PROCEDURE COVER SHEET

SUSQUEHANNA NUCLEAR, LLC PROCEDURE	
ENGINEERING CHANGE PROCESS ADHERENCE LEVEL: INFORMATION USE	NDAP-QA-1220 Revision 14 Page 1 of 110 Unit 0

QUALITY CLASSIFICATION:	APPROVAL CLASSIFICATION:
[X] QA Program [ ] Non-QA Program	[X] Plant [ ] Non-Plant [ ] Instruction

EFFECTIVE DATE: _____

PERIODIC REVIEW FREQUENCY: NONE

NEXT PERIODIC REVIEW DUE DATE: NONE

RECOMMENDED REVIEWS:
Design Engineering, Station Engineering, Operations, DCS, Security

Procedure Owner: Senior Engineer - Design Engineering

Responsible Supervisor: Branch Manager - Design Engineering

Responsible FUM: Manager-Design Engineering

Responsible Approver: Manager-Design Engineering

PROCEDURE REVISION SUMMARY

1. Changed RIE to RIE-CC and RIE-DEC (to support CMISDP uploads) (Steps 1.2.5a, 3.1.2, 5.2.5a, 5.3.1a(1), & 5.3.4)

2. Deleted quality class C as an augmented quality (Step 3.1.2).

3. Deleted requirement to enter accounting in NIMS (Section 5.2.5).

4. Addressed the Safeguards/Confidential box in NIMS (Step 5.2.5j).

5. Allowed simple security changes to be processed as a short path commercial change (Step 5.3.1b).

6. Clarified IMG-ENG-001 required for spec and drawing design inputs (Steps 5.3.6 b & c)

7. Allowed sketches to be in an IP instead of the EC package (Steps 5.4.6a & 5.4.7b(1)).

8. Added step to consider a learning WO for digital items to support EC preparation (Step 5.5.1b(3))

9. Revised Transition to eliminate use of MFP-QA-1220 with rare exception (Section 5.11).

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1.0 PURPOSE AND SCOPE

1.1 Purpose

1.1.1 This procedure identifies the activities and requirements for Engineering Changes (ECs) at Susquehanna SES.

1.1.2 This procedure endorses and implements the industry Standard Design Process (SDP) in IP-ENG-001 in its entirety as written.

1.1.3 This procedure describes the workflow that supports this process.

1.2 Scope

1.2.1 The engineering change process addresses the requirements of Configuration Management Program (NDAP-QA-1201) to have a controlled methodology to make permanent and temporary alterations to the plant design and physical configuration.

a. This methodology also ensures that the affected facility configuration information is updated at the appropriate time in the change process to accurately reflect the change.

1.2.2 An engineering change is required for all changes to an SSC (Structure, System, or Component) that is in the Configuration Management Program **PER** NDAP-QA-1201 Attachment B.

a. An update to software/firmware that addresses a deficiency or error in the intended design is **NOT** considered a change.

b. An update to software/firmware that changes the intended function or output is considered a change.

1.2.3 This procedure refers to IP-ENG-001 for the requirements and instructions for the following engineering change subtypes:

a. Design Change (DCP)

b. Design Equivalent Change (DEC)

c. Commercial Change (CC)

d. Temporary Design Change (TDC)

e. Temporary Design Equivalent Change (TDEC)

f. Temporary Commercial Change (TCC)

1.2.4 Changes to SSCs that are considered Outside Controlled Plant Equipment (OCPE) will always use the Commercial Change process in IP-ENG-001.

a. OCPE changes are not required to comply with the requirements of the SSES Operational Quality Assurance (OQA) program because OCPE changes cannot impact an SSC within the SSES OQA program.

1.2.5 Although not part of the SDP, this procedure includes requirements and instructions for the following change types:

a. Replacement Items (RIE {RIE-CC/DEC} will be used to support NIMS workflow only)

b. Exempt from Configuration Management

c. Pre-engineered specifications and drawings

1.2.6 This procedure uses the requirements and instructions in IP-ENG-001 for Document Only changes that are not otherwise covered under Section 1.2.5 of this procedure.

1.2.7 This procedure does **NOT** apply when the station is beyond an Alert condition in the Emergency Plan.

a. In the emergency conditions, the station can take whatever actions are necessary as directed by the Emergency Response Organization.

1.2.8 Excluded from this procedure are changes to the Reactor Core Design, which are evaluated and processed by Nuclear Fuels.

1.2.9 Sections and sub-sections within this procedure and IP-ENG-001 may be performed in any order or in parallel unless specified otherwise within the procedure.

1.2.10 Only the section(s) and/or subsection(s) needed for the task(s) are required to be performed.

2.0 REFERENCES AND COMMITMENTS

2.1 Performance References

2.1.1 EPRI 1008254, Guidelines for Optimizing the Engineering Change Order Process for Nuclear Power Plants, Revision 2

2.1.2 ER-30, Integrated Equipment Reliability Long Term Planning Program Description

2.1.3 G1006, Design and Installation of Instrument Tubing and Tubing Supports

2.1.4 GDS-09, EQ Program Scope Determination

2.1.5 GDS-15, Structure and Content Development of Environmental Qualification Binders

2.1.6 IP-ENG-001, Standard Design Process

2.1.7 JDS-02, Setpoint Calculation Methodology

NOTE

MEG-DTG-004 can be found on the Station Engineering webpage.

2.1.8 MEG-DTG-004, Modification Pipeline Process

2.1.9 MFI-2241, Administration and Control of 120VAC, 125VDC, and 250VDC Voltage Drop Calculations Using VOLTCALC

2.1.10 MFI-4001, Drawing Revision

2.1.11 MFP-QA-1220, Engineering Change Process Handbook

2.1.12 MFP-QA-2241, Electrical Discipline Calculations

2.1.13 MFP-QA-4002, Drawing Control and Classification

2.1.14 MFP-QA-4004, NIMS Component Management Database

2.1.15 MT-GE-010, Control Instrumentation Cable Lower Range Power Circuit Wire Terminations and Cable Jacket Repair

2.1.16 NDAP-00-1600, Technical Task Risk Assessment, Pre-Job Brief, Independent Third Party Review, and Post-Job Brief

2.1.17 NDAP-00-1912, Scheduling and Coordination of Work

2.1.18 NDAP-QA-0023, Susquehanna Nuclear, LLC Records Management Program

2.1.19 NDAP-00-0026, Conduct of Major Projects

2.1.20 NDAP-QA-0101, Document Review

2.1.21 NDAP-QA-0302, System Status and Equipment Control

2.1.22 NDAP-QA-0322, Energy Control Process

2.1.23 NDAP-QA-0324, Plant Labeling Program

2.1.24 NDAP-QA-0502, Work Order Process

2.1.25 NDAP-QA-0507, Conduct of Refuel Floor

2.1.26 NDAP-QA-0726, 10 CFR 50.59 and 10 CFR 72.48 Implementation

2.1.27 NDAP-QA-0730, Licensing Document Changes

2.1.28 NDAP-QA-0902, Safeguards Information Program and the Protection of Sensitive Unclassified Security Information

2.1.29 NDAP-QA-1102, Environmental Qualification (EQ) Program

2.1.30 NDAP-QA-1105, Dynamic Qualification of Equipment/SQRT Program

2.1.31 NDAP-QA-1201, Configuration Management Process and Program

2.1.32 NDAP-QA-1213, Control and Use of Vendor Technical Information

2.1.33 NDAP-QA-1218, Temporary Changes

2.1.34 NDAP-QA-1609, Quality Classification

2.1.35 NDAP-QA-1903, Refueling Outage Planning Implementation and Assessment

2.1.36 NEPM-QA-0200, Design Basis Documentation

2.1.37 NEPM-QA-0221, Preparation of Engineering Calculations

2.1.38 NEPM-QA-0231, Specifications

2.1.39 NEPM-QA-0241, Review Design Verification and Approval of Design Documents

2.1.40 NSEP-QA-0004, Station Engineering Surveillance and Technical Procedures Preparation and Performance Guidelines

2.1.41 PSP-35, Engineering Change Fast Track Sponsored Work Process

2.1.42 Resource Manual for IP-ENG-001, Standard Design Process

2.2 Developmental References

2.2.1 10CFR50 Appendix B Section III & VI

2.2.2 10CFR50.59

2.2.3 10CFR50.67

2.2.4 10CFR72.48

2.2.5 ACT-04-CR-2014-03578

2.2.6 ANSI N45.2.11-1974, Quality Assurance Requirements for the Design of Nuclear Power Plants

2.2.7 AR 2017-09255, Tracking AR for removing commitments

2.2.8 CR 1661024, Tracking CR for removing commitment

2.2.9 EPRI 1008256 Revision 1, Guidelines for the Technical Evaluation of Replacement Items in Nuclear Power Plants

2.2.10 FSAR 12.1, Ensuring That Occupational Radiation Exposures Are As Low As Reasonably Achievable (ALARA)

2.2.11 FSAR 13.1, Organizational Structure

2.2.12 FSAR 13.4, Review & Audit

2.2.13 FSAR 17.2, Quality Assurance During the Operations Phase

2.2.14 OPS-1, Operational Quality Assurance Program

2.2.15 OPS-1-R, Quality Assurance For Nuclear Safety Impact Items

2.2.16 OPS-2, Terms and Definitions

2.2.17 OPS-3, Control and Issuance of Documents

2.2.18 OPS-9, Control of Modifications and Design Activities

2.2.19 OPS-13, Maintenance, Installation of Modifications, and Related Activities

2.2.20 OPS-18, Repair/Replacement Activities Under Section XI of the ASME Boiler and Pressure Vessel Code

2.2.21 Technical Specifications, Section 5.1.1

2.3 Commitments

2.3.1 [C-3] CRA 470286, Define technical review

2.3.2 [C-6] CRA 744138, Evaluate safeguards documents for safeguards information

2.3.3 [C-25] CR 96-0379, Alarm windows labeled incorrectly

2.3.4 [C-30] CR 96-0121, No documentation of “sound reason” for not upgrading EQ equipment to Category 1

2.3.5 [C-34] CRA 679976, Non-Q part installed in Q application

2.3.6 [C-35] CR 95-0581, DCS posting of drawing changes after modification closure

2.3.7 [C-40] CRA 1219347, Prerequisite steps in work documents that tie-in energy sources

2.3.8 [C-41] CRA 1532248, Track identified unauthorized modifications

2.3.9 [C-43] CRA 1543165, Vendor interface and vendor oversight for digital projects

2.3.10 [C-44] ACT-07-CR-2013-04819, 2013 WANO peer review AFI CM.3-1: engineering design change errors

2.3.11 [C-47] PLA-7404, NRC Commitment to Maintain Severe Accident Management Guidelines

3.0 DEFINITIONS

3.1.1 See IP-ENG-001 for Definitions.

3.1.2 SDP Terminology Interpretation

	SDP	**Susquehanna**
1.	Advanced Work Authorization	Formerly known as At Risk
2.	Augmented Quality	Quality Classes A, B, D, F, L, R, S
3.	Design Equivalent Change	Formerly known as Permanent Equivalent Change, Repair, Use-As-Is
4.	Item or Parts Equivalency	Replacement Item (also known as RIE; NIMS uses RIE-CC or RIE-DEC)
5.	Modification Request Form	EPMC
6.	Risk Category	Risk Rank
7.	Staging or Phasing or Parent/Child Concept	Partial Closure
8.	Temporary Configuration Change	Temporary Change, including Temporary Alterations & Compensatory Measures
9.	Temporary Modification	Temporary Engineering Change
10.	UFSAR	FSAR
11.	Turnover to Operations	Return to Service
12.	Fire Protection, Appendix R, and NFPA 0805 Programs	Fire Protection and Appendix R Programs
13.	Controlled Plant Equipment (CPE)	At Susquehanna, CPE has a quality classification of something other than "N" (per NDAP-QA-1609) or has a component criticality in NIMS of 1, 2, or 3.
14.	Engineering Change (EC)	At Susquehanna, any change to a SSC in the Configuration Management Program, including tools identified in NDAP-QA-0507.
15.	Implementation Hold	30-Month Review

3.1.3 Abandoned Equipment

Plant components no longer used to support plant operations, but still physically existing in the plant.

3.1.4 Contingency Engineering Change

A change that must be ready to install on an urgent basis because it represents a solution to failed equipment that is important to the company from any number of perspectives (e.g., safety, power generation, radiological, etc).

3.1.5 Core Design Change

A change to the fuel design or the location of specific fuel assemblies in the core, any change to the control blade design or the location of specific control blades in the core, and any change to the fuel channel design (including fasteners and clips) or the location of specific channels in the core. Changes to fuel/core support structures and other vessel internal components are not considered Core Design Changes.

3.1.6 Deleted Equipment

Plant components no longer used to support plant operations and physically removed from the plant.

3.1.7 Engineering Restraint

The mechanism used by the engineering organization to restrict the installation and/or return to service of SSCs that are the subject of the engineering change, **OR** to prevent closeout of the engineering change until all configuration management documents have been issued.

3.1.8 Exempt From Configuration Management Change

A change that **ONLY** affects SSCs outside the scope of the configuration management program as described in NDAP-QA-1201.

3.1.9 Final Closure

The process that allows all equipment associated with an engineering change to be returned to service when all activities associated with the engineering change have been completed.

3.1.10 Generic Change (EPRI 1008254)

An engineering change applied to a number of different applications, usually over an extended period of time. This permits implementation as a maintenance activity on an "as needed" basis.

3.1.11 Outside of Controlled Plant Equipment (OCPE)

Structures, systems and components (SSCs) that are not controlled plant equipment. (EPRI 1008254)

OCPE has a quality class of "N" and a component criticality (CCCP) in NIMS of 4 or E when other related SSCs (such as valves or end devices) have a component criticality of 4.

3.1.12 Planned Partial Closure

The process that allows a portion of equipment associated with an engineering change to be returned to service when some activities associated with the engineering change have been completed. This partial closure is identified in the engineering change and for design changes is addressed in the 50.59 and 72.48 Screen or Evaluation.

3.1.13 Set Point Change

An engineering change to the designed actuation point in process units for a bistable or adjustable device, where the value at which the actuation takes place assures design bases requirements are met.

The following as a minimum are setpoint changes under this procedure:

- Instrument setpoint changes
- Relief valve setpoint changes
- Relay Setting Change Notices (RSCNs)
- Transformer Tap Setting Change Notices (TSCNs)
- Voltage Schedule Change Notices (VSCNs)
- Area Radiation Monitor (ARM) setpoints as determined by HP-TP-441
- Overload heater changes.

3.1.14 Support Work Orders

Work orders that direct the installation and removal of scaffolding or insulation, the disconnection and reconnection of smoke detectors, penetration breach and reseal, and support testing.

3.1.15 Technical Review

A review of work orders by the Field Engineer (that implement an engineering change) to ensure the relevant design output information, such as specifications, drawings, material, and testing have been accurately translated into work steps. This does not include a review of proposed blocking. [C-3]

3.1.16 Un-Planned Partial Closure

The process that allows a portion of equipment associated with an engineering change to be returned to service when some activities associated with the engineering change have been completed. This partial closure was not identified in the engineering change. For design changes, the need to revise the 50.59 and 72.48 Screen or Evaluation is addressed.

4.0 RESPONSIBILITIES

4.1 See IP-ENG-001 for Responsibilities.

4.2 The following is Susquehanna's organizational differences for the responsibilities:

	SDP	**Susquehanna**
1.	Senior Design Manager or designee (except for IP-ENG-001 steps 1.2.6 & 1.2.8 {3rd paragraph})	Person with Design Approval Authority (except for IP-ENG-001 steps 1.2.6 & 1.2.8 {3rd paragraph})
2.	Senior Design Manager or designee (IP-ENG-001 steps 1.2.6 & 1.2.8 {3rd paragraph})	Manager Design Engineering (IP-ENG-001 steps 1.2.6 & 1.2.8 {3rd paragraph})
3.	Plant Review Board	PORC
4.	Responsible Engineer	Design Engineer
5.	Responsible Supervisor	Design Engineering / EFIN Branch Manager, Procurement Engineering Supervisor / Computer Group Supervisor
6.	Stakeholders	Impacted organizations such as Operations, Maintenance, Chemistry, RP, Station Engineering, etc
7.	Operations Update control room log	Temporary Engineering Change Coordinator updates the Temporary EC log
8.	Installer completing implementation portions of turnover to Operations	Engineering completes Return to Service – FE/NSE
9.	Responsible Supervisor determining type of review	Type of review is determined using NEPM-QA-0241

4.3 Plant Manager

4.3.1 Approving, prior to implementation, design changes that affect nuclear safety. (Satisfies Tech Spec 5.1.1 and FSAR 13.1.2.2)

4.3.2 Ensuring temporary structures, systems, or components (equipment) do not create Safety Impact Items (SIIs), and identifies and reports observed Potential SIIs to Engineering for evaluation and disposition. (OPS-1-R)

4.3.3 Ensuring that on site activities related to engineering changes that fall under the OQA program are processed in accordance with OPS-9 (Control of Modifications and Design Activities). (OPS-9)

4.3.4 Ensuring that maintenance and related activities are performed in a manner consistent with general programmatic and specific design output documents governing the activity being performed. (OPS-13)

4.3.5 For activities covered under ASME Section XI, preparing repair plans, written instructions and procedures for repairs and replacements that do not involve design changes. (OPS-18)

4.4 Senior Leaders

4.4.1 Reinforcing behaviors in IP-ENG-001 Attachment 9, Expectations for Effective Design Changes.

4.5 General Manager–Nuclear Engineering

4.5.1 Ensuring that the design basis, detailed design of the plant, and the design control program are adequate to meet Susquehanna's commitment to safe, efficient, and reliable operation. (FSAR 13.1.1.1.3)

4.5.2 The design and design verification related to plant engineering changes. (FSAR 17.2.1.4)

4.5.3 Ensuring that there are programs and procedures for the identification of Potential Safety Impact Items (SIIs) in conjunction with the engineering change of plant facilities, and for the evaluation and disposition of Potential SIIs identified by Engineering or others. (Appendix OPS-1-R)

4.5.4 Providing the engineering support required for activities related to maintenance and the design and installation of engineering changes. (OPS-13)

4.5.5 Ensuring that the Station design remains in compliance with all applicable radiation safety standards found in 10CFR20, 10CFR50, 10CFR50.67, 40CFR190 and applicable regulatory guidance documents. (FSAR 12.1.1.2)

4.6 Manager-Design Engineering

4.6.1 Ownership of the overall engineering change process as delegated by the General Manager-Nuclear Engineering including the following considerations:

- Ensuring ALARA/dose reduction opportunities are identified for inclusion into the design of engineering changes and new facilities. (FSAR 12.1.2.4)

4.6.1 (continued)

- Ensuring the ALARA program is incorporated into the design of plant engineering changes and new facilities related to the SSES. (FSAR 12.1.1.2)

- Design and Installation of Safety Impact Item Barriers/Supports/Restraints associated with engineering changes. (OPS-1-R)

- Origination of documents pertaining to activities within the scope of the OQA program shall adhere to OPS-3 (Control & Issuance of Documents). (OPS-3)

4.6.2 Ensuring that the design and modification of the plant is in accordance with applicable codes, standards, and regulations. (FSAR 13.1.1.1.3 and 17.2.1.9)

4.6.3 Establishing and implementing procedures that control system designs and engineering change activities. (FSAR 13.1.1.1.3 and 17.2.1.9)

4.6.4 The General Manager-Nuclear Engineering delegates the following responsibilities to the Manager-Design Engineering:

a. Developing an engineering change program that ensures changes to the plant configuration are: (OPS-9)

(1) Engineered so as to maintain, as a minimum, the level of quality and safety specified in the original approved design.

(2) Reviewed to ensure that they satisfy the requirements of 10CFR50.59 and 10CFR72.48.

(3) Accomplished in a manner that ensures configuration control and properly maintains the design of the plant throughout the engineering change process.

b. Determining which changes to the plant configuration constitute an engineering change. (OPS-9)

c. Providing the engineering support necessary to implement the engineering change program and generate/revise any necessary design output documents. (OPS-9)

d. Design of engineering changes and administration of some engineering change installation. (OPS-13)

e. Activities covered under ASME Section XI (OPS-18):

- Performing design activities in support of repairs and replacements and providing design reconciliation.

4.6.4e (continued)

- Preparing repair plans, written instructions and procedures for repairs and replacements that involve engineering changes.

4.6.5 Delegating the responsibility for the design and installation of computer related engineering changes to the Supervisor Computer Systems. (OPS-13)

4.6.6 Delegating portions of the design of engineering changes to the Supervisor Procurement Engineering. (OPS-13)

4.6.7 Delegating portions of the design of engineering changes to the EFIN Branch Manager. (OPS-13)

4.6.8 Delegating the responsibility for administration of some engineering change installation to the Manager - Project Management. (OPS-13)

4.7 Plant Operations Review Committee (PORC)

4.7.1 Reviewing evaluations for all proposed changes or design changes to facility systems or equipment completed under the provisions of 10CFR50.59. This review shall include a full description of the change or engineering change and its purpose, identification of all components directly or indirectly affected, safety functions of affected systems/components, and effects on safety functions. (FSAR 13.4.1.3)

4.7.2 The design change-and any related 10CFR50.59 Evaluations shall be reviewed by the Plant Operational Review Committee (PORC) and the Nuclear Safety Review Board (NSRB) in accordance with the requirements established in Section 5.0, Administrative Controls, of the SSES Technical Specifications and FSAR Subsections 13.4.1 and 13.4.2. The approval of 10CFR50.59 Evaluations and/or Design Change Packages by the Plant Manager, based on PORCs recommendation of acceptance, fulfills the Technical Specification 5.1.1 requirement for the plant manager's approval of an engineering change. (OPS-9)

4.8 Lead Design Engineer

4.8.1 Performing the role of the Field Engineer when assigned.

4.8.2 Performing the role of Project Manager when assigned.

4.8.3 Initiating Plant Component Work Orders (PCWOs), when necessary.

4.8.4 Identifying and requesting engineered material in PCWOs.

4.8.5 Evaluating the following in accordance with NDAP-QA-0902 for engineering changes identified as Safeguards Information or Safeguard Information Modified Handling: [C-6]

NOTE
Obtain assistance from Nuclear Security as necessary.

a. Which documents need to be identified as Safeguards Information.

b. Which documents need to be declassified Safeguards Information.

c. Which documents need to be decontrolled.

4.9 Manager Station Engineering

4.9.1 Ensuring that the technical information for both the original and replacement devices attached to the Preference replacement item request is adequate to enable performance of an equivalency evaluation.

4.10 Supervisor Computer Systems

4.10.1 Ensuring installation and closeout activities associated with computer engineering changes are performed in accordance with this procedure.

4.10.2 Preparing Computer system/Software Quality Assurance work instructions for computer related engineering changes that result in system changes.

4.10.3 Providing support for engineering changes that impact the plant computer systems.

4.10.4 Providing support for engineering changes that include digital devices that contain process software, firmware, and configuration data values.

4.10.5 Ensuring Software Quality Assurance Plans are developed and maintained for the life cycle of software, firmware, and configuration data values associated with digital assets at SSES.

4.10.6 Ensuring that engineering changes which add, modify, or delete digital devices comply with the SSES Cyber Security Plan.

4.11 System/Program Engineer

4.11.1 Providing a markup of affected Checkoff Lists (CLs) to the Operations' CL Administrator prior to engineering change implementation.

4.11.2 Participating in the return to service for certain engineering changes.

4.12 Work Management

4.12.1 Scheduling the work documents associated with the implementation of engineering changes.

4.13 Field Engineer

4.13.1 Interpreting design requirements to ensure technical adequacy of the work instructions and material ordered.

4.13.2 Assisting in the identification of impacts and effects on SSCs of the work being authorized by the work order.

4.13.3 Preparing Plant Change Notices (PCNs) to support field changes.

4.14 Project Management

4.14.1 Coordinating activities with Susquehanna organizations impacted by the engineering change during scoping and design.

4.14.2 Coordinating activities with Susquehanna organizations impacted by the engineering change during installation and closeout.

4.14.3 Performing functions in accordance with NDAP-00-0026.

4.14.4 Developing and maintaining the project plan and controls for engineering changes associated with projects.

4.14.5 Developing and maintaining the schedule for engineering changes associated with projects.

4.14.6 Coordinating actions for the implementation of Fast Track engineering changes.

4.14.7 Managing contracts associated with the implementation of an engineering change.

4.15 Designer/Drafter

4.15.1 Providing configuration support for the engineering change.

a. Providing design drafting support per direction of the lead design engineer.

b. Incorporating change mechanisms in accordance with MFI-4001.

4.15.2 Performing the design record closeout activities associated with an engineering change.

4.16 Supervisor Document Control Services

4.16.1 Supporting the engineering change process by establishing methods and procedures that comply with regulatory commitments for managing QA Records generated as a result of the process.

4.16.2 Document Control Services (DCS)

a. Issuing controlled copies of engineering changes upon request. (Uncontrolled copies are printed from NIMS by the user.)

4.16.2 (continued)

b. Posting document changes in support of engineering change closure.

c. Posting PCNs in support of engineering change installation.

d. Processing engineering changes for records retention.

4.17 Planning

4.17.1 Notifying Design Engineering via an AR/EWR when the need for a replacement item is identified during the planning process.

4.17.2 Identifying and requesting non-engineered material in PCWOs.

4.17.3 Providing support for non-EC type changes, such as pre-engineered specifications, directed by this procedure and as specified in the document.

4.18 Supervisor Procurement Engineering

4.18.1 Initiating requests for Obsolete replacement items by submitting an AR/EWR.

4.18.2 Ensuring that the technical information for both the original and replacement items is attached to or referenced in the AR/EWR and is adequate to enable the design engineer to perform an equivalency evaluation.

4.19 Manager Nuclear Oversight

4.19.1 Reviewing 10CFR50 Appendix B QA programs of suppliers that provide SSES with replacement item evaluations to ensure their programs include the performance of replacement item evaluations that meet the intent of our replacement item program and that their replacement item evaluations are available for review.

4.19.2 Documenting the adequacy of suppliers' programs for evaluating non-identical replacements and the availability of their evaluations in our QSL.

5.0 INSTRUCTIONS

5.1 General Requirements

5.1.1 **FIND** the SDP forms to support IP-ENG-001 on the Design Engineering website.

a. Design Engineering **MAINTAINS** the forms.

5.1.2 **SEE** Attachment A for the utility procedures/processes referred to in the SDP.

NOTE

The industry Standard Design Process (SDP) is supported by a "Resource Manual for IP-ENG-001, Standard Design Process".

5.1.3 SDP Resource Manual

a. **FIND** the Resource Manual on the Design Engineering website **OR** Design Oversight Working Group (DOWG) Nuclear Community website.

5.1.4 Engineering Change Process Guidance Document

a. When appropriate, **USE** the Engineering Change Process Guidance Document, which supports this procedure.

b. **FIND** the guidance document on the Design Engineering website.

c. Design engineers and stakeholders **USE** the guidance document as a tool to support different aspects of the engineering change process.

d. The Guidance Document **INCLUDES**

(1) Engineering Change Process Guidance Screen

(2) Tie-in strategy

(3) Vendor Oversight Plan

(4) Walkdowns

(5) Assumptions

(6) Completion of Impact Reviews by Work Groups

(7) Design Inputs

(8) ALARA Considerations

(9) Design Attribute Review

(10) Safety Impact

5.1.5 Qualifications

a. With the industry wide qualification (IMG-ENG-001), **APPLY** the following additional qualifications:

(1) The individual performing the screening determination in IP-ENG-001 (Attachment 3 and/or Attachment 5 Step 3.3.5) **SHALL** have EG912.

(a) For an EOC (engineer of choice), the individual(s) performing the Owner's Acceptance Review **SHALL** concur with the determination **AND** have EG912.

(2) Utility Approver – EG299 or EG300

b. For ECs with a quality class other than N, the reviewer/verifier **SHALL** have the QADR qualification in addition to IMG-ENG-001.

(1) For an EOC (engineer of choice), Design Engineering **OR** computer group (digital only) **PERFORMS** the QADR review.

c. For all documents per the utility process, **APPLY** the utility process qualifications.

d. Qualification transition

(1) Individuals who have EG772 will be given the industry qualification (IMG-ENG-001).

(2) Individuals who have EG149 will need to complete an engineering change under IP-ENG-001 with a qualified co-signer prior to being given the industry qualification (IMG-ENG-001).

(3) Individuals who have EG773 (and not EG772) will need to obtain the industry SDP qualification (IMG-ENG-001) to prepare and/or review design inputs outside of the transition plan.

5.1.6 Workflow Overview

a. **USE** the NIMS workflow to track all engineering changes.

- There are seven (7) steps to the engineering change process.
- These same seven (7) steps represent the workflow in NIMS.

b. **SEE** Attachment C for the NIMS workflow and sub status codes for engineering changes.

c. **SEE** Attachment D for guidance on when to TURN OFF (or ON for shelf) steps in the engineering change workflow.

5.1.7 EC Issuance

a. **ISSUE** CCs, DECs, and DCPs by the milestones identified in the following procedures:

- NDAP-QA-1903 for refuel outage installation
- NDAP-00-1912 for on-line and SOW (System Outage Window) installation

b. For CC/DEC/DCP issuance and installation outside of the milestones, **FOLLOW** the fast track process in PSP-35.

5.2 Initial Scoping Phase

5.2.1 **MAKE** changes to SSCs within the Configuration Management Program (NDAP-QA-1201 Attachment B) via the Engineering Change Process.

5.2.2 EC Process Entry Point

a. Refurbished or repaired components.

(1) **RECEIVE** as identical replacements non-Q items that are refurbished or repaired by vendors or manufacturers

(a) The EC Process is **NOT** entered.

(2) **RECEIVE** as identical replacements non-EQ Q items that are refurbished or repaired by vendors or manufacturers that have a current 10CFR50 Appendix B program and are listed on the QSL

(a) The EC Process is **NOT** entered.

(3) **ADDRESS** EQ Q items that are refurbished or repaired by vendors or manufacturers per Attachment B Section C.

b. Part/Model/Catalog number "only" changes

(1) Example

(a) A manufacturer adds leading or trailing zeros to accommodate a computerized P/N System.

(2) There **SHALL** be no physical changes to the item.

(3) The EC Process is **NOT** entered.

(4) Procurement **DOCUMENTS** these changes.

5.2.2 (continued)

c. Normally **GENERATE** an AR/EPMC **PER** ER-30 **AND** MEG-DTG-004 for the following EC types:

(1) DCP

(2) DEC

(3) CC

d. Normally **GENERATE** an AR/EWR **PER** the requirements in NDAP-QA-1218 for the following EC types:

(1) TDC

(2) TDEC

(3) TCC

e. Normally **GENERATE** an AR/EWR for the following:

(1) Obsolescence replacement item

(a) Requested by Procurement

(2) Preference replacement item

(a) Requested by Station Engineering to improve equipment reliability

f. **GENERATE** emergent ECs based on AR/EWRs **OR** Management direction.

5.2.3 Preliminary Determination of EC Type

a. **USE** Attachment B to determine if entry into IP-ENG-001 is required.

NOTE

Commercial Changes will use the “long path” (IP-ENG-001 Attachment 6 steps 3.4.3 through 3.4.11) unless specified otherwise in this procedure.

b. **SEE** IP-ENG-001 Attachment 3 to determine if the change is a Commercial Change, Design Equivalent Change, or Design Change.

c. **USE** the Commercial Change process for changes to SSCs that are considered OCPE.

d. **CHANGE** the engineering change subtype if something in the design phase indicates that the EC subtype is different.

NOTE

Completion of IP-ENG-001 Form 6 is required for the Advanced Work Authorization prior to performing any field work.

5.2.4 Advanced Work Authorization

a. **SEE** IP-ENG-001 Attachment 2 Step 1.4a.

5.2.5 Generate ECWO in NIMS

a. **ENTER** the EC subtype as follows:

(1) Design Change (permanent) – DCP

(2) Design Equivalent Change (permanent) – DEC

(3) Commercial Change (permanent) - CC

(4) Design Change (temporary) - TDC

(5) Design Equivalent Change (temporary) – TDEC

(6) Commercial Change (temporary) - TCC

(7) Replacement Items (commercial) – RIE-CC (to support NIMS workflow only)

(8) Replacement Items (design equivalent) – RIE-DEC (to support NIMS workflow only)

b. In ActionWay, **RELATE** the EC to the item that requested the change (e.g., AR/EPMC or AR/EWR).

c. **RELATE** the implementing work order(s).

d. **IF** the change is to be a generic change,

THEN SPECIFY "GENERIC" in the title.

e. **IF** the change is to be a contingency change,

THEN SPECIFY "CONTINGENCY" in the title.

f. **ATTACH** the Scope Document, if prepared, to the ECWO.

g. **IDENTIFY** all affected design components under Affected Objects.

h. **ENTER** the system number(s) under Affected Objects.

5.2.5g (continued)

i. For replacement items, **ENTER** the catalog number of the original (if known) and replacement items.

j. **ENTER** "Y" in the Safeguards/Confidential box if a summary of the EC is **NOT** to be uploaded to CMISDP; otherwise, **ENTER** "N".

k. **MOVE** the ECWO to Design.

(1) **CONFIGURE** the workflow.

5.3 Detailed Design Phase

5.3.1 **DEVELOP** a Commercial Change **PER** IP-ENG-001 Attachment 6.

a. **WHEN** criteria for Section C is met in Attachment B,

THEN FOLLOW the "short path" in IP-ENG-001 Attachment 6 workflow **AND PERFORM** Steps 3.4.2 and 3.4.12.

(1) For replacement items, **USE** RIE-CC subtype in NIMS.

(2) For simple repairs, **USE** CC subtype in NIMS.

b. **WHEN** the change is a simple security change that requires no engineering,

THEN FOLLOW the "short path" in IP-ENG-001 Attachment 6 workflow **AND PERFORM** Steps 3.4.2 and 3.4.12.

(1) "No engineering" means "skill of the craft" and that none of the following is required:

(a) Design Inputs/Bounded Technical Requirements

(b) Evaluation of load (electrical or civil)

(c) Evaluation of stress

(d) Critical comparission of a replacement

c. **IF** the affected object(s) has a quality class other than N,

THEN PERFORM a QADR **PER** step 5.4.12b.

5.3.2 **DEVELOP** a Design Equivalent Change **PER** IP-ENG-001 Attachment 5.

5.3.3 **DEVELOP** a Design Change **PER** IP-ENG-001 Attachment 7.

5.3.4 **DEVELOP** a Replacement Item as a Commercial Change (RIE-CC) using IP-ENG-001 Attachment 6 **OR** as a Design Equivalent Change (RIE-DEC) using IP-ENG-001 Attachment 5 with the following exceptions:

a. **ENTER** "(Replacement Item)" at the beginning of the title on the CC or DEC form.

b. **IDENTIFY** any Special Procurement Requirements in Section A of the CC/DEC form under Solution Statement.

(1) **IF** the replacement item is for a subcomponent and it can be procured with a different quality class than the quality class of the parent component,

THEN SPECIFY the procurement quality class of the subcomponent as a Special Procurement Requirement.

c. IP-ENG-001 Step 3.3.2/3.4.3 (design activities/team identification) is **NOT** required; however, **COMPLETE** step 3.3.2a/3.4.3a (Design Attribute Review).

d. IP-ENG-001 Step 3.3.3/3.4.4 (kickoff meeting) is **NOT** required.

e. IP-ENG-001 Step 3.3.8/3.4.8 interdepartmental reviews are **NOT** required.

f. Instead of Comment/Impact Review (IP-ENG-001 Step 3.3.10/3.4.10), **EVALUATE** impacts **PER** Section 5.4.3.

5.3.5 Exempt from Configuration Management Documentation

a. **PROCESS AND DOCUMENT** changes to SSCs that are Exempt from Configuration Management Program requirements, when requested, per Attachment B via an AR/EWR.

(1) An EC number in NIMS is **NOT** generated.

b. Even though programmatic elements of the EC process are not applied, the responsible engineer **ENSURES** compliance to applicable regulations (e.g., OSHA, building codes, environmental) and to all applicable Codes and Standards.

c. **TAKE** extreme care to ensure that there is no impact to any SSCs within the Configuration Management Program.

(1) Specifically **STATE** in the AR/EWR response that there is no impact to any SSCs within the Configuration Management Program.

NOTE

Certain specifications and drawings are pre-engineered documents that when applied appropriately can effect plant changes.

5.3.6 Specifications and Drawings for Engineering Change

a. **GENERATE** specification(s) or drawing(s) for changes that are generic in nature.

b. Specifications

NOTE

IF a pre-engineered specification revision requires change to a document in Step 5.3.6b(2),

THEN the documents specified in step 5.3.6b(1) are to be prepared (or revised) for the specification revision.

(1) For a specification to be considered pre-engineered, **PERFORM** the following:

(a) **COMPLETE** a 50.59 Screen and/or 50.59 Evaluation for the specification

NOTE

IMG-ENG-001 qualification is required for the preparer and reviewer of the technical evaluation.

(b) **PREPARE** a technical evaluation that addresses applicable design inputs **AND** design attribute review (DAR) topics identified in IP-ENG-001 (Attachments 11 and 10, respectively).

- **INCLUDE** the technical evaluation as an Attachment/Appendix to the specification **OR** as a standalone document in the backup that has prepared, reviewed, **AND** approved signatures.
- **FORMAT** the design inputs **AND** DAR in accordance with Attachment I.
- **IF** the specification affects stocking of parts or catalog information for a component,

  THEN WORK with Procurement on how the changes should be made **AND**, if appropriate, **ADDRESS** this in the specification.

5.3.6b(1) (continued)

(c) **INCLUDE** the following in the specification:

- Limitations
- Responsibilities for Design Engineering and Maintenance/Planning as a minimum
- Bill of Material
- Installation steps
- Testing
- Configuration Control (FCI source changes, procedure changes, etc)

(d) **ADDRESS** routine tasks **AND** spare parts, including stocking and catalog information.

(e) **ADDRESS** Software Quality Assurance **AND** Cyber Security.

(2) For specifications prepared or revised prior to June 30, 2017, **FIND** the following documents:

(a) Equivalent Change Evaluation (ECE) or Design Inputs (DIs)

(b) Engineering Change Considerations Checklist

(c) 50.59 Screen and/or 50.59 Evaluation if one of the following applies:

- Specification was issued prior to 12/15/08.
- An ECE was not completed or the ECE identifies that the change is a design change.

(3) **GENERATE AND PROCESS** the specification in accordance with NEPM-QA-0231.

(4) Examples:

- M1579 – helicoils
- M1557 & M1583 – Gasket material
- M1581 – air regulators

5.3.6b (continued)

(5) **IDENTIFY** in the Scope Section of the specification that the document is a pre-engineered specification.

(6) **IF** it is desired to use a specification to make changes in the plant and it is not clear if the specification is pre-engineered or acceptable for the application,

THEN GENERATE an AR/EWR to Design Engineering for assistance.

(a) **RELATE** the AR/EWR to the work order(s).

(b) **INCLUDE** as Affected Objects all components to be evaluated.

(7) Configuration Control

(a) For new specifications **AND** revisions to specifications, **ADDRESS** configuration control in the specification.

- For installations, **FOLLOW** the configuration control guidance in the Specification.

(b) **IF** the existing specification does not address configuration control,

THEN GENERATE an AR/EWR to Design Engineering to address configuration control.

- **RELATE** the AR/EWR to the work order(s).
- **INCLUDE** as Affected Objects all components that are to be changed.
- **IF** an AR/EWR is generated **PER** Step 5.3.6b(6),

  THEN an additional AR/EWR is **NOT** required.

(c) The design engineer **PERFORMS** the following:

- **CHANGE** the AR/EWR Subtype to EWR-CU, if necessary.
- As Attached Media or in the Action Taken, **INCLUDE** a listing of what documents/NIMS components need to be changed and how to maintain configuration control.

5.3.6b(7) (continued)

(d) The designer/drafter **DRAFTS** the document changes (via DCN or direct revision) and NIMS pending changes.

(e) **WHEN** the physical work is complete (work order is in 990Closing),

THEN PROCESS the changes for review and approval.

- For Class 1 & 2 drawings, **APPROVE** the change within 10 business days.
- For all other changes, **APPROVE** the change in a timely manner.

c. Drawings

(1) For a drawing to be considered pre-engineered, as a minimum **PERFORM** the following:

(a) **COMPLETE** a 50.59 Screen and/or 50.59 Evaluation for the drawing.

NOTE

IMG-ENG-001 qualification is required for the preparer and reviewer of the technical evaluation.

(b) **PREPARE** a technical evaluation that addresses applicable design inputs and design attribute review items identified in IP-ENG-001 (Attachments 11 and 10, respectively).

- **INCLUDE** the technical evaluation as a standalone document in the backup that has prepared, reviewed, and approved signatures as well as revision control.
- **FORMAT** the design inputs **AND** DAR in accordance with Attachment I.
- **IF** the drawing affects stocking of parts or catalog information for a component,

  THEN WORK with Procurement on how the changes should be made **AND**, if appropriate, **ADDRESS** this in the drawing.

5.3.6c (continued)

(2) For drawings prepared or revised prior to June 30, 2017, **FIND** the following documents:

NOTE
The <u>original</u> Bechtel drawings do not require the documents identified below.

- Equivalent Change Evaluation
- Engineering Change Considerations Checklist
- 50.59 Screen only, if the drawing was issued prior to 9/30/09.

(3) If desired, **USE** pre-engineered drawings to make changes in the plant if the following conditions are met:

- The drawing is generated in accordance with MFP-QA-4002, and has a drawing class of 1, 2, 3, 4, 5, N, or T.
- Configuration control is maintained **PER** Section 5.3.6c(6).
- A 50.59 screen is not required for actual implementation of a pre-engineered drawing.
- Pre-engineered drawings may be used by themselves or in conjunction with other pre-engineered documents.

(4) Examples:

- Drawing C-1127 - duct access hatches
- Drawing C-1975 - lifting lugs
- Drawing X-101 Sh. 1-5 - sleeve and seal details
- Drawing E-59 - cabling and wiring installation
- Drawing M-199 – Note 38 & Lokrings

(5) **<u>IF</u>** it is desired to use a drawing to make changes in the plant,

<u>THEN</u> GENERATE an AR/EWR to Design Engineering for approval to use the drawing and to provide any additional guidance needed.

(a) **RELATE** the AR/EWR to the work order(s).

5.3.6c(5) (continued)

(b) As a part of the approval to use the drawing, Design Engineering **SHALL ADDRESS** Routine Tasks and Spare Parts with regard to stocking and catalog information.

(6) Configuration Control

(a) **WHEN** a drawing is approved for use **PER** Step 5.3.6c(5),

THEN the design engineer **GENERATES** an AR/EWR Subtype EWR-CU.

- **RELATE** the AR/EWR to the work order(s).
- In the AR/EWR description, **INCLUDE** a listing of what documents/NIMS components need to be changed to maintain configuration control.
- **INCLUDE** as attached media or in the description information/documentation that is needed to complete the document/NIMS changes.
- **INCLUDE** as Affected Objects all components that are affected.

(b) The designer/drafter **DRAFTS** the document changes (via DCN or direct revision) and NIMS pending changes.

(c) **WHEN** the physical work is complete (work order is in 990Closing),

THEN PROCESS the changes for review and approval.

- For Class 1 & 2 drawings, **APPROVE** the change within 10 business days.
- For all other changes, **APPROVE** the change in a timely manner.

5.4 Supporting Requirements for Detailed Design Phase

5.4.1 Risk Assessment

a. **COMPLETE** a risk assessment and a pre-job brief, when applicable, for design **PER** NDAP-00-1600 and IP-ENG-001 as follows: [C-44]

- After an engineering change has been initiated and prior to the start of design

5.4.1a (continued)

- Prior to completion of the design phase if there is more than a minor change in scope.

NOTE

The requirements in Step 5.4.1b are to be applied to Add-a-Tags for replacement items.

b. For EC revisions, **COMPLETE** a risk assessment (and a pre-job brief when applicable) **PER** NDAP-00-1600 and IP-ENG-001 as follows: [C-44]

(1) **REVIEW** the original/previous risk assessment for applicability to the revision.

(2) **IF** the original/previous risk assessment was completed prior to Revision 5 of Form NDAP-00-1600-1 **OR** the original/previous risk assessment does not cover the EC revision (e.g. change in scope, add-a-tag that is not covered by the systems already evaluated),

THEN COMPLETE a new risk assessment for the EC revision using the latest revision of Form NDAP-00-1600-1.

(3) **IF** the original/previous risk assessment was completed on Revision 5 or later of Form NDAP-00-1600-1 **AND** the original/previous risk assessment covers the EC revision,

THEN DOCUMENT in the ECWO Action Taken or on the EC Backup Coversheet that the original/previous risk assessment was reviewed and it covers the scope of the EC revision.

c. For ECs prepared by an EOC, the EOC **COMPLETES** a risk assessment and a pre-job brief, when applicable, **PER** NDAP-00-1600 and IP-ENG-001.

(1) **INCLUDE** the applicable SSES design engineer in the pre-job brief.

5.4.2 Vendor Oversight [C-43]

a. **APPLY** vendor oversight to the following types of ECs:

- Large ECs/Major Projects, such as Digital EHC, VERMS, ICS, and chiller upgrades, when purchasing a vendor product that is not fully understood
- Specially or uniquely designed items
- Vendor (EOC) prepared ECs

5.4.2 (continued)

b. **IF** any of the below criteria are met,

THEN DEVELOP a Vendor Oversight Plan.

(1) The SSC being procured or designed involves or will involve components that have a Component Criticality of 1 or 2.

(2) An Independent Third Party Review is required **PER** NDAP-00-1600

(3) The procurement activity is an error likely activity.

- Fast track or delivery outside of normal target week/outage milestone requirements
- "first of kind"
- Rarely performed or technically complex activity

(4) Operating Experience or 10 CFR Part 21 issues have been identified related to this procurement or design activity.

(5) Previous experience with the vendor has been less than satisfactory or the vendor has known technical limitations.

c. As necessary, **SEE** the Engineering Change Process Guidance Document for guidance on what may be included in the Vendor Oversight Plan.

5.4.3 EC Impact Identification for replacement items

a. The Lead Design Engineer **IDENTIFIES** impacts.

b. The following is a list of items that could be impacted:

- Procedures
- Check Off Lists (CLs)
- Routine Tasks (PMs)
- FCI Sources outlined in Section 5.4.4
- Training
- Severe Accident Guidelines (SAGs) found in EP-DS-001 and EP-DS-002. [C-47]
- Others, such as Cyber Security Program

5.4.3 (continued)

c. To identify impacts, **REVIEW** NIMS information.

(1) **SEE** the engineering change website for instructions on how to do the review in NIMS.

d. In addition, **IDENTIFY** impacts by conversation with other work groups such as Station Engineering and Operations.

e. **ENSURE** that Operations training on the EC is evaluated when identifying impacts.

f. Each impact identified **NEEDS** to be evaluated and changed.

(1) **SEE** Section 5.4.4 for Managed FCI Source changes.

(2) **GENERATE** AR(s) to the appropriate work group(s) to complete the action(s).

- In ActionWay, **RESTRAIN** the appropriate EC workflow step or implementing work order.

5.4.4 Changes to Facility Configuration Information (FCI) Sources (ref. NDAP-QA-1201 Attachment A)

a. **FIND** the list of affected FCI Sources in NIMS WMCMMAIN under the CDL button.

(1) **FIND** affected calculations and EQARs listed in the change package.

b. With input from the discipline engineers, **IDENTIFY** managed FCI sources affected by the engineering change.

c. For each affected document, DCS (Document Control Services) **ENTERS** the change mechanism number into NIMS.

d. **INCLUDE** all changes to FCI Sources in the Engineering Change Package when submitted for approval, except as outlined below.

(1) **IF** information is not available (such as vendor drawings or IOMs) to complete an FCI Source change at the time of package issuance,

THEN GENERATE an Engineering Restraint in accordance with Section 5.8.1 to complete the FCI Source change.

(a) Do **NOT** issue IDCNs for PCNs to be issued later.

(b) This **INCLUDES** blank or incomplete IDCNs.

5.4.4d (continued)

(2) **COMPLETE** generic engineering change FCI source changes in accordance with Step 5.4.4h.

e. For each document that is considered Field (see Step 5.4.4f), **IDENTIFY** the document as "FIELD" in NIMS.

(1) This **INDICATES** to DCS that the checked documents are to be included in the Field copy of the Engineering Change package.

(2) **IF** additional documents are marked as Field in NIMS after the EC is issued by DCS,

THEN NOTIFY DCS of the changes.

f. Field documents **CONSIST** of the following as a minimum:

- FCI Sources required by the field to perform physical work.
- FCI Sources required by the field to perform testing.
- Drawings classified as Class 1 or Class 2 (**PER** MFP-QA-4002).
- FCI Sources that list engineered material.

g. Typically **CONSIDER** the following types of document changes as non-field documents:

- Seismic Qualification Binder Change Notice (SBCN)
- Environmental Qualification Assessment Report (EQAR) Updates
- Licensing Document Change Notice (LDCN)
- Specification Change Notice (SCN)
- Design Basis Document change Notice (DBDCN)
- Miscellaneous drawings that are required to maintain configuration control, but are not required for field implementation.

5.4.4 (continued)

h. Generic engineering changes

(1) **IDENTIFY** all of the affected FCI Sources during the design phase.

(a) **OBTAIN** change mechanism numbers for the FCI Sources (CDL button in NIMS is populated).

- **GENERATE** the change mechanisms at a later time, when the change is installed.

(b) **INITIATE** Pending Changes for each of the affected components (Pending Change button in NIMS is populated).

- **WHEN** the change is installed,

  THEN PREPARE, **REVIEW**, **AND APPROVE** the pending changes.

(2) **WHEN** notified (via an AR/EWR) that the generic engineering change will be installed for a component,

THEN PERFORM the following:

(a) **COMPLETE** the change mechanisms for the component.

(b) **TRANSMIT** the change mechanisms to DCS.

(c) **COMPLETE** the pending change for the component **AND PROCESS** to Holding status.

i. Drawings

(1) **CREATE** new drawings and changes to existing drawings using the Interim Drawing Change Notice (IDCN), Form MFP-QA-4002-2 **AND** the Drawing Change Mechanism (DCM) Continuation Sheet, Form MFP-QA-4002-4.

(a) **DEVELOP** IDCNs in accordance with the requirements of MFP-QA-4002.

- **IF** a posted change mechanism(s) exists,

  THEN, as a minimum, **INCORPORATE** the posted change mechanism(s) that impact development of the new IDCN, which includes changes in the area of the new change, prior to preparing the new IDCN.

5.4.4i(1)(a) (continued)

- For Class 1 and 2 drawings, **INCLUDE** the entire drawing in the IDCN.
- For all other drawings, **INCLUDE** the entire drawing in the IDCN unless approved by the lead design engineer.

(b) At the discretion of the design engineer, directly **ENTER** new vendor drawings into the document management system **PER** MFP-QA-4002.

(c) DCS **ASSIGNS** IDCN numbers.

NOTE

For temporary engineering changes, Change Mechanisms for all impacted FCI other than Class 1 or 2 drawings and those needed for installation may be prepared per discretion of the Lead Design Engineer.

(2) For temporary engineering changes, **PREPARE** an IDCN(s) for all affected drawings that are classified as Class 1 or 2 **AND** for drawings that are needed to support installation.

(a) **INDICATE** on the IDCN(s) that they are not to be incorporated.

(3) **OBTAIN** all affected drawings used in designing the engineering change as "As-engineered".

(4) Prior to starting detailed design work, **REVIEW** all Outstanding Change Mechanisms regardless of their status (Preliminary, Issued or Posted) for impacts.

(a) For Outstanding Change Mechanisms in Preliminary status, **CONTACT** the responsible engineer for the preliminary change to understand if that change has any impact on the design being developed.

- **DOCUMENT** any impact/conflict resolution in both engineering changes under Section D under Sequencing to ensure smooth installation of each EC.

(b) For Outstanding Change Mechanisms in Issued status, **GENERATE** an AR/EWR to disposition any potential impacts of the developing design to the issued, but not installed engineering change.

- **MAKE** the EWR a restraint to Design for the new EC.

5.4.4i(4)(b) (continued)

- **SEND** the EWR to the responsible engineer for the uninstalled engineering change.

- **IF** the existing EC requires revision due to the impact/conflict,

  THEN DOCUMENT the impact/conflict resolution in both engineering changes under Section D under Sequencing to ensure smooth installation of each EC.

- **IF** the existing EC does **NOT** require revision,

  THEN DOCUMENT any impact/conflict resolution in the new engineering change under Section D under Sequencing to ensure smooth installation of each EC.

(5) For tubing, **FOLLOW** the drawing requirements outlined in Specification G1006.

(6) **VOID** drawings using the Void Change Notice (Form MFP-QA-4002-5).

(a) **DEVELOP** Void Change Notices (VCNs) in accordance with the requirements of MFP-QA-4002.

(b) DCS **ASSIGNS** VCN numbers.

(7) For IDCN/VCN numbers that are obtained but not used, **NOTIFY** DCS to void the IDCN/VCN number.

(8) For Safeguards drawings, **ADD** the appropriate Safeguard statements **PER** NDAP-QA-0902 on all Safeguard drawing pages.

j. NIMS Design Component Database

(1) **USE** NIMS Component Pending Changes to identify design information for new SSCs and changes to existing SSC design information found in the NIMS Design Component Database.

(a) **DEVELOP** NIMS Component Pending Changes in accordance with MFP-QA-4004 and NEPM-QA-0241.

5.4.4j (continued)

NOTE

1. For temporary engineering changes, Pending Changes are required if a component is added to the plant that can be manipulated (e.g. a valve or switch) **OR** it is a digital device.
2. For temporary engineering changes, Pending Changes are also permitted at the discretion of the Lead Design Engineer.

(2) For temporary engineering changes, **IF** the only place changed information exists is in NIMS,

THEN PERFORM the following:

(a) **GENERATE** one pending change to reflect the temporary engineering change installation.

(b) **GENERATE** one pending change to restore the changed information after removal of the temporary engineering change

(3) With input from the EC Team discipline engineers, **IDENTIFY** the list of NIMS component pending changes to be completed.

(4) **REVIEW** outstanding pending changes against affected SSCs regardless of their status (identified, preparing, reviewing, approving, holding) for impacts.

(a) For outstanding pending changes (in any status other than holding) where there is potential conflict, **CONTACT** the responsible engineer for the pending change.

- **DOCUMENT** any conflict resolution in both engineering changes under Section D under Sequencing to ensure smooth installation of each EC.

(b) For outstanding pending changes in holding status where there is conflict with the new EC, **GENERATE** an AR/EWR to disposition the conflict.

- **MAKE** the EWR a restraint to Design for the new EC.
- **SEND** the EWR to the responsible engineer for the issued engineering change.

5.4.4j(4)(b) (continued)

- **IF** the existing EC requires revision due to the conflict,

  THEN DOCUMENT the conflict resolution in both engineering changes under Section D under Sequencing.

- **IF** the existing EC does **NOT** require revision,

  THEN DOCUMENT any conflict resolution in the new engineering change under Section D under Sequencing.

(5) **UPDATE** NIMS Database design information for SSES plant systems, structures, components, subcomponents and parts during the Design process step.

(a) For new SSCs, **POPULATE** the following non-NIMS mandated fields in the Pending Change, as a minimum:

- Noun Name
- EQ
- ASME
- Failure Effect Code
- Maintenance Rule Code
- Start Up System
- Manufacturer, Model and/or Part Number, and Catalog Number, if known
- Characteristics
- Documents
- Group Code (for digital assets)

(b) **IF** the Manufacturer, Model and/or Part Number is not known at the time of EC issuance,

THEN GENERATE an AR/EWR for the Field Engineer to generate DPRs with the information.

(c) For revised SSCs, **UPDATE**, as appropriate, the non-NIMS mandated fields in the Pending Change.

5.4.4j (continued)

(6) **APPROVE** all component pending changes prior to issuance to DCS **OR ISSUE** a restraint for the process **PER** Section 5.8.1.

(a) **RESTRAIN** the PCWO that will install the labels.

(b) **RESTRAIN** the field Return to Service (RTS FE) step if there are NO labels required.

(7) **PREPARE** a NIMS pending change for each setpoint change.

k. Design Calculations

(1) **PREPARE** Design Calculations in accordance with NEPM-QA-0221.

(2) **SEE** Design Standard JDS-02 for guidance in the preparation of I&C setpoint calculations.

(3) Electrical Calculations

(a) **PREPARE AND MAINTAIN** electrical distribution system calculations in accordance with MFP-QA-2241.

(b) **PREPARE AND MAINTAIN** 120V AC, 125V DC, 250V DC voltage drop calculations in accordance with MFI-2241.

(c) **GENERATE** RSCNs, TSCNs and VSCNs, as appropriate.

- If applicable, **PREPARE** calculations for System Development equipment setpoint changes in accordance with EC-SOPC-0510, EC-SOPC-0520 and EC-SOPC-0516.

(4) **LIST** calculations revised or generated in the change package (Section C).

(5) **IF** a calculation requires revision for a temporary engineering change,

THEN EVALUATE the calculation for revision following removal of the temporary change.

(a) **GENERATE** an AR/EWR to evaluate the need for a calculation revision following removal and to revise if necessary.

(b) **RELATE** the AR/EWR to the ECWO and the removal PCWO.

(6) **TRANSMIT** the calculation to DCS separately from the Engineering Change Package.

5.4.4 (continued)

l. SQRT Binders

(1) **EXECUTE** changes to Section II of existing SQRT Binders using SQRT Binder Change Notices (SBCNs).

(a) **DEVELOP** SBCNs in accordance with the requirements of NDAP-QA-1105.

(b) DCS **PROVIDES** SBCN numbers.

(2) **EXECUTE** changes to existing SQRT Binder Sections other than Section II in accordance with the applicable guidelines and requirements of NDAP-QA-1105 **AND** CDS-09.

(3) **ISSUE** new SQRT Binders associated with engineering changes in accordance with the applicable guidelines and requirements of NDAP-QA-1105.

(4) For SBCN numbers that are obtained but not used, **NOTIFY** DCS to void the SBCN number.

(5) **SEE** NDAP-QA-1105, Attachment B for the plant components that have a quality classification of non-Q, but have requirements for seismic qualification.

m. Environmental Qualification Assessment Reports (EQARs)

(1) **PREPARE** new or revised Environment Qualification documentation in accordance with NDAP-QA-1102, GDS-09, and GDS-15.

(2) Based on the type of change being made, **PERFORM** one or more of the following activities:

(a) **SEE** NDAP-QA-1102 for detailed requirements.

(b) **PREPARE** new or revised EQAR(s) in accordance with NDAP-QA-1102.

- EQ Program owner **APPROVES** new or revised EQARs prior to issuance of the engineering change.

(c) **GENERATE** an IDCN for drawing C-1815, "Equipment Qualification Harsh Environmental Zones".

5.4.4m (continued)

(3) **WHEN** Environmental Qualification is required **AND** a replacement qualified to NUREG 0588 Category II (IEEE-323-1971) is being evaluated,

THEN PERFORM the following: [C-30]

(a) **CONSIDER** the availability of a suitable replacement qualified to 10CFR50.49 and as recommended by Regulatory Guide 1.89, Revision 1 and IEEE-323-1974 (or IEEE-323-1983) (usually referred to as Category I).

(b) **IF** the replacement is qualified to Category II,

THEN DOCUMENT the "sound reason(s)" for not upgrading, as delineated in Attachment F, in the change package.

(4) **LIST** EQARs revised or generated as a part of the EC in the change package (Section C).

n. Licensing Documents (FSAR, FPRR, TS and TS Bases, TRM, Operating Licenses, and 72.212 Evaluations)

(1) **EXECUTE** changes to Licensing Documents using Licensing Document Change Notices (LDCNs)

(a) **DEVELOP AND PROCESS** LDCNs in accordance with the requirements of NDAP-QA-0730.

(b) **WRITE** LDCNs on a per Unit basis for configuration control purposes since the FSAR does not normally distinguish between units.

(2) **GENERATE** FSAR changes for temporary engineering changes as follows:

(a) **GENERATE** an AR/EWR to complete the LDCNs.

- **ASSIGN** a due date for the EWR no later than April 30 in the year of the next (or current) Unit 2 refuel outage
- Do **NOT RESTRAIN** the EWR to the ECWO or work order(s).

5.4.4n(2) (continued)

(b) **IF** the temporary change remains installed on April 30 in the year of a Unit 2 refuel outage,

THEN COMPLETE the following:

- LDCN for the temporary change installation
- LDCN for the temporary change removal

NOTE

The process of obtaining a Licensing approved LDCN takes approximately 6-8 weeks.

(3) **IF** the permanent engineering change is issued prior to approval of an LDCN,

THEN GENERATE an Engineering Restraint in accordance with Section 5.8.1 of this procedure.

(a) **RESTRAIN** the implementing work order(s) for those LDCNs that are technical in nature and reflect a change to the licensing basis.

(b) **RESTRAIN** the RTS DCS process step for those LDCNs that are mostly editorial and do not reflect a change to the licensing basis.

(4) For LDCN numbers that are obtained but not used, **NOTIFY** NRA to cancel the LDCN number.

o. Installation, Operating and Maintenance Manuals (IOMs)

(1) **EXECUTE** new IOMs and changes to existing IOMs using IOM Change Notices (IMCNs).

(a) **DEVELOP** IMCNs in accordance with the requirements of NDAP-QA-1213.

(b) DCS **PROVIDES** IMCN numbers.

(2) For IMCN numbers that are obtained but not used, **NOTIFY** DCS to void the IMCN number.

5.4.4 (continued)

p. Specifications

(1) **EXECUTE** changes to existing Specifications using Specification Change Notices (SCNs) or revisions.

(a) **DEVELOP** SCNs or revisions in accordance with the requirements of NEPM-QA-0231.

(b) DCS **PROVIDES** SCN numbers.

(c) **ISSUE** SCNs associated with an engineering change in the engineering change package to ensure that the as-built configuration of any Specification affected by an engineering change is maintained.

(2) **GENERATE** new specifications in accordance with NEPM-QA-0231.

(3) For SCN numbers that are obtained but not used, **NOTIFY** DCS to void the SCN number.

q. Design Basis Documents (DBDs)

(1) **EXECUTE** changes to DBDs using Design Basis Document Change Notices (DBDCNs)

(a) **DEVELOP** DBDCNs in accordance with the requirements of NEPM-QA-0200.

(b) DCS **PROVIDES** DBDCN numbers.

(2) For DBDCN numbers that are obtained but not used, **NOTIFY** DCS to void the DBDCN number.

NOTE

An Applicability Determination is **NOT** required for engineering changes.

5.4.5 50.59/72.48 Screens and Evaluations

a. For DCPs and TDCs, **COMPLETE** a 10CFR50.59 and/or 10CFR72.48 Screen and Evaluation, if necessary, in accordance with NDAP-QA-0726 prior to issuance of the EC Package.

b. For DECs and TDECs when required by IP-ENG-001, **COMPLETE** a 10CFR50.59 and/or 10CFR72.48 Screen in accordance with NDAP-QA-0726 prior to issuance of the EC Package.

5.4.5 (continued)

c. **IF** a 10CFR72.48 Screen is **NOT** required,

THEN ENTER a statement in Section II (Applicability Determination) of the 50.59 Screen that states that the screen is not required.

(1) Suggested wording is as follows:

A 72.48 Screen is not required since the engineering change does not affect any SSC associated with FSAR Section 11.7, the CSAR, or the 72.212 Evaluation (and C. of C. No. 1004).

d. **DISCUSS** documents that are included in Section V of the 50.59 Screen, including identification of the document by number, in Section VI of the 50.59 Screen.

e. In the 50.59 Screen/Evaluation, **ADDRESS** placing any SSC (new or existing) in an unusual (i.e. unanalyzed) condition during construction.

(1) An example is pulling/coiling cables into a safety-related, dynamically qualified panel and leaving them for period before they are completely installed/terminated.

(a) In this example, **ADDRESS** the impacts to the dynamic qualification and to separation criteria in the 50.59 Screen/Evaluation.

NOTE

A FPP Screen may be required for a change mechanism (ex: FPRR LDCN).

f. Fire Protection Program (FPP) Screen

(1) **COMPLETE** a FPP Screen (Form NDAP-QA-0449-1) for any engineering change that impacts the FPRR, the Fire Protection Program, or any fire protection components with the following exceptions:

(a) A FPP Screen is **NOT** required for replacement items.

(b) A FPP Screen is **NOT** required for any other change that is considered a replacement.

5.4.6 Sketches

a. **PREPARE** sketches, if necessary, **AND ATTACH** to the appropriate change package **OR** include in an IP with the Bill of Material.

(1) **USE** an EIP **OR** MIP drawing type, if desired, when the sketch(es) is larger than a standard page.

(a) **OBTAIN** the EIP **OR** MIP number from DCS.

(b) Do **NOT USE** the other IP types; they are no longer used with the standard design process.

b. For tubing, **FOLLOW** the sketch requirements outlined in Specification G1006.

c. Typically, designers/drafters **PREPARE** sketches.

d. **GENERATE** construction sketches, when necessary, for complex engineering changes where the installation work is shown on several different drawings.

(1) Example

- For an engineering change involving piping, electrical and I&C installation work, a plan view drawing showing pipe, conduit and tubing routing with power and control panel locations can be used.

e. **CONSIDER** using construction sketches for engineering changes requiring a C-1804 (installation clearances) walkdown.

f. **INCLUDE** references to the applicable permanent plant drawings on construction sketches.

(1) For the references, **INDICATE** which information on the composite is found on each design drawing.

5.4.7 Bill of Material

a. **SEE** Section 5.8.4 for guidance on ordering material, including long lead items.

5.4.7 (continued)

b. **INCLUDE** the bill of material (BOM) in the appropriate change package, drawing/sketch, or in an IP.

(1) **USE** an EIP **OR** MIP drawing type when the associated drawings do not provide a BOM **AND** there are too many items to be practical to put in the installation instructions in the change package **OR** when the IP includes sketches.

(a) **OBTAIN** the EIP **OR** MIP number from DCS.

(b) Do **NOT USE** the other IP types; they are no longer used with the standard design process.

NOTE

Engineered items are the devices that perform unique functions or possess characteristics for which the design relies upon.

(2) For engineered items, **INCLUDE** catalog numbers.

- **IF** a catalog number does not exist,

  THEN GENERATE a catalog number **PER** Section 5.8.4.

(3) For non-engineered items, **INCLUDE** catalog numbers, if known.

(a) **CONSIDER** entering “or equivalent” for the catalog number if there may be more than one acceptable catalog number for the item.

(4) As a part of the BOM, **INCLUDE** the quality class of each item.

5.4.8 EC Package Needs to Support Return to Service

a. At the end of Section B.1 (Description of Change) of the change package, **IDENTIFY** whether or not Station Engineering **AND/OR** Operations are required for Return to Service.

(1) **INCLUDE** partial numbers, as applicable.

5.4.8 (continued)

b. Partial Closure Strategy

(1) **IF** the potential exists that the engineering change will be installed with gaps between installation windows and components are being added,

THEN PLAN for a partial closure after each installation window is completed.

(a) This **ENSURES** that the configuration documentation of the plant is maintained in the as-built condition without undue delay and/or impact to the Energy Control Process.

(2) **CONSIDER** the need for a planned partial when adding components that are reflected in an Operations checkoff list (CL).

(a) Partial closure indicating pipe tight or ready for testing

(3) In Section C (Affected Documents list) of the change package, **ENTER** the associated partial number, if applicable, for affected documents under the Doc Update Requirements field.

(4) Under the CDL button for the ECWO in NIMS, **IDENTIFY** the partial number (**ENTER** 1, 2, 3, etc., in the Plan Partial # field) or final (**ENTER** F in the Plan Partial # field) for each change mechanism.

(5) Under the Pending Change button for the ECWO in NIMS, **IDENTIFY** the partial number (**ENTER** 1, 2, 3, etc., in the Plan Partial # field) or final (**ENTER** F in the Plan Partial # field) for each pending change.

(6) Under the Associated WMechs button for the ECWO in NIMS, **COMPLETE** the Partial # field by following the guidance in Step 5.5.1d.

5.4.9 Label Requests

NOTE

If a component that is being abandoned in place was used for blocking, then the revised label cannot be installed until the clearance is removed. This should be specified in the engineering change documents.

a. Prior to generating a label request, **ENSURE** that the pending change(s) is in Holding status.

5.4.9 (continued)

b. **OBTAIN** component labels in accordance with NDAP-QA-0324.

(1) The planner, field engineer, **OR** the Design Engineer **COMPLETES** label requests (AR/OPS/LRF).

(2) If necessary, **ATTACH** a spreadsheet to the Label Request Form, Form NDAP-QA-0324-1, instead of completing the form.

(a) **IF** a spreadsheet is used,

THEN INCLUDE the following information on the spreadsheet:

- Component ID
- Noun Name
- Save Code

(3) In ActionWay, **RELATE** the AR/OPS/LRF to the EC.

(4) In ActionWay, **RELATE** the AR/OPS/LRF to the installing PCWO(s).

c. When fabricated, Operations **GIVES** the labels to the originator of the AR/OPS/LRF.

(1) **GIVE** the labels to the Field Engineer to hold until the work group is ready to install them.

5.4.10 Additional Temporary Engineering Change Requirements

a. **NOTIFY** the Temporary EC Coordinator to enter the temporary engineering change request in the Temporary EC Log.

(1) The Temporary EC Coordinator **ENTERS** the following information in the Temporary EC log:

- The EC number
- EC title
- Lead Design Engineer
- System Engineer
- Unit
- Issue Date

5.4.10a(1) (continued)

- Forecast Removal Date
- Removal PCWO
- NO under Monitoring Only.

(2) **IF** the Temporary EC monitors a plant parameter only (e.g. temporary gauge, intrusive monitoring, etc.),

THEN the Temporary EC Coordinator **ENTERS** YES for Monitoring Only in the Temporary EC log.

b. **IF** the scope of the temporary engineering change being prepared is to reinstall a completed temporary engineering change where the completed temporary engineering change did not resolve the problem,

THEN CONSIDER that the temporary engineering change being prepared is a continuation of the closed temporary engineering change.

(1) **INCLUDE** in the title of the temporary engineering change being prepared, “Continuation of TCC/TDEC/TDC XXXXXXX”, where XXXXXXX represents the closed temporary engineering change number.

(2) **NOTIFY** Temporary EC Coordinator to use the installation date of the completed temporary engineering change on the Temporary EC Log.

(a) The installation date of the temporary engineering change **SHALL** be the installation date of the closed temporary engineering change for installation duration **AND** Performance Indicators.

(3) **PROCESS** a Temporary Engineering Change Extension **PER** NDAP-QA-1218, for the completed temporary engineering change.

(a) Original Forecast Removal Date **SHALL** be the Required Removal Date of the closed temporary engineering change.

(b) New Forecast Removal Date **SHALL** be the required removal date of the temporary engineering change being prepared.

(c) **ADD** the approved Temporary Engineering Change Extension into the backup package of the temporary engineering change being prepared.

5.4.10 (continued)

c. TMOD Tags

(1) **ADDRESS** TMOD tags/stickers **AND** status control **PER** NDAP-QA-1218.

5.4.11 EC Backup Coversheet

a. Backup **CONTAINS** supporting information for the engineering change.

b. **INCLUDE** the EC Backup Coversheet, Form NDAP-QA-1220-1 (Attachment E), as the first page of the backup package.

- **ADD** documents to the list as required.

c. Individual page numbering of backup documentation is **NOT** required.

d. Upon issuance of the engineering change, **TRANSMIT** the backup package to DCS with the engineering change package.

5.4.12 Review (Supplements IP-ENG-001)

a. **PERFORM** an Engineering Review for all engineering changes except quality related DCPs and TDCs in accordance with NEPM-QA-0241 and IP-ENG-001.

b. **PERFORM** a Quality Assurance Document Review (QADR) in accordance with NDAP-QA-0101 for all quality related ECs.

(1) **DOCUMENT** the review in one of the following ways:

(a) **DOCUMENT** on a Document Review form (form NDAP-QA-0101-1 & NDAP-QA-0101-2)

(b) **IF** there are no comments,

THEN DOCUMENT that the QADR review was performed with no comments in Section F under Summary of Verification on the change package.

c. For ASME Class 1 and Class MC components, a Registered Professional Engineer **CERTIFIES** engineering changes in accordance with the requirements of NEPM-QA-0241, when required.

d. **ATTACH** electronic documents as attached media in WMCMMAIN.

5.4.13 Design Verification (Supplements IP-ENG-001)

a. **PERFORM** design verification for all quality related DCPs and TDCs in accordance with NEPM-QA-0241 and IP-ENG-001.

5.4.14 Approval (Supplements IP-ENG-001)

a. **APPROVE** the engineering change in accordance with NEPM-QA-0241 and IP-ENG-001.

b. PORC Review

(1) The following engineering changes **REQUIRE** PORC review:

(a) Design changes that have a 50.59 Evaluation.

(b) Design changes that:

- Involve a safety-related SSC that affects a safety function.
- Involve non-safety-related SSCs where there is an effect to a safety-related SSC safety function.

(2) **PRESENT** these design change packages to PORC to obtain approval of the Plant Manager (or designee).

(3) **SUBMIT** the following documents, as a minimum, to PORC for the review:

- Design Change Package (only design change form required)
- 50.59 Screen
- 50.59 Evaluation, if required

(4) After the package is reviewed by PORC and recommended for approval, **OBTAIN** the Plant Manager approval.

(5) **OBTAIN** PORC review of the design change package and Plant Manager approval prior to moving the ECWO to Implement and prior to transmitting the package to DCS.

c. After approval, the lead design engineer **MOVES** the ECWO to Implement.

(1) **IF** the ECWO has a restraint to the Design step,

THEN ADDRESS the restraint prior to changing the status to Implement.

5.4.15 Issue to Document Control Services (DCS)

a. **ISSUE** approved engineering changes, excluding engineering changes that include safeguards documents, to DCS using Form NDAP-QA-0023-1, Document & Drawing Transmittal.

b. For safeguard engineering changes, **DELIVER** the entire engineering change package to Nuclear Security **PER** NDAP-QA-0902.

(1) **ENSURE** that documents that contain safeguards have the appropriate Safeguard statements **PER** NDAP-QA-0902 on all Safeguard document pages.

(2) Nuclear security will **PROCESS** the engineering change **AND DELIVER** the engineering change package, minus safeguards documents, to DCS.

c. If desired, **SUBMIT** information received as PDF files from vendors that are to be included in the EC Backup Package to DCS electronically as follows:

(1) **GIVE** the electronic document a name that starts with the EC number.

(2) **PLACE** the document in the following folder on the t drive:

T:\SSES810\Document Services\Staging Design Engineering

(3) **NOTIFY** DCS that the document was placed in the folder.

5.4.16 EC Revisions

NOTE

An engineering change revision is not required to add information to the backup package.

a. **REVISE** engineering changes **PER** IP-ENG-001.

b. Exceptions to when an EC Revision is required

(1) 50.59 Screen/Evaluation

(a) The revision to the document is a typographical error or an editorial change; there is no change in technical content.

(b) The document change does **NOT** require any of the other documents in the EC package to be changed.

5.4.16b(1) (continued)

(c) **IF** the criteria in steps (a) & (b) are met,

THEN COMPLETE the following actions; an EC Revision is **NOT** required:

- **REVISE** the document.
- **ENTER** ECWO Action Taken identifying the document that was revised and the revision number.
- **ENTER** ECWO Action Taken identifying that the other EC documents were reviewed and no changes to the other documents are required as a result of the document that was revised.
- **COMPLETE** an EC Backup Coversheet, **ATTACH** the revised document, **AND TRANSMIT** to DCS.

(2) Add a CDL Item

(a) **REVIEW** the entire EC Package to determine if any changes are required other than the missing CDL item or new IDCN to incorporate PCN(s).

(b) **IF** no changes are required to any part of the EC package,

THEN COMPLETE the following actions; an EC Revision is NOT required:

- **CREATE** CDL item change mechanism **AND RELATE** it to the EC.
- **ENTER** ECWO Action Taken identifying CDL item added.
- **ENTER** ECWO Action Taken identifying that the EC package was reviewed and no changes to the EC are required other than addition of the missing CDL item or new IDCN to incorporate PCN(s).
- **TRANSMIT** CDL items to DCS.

(3) Add a Pending Change

(a) **REVIEW** the entire EC Package to determine if any changes are required other than the missing Pending Change.

5.4.16b(3) (continued)

(b) **IF** no changes are required to any part of the EC package,

THEN COMPLETE the following actions; an EC Revision is **NOT** required:

- **CREATE** Pending Change **AND RELATE** it to the EC.
- **ENTER** ECWO Action Taken identifying Pending Change added.
- **ENTER** ECWO Action Taken identifying that the EC package was reviewed and no changes to the EC are required other than addition of the missing Pending Change.

(4) Add-a-Tag to a replacement item

(a) Installation in parallel with add-a-tag:

1) **ALLOWED** for class N components only

2) **OBTAIN** concurrence from SDE or EFIN.

3) **GENERATE** an AR/EWR to EFIN/SDE to complete the add-a-tag.

4) **LEAVE** the work order in 800 Working until the add-a-tag EWR is complete.

- SDE/EFIN **NOTIFIES** planning and/or the work group of any changes that affect the installation.

(b) **IF** the current revision of the replacement item is on an Engineering Change Coversheet Form MFP-QA-1220-1 **OR** a Commercial Change/Design Equivalent Change form **PER** IP-ENG-001,

THEN if desired, **PERFORM** an add-a-tag to the replacement item.

5.4.16b(4) (continued)

(c) **REVIEW** the entire EC Package to determine if any changes are required to any of the documents to cover the component to be added.

- The EC Package must **SUPPORT** the component to be added without any changes required to the Description, Comparison of critical characteristics/bounded technical requirements, Installation Instructions, Testing Required, and Affected Documents, excluding CDL items.

(d) **IF** no changes are required to the EC package,

THEN COMPLETE the following actions; an EC Revision is **NOT** required:

- **ADD** the component(s) under Affected Objects.
- **CREATE** CDL item changes and Pending Changes **PER** Sections 5.4.4i through 5.4.4q.
- **REVIEW** Routine Tasks and Spare Parts **AND TAKE** appropriate actions with regard to stocking and catalog information.
- **REVIEW** Software Quality Assurance and Cyber Security **AND TAKE** appropriate actions.
- **ENTER** ECWO Action Taken identifying component(s) added.
- **ENTER** ECWO Action Taken identifying that the EC package was reviewed and no changes to the EC are required for the additional component(s).
- **ENTER** ECWO Action Taken identifying Pending Change and CDL items added.
- **TRANSMIT** CDL items to DCS.

(5) Add-a-Tag to an existing BTT:

(a) **REVIEW** the EC/BTT evaluation, including the scope, installation, testing, ECE & ECCCs, criteria, and attachments, to determine if any changes are required to cover the add-a-tag.

- Impacted FCI sources are **NOT** included in this review.

5.4.16b(5) (continued)

(b) **IF** no changes are required to the BTT evaluation,

THEN COMPLETE the actions under step 5.4.16b(4)(d); a BTT revision is **NOT** required:

(c) **IF** changes are required,

THEN REVISE the EC/BTT to the appropriate EC type **PER** Attachment B.

(d) **IF** the BTT evaluation is in an AR/EWR or CRA,

THEN GENERATE an EC using the appropriate type **PER** Attachment B.

5.5 Planning Phase

5.5.1 Generate PCWOs

a. **PERFORM** all work associated with engineering changes using work orders (PCWO, RTPM, SPWO, or RTSV).

b. Planning, the field engineer, and/or Design Engineer **INITIATES** PCWOs, linked to the ECWO, for implementation of the engineering change.

(1) For tie-in PCWOs, **STATE** "TIE-IN" in the title of the PCWO.

(2) Station Engineering **GENERATES** test support PCWOs for TPs in accordance with NSEP-QA-0004.

(3) For digital items with limited information, **CONSIDER** generating a "learning" PCWO to set-up/determine configuration information prior to generating the engineering change.

c. Design engineers, field engineers, and planners **WORK** together to develop a breakdown of PCWOs for the engineering change.

NOTE

For temporary engineering changes, the same PCWO/RTPM cannot be used for installation and removal.

(1) **GENERATE** at least one WO for installation of a temporary engineering change, if needed.

(2) **GENERATE** at least one WO for removal of a temporary engineering change, if needed.

5.5.1 (continued)

d. Completion of Partial # Field for Work Orders

(1) The Design Engineer and/or the Field Engineer **ENTERS** information in the Partial # field.

(2) CCs, DECs, and DCPs

(a) For Work Orders that are specified in the EC, **ENTER** the following:

- Under the Associated WMech button for the ECWO in NIMS, **COMPLETE** the Partial # field.
- **IF** the WO supports a partial closure,

  THEN ENTER that associated partial number (e.g. P1, P2, P3, … or 1, 2, 3, …)
- **IF** the WO supports the Final or Full Closure,

  THEN ENTER F in the Partial # field.

(b) Work Orders related to the ECWO that are for work not specified in the EC, **ENTER** "NA" or "N/A" in the Partial # field.

1) Examples:

- Work Order is for job setup and/or cleanup
- Work Order is for scaffolding
- Work Order is a penetration breach and reseal only **AND** there is no change in the penetration design
- Work Order is for insulation **AND** the insulation does not require installation prior to return to service
- Work Order is for decon support
- Work Order that installs/removes temporary shielding **AND** there is no change to the permanent shielding design

5.5.1d (continued)

(3) TEC, TCC, TDEC, or TDC

(a) For Work Orders that are completing installation/removal and/or testing specified in the EC, **ENTER** the following:

- Under the Associated WMech button for the ECWO in NIMS, **COMPLETE** the Partial # field.
- **IF** the WO supports installation,

  THEN ENTER I in the Partial # field
- **IF** the WO supports removal,

  THEN ENTER R in the Partial # field.

(b) For other Work Orders, **ENTER** "NA" or "N/A" in the Partial # field.

5.5.2 Prepare & Process PCWOs

a. **PREPARE AND PROCESS** PCWO(s) in accordance with NDAP-QA-0502, Work Order Process.

b. Temporary Engineering Change WOs

(1) **ENSURE** the installation WO(s) are coded to the appropriate work window (e.g. NON-OUTAGE, U2RIO-SSCR, U118RIO, etc.)

(2) **ENSURE** the removal WO(s) are coded to the appropriate work window (e.g. NON-OUTAGE, U2RIO-SSCR, U118RIO, etc.)

(a) **IF** the removal is to occur NON-OUTAGE,

THEN NOTIFY the System Engineer, as required, to schedule the removal WO(s) **PER** NDAP-QA-1901, Susquehanna Station Work Management Process.

(3) **IF** repairs are required to remove the temporary engineering change,

THEN ENSURE that the scope of the repair is described in the removal WO that will perform the repairs.

5.5.2 (continued)

NOTE

Tie-in strategy may be moved from tie-in PCWOs to RLWOs for the tie-in PCWOs after the RLWOs are initiated in accordance with Step 5.6.1a.

c. For construction and tie-in PCWOs, **FOLLOW** the tie-in strategy outlined in Section D (Special Implementation Instructions) of the change package **AND** the Field Engineer or the Design Engineer **PERFORMS** one of the following: (Ref. NDAP-QA-0322 Section 6.3.6) [C-40]

(1) For a series evolution, **MAKE** all the prerequisite construction PCWOs a restraint to the tie-in PCWO in NIMS.

(a) If desired, **INCLUDE** a Prerequisite step in the tie-in PCWO indicating the PCWOs that need to be in at least 990 Closing.

(2) For a parallel evolution, **CHECK** the clearance required box in NIMS for the construction PCWOs.

(a) If desired, **INCLUDE** a Prerequisite step in the construction and tie-in PCWOs indicating the parallel installation.

d. Planning **CONFIRMS** that the 930 Engr Rvw block is checked in NIMS for all work orders that implement an engineering change, except for EC/RIEs and EC/BTTs.

(1) Do **NOT** uncheck the 930 Engr Rvw block, if checked, for EC/RIEs and EC/BTTs.

e. Promptly **IDENTIFY AND REQUEST** in NIMS material for each PCWO.

(1) The design engineer **REQUESTS** engineered items.

(a) **ENSURE** long lead items are ordered early enough to support target week/ outage material delivery requirements.

NOTE

Changes to the EC documents are **NOT** required when using alternate catalog numbers for non-engineered items as long as the alternate catalog number meets the item specified.

(2) Engineering or planning **REQUESTS** non-engineered items.

5.5.2e (continued)

(3) **IF** material is required to be installed in the plant simulator:

THEN PERFORM the following:

(a) **GENERATE** an administrative PCWO for this material.

(b) **IDENTIFY** the "simulator" as the affected object.

(c) **REQUEST** the material.

(d) **NOTIFY** the Learning Center personnel of the PCWO under which the material is ordered.

f. **INCLUDE** a copy of the approved EC in the WO package.

g. For temporary engineering changes, **INCLUDE** the following additional items in the WO package:

- Temporary Engineering Change Installation/Removal Instructions form (Form NDAP-QA-1218-9/10)
- Temporary Engineering Change Tag Status Control Sheet (Form NDAP-QA-1218-11)
- TMOD Tags and/or stickers (installation only)

h. For generic engineering changes, the planner **GENERATES** an AR/EWR to Design Engineering.

(1) **IDENTIFY** the component(s) that will be changed in accordance with the generic engineering change.

(2) **SPECIFY** "Complete the appropriate IDCNs and Pending Changes for the identified component(s)."

(3) **RESTRAIN** the AR/EWR to the implementing WO.

i. **WHEN** planning is complete,

THEN PROVIDE a hardcopy or electronic copy of the PCWO(s) to the Field Engineer or Lead Design Engineer for review.

NOTE

Technical Review of WOs is limited to WOs that include engineering change related installation. Support WOs and other WOs that have N/A in the partial # field **PER** Step 5.5.1d do **NOT** require technical review.

5.5.3 Engineering Technical Review of PCWOs

a. For all EC subtypes except RIEs and BTTs, the design engineer **OR** field engineer **PERFORMS** a technical review of the PCWO.

(1) **PERFORM** the review after the planner has completed the work instructions, all material has been ordered, and the WO package is prepared.

b. **REVIEW** the work package to ensure the following:

(1) **ENSURE** that the planner translated the engineering change requirements into work instructions for the work group to implement

(2) **ENSURE** that the requirements of Step 5.5.2c are met.

(3) **ENSURE** that engineered and non-engineered material is identified and ordered.

- **IF** the material was ordered in the PCWO by an engineer,

  THEN another engineer **OR** a planner **REVIEWS** the material selection in NIMS. [C-34]

NOTE

The documented review signature may be a typed name below the Planners name as long as the NIMS workflow shows the PCWO was in the reviewer's inbox during/after planning.

c. **DOCUMENT** the review by signature under the Planner's name on the work plan.

d. After the review, **RETURN** the PCWO to Planning.

e. **WORK** with Planning to get the comments incorporated.

NOTE

Replacement items are excluded from the 30 month review requirements.

5.5.4 30 Month Review

a. **PERFORM** a 30 month review for issued ECs that have been deferred.

(1) **IF** installation is in progress (PCWO in 800 working),

THEN a 30 month review is **NOT** required.

(2) The status of the ECWO in NIMS will be "Design" with a sub status of "30 month".

b. **WHEN** approved by the Manager - Design Engineering,

THEN EXEMPT generic ECs from the 30 month review requirement.

(1) **DOCUMENT** the approval in the Action Taken of the ECWO.

(2) **RETURN** the ECWO to Implement.

c. **WHEN** the EC installation has been deferred (installation has not been performed within 30 months of the last revision issue date **OR** last 30 month review) **AND** installation is not in progress (no EC required PCWOs in 800Working),

THEN RESTRAIN the engineering change from installation in accordance with Section 5.8.1.

(1) Design Engineering Supervision **MONITORS** the age of ECs.

(2) **WHEN** an EC is in IMPLEMENT **AND** it has been 30 months since the last issue date **OR** last 30 month review,

THEN PERFORM the following:

(a) **MOVE** the EC back to Design.

(b) **ENTER** “30 Month” for the Sub Status.

(c) **GENERATE** an AR/EWR restraint to complete the 30 month review.

- **ENTER** a due date for the EWR that is at least 11 weeks prior to the planned EC implementation.

d. Until the 30 month review is completed, do **NOT INSTALL** the engineering change.

5.5.4 (continued)

e. **PERFORM** the following:

(1) **CONFIRM** the engineering change type and subtype are correct in accordance with this procedure **AND CHANGE** as required.

(2) **CONFIRM** that no commitment dates (e.g., Regulatory, Condition Report Corrective Action, etc.) are violated.

(3) **ENSURE** that installation is still warranted **OR CANCEL** the engineering change in accordance with this procedure.

(4) **PERFORM** the 30 Month review **PER** IP-ENG-001 Attachment 2 Step 4.3 Engineering Review Criteria.

(5) **REVISE** the engineering change, if required, in accordance with Section 5.4.16 of this procedure.

(a) **IF** the review determines that there are no changes required to the engineering change package,

THEN DOCUMENT the 30 month review in the ECWO Action Taken.

f. The lead design engineer **MOVES** the ECWO back to Implement.

5.6 Installation/Testing Phase

5.6.1 EC Installation

a. After the RLWO(s) is generated for a tie-in PCWO, if desired Project Management **TRANSFERS** the tie-in strategy from the tie-in PCWO(s) to the RLWO.

(1) **ADD** construction PCWO(s) to the RLWO as a restraint.

(2) Project Management **REVIEWS** the restraint(s) added to the RLWO to confirm that it matches the strategy in Section D (Special Implementation Instructions) of the change package.

(a) **ENSURE** that the reviewer is not the person who performed Step (1).

(3) **REMOVE** the construction PCWO(s) restraint from the tie-in PCWO(s).

5.6.1 (continued)

b. Design Engineering **RECOMMENDS** that drawing IDCNs in an engineering change be free of PCNs prior to installation.

(1) **IF** there is more than 1 PCN against a drawing,

THEN CONSIDER generating a new IDCN incorporating the PCN.

(2) **IF** any PCN is extensive, changes more than 25% of the IDCN,

THEN CONSIDER generating a new IDCN incorporating the PCN.

c. The work group **INSTALLS** the engineering change in accordance with the work instructions.

d. As directed by the EC and the WO work instructions, the work group **INSTALLS AND VERIFIES** installation of the component labels.

e. The work group **TESTS** the engineering change in accordance with the work instructions.

5.6.2 Monitor Installation & Testing

a. The field engineer **MONITORS** the progress of installation and testing for the engineering change. [C-25]

(1) **VERIFY** that the installation and testing is correct by personal inspection, whenever practical.

(2) **IF** the tie-in strategy identified in Section D (Special Implementation Instructions) of the change package changes,

THEN GENERATE an FCR/EC revision to reflect the changes **PER** Section 5.6.2b.

(a) **EVALUATE** the PCWOs **AND WORK** with Planning to update the restraints and clearance order requirements.

(3) **ENSURE** satisfactory completion of functional/component testing.

5.6.2 (continued)

b. Engineering Change Package Field Changes

(1) **UPDATE** the EC Package to reflect changes in accordance with IP-ENG-001.

(a) **USE** the FCR Revision process in IP-ENG-001 Attachment 8.

- **IF** initiated by the design engineer **AND** there is no impact to field work,

  THEN BYPASS the FCR process **AND GENERATE** an EC Revision.

(2) **INITIATE** a PCN in accordance with MFP-QA-4002.

(a) Do **NOT** use PCNs to make design changes.

(b) Do **NOT** use PCNs to make changes that affect the design Inputs or design requirements.

NOTE

For EC packages with a quality class of N, generating PCNs to drawings may be deferred to the end of the installation to reflect the final configuration.

(c) On PCNs to drawings, **SHOW** all IDCN information as well as the PCN changes.

(d) PCNs against IDCNS that are safeguards

- **ENSURE** that if the document contains safeguards it has the appropriate Safeguard statements **PER** NDAP-QA-0902 on all Safeguard document pages.
- **TRANSMIT** the PCN in accordance with Step 5.4.15b of this procedure.

(3) **GENERATE** a CR for any PCN where Category 2A or 2C is selected.

(4) **WHEN** changes are made to an EC that makes any changes in the installation **AND** the other unit/division/loops is designed or being designed but is not yet installed,

THEN GENERATE an AR/EWR to evaluate/make changes to the sister EC.

c. **COMPLETE** changes to NIMS pending changes in accordance with MFP-QA-4004.

5.6.2 (continued)

d. **UPDATE** PCWO, Pending Change, and CDL partial plan numbers in NIMS, as appropriate.

(1) For WOs, **FOLLOW** guidance in Step 5.5.1d.

(2) For pending changes and CDL, **FOLLOW** guidance in Step 5.4.8.

(3) **OBTAIN** lead design engineer concurrence, as appropriate.

NOTE

The need for partial closures should have been identified as part of the engineering change design package. These are planned partial closures.

e. Unplanned Partial Closures

(1) **IF** performing an unplanned partial closure,

THEN the Field Engineer **GENERATES** an EC Revision **PER** IP-ENG-001 to update the closure strategy in Section D (Special Implementation Instructions) of the change package.

(2) **PROCESS** Return to Service when the EC has been revised.

(3) **UPDATE** PCWO, Pending Change, and CDL partial plan numbers in NIMS, as necessary.

f. **PROCESS** an Unplanned Partial Closure when all of the following conditions are met:

- An EC is partially installed with no ongoing installation.
- The partially installed EC added components or changed configuration such that there could be issues with the Energy Control Process.
- At least one PCWO is completed and in 990 Closing.
- The remainder of the EC is not scheduled to be installed or installation is scheduled to start over four weeks after completion of the partial installation.

5.6.2 (continued)

g. **IF** a closure that includes Class 1 and/or Class 2 drawings is planned to be processed on a Friday afternoon, a weekend, **OR** holiday (outside of a refuel outage),

THEN NOTIFY DCS that the closure is planned so that they can make arrangements for posting the Class 1 and 2 drawings to meet the 24 hour requirement.

5.6.3 Work Order Closeout

a. **WHEN** the field work is complete for a work order,

THEN the work group **COMPLETES** the foreman review of the work package.

b. **WHEN** the foreman review is complete,

THEN the work group **MOVES** the work order to 930 Engineering Review in NIMS **AND DELIVERS** the work package to the Design Engineer.

(1) Work orders that install replacement items do **NOT** require a 930 Engineering Review unless there are Weld Documents **OR** ASME Code Program Forms.

(2) **SEE** Step 5.6.3e for when 930 Engineering Review may be omitted for other work orders.

c. For work orders related to EC/RIEs and EC/BTTs

(1) The foreman **IDENTIFIES** if the RIE/BTT was installed via a Trend Code in NIMS.

(2) The foreman **TAKES** the work order from 910 Foreman Review to 990 Closing.

(3) **WHEN** the work order is in 990 Closing,

THEN Site Design **PROCESSES** the EC/RIE or EC/BTT in NIMS **PER** Step 5.6.3i.

d. 930 Engineering Review

(1) The Design Engineer (or SE Computer group for computer WOs) **OR** Field Engineer **REVIEWS** the hardcopy work order as follows:

(a) **REVIEW** the Action Taken to ensure that the scope of the engineering change work and/or testing has been performed.

5.6.3d(1) (continued)

(b) For an installation that is accessible, **PERFORM** a walkdown to review the physical installation.

(c) **REVIEW** Weld Documents **PER** NDAP-QA-1208.

(d) **PERFORM** a post work review of the ASME Code Program Form, if applicable, **PER** MT-AD-522

(e) **ENSURE** satisfactory completion of functional testing.

(f) **IF** appropriate and labels were installed,

THEN CLOSE the associated AR/OPS/LRF.

(g) **RETURN** the hardcopy work order to the work group as necessary to address discrepancies, errors, and omissions.

- In NIMS, **REFUSE** the work order **AND ENTER** the reason for the refusal as a comment under Refuse.
- **GENERATE** a CR for significant errors/oversights.

(2) Once the work order has been reviewed, **PERFORM** the following:

(a) **SIGN AND DATE** the coversheet for the work order

(b) **ADVANCE** the work order to 990Closing in NIMS

(c) **DELIVER** the hardcopy work order to the Functional Unit clerk for further processing in accordance with NDAP-QA-0502

e. If desired, **OMIT** the 930 Engineering Review if all of the following conditions are met.

- The engineering change is for SSCs with a quality class of N.
- The work instructions are simple/straightforward.
- There are no Weld Documents **OR** the document post work reviews have already been completed.
- There are no ASME Code Program Forms in the work order **OR** the 522 post work reviews have already been completed.
- There were no issues or questions raised during the physical work.
- The lead design engineer concurs.

5.6.3 (continued)

f. **IF** a 930 Engineering Review is to be omitted **PER** Step 5.6.3e,

THEN PERFORM the following:

(1) **UNCHECK** the 930 Engr Rvw box in NIMS.

(2) **MONITOR** the work so that the workflow can be moved to Return to Service in accordance with Step 5.6.3h.

g. **WHEN** at least one work order is in 990 Closing status,

THEN if desired, **MOVE** the NIMS ECWO status to Return to Service – Field.

NOTE

1. Support work orders do not need to be closed in order for the EC closure to be processed (e.g., scaffolding, or routine insulation SPWOs).
2. In-service leak inspections that have been transferred to an alternate WO using a PMT traveler (reference PSP-29) do not need to be performed in order for the EC closure to be processed.

h. **WHEN** all the work orders required (for the Partial, Final, temporary engineering change installation, etc.) are in 990 Closing status,

THEN MOVE the NIMS ECWO status in NIMS to Return to Service – Field.

(1) **FOLLOW** the closure strategy outlined in Section D (Special Implementation Instructions) of the change package, if applicable.

i. EC/RIEs and EC/BTTs

(1) **PERFORM** a cursory review of EC/RIE or EC/BTT work order, after the work order is in at least 990 Closing, to ensure that the RIE was installed.

- A review in accordance with Step 5.6.3d is **NOT** required.
- The review can be electronic in NIMS, such as review of WMWOMAIN screen.

(2) **WHEN** the review is complete,

THEN MOVE the ECWO to RTS-FE.

(3) For EC/RIEs and EC/BTTs that were **NOT** installed via the work order, **DELETE** the work order from the EC/RIE or EC/BTT Associated WMechs in NIMS **AND MOVE** the EC/RIE or EC/BTT back to Shelf.

NOTE

PCWOs for existing penetrations (excluding Primary Containment penetrations) that are affected by engineering changes do not require processing through the Return to Service steps. The closed PCWO (in at least 990Closing) signifies that the existing penetration is returned to service. (Reference NDAP-QA-0302)

5.6.4 Field Return to Service (RTS-FE)

NOTE

1. Support work orders do not need to be closed in order for the EC closure to be processed (e.g., scaffolding, or routine insulation SPWOs).
2. In-service leak inspections that have been transferred to an alternate WO using a PMT traveler (reference PSP-29) do not need to be performed in order for the EC closure to be processed.

a. **ENSURE** that all work orders required for the closure are in 990 Closing and the ECWO is in RTS-FE. (Reference Step 5.6.3h)

b. **ENSURE** that all PCNs have been approved and submitted to DCS for those drawings that will be posted for the closure.

c. **IF** there are any change mechanisms needed to support the closure that have a Status of Preliminary in NIMS **OR** are not in NIMS at all,

THEN NOTIFY DCS prior to marking RTS-FE complete.

(1) **ENSURE** that an Engineering Restraint for closure of RTS-DCS exists to complete the change mechanism.

(2) **DELIVER** these change mechanisms to DCS when completed.

d. ECOs, CCs, DECs, and DCPs

(1) In NIMS WMCMMAIN screen for the engineering change, **PERFORM** the following steps:

(a) In the Sub Status field, **ENTER** "Partial" or “Final”.

5.6.4d(1) (continued)

NOTE

IF a component that is being abandoned in place was used for blocking,

THEN the Pending Change cannot be submitted until the clearance is removed.

(b) Under the Pending Changes button, **PERFORM** one of the following:

1) **CHECK** the Partial block for all pending changes associated with the partial closure **AND SELECT** the Submit Partial button.

2) **SELECT** the Submit Final button.

(c) Under the CDL button, **PERFORM** one of the following:

1) **CHECK** the Partial block for all documents associated with the partial closure **AND SELECT** the Submit Partial button.

2) **SELECT** the Submit Final button.

(d) Under the RTS Info button, **PERFORM** the following:

1) **ENTER** the Scope of the closure (i.e., a summary of the change covered by the closure).

2) **COMPLETE** the FE Engineering Change Closure questions (Seq 1-4) by entering Yes, No, or N/A in the Value field.

3) **IF** an answer is No,

THEN EXPLAIN why in the Comment field.

4) **IF** the answer to question 2 (functional testing) is Yes,

THEN IDENTIFY the testing that has been completed.

(2) After Section (1) is complete, electronically **SIGN** the ECWO in NIMS.

(3) **NOTIFY** the person for the next workflow step (System Engineer, Operations, or DCS) that the ECWO is to them in NIMS.

5.6.4 (continued)

e. Temporary Engineering Changes (TDC/TEC/TDEC/TCC)

(1) For temporary engineering change installations, **GENERATE** an AR/EWR to Station Engineering to perform periodic reviews of the installed temporary change in accordance with NDAP-QA-1218.

(a) In ActionWay, **RELATE** the AR to the EC.

(2) In NIMS WMCMMAIN screen for the engineering change, **PERFORM** the following steps:

(a) In the Sub Status field, **ENTER** "INSTALLED" or “REMOVED”.

(b) Under the CDL button, **SELECT** the Submit Final button.

(c) Under the Pending Changes button, **PERFORM** the following:

1) **CHECK** the Partial block for all pending changes associated with the installation/removal.

2) **SELECT** the Submit Partial button.

(d) See Step 5.6.4d(1)(d) for actions under the RTS Info button.

(3) After Section (2) is complete, electronically **SIGN** the ECWO in NIMS.

(4) **NOTIFY** Nuclear Training if the Simulator model is affected by the temporary engineering change.

(5) **NOTIFY** the person for the next workflow step (System Engineer, Operations, or DCS) that the ECWO is to them in NIMS.

(6) **NOTIFY** the Temporary EC Coordinator to update the Temporary EC Log indicating that the temporary engineering change is installed/removed.

f. Generic Engineering Change, REP, RIE, or BTT

(1) In NIMS WMCMMAIN screen for the engineering change, **PERFORM** the following steps:

(a) In the Sub Status field:

1) **ENTER** "PARTIAL" if there is a work order related to the ECWO that is not in 990Closing or Archived.

5.6.4f(1)(a) (continued)

2) **ENTER** "FINAL" if all work orders related to the ECWO are in 990Closing or Archived.

(b) Under the Pending Changes button, **PERFORM** the following:

1) **CHECK** the Partial block for all pending changes associated with the component replaced in the work order.

2) **SELECT** the Submit Partial button.

(c) Under the CDL button, **PERFORM** the following:

1) **CHECK** the Partial block for all documents associated with the component replaced in the work order.

2) **SELECT** the Submit Partial button.

(d) See Step 5.6.4d(1)(d) for actions under the RTS Info button.

(2) After Section (1) is complete, electronically **SIGN** the ECWO in NIMS.

(3) **NOTIFY** the person for the next workflow step (System Engineer, Operations, or DCS) that the ECWO is to them in NIMS.

(4) For RIEs and BTTs, **COMPLETE** the Return to Service steps above within the following time frames:

- Within 5 business days of work order review **PER** Step 5.6.3i for affected components with a Quality Class of "Q"
- Within 15 business days of work order review **PER** Step 5.6.3i for affected components with a Quality Class other than "Q" and "N"
- Within 30 business days of work order review **PER** Step 5.6.3i for affected components with a Quality Class of "N"

g. **WHEN** Pending Change and CDL items are submitted in the RTS-FE step,

THEN APPLY OR POST the changes at that time.

NOTE

RTS-NSE can be completed by engineers outside of Station Engineering if determined appropriate.

5.6.5 Station Engineering Return to Service (RTS-NSE)

NOTE

Step 5.6.5a does not include ensuring that the CLs are issued.

a. **NOTIFY** the Operations Checkoff List Administrator to issue new CLs.

b. **ENSURE** that all procedure changes, excluding Operations procedures and CLs, required for the closure are issued.

(1) **REVIEW** the Affected Document list in the change form, as necessary.

c. For ECs that include digital devices, **ENSURE** that the Computer Group activities for the engineering change are complete.

d. **ENSURE** that changes to the Tech Specs and TRM have been submitted to the Control Room.

e. In NIMS WMCMMAIN screen for the engineering change, **PERFORM** the following steps:

(1) Under the RTS Info button:

(a) **REVIEW** the Scope of the closure.

(b) **COMPLETE** the SE Engineering Change Closure questions (Seq 1-4) by entering Yes, No, or N/A in the Value field.

(c) **IF** an answer is No,

THEN EXPLAIN why in the Comment field.

f. After Step e. is complete, electronically **SIGN** the ECWO in NIMS.

g. **NOTIFY** the person for the next workflow step (Operations or DCS) that the engineering change is to them in NIMS.

5.6.6 Operations Return to Service (RTS-OPS)

a. **ENSURE** that all Operations activities, including Operations procedure and CL changes, required to support return to service and operability, if necessary, have been completed.

(1) **REVIEW** the Affected Document list in the change form, as necessary.

NOTE

The following step does not include functional testing. Functional testing is confirmed to be complete in the RTS-FE step.

b. **ENSURE** that all required testing to return the system to service and operability, if necessary, has been completed (review of RLWOs).

c. **DETERMINE** if the engineering change imposes a new source for injection of external energy or impacts blocking of plant equipment.

d. In NIMS WMCMMAIN screen for the engineering change, **PERFORM** the following steps:

(1) Under the RTS Info button:

(a) **REVIEW** the Scope of the closure.

(b) **COMPLETE** the OPS Engineering Change Closure questions (Seq 1-3) by entering Yes, No, or N/A in the Value field.

(c) **IF** an answer to question 1 or 2 is No,

THEN EXPLAIN why in the Comment field.

e. After Step d. is complete, electronically **SIGN** the ECWO in NIMS.

f. **NOTIFY** DCS that the engineering change is to them in NIMS.

5.6.7 DCS Return to Service (RTS-DCS)

a. **UPDATE** the Control Room (stick 127) and Work Control Center (stick 53) stick files with all drawing change mechanisms for Class 1 and 2 drawings.

(1) **UPDATE** the sticks within 24 clock hours from receipt of Return to Service in NIMS by DCS. [C-35]

(a) The clock **STARTS** when the ECWO enters the RTS-DCS workflow step.

5.6.7a (continued)

(2) For a listing of drawings submitted, **REVIEW** the most recent CDL Report that can be found under Attached Media for the ECWO.

b. During Refuel Outages, **UPDATE**, within 24 clock hours, the Outage Control Center (stick 10) Class 1 and 2 drawings.

c. POST drawing change mechanisms in accordance with DCS procedures.

(1) **POST** and do **NOT** incorporate IDCNs for temporary engineering changes.

d. **COMPLETE** posting and physical hanging of Class 1 & 2 drawings to mark RTS-DCS complete.

e. For temporary engineering changes that have been removed, **VOID** all IDCNs associated with the temporary engineering change.

f. In NIMS WMCMMAIN screen for the engineering change, **PERFORM** the following steps:

(1) Under the RTS Info button:

(a) **COMPLETE** the DCS Engineering Change Closure questions (Seq 1) by entering Yes, No, or N/A in the Value field.

(b) **IF** the answer is No,

THEN EXPLAIN why in the Comment field.

g. After Step f. is complete, electronically **SIGN** the ECWO in NIMS.

h. **NOTIFY** work groups of a partial closure in accordance with applicable DCS instructions, if required.

NOTE

Design Record Closeout should be completed within 90 days of the EC Final Closure.

5.7 Design Closure Phase

5.7.1 Closeout Activities performed

a. **ISSUE** all drawing revisions to incorporate Class 1 and Class 2 drawing changes in accordance with MFI-4001.

b. **ENSURE** all NIMS Design Component Pending Changes have been applied in accordance with MFP-QA-4004.

5.7.1 (continued)

c. **ENSURE** all engineering restraints have been removed.

5.7.2 After the activities in Section 5.7.1 are completed, the NIMS workflow automatically **MOVES** to COMPLETED (or SHELF).

5.7.3 EC Process End Point

a. The engineering change process **ENDS** when the engineering change is in Completed status.

5.7.4 Shelf

a. **PLACE** engineering changes that will be used again in Shelf.

- Replacement items that can have additional components added
- Generic engineering change that still has affected objects to be modified
- Temporary engineering changes that will be reinstalled at a later date
- EC that has been installed and that will be revised at a later date to add another unit/division/loop

b. **RETURN** engineering changes in Shelf to Design at a later date for further engineering/drafting.

c. **IF** it is desired to move an ECWO from Shelf to Completed in NIMS,

THEN electronically **SIGN** the ECWO.

NOTE

An EC cancellation does not have to be processed to change an engineering change type/subtype (e.g., from a DEC to a DCP).

5.7.5 EC Cancellation

a. **INITIATE** an EC Cancellation **PER** IP-ENG-001 Attachment 2.

b. **ENSURE** that ECWO NIMS Workflow is configured properly to support the cancellation.

(1) **REFUSE** the ECWO in NIMS to "design" status.

(2) **SET** NIMS Workflow as follows:

- Implement – turned off.

5.7.5b(2) (continued)

- RTS-FE – turned on.
- RTS-SE – turned off.
- RTS-OPS – turned off.
- RTS-DCS - turned on if there are FCI source changes to be voided.
- Shelf – turned off.

c. Engineering **PERFORMS** the following in support of cancellation of ECs not yet being installed:

(1) **IF** calculations have been created or revised,

THEN GENERATE an AR/EWR to Design Engineering to revise/cancel the affected calculations to eliminate the impact of the engineering change.

(a) In ActionWay, **RESTRAIN** the Design Record Closeout (DSGN CLS) step for the EC.

(2) **IF** PCWOs have been created,

THEN PERFORM one of the following:

(a) **GENERATE** an AR/MAINT-PLANNING to Planning to close and cancel the associated PCWOs.

- In ActionWay, **RESTRAIN** the Design Record Closeout (DSGN CLS) step for the EC.

(b) Field Engineer or Design Engineer **CANCELS** the associated PCWOs prior to processing RTS-FE.

(3) **IF** NIMS Pending Changes have been prepared,

THEN DELETE/CANCEL all Pending Changes.

(4) **NOTIFY** Nuclear Regulatory Affairs (via e-mail or an AR/NRA) to cancel all LDCNs issued against the engineering change.

(5) The lead design engineer **MOVES** the ECWO to RTS-FE.

(6) In the RTS-FE step, **PERFORM** the following:

(a) In the Sub Status field, **ENTER** "Cancelled".

5.7.5c(6) (continued)

(b) Under the RTS Info button:

1) **ENTER** "EC cancelled" for the Scope.

2) **COMPLETE** the FE Engineering Change Closure questions by entering N/A in the Value field.

(c) **MOVE** the ECWO to RTS-DCS.

(7) In the RTS-DCS step, DCS **VOIDS** all change mechanisms for the engineering change.

5.8 Additional Program Elements

5.8.1 Engineering Restraints

a. Engineering restraints **RESTRICT** the ECWO workflow (e.g., design issuance, equipment return to service, design record closeout) when completion of an engineering activity is required and has not yet occurred.

b. **ISSUE** any engineering restraint that restrains physical work in the plant against the specific PCWOs and not the EC itself.

c. **MINIMIZE** the use of engineering restraints.

(1) The engineering change package should be issued with all design complete.

d. Use of an engineering restraint **REQUIRES** approval of the Design Engineering Branch Manager.

e. If necessary, **ISSUE** engineering restraints for the following:

- Obtain support of the design effort (e.g. calc support, CRT support, etc), from engineering groups (Reactor Engineering, Station Engineering, and/or Design Engineering).
- Provide impact review by affected groups during the design process.
- Calculations required to support the design are not approved.
- Nuclear Regulatory Affairs has not approved the LDCN(s).
- Design information has not been received and evaluated.
- Verification of assumptions.
- 30 month reviews

5.8.1e (continued)

- Any other condition at the discretion of the Design Engineering Branch Manager.

f. Do **NOT** use an engineering restraint for completion of a 50.59 and/or 72.48 Screen **OR** a Fire Protection Program Screen.

g. **USE** an AR to restrain the specific activity associated with the engineering change that is impacted by the restraint. (e.g., EC, PCWO).

(1) To restrain a step in the EC workflow, **RESTRAIN** the process when the AR is generated.

(a) For the AR in ActionWay, **ENTER** "RESTRAINS" **AND** the workflow step that cannot be exited until the restraint is complete.

- **ENTER** RESTRAINS RTS-FE or RESTRAINS RTS-NSE for items required for Operability or Return to Service.
- **ENTER** RESTRAINS RTS-DCS for CDL items that are not required for Operability or Return to Service.
- **ENTER** RESTRAINS DSGN CLS for other (non-CDL) items that are not required for Operability or Return to Service.

(b) For actions that restrain DSGN CLS, **ENTER** a due date within 60 days of the anticipated final closure date to support completion of DSGN CLS within 90 days.

(2) To restrain a work order, **RELATE** the work order to the AR/EWR in ActionWay.

(a) **ENTER** "RESTRAINS" as the Relationship.

h. **USE** the following format for the engineering restraint AR/EWR:

(1) For the Summary, **ENTER** "Engineering Restraint" at a minimum.

(2) For the Description

(a) **STATE** "Step Restrained:" **AND ENTER** the following:

1) The EC workflow step that is restrained

2) "PCWO implementation" for restrained work orders

5.8.1h(2)(a) (continued)

3) Examples

- Step Restrained: Design Record Closeout
- Step Restrained: PCWO implementation

(b) **STATE** "Action Required:" **AND ENTER** what specific actions need to be completed to remove the restraint.

1) Examples

- Action Required: Issue LDCN XXXX.
- Action Required: Complete NIMS Pending Changes and process to Holding status.
- Action Required: Issue calculation EC XXX XXXX.

(c) As necessary, **ADD** a third section that starts with the statement "Additional Information:"

1) **INCLUDE** any information that is needed to complete the required action.

2) Example

- Additional Information: The calculation needs to be revised to address the change in motor weight after the information is received.

i. **DOCUMENT** the disposition of the restraint in the AR Comments section.

5.8.2 After Action Review (AAR)

a. **PERFORM** an AAR for the following:

(1) Any EC where the Supervisor/Branch Manager identifies during the pre-job brief that a post-job brief is required.

(2) When determined necessary by the Supervisor/Branch Manager due to design, installation, **OR** testing issues

b. **IF** an AAR is required,

THEN GENERATE an AR/EWR/AAR.

(1) In ActionWay, **RELATE** the AR/EWR to the EC.

5.8.2b (continued)

(2) **RESTRAIN** the DSGN CLS step **PER** Section 5.8.1.

(3) **ENTER** a due date of 30 days beyond the planned Final Closure of the EC.

c. The Lead Design Engineer and/or the Project Manager **COMPLETE** the AAR within 30 days after Final Closure for the Engineering Change has been processed.

(1) **USE** Attachment H, Engineering Change After Action Review (Form NDAP-QA-1220-2), to document the AAR.

(2) The Lead Design Engineer and/or the Project Manager **FACILITATES** the AAR.

(3) The AAR should **CONSIDER** sister ECs (other unit/division/loops) that are not yet installed and potential changes to them as a result of lessons learned.

(4) **ATTACH** the completed AAR Form to the AR/EWR.

(5) **GENERATE** AR/EWRs for actions that require follow up.

(a) **RELATE** these actions to the AR/EWR/AAR.

5.8.3 Abandoned SSCs

a. **DELETE OR ABANDON** in place plant components by an Engineering Change.

(1) This **ASSURES** that the operating, design, and licensing bases are consistently maintained.

b. **EVALUATE** deleting versus abandoning in place of plant components on a case by case basis.

(1) This is a business decision based on cost/benefit, safety, and ALARA considerations.

NOTE

For abandoning components, the philosophy is that of "energy isolation".

c. In the engineering change, **ENSURE** that there can be no "energy" (such as power, fluid flow, etc.) transferred from the abandoned component to the operating facility, or vice versa, by either human error, or plant transient.

5.8.3 (continued)

d. **IF** the decision is that the component(s) will be abandoned in place,

THEN the EC Team **DETERMINES** whether a physical isolation or a passive isolation will be employed.

- The type of isolation used is based on safety significance, cost/benefit, and ALARA considerations.
- Physical isolation is the preferred method of abandonment.

e. Boundary Criteria

NOTE
There are two methods in which plant components may be abandoned in place.

(1) Physical isolation of plant components

(a) Physical isolation is where the abandoned component is physically disconnected from the plant.

- There is a physical break in the pipe, duct, cable, etc. such that the two "sides" no longer communicate.

(b) Examples:

- De terming and pulling back cables
- Installing blind flanges or caps in piping systems

(2) Passive isolation of plant components

(a) Passive isolation is where the abandoned component is **NOT** physically disconnected from the plant.

- There is an existing component in the pipe, duct, cable, etc. that can be "closed" (mechanically) or "opened" (electrically) to separate the two "sides".

(b) Examples:

- Closing and locking valves
- Operations procedures prevent breaching of boundary

5.8.3e (continued)

(3) **ADDRESS** the separation and isolation of abandoned in place components by category.

(a) Mechanical Components (pumps, valves, tanks, HVAC, etc.)

1) Passive Isolation

- As a minimum, passive isolation of a SSC **INCLUDES** closed and locked valves or dampers that are controlled by Operating Procedures.

2) Physical Isolation

- Physical Isolation of a SSC **INCLUDES** installation of blind flange(s)/cap(s) in piping or blank plates for HVAC ductwork.

(b) Electrical Components (cable, raceway, breakers, instruments, panels, etc.)

1) Passive Isolation

- As a minimum, passive isolation of a SSC is by de-terming at the source of the power supply.
- Do **NOT** use an open breaker for isolation; it is a standard plant practice that the normal position of all breakers is closed.

2) Physical Isolation

- As a minimum, physical isolation of a SSC is by de-terming at the source of the power supply.

(4) The boundary component used in passive isolation is **NOT** considered to be abandoned.

5.8.3 (continued)

f. Configuration Control

(1) Abandoned Components

(a) In the NIMS component database, **INSERT** ABAND in the Design Status block for all abandoned in place components.

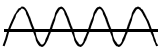
- For passive abandonment, the component that provides the passive abandonment boundary (such as a locked closed valve) is **NOT** considered abandoned in place **AND** does **NOT** have the design status changed to ABAND.
- For passive abandonment, **IF** a component to be abandoned is to be used for blocking,

  THEN the Pending Change can **NOT** be applied until the clearance is removed.

(b) For passive abandonment, **IDENTIFY** the following on drawings, as a minimum:

- the boundaries for SSCs that are abandoned **AND**
- the boundary component position.

(c) For physical abandonment, **IDENTIFY** the following on drawings, as a minimum:

- the break(s) in pipe, duct, cable, etc. **AND**
- a squiggly line () over the components that are abandoned.

(d) Deleted But Installed (DBI) Cable

- The Cable and Raceway Information Management Program (CRIMP) **IDENTIFIES** all DBI cable.
- DBI'd cable is **NOT** typically noted as being DBI on Electrical design drawings.
- **REMOVE** cable that is being changed to DBI status from Electrical Schematic Diagram and Loop Diagram drawings.

5.8.3f(1)(d) (continued)

- **CONTINUE** to show DBI cable that remains terminated on Electrical Connection / Wiring Diagram and Connection List drawings.

- **IF** the DBI cable is being de-terminated in a panel or terminal box,

  THEN REMOVE the cable from the Electrical Connection / Wiring Diagram or Connection List drawing that shows the termination.

(2) Deleted Components

(a) In the NIMS component database, **INSERT** DELETE in the Design Status block for all deleted components.

(b) **REMOVE** the component(s) from drawings.

(c) **VOID** drawings where the information is completely deleted.

g. Field Labeling

(1) **LABEL** the abandoned in place components with abandon in place tags **PER** NDAP-QA-0324.

(a) For passive abandonment, the component that provides the passive abandonment boundary (such as a locked closed valve) is **NOT** considered abandoned in place **AND** does **NOT** receive an abandon in place tag.

(b) For passive abandonment, **IF** a component to be abandoned is to be used for blocking,

THEN the label cannot be changed until the clearance is removed.

(2) **CONSIDER** re-labeling additional components to eliminate confusion regarding SSC status.

(3) **REFER** to MT-GE-010 for labeling of spared or DBI electrical cabling.

(4) **CONSIDER** applying orange paint in stripes on abandoned in place equipment, such as pipe and supports.

5.8.3 (continued)

h. Updates of Managed Information

(1) As part of the EC:

(a) **IDENTIFY** if any maintenance (PMs) is required on the abandoned components for general preservation, safety impact item concerns, etc.

(b) **IDENTIFY AND DISPOSITION** (keep, revise, delete) any Routine Tasks (e.g., PMs) for the abandoned or deleted component(s).

5.8.4 Material

a. The Lead Design Engineer **IDENTIFIES AND ORDERS** the engineered material needed for an engineering change.

(1) For long lead items such as ASME Code valves, large pumps, large motors, large vessels, specialty cable, and skids, **ENSURE** that the materials that are a long lead items are identified and ordered as early as possible.

b. Planning in conjunction with the Field Engineer or Design Engineer **IDENTIFIES AND ORDERS** the non-engineered material needed for an engineering change.

c. **IF** the engineered material is not covered by an existing specification or Drawing M-199,

THEN GENERATE a specification to outline the material design requirements.

(1) **IF** the “engineered” material is not safety-related,

THEN if desired, **DOCUMENT** the unique design requirements on the Bill of Material instead of a specification

d. If possible, do **NOT** use components that are on the Defective Device List (DDL).

(1) **IF** a component on the DDL is used,

THEN INCLUDE in the EC Package why the component is acceptable to use.

e. Ordering Material

(1) **GENERATE** a Catalog Number in Asset Suite, if one does not exist for the component/subcomponent desired.

5.8.4e (continued)

(2) **ENTER** the material for the PCWO in NIMS.

NOTE

To be able to issue the CLs, Pending Changes will need to be applied. Pending Changes are applied after RTS-FE is completed.

5.8.5 Processing of Changes to Operations' Checkoff Lists (CLs)

a. Prior to EC closure **AND** if desired by Operations, **STAGE** changes to CLs so that implementation will not impede engineering change closure.

b. Prior to EC closure, the System Engineer **PROVIDES** a mark-up copy of the affected CLs to Operations.

(1) **INCLUDE** in this markup (as applicable) the following information:

- Component Id
- Noun Name Description
- Component position
- The component located in walkdown order.

c. Operations **PERFORMS** a pre-closure walkdown of the CL to ensure accuracy.

NOTE

Section 5.8.6 applies to RIEs generated prior to MFP-QA-1220 & NDAP-QA-1220.

5.8.6 Implementation of Old Process RIEs

a. **REVIEW** the RIE for documents/databases to be revised/updated after installation.

(1) **IF** "None",

THEN RETURN the EC/RIE to Shelf **AND** the remainder of section 5.8.6 is **NOT** applicable.

(2) **IF** documents and/or databases are identified,

THEN CREATE the change mechanisms prior to completion of RTS-FE to maintain configuration control.

5.8.6 (continued)

b. **WHEN** an old process RIE is used,

THEN REVIEW Routine Tasks and Spare Parts **AND TAKE** appropriate actions with regard to stocking and catalog information.

c. **GENERATE** an AR/EWR, if desired, to generate the Pending Changes and/or change mechanisms for the component(s) to be installed.

(1) In ActionWay, **RELATE** the EC to the AR **AND RESTRAIN** RTS-FE.

(2) If desired, the engineer **GENERATES** the Pending Changes and change mechanisms.

d. **IF** an AR/EWR is generated **PER** Step 5.8.6c,

THEN MOVE the ECWO to Implement.

e. **IF** Pending Changes and/or change mechanisms are to be completed by the assigned engineer,

THEN LEAVE the EC/RIE in Design until all Pending Changes and change mechanisms are prepared, reviewed, and approved.

(1) **WHEN** Pending Changes and change mechanisms have been approved,

THEN MOVE the ECWO to Implement.

f. After any change mechanisms are prepared, reviewed, and approved, **TRANSMIT** the change mechanisms to DCS.

g. **PROCESS** EC/RIEs from Implement to RTS-FE **PER** Sections 5.6.3 and 5.6.4f.

5.9 Unauthorized Changes [C-41]

5.9.1 **GENERATE** a CR to identify an unauthorized change.

5.9.2 **ENTER** the Trend Code for unauthorized engineering changes (UNAUTH MOD) in the CR.

5.9.3 **EVALUATE** whether the unauthorized change should be removed or if an engineering change should be processed to properly document the unauthorized change.

a. Station Engineering and Site Design **PROVIDE** input to the Screening Team for this action.

5.9.4 **IF** the unauthorized change is to be removed,

THEN PERFORM the following:

NOTE
The 50.59 screen does not authorize or justify leaving the unauthorized change installed.

a. Station Engineering **COMPLETES** a 50.59 Screen for the unauthorized change.

b. **REMOVE** the unauthorized change by the completion of the next refuel outage, if system & plant conditions allow.

c. Station Engineering **WORKS** with Work Management to ensure that the PCWO is scheduled for removal of the unauthorized change.

5.9.5 **IF** an engineering change is to be processed,

THEN PERFORM the following:

NOTE
The term generate is used to include new ECs, revisions to ECs, and adding components to ECs.

a. **GENERATE** the engineering change **AND PROCESS** return to service within 90 days.

5.10 Monitoring, Trending, and Performance Indicators

5.10.1 **UTILIZE** industry performance indicators to monitor the performance and effectiveness of the engineering change process.

a. Until the SDP Software is implemented at Susquehanna, **MAINTAIN** an FCR Reason Code log for all FCRs, PCNs, **AND/OR** EC Revisions.

5.10.2 **MONITOR AND TREND** quality aspects of the engineering change process to identify issues with human performance and overall process effectiveness, for continuous performance improvement.

a. **MONITOR** change type determination

b. **MONITOR** station engagement using IP-ENG-001 Attachment 9.

5.10.3 Design Engineering **SHALL CONDUCT** periodic self-assessments of the engineering change process, including temporary engineering changes, in accordance with LS-126 considering:

a. Performance indicator trends

b. NRC Inspection Manual(s) for permanent and temporary plant modifications.

5.10.4 Design Engineering **SHALL CONDUCT** benchmarking of the engineering change process, including temporary engineering changes, on a periodic basis in accordance with LS-126.

5.11 Transition Plan

5.11.1 ECs issued/approved under MFP-QA-1220

a. ECO/DCP revision necessary

(1) **REVISE** the EC **PER** IP-ENG-001.

OR

NOTE
Permission cannot be delegated to another person/position.

(2) **OBTAIN** permission from the Manager Design Engineering **OR** Engineering General Manager to complete the EC using MFP-QA-1220.

- **DOCUMENT** the approval on the EC Coversheet adding a line **AND** obtaining the approval signature in Block 11.

b. RIE

(1) **IF** a revision is **NOT** required,

THEN Add-a-tag to existing RIE **PER** this procedure.

(2) **IF** a revision is required,

THEN REVISE the RIE **PER** this procedure **AND** IP-ENG-001.

c. REP

(1) **IF** a revision is **NOT** required except to add a component,

THEN Add-a-tag to the existing EC/REP using RIE add-a-tag criteria in this procedure.

5.11.1c (continued)

(2) **IF** a revision is required,

THEN REVISE the EC **PER** this procedure **AND** IP-ENG-001.

- **CHANGE** the EC subtype in NIMS.

d. BTT

(1) **IF** a revision is **NOT** required,

THEN Add-a-tag to existing BTT **PER** this procedure.

(2) **IF** a revision is required,

THEN REVISE the EC **PER** this procedure **AND** IP-ENG-001.

(a) **CHANGE** the EC subtype in NIMS.

5.11.2 Non-EC Design Inputs approved prior to June 30, 2017

a. **REVISE** the Design Inputs using NEPM-QA-0231 **AND** this procedure.

OR

b. **OBTAIN** permission from the Manager Design Engineering **OR** Engineering General Manager to revise the Design Inputs using Form MFP-QA-1220-3.

- **DOCUMENT** the approval for using Form MFP-QA-1220-3 in the Scope Section of the Design Inputs.

END of Instructions

6.0 RECORDS

- All forms and documents generated by this procedure and IP-ENG-001 are considered Quality Assurance records and shall be processed in accordance with NDAP-QA-0023.

- **TRANSMIT** the engineering change and backup packages to DCS in accordance with NDAP-QA-0023

Attachment A, Utility Interfaces

B. The SDP refers to utility procedures for performance of aspects of the process. The following is the interpretation between SDP and Susquehanna procedures:

	SDP	**Susquehanna**
Initial Scoping Phase		
1.	Plant Health Process	ER-30, NDAP-QA-0405
2.	Budget/Financial Process	NDAP-00-0018 (capital), NDAP-00-1800 (capital), NDAP-00-0044, NDAP-QA-0405
3.	Project Management Process	NDAP-00-0044, NEPM-00-1167 (scoping), NDAP-00-0026 (major projects)
4.	Engineering Study Process	NEPM-QA-0221
5.	Document-Only Change Process	This procedure
6.	Temporary Configuration Change Process	NDAP-QA-1218
Conceptual and Detailed Design Phase		
7.	Pre-Job Brief Process	Section 5.4.1 & NDAP-00-1600
8.	Risk Assessment/Mitigation Process	Section 5.4.1 & NDAP-00-1600
9.	Calculation/Analysis Process	Section 5.4.4k & NEPM-QA-0221
10.	Failure Modes and Effects Analysis Process	GDG-17
11.	Specification Process	This procedure & NEPM-QA-0231 & NSEP-QA-513 (CDA procurement)
12.	Equipment/Component/Cable/Raceway Database Processes	NDAP-QA-1215 & MFP-QA-4004 (NIMS), NDAP-QA-1216 (CRIMP)
13.	Safety Classification Process	NDAP-QA-1609, GDS-06
14.	Preventive Maintenance / Component Criticality Classification Process	NDAP-QA-0415 (PM), ER-1001 (CC)
15.	Drawing Process	Section 5.4.4 & MFP-QA-4002, MFI-4014
16.	Vendor Equipment and Technical Information Program	Section 5.4.4 & NDAP-QA-1213
17.	Regulatory Process Applicability Determination Process	Section 5.4.5 & NDAP-QA-0726
18.	10 CFR 50.59/72.48 Processes	Section 5.4.5 & NDAP-QA-0726
19.	Licensing Document Change Process	Section 5.4.4n & NDAP-QA-0730
20.	Safeguards Information Process	NDAP-QA-0902

	SDP	**Susquehanna**
21.	Post Maintenance/Post Modification Test Processes	PSP-29 (Post Maintenance), MFP-QA-2310 (post EC), NDAP-QA-0480, NDAP-QA-0482
22.	Supply Chain and Procurement Processes	OPS-10, NDAP-QA-0201, NDAP-QA-0202, NDAP-QA-0203, & NSEP-QA-513 (CDA procurement)
23.	Vendor Oversight Process	Section 5.4.2
24.	Training Programs	TQs
25.	Procedure Revision Process	NDAP-QA-0004
26.	Single Point Failure/Single Point Vulnerability Review Process	ER-2002
27.	Plant Review Board / Committee Process	Section 5.4.14b & NDAP-QA-0006
28.	Core Reload Process	NFP-QA-005
29.	Cyber Security Program and Assessment Process	ER-50, NSEP-QA-504, NSEP-QA-507, NSEP-QA-513, NSEP-QA-516
30.	Registered Professional Engineer Seal / Stamp / Signature Process	NEPM-QA-0241, NDAP-QA-1214
31.	Digital Design Guidance Process	DHB-001, DHB-005, DHB-006, DHB-007, DHB-013, DHB-014
32.	Software Quality Assurance Program	NSEP-QA-500, NSEP-00-500
33.	Radiation Protection / ALARA Program	NDAP-QA-0623, NDAP-QA-1191
34.	Fire Protection, Appendix R, and NFPA 0805 Programs	NDAP-QA-0449
35.	Other Regulatory, Engineering and Plant Programs	See Section C below
Planning and Installation/Testing Phases		
36.	Work Management Processes	NDAP-QA-0502, NDAP-QA-1901, NDAP-QA-1902
37.	Post Maintenance/Post Modification Test Processes	PSP-29 (Post Maintenance), MFP-QA-2310 (post EC), NDAP-QA-0480, NDAP-QA-0482
38.	Operational Risk Assessment Process	NDAP-QA-1902
39.	Clearance and Tagging Processes	NDAP-QA-0322, NDAP-QA-0323, NDAP-QA-0302
40.	Registered Professional Engineer Seal / Stamp / Signature Process	NEPM-QA-0241, NDAP-QA-1214
41.	Engineering Change Turnover to Operations Processes	Sections 5.6.4, 5.6.5, & 5.6.6
42.	Temporary Modification Tagging and Control Processes	NDAP-QA-1218

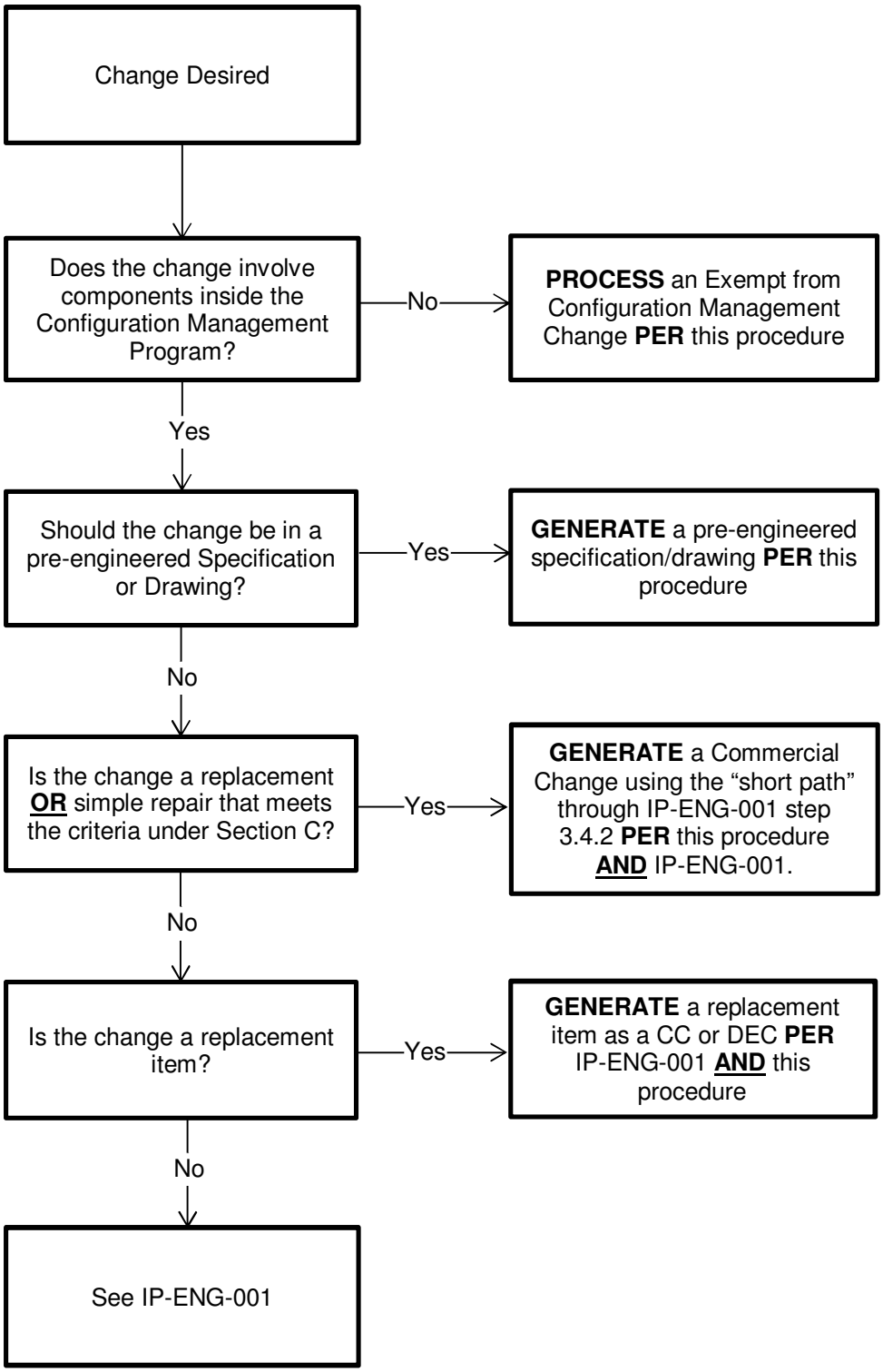
	SDP	Susquehanna
Design Closure Phase		
43.	Engineering Change / Modification Closeout Process	Section 5.7
44.	Document Control/Records Management Processes	Sections 5.4.15 & 6.0, NDAP-QA-0023
45.	Procedure Revision Process	NDAP-QA-0004
46.	PM Programs	NDAP-QA-0415
47.	Training Programs	TQs

C. Other Programs:

- NDAP-00-0667, Susquehanna Environmental Management Program
- NDAP-QA-0017, Motor Operated Valve Program
- NDAP-QA-0101, Document Review
- NDAP-QA-0324, Plant Labeling Program
- NDAP-QA-0338, Reactivity Management and Controls Program
- NDAP-QA-0412, Leakage Rate Test Program
- NDAP-QA-0420, Motor Program
- NDAP-QA-0423, Station Pump and Valve Testing Program
- NDAP-QA-0424, Control Room Envelope Habitability Program
- NDAP-QA-0483, Underground Piping and Tanks Program
- NDAP-QA-0504, Heat Exchanger Program
- NDAP-QA-0511, Lubrication Control Program
- NDAP-QA-0525, Boiler and Unfired Pressure Vessel Inspection Program
- NDAP-QA-0642, Environmental Protection Plan Program
- NDAP-QA-0647, Chemical Control and Susquehanna Approved Materials Program
- NDAP-QA-0658, Dry Fuel Storage Program
- NDAP-QA-1102, Environmental Qualification (EQ) Program

- NDAP-QA-1105, Dynamic Qualification of Equipment SQRT Program
- NDAP-QA-1106, Flow Accelerated Corrosion Program
- NDAP-QA-1163, Structural Monitoring Program
- NDAP-QA-1170, Air Operated Valve Program
- NDAP-QA-1195, Chemistry Program
- NDAP-QA-1201, Configuration Management Process and Program
- NDAP-QA-1205, Nuclear Department Welding Program
- NDAP-QA-1214, Nuclear Department Program for ASME Code Section XI Repairs or Replacements and National Board Inspection Code Repairs and Alterations

Attachment B, Engineering Change Type Determination



A. Does the change involve components inside the Configuration Management Program?

The configuration management program applies to those components within the plant configuration. NDAP-QA-1201 identifies those SSCs included in and exempt from the Configuration Management Program.

B. Should the change be in a pre-engineered Specification or Drawing?

1. Specifications and drawings can be generated as pre-engineered documents that when applied appropriately can effect plant changes.

2. These changes are intended to be installed in multiple locations with no pre-determined timeframe.

3. Section 5.3.6 of this procedure provides the details for pre-engineered specifications and drawings.

C. Is the change a replacement <u>OR</u> simple repair that meets the criteria under this Section?

<u>General Criteria</u>

a. Changes in which the Original Equipment Manufacturer (OEM) **<u>OR</u>** current design owner provides documentation that the SSC replacement **<u>OR</u>** repair meets the original design or purchase specification.

   (1) The documentation must contain a “signature” (such as a letter with a signature, an approved evaluation, an electronic signature, or an e-mail) from OEM or current design owner engineering, except as allowed by (2) below.

   (2) Documentation can be information from the OEM/current design owner catalog or website for simple commercial grade items that are mass produced and the product line has been changed out.

   (3) This criteria does not include digital changes.

b. EQ Q items that are refurbished or repaired by vendors or manufacturers that have a current 10CFR50 Appendix B program and are listed on the QSL. (See Step 5.2.2a)

c. Changes in which the original part is reverse engineered. Appropriate documentation to support the reverse engineering for the replacement part is supplied by the manufacturer/vendor.

   (1) The documentation must contain an indication that the documentation is from manufacturer/vendor engineering or reviewed by manufacturer/vendor engineering.

   (2) This criteria does not include digital changes.

D. Is the change a replacement item?

1. Replaces a discreet component/subcomponent ("one-for-one" or "like-for-like" replacement)

2. Other components/subcomponents are not changed or moved for the replacement item to work properly.

   a. Exceptions:

   - For valves, a short length of pipe ($\leq$ 2") on either side of the valve may be adjusted.

   - Software/firmware may be modified to address the replacement component.

3. A replacement item may not be used for the following conditions:

   - To add or remove plant components or subcomponents

   - To modify or make minor changes, such as mounting, wiring, cutouts, setpoints, supports

   - When a replacement item introduces any new failure modes or adverse effects

   - When an evaluation indicates that any bounded technical requirements, including critical characteristics for design, will not be met (i.e., a design change)

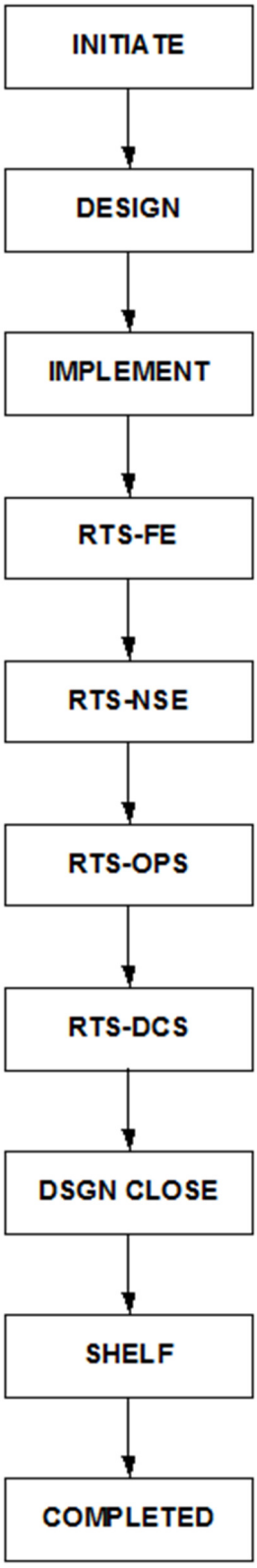
E. See IP-ENG-001

1. **SEE** IP-ENG-001 Attachment 3 to determine change type for all other changes.

2. To support the Commercial Changes screening questions (Step 1.2.6), **USE** the following guidance:

   a. Question 13 – Maintenance Rule Code = 1 in NIMS **OR** associated function in the Maintenance Rule Basis Document is identified as Y (yes) for HSS

   b. Question 14 - component is a Single Point Vulnerability (FEC = 1A) **OR** associated function in the Maintenance Rule Basis Document is identified as Y (yes) for Cause Scram or Y (yes) for Acc Mitigation or Y (yes) for Used in EOPs



Attachment C, EC Workflow

INITIATE

- Engineering Change number is created and linked to an authorizing mechanism
- Determination of Engineering Change Type
- Lead Design Engineer is identified
- Document Shell is created

DESIGN

- Engineering Activities associated with Engineering Change
- Stakeholder meeting(s) / Impact reviews
- Generation of PCWO coversheets
- Design approval
- Sub status codes:
  1. **Working** – Actively working design.
  2. **30 Month** – 30 month review of design is required.

IMPLEMENT

- Associated PCWOs are being implemented
- Sub status codes:
  1. **Planning** – At least one PCWO in planning status
  2. **Scheduled** – At least one PCWO is scheduled
  3. **Plan Comp** – At least one PCWO planning has been completed
  4. **Working** – At least one PCWO has been released

RTS - Return to Service

- Workflow steps within Return to Service:
  1. FE – Field Engineer performs activities associated with Return to Service
  2. NSE - System Engineer performs activities associated with Return to Service
  3. OPS – Operations performs activities associated with Return to Service
  4. DCS – Document Control performs activities associated with Return to Service
- Sub status codes:
  1. **PARTIAL** – Partial Closure of EC
  2. **FINAL** – Final Closure of EC
  3. **INSTALLED** – TDC/TCC/TDEC installed
  4. **REMOVED** – TDC/TCC/TDEC removed
  5. **CANCELLED** - EC cancelled

DSGN CLOSE - Design Record Closeout

- Closeout activities are performed to assure that all affected functions and programs have been appropriately revised.
- Workflow advanced automatically when all closeout activities have been completed.

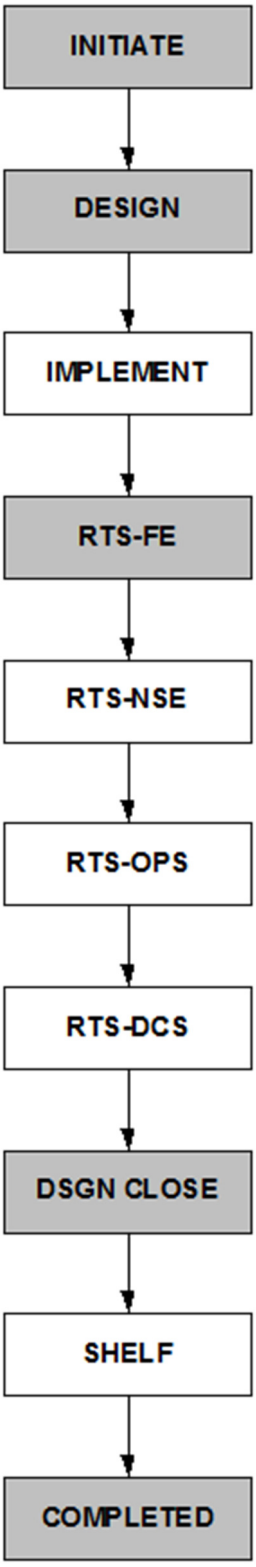
SHELF

- Optional workflow step which will hold ECs for future revision or use, if enabled.

COMPLETED

- Engineering Change workflow will be complete.
- A report of the Engineering Change will be generated and attached to the EC document.
- The EC document record will have a status of Complete

Attachment D, When to Turn OFF Steps in the Engineering Change Workflow



INITIATE

Cannot be turned OFF

DESIGN

Cannot be turned OFF

IMPLEMENT

Can be turned OFF when:

- there are no PCWOs that will be used to EVER implement the change.
- EC cancellation

RTS - FE

Cannot be turned OFF

RTS - NSE

Can be turned OFF when:

- approved by NSE (as documented in the EC), or
- there are no Tech Spec or TRM changes, or
- there are no procedure changes other than Operations procedures/CLs
- EC cancellation
- the EC does not include a digital device

RTS - OPS

Can be turned OFF when:

- approved by Operations (as documented in the EC) or
- there is no change to Tech Specs, the TRM, Operations' procedures, CLs, system operating characteristics/parameters, no Operations training is required, or if no Operability testing (e.g., SOs, SEs, etc) is specified in the EC
- EC cancellation

RTS - DCS

Can be turned OFF when:

- there are no changes to FCI sources to be posted

DSGN CLOSE

Cannot be turned OFF

SHELF

Defaulted to OFF, can be turned ON if:

- future revisions are expected after the entire scope has been performed, or
- additional scope will be added to an approved replacement item
- more components are to be installed for a Generic CC, DEC

COMPLETED

Cannot be turned OFF

Attachment E, EC Backup Coversheet

EC BACKUP COVERSHEET		
EC#:	Date:	
DESCRIPTION (**ADD** additional items as needed)	**Supersede Previous Backup** (X if Yes)	**# of Pages**
NDAP-00-1600 Risk Assessment		
Comment/Impact Review Forms		
Document Review Forms		
Meeting Agenda/Minutes		
Field Walkdown Notes		
Correspondence		
Vendor Information		
Field Change Request		
Advanced Work Authorization		

Attachment F, Use of EQ Category II Replacements

As specified in Section C.6 of Reg Guide 1.89, the NRC staff **CONSIDERS** the following to be **sound reasons for not upgrading** to an EQ Category I replacement.

A. The item to be replaced is a component that is routinely replaced as part of normal maintenance (e.g., gaskets, o-rings, coils, etc.).These may be replaced with identical components.

B. The item to be replaced is a component that is part of an item of equipment that was qualified as an assembly. These items may be replaced with identical components.

C. The identical equipment to be used as a replacement was on hand as part of existing stock prior to 2-23--83.

D. Replacement equipment qualified in accordance with the provisions of 10CFR50.49 does not exist.

E. Replacement equipment qualified in accordance with the provisions of 10CFR50.49 is not available to meet installation and operation schedules. However, in such cases, the replacement equipment may be used only until upgraded equipment can be obtained and an outage of sufficient duration is available for replacement.

F. Replacement equipment qualified in accordance with the provisions of 10CFR50.49 would require significant plant engineering changes to accommodate its use.

G. The use of replacement equipment qualified in accordance with the provisions of 10CFR50.49 has a significant probability of creating human factor problems that would negatively affect plant safety and performance, for example:

1. Knowledge, skills and ability of existing plant staff would require significant upgrading to operate or maintain the specific replacement equipment.

2. The use of the replacement equipment would create a one-of-a-kind application.

3. Maintenance, surveillance or calibration activities would be unnecessarily complex.

Attachment G, 30 Month Review Requirements Matrix

This Attachment intentionally left blank.

Attachment H, Engineering Change After Action Review

ENGINEERING CHANGE AFTER ACTION REVIEW		
EC#:	**Title**:	
EWR#:	**AAR Facilitator**:	Date of AAR:
Participants:		

What problem was the EC expected to solve?

Did the EC solve the problem? Yes ☐ No ☐ Not enough information at this time ☐

EXPLAIN: (**INCLUDE** in the discussion objective acceptance criteria or metrics to support the conclusion)

Review and Discussion of Engineering Change Quality Metrics

A. Number of CRs generated related to this Engineering Change	A. ____
B. Number of PCNs & FCRs issued	B. ____
B1. Number of Design, Planning/Construction, or Testing Error PCNs/FCRs	B1. ____
C. Were actions resulting from Impact Reviews properly prepared and completed in support of EC Return to Service?	C. Yes ☐ No ☐ N/A ☐
D. Were spare parts and routine tasks addressed?	D. Yes ☐ No ☐ N/A ☐
E. Have procedures been revised, as necessary?	E. Yes ☐ No ☐ N/A ☐

Comments:

ENGINEERING CHANGE AFTER ACTION REVIEW

Strengths/Successes/What Went Well: (**ACKNOWLEDGE AND REINFORCE** positive behaviors)

Areas for Improvement (AFI):

Action Items: (**LIST** actions and AR/EWRs generated to address actions. **RELATE** the AR/EWRs to the EC)

Action Item No. Action

Supervisor Comments:

Attachment I, Template for Design Inputs and Design Attribute Review

Design Inputs/Bounding Technical Requirements:

Design Input / Bounding Technical Requirement	Source Document(s)	Description / Title

Design Evaluation:

Design Input / Bounding Technical Requirement	Summary of Design Evaluation	References