

NCSX		<u>NATIONAL COMPACT STELLARATOR EXPERIMENT</u>	
		PROCEDURE: NCSX-PROC-007 Revision 0	Page 1 of 8
Title NCSX Electronic Model and Drawing/INTRALINK Processes	Initiated by: NCSX Systems Engineering Support Manager	Effective Date: Revision 0 May 4, 2005	
Concurrence by: NCSX Quality Assurance Manager	Concurrence by: NCSX Design Integration Manager	Concurrence by: PPPL Mechanical Design Branch Head	
Concurrence by: PPPL Head, Engineering & Technical Infrastructure	Approved by: NCSX Engineering Manager	Supersedes: New	

Record of Revisions

Revision	Date	Description of Changes
0	5/4/2005	Initial Issue

Applicability

This procedure is applicable to the entire NCSX Project.

Introduction

The NCSX ProE/INTRALINK Users Guide provides the processes by which a electronic 3D Computer Aided Design and Drafting(CADD) model, assembly, part, or drawing is promoted from a “conceptual design” status through a “release for fabrication” status. Once a drawing is “released for fabrication”, it is placed under configuration control and revisions are controlled by ECPs per PROC-002. INTRALINK provides both a storage capability that is utilized for both Pro/Engineer (Pro/E) models and drawings (mechanical) and AUTOCAD (electrical). However, the review and approval process is different in that Pro/E models and drawings are reviewed and approved within INTRALINK and only the final signature of the pdf drawing representation is done. In AUTOCAD, the INTRALINK review and approval process is not available so electronic signatures of reviewers and approvers is done on the pdf representation.

While this procedure will focus on Pro/Engineer (Pro/E) mechanical drawings as a reference, the differences for AUTOCAD drawings will be noted. Rather than repeat the process for each step in the promotion process, this procedure will focus on the final step where a draw or set of drawing have advanced to the stage where they are now ready to be released for fabrication and/or installation. It will then address the process by which these are revised.

Electronic models are the basic building block of the ProE CAD system. From these 3D mechanical models all the associated parts and assemblies with the exception of standard or “library” parts such as fasteners, washers, etc and 2D mechanical drawings are derived. This will also include data curves if they

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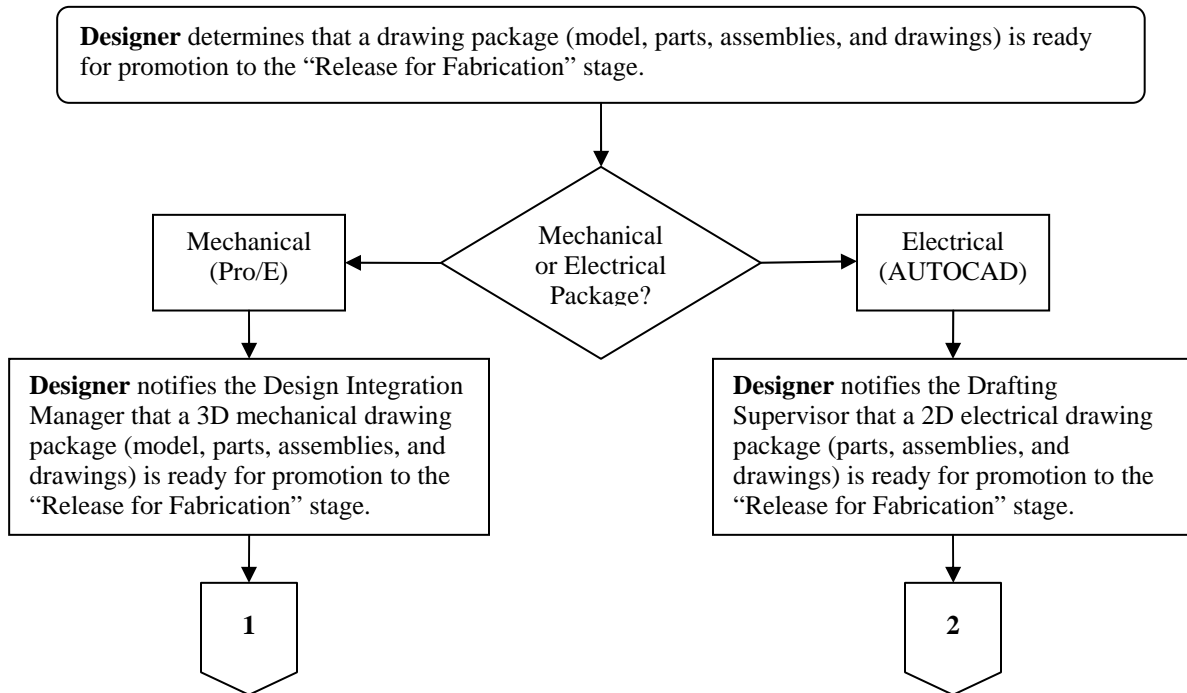
are needed or skeleton parts (used for making port cuts). However, STEP or IGES files are not stored in the promotion process since they are directly obtained from the approved data files that are in the promotion process. Only final 2D drawings are “physically” signed in a pdf format using the procedure described in the NCSX Electronic Signature Procedure PROC-005. All others will be electronically reviewed and approved using the inherent ProE/INTRALINK database processes and procedures in PROC-007. The ProE/INTRALINK database also provides configuration control processes for 3D models, parts, assemblies, and 2D drawings.

Referenced Documents

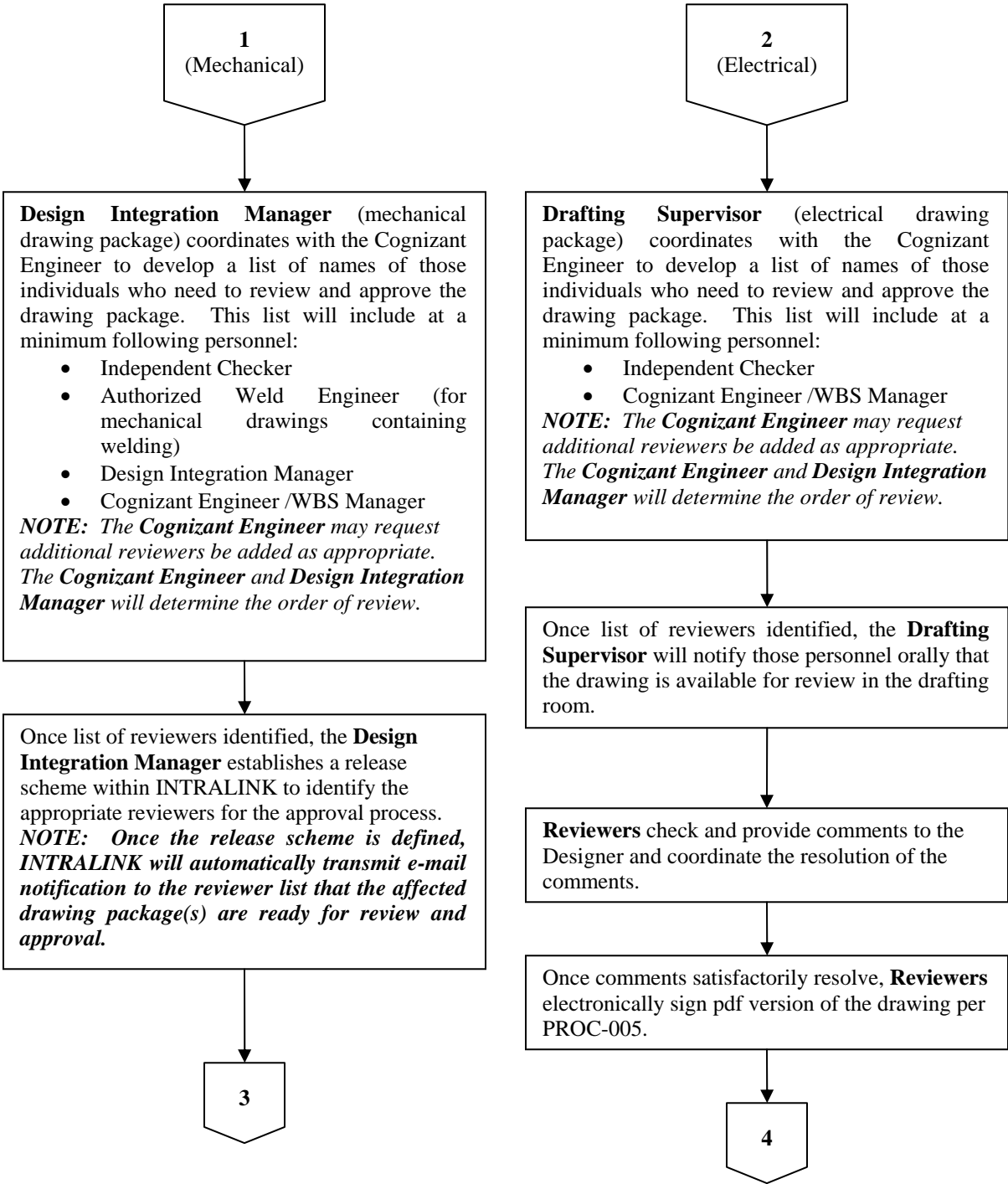
Document Number	Document Title
NCSX-PLAN-CMP	Configuration Management Plan
NCSX-GUID-PRO/INTR	Pro/INTRALINK Users Guide
NCSX-PROC-002	Configuration Control
NCSX-PROC-005	Electronic Signatures
NCSX-PROC-009	Requests for Deviations
PPPL Engineering Procedure 010	Control of Drawings, Software, and Firmware
PPPL-DRFT-001	PPPL Engineering Drafting Standard

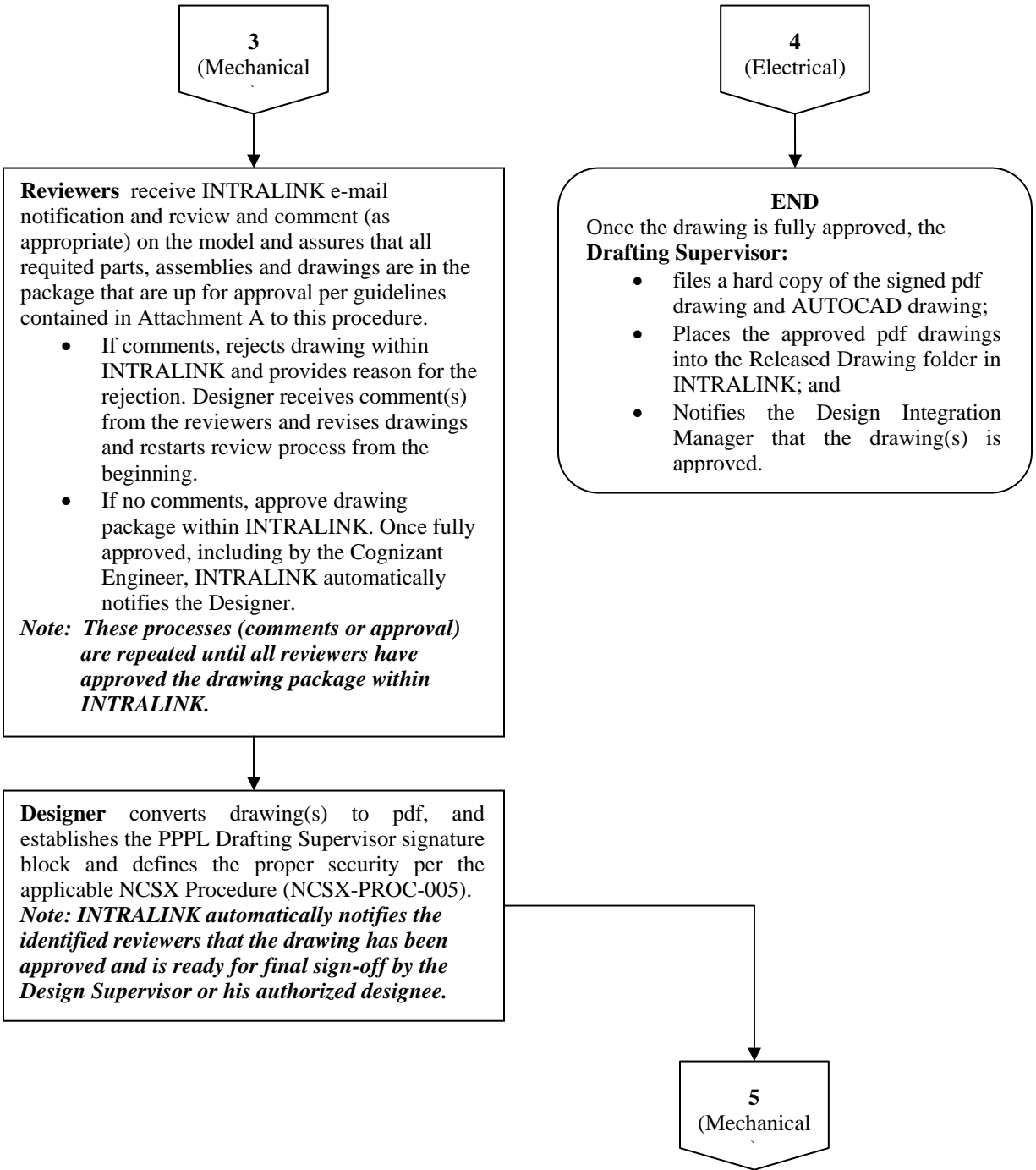
Procedure

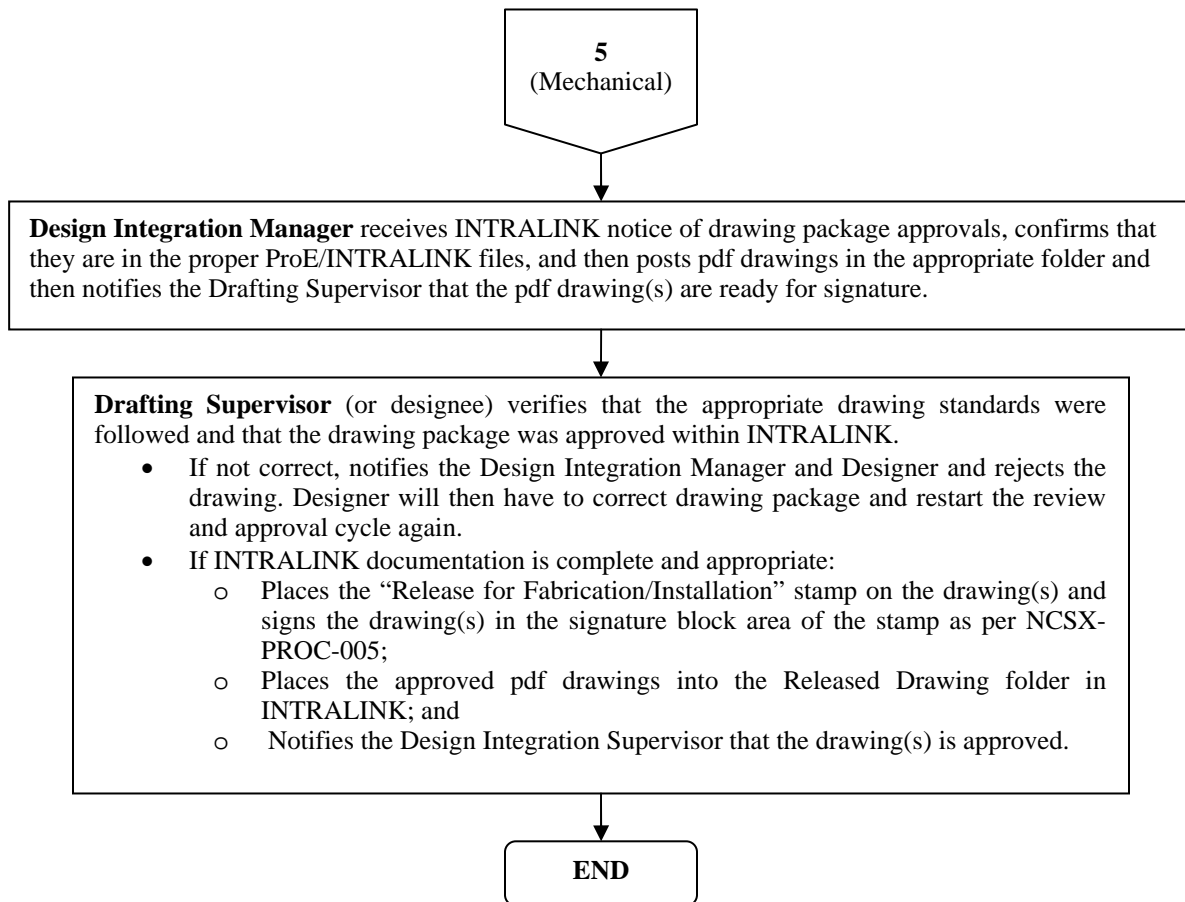
A. Final Review and Approvals of Models, Assemblies, Part, and Drawings Ready for Fabrication



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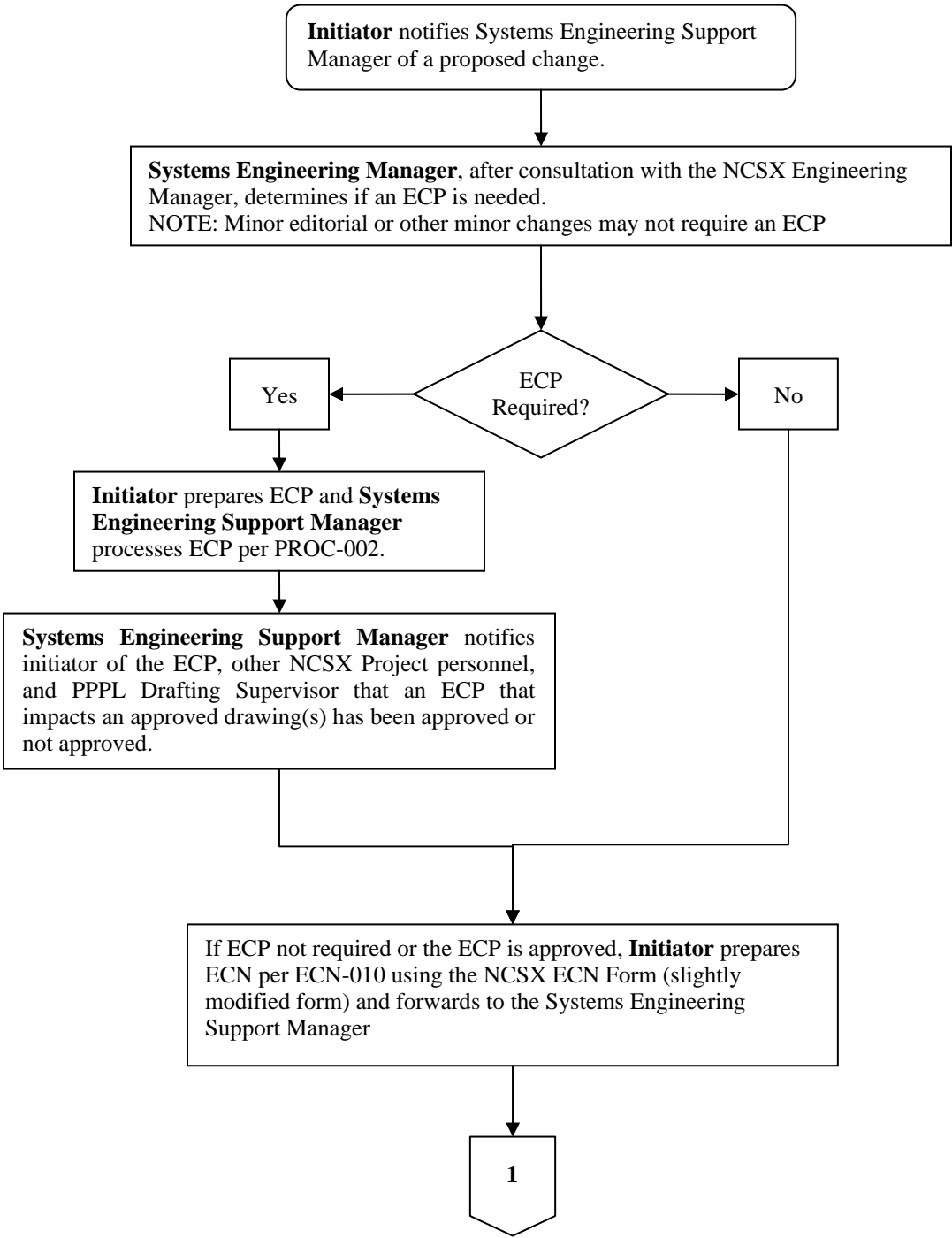


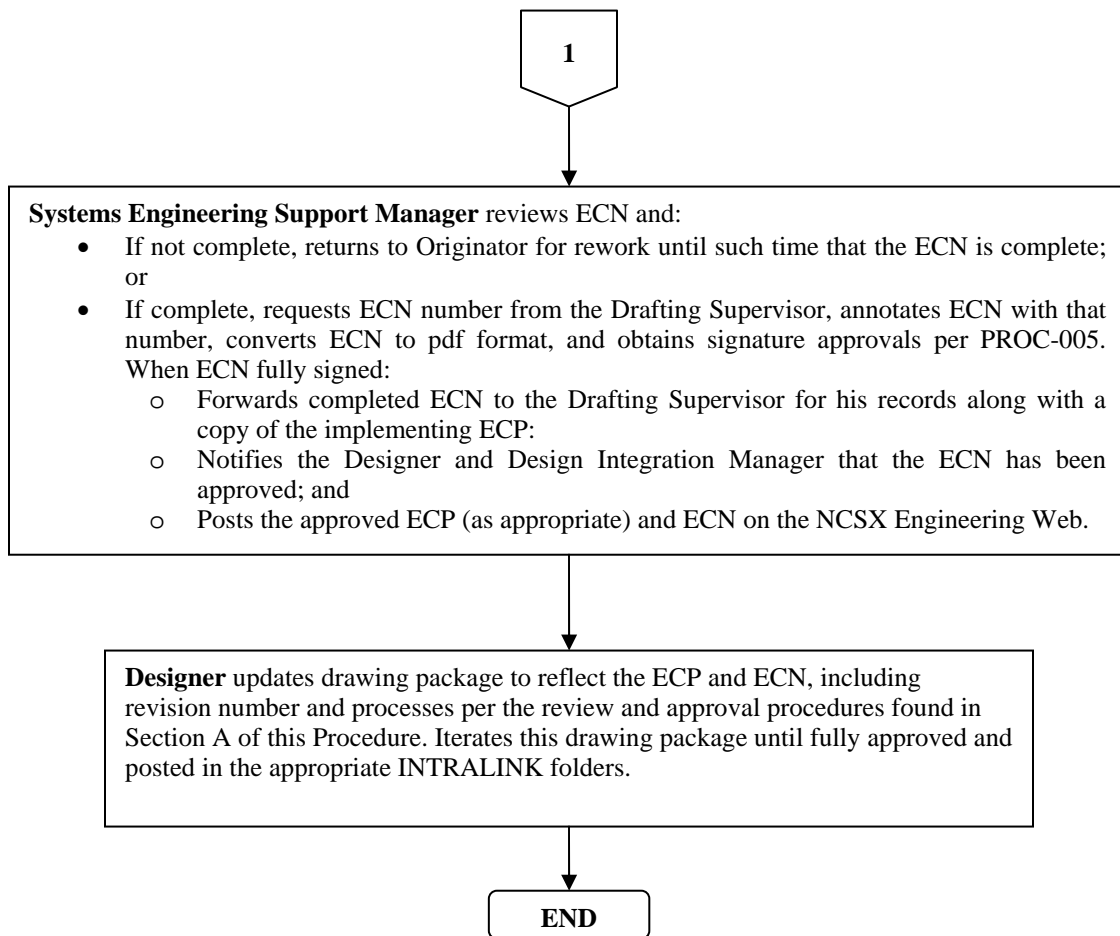
B. Revision of “Release for Fabrication” Drawings

Once a drawing is promoted and approved in a “Release for Fabrication” status, the drawing comes under configuration control. In accordance with the NCSX Configuration Control process outlined in the NCSX Configuration Management Plan (NCSX-PLAN-CMP) and its accompanying NCSX Procedure (NCSX-PROC-002), once any document is under configuration control, an Engineering Change Proposal (ECP) is required to initiate and authorize a change, unless the NCSX Systems Engineering Manager, after consultation with the NCSX Engineering Manager, specifically authorizes a change without an ECP (generally only limited to editorial and minor changes). Per the applicable PPPL Engineering Procedure (ENG-010), an Engineering Change Notice (ECN) is also required to document and authorize changes to drawings already in a “Release for Fabrication” status and/or add new drawings needed to fully implement and document the authorized change. The procedure that follows provides the step-by-step process.

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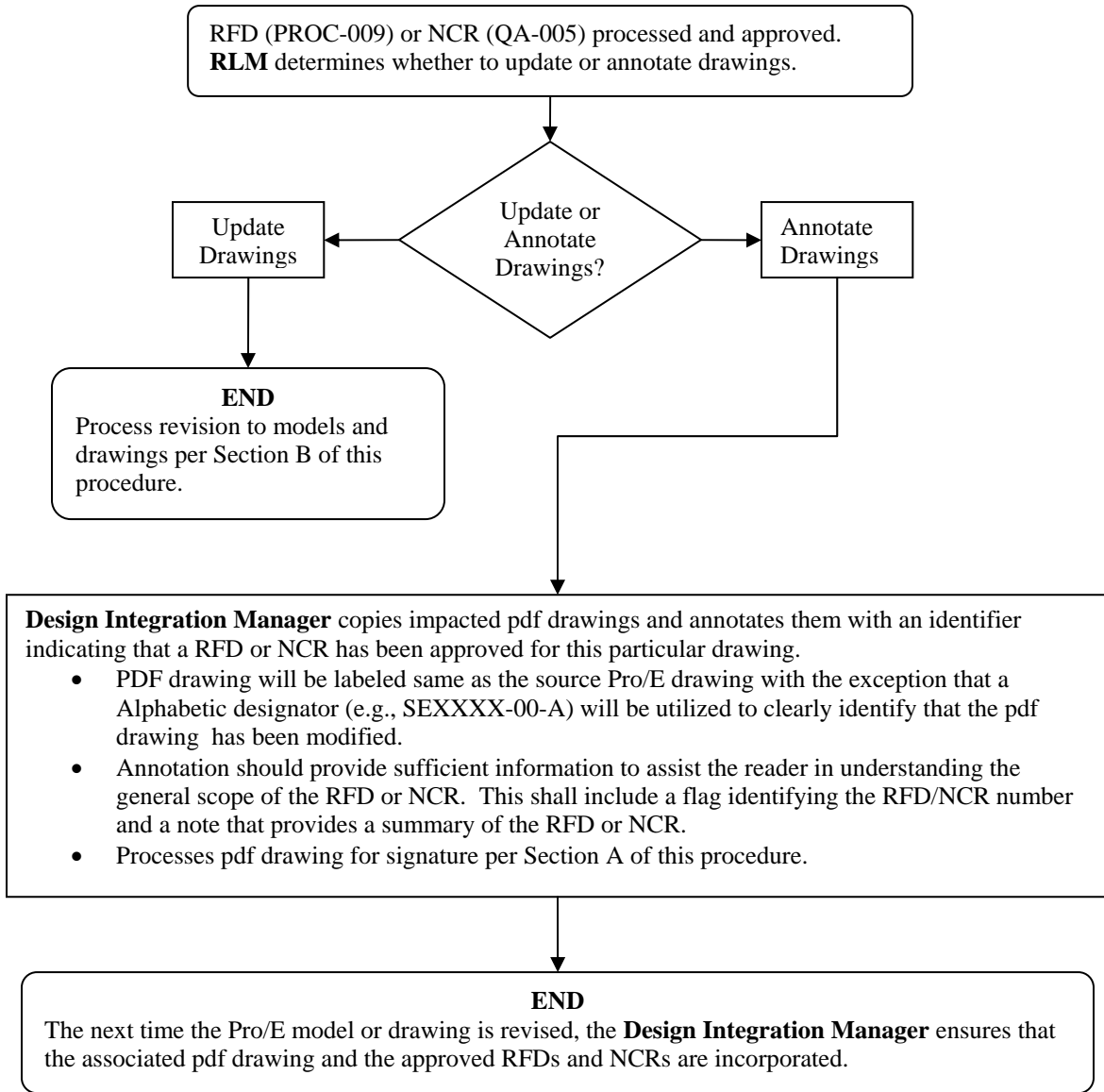




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C. Annotation of Drawings with RFD or NCR Identification



Attachments

- 1 – Guidelines for Reviewing/Checking Electronic Models and Drawings**
- 2 – NCSX ECN Forms**

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Attachment 1
Guidelines for Reviewing/Checking Electronic Models and Drawings

The new PPPL Engineering Drafting/CAD Guidelines and Standards (ES-DRFT-001) contains guidelines and standards for electronic models and drawings. Section 6 of that new PPPL Engineering Standard contains general guidelines for reviewing/checking models and drawings. The NCSX Project has developed the following NCSX-specific guidelines to assist reviewers/checkers in performing these tasks:

General Responsibilities of a Checker

An individual shall be assigned as checker to review the models and drawing relating to quality, accuracy, manufacturability and conformance to standards. These guidelines and responsibilities apply to either mechanical ProE models and drawings as well as for electrical AUTOCAD drawings. The checker must be familiar with the function and criteria of the model and drawings to be checked, but should not have been an active participant in preparing this material. Responsibilities include:

- Ensuring the accuracy and completeness of the drawings submitted to him/her, taking into account the design requirements, and assuring compliance with PPPL Drafting/ CAD Process and Standards plus other applicable standards.
- Examining detail, layout, assembly and installation model and drawings for practicality of design; accuracy and conformity to the design criteria and/or existing specification & standards.
- Applying knowledge of mechanical and/or electrical design methods; of manufacture/assembly; and drafting techniques/procedures in performing this review and check.
- Identifying inconsistencies or needed changes (if any) in the models and drawings. The checker shall discuss required changes with Cognizant Individual and/or Designer and shall coordinate and check corrections.

Additional Responsibilities for Checking Mechanical ProE Models and Drawings

In addition to the general reviewing and checking responsibilities identified previously, the following specific additional checks need to be made by a reviewer/checker of electronic Pro/Engineer Models and Drawings:

- All Intralink released objects must have a description. The description should all be in caps.

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Attachment 1**Guidelines for Reviewing/Checking Electronic Models and Drawings**

- All objects should have a number – no names. The number should be of the form: se123-115, where “s” represents the NCSX Project, “e” represents the drawing size, 123 represents the WBS number (either 3 or 4 place WBS), and 115 is a sequential part/drawing number within this WBS. A vendor part number or legitimate library part number may also be used. It should be noted that concepts numbers such as smc123-115 (mc represents your initials) must be converted to se123-115 before the model is moved to the fabrication release level.
- Models should be moved out of our sketch areas and moved to the correct WBS INTRALINK folder if the model represents the final released part.
- All parts should have a density specified.
- All parts and assemblies should have the analysis, model analysis, model mass properties calculated based on the master rep.
- Make sure the “Insert Here” is located after the last feature or component in the model.
- Layers / Features should be placed on one layer only. Layers should be blanked and the status saved.
- Models should be check to assure that there are no warnings; frozen features, circular references, etc.
- Assembly models – Parts/components/subassemblies should not be placed on layers. Simplified reps should be used to control the display.
- Geometric datum(s) should be placed on a layer called 9_GEO.

Note: Any components that are suppressed should be removed from the model. If the component or feature needs to be suppressed the Project should understand why and try to work in the direction of removing the suppressed features/models.

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PPPL ENGINEERING CHANGE NOTICE (ECN) ECN #

REASON FOR CHANGE:

ENGINEERING CHANGE PROPOSAL:	DATE:
COGNIZANT INDIVIDUAL MAKING THE CHANGE:	
RESPONSIBLE LINE MANAGER:	

ECN #

