrary standard).
- Multi-detail sheets are strongly discouraged in order to maintain a viable revision history in the database at the part level. Notable exceptions are tabularized parts (family tables of parts) and inseparable assemblies (e.g. weldments) where all the parts can be fully described on the field of the drawing and in the parts list.
- All detailed parts shall be assigned unique part numbers based on the drawing numbers obtained from SNS EDIS database. In all cases it is very desirable to have the detail drawing number to be exactly the same as the part name.
- Stock parts from a vendor catalog can be assigned a part number based on the catalog number with the vendor CAGE code identifier (alternatively use notation in the parts list for the vendor information). If this causes a conflict when entering the drawing (and associated models) in the database (because that exact number is already being used for another piece of vendor equipment) the part number will be amended to add an arbitrary suffix. The suffix will take the form of an underscore (_) followed by a lower case letter (e.g. SS-6-UT-6-4 for a Swagelock fitting might be amended to SS-6-UT-6-4_a if that same number was already being used to describe a Bimba air cylinder).
- Commodity items (e.g. fasteners) can be assigned part numbers based on the assembly drawing and adding a “dash number” (e.g. 106050201M8E8700A001-5 where the “-5” is a screw that is fully described in the parts list on the, A001 assembly drawing). The commodity item may exist in the database with this same number but it is not fully detailed on a drawing.
- Alternatively, commodity items may be assigned numbers from the standard library of parts. The user should be aware that material properties (e.g. density) for the part might not be correct in the library parts database.
- The drawing format usually contains a block for the change control system and the user should use SNS-TS-G001 as relevant guidance and assign a system number after collaborating with the Lead Engineer and the QA representative.
- In some cases, as in the procurement of design and fabrication services, 3 dimensional (3-D) models may be used and will be supplemented with 2-D equipment drawings containing tolerances and key dimensions.
- Transmittal for issuance of drawing submittal (new or revised) must have an itemized list of drawings included and contain signature of issuing Division Office, Group Leader, or Lead Engineer.
- Signed transmittal and drawing package is provided to DCC for processing.
- Revised drawings must have same approvals as original issue.
- Deviation Request (DR) indicating approved changes to technical documents must have same approvals as originals. DR should also cross-reference documents being changed.