

SUMMARY OF EVALUATED AREAS FOR CENTERS OF EXPERTISE

This enclosure provides an assessment of a number of technical and programmatic areas for centers of expertise (COEs). The specific areas include:

1. Decommissioning
- 2a. Security for research and test reactors
- 2b. Security for radiation sources
3. External hazards evaluations (e.g., seismic, flooding, meteorology)
4. Environmental reviews
5. Rulemaking
6. Operating experience and generic communications
7. Criticality safety evaluations
8. Advanced reactor technology
9. Technical specifications
10. Human factors
11. Allegations

Area 1: Decommissioning

Recommendation

The working group (WG) does not recommend further consolidation of agency decommissioning functions. The current program is effective, and there would be minimal efficiencies gained to offset the costs of forming a COE. In addition, consolidation at this time would potentially disrupt the integrated rulemaking for power reactor decommissioning that is currently underway. This rulemaking will streamline the transition from operations to decommissioning and will result in efficiencies in the decommissioning process.

The WG notes that consolidation of the Regional materials programs is being considered as a separate part of the Commission direction on Project AIM. As part of that tasking, the staff plans to evaluate the potential efficiencies that could be achieved through centralizing a variety of functions that may include inspection activities supporting materials decommissioning.

Current Roles and Responsibilities

Decommissioning is largely already a COE within the Office of Nuclear Material Safety and Safeguards (NMSS). NMSS is responsible for the decommissioning program for both power reactors and research and test reactors. For power reactors, NMSS assumes this responsibility after the reactor has permanently shut down and completed a number of post-shutdown activities. The transition occurs with the issuance of the Defueled Technical Specifications. For research and test reactors, NMSS assumes the decommissioning responsibility when the Decommissioning Plan is received from the licensee. The interfaces between the Office of Nuclear Reactor Regulation (NRR) and NMSS for post-shutdown and decommissioning functions for both power and research and test reactors are defined in NMSS Policy and Procedure 5-1, "Reactor Decommissioning Program Procedures for Interfacing with the Office of Nuclear Reactor Regulation."

NMSS also leads decommissioning activities for complex material (non-power reactor) sites¹ such as facilities containing commercial fuel (i.e., Hematite) and former uranium recovery sites. Staff performing decommissioning activities are housed in the Division of Decommissioning, Uranium Recovery, and Waste Programs. Support for environmental reviews and state and tribal interfaces is provided by other NMSS divisions. Contract support from Oak Ridge Associated Universities is used to conduct confirmatory surveys.

Regions I, III, and IV are responsible for the oversight of decommissioning activities in their respective regions, and sites located in Region II are managed by Region I. In addition to inspection implementation, the Regional offices lead the programmatic functions of decommissioning for non-complex sites such as medical facilities, universities, and laboratories. In Regions I, III, and IV, staff performing decommissioning activities are housed within a single branch in each regions' Division of Nuclear Material Safety. This configuration has proven to be effective because the Regional offices perform licensing for materials sites² and have a high level of familiarity with licensees due to their implementation of the inspection program. In such cases, regional inspection and project management staff have comprehensive knowledge of the technical aspects of the site and are able to evaluate licensee activities in a more effective and efficient manner than would a Headquarters-based team. Non-complex materials decommissioning activities require little to no technical or administrative support from the Headquarters program office and can typically be completed in less than one year. The distribution of decommissioning work based on complexity allows the Regional offices to integrate this work into their routine inspection activities and enables NMSS to dedicate resources to the completion of complex decommissioning, which is often resource-intensive and of high visibility for the Agency.

NRR performs annual financial assurance reviews for power reactors throughout the decommissioning process and NRO reviews all changes to quality assurance plans for power reactors that maintain their 10 CFR Part 50 licenses throughout the decommissioning process; funding for these reviews is provided as part of the Operating Reactors Business Line.

¹ NUREG-1757, Volume 1, "Consolidated Decommissioning Guidance," Revision 2, classifies facilities undergoing decommissioning into seven groups, based on the amount of residual radioactivity, the location of the material, and the complexity of the activities needed to decommission the site. In general, NRC Headquarters will have responsibility for managing decommissioning projects for material sites in Groups 4-7, since they require site-specific dose modeling evaluations, have contaminated groundwater, or are requesting release in accordance with 10 CFR 20.1403 or 10 CFR 20.1404. Typically, decommissioning activities that fall into groups 4-7 are referred to as "complex" and decommissioning activities that fall into the other categories are referred to as "non-complex." Examples of complex materials sites include: sites with groundwater contamination; sites containing significant soil contamination; sites in which the owners are in bankruptcy; any site where a decommissioning plan is required; all fuel cycle facilities undergoing decommissioning; and sites where there is significant public and/or Congressional interest.

² With the exception of exempt distribution licensing, which represents a small portion of the overall case work and is managed by NMSS.

The resources associated with decommissioning activities are shown in the table below.

Fiscal Year (FY) 2016 Resource Estimates*

Business Line	Office or Region	Full Time Equivalent (FTE)	\$ K
Decommissioning and Low Level Waste	NMSS	28.5	1,013
Decommissioning and Low Level Waste	Regions I, III, and IV	RI: 4.5 FTE RIII: 4 FTE RIV: 7.5 FTE	RIII: 78 RIV: 11

* The resources in this table are a subset of resources budgeted in this business line. The budget is not formulated at the level of detail related to this topical area, and thus the FTE and \$ K provided in the table above are approximations. The FTE values reflect both staff and supervisors, if the supervisor is a dedicated resource in this area.

** The table does not include the resources for NRR to conduct financial assurance reviews and NRO to conduct reviews of quality assurance plans.

Evaluation for a Center of Expertise

As described above, decommissioning of power reactors, research and test reactors, and complex materials sites is a functional area that is heavily centralized in NMSS. The decommissioning of non-complex materials sites and inspection of all decommissioning sites is led by Regions I, III, and IV with technical support from NMSS. Interfaces between the lead, support, and Regional offices are clear and effective. Associated regulations, guidance and processes are distinct and readily implemented.

In order to ensure coordination of the reactor decommissioning transition activities for the recent five (5) prematurely shutdown plants, an agency-wide Decommissioning Transition Working Group was formed to facilitate actions and ensure lessons are learned to improve future unplanned permanent shutdowns. The working group is co-chaired by NMSS and NRR managers and includes representatives from NMSS, NRR, the Office of Nuclear Security and Incident Response, Regional offices, and the Office of General Counsel (OGC). Support organizations, such as the Office of Public Affairs, also participate. The working group ensures routine communication on policy, programmatic, and work planning issues related to reactors that have permanently shut down, are planning to cease operations, or are transitioning from operations to decommissioning.

Decommissioning activities performed by NMSS and the Regional offices are coordinated by a Decommissioning Board that consists of branch chiefs in NMSS and each of the four regions. The Board meets on a quarterly basis and holds an Annual Counterpart Meeting to allow for focused interaction and alignment on programmatic issues affecting the decommissioning of power reactors, research reactors, materials, and uranium recovery sites. Monthly teleconferences between decommissioning branch chiefs and senior staff are also held to facilitate planning and coordination for licensing actions, technical support issues, programmatic improvements, and inspection activities.

NMSS expects the workload for decommissioning activities to increase gradually, particularly in the areas of power reactor decommissioning and radium site decommissioning. The increase in power reactor decommissioning is a natural progression due to the aging of the operating reactor fleet. Additionally, there have been a number of reactors that have shut down prematurely because of other circumstances such as uncertain economic viability. An increase

in decommissioning activities for sites containing radium contamination is expected due to the identification of historic, non-military sites with radium contamination. Resources in the budget are reflective of these changes.

Given that there is little overlap in functions for the conduct of decommissioning activities, any further consolidation would be primarily achieved by (1) combining NMSS and Regional functions of decommissioning for complex and non-complex materials sites, and/or (2) transitioning post-shutdown power reactor activities currently performed by NRR into NMSS. In considering the consolidation of complex and non-complex materials decommissioning, one consideration would be to transfer non-complex sites to NMSS. This may result in a slight improvement in the agency's agility in responding to changes in regulations, workload, and resources. This may require the relocation of regional resources to Headquarters and would create inefficiencies by requiring more collaboration between NMSS staff and regional inspectors and project managers in order to gather information for relatively simple decommissioning efforts. Such a consolidation would also need to consider the role the Regions have in performing licensing for materials sites and the potential inefficiencies that would be created by separating programmatic decommissioning functions from licensing functions. In this case, the consolidation of decommissioning functions would likely result in an increased cost to implement the program in the near-term and a neutral outcome in terms of maintaining or enhancing critical skills and knowledge sharing. The costs associated with this consolidation would be primarily associated with the cost of moving Regional staff to Headquarters, to be co-located.

With respect to power reactor decommissioning, the current regulatory infrastructure requires a number of licensing actions on the part of the licensee to revise technical specifications and align requirements for emergency plans, physical security plans, training standards, fitness for duty, and wet spent fuel storage criticality accident requirements with the licensee's shutdown status and decommissioning risk profile. The time and resource-intensive nature of this regulatory infrastructure, paired with the recent increase in the number of power reactors permanently shutting down, demonstrated the need for improved regulations to effectuate the decommissioning process. In Staff Requirements Memorandum (SRM)-SECY-14-0118, "Request by Duke Energy Florida, Inc., for Exemptions from Certain Emergency Planning Requirements," dated December 30, 2014 (ADAMS Accession No. ML14364A111), the Commission directed the NRC staff to proceed with rulemaking on reactor decommissioning and set an objective of early 2019 for its completion. In its SRM, the Commission stated that the rulemaking should address a number of items, including lessons learned from the plants that have already (or are currently) going through the decommissioning process and issues discussed in SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning," dated June 28, 2000), which proposed an integrated rulemaking to streamline the transition from operations to decommissioning³.

The integrated rulemaking will result in regulatory changes that reduce the number of licensing actions needed during the post-shutdown phase of reactor operations and will result in an earlier transition of decommissioning responsibilities to NMSS. This will allow NRR staff (and the supporting program offices) to focus on operational plant activities and enable NMSS staff to enhance and consolidate the process and procedures for decommissioning commercial power

³ After a licensee has certified permanent cessation of operation and removal of fuel from the reactor, its authority to operate is withdrawn. However, the plant still retains a Part 50 license and continues to be subject to many of the requirements that apply to operating plant Part 50 licensees, such as emergency planning and security requirements.

reactors. The rulemaking is being led by NRR with close involvement of the other program offices and key stakeholders. Once the rulemaking is complete, it is anticipated that there will be a decrease in the amount of licensing and project management support needed by NRR and less technical and legal support in the post-shutdown phase as there will be fewer licensing actions to manage. Completion of the integrated rulemaking for power reactor decommissioning will create efficiencies in the decommissioning process. Consolidation of post-shutdown activities with NMSS decommissioning activities while this rulemaking is being conducted would be an unnecessary distraction and could inhibit the efficiency and timeliness of the rulemaking. Realigning the organizational responsibilities during the rulemaking process would also result in challenges in determining the right balance of staff for the COE as the completion of the rulemaking will result in a change to the staffing and technical expertise needs for the post-shutdown phase of reactor decommissioning, the extent of which is yet to be fully determined.

Area 2a: Research and Test Reactor (RTR) Security

Recommendation

The WG does not recommend reconsolidating RTR security into NSIR. While there is value in consolidating all security staff into NSIR, there would be minimal efficiencies gained to off-set the disruption to the RTR community and the Molybdenum-99 (Mo-99) construction permit currently under review. RTR security is currently well integrated into NRR's RTR organization, and some efficiencies in dealing with the RTR community may be compromised by separating RTR security from its current organization.

Current Roles and Responsibilities

There are currently 31 operating RTRs. Licensing and oversight responsibilities for RTRs, including security, is housed within NRR's Division of Policy and Rulemaking. In SRM-SECY-06-0111, "Staff Recommendations Regarding Security at Research and Test Reactors," the Commission designated NRR as the lead for RTR responsibilities, including physical security.

NSIR provides security technical support to NRR, the Office of New Reactors (NRO), NMSS and the Regional offices. NSIR has responsibility for monitoring and assessing the threat environment, developing and overseeing the agency's security oversight program, ensuring protection of classified and sensitive unclassified information, overseeing the development of security policy and guidance, and coordinating and managing agency-wide cyber security activities at licensed facilities. NSIR is also the primary interface with other Federal partners on security-related topics. Currently, only research and test reactor security (NRR) and radiation source security (NMSS) reside in non-NSIR offices. However, NSIR provides technical expertise in support of NRR on RTR security activities on an "as needed" basis.

The resources associated with RTR security are shown in the table below.

FY 2016 Resource Estimates*

Business Line	Office or Region	FTE	\$ K
Operating Reactors	NRR	2.0	0

* The resources in this table are a subset of resources budgeted in this business line. The budget is not formulated at the level of detail related to this topical area, and thus the FTE and \$ K provided in the table above are approximations. The FTE values reflect both staff and supervisors, if the supervisor is a dedicated resource in this area.

Evaluation for a Center of Expertise

Consistent with SRM-SECY-06-0111, NRR has responsibility over RTR security although NSIR provides technical expertise in support of NRR on an as-needed basis. This arrangement has demonstrated itself to be effective.

With respect to workload, NRR is currently managing a steady workload, including the review of two construction permit applications to build Mo-99 production facilities with another application expected in the near term. NRR does not anticipate any changes to its workload in the near term (~ 5 years). Similarly, NSIR is currently managing a steady workload supporting all the business lines.

The WG acknowledges that movement of the RTR security function from NRR to NSIR would be consistent with NSIR’s current responsibilities, and NSIR could assume responsibilities for RTR security. Adding RTR security into the NSIR organization would provide an expanded peer group for staff working in that area, as well as additional staff for knowledge transfer. In addition, having all security staff in one organization could provide more flexibility to address any security-related workload issues.

Because of the small amount of FTE, the cost of co-locating the NRR RTR security staff into NSIR would be minimal. However, given that NRR is currently the COE for RTRs, this would cause a disruption to the organization within NRR as the staff is highly focused on the regulation of this unique community. Additionally, the RTR industry is strongly in favor of maintaining the current organizational construct. Lastly, this branch is the lead for managing Mo-99 construction permit reviews, which have a security review aspect to it. Movement of NRR staff to NSIR could be disruptive to that review. Based on this, the WG does not recommend movement of RTR security into NSIR.

Area 2b: Radiation Source Security

Recommendation

The WG does not recommend reconsolidating radiation source security into NSIR. While there is value in consolidating all security staff into NSIR, there would also be a loss of efficiency with respect to interaction with the various Agreement State programs as a result of removing the radiation source management program from NMSS. The radiation source management program is currently well integrated into NMSS’s infrastructure. If needed, NMSS has access to the security technical experts in NSIR.

Current Roles and Responsibilities

NMSS is responsible for programmatic and technical leadership and support for the safety, security, and control of radioactive materials. The office's purview includes overseeing the development and implementation of the Integrated Source Management Portfolio which includes 3 major applications – the National Source Tracking System, Web Based Licensing System and the License Verification System. NMSS also oversees the development and nationwide implementation and integration of the various initiatives to enhance source security; oversees the coordination of the Radiation Source Protection and Security Task Force activities for NMSS; and provides subject matter expertise support to the international community. Radiation source security is currently housed in one branch within NMSS' Division of Material Safety, State, Tribal, and Rulemaking Programs.

NSIR provides security technical support to NRR, NRO, NMSS and the Regional offices. NSIR has responsibility for monitoring and assessing the threat environment, developing and overseeing the agency's security oversight program, ensuring protection of classified and sensitive unclassified information, overseeing the development of security policy and guidance, and coordinating and managing agency-wide cyber security activities at licensed facilities. NSIR is also the primary interface with other Federal partners on security-related topics. Currently, only research and test reactor security (NRR) and radiation source security (NMSS) reside in non-NSIR offices. NSIR does provide technical expertise in support to NMSS on radiation source security activities.

The resources associated with radiation source security are shown in the table below.

FY 2016 Resource Estimates *

Business Line	Office or Region	FTE	\$ K
Materials Users	NMSS	15.0	0
Materials Users	NSIR	2.0	0

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Evaluation for a Center of Expertise

As described above, NMSS has overall lead responsibility for radiation source safety and security with NSIR providing additional technical expertise in the area of security. NSIR originally led radiation source security policy for NMSS regulated activities. The shift in NMSS and NSIR's roles and responsibilities began over a decade ago when Agreement States, as part of their partnership arrangement with NRC, asked the Commission to recognize that regulations relating to the security of materials provide dual functions in protecting public health and safety and protecting the common defense and security. In the 2013 Statements of Consideration for the final rule on the physical protection of byproduct material, the following statement was made: *"The NRC believes that the Agreement States can consistently and adequately implement the physical protection requirements on a nationwide basis, and as such, there will be no need for independent NRC action to protect the common defense and security."* [78 FR 16921] Consistent with this vision, NMSS has integrated security within the established safety program structure, and NSIR has transitioned to a support role for radiation source security, providing technical advice on as needed basis. This arrangement has been demonstrated to be effective.

The workload for radiation source security has been steady for a number of years. There are no major changes to the workload expected in this area.

The WG acknowledges that movement of the radiation source security function from NMSS to NSIR would be consistent with NSIR's current responsibilities, and NSIR could assume this responsibility. Adding radiation source security into the NSIR organization would provide an expanded peer group for staff working in that area, as well as additional staff for knowledge transfer. In addition, having all security staff in one organization could provide more flexibility to address security-related workload issues.

Some cost would be incurred in forming a COE. Physical relocation of a number of staff members would be the most tangible and immediate cost. There would also be "organizational" costs to a consolidation. Radiation source security requires substantial coordination with the Agreement States program. In addition, there is a strong connection between safety and security within this program, and attempting to delineate what is safety and what is security would be challenging and could have a negative impact on the overall effectiveness of the program.

Area 3: External Hazards Evaluations (e.g., seismic, flooding, meteorology)

Recommendation

The WG recommends pursuing a limited scope COE between NRR and NRO to centralize natural external hazards reviews within NRO in support of both the new and operating reactors business lines. Centralization of reactor functions in this area will assist with an eventual NRR/NRO merger and will assist with normalization of workload in the reactor area as the workload decreases in the next several years. The formation of this limited scope COE would involve the transfer of approximately 3-4 FTE and approximately \$20k from NRR to NRO. The WG does not recommend a COE that includes the materials programs in this area. Such consolidation would disrupt mission critical work in the materials programs and would not result in efficiencies due to the significant and necessary differences in standards, regulations, and approaches between the reactors and materials programs.

Current Roles and Responsibilities

NRR, NRO and NMSS each have staff that evaluate the impact of natural external hazards on site safety as part of their respective licensing programs. The staff evaluates site suitability features including flooding, faulting, folding, seismic activities, volcanism, meteorology, climate, tornados, wind, and surface water. Natural external hazards reviews are completed for each new application for a power reactor, as well as for new fuel cycle, uranium recovery, and Independent Spent Fuel Storage Installation (ISFSI) facilities (that are not co-located with an operating reactor). In addition, external hazards reviews are completed for certain licensing actions during site operations for operating reactors, fuel cycle, and ISFSI facilities. As a result of the lessons learned from Fukushima, work is currently ongoing to evaluate new hazard information and determine the need for additional regulatory action for operating reactor and fuel facilities. The Office of Nuclear Regulatory Research (RES) supports the program offices in the area of external hazards. RES staff generally do not support the licensing programs directly. Instead, their role is to provide in-depth technical expertise in certain specific areas and to conduct related research.

NRR's staff are housed in two branches, one branch within the Division of Engineering and the other branch within the Division of Risk Assessment. Of the 3-4 NRR staff members conducting such work, one (a meteorologist) has been on a long-term detail to NRO, and the work is currently managed out of NRO. The remaining staff members perform hydrology and seismology reviews. The branch also contracts dam safety work with the Federal Energy Regulatory Commission in support of operating reactor licensing. NRO's staff are housed in four branches in the Division of Site Safety & Environmental Analysis. The NRO staff support both new reactor licensing reviews as well as operating reactor licensing amendment reviews and more critically, reviews for post Fukushima actions. NMSS has staff members housed in three separate branches in three divisions (the Division of Fuel Cycle Safety, Safeguards and Environmental Reviews; the Division of Spent Fuel Management, and the Division of Decommissioning, Uranium Recovery, and Waste Programs). Only a portion of the NMSS staff's workload is dedicated to natural external hazards reviews. The staff also have other review duties within the NMSS business lines.

The resources associated with external hazards are shown in the table below.

FY 2016 Resource Estimates *

Business Line	Office or Region	FTE	\$ K
Operating Reactors	NRR	3.0	20
Operating Reactors; New Reactors	NRO	31.0	3,200
Fuel Facilities; Decommissioning and Low Level Waste; and Spent Fuel Storage and Transportation	NMSS	3.0	0

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Evaluation for a Center of Expertise

Although regulations in both the materials and reactor areas require external hazards evaluations for new and operating facilities, the regulatory requirements necessarily differ between new reactors, operating reactors, and materials facilities. In addition, the overall process and guidance used for these reviews is different across the offices. Licensing reviews for reactor and materials sites are conducted under different regulations (e.g., 10 CFR Part 50 for operating nuclear reactors, 10 CFR Part 52 for new nuclear reactors, 10 CFR Part 40 for uranium recovery facilities, 10 CFR Part 70 for fuel cycle facilities, etc.). Accordingly, while each set of regulations requires some form of an external hazards review, each program office that conducts external hazards reviews has developed processes, procedures, guidance, and work planning tools that are specific to the types of facilities they license. Differences in the risks posed by the different facilities as well as the timing of when facilities were built contribute to necessarily different regulatory approaches in these areas.

The workload in the area of natural external hazards is currently high and is expected to decline for both new and operating reactors in the next 5 years due to completion of the current combined license reviews (including the mandatory hearings for combined license applications)

and post-Fukushima work. The workload in the materials area is steady and is anticipated to remain steady or slightly decrease due to completion of post Fukushima actions.

Centralization of functions in this area could result in some standardization of processes, procedures, guidance, and work planning tools, although given the differences in regulated facilities, complete standardization across the agency would not be practical or appropriate. Centralization would also improve agility in responding to changes in regulations, science, law, workload, and resources and would improve the agency's ability to maintain or enhance critical skills and knowledge sharing. Centralization of functions would also result in efficiencies over time, as the staff and supporting contractors gained the necessary expertise to support more than one program area.

The creation of an agency-wide COE at this time would be a significant organizational change. It would cause a disruption in near-term mission critical work, most notably in the materials program because NMSS staff that complete natural external hazards reviews also conduct other mission critical work for the materials programs. Lastly, the potential organizational distractions that may be caused by integrating the materials and reactors programs in the near future may put at risk the high priority Fukushima work that NRR, NRO, and RES are currently supporting. That being said, coordination among the offices has begun between the offices through matrixed staff and rotations. Physically relocating the number of staff involved in this work across the agency would also be a tangible cost.

The above benefits can be largely obtained and the above costs can be largely avoided by creating a COE for natural external hazards in support of the new and operating reactor business lines. Centralizing the external hazards review functions in NRO to support both new and operating reactors would also support a future merger between the offices and would have a small impact on the current organizations since only a limited number of staff in NRR conduct this type of work. NRO staff currently support the majority of external hazards evaluations for both reactor programs and are already addressing the challenges related to the differences in regulation and guidance between new and operating reactors. Work has already begun to establish the infrastructure necessary to integrate and prioritize the work in the reactor program, including integrating the work planning tools between NRR and NRO in this area. In addition, given the expected decline in the reactor workload in the next five years, centralizing reactor functions will assist in normalizing workload.

While a COE for both the reactors and materials programs is not recommended, external hazards staff do complete some work that is matrixed between the offices, and some have been cross trained between reactors and materials reviews. It is possible that the lessons learned from centralizing functions in the reactor area could be applied to explore what additional synergies are possible in the longer term.

Area 4: Environmental Reviews

Recommendation

The WG does not recommend the creation of a COE for environmental reviews at this time because it would disrupt near-term, mission critical work (e.g., hearings, license renewal, licensing reviews).

The WG has determined that enhancements in efficiency and effectiveness could be achieved through consolidation of all the environmental review staff into one organization; however,

separating environmental review from the licensing projects they support may negatively impact the efficiency and effectiveness of licensing actions.

The WG notes that the agency is considering a merger between NRR and NRO. If a merger is approved and implemented, it is expected that the merger plan will review the potential for consolidating staff performing environmental reviews for the reactor programs. The WG recommends that the National Environmental Protection Act (NEPA) steering committee continue to assess the appropriate timing for any COE as the workload in this area changes.

Current Roles and Responsibilities

NMSS conducts environmental reviews in support of NMSS' decommissioning, uranium recovery, fuel cycle, spent fuel storage and transportation, and byproduct materials programs. Environmental review activities within NMSS are conducted by staff housed in one branch in the Division of Fuel Cycle Safety, Safeguards, and Environmental Review. This branch is responsible for performing environmental reviews and providing environmental review guidance, training, and technical expertise related to non-reactor environmental reviews.

NRR conducts environmental reviews in support of the NRR's operating reactor programs, with the majority of the work supporting license renewal. Environmental review activities within NRR are performed by two branches within the Division of License Renewal. One branch performs project management of the environmental reviews and one branch provides the technical expertise.

NRO conducts environmental reviews in support of NRO's new reactor program. Environmental review activities within NRO are performed by two branches: one branch within the Division of New Reactor Licensing, responsible for the project management of the environmental reviews, and one branch in the Division of Site Safety & Environmental Analysis, responsible for providing the technical expertise. NRO employs a combination of in-house staff and contractors to perform environmental reviews.

Staff in NRR, NRO, NMSS and Regions I, III, and IV perform simple environmental assessments and reviews of categorical exclusions for both reactors and materials licensing work. These efforts are typically captured as part of licensing product lines within the respective business lines and could be approximated at less than one FTE for each program office or region. Because of the minimal resources, this aspect was not considered as part of this evaluation.

The resources associated with environmental reviews are shown in the table below.

FY 2016 Resource Estimates *

Business Line	Office or Region	FTE	\$ K
Fuel Facilities; Decommissioning and Low Level Waste; and Spent Fuel Storage and Transportation	NMSS	11.0	3,482
Operating Reactors	NRR	13.0	0
New Reactors	NRO	15.0	2,000

* The resources in this table are a subset of resources budgeted in this business line. The budget is not formulated at the level of detail related to this topical area, and thus the FTE and \$ K provided in the table above are approximations. The FTE values reflect both staff and supervisors, if the supervisor is a dedicated resource in this area.

Evaluation for a Center of Expertise

The regulatory infrastructure for the conduct of environmental reviews performed under the NEPA is the same for NRR, NRO, and NMSS (e.g., 10 CFR Part 51). The overall process and guidance used for these reviews is similar across the offices. However, the implementation of environmental reviews under 10 CFR Part 51 is shaped by the set of regulations that govern each specific licensing program. Licensing reviews for reactor and materials sites are conducted under different regulations (e.g., 10 CFR Part 50 for operating nuclear reactors, 10 CFR Part 52 for new nuclear reactors, 10 CFR Part 40 for uranium recovery facilities, 10 CFR Part 70 for fuel cycle facilities, etc.). Accordingly, each program office with NEPA responsibilities has developed processes, procedures, guidance, and work planning tools that interface effectively with the review functions and regulatory requirements for each licensing program. Within each program office, the environmental review staff support the licensing programs through coordination with project management staff. This coordination ensures consistency in the concurrent safety and environmental reviews that support various licensing applications. It also allows for the timely identification of technical and programmatic issues that could affect the scope, schedule, and resources of the safety and environmental reviews. As such, separation of the environmental reviews from the safety review may create inefficiencies and a disconnect between the safety and environmental reviews.

The NEPA-implementing program offices recognized the value of and need for coordinating agency-wide environmental functions. Therefore, in 2010, NRR, NMSS, NRO, and the Office of the General Counsel established the NEPA Steering Committee to discuss cross-cutting environmental review matters in order to improve the agency's consistency in conducting environmental reviews, ability to share and leverage resources, and improve staff development, knowledge management, and flexibility in responding to agency-wide environmental issues. In 2011, the NEPA Steering Committee considered and evaluated the advantages and disadvantages of a dedicated organization responsible for conducting the agency's environmental reviews. The NEPA Steering Committee, however, concluded that creation of and transition to a COE for environmental reviews would not be appropriate at that time based the volume of NEPA environmental work that was ongoing at that time. Specifically, the Steering Committee felt that dedicating the level of resources necessary to centralize

environmental reviews for the agency could have impacted the progress of environmental reviews related to uranium recovery, new reactors, and license renewal.

With respect to workload, NMSS is currently managing a steady and significant number environmental reviews in support of uranium recovery, fuel cycle, decommissioning, and spent fuel storage licensing reviews. NMSS is also currently managing a high number of contested hearings related to uranium recovery license applications. NMSS expects to continue to support a similar number of environmental reviews, including the associated hearings, into the future. NRO's current workload is steady and consists of environmental reviews in support of new nuclear power reactor applications and the associated mandatory hearings. While the current workload to support mandatory hearings is high, NRO expects a decline in the environmental review workload based on the anticipated number of license applications in the near future. NRR's current workload is steady and consists of license renewal application reviews and two construction permits for Mo-99 production facilities. NRR expects an increase in workload due to anticipated subsequent license renewal applications in calendar year 2019 and beyond. In NRO and NMSS, there are significant efforts underway in FY15 and FY16 to complete hearings associated with new reactor and uranium recovery licensing. As such, the evaluation of forming a COE at this time identified that pursuing a COE prior to completion of those hearings could impede the effectiveness of hearing preparation and completion.

Given the alignment of regulatory requirements for environmental reviews, a COE that encompasses both the reactors and materials programs would improve consistency in environmental reviews through standardization of processes, procedures, guidance, and work planning tools. A COE would also improve agility in responding to changes in regulations, science, law, workload, and resources and would improve the agency's ability to maintain or enhance critical skills and knowledge sharing. The creation of a COE would also result in efficiencies in the agency's ability to manage increases in the number and complexity of reviews.

The creation of a COE for both the reactors and materials programs at this time would be a significant organizational change, affecting a significant number of staff. It could cause a disruption in near-term mission critical work, most notably hearings. It would make it more difficult for the environmental review staff to maintain the current level of coordination and communication with their licensing counterparts that would remain housed in the program offices. This in turn could impact the timeliness, effectiveness, and efficiency of licensing reviews. Physical relocation of a number of staff members would be another tangible and immediate cost. There would also be a cost associated with creating common procedures, guidance, and work planning tools. While none of these are insurmountable challenges, the training and knowledge management activities required to make the COE personnel fully fungible across all business lines would result in a need for additional resources.

Area 5: Rulemaking

Recommendation

The WG recommends creating a COE in the area of rulemaking, for the rulemaking staff (i.e., project managers, regulatory analysis staff), and recommends that the COE be established in NMSS. Technical support for rulemakings would continue to be the responsibility of technical staff in each of the program offices. In selecting the home office for the COE (i.e., NMSS), the WG evaluated pros and cons. The WG determined that it is preferable for the office to be a program office, and not a supporting office such as ADM. NMSS is recommended because: 1)

NMSS currently has a large rulemaking program; 2) NMSS staff is experienced in forming and leading interoffice working groups and working with a diverse set of public stakeholders as well as supporting multiple business lines; and 3) NMSS will not be impacted by any potential merger of NRR and NRO. This recommendation does not extend to rulemaking activities conducted by offices reporting to the Commission, including the Office of International Programs and the Office of the Chief Financial Officer.

Current Roles and Responsibilities

Before 1998, NRC's rulemaking activities were centralized within RES. In COMSECY-96-066, the Commission directed the staff to transfer responsibility for rulemaking from RES and into the program offices (i.e., NRR and NMSS), with the administrative infrastructure responsibilities moving to the Office of Administration (ADM). The Commission's direction was based on recommendations in Directions Setting Issue Paper 22, the purpose of which was to assess the scope and role of NRC's research programs. The objective, in part, of this transfer of rulemaking functions to NRR and NMSS was to better align the work with the program owners. It was believed that overall rulemaking efficiency could be improved because of the clear stake and direct interest the Program Offices have in enhancing the Agency's regulations. In addition, it was believed that the direct experience of the Program Offices provided a better understanding of the problems and shortcomings of existing regulations. In 2009, the Commission approved the designation of NRO as the lead office for design certification and other rulemaking activities related to new and advanced reactors. NRO established a branch that followed the same processes and procedures as the NRR rulemaking branch.

In NRR, the rulemaking functions are housed in one branch in the Division of Policy and Rulemaking. In NMSS, the rulemaking functions are housed in one branch in the Division of Material Safety, State, Tribal, and Rulemaking Programs. In NRO, the rulemaking functions are housed in one branch in the Division of Advanced Reactors and Rulemaking. Each office is responsible for rulemakings that affect its principle business line(s).

As indicated in the Common Prioritization of Rulemaking, Report 3 (May 23, 2015), the FY16 budget provides for a total of 139.5 FTE and \$4.6 million dollars to support rulemaking activities. A subset of those resources perform direct rulemaking activities (e.g., project managers, rule writing and regulatory analysis); the remaining resources are for technical experts throughout the agency to provide the supporting technical bases for those rulemakings, and for the required legal and administrative support. Those remaining resources would not be impacted by the potential formation of a COE.

The resources associated with rulemaking staff in the program offices are shown in the table below.

FY 2016 Resource Estimates *

Business Line	Office or Region	FTE	\$ K
Fuel Facilities; Decommissioning and Low Level Waste; and Spent Fuel Storage and Transportation	NMSS	17.3	10
Operating Reactors	NRR	16.7	980
New Reactors	NRO	5.1	60

* These resources are provided on the Common Prioritization of Rulemaking, Report 3 (May 23, 2015).

Evaluation for a Center of Expertise

Rulemaking follows similar processes and regulations and the procedures and guidance found in each office is similar. In addition, the staff of different offices and business lines work to a set of common prioritization criteria when prioritizing rulemakings. Recognizing the value of and need for coordinating agency-wide rulemaking activities, the NRC Rulemaking Coordinating Committee (RCC) was established in May 1998. The RCC is intended to ensure that the NRC rulemaking process remains consistent among the program offices. The RCC is chaired by the Office of Administration and consists of representatives from the primary offices involved in rulemaking: NRR, NRO, NMSS, and OGC. The primary focus of the RCC is to ensure consistency in methods used to develop and promulgate rules and to facilitate initiatives for improving all aspects of the rulemaking process.

The overall workload in the area of rulemaking is expected to decrease over the next five years. Centralizing functions would provide additional flexibility and agility in addressing this change while continuing to maintain critical skills. Consolidation of the rulemaking functions for NRR, NRO and NMSS should also result in improved knowledge management and maintenance of critical skills, as well as increased ability of the organization to respond to changing workload and circumstances. Having all the rulemaking staff established in a COE would further ensure consistency in approach to regulatory analyses for rulemakings, including the costs and benefits, use of qualitative versus quantitative factors, and cumulative effects of regulation. In addition, it would support the ongoing efforts associated with the merger of NRR and NRO.

As part of the formation of the COE, the staff will specifically evaluate possible FTE savings in this area. Over time, as the staff gains the necessary expertise to support all of the program areas, additional efficiencies would be expected. However, they cannot be quantified at this time.

Although the guidance, policy, processes, and regulations followed for rulemaking are consistent across the program offices and would facilitate the formation of a COE, the training and knowledge management activities required to make the COE personnel fully fungible across types of rulemakings could result in a need for additional resources due to changing procedures, training staff on new procedures, and cross training of staff. The cost of forming a COE would also include the physical relocation of rulemaking project management and regulatory analysis staff.

Area 6: Operating Experience and Generic Communications

Recommendation

NRR and NRO implemented a limited scope COE for reactor operating experience for both reactors in operation and those under construction. The staff will continue to consider opportunities to improve the efficiency of this COE, including the potential for minor changes in staffing levels (i.e., reductions in staffing to capture gains from future process improvements). Due to the differences in the existing operating experience programs, it is not clear that consolidating the reactor and materials programs in this area would lead to enhanced effectiveness or efficiency. Thus, consolidation of this area is not recommended at this time.

The Generic Communications Program is currently centralized within NRR with an office coordinator in NRO, NMSS, NSIR, and ADM. No additional consolidation is recommended.

Current Roles and Responsibilities

Reactor Operating Experience:

In March of 2012, NRR and NRO issued a memorandum to the Executive Director for Operations, "Centers of Expertise for Allegations, Operating Experience/Construction Experience, Electrical Engineer, and Vendor Inspection," (ML12031A191) to describe the coordination and interdependency between the offices in the area of Operational Experience and Construction Experience (OpE/ConE) with the establishment of a COE for the reactor programs. This COE uses a common set of processes and procedures for the two program offices to ensure consistent screening and processing of operating and construction experience for reactors. An operating experience clearing house is established and is the initial step in determining what, if any, agency action is taken in relation to an operating experience issue or event. Representatives of RES, NRO, NSIR, and NMSS also attend Clearinghouse meetings.

This COE is led by NRR, with supporting staff residing in both NRR and NRO. In NRR, 11 FTE and one supervisor are provided within the operating reactor business line to collect, evaluate, and communicate domestic and international reactor operating experience. Within NRO, 2 FTE and a portion of one supervisor are provided within the new reactor business line to collect, evaluate, and communicate domestic and international reactor construction experience, and apply the lessons learned. The staff in both offices perform this function as their primary duty. Because of their experience with new reactor licensing and inspection processes, NRO staff routinely provide construction insights that enhance COE work products. As part of the Project AIM rebaselining process, NRR and NRO have both proposed restructuring the limited scope COE to gain additional efficiencies.

NMSS Operating Experience:

In NMSS, two divisions are responsible for OpE. The Division of Fuel Cycle Safety, Safeguards and Environmental Review (FCSE) is responsible for the OpE program for the fuel cycle program. The Division of Material Safety, State, Tribal, and Rulemaking Programs (MSTR) is responsible for the OpE program for the other materials programs. The staff in NMSS are responsible for events tracking and evaluation, regional and Agreement State coordination. A critical aspect of the materials operating experience program is updating and maintenance of the Nuclear Material Event Database (NMED) system, which contains records of events involving nuclear material reported to the NRC by NRC licensees, Agreement States, and non-

licensees. The database is maintained by the Idaho National Laboratory. Use of NMED and the types of events that are tracked in the system represents a significant difference in application of operating experience between the reactor and materials programs. Unlike NRR and NRO, NMSS staff do not perform this function as their primary duty.

The resources associated with OpE/ConE activities are shown in the table below.

FY 2016 Resource Estimates *

Business Line	Office or Region	FTE	\$ K
Fuel Facilities; Materials Users	NMSS	4.0	1,200
Operating Reactors	NRR	11.0	0
New Reactors	NRO	2.0	0

* The resources in this table are a subset of resources budgeted in this business line. The budget is not formulated at the level of detail related to this topical area, and thus the FTE and \$ K provided in the table above are approximations. The FTE values reflect both staff and supervisors, if the supervisor is a dedicated resource in this area.

Generic Communications: Generic communications for the Agency is centralized in the Generic Communications Branch of the Division of Policy and Rulemaking in NRR. The branch works across all program and support offices to oversee the issuance of generic communications. The resources for this are budgeted within the Operating Reactor business line. NRR has 14 FTE to support this activity. The offices of NSIR, NMSS and NRO each maintain a Generic Communications coordinator, who performs this role as a part-time duty. Because it already exists as a COE, the WG did not conduct further evaluations of this focus area.

Evaluation for a Center of Expertise

As discussed above, there are differences in the approach to OpE for the reactor and materials programs that are reflective of the environment and the diversity of the regulated entities. Both are functioning well. The COE for the reactors programs ensures focus on operating experience issues for the operating fleet and construction experience issues for new reactor construction. OpE for the materials program does not have as many resources as the reactor program at this time, and these resources perform both OpE and non-OpE functions and are distributed throughout the office, reflective of the diversity of licensees in the materials program.

The workload in the area of operating experience has been and is expected to remain steady in the reactor and materials areas. There could be an increase in operating experience when new reactors commence operations. However, the reactor COE is equipped to manage workload fluctuations within the existing structure of the COE.

Further consolidation of reactor OpE/ConE resources with the material OpE resources in a centralized location could provide more flexibility to address workload fluctuations, once staff became fully fungible. However, there would be costs to further consolidation of OpE. For NMSS/FCSE, the individuals responsible for the OpE program have additional responsibilities providing support for other areas of the fuel cycle program. The staff in NMSS/MSTR also support work related to the Medical Radiation Safety Team. In addition, materials expertise would be required to support an agency-wide COE. Because the materials program is diverse (i.e., fuel facilities; medical, industrial, and academic use of materials; spent fuel storage and transportation), this technical expertise would consist of multiple staff members. The current

structure allows for immediate and efficient interactions with licensees, Agreement States, other regulatory agencies, and the Regions. OpE in NMSS is generated from varying licensee types (radiographers, well loggers, irradiators, medical modalities, fuel cycle facilities, general licensees, etc.). As such, the types of issues addressed vary significantly from the reactor COE with its focus on reactor operations. These differences reduce the potential for effectiveness and efficiency gains if the materials and reactor programs were centralized. Inefficiencies would be created if the OpE staff in NMSS were removed from their current organizations and consolidated into a separate organization. The impact on the remaining organizations would be significant because this staff would no longer be able to support the other reviews they perform for their business lines. Thus the creation of a COE for OpE would create inefficiencies by creating the need to supplement other parts of the organization with staff to perform those mission critical activities. Physical relocation of a number of staff members would be another tangible and immediate cost.

Area 7: Criticality Safety Reviews

Recommendation

The WG does not recommend the creation of a COE related to criticality safety reviews at this time. While some efficiencies could be gained by more closely aligning approaches to criticality safety reviews across the agency, the creation of a COE would disrupt mission critical work and would not result in efficiencies due to the significant and necessary differences in standards, regulations, and approaches between the reactors and materials programs.

The WG notes that the agency is considering a merger between NRR and NRO. If a merger is approved and implemented, it is expected that the merger plan will review the potential for consolidating staff performing criticality safety reviews for the reactor programs.

Current Roles and Responsibilities

Criticality safety reviews are performed in NRO, NRR and NMSS, with limited support from RES. NRO staff perform criticality safety evaluations for fresh and spent fuel storage and handling for initial certification and licensing of design certifications (DC) and combined licenses (COL) under 10 CFR Part 52, as well as license amendment requests for COLs. The staff conducting these reviews reside in one branch in the Division of Division of Safety Systems and Risk Assessment. A small fraction of each individual's workload is dedicated to criticality safety reviews. For example, these staff members also perform reviews and evaluations of the design, process design parameters, and performance of reactor systems for new reactor designs, concentrating on reactor coolant system and emergency core cooling system performance under steady-state, transient and accident conditions.

NRR staff primarily performs evaluations of license amendment requests and topical reports related to the criticality analysis of spent fuel pools for 10 CFR Part 50 licensees. NRR's Spent Fuel Team consists of 3 staff members and one Team Leader housed within one branch in the Division of Safety Systems. The NRR staff have technical capabilities and experience beyond just spent fuel criticality and routinely perform other technical and safety work in support of the operating reactor business line. The NRR staff also evaluate reactor operating procedures, and the design and performance of reactor systems; particularly reactor control and protection systems, as used in commercial nuclear power plants. They review and evaluate proposed changes to existing commercial nuclear power plant operating licenses with respect to their

effects upon plant safety related and non-safety-related systems, core physics, and core thermal hydraulic performance.

NMSS staff conducts the technical criticality safety review of commercial transportation cask designs under 10 CFR Part 71 and spent fuel storage cask designs under 10 CFR Part 72, and in support of special nuclear material licensing under 10 CFR Part 70. The staff conducting these reviews reside in one of two branches, one branch housed within the Division of Spent Fuel Management (DSFM) and the other is housed within the Division of Fuel Cycle Safety, Safeguards & Environmental Review (FCSE). The staff in each of these branches also perform other technical and programmatic functions. Specifically, staff in DSFM oversee the research projects performed in support of criticality safety, act as Contract Officer Representatives for various projects, and perform shielding design reviews. Staff in FCSE perform criticality safety licensing reviews, inspection and event analysis, and OpE screening functions. Staff in both divisions develop Regulatory Guides and NUREGs and take part in collaborative exchanges such as those led by the International Atomic Energy Agency and the American Nuclear Society.

The resources associated with criticality safety reviews are shown in the table below.

FY 2016 Resource Estimates *

Business Line	Office or Region	FTE	\$ K
Spent Fuel Storage and Transportation; Fuel Facilities	NMSS	7.5	350
Operating Reactors	NRR	2.5	200
New Reactors	NRO	0.5	0

* The resources in this table are a subset of resources budgeted in this business line. The budget is not formulated at the level of detail related to this topical area, and thus the FTE and \$ K provided in the table above are approximations. The FTE values reflect both staff and supervisors, if the supervisor is a dedicated resource in this area.

Evaluation for a Center of Expertise

NRO and NRR are fairly well aligned on training and qualification programs, regulatory infrastructure, guidance, and codes in support of the reactor programs. However, there are significant differences in approach between the reactor and materials programs that reflect the significant and necessary differences in approaches, regulations, guidance, and computational codes. To support knowledge sharing and increased standardization, the Nuclear Criticality Safety Community of Practice and the Nuclear Criticality Safety Technical Advisory Group were established.

The creation of a COE in criticality safety reviews would lead to some increased standardization, enhanced knowledge management, improved maintenance of critical skills, and greater flexibility in responding to changes, and normalizing workloads.

There would be a significant cost to the creation of a COE in this area. The impact on the remaining organizations would be significant because this staff would no longer be able to support the other reviews they perform for their business lines. Thus the creation of a COE for criticality safety would create inefficiencies by creating the need to supplement other parts of the organization with staff to perform those mission critical activities. Physical relocation of a number of staff members would be another tangible and immediate cost. The staff notes that

the agency is considering a merger between NRR and NRO. If a merger is approved and implemented, it is expected that the merger plan will review the potential for consolidating staff performing criticality safety reviews for the reactor programs.

Area 8: Advanced Reactors

All of the Agency's resources for advanced reactors, defined in this report as non-light water power reactors (vice the small light-water modular reactors) are currently centralized within NRO. NRO has the lead for managing the development and resolution of policy issues for all activities involving the licensing of non-light water power reactor designs, such as engaging with reactor vendors, interacting with the Department of Energy (DOE) and international groups, considering approaches for the licensing reviews, and developing Commission papers on policy issues. NRO leverages the work of the DOE in this area. For FY16, 2 FTE is budgeted in the New Reactor Business Line for advanced reactor work. Technical staff from all of the program offices engage in various non-light water reactor activities at a minimal resource level to stay informed of the Department of Energy activities (e.g., attending technical seminars). If this becomes a growth area for the agency, the current organizational structure will be reassessed. Because it already exists as a COE, the WG did not conduct further evaluations of this focus area.

Area 9: Technical Specifications

Recommendation

The WG recommends that NRR and NRO centralize technical specifications reviews within NRR in support of both the new and operating reactors business lines. This limited scope COE would involve the transfer of 3-4 staff members as well as contract support from NRO to NRR. The WG does not recommend a COE that includes the materials programs in this area. Such consolidation would disrupt mission critical work in the materials programs and would not result in efficiencies due to the significant and necessary differences in standards, regulations, and approaches between the reactor and materials programs.

Current Roles and Responsibilities

In NRR, technical specifications (TSs) reside in one branch housed within the Division of Safety Systems. The branch is responsible for implementing, interpreting, and developing plant technical specifications to ensure that the regulatory approach to plant licensing embodied in the Standard Technical Specifications are appropriately applied to plant technical specifications.

In NRO, TSs reside in one branch housed within the Division of Safety Systems and Risk Assessment. The branch is responsible for developing programs and guidelines for technical specifications for new reactors, providing interpretations of technical specification requirements and verifying that technical specifications meet regulatory requirements and include all necessary systems, structures, and components, and safety limits.

In NMSS, responsibility for technical specifications resides in two branches, one housed within the Division of Spent Fuel Management (DSFM) and the other in the Division of Decommissioning, Uranium Recovery, and Waste Programs (DUWP). Technical specifications staff in DSFM are responsible for coordinating and conducting the safety reviews of commercial transportation cask designs under 10 CFR Part 71 and spent fuel storage cask designs under 10 CFR Part 72. One part of these review activities includes the review of the technical

specifications of the packages. This aspect of the review activity accounts for less than one FTE of the overall licensing review activities. Technical specifications staff in DUWP approve technical specifications for the decommissioning of power reactors. The review and approval of decommissioning technical specifications represents less than 1 FTE of effort in the branch. Staff performing this function perform many other duties, such as project management of decommissioning reactors.

The resources associated with technical specifications are shown in the table below.

FY 2016 Resource Estimates *

Business Line	Office or Region	FTE	\$ K
Spent Fuel Storage and Transportation; Decommissioning and Low Level Waste	NMSS	<2.0	0
Operating Reactors	NRR	10.0	0
New Reactors	NRO	3.8	200

* The resources in this table are a subset of resources budgeted in this business line. The budget is not formulated at the level of detail related to this topical area, and thus the FTE and \$ K provided in the table above are approximations. The FTE values reflect both staff and supervisors, if the supervisor is a dedicated resource in this area.

Evaluation for a Center of Expertise

For the reactor programs, the consolidation of technical specifications aligns with the potential NRR/NRO merger, and the organizations would benefit from merging the functions early. The roles and responsibilities in NRR and NRO are similar, and the NRR and NRO training programs in this area have a high degree of alignment. Some differences between Parts 50 and 52 exist; however, these differences should not impact the effectiveness of a COE in this area. In contrast, there are significant differences in regulations, guidance and processes between the reactor technical specification programs and the NMSS technical specification programs. These differences do not lend themselves to consolidation.

Workload in the area of technical specifications is expected to remain steady in NRR and NMSS, however the workload in NRO is expected to decrease as new reactor licensing decreases. Consolidation of this function in the reactor area may therefore assist with the normalization of workload.

The main benefits that can be achieved by centralizing functions in this area are knowledge management, maintenance of critical skills, and increased ability of the organization to respond to changing workload and circumstances. NRR and NRO are already leveraging resources across business lines and supporting each other due to attrition of staff. For example, NRO has been performing some operating reactor standard technical specification reviews in order to address the combination of a loss of several staff members in NRR and a decline in the workload in NRO. If the technical specifications functions of NRR and NRO are consolidated, this kind of cross business line support would be a natural function of the COE, creating efficiencies

The cost of centralizing functions between NRR and NRO in this area would be low given that NRR and NRO have similar processes and products. In addition, the consolidation of these

functions, and any costs associated with moving or integration of staff, would be expected to occur anyway if and when the offices merge.

The WG considered the creation of a COE that would include technical specifications for the materials program. Because of the significant differences in regulations, guidance and processes between the reactor technical specification programs and the materials' technical specification programs, a COE that encompasses all of the technical business lines would be difficult to implement. The NMSS staff performing the technical specification work are dispersed in different organizations within the office and have other responsibilities beyond technical specifications related to the functions of those organizations. As a result, a consolidation of NMSS technical specification functions would have significant impact on the office and its ability to complete the non-technical specification work currently being performed by the existing technical specification staff. Based on the above, the WG concluded that creation of a COE across both the reactor and materials programs would involve significant inefficiencies and impact the ability of the NMSS to perform its other mission critical work. Further, the cost of establishing a COE would be high given the significant and necessary differences in standards, regulations, and approaches between the reactors and materials programs.

Area 10: Human Factors

Recommendation

The WG does not recommend the creation of a COE related to human factors because it would disrupt mission critical work and would not result in efficiencies based on the high degree of differences in the types of work performed by each organization.

The WG notes that the agency is considering a merger between NRR and NRO. If a merger is approved and implemented, it is expected that the merger plan will review the potential for consolidating staff performing human factor licensing reviews.

Current Roles and Responsibilities

Human factors reviews are performed in NRR and NRO, with support from RES. In NRR, human factors resides in one branch housed within the Division of Risk Analysis. The branch is responsible for reviewing license amendments using risk insights for operating reactors, supporting rulemaking (e.g. Fatigue Rule, Decommissioning), and leading or supporting safety culture inspections at all facilities, developing supporting inspection manual chapters and inspection procedures, and developing training material for safety culture and human factor related areas, among other activities.

In NRO, human factors resides in one branch housed within the Division of Construction Inspection and Operational Programs. The branch is responsible for performing licensing reviews of human factors engineering for new reactors, performing licensing reviews to support simulator and control room designs for operator licensing, and supporting rulemaking. The operator licensing reviews rely heavily on the human factors engineering staff for simulator design reviews and for the commission approved simulator. The resources for this area are budgeted within the New Reactors business line.

RES supports the program offices in the area of human factors. RES staff generally do not support the licensing programs directly. Instead, their role is to provide in-depth technical expertise in certain specific areas and to conduct related research.

The resources associated with human factors are shown in the table below.

FY 2016 Resource Estimates *

Business Line	Office or Region	FTE	\$ K
Operating Reactors	NRR	5.0	100
New Reactors	NRO	3.0	0

* The resources in this table are a subset of resources budgeted in this business line. The budget is not formulated at the level of detail related to this topical area, and thus the FTE and \$ K provided in the table above are approximations. The FTE values reflect both staff and supervisors, if the supervisor is a dedicated resource in this area.

Evaluation for a Center of Expertise

The roles and responsibilities of the human factors staff in NRR and NRO are very different. NRR's work includes safety culture while NRO's does not. The majority of NRR's workload comes from review of licensing actions of operating reactors in human factors engineering, supporting or leading safety culture inspections, implementing the Fatigue Rule, and maintaining the regulatory infrastructure that supports human factors engineering (Human Factors Information System) and safety culture (training, inspection procedures). The majority of NRO's workload is licensing reviews. NRO human factors staff review control room and simulator designs to determine if the man/machine interactions are compatible with guidance and best practices and to support operator licensing. Workload in NRR and NRO is expected to remain stable.

The creation of a COE in the area of human factors would not help standardize processes because the work that NRR and NRO conduct are distinct and different within the broader area of human factors. A COE may help aid knowledge management because more staff would gain expertise in the varied areas of human factors.

Because the NRO and NRR work in this area is different and requires different skill sets, it is likely that if a COE is created for this area, the COE would continue to maintain separate staff (by type of work assignments) for NRO and NRR activities. This would diminish any benefits and efficiencies that could be gained by the creation of the COE and would not justify the costs to implement the COE. The creation of a COE would also be disruptive at this time, particularly for NRO as the human factors staff are also used by NRO extensively for simulator design reviews and for the commission approved simulator, in support of the new reactor builds. The agency is considering a merger between NRR and NRO. If a merger is approved and implemented, it is expected that the merger plan will review the potential for consolidating staff performing human factor licensing reviews and safety culture work.

Area 11: Allegations

Recommendation

The WG recommends consolidating Headquarters' (HQs') Office Allegation Coordinator (OAC) functions in the Office of Enforcement (OE) and maintaining Regional OAC roles as they currently exist. Technical review of allegations would remain the responsibility of the appropriate region or program office. This consolidation offers potential resource savings and enhances agility and efficiency across all business lines with minimal risk of negative side effects.

Current Roles and Responsibilities

The Project AIM report states that NRC is utilizing a COE across certain business lines in the area of allegations. This referenced COE is a limited scope COE for HQs' implementation of the allegation program for NRR, NRO, and NSIR and is implemented through a team in NRR. This limited scope COE was established in FY 2012 for NRR4 and NRO for the Operating and New Reactor business lines. The limited scope COE continues to be effective at implementing the allegation program for NRR, NRO and NSIR. The Office of Enforcement (OE) currently provides centralized allegations policy development and oversight for the agency. The Agency Allegation Advisor (AAA) in OE advises the Commission on allegation program-related policy matters and oversees the activities of the agency's Allegation Program, which administers the evaluation of safety concerns received by the NRC from sources outside the agency. Efficiencies are being realized today by the centralization in OE of allegation program-related policy development, including Management Directive (MD) 8.8, "Management of Allegations;" oversight, including independent assessments against the MD requirements; data analysis, including the preparation of trend reports; services; leadership; best practices, as documented in OE's Allegation Manual; processes, including the Allegation Management System (AMS) database; mentoring; public outreach, including the preparation and maintenance of Form 3, "Notice to Employees," the Allegation Program Brochure, NUREG/BR-0240, "Reporting Safety Concerns to the NRC," and the public website, which includes instructions for raising allegations, program statistics, frequently asked questions, and trend reports; and finally knowledge management and training, including modules developed by OE in iLearn.

The responsibility for reviewing and taking actions to evaluate allegations in accordance with the program policy and guidance is managed within the appropriate region and program office; namely each region is responsible for those allegations related to activities at licensed facilities within their oversight responsibility, while allegations that are generic in nature or that apply to activities uniquely conducted by offices located in NRC HQs (e.g., vendor inspection, review of power reactor license change requests, import and export activities) are normally assigned to the responsible HQs office. The OAC is a designated staff member who serves as the point of contact for that office regarding the processing of allegations. The responsibilities of the OAC include ensuring that allegation-related correspondence and other staff-generated documentation related to allegations is consistent with the requirements of MD 8.8 and responsive to the allegor's concerns; providing or supporting staff in providing information to an allegor regarding the evaluation of his or her allegation; establishing and maintaining allegation files; tracking allegation activities in AMS; scheduling and participating in Allegation Review Board (ARB) meetings; and ensuring that management and responsible staff are informed of allegations under their purview, including supporting management's effort to inform the resident inspectors and other inspectors, as appropriate, about open allegations, ARB-assigned actions, and past allegation trends related to areas to be inspected.

⁴ NRR had already assumed Office Allegation Coordinator duties for NSIR in 2003.

The resources associated with policy development and the OAC functions are shown in the table below.

FY 2016 Resource Estimates *

Business Line	Office or Region	FTE	\$ K
Operating Reactors	NRR	5**	0
	OE	3.5	
	Regions	10 (2.5 each)	
New Reactors	NRR	2	0
Nuclear Materials Users; Fuel Facilities	NMSS	1***	0

* The resources in this table are a subset of resources budgeted in this business line. The budget is not formulated at the level of detail related to this topical area, and thus the FTE and \$ K provided in the table above are approximations. The FTE values reflect both staff and supervisors, if the supervisor is a dedicated resource in this area.

**Provides OAC functions for NRR, NRO, and NSIR

*** Provides OAC functions for NMSS and Office of International Programs (OIP)

Evaluation for a Center of Expertise

As described above, OE provides agency-wide leadership for allegation matters of policy and oversight and NRR, NRO and NSIR have previously consolidated their OAC allegation resources for implementing the allegation program into an allegation team in NRR NMSS and the Regions currently have their own resources for OAC functions, with NMSS providing the OAC function for OIP.

Regarding workload, in the last 10 years the NRC has received between 400 – 600 allegations each year, and one allegation can represent several specific concerns requiring evaluation by the staff. Workload in the Allegation Program fluctuates based on a number of external factors, including facility- or vendor-specific matters (e.g., significant outage activity, construction activity, security activity, process/program changes, and company restructuring/staffing adjustments), domestic factors (e.g., events of September 11, 2001), and international events (e.g., the accident at the Fukushima Dai-ichi facility).

With the implementation of the limited scope COE for the OAC function within NRR for NRR, NRO and NSIR, the team has consolidated efforts to process allegations for each office while ensuring allegations were processed in accordance with the requirements in MD 8.8 and the Allegation Manual. The team has additionally succeeded in streamlining the allegation process and gaining efficiencies through minimizing duplicative effort, creating a consistent process and using best practices for the processing of allegations. Between FY12 and FY14, the allegations team completed the review and processing of an increased volume of allegations in NRO without additional staffing due to the efficiencies gained from the implementation of the team. Further potential efficiencies may be realized by having a HQs' Allegations COE housed in OE. The benefits include:

- Alignment with the strategic plan and OE's mission avoiding confusion to both internal and external stakeholders;
- Efficiencies in decision making, with less management layers and direct access to the OE director. OE director/COE would keep affected HQs' office directors and staff appropriately informed;

- The ability to respond to the Commission and public, including Congressional inquiries on issues of high interest will be improved;
- Effectiveness in program oversight and implementation through additional standardization, transparency, and consistency in allegation products and services;
- Ability to enhance critical skills, increase knowledge sharing and knowledge management by having a single Allegations team in HQ working together with the agency's Allegations experts;
- Enhanced ability to address fluctuating workloads and provide backup capabilities for all business lines;
- Anticipated reductions in the level of resources needed. Although there would be a near-term cost of physically co-locating staff, there would be a potential initial savings of ~1 FTE gained by combining the staff who work on allegation policy, assessment, and reporting with the staff who perform OAC functions.

The AAA assessments produce two products: 1) Assessment Report with overall metric results, significant findings, and trends in observations; and 2) observations on the files audited that didn't rise to the level of "significant" findings. To alleviate any concerns regarding potential conflict of interest and to maintain independence in the audit functions, the Assessment Reports would be signed by the AAA and issued to the corresponding Program Office Director (OD) being assessed, and the Director of OE. Observations would be given to the Allegations COE team in OE. If the report identifies recommendations that the Program Office needs to address, the COE team leader would brief the corresponding OD to ensure that any issues can be addressed in a timely manner.