



## Use of Newly Developed Methods in PRA Models November 14, 2018

Mary Drouin, Sr. Programs Manager, RES/DRA  
Sunil Weerakkody, Sr. Technical Advisor, NRR/DRA

### Contributors

Jonathan Evans, NRR/DRA/APLA  
Shilp Vasavada, NRR/DRA/APLB  
Antonios Zoulis, NRR/DRA/APOB

# Outline Of NRR Presentation

- Status of Tech Spec 4b reviews & TSTF-505 Rev. 1
- Assessment of Current Status and Desired Endpoint
- Additional Feedback on NEI Proposal
- Challenges and Path Forward
- Next steps

# Status of Tech Spec 4b Reviews & TSTF-505 Rev. 1

**NRC staff is continuing its reviews of Tech Spec 4b submittals.**

- NRC has issued two Safety Evaluations:
  - Vogtle Units 1, 2 (ADAMS No. ML15127A669)
  - Calvert Cliffs Units 1, 2 (ADAMS No. ML18270A130)
- List of license amendment request (LARs) under review:
  - Turkey Point Units 3 & 4
  - St. Lucie Units 1 & 2
  - Palo Verde Units 1, 2, 3
  - Farley Units 1 & 2
- Target to lift suspension of TSTF-505: End of November 2018
- Workshop on RII Lessons Learned: January 2019

# Desired Endpoint

## (Assessment of the Current Status)

- Industry and NRC staff aligned at a high-level about the desired endpoint (definition of success) ?
- Industry and NRC have a common understanding about challenges that we need to overcome ?
- Reaching the desired end within a timeframe acceptable to NRC staff and the industry will be a significant challenge.
- Discussion of details may reveal some misalignments.

## Desired Endpoint (NRC Understanding of Industry View)

Industry senior leadership's characterization of status & definition of success (Public RISC Meeting, 9/13/18).

- Definition of success: *“staff has confidence in the peer-review process”*

NRC agrees that the above is one critical measure of success!

# Desired Endpoint

## (NRC View: Products & Experiences that Constitute Success)

A framework that permits the Industry to implement Newly Developed Methods in a manner that is acceptable to the NRC staff.

- Revised ASME/ANS PRA Standard that enables peer reviewer of Newly Developed Methods in a manner acceptable to the staff.
- Revised Regulatory Guide 1.200 that endorses the Revised ASME/ANS Standard with appropriate clarifications.
- Inspections rarely identify PRA methods unacceptable to the staff.
- Identified issues do not have potential adverse safety impacts.
- In the event a concern with a method is identified during an inspection, the issue is resolved without undue burden to licensee or staff.

## Additional Feedback

- Staff should not create processes that use oversight function to tacitly approve newly developed methods.
  - During the public meeting on 9/6/18, industry informed that the purpose of proposing the 30-day time limit was to enable licensees to update their models in a timely manner for purposes of RICT and that industry understood use of peer-reviewers does not constitute tacit approval of methods.
  - Staff is exploring means to document this discussion in a formal document.
  - Staff will also examine how the administrative TS in TSTF-505 can be modified to accommodate implementation of the NEI proposal w/o tacit approval.

# Challenges on the Path Forward & Strategies to Overcome Challenges

- NRC staff is cognizant of most challenges associated with the development of framework for newly developed methods. NRC is developing strategies to overcome the known challenges.
- Significant number of risk-informed initiatives that are underway which demand PRA resources is, in itself, a significant challenge.
- Industry's request to expedite resolution exacerbates the challenges.





# Challenge#1 and Path Forward

**Establish processes or assure that existing processes can be modified to accommodate NEI's proposal (modified as needed to address staff comments).**

- Establishing processes to ensure acceptability (as opposed to review/approval) of Newly Developed Methods introduces number of technical, legal, organizational, and budgetary challenges.

## Challenge#1 and Path Forward (Contd.)

- How can we align on information needed by NRC staff to make an expeditious determination on the acceptability of newly developed methods?
- How can NRC set up a process where staff provide a timely review on acceptability?
- What are realistic time frames to conclude acceptability of newly developed methods?
- What is the process to follow if reviewers conclude that a proposed newly developed method is unacceptable?
- What are the criteria that NRC staff should use to provide a timely review on acceptability?
- How should the staff document conclusions on acceptability?
- How should ROP consider NRC conclusions on the acceptability (or lack thereof) of newly developed methods?

## Challenge#1 and Path Forward (Contd.)

- DRA Staff is developing a proposal that complements NEI's proposal.
- DRA staff is continuing their dialogue with other divisions in NRR, OGC, and the regional staff to ensure the viability of the proposal.
- DRA staff is evaluating whether the process that the staff is designing to complement the NEI process can be amenable for use by licensees prior to performing a peer review.

**Staff will hold a public meeting to discuss details of the staff proposal.**

# Challenge #2 and Path Forward

**Expedite resolution of the issue so that the alternative path becomes available to licensees who choose to submit LARs using TSTF-505.**

- Considering NRC letter and/or an NEI document endorsed by NRC as a temporary placeholder that delineates guidance acceptable to the NRC and licensees.
- Ensure that inputs from a variety of stakeholders are received and considered prior to implementation to minimize the need for subsequent changes.
- Ensure that the NEI guidance becomes available to all interested external stakeholders.
- Develop a realistic timeframe.

**Staff will hold public meeting to discuss the approach and a realistic timeframe to implement that approach.**

# Challenge #3 and Path Forward

**Refine the peer-review framework to address staff and industry concerns.**

- Reach alignment with industry on key issues (e.g., Newly Developed Method, PRA Upgrade vs. PRA Maintenance, and review criteria used to review Newly Developed Methods).
- Review & Endorse NEI 17-07.
- Update ASME/ANS PRA Standard.
- Develop Rev. 3 of RG 1.200.

**Detailed discussions will be provided by RES/DRA.**

# Challenge #4 and Path Forward

**Enhance the ROP framework to address staff and industry concerns relating to Newly Developed Methods.**

- Enhance the existing ROP to focus on safety performance of implementing risk-initiatives.
  - Additional consideration for appropriate level of regulatory oversight if the NRC approves the alternative approach of using peer-review process to accept (not approve) Newly Developed methods (i.e., no LAR).

**A brief overview of progress and status will be provided by NRR/DRA/PRA Operations Branch.**

# Next Steps

Staff to develop plans for closure of long-term and short-term deliverables to disposition the new methods issue. (NRC's goal is to prepare plans AND plan and complete items 2, 3, and 5 within about 1 year. Large number of other high-priority items which require PRA expertise or limitations on staff's ability to make changes without Commission approval may challenge that goal.)

1. Formalize plan to update RG 1.200.
2. Formalize plans to endorse NEI 17-07.
3. Prepare plan to issue letter that documents the subset of issues that will be published in RG 1.200 which are important to address new methods issue.
4. Finalize plan to enhance ROP frame work to support risk-informed initiatives.
5. Prepare plan to implement NEI alternative by developing or adjusting NRC's internal procedures/processes.

# **“Staff Review and NEI 17-07 and Status of PRA Maintenance, PRA Upgrade and PRA New Method”**

Mary Drouin  
Office of Nuclear Regulatory Research  
[mry.drouin@nrc.gov](mailto:mry.drouin@nrc.gov) (301) 415-2091  
November 14, 2018



# OUTLINE

---

- Staff review of NEI 17-07
- RG 1.200: PRA Maintenance, Upgrades and New Method

# Staff Review of NEI 17-07

---

# HISTORY OF NEI PEER REVIEW GUIDANCE

INDUSTRY GUIDANCE		NRC REVIEW AND ENDORSEMENT	
DOCUMENT	DATE	RG 1.200	DATE
NEI 00-02, Probabilistic Risk Assessment Peer Review Process Guidance,”	March 2000	RG 1.200, Rev 0	Feb 2004
Revision 1, Self Assessment	Nov 2006	RG 1.200, Rev 1	Jan 2007
NEI 05-04, Process for Performing Follow-On PRA Peer Reviews Using the ASME PRA Standard	Aug 2006	RG 1.200, Rev 1	Jan 2007
Revision 2	Nov 2008	RG 1.200, Rev 2	March 2009
Appendix x (Appendix E, Closure of F&Os) to NEI 17-07	Feb 2017	Approval letter	May 2017
NEI 07-12, Fire Probabilistic Risk Assessment (FPRA) Peer Review Process Guidelines,”	Dec 2007	DG-1200	June 2008
NEI 12-13, External Hazards PRA PEER Review Process Guidelines	August 2012	Approval letter	March 2018
NEI 17-07, Performance of PRA Peer Reviews Using the ASME/ANS PRA Standard	Dec 2017 (draft) Final (TBD)	<ul style="list-style-type: none"> <li>• Approval letter</li> <li>• DG-TBD</li> <li>• RG 1.200, Rev 3</li> </ul>	<ul style="list-style-type: none"> <li>• Mid 2019</li> <li>• Late 2019</li> <li>• Late 2020</li> </ul>

# NEI 17-07

---

- NRC in May 3, 2017, letter to NEI, stated:
  - “The NRC staff recommends that NEI create a single document and incorporate Appendix X into the document. Incorporation of the governing peer review processes into one singular document will improve the effectiveness and efficiency to support future revisions and endorsements requested, reduce confusion on the part of peer reviewers and other document reviewers, and ensure consistent guidance for all types of peer reviews.”
- NEI in December 2017 published a draft guidance document (NEI 17-07) addressing PRA peer review for all hazards using the ASME/ANS PRA standard
- NEI 17-07 is meant to replace the previous peer review guidance documents

# NEI 17-07 – Staff Review

---

- NRC has completed its draft review of 17-07
  - Review included comparing to the previous guidance documents
  - Review included determining whether previous staff comments were addressed
- NRC provided NEI detailed comments on 11-9-18

# Summary of Major Staff Comments

---

- In several places in the guidance, it can be inferred that the peer reviewer does not need to look at every SR in the standard
  - Every SR has to be peer reviewed
- Throughout the report, the guidance does not address internal flood
  - Most of the guidance addressing internal events is applicable, however, like internal fire, seismic and other hazards, internal flood does have unique aspects
- Guidance states that consensus requires all agree with the final assignment
  - Cannot achieve consensus if there is a dissenting opinion
- Dissenting opinions need to be documented in the final report
- Staff comments provided in letter to NEI in March 2018 on NEI 12-13 need to be addressed

# Summary of Major Staff Comments

---

- Section 7.1: The observation “UAM” should be supplemented with another observation entitled “newly developed method”
  - The newly developed method observation should have three outcomes:
    1. Reviewed by peer review team and found acceptable,
    2. Reviewed by the peer review team and not found acceptable, and
    3. not reviewed by the peer review team.
- There should be limitations for when licensee can request a review to CC I
  - Causes excessive time and complexity
  - RG 1.200 states CC II is the acceptable target
  - Have applied to NFPA-805 as the default acceptable
  - Safety evaluation on 4b applications says CC II is expected capability for all SRs
- The results of the peer review need to be well defined and permitting different licensees to request different end points will greatly complicate LAR reviews

# Summary of Major Staff Comments

---

- The guidance now states that the peer review is charged with reviewing newly-developed methods and need only write an F&O if they find it a UAM
  - Comments by the peer reviewers of newly-developed methods must reflect the developing position on newly-developed methods
- Several places refer to the “application,” the peer review is not done for each application so any application specific results will most likely be invalid for later applications
- In Section 7.1, what should be included in a Finding could be better described
- In places, similar language that appears in either 05-04, 07-12 or 12-13 was slightly revised and made more relaxed in 12-13; for example:
  - NEI 12-13 states for walkdowns: “an important element ... is the walkdown of the areas of the plant that are deemed to be important ...”
  - NEI 17-07 states for walkdowns: “it may be necessary to conduct walkdowns.”
  - There have been peer reviews of external flood and high winds with no walkdowns



# Questions

---

- What is NEI' intention with regard to “maintaining” the previous peer review guidance documents?
- For example, will peer reviewers be allowed to peer review using the “old” peer review guidance documents?
  - Revision 3 to RG 1.200 will only include endorsement of NEI 17-07 for peer review guidance

# Path Forward

---

- Continue dialogue with NEI as needed
- Provide approval of NEI 17-07 in letter, if desired
  - Approval may contain NRC comments that need to be addressed
- Provide final endorsement in Revision 3 of RG 1.200

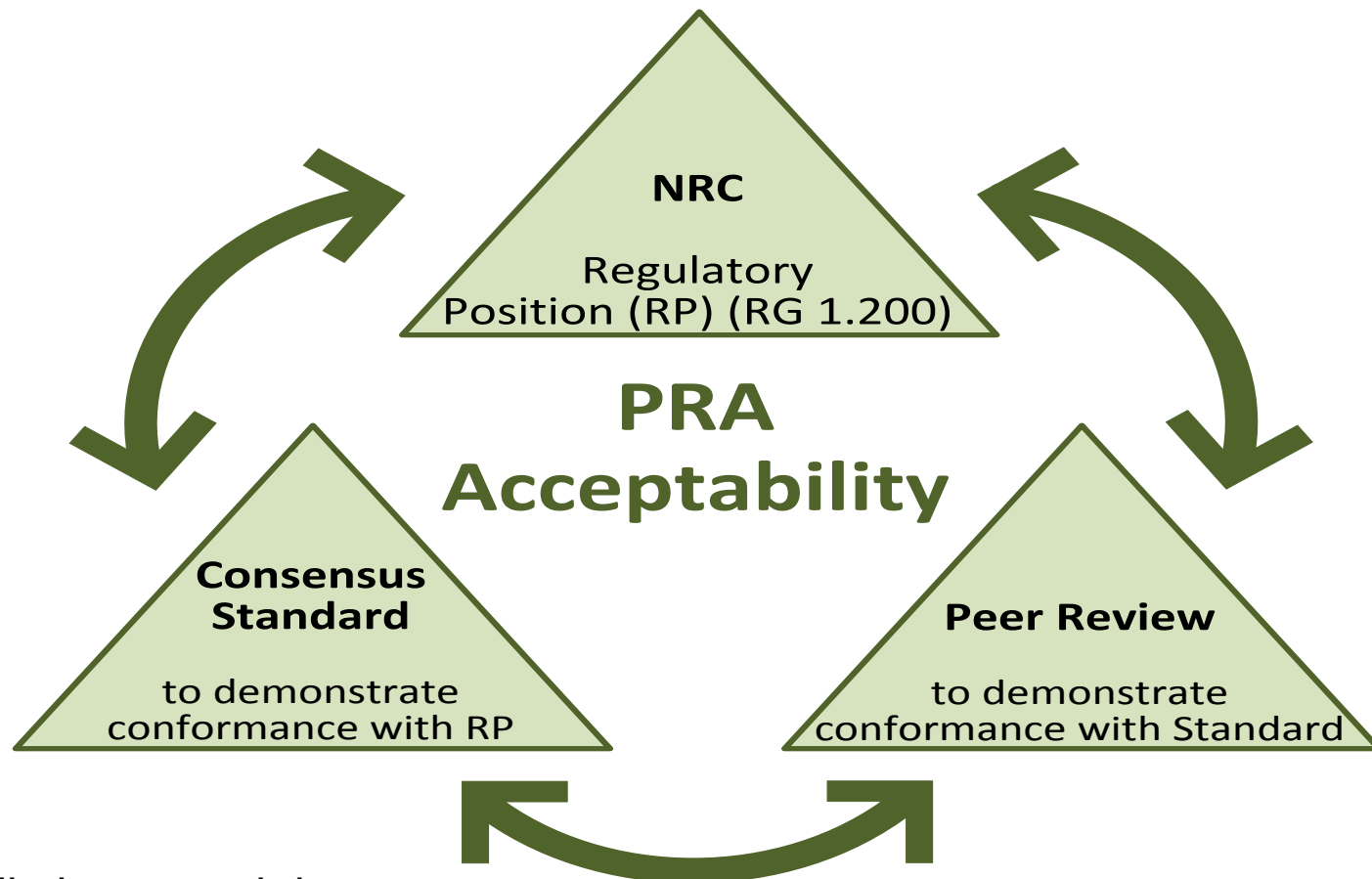
# RG 1.200: PRA Maintenance, Upgrades and New Method

---

# NRC RG, ASME/ANS Standard, NEI Guidance

---

## All three must work together



Preliminary, work-in-progress

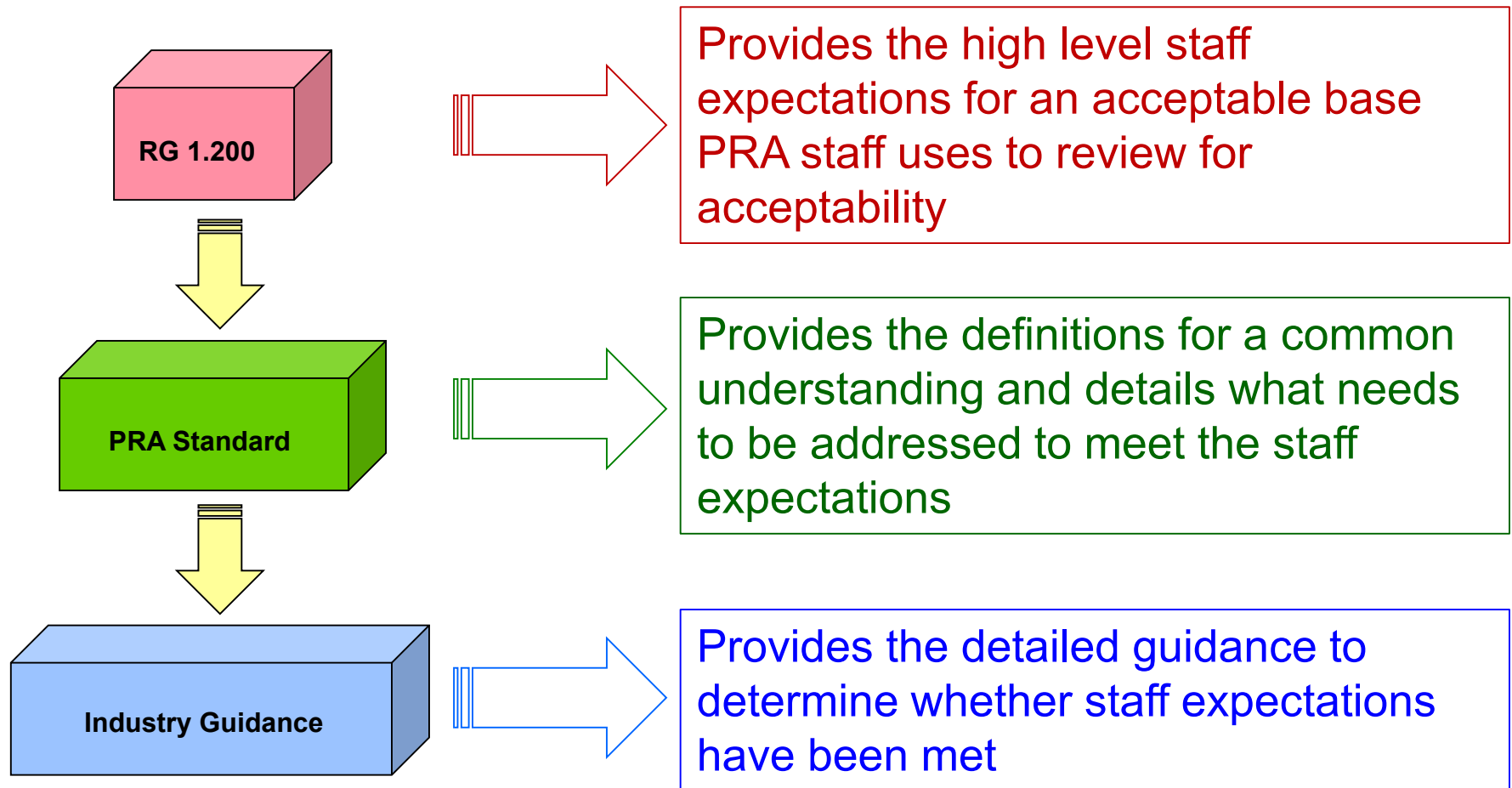
# Issues and Challenges

---

- Major issues
  - Terminology
  - Criteria for risk significance
  - Criteria for screening
  - Process for determining need for peer review
- Workshops being held by OGs to help resolve issues
  - Next presentation
- Determine best place where various levels of information should reside

# NRC Perspective In Determining Information Location

---



# Plans for RG 1.200

---

- Only develop the necessary attributes and characteristic to communicate staff position (expectations)
- Only add detail if standard and industry guidance fail to address

# New Issue

---

- Has the standard been sufficiently vetted by the users?
- Are there issues with the standard causing unforeseen negative impacts; for example
  - Are any of the revisions adding little to no value, but adding additional work?
  - Are there SRs that are still vague, confusing and can result in challenges to the peer reviewer?
  - Are there SRs that are “incorrect” and user cannot meet?
  - Are there SRs indirectly resulting in RAIs?



# Path Forward

---

- Continue dialogue with ASME/ANS and stakeholders
- Continue working with OG to address and resolve issues
- Proposed public workshop
  - Purpose is for users of standard to come to workshop and provide feedback on issues with the standard
  - 1-2 day workshop
  - Workshop either end of January or early February
  - Results of workshop provided to JCNRM