



Action Plan
Risk-Informed Decision-Making
Operating Reactor Business Line

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1.0 INTRODUCTION

On May 11, 2017, the Commission was briefed on risk-informed regulation by nuclear industry representatives and U.S. Nuclear Regulatory Commission (NRC) staff. The briefing included a status of NRC and industry risk-informed initiatives and an overview of success and focus areas in advancing risk-informed regulation. The Commission issued a staff requirements memorandum (SRM) in response to the meeting on June 26, 2017 (Reference 1). The staff responded to the SRM by SECY-17-0112 (SECY paper) dated November 13, 2017 (Reference 2). The SECY paper provided the staff's plans for increasing capabilities to use risk information in decision-making activities. It also described challenges towards further progress in risk-informed decision-making (RIDM) and measures that the staff is taking to overcome these challenges.

After the conclusion of the Commission meeting on May 11, 2017, the Office of Nuclear Reactor Regulation (NRR) executive team (ET) and leadership team (LT) held their quarterly strategy meeting on June 12, 2017. During this meeting, the ET/LT decided that NRR should enhance how the office integrates risk into our decision-making procedures and processes and increase the staff's understanding of risk and risk tools. By memorandum dated June 29, 2017 (Reference 3), the Director of NRR summarized the outcome of the meeting, including the mission statement of the RIDM project, supporting objectives, and tasks that the staff should complete to enhance the integration of risk into our decision-making procedures and processes. In addition, the June 29, 2017 memorandum referenced a differing professional opinion (DPO) panel review (References 4, 5, and 6) regarding two emergency license amendments issued on December 23, 2016 (Reference 7), and January 4, 2017 (Reference 8), for Palo Verde Nuclear Generating Station (Palo Verde), Unit 3 involving diesel generator allowed outage times (AOTs). The DPO panel proposed eight recommendations for associated with enhancing guidance for consideration of risk information during the review of deterministic license amendment requests.

The purpose of this NRR RIDM project action plan is to define a process to implement the SECY paper's five overarching strategies and the tasks outlined in the June 29, 2017 memorandum. The process outlined in this plan consolidates the tasking directed by the Director of NRR in its June 29, 2017 memorandum and the eight recommendations from the DPO panel. Specifically, this plan establishes the activities and schedule for completing the NRR RIDM project. This action plan is a living document and will be updated quarterly or as needed. The staff used LIC-502, Revision 3 (Reference 9), "Procedure for Development, Implementation, and Management of Action Plans," with variations to create this action plan.

2.0 NRR RIDM PROJECT FRAMEWORK

During the early stages of the NRR RIDM project, the staff noted that there were several contributing factors that helped shape this project. For example, the mission statement and supporting objectives discussed in the June 29, 2017 memorandum, and the five cross-cutting SECY paper strategies. To consolidate the contributing factors of this project, the staff developed a framework to define the hierarchy and relationship between the NRR RIDM mission, NRR supporting objectives, SECY paper strategies, NRR RIDM tasks, and cross-cutting item of communication. Figure 1 provides an overview of the framework of this project. The framework incorporates a phased approach to complete this project. Phase 1, which includes Strategies I and II of the SECY paper, includes collecting data, evaluating and analyzing the eight (8) NRR RIDM tasks to generate findings and recommendations reports. Phase 2, which includes Strategy III of the SECY paper, is the implementation of the recommendations from the reports, including revising guidance and training staff. Strategies IV and V are considered cross-cutting due to these items being associated with communication. Additional details on the framework are discussed below in this section, and details on the phased approach are discussed in Section 5.0, NRR RIDM Project Process, of this action plan.

2.1 Mission Statement and Supporting Objectives

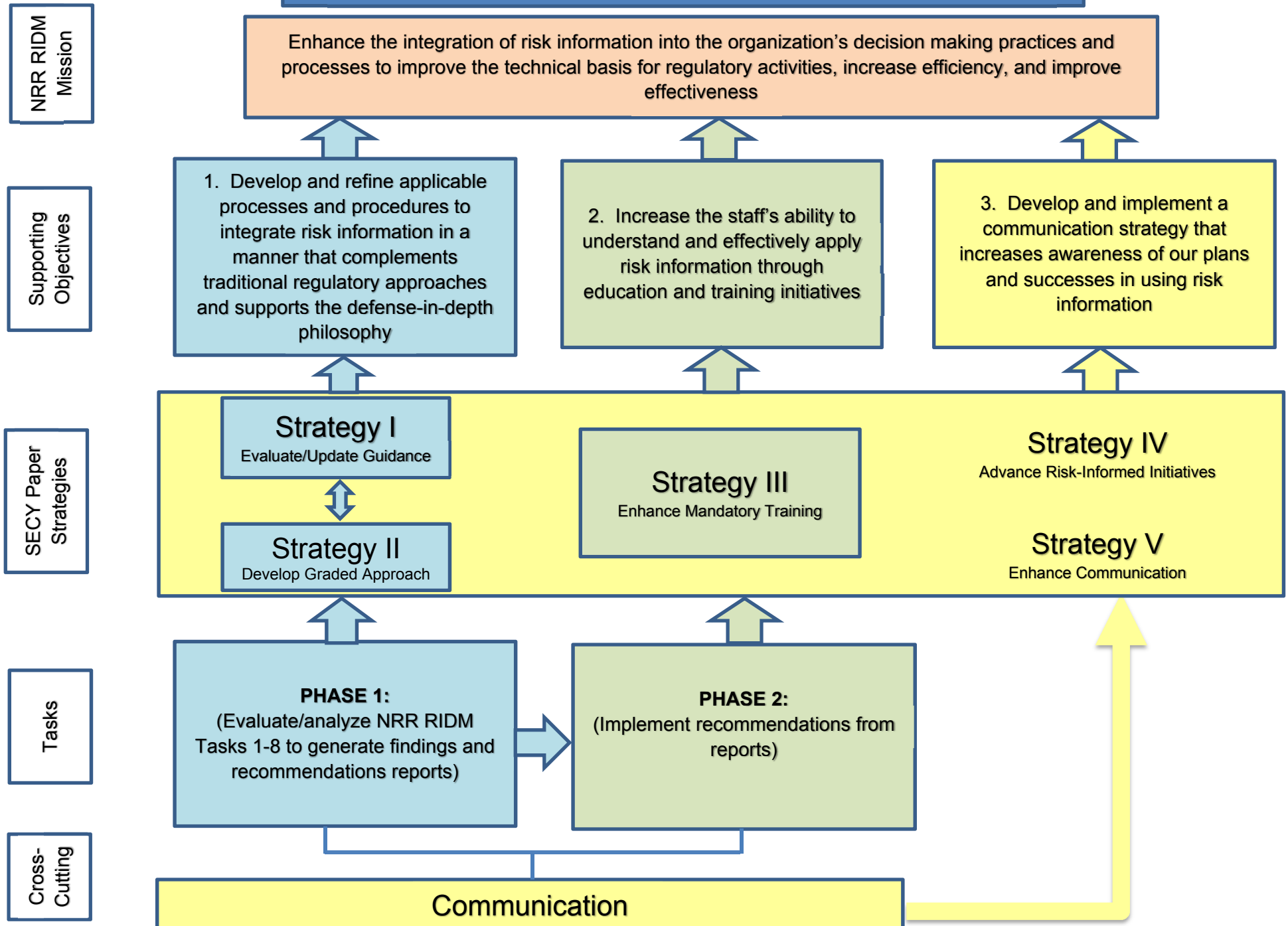
As stated above, the executive leadership team (ET/LT) held a strategy meeting on June 12, 2017, and decided that NRR should enhance integration of risk insights into decision-making procedures and processes and should also increase the staff's understanding of risk and risk tools. During this meeting, the attendees developed a mission statement and supporting objectives. The mission statement and supporting objectives for this project are summarized below:

Mission Statement: Enhance the integration of risk information into the organization's decision-making practices and processes to improve the technical basis for regulatory activities, increase efficiency, and improve effectiveness.

Supporting Objectives:

1. Develop and refine applicable processes and procedures to integrate risk information in a manner that complements traditional regulatory approaches and supports the defense-in-depth philosophy;
2. Increase the staff's ability to understand and effectively apply risk information through education and training initiatives; and
3. Develop and implement a communication strategy that increases awareness of our plans and successes in using risk information.

Figure 1: NRR RISK-INFORMED DECISION-MAKING (RIDM) FRAMEWORK



2.2 SECY Paper Strategies

The SECY paper identified current challenges that could inhibit progress in RIDM and five overarching strategies to help overcome those challenges. The set of strategies described in the paper represent a multifaceted approach to overcoming challenges. Below are the five strategies identified in the SECY paper.

- Strategy I:** Evaluate and update RIDM guidance to foster a collaborative review process and a broadened understanding of risk and risk insights.
- Strategy II:** Develop a graded approach for using risk information in licensing reviews.
- Strategy III:** Enhance mandatory training requirements related to RIDM for managers and staff.
- Strategy IV:** Advance NRC and industry risk-informed initiatives.
- Strategy V:** Enhance communication on risk informed activities.

As mentioned above, a phased approach is being used to complete this project. The staff considers Strategies I and II as Phase 1 (Evaluation) activities due to the necessary steps of collecting data, and evaluating and analyzing the data to support the development and the updating of guidance/training. Strategy III is considered Phase 2 (Implementation) due to the dependency and outcome from the Phase 1 activities. Strategies IV and V are considered cross-cutting since these items are associated with communication.

2.3 NRR RIDM Tasks

This action plan initially contains 8 NRR RIDM tasks. The successful completion of these tasks is expected to enhance the integration of risk information into regulatory decision-making practices and processes; improve the technical basis for regulatory activities; and increase the efficiency, effectiveness, and consistency of RIDM. Table 1 summarizes the 8 NRR RIDM tasks. Specific details on each of the tasks are provided in Section 4.0, NRR RIDM Scope of Work, of this action plan.

Recognizing that this action plan is a living document, there is a potential that NRR RIDM tasks may need to be revised or added to the scope of this project. Therefore, this action plan defines a process for revising or adding tasks and updating the action plan to reflect the revisions. This process is explained in Section 9.0, Control Process, of this action plan.

Table 1: Summary of the NRR RIDM Tasks

NRR RIDM Tasks	Task Description
NRR RIDM Task 1	Expanded use of license review teams that would team up risk analysts with technical staff vice relying on sequential or independent reviews. In addition, evaluate the roles/responsibilities for the technical reviewer, risk analyst, and project manager.
NRR RIDM Task 2	Broaden the definition of risk more transparently such that all of the technical staff can see how their work embodies risk considerations—beyond CDF [Core Damage Frequency], LERF [Large Early Release Frequency].
NRR RIDM Task 3	Develop a graded approach for using risk information more broadly in licensing reviews.

NRR RIDM Task 4	Review Branch Technical Position (BTP) 8-8, Onsite (Emergency Diesel Generators) and Offsite Power Sources Allowed Outage Time [AOT] Extensions.
NRR RIDM Task 5	Evaluate DPO recommendations 5 and 6, including evaluating the possibility to leverage the risk-informed notebooks as job aids for the staff.
NRR RIDM Task 6	Evaluate the guidance in the four pertinent documents (RG 1.174 [Reference 10], RG 1.177 [Reference 11], RG 1.200 [Reference 12], and NUREG-1855 [Reference 13], discussed in DPO Panel Recommendation 7 to determine if better harmonization is appropriate, and provide recommendations on a path forward, if appropriate.
NRR RIDM Task 7	In addition to RG 1.174, determine whether any other pertinent documents or procedures should be updated (e.g., RG 1.177).
NRR RIDM Task 8	<p>Evaluate the use of Large Early Release Frequency (LERF) in various regulatory applications and determine if different approaches are supported:</p> <ul style="list-style-type: none">• Permanent license amendment versus 1-time AOT extension• Significance Determination Process (SDP) analysis (truncates LERF after 8 days)• Consistency among regions when processing Notices of Enforcement Discretion (NOEDs)

3.0 NRR RIDM TEAM

The SECY paper (Reference 2), states that it focuses on RIDM for the reactor program (i.e., operating and new reactors); however, the SECY paper also discusses that although successful execution of these strategies should benefit both current and future licensees, next generation advanced non-light water reactor developers are increasingly using probabilistic risk analysis (PRA) throughout the design process. Therefore, the current focus of this this action plan is the 8 NRR RIDM tasks. Once the 8 tasks are successfully completed, the future focus will expand to NRO. The NRR RIDM team is scheduling a briefing on the action plan and project to NRO in March 2018.

Figure 2 provides an overview of the RIDM team. The team's Executive Sponsor is the NRR Deputy Director for Engineering. There are 4 Senior Executive Service (SES) Champions from the Division of Operating Reactor Licensing (DORL), Division of Risk Assessment (DRA), and Division of Engineering (DE). Each SES Champion and their respective division provide oversight on the direction of their assigned task(s). DORL is championing Tasks 1 and 5; DRA is championing Task 3; and DE is championing Tasks 2 and 4 (NOTE: Tasks 6 and 7 were led by DRA and Task 8 was led by DORL, and they were completed before this action plan was implemented.). Each task is supported by a working group, with each working group having a team lead.

The Risk-Informed Steering Committee (RISC) was formed as an NRC senior management committee that provides strategic direction to the NRC staff to advance the use of risk-informed decision-making in licensing, oversight, rulemaking and other regulatory areas, consistent with the Commission's PRA Policy Statement (60 FR 42622, August 16, 1995). Membership of the

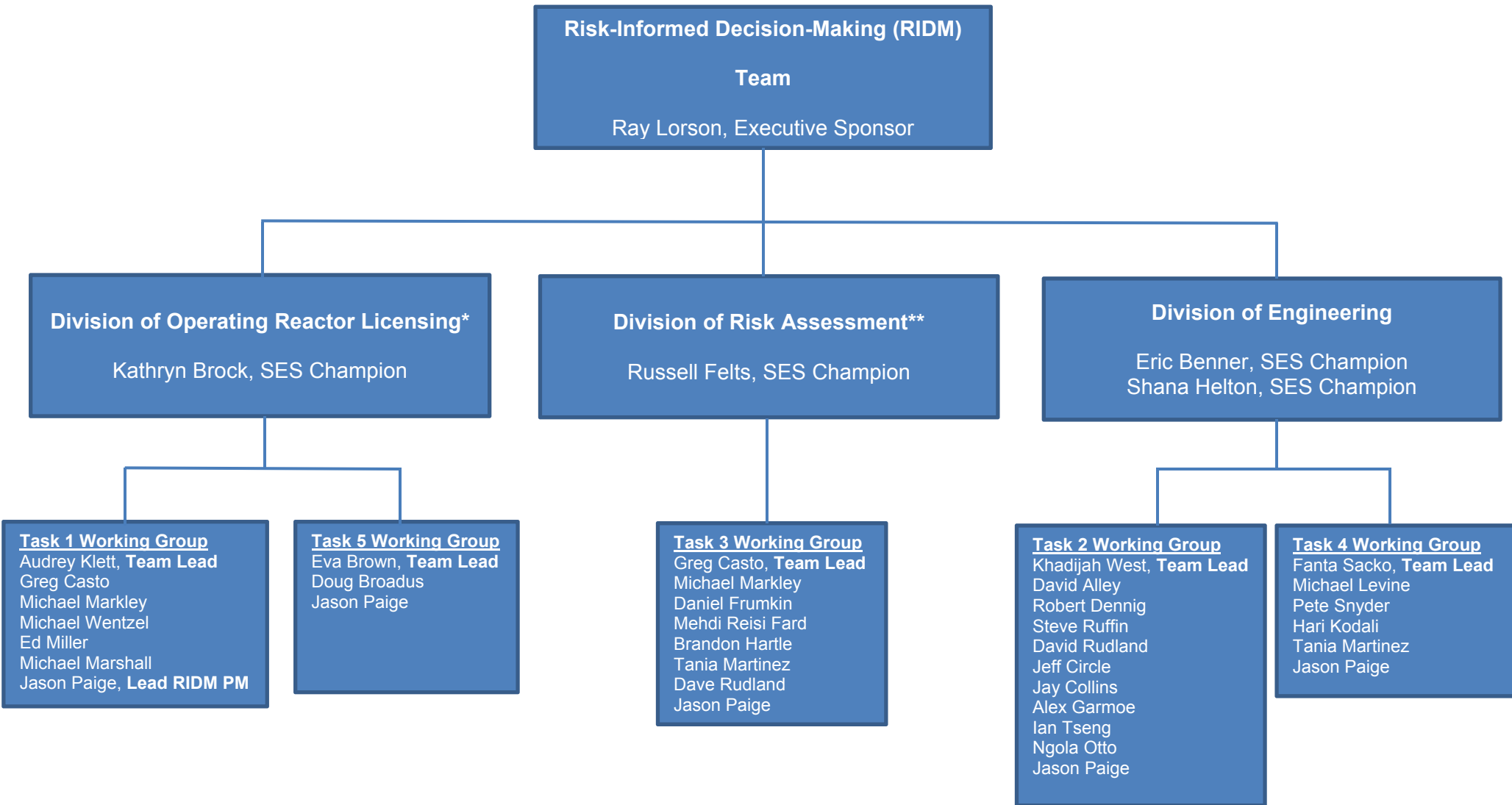
RISC is comprised of SES-level representatives from various NRC organizations, including the NRR Deputy Director for Engineering. The staff plans to utilize the quarterly RISC public meetings to provide updates to industry and members of the public on the progress of the NRR RIDM project. Figure 3 provides the relationship between the RISC and the NRR RIDM team.

3.1 Project Management Structure

Below is a description of the roles and responsibilities of each of the positions of the NRR RIDM team.

- **Executive Sponsor:** Provides policy direction on the NRR RIDM project.
- **SES Champions:** Provide oversight of their task(s) and ensures that the working groups implement the policy direction received from the Executive Sponsor. DORL is the NRR RIDM project management lead, and DRA is the NRR RIDM technical lead.
- **Lead RIDM Project Manager:** The lead DORL RIDM project manager is responsible for generating and implementing the process as defined in this action plan. In addition, the project manager will attend the working group meetings to ensure the continuity of the project and address any process-related questions or questions interrelated to another working group's task. In addition, the project manager will update the action plan, as needed, provide updates to the SES Champions (or any issues requiring their attention) during their bi-weekly meetings, and assist with communicating policy direction received from the Executive Sponsor to the working groups.
- **Working Group Team Leads:** Each working group is assigned a team lead, who serves as the main point of contact for the working group. The team lead is responsible for facilitating the working group meetings, updating their SES Champion, and coordinating the action items assigned by the lead RIDM project manager.
- **Working Groups:** The working groups are responsible for the management and review of their assigned task.

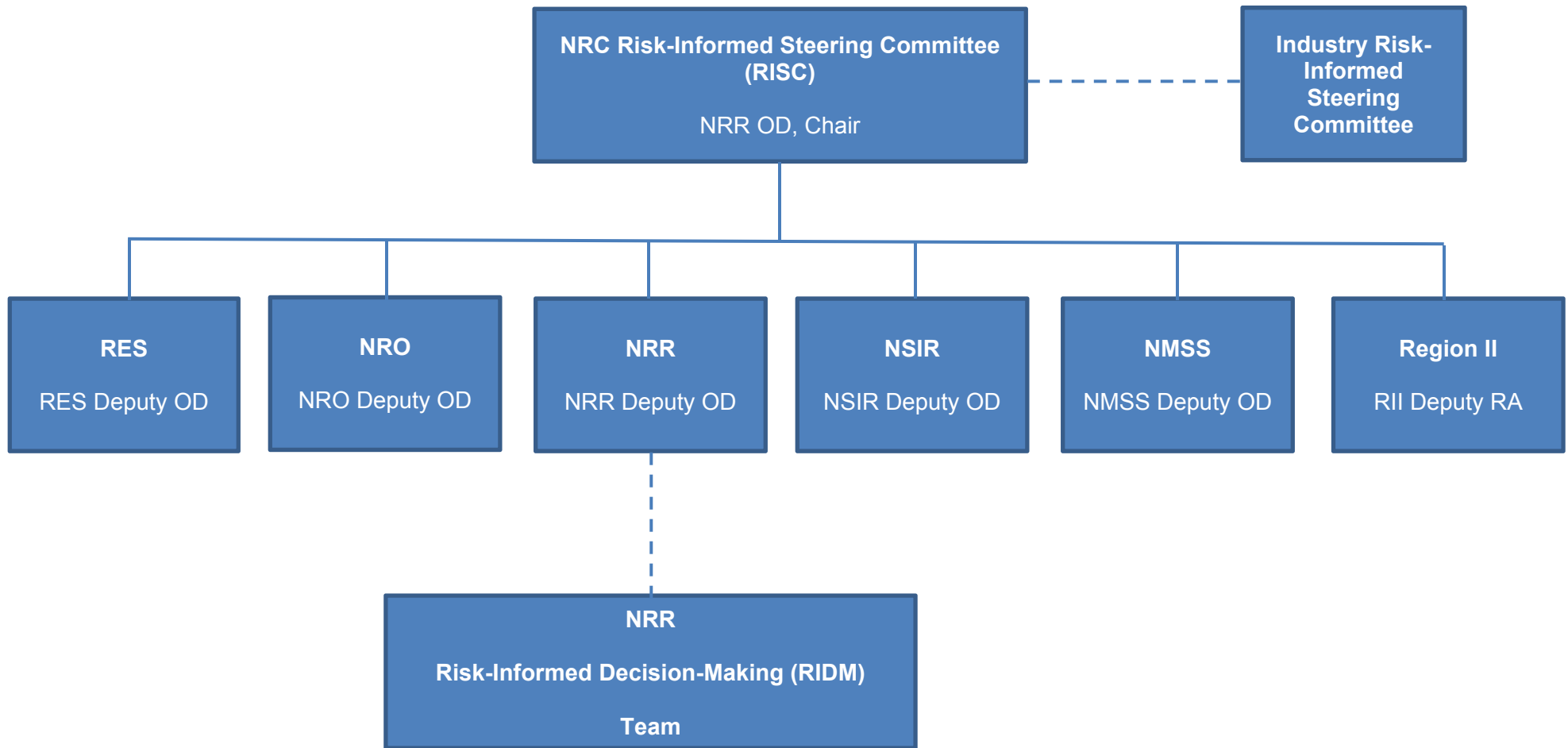
FIGURE 2: Organization Chart: NRR Risk-Informed Decision-Making (RIDM) Team



*DORL is the NRR RIDM project management lead

**DRA is the NRR RIDM technical lead

FIGURE 2: Organization Chart: NRR Risk-Informed Decision-Making (RIDM) Team



4.0 NRR RIDM SCOPE OF WORK

During the ET/LT quarterly strategy meeting on June 12, 2017, NRR leadership decided that NRR should enhance how the agency integrates risk into our decision-making procedures and processes and increase the staff's understanding of risk and risk tools. By memorandum dated June 29, 2017, the Director of NRR summarized the outcome of the meeting, including the tasks that the staff should complete to enhance the integration of risk into our decision-making procedures and processes. In addition, the June 29, 2017 memorandum Referenced a DPO panel review regarding two emergency license amendments issued on December 23, 2016, and January 4, 2017, for Palo Verde involving diesel generator AOTs. The DPO panel proposed eight recommendations for NRR consideration associated with enhancing guidance for deterministic license amendment requests with supplemental risk information. The scope of the NRR RIDM project includes the tasks summarized in the memorandum dated June 29, 2017, and takes into consideration the eight recommendations from the DPO panel review. Table 2 provides the relationship between the 8 NRR RIDM tasks and the eight DPO recommendations, and how they support the five SECY paper strategies.

Sections 4.1, 4.2, 4.3, 4.4, and 4.5 provide the scope of each task, including documents that will be reviewed under each task, interdependencies between tasks, and expected outcome from each task.

NOTE: This section only includes the scope for NRR RIDM Tasks 1-4. NRR RIDM Tasks 5-8 were complete or nearly completed before the completion of this action plan. The staff's evaluation for Tasks 5-7 are documented in draft closeout memorandum, Risk-Informed Decision-Making Action Plan Tasks 5, 6, and 7 Recommendations (Reference 45), and the staff's closeout for Task 8 is documented in draft memorandum, Consideration of Large Early Release Frequency in NRC Staff Evaluation of Licensee Requests for Enforcement Discretion (Reference 43).

Table 2: SECY Paper Strategies and NRR RIDM Project Tasks -- PHASE 1

Table 2: SECY Paper Strategies and NRR RIDM Project Tasks -- PHASE 1				
SECY Paper Strategies		DPO Panel Recommendations	NRR RIDM Tasking	Working Group Lead
Strategy I: Evaluate and Update Guidance	a. Collaborative Review Process	Recommendation 3: It was not clear how the staff considered the guidance in NRR Office Instruction LIC-101 that discourages resource-intensive reviews of risk-informed LARs submitted under emergency circumstances. Additional guidance appears to be warranted in this area.	NRR RIDM Task 1	DORL
	b. Broadened Understanding of Risk and Risk Insights		NRR RIDM Task 2	DE
		Recommendation 2: Because of inconsistent interpretations related to BTP 8-8 guidance, the staff should evaluate this guidance to determine if it requires clarification.	NRR RIDM Task 4	DE
		Recommendation 8: Because of inconsistent interpretations, the staff should evaluate guidance to determine if the following issues require clarification: acceptability of long duration AOTs for one time extensions, and maximum AOTs (i.e., a firm completion time backstop), even when supported with risk information, to limit the permitted amount of time operation without single failure protection.		
		Recommendation 5: The staff should consider evaluation of whether a standardized method for using insights from independent risk tools (e.g., a Standardized Plant Analysis Risk (SPAR) model) to support the review of LARs to ensure an objective, consistent, and independent verification of the licensee’s risk evaluation.	NRR RIDM Task 5	DORL
		Recommendation 6: The staff should evaluate additional guidance that would require a critical lessons learned review be conducted after first-of-a-kind licensing actions to determine, in part, whether this application and/or safety evaluation should be used going forward as a precedent.		
		Recommendation 7: The staff should evaluate additional guidance on the conduct of probabilistic risk assessment (PRA) sensitivity studies.	NRR RIDM Task 6	DRA
			NRR RIDM Task 7	DRA
			NRR RIDM Task 8	DORL
	Strategy II: Develop a Graded Approach for Using Risk Information in Licensing Reviews		Recommendation 4: The staff should evaluate the development of guidance for reviewing deterministic-based LARs with supplemental risk information provided to ensure these types of risk evaluations receive a minimally acceptable review for validity and consistency.	NRR RIDM Task 3

NOTE: DPO Recommendation 1 indicated that there may be opportunities to more effectively communicate with the public during emergency LARs, including the use of less formal communications tools. Furthermore, the staff should consider guidance and training in this area. However, the June 29th, Bill Dean memo concluded that no action is required.

- NRR RIDM Task 1: Expanded use of license review teams, including evaluating the technical reviewer, risk analyst, and project manager roles/responsibilities
- NRR RIDM Task 2: Broaden the definition of risk more transparently such that all of the technical staff can see how their work embodies risk considerations—beyond CDF, LERF
- NRR RIDM Task 3: Develop a graded approach for using risk information more broadly in licensing reviews.
- NRR RIDM Task 4: Review of BTP 8-8
- NRR RIDM Task 5: Evaluate DPO recommendations 5 and 6, including evaluating the possibility to leverage the risk-informed notebooks as job aids for the staff.
- NRR RIDM Task 6: Evaluate the guidance in the four pertinent documents (RG 1.174, RG 1.177, RG 1.200, and NUREG-1855) discussed in DPO Panel Recommendation 7 to determine if better harmonization is appropriate, and provide recommendations on a path forward, if appropriate.
- NRR RIDM Task 7: With the impending revision to RG 1.174, determine whether there are any other pertinent documents or procedures that should be updated (e.g., RG 1.177).
- NRR RIDM Task 8: Evaluate the use of Large Early Release Frequency (LERF) in various regulatory applications and determine if different approaches are supported: Permanent license amendment versus 1-time AOT extension; Significance Determination Process (SDP) analysis (truncates LERF after 8 days); Consistency among regions when processing Notices of Enforcement Discretion (NOEDs)

Table 2 (cont.): SECY Paper Strategies and NRR RIDM Project Tasks -- PHASE 2

Strategy III: Enhance Mandatory Training Requirements Related to Risk-Informed Decision-Making for Managers and Staff		Implement recommendations from the Phase 1 Findings and Recommendations Report	Tasks 1-7
		Develop a web-based training activity to expose staff to key RIDM principles to enhance understanding and awareness.	Tasks 1-7
		Modify as appropriate the technical reviewer, risk analyst, and project manager courses to embed RIDM principles. This should consider integration of the revised RG 1.174 noted below.	Task 1
Cross-Cutting – Communication – PHASES 1 and 2			
Strategy IV: Advance Risk-Informed Initiatives		Utilize the Risk-Informed Steering Committee internal/public meetings to provide routine updates on the NRR RIDM project.	DORL
Strategy V: Enhance Communication on Risk-Informed Activities		Develop an Action Plan outlining NRR's initiative to enhance risk-informed decision-making procedures and processes, and the strategic framework to complete the NRR RIDM project.	DORL
		Evaluate whether NRR can leverage RES and/or NRO communication assets to develop the periodic communication products/newsletters.	DORL

4.1 NRR RIDM Task 1

NRR RIDM Task 1: Expanded use of license review teams that would team up risk analysts with technical staff vice relying on sequential or independent reviews. In addition, evaluate the roles/responsibilities for the technical reviewer, risk analyst, and project manager.

4.1.1 NRR RIDM Task 1 Scope

The NRR RIDM Task 1 working group will develop workload management tools for reviewing SECY-17-0112 Type 1, 2, and 3¹ applications. These tools will enable early and periodic team communications and meetings to understand the following during a review:

- purpose of the application
- each reviewer's scope and interdependencies among reviewers' scopes
- how the review will be accomplished
- what conclusions and decisions need to be made and by whom
- whether risk and traditional engineering insights can be used together and complement one another
- team member functional responsibilities

In addition, these tools will assist with the development of a consolidated safety evaluation early in the review process that outlines the integration of risk and traditional engineering insights, and early identification of issues (ideally during the acceptance review), management engagement, and a path for resolution.

4.1.2 NRR RIDM Task 1 Document Review

The NRR RIDM Task 1 working group will review and enhance, as needed, the following documents to complete this task.

- NRR Licensing Process Office Instruction (LIC) – 101, License Amendment Review Procedures, Revision 4 and 5 (References 15 and 16)
- NRR Licensing Process Office Instruction (LIC) – 102, Relief Request Reviews (Reference 17)
- NRR Licensing Process Office Instruction (LIC) – 109, Acceptance Review Procedures (Reference 18)
- NRR Licensing Process Office Instruction (LIC) – 600, Review of Technical Specifications Task Force (TSTF) Travelers and Creation of "CLIIP" Model Applications (Reference 19)

¹ "Type 1 includes traditionally deterministic requests that demonstrate regulatory compliance largely through the use of NRC-approved prescriptive analyses. In these cases, quantitative PRA results have rarely been included. Type 2 includes licensing submittals that contain quantitative or qualitative risk information but are not formally submitted using the guidance in RG 1.174 and RG 1.200. Lastly, Type 3 applications are formal risk-informed changes that use quantitative risk information derived from a RG 1.200-compliant PRA and are subject to the review guidelines in RG 1.174."

4.1.3 NRR RIDM Task 1 Interdependencies

- NRR RIDM Task 1 relies on NRR RIDM Task 2 for fostering an understanding of concepts such as PRA, risk, defense-in-depth, safety margins, and compliance, which will enable review teams to work from a common language and understanding to ease safety evaluation and conclusion development.
- NRR RIDM Task 1 relies on NRR RIDM Task 3 to develop the review methodology for considering risk and traditional engineering insights to complete the “Technical Evaluation” section of licensing reviews (i.e., how to identify when risk and technical insights can complement one another and how to develop conclusions using risk and technical insights).
- NRR RIDM Task 1 will consider any NRR RIDM Task 5 products regarding lessons learned.

4.1.4 NRR RIDM Task 1 Expected Outcome

The completion of NRR RIDM Task 1 will enable NRR staff to develop efficient and effective teams to communicate, resolve issues, and complete licensing reviews in a timely and effective manner. In addition, after management endorses the NRR RIDM Task 1 working group's findings and recommendations, the recommendations will be communicated to the staff and eventually incorporated into licensing process office instructions and training programs, as needed.

4.2 NRR RIDM Task 2

NRR RIDM Task 2: Broaden the definition of risk more transparently such that all of the technical staff can see how their work embodies risk considerations—beyond CDF, LERF.

4.2.1 NRR RIDM Task 2 Scope

The NRR RIDM Task 2 working group will identify how the concepts of risk and risk insights are currently understood and used in NRR by collecting information via cafés with staff and managers, focused interviews, and online questionnaires, which will be compared to the agency's current policy and guidance documents on risk. Once this comparison is complete, the working group will: (1) re-emphasize the definition of risk to ensure awareness and common understanding; (2) clarify the concepts of risk and risk insights in regulatory applications; and (3) provide recommendations on how these concepts could be used more broadly.

4.2.2 NRR RIDM Task 2 Document Review

The NRR RIDM Task 2 working group will review the following to establish a baseline for the definition and use of risk in NRC documents:

- Commission PRA Policy Statement and related historical documents
- SECY-99-007A, Recommendations for Reactor Oversight Process Improvements (Follow-up to SECY-99-007) (Reference 20)
- Regulatory Guide 1.160, Monitoring the Effectiveness of Maintenance at Nuclear Power Plants (Reference 21)

- Regulatory Guide 1.174, An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis (Reference 10)
- Regulatory Guide 1.177, An Approach for Plant-Specific, Risk-Informed Decision-Making: Technical Specifications (Reference 11)
- Regulatory Guide 1.178, An Approach for Plant-Specific Risk-Informed Decision-Making for In-service Inspection of Piping (Reference 22)
- NUREG-1855, Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decision-Making (Reference 13)
- Topical Reports and associated safety evaluations for WCAP-15666, Revision to RCP Flywheel Inspection Program, WCAP-14572, Westinghouse Owners Group Applications of Risk-Informed Methods to Piping In-service Inspection Topical Report, and BWRVIP-05, Report to Request Relief from Augmented Examination Requirements on Reactor Pressure Vessel Circumferential Shell Welds
- NRR Licensing Process Office Instruction (LIC) - 504, Integrated Risk-Informed Decision-Making Process for Emergent Issues (Reference 23)
- NRR Licensing Process Office Instruction (LIC) -101, License Amendment Review Procedures (References 15 and 16)
- SECY-15-0168, Recommendations on Issues Related to Implementation of Risk Management Regulatory Framework (Reference 24)
- NUREG/BR-0318, Effective Risk Communication: The Nuclear Regulatory Commission's Guidelines for Internal Risk Communication (Reference 25)
- Risk-Informed Thinking Workshop feedback forms and training slides

4.2.3 NRR RIDM Task 2 Interdependencies

NRR RIDM Task 2 is defining how risk can be used and/or enhanced in our decision-making activities. Therefore, NRR RIDM Tasks 1, 3, and 4 are dependent on the findings and recommendations of NRR RIDM Task 2. See Sections 4.1.3, 4.3.3, and 4.4.3 for the interdependencies of NRR RIDM Tasks 1, 3, and 4 to NRR RIDM Task 2.

4.2.4 NRR RIDM Task 2 Expected Outcome

The NRR RIDM Task 2 working group will document (i.e., findings and recommendations report) the current understanding and use by NRR staff of risk and risk insights in regulatory applications. In addition, the working group will define the concepts of risk and risk insights and recommend how these concepts can be used more broadly. From NRR RIDM Task 2 findings, the working group will identify needed developments or enhancements to current training tools to broaden the staff's understanding of risk concepts.

4.3 NRR RIDM Task 3

NRR RIDM Task 3: Develop a graded approach for using risk information more broadly in licensing reviews.

4.3.1 NRR RIDM Task 3 Scope

The NRR RIDM Task 3 working group plans to enhance or develop a process that can be used to consider risk information and insights, as needed, in NRC reviews defined in SECY-17-0112 as Type 1, 2, and 3 applications. The process will:

- Establish new tools (e.g., checklists) for NRR staff to efficiently develop qualitative insights that may be used to support the regulatory decision. These tools would apply to licensing actions that contain no quantitative risk information, and submittals that contain varying degrees of risk information. Tools may be useful to RG 1.174 applicable reviews, but the working group does not intend to specifically modify RG 1.174 processes or guidance.
- Establish necessary framework to provide support for reviews from NRR reliability and risk analysts, consistent with the NRR RIDM Task 1 workload management product.
- Recommend necessary framework/process for reviewing qualitative or semi-quantitative risk insights in deterministic licensing actions.

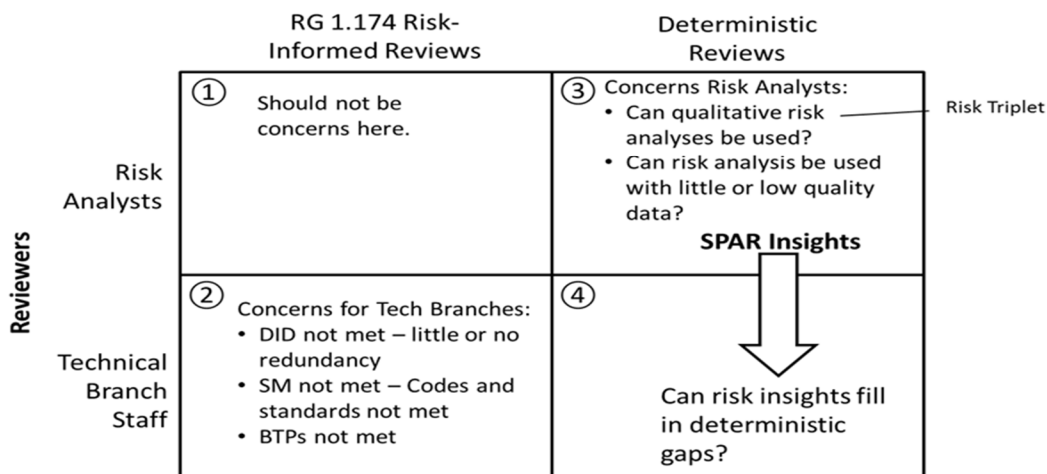
4.3.2 NRR RIDM Task 3 Document Review

The NRR RIDM Task 3 working group will review and enhance, as needed, office instructions, regulatory guides, and standard review plan risk information resources to provide recommendations for other Phase 1 Tasks, and as part of implementation of Phase 2 activities.

4.3.3 NRR RIDM Task 3 Interdependencies

- NRR RIDM Task 3 represents a process that may be used early in reviews (NRR RIDM Task 1, kick-off meetings) where the licensee did not provide risk information that is sufficient to make a regulatory decision under the Regulatory Guide 1.174 framework.
- NRR RIDM Task 3 relies on NRR RIDM Task 2 for training technical staff on the risk-informed decision-making framework, and the use of common language and understanding to ease safety evaluation and conclusion development.
- In the figure below, NRR RIDM Task 3 applies primarily to block ③ for risk analyst engagement in reviews where the licensee did not provide risk information that is sufficient to make a regulatory decision under the Regulatory Guide 1.174 framework (i.e., SECY-17-0112 Type 1 and 2 applications).

Applying RIDM to a Broad Set of Reviews



4.3.4 NRR RIDM Task 3 Expected Outcome

The NRR RIDM Task 3 working group plans to provide updates to office instructions and guidance documents to establish a need for technical branches to solicit input from reliability and risk analysts early in the review process in order to facilitate or ensure there is consideration of risk information in technical reviews. In addition, the working group plans to identify readily available tools and suitable insights for reliability and risk analysts to support non-risk-informed reviews. Lastly, the working group will provide guidance for identifying appropriate risk information for licensing actions that leverage risk insights

4.4 NRR RIDM Task 4

NRR RIDM Task 4: Review of Branch Technical Position (BTP) 8-8, Onsite (Emergency Diesel Generators) and Offsite Power Sources Allowed Outage Time [AOT] Extensions

4.4.1 NRR RIDM Task 4 Scope

The NRR RIDM Task 4 working group will complete the following:

- identify guidance with similar purposes and requirements and interview stakeholders
- evaluate Region IV DPO package, BTP 8-8, sample of reviews performed in accordance with BTP 8-8, and other information collected
- develop preliminary insights, observations, and recommendations
- provide a redline strikeout version of recommended changes to BTP 8-8
- provide recommendations for revisions to similar guidance documents

4.4.2 NRR RIDM Task 4 Document Review

The NRR RIDM Task 4 working group will review and enhance, as needed, the following documents to complete this task. In addition to the documents listed below, the working group will review a sample of AOT licensing actions.

- NUREG-0800 BTP 8-8, Onsite (Emergency Diesel Generators) and Offsite Power Sources Allowed Outage Time Extensions (Reference 26)
- NUREG-0800 SRP 16.1, Risk-Informed Decision-Making: Technical Specifications (Reference 27)
- NUREG-0800 SRP 19.0, Probabilistic Risk Assessment and Severe Accident Evaluation for New Reactors (Reference 28)
- NUREG-0800 SRP 9.2.1, Station Service Water System (Reference 29)
- NUREG-1431, Standard Technical Specifications – Westinghouse Plants (Reference 31)
- Regulatory Guide 1.9, Application and Testing of Safety-Related Diesel Generators in Nuclear Power Plants (Reference 30)
- Regulatory Guide 1.93, Availability of Electric Power Sources (Reference 32)
- Regulatory Guide 1.155, Station Blackout (Reference 33)
- Regulatory Guide 1.174, An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plants Specific Changes to the Licensing Basis (Reference 10)
- Regulatory Guide 1.177, An Approach for Plant-Specific, Risk-Informed Decision-making: Technical Specifications (Reference 11)

- Regulatory Guide 1.182, Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants (Reference 34)
- Regulatory Guide 1.187, Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments (Reference 35)
- NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants (Reference 36)
- NUMARC 87-00, Guide lines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors (Reference 37)
- NEI 96-07, Revision 1, Guidelines for 10 CFR 50.59 Evaluations (Reference 38)
- NEI 06-09, Risk-Informed Technical Specifications Initiative 4b (Reference 39)
- TSTF-505, Provide Risk-Informed Extended Completion Times - RITSTF Initiative 4b (Reference 40)
- NUREG/CR-6141, Handbook of Methods for Risk-Based Analyses of Technical Specifications (Reference 41)
- NSAC-125, Guidelines for 10 CFR 50.59 Safety Evaluations. (Reference 42)

4.4.3 NRR RIDM Task 4 Interdependencies

- NRR RIDM Task 4 relies on NRR RIDM Task 2 to understand their findings on defining risk and risk insights.
- NRR RIDM Task 4 relies on NRR RIDM Task 3 to understand their process to conduct deterministic reviews with risk insights.
- NRR RIDM Task 4 relies on NRR RIDM Task 5 when evaluating the Region IV DPO package and incorporate any lessons learned.
- NRR RIDM Task 4 will use NRR RIDM Tasks 2, 3, and 5 findings to review guidance and make recommendations for BTP 8-8 and other guidance documents, as appropriate.

4.4.4 NRR RIDM Task 4 Expected Outcome

As the NRR RIDM Task 4 working group evaluates the above documents and draft its findings and recommendations report, the short-term expected outcome is to issue an interim guidance memorandum on AOT extension requests. The long-term expected outcome is to provide a redline strikeout version of recommended changes to BTP 8-8 that will eventually be incorporated into the guidance document. As the BTP 8-8 is being revised, the NRR RIDM Task 4 working group will train staff on the proposed BTP 8-8 revisions. Lastly, the working group will include recommendations for revisions to similar guidance documents.

4.5 NRR RIDM Task 8

NRR RIDM Task 8: Evaluate the use of Large Early Release Frequency (LERF) in various regulatory applications and determine if different approaches are supported:

- Permanent license amendment versus 1-time AOT extension
- Significance Determination Process (SDP) analysis (truncates LERF after 8 days)
- Consistency among regions when processing Notices of Enforcement Discretion (NOEDs)

4.5.1 NRR RIDM Task 8 Scope

During an internal meeting with the NRR ET on September 8, 2017, the NRR Office Director directed the staff to evaluate the use of LERF in various regulatory applications and determine if different approaches are supported. As a result of the meeting, and before the formulation of the NRR RIDM team, DORL took the initiative to begin evaluating the items listed above. The staff's evaluation is documented in draft memorandum, Consideration of Large Early Release Frequency in NRC Staff Evaluation of Licensee Requests for Enforcement Discretion (Reference 43). Once the NRR Office Director reviews and concurs on the memorandum, it will close NRR RIDM Task 8.

5.0 NRR RIDM PROJECT PROCESS

The SECY paper identified challenges that inhibit further progress in RIDM. For example, the SECY paper stated that some staff are not as familiar or experienced with the use of RIDM and the benefits it can bring to the overall regulatory approach. Overcoming this overarching change-management challenge and culture change is essential to making progress in RIDM. To mitigate this overarching challenge, this action plan utilizes a systematic or phased approach to enhance risk in our decision-making activities. The staff believes that utilizing this approach will ensure the successful achievement of the NRR RIDM project mission statement and support the cultural transition from the current processes in place. Also, with any cultural change there are questions that arise on why a change is being made and the proper documentation is necessary to justify the proposed changes. Therefore, the action plan's phased approach also includes actions to document and communicate the team's progress to ensure a more complete understanding of the benefits achieved by these changes.

This action plan implements two phases. Phase 1 is the evaluation and analysis of the tasks to generate findings and recommendations reports and Phase 2 is implementation of the recommendations. The working groups review and completion of their tasks are independent from each other, with the exception of interdependencies discussed above; therefore, each working group will follow their task's specific schedule (Section 7.2 of this action plan). Each working group is expected to complete their findings and recommendations report by spring 2018 (Phase 1) and implementation of the recommendations by December 2018 (Phase 2). Sections 5.1 and 5.2 provide additional details on the two phases, and Section 7.2, Overall Schedule provides additional details on the NRR RIDM project milestones.

5.1 Phase 1: Evaluation and Analysis to Generate Recommendations

Phase 1 is defined as the evaluation and analysis phase to support the working groups' findings and recommendations reports. This phase includes four steps to ensure successful completion of this portion of the project. Step 1 is finalizing the scope of the tasks, Step 2 is collecting data, Step 3 is analyzing the data, and Step 4 is finalizing the findings and recommendations reports. Below are additional details on each step.

5.1.1 Step 1: Finalize Scope of Tasks

Each working group will define and finalize the scope of their assigned task by providing scoping statements to the lead RIDM project manager. Once the working groups have completed their scoping statements, the lead RIDM project manager will schedule a meeting with the team to discuss each of the scoping statements to ensure alignment between each of the working groups. Once the team is aligned, each of the working groups will brief the ET/LT

on the scope of their task. The purpose of the ET/LT briefs is for the working groups to provide an update on their task, align on the scope, and seek feedback and incorporate comments from management.

5.1.2 Step 2: Data Collection

Each working group will collect data or identify documents (see Section 4.0 of this action plan) that will be reviewed by their working group to complete their task. This data collection includes lessons-learned from previous licensing actions that use risk insights, guidance documents that could be revised to incorporate risk or clarified on how risk is used in our decision-making activities (e.g., office instructions, regulatory guides, NUREGs, etc.), and current training offered to the staff. Also, the working groups may interview staff, provide questionnaires, and host cafés with the intent to capture a broad spectrum of the staff's understanding on how risk is used in the agency's decision-making activities.

5.1.3 Step 3: Analyze and Evaluate Data

From the data collected under Step 2, the working groups will analyze and compare information from the policy statements and guidance documents reviewed to the information that is collected from the staff (e.g., cafés, focused interviews, etc.). The intent is to identify any gaps between the agency's policy statements and supporting guidance documents and the way the staff is interpreting or implementing these documents. This information will provide the supporting information to justify any revisions or improvements to clarify existing guidance documents and/or training programs, and identify the need to generate new guidance and/or training programs.

5.1.4 Step 4: Findings and Recommendations Reports

Each working group will generate a findings and recommendations report. This report will summarize the findings from the information collected and analyzed to justify the proposed revisions to guidance documents and training programs (i.e., recommendations). The proposed recommendations will be briefed to the ET/LT before implementation is commenced. When the working group completes the ET/LT brief and incorporates comments, they have successfully completed Phase 1, and the working group can begin Phase 2.

5.2 Phase 2: Implementation of the Recommendations

Phase 2 is considered implementation of the recommendations from the working groups' reports. The lead RIDM project manager is currently working on a process for the team to follow to implement the recommendations. For example, the process will need to consider how to efficiently implement recommendations from different working groups that revise the same guidance document.

6.0 COMMUNICATION PLAN

6.1 Key Messages

- The action plan includes a strategic framework (i.e., process) for completing the NRR RIDM project.
- The action plan is considered a living document and will be updated, as needed, to reflect changes to the process or changes to the NRR RIDM tasks.
- The RIDM framework incorporates the 5 strategies from the SECY paper in response to the June 26, 2017 SRM. The 5 strategies are (1) evaluate and update guidance, (2) develop a graded approach, (3) enhance mandatory training, (4) advance risk-informed initiatives, and (5) enhance communication.
- The NRR RIDM tasks consolidates the 8 Region IV DPO recommendations and the June 29, 2017 Bill Dean memorandum.
- The RIDM project will utilize a phased approach to complete the tasks. Phase 1 includes collecting data, and evaluation and analysis of the data for each working group to generate a recommendations report. Phase 2 will be the implementation of the recommendations from the working group reports, including revising guidance and training staff.

6.2 Audience and Stakeholders

6.2.1 Internal Stakeholders

Internal stakeholders include the Commission, Office of the Executive Director for Operations (OEDO), Office of General Counsel (OGC), Office of Nuclear Reactor Regulation (NRR), Office of Nuclear Regulatory Research (RES), Office of New Reactors (NRO), Office of Nuclear Material Safety and Safeguards (NMSS), Office of Nuclear Security and Incident Response (NSIR), Office of Public Affairs (OPA), Office of Congressional Affairs (OCA), Region I, Region II, Region III, Region IV, and Office of Inspector General (OIG).

6.2.2 External Stakeholders

External stakeholders include the public, licensees, the Nuclear Energy Institute, public interest groups, the media, and Congress.

6.3 Communication Tools

Below are the communication tools that the staff may utilize to keep internal and external stakeholders informed on the progress of this project. In addition, the internal tools will be used to (1) collect data to identify gaps in the staff's understanding of the agency's use of risk and (2) train the staff on the proposed revisions to guidance documents and training programs.

6.3.1 Internal Communication Tools

Action Plan: Provides the strategic framework or process for completing the NRR RIDM project. Since the action plan will be a publicly available document, it will also be used as an external communication tool.

Internal Communications:	Briefings, emails, etc. will be provided to headquarters and regional management and/or staff (as well as the Commission), as required, to provide updates on the progress of the NRR RIDM project and help prepare internal stakeholders to communicate to external stakeholders.
Focused Interviews/ Questionnaires:	Interview staff with experience in processing risk-informed licensing actions to gain a broad understanding on how the staff uses risk in their decision-making activities. In addition, questionnaires will be used to identify the staff's understanding of the agency's use of risk and to enhance or clarify guidance documents and/or training programs.
Workshops/Cafés:	This action plan will leverage the paradigm from the Risk Informed Thinking workshops to communicate to the staff proposed changes made under this project. Also, the cafés will be used to gain a broad spectrum of the staff's (technical reviewers and risk analysts) understanding on how risk is used in the agency's decision-making activities.
NRR Announcements:	Used to announce the questionnaires and cafés.
Division Meetings:	The team will provide updates on the progress of this project and training during NRR division meetings.
Regional Counterpart Meetings:	The team will provide updates on the progress of this project and training during the regional counterpart meetings.
Findings and Recommendations Reports:	At the conclusion of Phase 1 of the project, each working group will produce a findings and recommendations report to identify proposed changes to the agency's current processes to enhance risk in our decision-making activities, including revisions to guidance documents and/or training programs. These reports will be made public, so they will also be used as external communication tools.

6.3.2 External Communication Tools

Action Plan:	Provides the strategic framework or process for completing the NRR RIDM project.
Public Meetings:	The NRR RIDM project will utilize the quarterly RISC public meetings to update licensees, NEI, and members of the public on the status of the project. Since the RISC public meetings are typically attended by NRC and licensee executives, independent staff level public meetings will be scheduled, as needed, to discuss working level items.

**Findings and
Recommendations
Reports:**

At the conclusion of Phase 1 of the project, each working group will produce a findings and recommendations report to identify proposed changes to the agency's current processes to enhance risk in our decision-making activities, including revisions to guidance documents and/or training programs.

7.0 MILESTONES

Section 7.1 provides a narrative description of the current status of the action plan tasks, and Section 7.2 provides an overall schedule and milestones for completing this project.

Updates to this action plan will occur quarterly or as needed.

7.1 Current Status

Each of the working groups have finalized their task's scoping statements (Phase 1, Step 1). The scoping statements were discussed during a team meeting on Tuesday, December 12, 2017, to reach alignment on the scope of each task. The next milestone is for each working group to brief the ET/LT on the scope and status of their task, which are currently scheduled in January 2018 (January 11, 2018: NRR RIDM Tasks 2 and 4; January 18, 2018: NRR RIDM Tasks 1 and 3; January 25, 2018: NRR RIDM Task 5). In parallel to the briefings, most of the working groups are currently collecting data to review and analyze to complete their task (Phase 1, Step 2). Specific upcoming milestones for each task are discussed below.

NRR RIDM Task 1: The working group will complete the following actions by January 2018: identify the scope of licensing actions that could be affected by Task 1; identify licensing processes and tools that could be affected by Task 1; identify Reactor Program System (RPS) capabilities that could be affected by Task 1; identify scopes and milestones of other RIDM tasks that could affect Task 1; identify current and recent licensing actions for lessons-learned; identify training documents associated with licensing processes.

NRR RIDM Task 2: Develop questions and topics for cafés, subject matter expert interviews, staff interviews, and questionnaires by January 16, 2018; schedule cafés and complete focused interviews by February 28, 2018.

NRR RIDM Task 3: Develop a checklist (A) for DORL and technical branches to use to identify reviews that would benefit from risk insights; develop a checklist to identify which existing risk tools would be best to use and how to use them when checklist A indicates that risk insights are appropriate to support a review.

NRR RIDM Task 4: Email questionnaire to staff to obtain their perspective on BTP 8-8 by January 12, 2018; issue interim guidance on BTP 8-8 by February 2, 2018.

NRR RIDM Task 5: Brief the NRR ET/LT on the lessons-learned guidance generated on January 25, 2018 and issue a close out memo.

NRR RIDM Tasks 6 and 7: DRA finalize the Tasks 6 and 7 closeout memorandum and prepare concurrence package by January 12, 2018.

NRR RIDM Task 8: Finalize the closeout memorandum to close NRR RIDM Task 8, Consideration of Large Early Release Frequency in NRC Staff Evaluation of Licensee Requests for Enforcement Discretion by January 31, 2018.

7.2 Overall Schedule

The below schedule (Table 3) provides the milestones for each task. The milestones in green are considered complete, the milestones in orange are the next action items for the working groups to complete, and the milestones in yellow are the cross-cutting item milestones for communication. If a specific milestone has a date entered, then the milestone is scheduled. If the milestone has "targeted" entered, then the team is in process of scheduling this action item.

	NRR RIDM Phase 1 Milestones								
	Step 1: Finalize Tasks		Step 2: Data Collection			Step 3: Analyze/Evaluate Data		Step 4: Findings/Recommendations Reports	
	December-17		January-18	February		March	April	May	June
Communication		Lead RIDM PM brief ET/LT on status of the action Plan - Complete	Finalize and issue action plan -- 1/12/18	Tasks ET/LT briefings: Tasks 2, 4: 1/11 Tasks 1, 3: 1/18 Task 5: 1/25	Lead RIDM PM brief NRO on status of the action plan -- Targeted			Brief ET/LT on the findings and recommendations - Targeted	
Milestones	Working groups generate one-pager scoping statements	Team meeting to finalize scope of the tasks	Finalize one-pager scoping statements	Document Review Data Collection, which may include Focus Interviews/Questionnaires/Cafes/Workshops with staff		Analyze data collected from documents, focus interviews, questionnaires, cafes, and workshops.		Finalize Findings and Recommendations Reports	
NRR RIDM Task 1: Expanded Use of License Review Teams, including evaluating the technical reviewer, risk analyst, and project manager roles/responsibilities	Complete	Complete	Complete	Identify current and recent licensing actions for lessons learned and training documents associated with licensing processes --1/2018	Analyze lessons learned from recent licensing actions -- 2/2018	Develop potential methods for enhancing workload management processes and tools, team structure, and team communications -- 3/2018			
NRR RIDM Task 2: Broaden the definition of risk more transparently such that all of the technical staff can see how their work embodies risk considerations—beyond CDF, LERF	Complete		Complete	Develop questions for cafes and questionnaire -- 1/16 Request NRR Announcement email for Cafes for NRR staff/managers and extend invite to targeted staff outside of NRR -- 1/31	Issue questionnaire online to NRR staff (and some targeted responses) -- 2/28 Schedule Cafés -- 2/28				
NRR RIDM Task 3: Develop a graded approach for using risk information more broadly in licensing reviews. Tasks 1 and 2 are related to NRR Task 3.	Complete		Complete	Develop a checklist for DORL and technical branch use to identify reviews that would benefit from risk insight development using information from DRA - 1/31	Develop a checklist to identify which existing risk tools would be best to use and how to use them when risk insights are appropriate to support a review -- 2/28				
NRR RIDM Task 4: Review of BTP 8-8	Complete		Complete	Provide questionnaire to staff -- 1/12 Provide Interim Staff Guidance on BTP 8-8 to SES Chmaps for review -- 1/26	Generate matrix to capture questionnaire findings -- 2/2 Issue Interim Staff Guidance -- 2/2				
NRR RIDM Task 5: Evaluate DPO recommendations 5 and 6, including evaluating the possibility to leverage the risk-informed notebooks as job aids for the staff.	N/A		Complete	N/A	N/A	Complete		Findings and Recommendations Report drafted -- Complete	
NRR RIDM Task 6: Evaluate the guidance in the four pertinent documents (RG 1.174, RG 1.177, RG 1.200, and NUREG-1855) discussed in DPO Panel recommendation 7 to determine if better harmonization is appropriate, and provide recommendations on a path forward, if appropriate.	N/A		Complete	N/A	N/A	Complete		Findings and Recommendations Report drafted -- Complete	
NRR RIDM Task 7: With the impending revision to RG 1.174, determine whether there are any other pertinent documents or procedures that should be updated (e.g., RG 1.177).	N/A		Complete	N/A	N/A	Complete		Complete	
NRR RIDM Task 8: Evaluate the use of Large Early Release Frequency (LERF) in various regulatory applications and determine if different approaches are supported	N/A		Complete	N/A	N/A	Complete		Findings and Recommendations Report drafted -- Complete	

8.0 PROJECT'S SUCCESS CRITERIA

During Phase 2 of this project, the working groups will implement the recommendations from their findings and recommendations reports, including revising guidance documents and training programs. As these documents are being revised, the working groups will update internal and external stakeholders on these proposed revisions. Before the guidance documents and training programs are finalized, the vision is to implement a pilot program using the draft and revised guidance documents while reviewing similar applications that shaped the NRR RIDM project (e.g., Palo Verde diesel generator AOT extension request). These pilot program applications will be identified by the staff and agreed upon by the licensee before submitting to the NRC for review.

The pilot program will identify criteria to measure the success of the revised guidance documents, and ensure the successful completion of the NRR RIDM mission statement and supporting objectives. The lead RIDM project manager will refine this pilot program and communicate this program to internal and external stakeholders once additional details are available.

9.0 CONTROL PROCESS

The NRR RIDM team recognizes that as this project progresses, there may be instances where tasks need to be revised or additional tasks added to this action plan. If a working group identifies a need to revise or add a task to this action plan, the working group team lead will communicate the revision to their assigned SES Champion and the lead RIDM project manager. The SES Champion and the lead RIDM project manager will communicate the proposed change to the SES Champions to discuss during their bi-weekly meeting. Once a decision is made by the SES Champions, the lead RIDM project manager will provide a summary on the outcome of the bi-weekly meeting to the working group team leads and update the action plan, as needed.

10.0 QUESTIONS AND ANSWERS

Q1. Why is the action plan implementing a phased approach to complete this project?

A1. To overcome the overarching change-management challenge and culture change identified in the SECY paper, this action plan utilizes a systematic or phased approach to enhance risk in our decision-making activities. This approach will ensure the successful completion of the NRR RIDM project mission statement and ease the cultural transition from the current processes in place. In addition, this approach will provide the appropriate documentation to justify the proposed changes recommended under this project.

Q2. Does the NRR RIDM project scope include operating and new reactors?

A2. The SECY paper states that it focuses on RIDM for the reactor program (i.e., operating and new reactors); however, the SECY paper also states that although successful execution of these strategies will benefit both current and future licensees, next generation advanced non-light water reactor developers are increasingly using PRA throughout the design process. Therefore, the NRR RIDM team is currently comprised of NRR staff, and this action plan will reevaluate the timing and NRO's priorities once the 8 NRR RIDM tasks are successfully completed. In preparation of identifying NRO's priorities, the NRR RIDM team is coordinating with NRO to ensure consistency across

business lines. The NRR RIDM team is scheduling a briefing on the action plan and project to NRO in February 2018.

Q3. What is the schedule for completing this project?

A3. Below is the schedule to complete this project for the operating reactors:

- Finalize the findings and recommendations reports -- spring 2018
- Implementation of the recommendations -- December 2018

11.0 CONTACT

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