



Joint BWROG/PWROG Technical Committee Meetings

NRC Panel: August 16, 2018

Mike Franovich, Director Division of Risk Assessment

Sunil Weerakkody, Sr. Technical Advisor, Division of Risk Assessment

Mike Montecalvo, Acting Branch Chief, Division of Risk Assessment

Adrienne Brown, Reliability and Risk Analyst

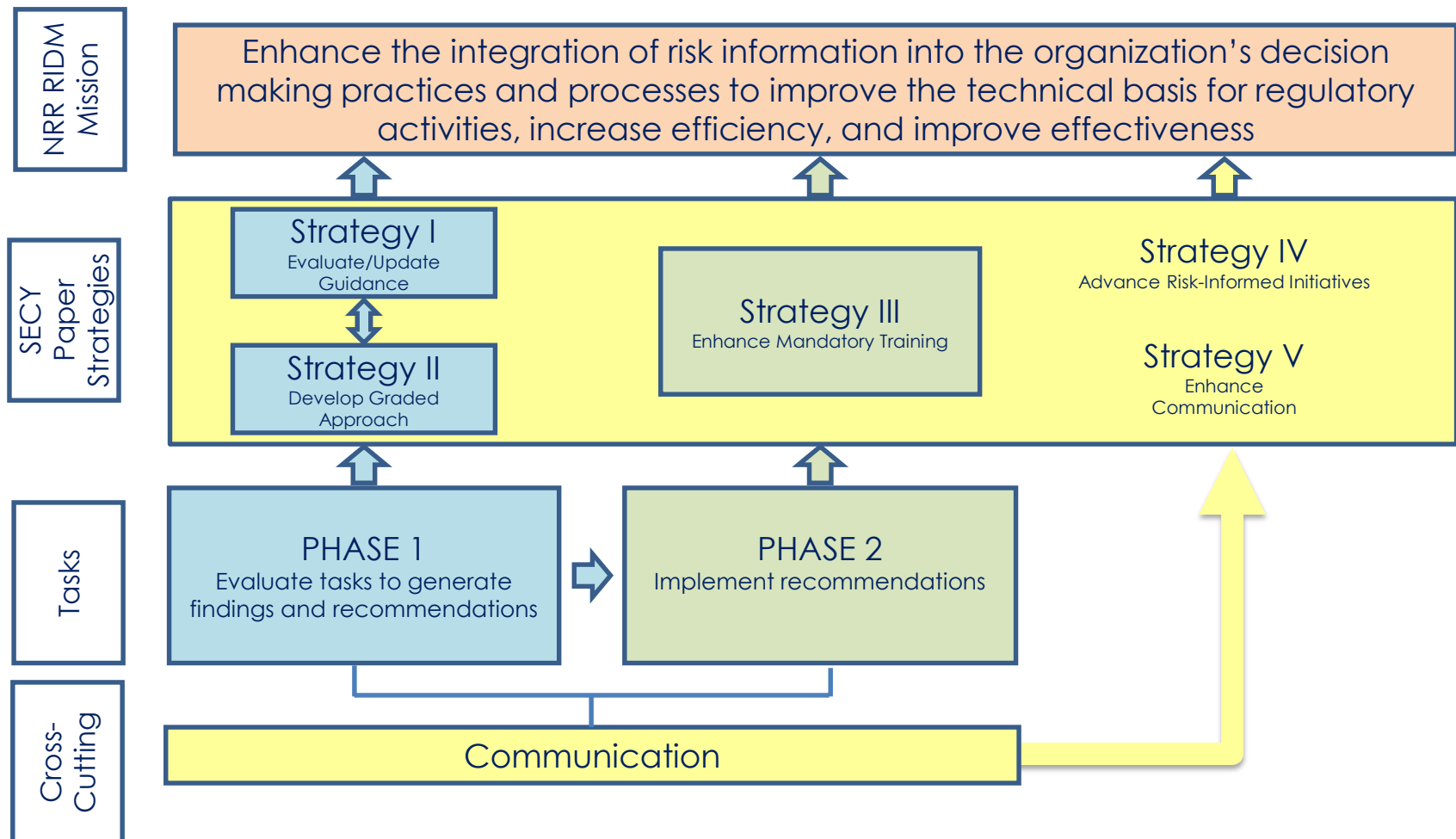




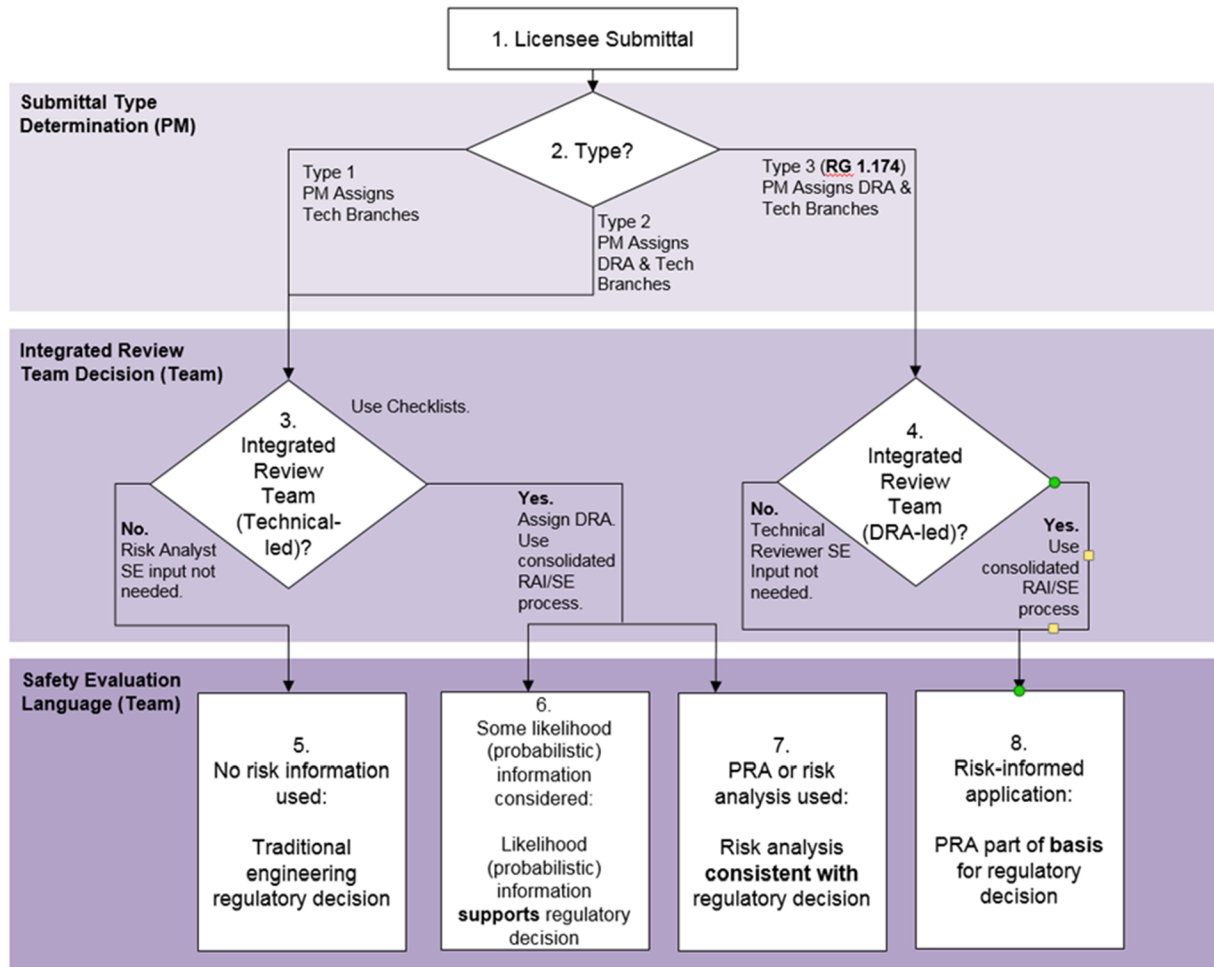
Risk-Informed Decision Making (RIDM): Action Plan

Mike Franovich, Director
Division of Risk Assessment

An Action Plan is Being Implemented to Improve Risk-Informed Decisionmaking



The Action Plan Supports Increased Use of Integrated Reviews and Safety and Risk Insights



Strategies to Optimize Regulatory Activities

- Broaden efforts to promote RIDM practices
- Increase FLEX regulatory credit
 - correlate future plant modifications with FLEX to reduce other hazards risk (e.g., internal fires & floods)
 - showcase FLEX capabilities when NRC conducts onsite audits - increase reviewers, inspectors, and managers awareness
- Focus communications and coordination
 - Conduct joint NRC-Industry workshops on lessons learned from 50.69 and TSTF-505 reviews
 - Improve coordination and accuracy of forecasted LAR submittals
 - Sequence risk related LARs:
 - Consider submitting TSTF-505 prior to 50.69 or lower tier LARs (TSTF-505 program has a very high pedigree for PRA acceptability), or
 - Couple TSTF-505 and 50.69 LARs and reviews

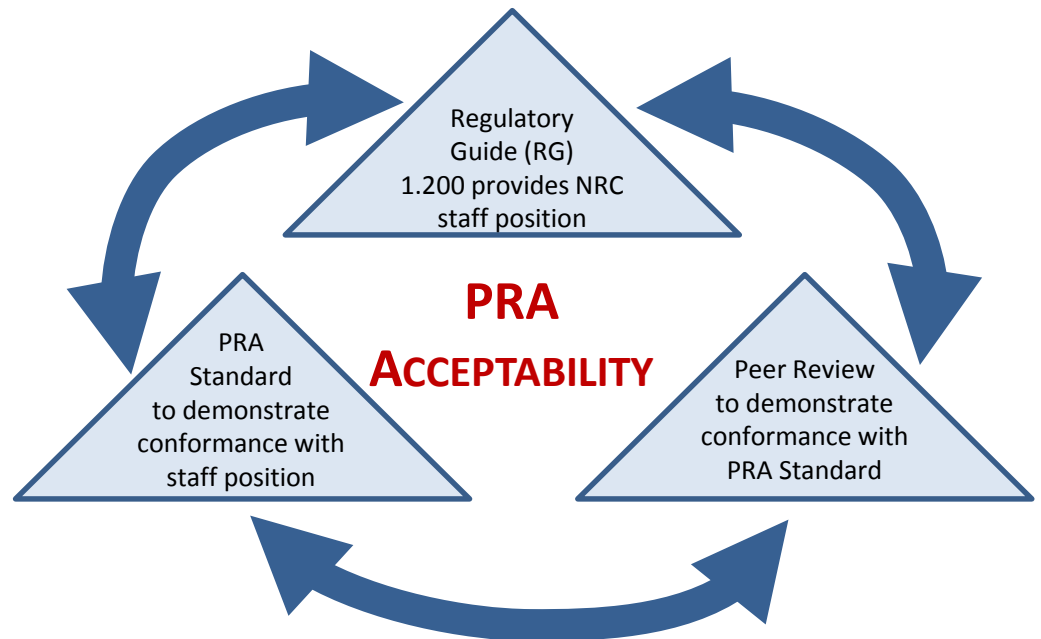


New Methods

Sunil Weerakkody
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PRA Acceptability – 3 Elements

- All 3 elements have to work together to demonstrate PRA acceptability



New Methods Are a Current Focus Area for NRC and Industry

- Ongoing focus on industry peer-review and the F&O closure process
 - ASME/ANS PRA Standard updates
 - RG 1.200 update
 - NEI 17-07
- A risk-informed oversight process will complement licensing activities and possibly new methods



Crediting Mitigating Strategies in Regulatory Applications

Mike Montecalvo
Acting, Branch Chief
Division of Risk Assessment

Crediting Diverse and Flexible Coping Strategies (FLEX)

- FLEX developed to meet the Commission's Orders after the Fukushima accident
- FLEX can also be utilized for:
 - Outages
 - Defense-in-Depth
- The NRC wants to encourage safety enhancements
- Addressing ongoing challenges

Challenges to Crediting FLEX

- **No Operational Experience (OpE) data**
 - Needed to develop, and support, equipment reliability used in risk assessments
 - Prior OpE collection effort by EPRI abandoned
 - Owner's Groups have taken lead
 - Have committed to sharing draft and final results
- HRA methods for unique FLEX actions
 - Current HRA methods not adequate for all FLEX actions
 - Ongoing work in NRR and RES to address this challenge
 - RES held an expert elicitation in April 2018
 - EPRI Workshop in February 2018

FLEX OpE data expectations

- Commission's PRA policy statement states:
 - "PRA evaluations in support of regulatory decisions should be as realistic as practicable and appropriate supporting data should be publicly available for review."
- The data needs to be of comparable resolution to what the NRC publishes on its public website.
 - Failures, Number of attempts (or hours), and number of components
- The data does **not** need to identify individual plants, consistent with our current approach.
- The data should be of sufficient resolution to verify that any poolability assumptions are statistically sound.
 - Basis for pooling FLEX diesels from different vendors

Path Forward on FLEX OpE data

- Owner's Group Effort
 - Draft report Fall 2018
 - Publish report (1st quarter 2019)
- NRC is looking forward to reviewing the report
- Possible Public Meeting
 - Discuss the NRC's review of the report
 - Discuss how RES will integrate this information into the current process
- NRC staff is looking forward to engaging the owner's groups on the FLEX OpE data.

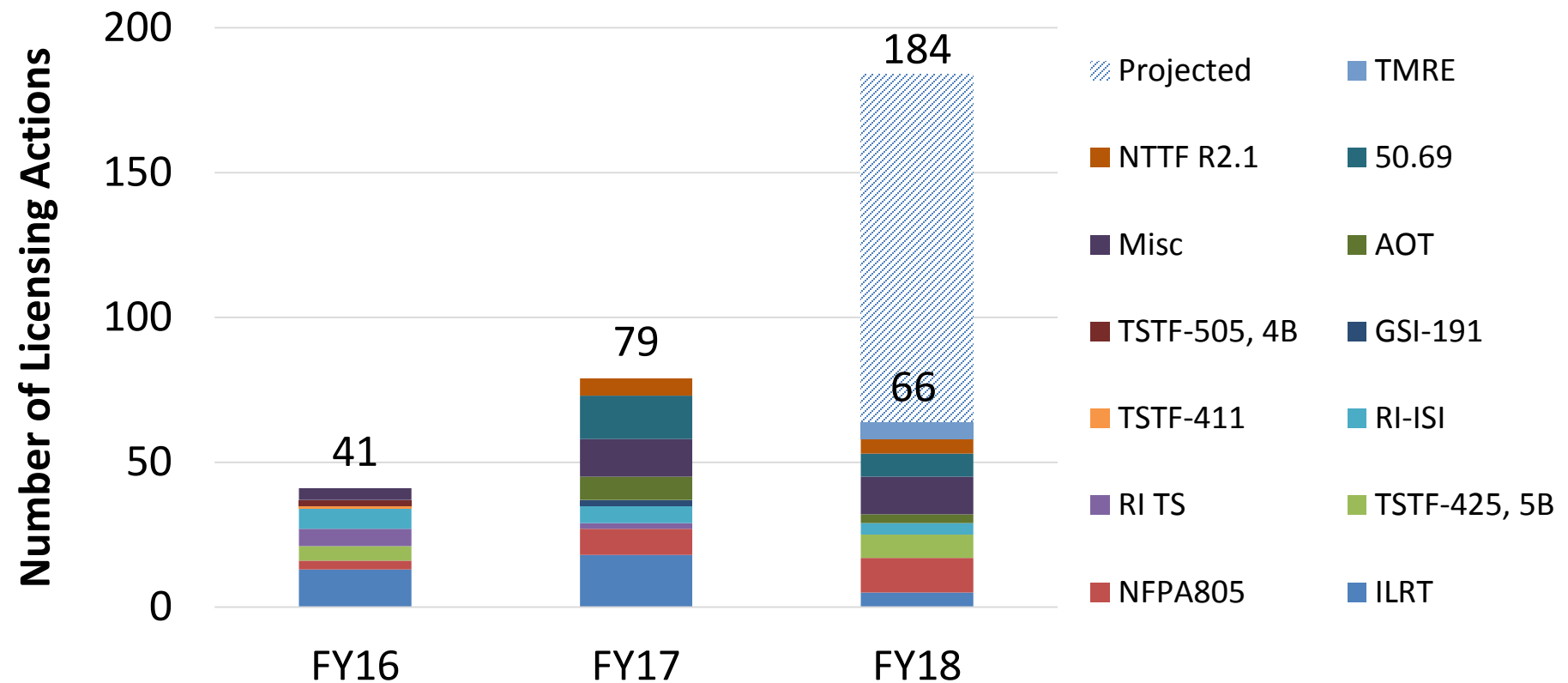


Lessons Learned: Recent Risk-Informed LAR Reviews

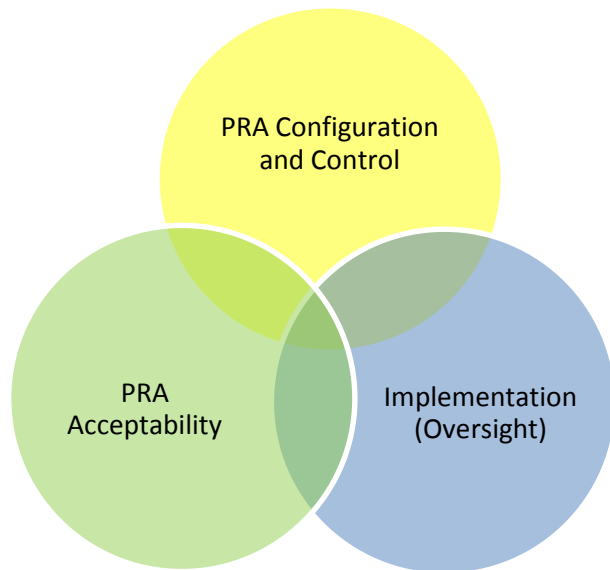
Adrienne Brown
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Influx of Risk-Informed Applications Requires Increased Coordination and Planning Between NRC and Industry

Risk-Informed Licensing Actions Received from FY16-FY18



High Quality Submittals to Streamline Efficient Staff Reviews



- PRA Quality
 - ❑ Up-to-date full-scope PRA peer reviews
- Crediting Appendix X, consistent with staff letter of acceptance
- Incorporations of precedent from previous SEs
- Disposition of open F&O applicable to risk-application

50.69: Risk Informed Categorization of Structures, Systems, and Components

- LAR review scope:
 - NRC staff reviews the quality of the PRA models used in the categorization process
 - NRC approves categorization process
 - NRC does not review categorization results, procedures, or alternative treatment during LAR review. These are subject to inspection
- 16 applications for 50.69 received
 - 6 in early stages of review; 3 withdrawn
 - One SE has been issued, several reviews approaching completion

Insights from Initial 50.69 Reviews

- Deviations from endorsed guidance
 - Categorization of passive SSCs
 - Public meetings preferred to discuss generic industry topics/deviations prior to LAR submittal
 - Public meetings to resolve generic topics related to seismic or fire (sites without seismic analysis or fire PRA)
- Some LARs require more review hours due to scope of PRA (e.g., seismic, high winds)
- NRC review resources are challenged due to the large volume of applications
- License Condition for approval specifying modeled PRA hazards and non-PRA methods

Tornado Missile Risk Evaluator (TMRE)

- Three pilot plant LARs using TMRE draft guide (NEI 17-02 draft Rev. 1)
 - Plant audits and RAs generated to pilots
 - Pilot plant RA responses also updating NEI 17-02
 - Staff positioned to complete safety evaluations (SEs) following receipt of licensee responses
 - Post-pilot amendments could model pilot SEs in advance of NEI 17-02 endorsement
 - Staff prepared to receive approximately 12 amendments in FY19
- 13 of 13 EGM 15-002 extension requests dispositioned between January and June

TSTF-505: Risk-Informed Technical Specification Completion Times

- Background
 - TSTF-505 suspended (November 2016)
 - Vogtle's License Amendment for RICT issued (August 2017)
 - Vogtle was the “pilot” for changes needed to unsuspend TSTF-505
 - NRC staff modified TSTF-505 and the model application/SE
 - No RICT for loss of function
 - Enables licensing efforts to advance forward
 - License Condition for use of new methods
- September/October target for revised TSTF model application and safety evaluation report

NRC PANEL: QUESTIONS



Acronyms

- ANS: American Nuclear Society
- ASME: The American Society of Mechanical Engineers
- CDF: Core Damage Frequency
- CFR: Code of Federal Regulations
- DRA: Division of Risk Assessment
- EGM: Enforcement Guidance Memorandum
- FLEX: Diverse and Flexible Coping Strategies
- F&O: Fact/Finding and Observation
- FY: Fiscal Year
- HRA: Human Reliability Analysis
- LAR: License Amendment Request
- LERF: Large Early Release Frequency
- NEI: Nuclear Energy Institute
- NFPA: National Fire Protection Association
- NOED: Notice of Enforcement Discretion
- NTTF: Near Term Task Force
- PM: Project Manager
- PRA: Probabilistic Risk Assessment
- RG: Regulatory Guide
- RI: Risk-Informed
- RICT: Risk-Informed Completion Time
- RIDM: Risk-Informed Decision-Making
- RISC: Risk-Informed Steering Committee
- RITS: Risk-Informed Technical Specifications
- ROP: Reactor Oversight Process
- SDP: Significance Determination Process
- SE: Safety Evaluation
- SFCP: Surveillance Frequency Control Program
- SR: Surveillance Requirement
- SSC: Structure, System, or Component
- TMRE: Tornado Missile Risk Evaluator
- TS: Technical Specification
- TSTF: Technical Specification Task Force