efficiency bulletin

Aug. 17, 2017

Color Code: Green

Efficiency Bulletin: 17-18

Optimizing Strategic Engineering, Engineering Response Team and Component Maintenance Support

This efficiency bulletin addresses optimization of strategic engineering (SE, formerly known as system engineering), engineering response teams (ERT) and component maintenance support (CMS). Program engineering and design engineering optimization are described in a complementary efficiency bulletin, EB 17-19, Optimizing Program and Design Engineering Organizations. The reactor engineering and procurement engineering organizations are outside the scope of these bulletins.

Addressees: **Chief nuclear officers, NEI APCs and INPO APCs**

Issue: **ENG-004, Standardize System Engineering Core Business**

Summary of Efficiency Opportunity

- Desired end-state—Improvement in equipment reliability is achieved through a redesigned engineering organizational structure that is better focused on core responsibilities and utilizes resources more efficiently.

- Value proposition (vision of excellence)—Depending on the utility's current processes and practices, increased efficiencies and indirect cost savings are realized by eliminating resource expenditures on non-core activities. These benefits are expected to be redirected to improving the long-term health of key systems.

- Why is it important?—Standardizing SE, CMS, and ERT organizations and core business activities will increase efficiency in the execution of work, eliminate low-value administrative work, and align the industry on best practices for focusing on the most important systems and components to improve safety and equipment reliability.

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- Industry benchmark value(s)—Equipment reliability index (ERI) will continue to meet or exceed current performance. Workweek execution, project implementation and human performance are not negatively impacted by the organizational changes in this efficiency bulletin.

- Measure of effectiveness—ERI goals are met or exceeded. Guiderails are fully established and industry performance for both safety and reliability will be maintained or improved.

Background

- System engineering duties have evolved and developed differently across the industry in response to well-meaning industry initiatives, fleet requirements and individual station needs. As a result, focus on core duties has been diluted, processes have become more complicated and duties outside of core business have been added. Contributing to the diminished focus on core activities is the increased reliance on system engineers to perform activities that were once performed by other station departments.

- This bulletin provides guidance to transform system engineering into a more strategic organization. Tactical activities such as troubleshooting support and response to emergent plant issues will transition to the maintenance department and engineering response team to enable system engineering to maintain a strategic long-term focus on assigned plant systems.

- The division of responsibilities and standard organizational structures for single and multiunit sites for SE, ERT and CMS are provided in Attachments 1-5 (fleets) and Attachment 6 (non-fleet). Also included are core duties that focus on system reliability, management of critical components, and long-term system and component management.

Relevant Standards

- Performance Objectives and Criteria (INPO)
    - OR.1, Station and corporate managers are aligned on the required support and allocation of resources needed to achieve and sustain high levels of nuclear, radiological, industrial, and environmental safety performance.
    - OR.2, Managers provide the staffing and resources for each department or functional area to support the accomplishment of their assigned responsibilities as well as to facilitate cross-functional responsibilities. They consider and mitigate the potential effects of organizational changes and staff reductions before these are initiated.
    - OR.3, Change management processes are implemented when applicable, and the progress of changes is systematically monitored to verify the intent of each change is met and to identify possible unintended consequences. The processes ensure the following:
        - Changes to plant equipment, procedures, and processes are planned and implemented systematically to improve safe and reliable plant operation.
        - Change objectives, responsibilities, and implementation schedules are clearly communicated, and appropriate training is provided to affected personnel.

Key to Color Codes:

Red: NSIAC initiative – full participation required for viability
Blue: Action expected at all sites, but is not needed for broad industry viability
Green: Utility discretion to implement, consistent with its business environment

    - LF.1, Leaders establish a culture in which personnel work together to communicate and promptly address any equipment issues and degraded conditions that could detract from nuclear safety and equipment reliability.
    - EN.1, Engineering personnel apply the essential knowledge, skills, behaviors, and practices needed to ensure equipment performs as required, the plant is maintained within design requirements, margins are controlled, and the plant is operated safely and reliably.
    - ER.1, High levels of reliability are achieved for equipment that supports nuclear safety, plant reliability, and emergency response capability.
    - ER.3, Engineering personnel maintain a long-term view of station performance, anticipate issues that could adversely affect long-term plant performance, and develop strategies to address these issues.
- INPO 10-005, Principles for Maintaining an Effective Technical Conscience.
    - Principle 5: Engineers present technical considerations to decision-makers and insist on conservative decisions related to nuclear safety. They escalate concerns to appropriate levels of management. For decisions related to plant reliability, engineers understand and accept decisions based on facts and appropriate consideration for the potential risks to plant reliability. In all cases, engineers understand that risk-based decision-making may not result in selecting the most conservative option.

Relevant Regulatory Requirements

- 10 CFR 50.65, Requirements for Monitoring Effectiveness of Maintenance at Nuclear Power Plants
- 10 CFR Part 54, Requirements for Renewal of Operating Licenses for Nuclear Power Plants
- 10 CFR 50 Appendix B, Criterion XVI, Corrective Action
    - Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected.

Guidance

This bulletin provides guidance to transform system engineering into a more strategic organization. To assist in the transformation, it is recommended to change the department name from system engineering to strategic engineering. Tactical activities such as troubleshooting support and response to emergent plant issues will transition to the maintenance department and engineering response team to enable SE to maintain a strategic long-term focus. Component engineers will be integrated into component maintenance support to reduce the inefficiencies associated with handoffs and turnovers during work on plant components.

This efficiency bulletin provides guidance for the following three functional areas:

- strategic engineering
- engineering response team
- component engineering and component maintenance support.

Additional supporting guidance for the roles and responsibilities of these three groups was developed by the industry. These documents are listed in the supporting document section of this efficiency bulletin and posted on the DNP sections of the INPO and NEI websites.

Strategic Engineering

Strategic engineering will continue to focus on the health of key systems while transitioning to a more strategic organization. Tactical activities such as troubleshooting support and response to emergent plant issues will transition to CMS and ERT to enable SE to maintain a strategic long-term focus.

SE core business will focus on the following key functions:

- performance monitoring and trending (key systems)
- system health reporting (key systems)
- life cycle management and long-range planning (key systems)
- preventive maintenance technical basis for critical components
- championing elimination and mitigation of single point vulnerabilities
- review of industry standards/guidelines and operating experience
- mitigating system performance index and maintenance rule monitoring.

Strategic engineers should use a graded approach for monitoring and reporting with their primary focus on those systems that are most important to safety and reliability. Detailed guidance for system monitoring and reporting is provided in EB 16-33, System Health Reporting Efficiencies.

The SE manager should report to the site engineering director.

Enabling changes to support improved efficiency are provided in Attachment 2 along with additional details on the SE organizational structure. Supporting document NISP-ER-01, Strategic Engineering Effectiveness, provides additional detailed guidance for effective use of strategic engineers in improving plant safety and performance.

Engineering Response Team

The overriding mission for ERT is to protect the workweek schedule and address emergent issues outside of the component maintenance support group expertise to minimize the impact on engineering core business. ERT should be staffed with experienced engineers that are capable of addressing mechanical, civil, electrical, and instrumentation and control (I&C) issues in a timely manner. ERT is to be closely aligned with the maintenance fix-it-now team and should be the initial point of contact for engineering support including complex troubleshooting support.

Additional information regarding ERT responsibilities are provided in Attachment 3. Supporting document NISP-ER-02, Engineering Response Team Effectiveness, provides additional detailed guidance for effective use of the team.

Component Maintenance Support

The primary function for CMS is to improve component reliability and performance, reduce operating and maintenance costs, and maintain compliance with the plant design basis and regulatory requirements when applicable. CMS will maintain a high level of technical expertise for the following components and programs:

- pumps and motors
- valves (AOV, MOV, SOV, CV, RV, manual and valve packing)
- heat exchangers
- circuit breakers
- cable reliability
- electrical and I&C components
- HVAC components (e.g., chillers, compressors)
- preventive and predictive maintenance program.

Component maintenance support will also provide life cycle management and complex troubleshooting support for components within CMS scope.

Site engineering oversight is required for CMS job functions that require qualifications in ACAD 98-04, Guidelines for Training and Qualifications of Engineering Personnel unless equivalent qualifications are provided within maintenance.

Additional information regarding CMS organizational structure and responsibilities are provided in Attachment 4. Supporting Document NISP-ER-03, Component Maintenance Support Effectiveness, provides additional detailed guidance for effective use of Component Maintenance Support.

Miscellaneous Engineering Duties Not Included in EB Recommendations

The engineering duties discussed in this section are necessary to support the entire site engineering organization but are not included with any specific engineering groups in this efficiency bulletin or its companion for program and design engineering. Examples include equipment reliability coordinator, outage integration team member, engineering human performance coordinator and general administrative support (specific duties are shown in Attachment 7). These duties are often assigned to the engineering director or other site or corporate engineering organizations. Attachment 7 provides this information to ensure implementing organizations account for these duties somewhere within site or corporate engineering organizations.

Additional information regarding miscellaneous engineering duties is provided in Attachment 7.

Fleet Governance and Oversight of SE, CMS, and ERT

Responsibility for governance and oversight of SE, CMS and ERT is depicted as follows:

Area of Responsibility	Governance and Oversight Owner
Strategic Engineering	Engineering Corporate Functional Area Manager (CFAM)
Engineering Response Team	Engineering CFAM
CMS – Engineering Functions	Engineering CFAM
CMS – Maintenance Functions	Maintenance CFAM

Additional information regarding fleet governance and oversight is provided in Attachment 5.

Recommended Industry Actions

- The equipment reliability working group and other applicable industry groups are requested to monitor implementation, capture unintended consequences and develop recommendations to address gaps as necessary.

Change Management Considerations

A robust change management plan, with realistic milestones, is necessary. A detailed change management outline is provided (Attachment 8). Industry experience has demonstrated that the following are key to a successful engineering reorganization:

- Identify and revise procedures within non-engineering departments where engineering support responsibilities are being reassigned.
- Ensure adequate staffing is maintained to support non-routine duties such as event response teams, security drills, emergency preparedness support, etc.
- Align departments on refueling and emergent outage roles and responsibilities.
- Implement changes in roles and responsibilities prior to commencing staff or budget reductions.
- Perform interim and final effectiveness reviews.

Industry Activities

- Industry webinar to provide background for initiative, guiderails, and an open forum to clarify expectations and ask questions. Webinar information can be found at https://web.inpo.org/Pages/Nuclear-Promise-Issues.aspx

Company Actions

- Develop a detailed change management plan consistent with station/fleet procedures. Refer to Attachment 8 for detailed change management considerations including specific tasks and estimated timeframes.
- Assess the proficiency of individuals assigned different responsibilities and ensure bridging strategies are enacted to address any gaps with an emphasis on coaching. Based on identified challenges to their proficient performance, formulate and implement development plans including, but not limited to, training.
- Engineering leaders should ensure the active implementation of a robust workforce planning tool for the engineering staff. The planning tool needs to consider the use of knowledge transfer from senior engineering staff to junior engineering staff when planned changes (such as retirements) are expected. In addition, the planning tool should consider depth of knowledge across the engineering organization for single subject matter expert knowledge to immediately accommodate unplanned losses. The planning tool must consider the organizational pipeline, since it is common that engineering is the “feeder” for other organizations, such as shift technical advisors and senior reactor operators, as well as other leadership roles. A good workforce planning tool is an active tool, which requires periodic updates to reflect the current condition of the existing engineering staff, as well as the needs of other organizations that rely on engineers as their feeder.
- Implement organizational changes in concurrence with the change management plan.

Guiderails

Implementation of this bulletin will result in the transfer of some engineering responsibilities to other work groups and individuals, both inside and outside of engineering. Transferred responsibilities include operability determinations, critical digital asset monitoring and support, work order review, maintenance support, surveillance testing coordination, and troubleshooting plan development. Consequently, stations should ensure that the following guiderails are in place:

- It is critical that the station senior leadership supports the changes and holds responsible departments accountable to perform their revised roles.
- Departments outside of engineering must explicitly accept the revised responsibilities identified in this bulletin. Attachments 1 and 6B provide the departments and responsibilities.
- Ensure that senior leaders understand the necessary assumptions (such as strong station performance and no increased regulatory oversight) that were required in developing the proposed staff sizes. These are included in Attachments 2, 3 and 4. Each station should verify that the assumptions are currently applicable prior to implementing the portions of this efficiency bulletin that result in reductions to staff size.
- Senior leaders must ensure that organizational capacity and capability is sufficient to manage operational and enterprise risk posed by emergent equipment issues and economic stressors. Challenges could include the size and scope of outages or corporate initiatives, potential or actual increased regulatory inspection, and corporate financial challenges.

- Organizational changes should not be initiated without considering the potential impact on loss of critical knowledge necessary to perform engineering core duties.
- Monitor station performance for any unintended consequences resulting from the reorganization. Engineering inputs to the ERI should be trended to ensure unintended consequences are identified and corrected in a timely manner. Workweek indicators should also be trended to monitor CMS effectiveness. Additional metrics may include human performance issues and project implementation effectiveness.
- Consistent with station/fleet commitments in response to Recommendation 2 of IER L1-14-20, Integrated Risk-Healthy Technical Conscience, conduct periodic self-assessments to identify early signs of weaknesses in technical conscience.

Report Your Site's Results

Please report your company's implementation of this improvement opportunity, including the date of completion. Send this information along with your company point of contact to EfficiencyBulletin@NEI.org.

Industry Contacts

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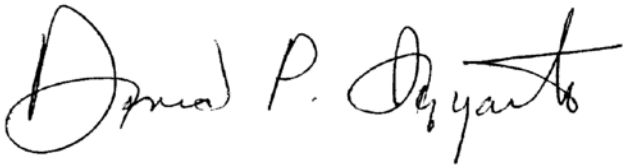
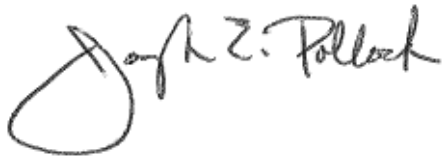


Joseph E. Pollock, Nuclear Energy Institute



Attachments

Supporting Documents

The following Nuclear Industry Standard Process (NISP) documents were developed by the industry group to assist stations in implementing this organizational change. Members of the industry group are provided in the efficiency bulletin. These documents are posted on the DNP sections of the INPO and NEI websites.

Supporting Document	Title
NISP-ER-01	Strategic Engineering Effectiveness
NISP-ER-02	Engineering Response Team Effectiveness
NISP-ER-03	Component Maintenance Support Effectiveness

Attachment 1
Fleet Division of Responsibilities

Responsibility	SE	CMS[(1)]	ERT	DE	FPE/SPE	Fleet SME[(2)]	Other / Comment
Performance Monitoring and Trending	X	X					See Note 3
System Health Reporting	X						Tier 1 systems only
Championing elimination/mitigation of Single Point Vulnerabilities (SPVs)	X						
Review of System or Component Related Industry Standards/Guidelines and Operating Experience (OE)	X	X			X		FPE/SPE for OE issues within program scope (e.g., system perturbations during Inservice Testing).
Mitigating System Perf. Index (MSPI)	X						
Maintenance Rule Monitoring	X			X			DE owns buildings & structures.
Thermal Performance	X						See Note 3
HVAC Systems & Control Room Habitability	X						SE monitors Tier 2 systems – CMS addresses HVAC equipment issues.
Maintenance Rule Program, ICES Reporting, Expert Panel Chairman	X						
Risk-Informed Surveillances	X						SE to provide system historical data and subsequent monitoring to projects.
Life Cycle Management and Long Range Planning for key systems & components	X	X			X		FPE/SPE for LCMS/LRPs within program scope.
Emergency Diesels & Support Systems	X						
Turbine / Main Generator / Exciter	X					X	See Note 3
Large Transformers	X					X	See Note 3
NEIL B&M Point of Contact	X						NEIL Property Point of Contact is Fire Marshal in Operations
Preventive Maintenance Technical Basis for critical components	X						
Asset Management Plan (budget)	X						
Operability Inputs	X	X	X				Wherever SME resides – primarily CMS/ERT
NRC inspection lead for heat sink inspection.	X						Based on SE oversight of MPSI cooling water system. CMS support for trending and DE support for design info.

Attachment 1
Fleet Division of Responsibility (continued)

Responsibility	SE	CMS[1]	ERT	DE	FPE/SPE	Fleet SME[2]	Other / Comment
GL 89-13 Program	X	X					CMS owns HX inspections, testing support, initial data review/evaluation, troubleshooting, and adjusts PM freq. with owner approval. See Note 3
Procedure Tech Reviews	X	X	X	X	X	X	Wherever SME is located
CAP Response to Equipment Failures	X	X					Tier 1 & 2 systems/comps to SE/CMS
Post Mod Test/Special Test (Tier 1 & 2)	X	X					Depends on test scope (if done in-house)
Post Maintenance Testing Support		X	X				
BOP Heat Exchangers		X					
Bolting, Torqueing, Gasket Support		X	X				ERT if design calcs are necessary.
PM Program		X					
Predictive Maintenance Program		X					Data analysis of oil, thermography, vibration, rotating equipment issues (data acquisition by Maintenance)
Pumps		X				X	See Note 3
Motors		X				X	See Note 3
HVAC Components		X					Chillers, compressors, fans
Circuit Breakers		X				X	
Cable Reliability		X				X	See Note 3
Valve expertise (all types)		X				X	See Note 3
Valve Packing		X					
I&C Component troubleshooting and support (Relays, Power Supplies, Recorders, Controllers, Transmitters)		X					
AOV Program Refer to separate responsibility matrix established by ENG-005 for AOV Program.		X		X	X		SPE/FPE owns test scope/frequency. CMS owns testing support, initial data review/ evaluation, troubleshooting, and adjusts PM frequency with owner approval. DE owns calculations. SPE/FPE to provide SME support when needed for non-program AOVs.

Attachment 1
Fleet Division of Responsibility (continued)

Responsibility	SE	CMS[1]	ERT	DE	FPE/SPE	Fleet SME[2]	Other / Comment
MOV Program Refer to separate responsibility matrix established by ENG-005 for MOV Program.		X		X	X		SPE/FPE owns test scope/frequency for program valves. CMS owns testing support, initial data review/evaluation, troubleshooting, and adjusts PM freq with owner approval. DE owns calculations. SPE/FPE to provide SME support when needed for non-program MOVs.
Relief Valve / SRV Expertise		X				X	CMS owns testing support, initial data review/evaluation, troubleshooting, adjusts PM freq. with owner approval. See Note 3
Check Valve Expertise		X				X	CMS owns testing support, initial data review/evaluation, troubleshooting, adjusts PM freq. with owner approval. See Note 3
Outage Scoping	X	X		X	X		
Traveling Screens / Strainers		X					
Crane Support		X					ERT owns risk assessment/load path supp.
Boilers		X					
Cathodic Protection		X					
Electrical Subcomponents		X					Primarily protective relays
Temporary Leak Repair Evaluations			X				
Freeze Seal Evaluations			X				
On-line Temporary Shielding Requests			X				
Excavation permits			X				
Approval of nonstandard scaffold reqs			X				
Rigging Support – point of attachment/rigging tools			X	X			DE for complex lift structures
Mobile Crane Risk Assessment and Load Paths Support unless associated with Design mod.			X				
Temp Mods and Temp Mod Auditing			X				

Attachment 1
Fleet Division of Responsibility (continued)

Responsibility	SE	CMS[1]	ERT	DE	FPE/SPE	Fleet SME[2]	Other / Comment
Emergent Minor Piping Configuration Changes (not approved as capital mod)			X				
Temporary Power Support			X				
Barrier analysis/impairment support			X				
Boric Acid Corrosion Control			X		X		BACC evaluations conducted by ERT
Engineering point of contact for daily online schedule coord. & Ops support			X				Coordinate/resolve online Engineering Holds and emergent red indicators for Engineering.
Support of complex troubleshooting			X				ERT Leads. CMS/SE involvement as necessary.
Equivalent Design Changes			X	X			ERT if emergent
Past Operability (Reportability)				X			CMS/SE involvement as necessary based on component/system expertise.
Coatings				X			See Note 3
Equipment Seismic Qualification				X			
Set-point Control				X			
Station Blackout				X			
Tornado Missile				X			
Maintenance Rule Buildings/Structures				X			DE owns the process and implementation.
Fire protection, Appendix R /NFPA 805	X			X	X		SPE owns overall program coordination. SE owns system monitoring functions. Other responsibilities reside in OPS, Design, PRA.

Legend:

SE:	Strategic Engineering
CMS:	Component Maintenance Support
ERT:	Engineering Response Team
DE:	Design Engineering
FPE:	Fleet Program Engineer
SPE:	Site Program Engineer
Fleet SME	Fleet SME – may work at a site or Headquarters

Attachment 1
Fleet Division of Responsibility (continued)

Notes:

(1) CMS responsibilities in Attachment 1 are engineering functions associated with the areas of responsibility listed. Non-engineering functions associated with the areas of responsibility may exist elsewhere in Maintenance.

(2) Responsibilities with fleet SMEs may be expanded to include additional areas than shown on matrix.

(3) Potential centralization opportunity for SE and CMS functions

(4) Additional details in responsibilities are provided in the ENG-005 EB 17-19, Optimizing Program and Design Engineering Organizations.

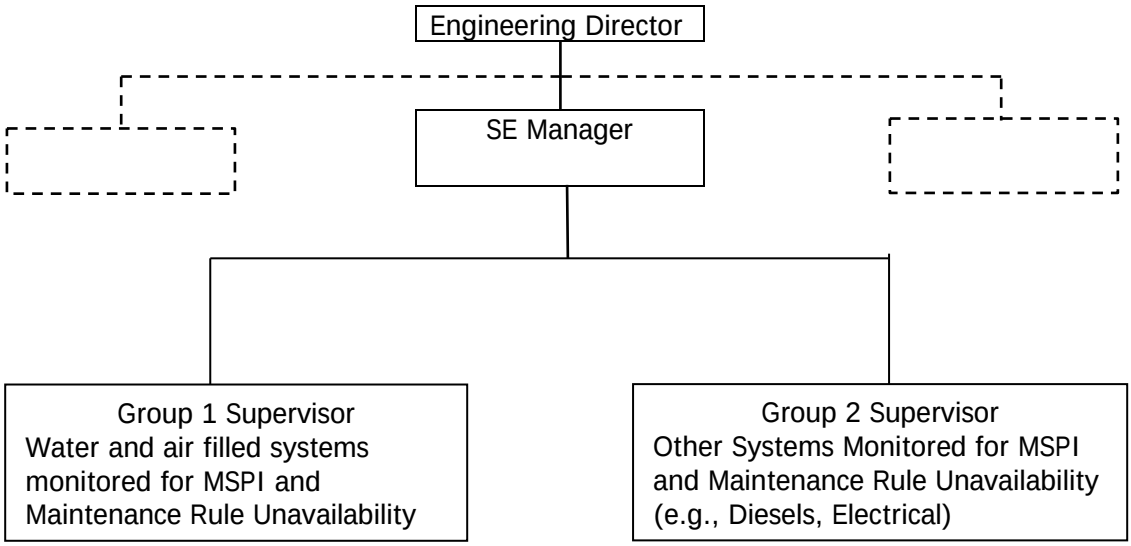
Assumptions for Responsibilities Outside of SE, ERT, CMS

Responsibility	**Owner**
ODMI / Abnormal Cond. Mon. Plan	Operations with input from ERT
B5B	Operations
Primary System Leakage (Id or Unid)	Operations
Cyber Security	Information Technology/Security/Ops
Degradation/SNM	Reactor Engineering
Equipment Reliability	Equipment Reliability Coordinator
FLEX / EP Equipment	Operations / Emergency Planning. Assumes FLEX mods complete /PMs implemented.
Fluid Leak Management	Maintenance
Procurement Engineering	Supply Chain
Obsolescence	Supply Chain
Quality Control (QC)	Nuclear Oversight
Cobalt Reduction	Rad Protection
Security Equipment	Security
Testing including post work test guide	Operations/Maintenance
NERC/FERC	Centralized function for fleets. Licensing coordinates site activities with SLT, Ops, Eng. and Prod.
NEIL Property Point of Contact	Operations (Fire Marshal)

Attachment 2
Fleet SE Organizational Structure and FTE Basis

The recommended organization structure for SE is depicted below. Systems in Groups 1 and 2 can deviate from this guidance based on management discretion.

Strategic Engineering Organization Structure



Key Assumptions for organization changes

- Good plant performance (few trips, good ER, etc.)
- Efficiencies in Corrective Action have been implemented
- Special projects are outsourced (e.g. MRule (a)(3))
- Does not include special assignments such as LCO Coord.
- Value-Based Maintenance implemented (EB 17-03a)
- Does not include Engineering Programs
- Does not include Reactor Engineering
- Active ERT and CMS
- Assumes no increased regulatory oversight

Attachment 2
Fleet SE Organizational Structure Basis

Enabling Changes to Support SE Organization Optimization:

Previous Practices	Future Practices
SE leads or participates in tactical activities and emergent issues, including direct support of Operations and Maintenance activities. Approximately 25% of SE time is spent on emergent issues.	ERT and CMS to address tactical activities and emergent issues to enable strategic focus by SE. ERT is the initial point of contact for engineering and provides support for complex troubleshooting outside the expertise of CMS. SE time spent on emergent issues is reduced to 5%.
SE conducts system owner functions on approximately 60 systems per unit (on average). System owner functions include performance monitoring, system walkdowns , health reporting, CAP response, and fielding questions from Operations, Maintenance, Planning, and management. Excluding health reporting, the time spent on system owner functions varies depending on importance of system. Overall average is approximately 4 man-hours per system per week.	A graded approach will be used for system owner functions using the guidance for Tier 1, 2, and 3 systems. This will focus SE attention to most important systems and is expected to reduce the number of systems fully monitored from an average of 60 to 12. Average time performing system owner functions on each of the 12 systems is assumed to increase to 6 man-hours per system per week. Also, an average of 25 Tier 2 systems will be monitored on a reduced scale (2 man-hours per system per week).
System Health Reporting – SE conducts system health reporting on 60 systems per unit on average. The time required for each health report varies between 4 – 12 man-hours for generation and review depending on the company. Most companies require quarterly to semi-annual frequencies resulting in an average of 150 health reports per unit per year.	A graded approach will be used for health reporting including system selection, content and frequency. In addition, a system health scorecard will be utilized allowing reduced content for good performing systems. This approach will reduce the number of health reports to approximately 24 per unit per year and will reduce the total time required for completing health reports to approximately 4 man-hours per report.
SE averages 14 root or apparent causes per yr. Each assignment results in approximately 25 man-hours on average (excludes management reviews).	Implement NEI 16-07, *CAP Enhancements* to significantly reduce the number of root/apparent causes assigned. Expected benefit per year is zero root causes and one apparent cause assigned to SE. Streamlined CAP process is estimated to reduce the time required to complete an apparent cause to approximately 4 hours.
Critical component definition in AP-913, Rev. 4 results in a high number of critical components directly impacting the number of PMs needing oversight and CAP response to equipment issues. Approximately 10 man-hours per week spent on PM process controls including review of PMs / PM feedback for T-28 work management meeting, PM changes, technical justifications for PM deferrals, and PM tracking.	The critical component definition per AP-913, Rev. 5 is expected to reduce the number of critical components by 50%. Therefore, SE time savings is also expected to reduce by 50%. SE time savings associated with reduced causal analyses of critical components is captured in #4.
CAP and ICES reporting processes are not aligned with regard to timeliness and content. This results in separate reports on separate timetables being generated for equipment issues. In addition, the 21 day expectation for ICES reports typically requires a preliminary report to be issued as the CAP process is still in progress. This sometimes requires a follow-up report for ICES following completion of the CAP process.	Align CAP and ICES reporting processes to combine the required content for both processes in a single report with the same timeliness expectations. This will reduce reporting requirements to a single report for each reportable issue. Expect reduction of 1.3 reports per reportable event due to elimination of follow-up reports. Assumes 25 reportable events per unit per year. Man-hour savings excludes management reviews.

Enabling Changes to Support SE Organization Changes (continued):

Previous Practices	Future Practices
There are multiple reporting requirements for Thermal Performance. Some reports have the same information in different formats which creates additional administrative burden. Also, some sites do not have effective action plans in place to aggressively recover lost MWs.	Best Practices in Thermal Performance monitoring and reporting based on industry benchmarking: • Report out cumulative MWhr losses on monthly basis, • Track ongoing losses weekly, separate by accounted & unaccounted losses; o Losses should be tracked with prioritized actions, o Identify/highlight actions with delays or issues, o Actions should specify owners and due dates. • Graphs may highlight station specific issues but should not be required in general.

Attachment 3
Fleet ERT Organizational Structure Basis

ERT Core Business includes:

- General:
  - Initial point of contact for Engineering support.
  - Protect work week schedule by supporting resolution of emergent engineering work.
  - Engineering point of contact for on-line work schedule coordination and resolution of online Engineering Holds and emergent red indicators for Engineering
  - Development of emergent modifications in support of scheduled work activities and Operations issues from the Daily Plant Status Report, or other emergent work source. This includes EC Evaluations, EC Replies, and Temp Mods. This excludes Nuclear Changes and Support ECs.
  - Equivalent Design Changes
  - Planning Support – Responding to emergent questions, assistance for unique field activities, etc.
  - System support for systems with no SE engineer assigned
  - Emergent complex troubleshooting support and systematic cause analysis (FMA/KT). SMEs from other engineering groups may be required to assist.
  - Operability inputs. SMEs from other engineering groups may be required to assist.
  - Complex Troubleshooting Support

- Mechanical
  - Temporary Leak Repair Evaluations
  - Freeze Seal Evaluations
  - Boric acid evaluations in support of Boric Acid Corrosion Control Program

- Civil/Piping
  - Rigging Support – Point of attachment/rigging tools only
  - Mobile crane risk assessment and load path support unless associated with DE mod.
  - On-line Temporary Shielding Requests
  - Evaluation and Approval of Nonstandard Scaffold Requests
  - Emergent Minor Piping Configuration Changes (not approved as capital mod)
  - Excavation permits
  - Barrier analysis/impairments

- Electrical/I&C
  - Temporary Power Support

Attachment 4
Fleet CMS Organizational Structure Basis

Key Assumptions for organization changes:

- Good plant performance (few trips, good ER, etc.)
- Efficiencies in Corrective Action have been implemented
- Special projects are outsourced (e.g. PMO Initiatives)
- Does not include special assignments such as LCO Coord.
- Does not include Engineering Programs
- Assumes no increased regulatory oversight

Attachment 4
Fleet CMS Organizational Structure Basis (continued)

Key position descriptions within CMS are as follows:

Component Engineers/Specialists
Serve as the owners of assigned component(s), acting as the station's focal point to increase component reliability and performance, reduce operating and maintenance costs and maintain compliance with the plant design basis and regulatory requirements when applicable. Responsibilities include:

- First responders to address any maintenance, work management, or planning issues for the site including technical expertise in support of station troubleshooting for their component types.
- Cross-system monitoring and trending of component performance by analyzing performance data to proactively predict and correct degrading performance of components. Component failures are monitored and trended for common issues and to establish effective corrective actions. IST results are trended by the IST Eng. No component health reports are required.
- Providing input to the on-line and outage schedules, including prioritization and continued advocacy of important work to ensure effective preventative and corrective maintenance to improve component condition and performance.
- Use of preventive maintenance strategy templates to plan work and effectively maximize reliability. Component Strategies and the PM Basis are continuously improved and maintained as a "Living Program." Components with unexpected equipment reliability issues are evaluated for potential maintenance strategy changes or design changes.
- Owns PM Technical basis for critical components in non-monitored systems.
- Monitoring Predictive Maintenance results for adverse trends prior to failure and factor into overall maintenance strategies.
- Use the Long Term Asset Management process to develop and track Long Term Major Maintenance plans for components.
- Serve as the primary interface with industry user groups and standard organizations for their component type and represents the interest of their utility on industry committees for regulatory issues, research, and the future of the U.S. nuclear industry (not required if fleet SME performs this function).

Predictive Maintenance (PdM) Specialist
The PdM Specialist is responsible for periodically monitoring and evaluating component health so that planned maintenance can be performed prior to equipment failure. PdM specialists utilize condition monitoring technologies such as vibration analysis, lube oil analysis, and thermography to make timely decisions regarding the maintenance requirements of plant components.

Preventive Maintenance (PM) Specialist
The PM Specialist is responsible for implementation of the PM Program to ensure appropriate equipment is maintained to prevent failure. This includes:

- Assistance with the development of PM strategies (scope, frequency, and basis).
- Providing oversight for developing and maintaining PM Basis for Essential PM Tasks.
- Reviewing and routing PM Feedback and craft recommendations to appropriate individuals.
- Reviewing/approving (or rejecting) requests for additions, changes, or deletions of Essential PM Tasks (including deferrals), and updating the PM Database with approved changes.
- Supporting Repetitive Task Review T-Week Meetings and ensuring actions are issued as determined in the meeting.

Attachment 5
Fleet Governance & Oversight of SE, CMS, and ERT

Responsibility for governance & oversight of SE, ERT, and CMS is depicted in the below table. Non-fleet governance and oversight is discussed in Attachment 6.

Area of Responsibility	Governance and Oversight Owner
Strategic Engineering	Engineering CFAM
Engineering Response Team	Engineering CFAM
CMS – Engineering Functions	Engineering CFAM
CMS – Maintenance Functions	Maintenance CFAM

Governance, Oversight, and Support Responsibilities

Responsibility	Gov	Ov	Supp
Establish fleet-wide best practices and develops fleet standardized policies, programs, processes, and department description for their functional area.	X		
Serve as lead of the functional area peer team and establish functional area direction and performance metrics.	X		
Ensure fleet performance metrics are periodically reviewed to identify fleet best practices and performance gaps.	X		
Represent, lead, and influence decision-making at the industry level.	X		
Participate in industry groups including meeting, interfacing, and reviewing correspondence from industry groups regarding emerging issues and initiatives. Maintain awareness of industry best practices and ensure fleet governance implements effective / efficient programs.	X		
Resolve industry issues affecting the fleet with site input and develop an overall strategy.	X		
Ensure fleet processes are implemented accurately and consistently across the fleet.		X	
Lead self-assessments to review and evaluate the adequacy and effectiveness of fleet programs, processes, and procedures.		X	
Periodically review engineering products such as performance monitoring trending, system health reports, and long range actions to validate effectiveness.		X	
Provide oversight and recommendations for routine program assessments, outage readiness and preparation for outside organizational assessments (i.e., INPO)		X	
Maintain experts on equipment important to the sites.		X	X
Develop or support development of fleet-wide long term asset management strategies for large or critical assets.			X
Coordinate common projects affecting multiple sites as part of business and project planning.			X
Maintain interface with key vendors and alliance partners that support plant equipment and processes.			X
Provide support to the sites on complex and strategic program and process issues.			X
Support complex engineering analysis, technical issues, and troubleshooting beyond the capabilities of the sites.			X

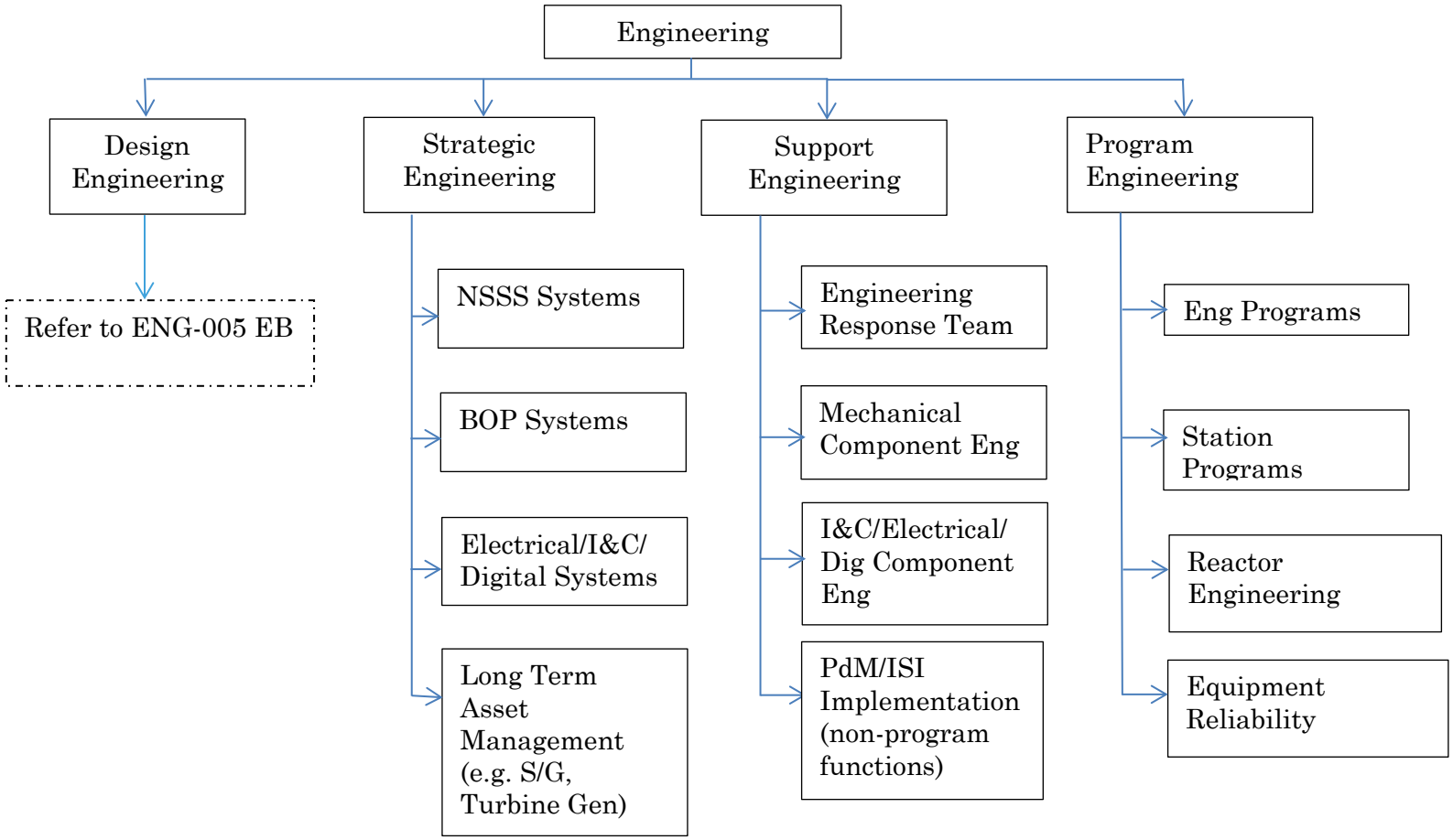
Attachment 5
Fleet Governance & Oversight of SE, CMS, and ERT (continued)

Governance and Oversight for SE and CMS

Based on benchmark information and evaluation of governance and oversight responsibilities, CFAMs are recommended to support SE and CMS.

Attachment 6
Non-Fleet Organization Structure and Responsibilities

The recommended non-fleet organization structure for engineering is depicted below. Attachment 2 contains the SE organizational description for fleets. Due to the site specific needs related to licensing, operating challenges and demographics, non-fleet organization recommendations are not included in this efficiency bulletin. Non-fleet sites should consider site specific adjustments to develop non-fleet site specific organization. Considerations should include organizational reporting of ICES Coordinator, NERC Compliance Coordinator, Engineering HU Coordinator Flex/B.5B Program Ownership, and CFAM functionality.



Attachment 6A
Non-Fleet Organization Structure and Responsibilities

Division of Responsibility

Responsibility	SE	CMS[(1)]	ERT	DE	SPE	Other / Comment
Performance Monitoring and Trending	X	X				
System Health Reporting	X					Tier 1 systems only
Championing elimination/mitigation of Single Point Vulnerabilities (SPVs)	X					
Review of System or Component Related Industry Standards/Guidelines and Operating Experience (OE)	X	X			X	SPE for OE issues within program scope (e.g., system perturbations during Inservice Testing).
Mitigating System Perf. Index (MSPI)	X					
Maintenance Rule Program, Monitoring, Expert Panel Chairman	X			X	X	SE owns system monitoring and Expert Panel Chair. DE monitors buildings & structures. Maintenance Rule Program Coordinator will reside in Site Programs and will manage program under the site Engineering Programs process.
ICES Reporting	X					
Thermal Performance	X					
HVAC Systems & Control Room Habitability	X					SE monitors Tier 2 systems – CMS addresses HVAC equipment issues.
Risk-Informed Surveillances	X					SE to provide system historical data and subsequent monitoring to projects.
Life Cycle Management and Long Range Planning for key systems & components	X	X			X	SPE for LCMS/LRPs within program scope.
NEIL B&M Point of Contact	X					SE is Point of Contact for NEIL inspections and evaluations. NEIL Property Point of Contact is Fire Marshal in Operations.
Preventive Maintenance Technical Basis for critical components	X	X				
Asset Management Plan (budget)	X					

Attachment 6A
Non-Fleet Organization Structure and Responsibilities

Division of Responsibility (continued)

Responsibility	SE	CMS[(1)]	ERT	DE	SPE	Other / Comment
Operability Inputs	X	X	X			Wherever SME resides – primarily CMS/ERT
NRC inspection lead for heat sink inspection.	X					Based on SE oversight of MPSI cooling water system. CMS support for trending and DE support for design info.
Procedure Tech Reviews	X	X	X	X	X	Wherever SME is located
Corrective Action Response	X	X	X			Tier 1 & 2 systems/comps to SE/CMS
Post Mod Test / Special Test (Tier 1&2)	X	X				Depending on test scope. Tier 3 to be SME
Post Maintenance Testing Support		X	X			
BOP Heat Exchangers		X				
Bolting, Torqueing, Gasket Support		X	X			ERT if design calcs are necessary.
PM Program Support	X	X				
Predictive Maintenance Program		X				Data analysis of oil, thermography, vibration, rotating equipment issues (data acquisition by Maintenance)
Pumps		X				
Motors		X				
HVAC Components		X				Chillers, compressors, fans
Circuit Breakers		X				
Cable Reliability		X				
Valve expertise (all types)		X				Includes AOV, MOV, SOV, CV, RV/SRV, Manual
Valve Packing		X				
I&C Component troubleshooting and support (Relays, Power Supplies, Recorders, Controllers, Transmitters)		X				
Outage Scoping	X	X		X	X	
Temporary Leak Repair Evaluations			X			
Freeze Seal Evaluations			X			
On-line Temporary Shielding Requests			X			

Attachment 6A
Non-Fleet Organization Structure and Responsibilities

Division of Responsibility (continued)

Responsibility	SE	CMS[(1)]	ERT	DE	SPE	Other / Comment
Excavation permits			X			
Approval of nonstandard scaffold reqs			X			
Rigging Support – point of attachment/rigging tools			X	X		DE for complex lift structures
Mobile Crane Risk Assessment and Load Paths Support unless associated with Design mod.			X			
Emergent Minor Piping Configuration Changes (not approved as capital mod)			X			
Temp Mods			X			
Temp Mod Owners/Monitoring	X	X				
Barrier analysis/impairment support			X			
Boric Acid Corrosion Control Evaluations			X		X	ERT evaluation in support of operability determination process.
Support of complex troubleshooting			X			ERT Leads. CMS/SE involvement as necessary.
Past Operability (Reportability)	X	X				
Coatings				X		
Equipment Seismic Qualification				X		
Set-point Control		X	X	X		
Station Blackout				X		
Tornado Missile				X		
Maintenance Rule Buildings/Structures				X		DE owns the process and implementation.
Fire protection, Appendix R /NFPA 805			X		X	SPE owns overall program coordination. ERT owns evaluation functions. Other responsibilities reside in OPS, Design, and PRA.

Attachment 6B
Non-Fleet Organization Structure and Responsibilities
Assumptions / Notes

Responsibility	Owner
ODMI / Abnormal Cond. Mon. Plan	Operations with input from ERT
B5B	Operations
Primary System Leakage (Id or Unid)	Operations
Cyber Security	Site Coordinator
Degradation/SNM	Reactor Engineering
Equipment Reliability	Equipment Reliability Coordinator for monitoring/oversight, CMS/SE for implementation
FLEX / EP Equipment	Operations / Emergency Planning/SPE.
Fluid Leak Management	Maintenance
Procurement Engineering	DE/ERT for emergent needs
Obsolescence	SE/CMS
Quality Control (QC)	Nuclear Oversight
Cobalt Reduction	Rad Protection
Security Equipment	Maintenance/SE
Testing including post work test guide	Operations/Maintenance/Planning
NERC/FERC	DE/SE
NEIL Property Point of Contact	Operations (Fire Marshal)/SE

Legend:

SE:	Strategic Engineering
CMS:	Component Maintenance Support
ERT:	Engineering Response Team
DE:	Design Engineering
SPE:	Site Program Engineer

(1) CMS responsibilities reflected in this attachment are engineering functions associated with the areas of responsibility listed. Non-engineering functions associated with the areas of responsibility may exist elsewhere in Maintenance.

(2) Tier 1 and 2 strategic engineers and Tier 3 points of contact are based on station licensing and design requirements.

(3) See Attachment 6C for list of CMS engineer functional areas.

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Attachment 6C
Non-Fleet Organization Structure and Responsibilities

CMS Functional Expertise

- Large Pumps
- Large Motors
- HVAC Components (e.g. Chillers, Compressors, Fans)
- Heat Exchangers
- Valves (AOV, MOV, SOV, CV, RV/SRV, Manual)
- Large Oil Filled Transformers
- Electrical Distribution Components (e.g. Circuit Breakers, Switchgear, Inverters, Batteries, Relays and Cables)
- I&C Field Instruments (e.g. Transmitters, RTDs, T/C, Controllers, Power Supplies, Recorders)
- Station Digital Equipment
- Refueling Equipment
- Predictive Maintenance Program
- Preventive Maintenance Program

Note 1: CMS functional expertise may reside in ERT.

Attachment 7
Miscellaneous Engineering Duties

Role Descriptions

Plant Health Committee (PHC) Coordinator • Coordinates PHC and Plant Health Working Group (PHWG) Meetings. • Interfaces with Design Coordinator to ensure design related issues are being worked in a timely manner. • Serves as the subject matter expert for the plant with regard to entering an issue into the Plant Health Process and ensuring that the issue is carried through in accordance with station procedures that govern the PHC. • Maintains the Plant Health Issues List PHIL) in accordance with PHC guidance. • Interfaces with the Design coordinator to add or remove items from the Design Work Management system per PHWG guidance. • Interfaces with the Financial Services coordinator to ensure Plant Health and non-plant health issues are being reviewed for funding and that any rejections are passed back to the PHC for rescheduling and impact reviews as necessary. • Ensures requirements of station procedure for the PHC are met. • Updates metrics.
Outage Integration Team (Engineering Representative) • Engineering representative on the Outage Integration Team • Coordinates all Engineering activities (such as ISI, Strategic Engineering Inspections, Design Change implementation coordination).
Training Coordinator • Coordinates the Engineering TRB/CRC. • Serves as the subject matter expert for engineering with regards to the training process. • Helps schedule training as directed by the TRB/CRC. • Ensures the engineering training program is healthy and maintained in accordance with applicable procedures. • Updates metrics.
Engineering HU Coordinator • Prepares Departmental HU Clock Resets • Attends departmental Human Performance Reviews for Engineering related HU events • Represents Engineering in Station HU Reviews
Corrective Action Coordinator • Represents Engineering in the daily Corrective Action meetings. • Creates and assigns Corrective Action assignments for Engineering. • Ensures Engineering maintains in compliance with the Corrective Action procedures. • Serves as the subject matter expert for engineering with regards to the Corrective Action process.
KPI Coordinator • Implementation of KPIs that are not performed by the ER Coordinator, and are more complex than Administrative support can provide.
Department Self-Assessment Coordinator • Coordinates and facilitates Engineering Department Self Assessments • Coordinates with OR department for roll-ups to the Station Self-Assessment • Tracks Actions from the Department Self Assessments

Attachment 7
Miscellaneous Engineering Duties

Role Descriptions (continued)

Administrative • Provides Time Sheet support/entry • Schedules Departmental Functions (e.g. "All Hands" meetings, etc.) • Provides general administrative support • Ensures no late Corrective Actions for Engineering. • Updates metrics • Provides updates to simple KPIs, such as Corrective Action assignments
ER Coordinator • Accurate update of ERI and ER Performance indicators. • Challenge of recovery actions for ERI and ER Performance indicators. • Provide status updates for indicator recovery action plans. • Development of ERI report. • Provide projections for ERI indicators. • Coordinates bubble charting of significant plant events. • Ensures requirements of pant ER procedures are met. • Set up challenge calls for ER Clock resets. • Manages and coordinates ER Strategies. • Ensure ER strategies are kept current.
Life Cycle Management (LCM) Coordinator • Ensure all required LCM plans are up to date and approved through the Plant Health Process. • Ensure actions required by the Long Range Plans are presented to PHC and included on PHIL. • Ensure that LCM actions are captured in the program/system health reports. • Ensures requirements the station procedure for LCM are met. • Updates metrics.
Component Scoping/SPV Coordinator • Maintains performance indicators related to the SPV program per station procedures • Coordinates support needed for SPV reviews • Maintains SPV documentation per station procedures • Ensures new or revised SPV mitigation strategies are presented to the PHWG for approval • Ensures requirements of Component Scoping and SPV procedures are met.
Risk Informed Coordinator • Coordinates and facilitates site actions for the implementation of 50.69. • Coordinates and facilitates site actions for the implementation of the Surveillance Frequency Control Program (SFCP).
System Health Coordinator • Provides appropriate System IQ rights to System Engineers at the sites. • Criticality and risk significant adjustments in System IQ for alignment with MRule. • System Health Reporting frequency adjustments for alignment with procedures. • Tracking Health Reporting completion status. • Tracking System Health Improvement actions status. • Tracking annual supervisor reviews of System Health templates. • Tracking System Health Reporting quality at the site. • Provides coaching and mentoring for system engineers on system health products. • Ensures requirements of System Health Reporting procedures are met. • Updates metrics.

Attachment 7
Miscellaneous Engineering Duties

Role Descriptions (continued)

MSPI Coordinator • Serve as the site subject matter expert (SME) for the MSPI Program. • Assist in CDE changes required for PRA updates. • Participate in MSPI Program self-assessments. • Monitor NRC FAQs (frequently asked questions) to NEI 99-02. • Serves as the site subject matter expert on MSPI failure and availability determinations. • Ensures requirements of station procedures for MSPI reporting are met. • Updates metrics.
Maintenance Rule Coordinator • Coordinate the day to day activities associated with implementation and compliance with the Maintenance Rule. • Administrates the MRULE database for the site, grants access to the database and sets administrative levels to requesting individuals. • Coordination of functional failure determinations. • Coordination of Maintenance Rule status updates in the MRULE database. • Review FF determinations on a monthly basis. • Facilitate the Maintenance Rule Expert Panel meetings. • Participate in MR Program scoping efforts. • Ensures requirements of MRULE Procedures are met. • Updates metrics.
PM Coordinator • Process PM Change Requests (PMCRs) for review and approval per station procedures. • Evaluate PM Feedback and generate PMCRs for PM Optimization per station procedures. • Facilitate PM Oversight Group meetings. • Participate in Fleet PM Program Technical Team monthly calls. • Populate PM Program Scorecard metrics monthly. • Coordinate with PM Template owners to gain approval for PM Template changes • Participates in the T-24 and T-16 meetings • Ensures requirements PM procedures are met.
Engineering Work Week Coordinator • Represents engineering at all T-week meetings. • Ensures engineering is in compliance with station procedures. • Ensures engineers are prepped and prepared for T-week meeting report outs. • Works with PM Coordinator to help drive improvements through Work Management process. • Updates metrics.
Configuration Management Database Coordinator • Updates the Configuration Management Data Base as a result of Design Changes • Coordinates with Engineering SME for Configuration Management Data Base reconciliation resolution and updates that are not the result of Design Changes
ICES Coordinator • Implements the ICES reporting program for the site. • Issues Technical Evaluations to System Engineers for development of ICES reports. • Ensures ICES reporting timeliness meets INPO 12-009 guidance. • Ensures requirements of station ICES reporting procedures are met. • Updates metrics.

Attachment 7
Miscellaneous Engineering Duties

Role Descriptions (continued)

Budget • Provides budget updates monthly, compares actual expenditures to projected • Develops Budgets for future years
Vendor Technical Manuals • Controls updates to VTMs • Performs periodic reviews in accordance with Station Procedures
Fluid Leak Management • Maintains Fluid Leak Management List • Tracks corrective Actions for Fluid leaks • Updates metrics
Bill of Materials Coordinator • Provides updates to the BOM based on changes to the plant from design changes and Item Equivalences • Changes stocking Min/Max based on Maintenance and Engineering feedback • Provides general administrative support
Failure Analysis Coordinator • Obtains and ships to failure analysis vendors equipment to support Cause Evaluations • Note: This is NOT the actual detailed Failure Analysis using advanced scientific equipment (such as scanning electron microscopes) to develop reports. Typically this is performed by either an outside vendor or a corporate failure analysis lab.
NERC Compliance Coordinator • Manages overall NERC compliance including following development of new requirements for compliance • Coordinates with Engineering, Operations, Maintenance and Planning on maintaining compliance with NERC Reliability Standards • Coordinates audits and audit submittals, and other compliance documentation for the stations. • Coordinates reliability data submittals • Participates in various NERC related industry groups such as NEI-NERC Task Force, PJM Nuclear Owners User Group, North American Generator Forum, North American Transmission Forum, and Nuclear industry peer calls • Determines applicability of all NERC Reliability Standard requirements to the nuclear sites • Coordinates facility ratings database management • Coordinates steady-state and dynamic modeling and simulation data management • Maintains Nuclear Plant Interface Requirements (NPIR) and Agreements with other NERC entities. • Coordinates Real and Reactive Power testing process and data reporting
B.5.b Coordinator • Provides updates to PMs and Corrective Maintenance for B.5.b Equipment • Tracks Out of Service hours for B.5.b Equipment • Coordinates and tracks resolution to B.5.b equipment concerns
FLEX/EP Equipment • Provides updates to PMs and Corrective Maintenance for FLEX Equipment and EP Equipment • Tracks Out of Service hours for FLEX Equipment and EP Equipment • Coordinates and tracks resolution to FLEX equipment and EP equipment concerns

Attachment 7
Miscellaneous Engineering Duties

Role Descriptions (continued)

Engineering Planner • Provides Planning for non-Design Change Engineering work activities • Assemblies Work Orders for Engineering work activities
Post Maintenance Testing • Updates the Post Maintenance database • Coordinates with Engineering SME for non-routine Post Maintenance Testing requirements

Attachment 8
Change Management Considerations

The below table provides detailed change management considerations including specific tasks and estimated timeframes. Note that many tasks may be performed in parallel. Predecessor tasks are provided for tasks that cannot be performed in parallel.

ID	Task Name	Approximate Duration	Predecessors
1	**Division of Responsibility Matrix**		
2	Review DNP ENG-004 and establish a draft division of responsibilities matrix for SE, CE, ERT, Programs, Design, and Corporate.	2 weeks	
3	Identify individuals within each engineering group who are currently performing the functions as outlined on the division of responsibility matrix. Ensure ancillary duties are identify as part of this review (PIs, HU/Safety, etc.)	2 weeks	
4	Identify the individuals within each engineering group who will be performing the functions as outlined on the division of responsibility matrix. Identify specialized skills required for the new position. (MOV/AOV, etc.)	2 weeks	
5	Identify the list of responsibilities that are recommended to be transferred to organizations outside of engineering.	2 weeks	
6	Meet with other change management leads to align on the division of responsibility matrix for SE, CMS, ERT, Programs, Design, and Corporate. Revise as required.	2 weeks	2,3,4,5
7	Perform final challenge with Sr Eng leadership Team and Engineering Change Management Leads to align and finalize division of responsibility matrix.	1 week	6
8	Meet with organizations outside of engineering to align and finalize transfer of responsibilities. Sr. Management ensures alignment across the site.	2 days	7
9	Develop a timeline for turnover of current responsibilities from current positions to transfer to the new organizational positions within engineering.	3 days	8
10	Develop timeline for turnover of responsibilities to outside organizations to support the new organizational model.	3 days	8
11	Develop and implement a site wide communication plan for the timeline to transfer responsibilities in engineering as well as external organizations.	1 week	9,10
12	Complete transition to finalize the engineering organization for SE, CMS, Programs and ERT.	2 weeks	8
13	Complete turnover of responsibilities to outside organizations to support the new organizational model. Engineering resources should be retained throughout transition period unless moving to outside organization to continue supporting the responsibility.	3 months	11,10

Attachment 8
Change Management Considerations

ID	Task Name	Approximate Duration	Predecessors
14	**Staffing**		
15	Solicit input from engineers on their desired position in the new organization.		
16	Determine the ideal position for each engineer based on their input and skillset. For example, experienced engineers that are good at troubleshooting and work well with Operations/Maintenance are typically ideal candidates for ERT.		15
17	Complete a change plan for each individual affected by the reorganization.	7 weeks	15,16
18	Determine the need for staff augmentation to support core business functions where there is not a current individual specialized to perform the role.	1 week	7,8
19	Create individual development plans for each individual role in the new organization.	2 weeks	7,8
20	Identify offsite training expenses to support individual contributors in the new organization.	1 week	19
21	Incorporate offsite training expenses into 2017-2018 budget.		20
22	Post vacancies and begin hiring supervisors.	1 month	
23	Post vacancies and begin hiring engineers.	1 month	
24	Perform leadership assimilations for supervisors, managers, and directors.	1 week	
25	**Procedure Changes**		
26	Identify procedures within Engineering that provide guidance on the roles, responsibilities, and activities of SE, CMS, ERT, Programs, Design, and Corporate.	2 weeks	
27	Identify procedures within Operations where tasks are currently assigned to SE, CMS, ERT, Programs, Design, and Corporate.	3 weeks	8
28	Identify procedures within Maintenance where tasks are currently assigned to SE, CMS, ERT, Programs, Design, and Corporate.	3 weeks	8
29	Identify procedures within Work Management where tasks are currently assigned to SE, CMS, ERT, Programs, Design, and Corporate.	1 week	8
30	Identify procedures within Chemistry where tasks are currently assigned to SE, CMS, ERT, Programs, Design, and Corporate.	2 weeks	8
31	Identify procedures within EP where tasks are currently assigned to SE, CMS, ERT, Programs, Design, and Corporate.	1 week	8
32	Identify procedures within Security where tasks are currently assigned to SE, CMS, ERT, Programs, Design, and Corporate.	1 week	8

Attachment 8
Change Management Considerations

ID	Name	Approximate Duration	Predecessors
33	Identify procedures within IT where tasks are currently assigned to SE, CMS, ERT, Programs, Design, and Corporate.	1 week	8
34	Identify procedures within Regulatory Assurance where tasks are currently assigned to SE, CMS, ERT, Programs, Design, and Corporate.	1 week	8
35	Identify procedures within Licensing where tasks are currently assigned to SE, CMS, ERT, Programs, Design, and Corporate.	1 week	8
36	Identify critical procedures within engineering that require revision to support going live on the reorganization. Consolidate procedures where possible.	2 weeks	26
37	Revise engineering critical procedures where roles, responsibilities, and activities of SE, CMS, ERT, Programs, Design, and Corporate will change.	1 month	36
38	Identify critical procedures within external organizations that require revision to support going live on the reorganization. Consolidate procedures where possible.	2 weeks	27,28,29,30,31, 32,33,34,35
39	Revise external organizations' critical engineering procedures where roles, responsibilities, and activities of SE, CMS, ERT, Programs, Design, and Corporate will change.	3 months	38
40	Identify all other procedures, external and internal, that require revision.	2 weeks	26,27,28,29,30, 31,32,33,34,35
41	Revise engineering non-critical procedures where roles, responsibilities, and activities of SE, CMs, ERT, Programs, Design, and Corporate will change.	3 months	40
42	Revise external organizations' non-critical engineering procedures where roles, responsibilities, and activities of SE, CMS, ERT, Programs, Design, and Corporate will change.	12 months	40
43	Develop a timeline for critical procedure revisions that support going live with a burndown curve to track completion.	1 week	36,38
44	Develop a timeline for non-critical procedure revisions that support going live with a burndown curve to track completion.	1 week	40
45	**Location**		
46	Considering the intent for SE to be strategic, ERT to be tactical, and CMS as part of Maintenance, determine new office locations for each group and affected organizations.	2 weeks	7,8
47	Submit IT requests for physical location moves.	3 days	46
48	Develop and implement a communication plan to external organizations for physical moves	3 days	47
49	Move individuals to new physical locations.	3 weeks	48

Attachment 8
Change Management Considerations

ID	Name	Approximate Duration	Predecessors
50	**On-Call, Outage, and EP Teams**		
51	Review and ensure adequate staffing for on-call, outage, and EP teams.	1 week	7,8
52	Close gaps in on-call, outage, and EP team coverage.	3 months	51
53	Align on refueling outage roles and responsibilities for site SE, CMS, ERT, Design, and Corporate Programs. Incorporate into high tier organizational document.	3 weeks	7,8
54	**KPIs/Metrics**		
55	Review current Engineering KPIs/Metrics to identity any change in ownership.	1 week	7,8
56	Review current Maintenance KPIs/Metrics to identify any change in ownership with CMS moving into Maintenance.	1 week	7,8
57	Develop timeline for transition of KPIs/Metrics.	2 days	55,56
58	Develop and implement a site wide communication regarding the changes.	3 days	57
59	Effectiveness Review – Six months after implementation.	5 days	ALL