IEEE NPEC Subcommittee SC-3
Operating, Maintenance, Aging, Testing & Reliability
Meeting 12-2 Minutes

Tuesday morning, July 24, 2012
San Diego, CA

Members Present:	George Ballassi	Singh Matharu
	Tom Carrier	Joe Napper
	Suresh Channarasappa	Jim Parello
	Tom Crawford (Secretary)	Vish Patel
	Dave Horvath	Ted Riccio
	Sharon Honecker	Glen Schinzel
	Peter Kang	Rebecca Steinman (arrived late)
	Jacob Kulangara	John Stevens
	Jim Liming (Chair)	Yvonne Williams (Vice Chair)
Members Absent	Gopal Aravapalli	Bob Lane
	John Beatty	Kirk Melson
	Hamid Heidarisafa	Zdenko Simic
	Steve Hutchins	John Taylor (Corresponding)
Guests	Kiyoteru Suzuki	

1.0 Introduction

- **Opening Remarks and Meeting Agenda**

  Jim called the meeting to order at 08:00. After introductions around the table, Jim reviewed the proposed agenda. Dave Horvath moved to approve the agenda, and Sharon Honecker seconded. The motion passed by acclamation.

2.0 Secretary's Report

- **Approval of SC-3 11-02 Meeting Minutes**

  Yvonne reviewed the draft minutes which had been previously distributed. She noted that we do have a quorum present (17 of 25 members) for general business and standards action. Jim noted that, per ADCOM, we are not working toward a 5-yr cycle. It was also agreed that the Standards Status would be changed to "Posted on the NPEC Website."

  A motion was made by George to accept the minutes as amended, seconded by Dave Horvath, and passed by acclamation.

- **SC-3 Membership**

  The rolling attendance report attached to the minutes was reviewed for the attendance of SC-3 members.

Hamid last attended the 10-01 Meeting. We agreed to change his status to "Corresponding Member," and Jim will notify him.

Jacob is present and wants to continue as a Regular Member.

John Stevens is present and we agreed to return him to full membership.

- **Alligator Fund**

  The status of the alligator fund was reviewed. Yvonne proposed a $10 meeting fee, which was seconded by George and approved by acclamation.

- **Action Item Status**

  The status of the action items was reviewed; the action item list is attached.

  SC-3 name (***AI-11-2-C***) – after some discussion about the subcommittee name, Jim Liming took action to bring the issue up again at ADCOM to find out what is required.

3.0 Chair's Report

- **Leadership Review / Succession Planning**

  The succession planning for SC-3 was reviewed by Jim. Jim Liming is the Chair now, and Yvonne is the Vice-Chair. Tom Crawford has accepted the position of Secretary. Typically the term is approximately two years, so Jim is expecting to run the 13-02 meeting and then turn over to Yvonne for the 14-01 meeting. Jim suggested that we establish a position of Assistant Secretary, similar to what NPEC has done; and Joe Napper volunteered.

- **Leadership Telecons**

  Leaderships telecons have been sporatic and noted that they should be more regular, to ensure proper coordination of the SC-3 activities. Jim suggested that a telecon be held every three months, i.e., half way between meetings, with the next one in early October.

- **PAR Status**

  Jim presented the Paul Yanosy status spreadsheet dated 06/23/12.

  336 – Last revision approved 07/17/2010. It will be up to the WG and SC-3 on when to update the standard to support the new cycle.

  338 – Revision published in March 2012.

  352 – PAR was approved by NESCOM 03/29/2012. Sharon has a WIP scheduled for the N12-02 NPEC meeting.

577 – Statistics submitted; revision is scheduled for final REVCOM review in August 2012.

692 – PAR for amendment was approved in Sept 2011 (NesCom), expires Dec 2014.

933 – PAR expires Dec 2012; ready for recirculation ballot; will need to request a PAR extension.

1205 – PAR approved in 2011, expires Dec 2015; Status is Active, with working phone calls every 4-6 weeks. Work is progressing smoothly, and Rebecca is confident in meeting this schedule.

1819 – PAR expires Dec 2014; an extension may be required. A WIP is anticipated for the N13-01 meeting.

These statuses were updated by Jim on the Paul Yanosy version of the standards spreadsheet (Attached). Jim will pass the updates to Paul.

Action 12-2-B: *Develop a Template / Strawman for gap analysis for SC3 standards – Yvonne.*

4.0 Operating Procedures Manual (OPM) Report

The latest version of the SC-3 OPM manual was previously distributed to members for review prior to the meeting. Tom Crawford presented this version and summarized the changes incorporated as a result of the S12-01 meeting.

George stated that he had reviewed the various WG submittals and he concluded that ours "met the intent and is acceptable."

Jacob identified two editorial corrections that were incorporated:

- The definition of standard 933 in the Table was missing the word "Power."
- In Section 1.0 there was an inconsistency between "WG" and "WGs," as defined. It was agreed that the definition would remain "WG" and the text would be reworded to "each Subcommittee Working Group" in order to resolve the concern.

Jim moved approval and George seconded. The Subcommittee APPROVED the SC3 OPM on 07/24/2012.

Action 12-2-A: *Distribute copies of the approved OPM to SC3 members – Tom Crawford.*

5.0 Working Group Reports

- **3.1**

  Of the three standards maintained by WG 3.1, two have been recently approved and published –

  - IEEE 336 was approved 17 June 2010 and published 30 September 2010
  - IEEE 338 was approved 06 Feb 2012 and published 23 March 2012

  Currently the WG is preparing the initial version of IEEE 1819. The PAR for this new standard was approved 25 March 2010 and expires 31 December 2014. Work on this standard has been slowed somewhat by work on IEEE 338, but has picked up after its issuance. Telecons are being used between formal WG meetings (prior to NPEC meetings) to focus and progress the work. It is anticipated that a work-in-progress presentation will be provided to NPEC at the 13-01 meeting.

  Patrick O'Regan, was appointed as a new member of the WG.

- **3.2**

  Working Group 3.2 met at the NRC offices in Washington, DC on April 11, 2012 to discuss NRC comments on IEEE Std 692-2010 resulting from regulation changes issued after completion of the standard. Because of the surprising large number of comments, it was decided that a PAR for a complete revision was a more appropriate vehicle for the needed changes rather than an amendment as previously planned. As a result, the attached draft PAR is attached for review by SC-3 and approval by NPEC AdCom. Note that this PAR also requests that the scope of the standard be clarified to apply only to electrical and I&C equipment to prevent continuing comments on deficiencies in security structural requirements (such as use of jersey blocks to limit effects of crashing vehicles, bullet resistant doors & enclosures, sally ports, etc).

  The next meeting is scheduled for Thursday September 20th (9am-5pm) and Friday September 21st (9am-noon). The meeting will take place in Tetra Tech Advent's office in Ann Arbor, MI.

- **3.3**

  WG 3.3 met on July 23, 2012 in San Diego in conjunction with the 12-02 NPEC meeting. The status of the three standards for which the group is responsible was as follows:

  - IEEE 352 is being actively revised. A work in progress presentation was prepared to be presented at the SC 3 meeting and subsequently approved for presentation at the NPEC meeting. The goal for the project is to present a preview to NPEC at the 13-02 meeting and publish the standard late in 2014.

- IEEE 577 has been balloted and the final ballot statistics have been submitted to IEEE REVCOM for approval. It is expected that the standard will be published later this year.
- IEEE 933 has been through the initial ballot process and the working group has addressed all of the comments. The comments need to be uploaded to the IEEE website and a recirculation ballot must be initiated. It is unlikely that the standard will be published before the PAR expires (December 31, 2012), so a PAR extension will be requested.

The working group's five-year plan was revised to reflect changes to the IEEE standard revision cycle. The working group's vice chair stated that his agency requested that he move to a different subcommittee within NPEC, so the working group is actively looking for a new vice chair. In addition to the regular meeting business, several members of the working group met on July 24 to develop a plan to review and update IEEE 352.

- **3.4**

The preparation of P1205 is moving forward at a reasonable pace. The WG did not meet at NPEC 12-02, but has been holding web-based telcons every 4-6 weeks. The group also held a face-to-face meeting at SC-2 in May in Las Vegas, NV. The WG completed the first cut revision to the main body of the standard early this year, with Annexes A, B, E, and F being mostly complete at this point. The remaining activities will focus on the revisions to the Annexes C and D. The WG has decided to completely revise Annex D, primarily to better align the examples with the standard. Due to the current efforts with complete revision of Annex D, the WG has pushed NPEC preview of this standard off until July 2013 (N13-02), although the intent is to preview the majority of the work to SC-3 in January 2013 and use the time between January and July to make minor tweaks to the standard as a result of unofficial review and comment in SC-2 and SC-3. The approved PAR expires December 31, 2015, but the current activities should allow for publication prior to PAR expiration.

6.0 Liaison Reports

Liaison reports were provided as follows:

- NRC – Singh Matharu
- ASME – Glen Schinzel
- NRMCC – George Ballassi

7.0 Old and New Business

Sharon presented a WIP brief on standard 352. Ted moved that it be accepted for presentation to NPEC, and Yvonne seconded; the motion was passed by acclamation.

Dave stated that we need to consider the impacts of post-Fukushima recommendations on our standards. Jim stated that SECY 12-025 discusses some of the recommendations. WG Chairs were requested to look at the recommendations and review with their groups. Dave stated that there are four NRC documents dated March 2012, which are pertinent.

Action 12-2-C: *Add a summary of post-Fukushima issues to the agenda – Jim Liming.*

A motion for adjournment was made by Ted, seconded by Yvonne and passed by acclamation.

Prepared by Tom Crawford, SC-3 Secretary.

SC-3 Website information:

http://grouper.ieee.org/groups/npec/private/sc3/sc-3.html
login name: [redacted] password: [redacted]

ATTACHMENTS

Attachment 1 Agenda	Attachment 2 Rolling Attendance	Attachment 3 Alligator Fund
Attachment 4 Action Items	Attachment 5 NPEC SC-3 Standards Status Spreadsheet	Attachment 6 ASME Liaison Report
Attachment 7 NRC Liaison Report	Attachment 8 NRMCC Liaison Report	Attachment 9 PAR P692 Draft
Attachment 10 P352 Work-in-Progress		

Agenda – Meeting 12-02

NPEC Subcommittee SC-3, *Operation, Maintenance, Aging, Testing and Reliability*

Meeting Date/Time:	Tuesday, 7/24/12 0800-1200 PT	**Chairman :** **Vice Chair:**	James Liming Yvonne Williams

Desired Outcomes:	1. Review status/activities of each SC Working Group 2. Update SC3 Std master schedule 3. Understand proposed changes for revision to IEEE Standards

WHAT (content)	WHO	WHEN (minutes)
Welcome, Review Desired Outcomes • Meeting logistics • Introductions	J. Liming All	0800-1815
Chairman's Introduction • Opening remarks • Review/approve agenda	J. Liming	0815-0830
Secretary's Report • Approval of SC3 12-01 Meeting Minutes • Action Item review/status • SC3 membership review • Alligator fund report	Y. Williams	0830-0900
Chairman's Report • SC3 Leadership review – succession planning • Leadership telecons • PAR status • NPEC meeting preparations	J. Liming	0900-0930
OPM Report • Operations Manual	T. Crawford	0930-0950
BREAK	All	0950-1010
Working Group Reports • WG-3.1 (Testing) • WG-3.2 (Security) • WG-3.3 (Reliability) • WG-3.4 (Aging)	Y. Williams D. Horvath S. Honecker R. Steinman	1010-1020 1020-1030 1030-1040 1040-1050
Liaison Reports • NRC Report • ASME Report • NRMCC Report	P. Kang G. Schinzel G. Ballassi	1050-1110
Old Business • Master schedule for Std review/updates	All	1110-1135
New Business • As identified during this meeting	All	1135-1145
Review of Action Items	Y. Williams	1145-1155
Next meeting date/location	J. Liming	1155-1200
Meeting closeout/adjournment	J. Liming	1200

Attendance at SC-3 Meetings

Last	First	2010-02	2011-01	2011-02	2012-01	2012-02
Aravapalli	**Gopal**	x	x	x		
Ballassi	**George**	x	x	x	x	O
Beatty	**John**	x	x	x	x	
Carrier	**Tom**		x	x	x	X
Channarasappa	**Suresh**	x	x	x	x	X
Crawford	**Tom**	x	x	x	x	X
Fitzpatrick	Bob			x		
Goedeke	Scott			x	x	
Heidarisafa	**Hamid**					
Honecker	**Sharon**	x	x	x	x	X
Horvath	**Dave**		x	x		X
Hutchins	**Steve**			x	x	
Kang	**Peter**	x		x		X
Koshy	Tom					
Kulangara	**Jacob**		x			X
Lane	**Bob**		x	x		
Liming	**Jim**	x	x	x	x	X
Matharu	**Singh**	x	x	x	x	X
McClure	Phil		dnp			
Melson	**Kirk**	x	x	x	x	
Napper	**Joe**	x	x			X
Parello	**Jim**	x	x	x	x	O
Patel	**Vish**			x	x	X
Phan	Hanh	x				
Riccio	**Ted**	x	x	x	x	X
Schinzel	**Glen**	x	x			X
Simic	**Zdenko**			half	x	
Steinmann	**Rebecca**		x	x	x	
Stevens	**John**					X
Williams	**Yvonne**	x	x	x	x	X
Members are shown in **bold** and colored as of end of 12-02 meeting.						
TOTAL PAYING ATTENDEES		17	20	21	17	15
TOTAL NON-PAYING ATTENDEES						2

NPEC Subcommittee SC-3

Operating, Maintenance, Aging, Testing and Reliability

Alligator Fund

The Alligator Fund is made up of voluntary contributions from SC-3 members to defray the cost of meeting rooms, refreshments, etc.

Meeting	Beginning Balance	Meeting Contributions	Expenses	Ending Balance
S05-1	$312.14	$207.18	$359.82	$159.50
S05-2	$159.50	$240.00	$0.00	$399.50
S06-1	$399.50	$220.00	$178.67	$440.83
S06-2	$440.83	$160.00	$335.00	$265.83
S07-1	$265.83	$200.00	$201.70	$264.13
S07-2	$264.13	$600.00	$340.87	$523.26
S08-1	$523.26	$300.00	$347.80	$475.46
S08-2	$475.46	$320.00	$386.26	$409.20
S09-1	$409.20	$180.00	$12.00	$577.20
S09-2	$577.20	$210.00	$92.54	$694.66
S10-1	$694.66	$220.00	$380.90	$533.76
S10-2	$533.76	$425.00	$474.90	$483.86
S11-1	$483.86	$200.00	$14.00	$669.86
S11-2	$669.86	$430.00	$480.50	$619.36
S12-1	$619.36	$340.00	$203.00	$756.36
S12-2	$756.36	$150.00	$0.00	$906.36

NPEC Subcommittee SC-3

Operating, Maintenance, Aging, Testing and Reliability

Action Items List

Item No.	Subcommittee 3.0 Actions	Owner	Due Date	Closure Comments
10-2-F	Standards status / schedule - update for meeting minutes and send to all SC3 members -- ensure 1819 is included in list	Yvonne	initial update 12-02, then ongoing	Mansoor to update spreadsheet based on discussions in 11-01 meeting and to include 1819 -- action was against status sheets with dates, 11-02 meeting - discussed the Paul Yanosy spreadsheet 12-01 Spreadsheet was discussed, with result that is useful as a more detailed version of Yanosy spreadsheet, update it to current status and provide to SC prior to meetings
11-2-C	SC-3 name in NPEC needs to reflect reliability	Jim Liming	AdCom mtg	bring up at AdCom meeting 11-2 12-1 mtg: more complicated - Jim to bring up at 12-01 AdCom meeting to make sure what is required and then get those actions started.
12-1-A	Send a formal thank-you letter to Bob Lane from SC-3 for the projector donation	Jim L / Yvonne	shortly after 12-1 mtg	
12-1-B	Track distribution of IEEE 338-2012 to working group members	Yvonne	after publishing of 338	IEEE 338-2012 was published and distributed in April. Anyone who did not receive a copy may contact Tom Crawford. Action Closed.
12-1-C	Send out SC-3 OPM out to SC-3 members for review for potential changes	Yvonne / Tom Crawford	approx Mar 2012	OPM was approved at 12-1 meeting to meet organizational demands. Because of the extensive changes, the OPM should be provided to the membership to identify issues and comments. The WG chairs should provide to the WG members since the appendix covers the WG operational procedures. All should review, with further discussion at the 12-2 meeting. The updated OPM was reviewed and approved at the 12-02 meeting. Item Closed. New Action 12-2-A assigned for distribution of the approved version.
12-1-D	Send out updated roster, WG officer updates to Rebecca for website update	WG chairs, Yvonne	approx April 2012	Need to pay attention to keeping the website up-to-date, so leaders should ensure that approriate information is provided to Rebecca. Yvonne will submit the updated roster to Rebecca with the 12-01 Meeting Minutes.
12-2-A	Distribute the approved SC3 OPM to members.	Tom Crawford		Awaiting signed coversheet from Jim L.
12-2-B	Develop a Template / Strawman for gap analysis for SC3 standards	Yvonne		
12-2-C	Add a summary of post-Fukushima issues to the next meeting agenda.	Jim Liming		

SC-3 "Operations, Maintenance, Aging, Testing & Reliability"

Chair: Jim Liming

PROJECT	Year	Re-Affirmation	PAR Expiration	TITLE	Working Group	Chair	Cycle Year	N12-1	N12-2	N13-1	N13-2	Status/Comments
1205	2000	2007	Dec. 2015	IEEE Guide for Assessing, Monitoring, and Mitigating Aging Effects on Class 1E Equipment used in Nuclear Power Generating Stations	3.4	R. Steinman	5	WIP			Preview	Standard approved at 3/30/2000 Standards Board Meeting. Ballot for corrigendum opened 1/8/06, approved 3/30/06. Re-afformation approved by Std Bd March 22, 2007. PAR approved by ADCOM 1/25/2011, and by REVCOM in March 31, 2011.
336	2010			IEEE Standard Installation, Inspection, and Testing Requirements for Power, Instrumentation, and Control Equipment at Nuclear Facilities	3.1	Y. Williams	2					Revision Approved by Stds Bd on 9/22/05. PAR approved byADCOM 08-02 and approved by StdBd Nov 7, 2008. Ballot opens Dec. 17 and closes on Jan 16, 2010. Revision approved by the StdBd on June 17, 2010.
338	2012		Dec. 2014	IEEE Standard Criteria for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems	3.1	Y. Williams	0					Revision approved by Stds Bd 12/6/06. PAR electronicaly approved by ADCOM and submitted to NesCom for Jan 2010 meeting. PAR approved by StdBd Feb 2010. Standard approved March 23, 2012.
352	1987	2010	Mar. 2016	IEEE Guide for General Principles of Reliability Analysis of Nuclear Power Generating Station Protection Systems	3.3	S. Honecker	2		WIP			Reaffirmation approved by StdBd March 17, 2010. PAR approved by ADCOM 1/25/2011. PAR approved by NesCom 3/29/12.
577	2004		Dec. 2012	IEEE Standard Requirements for Reliability Analysis in the Design and Operation of Safety Systems for Nuclear Power Generating Stations	3.3	S. Honecker	8					Recirculation ballot completed on 2/27/2011; 100% approval; preparing draft submittal for RevCom 9/2011 meeting. RevCom to review at 8/29/12 meeting.
692	2010		Dec. 2015	IEEE Standard Criteria for Security Systems for Nuclear Power Generating Stations	3.2	D. Horvath	2					Standard approved by Std Bd February 2, 2010. PAR P692A was approved to amend 692 2010 in September 2011. New draft PAR P692 is being submitted for ADCOM review July 24, 2012.
933	1999	2011	Dec. 2012	Guide for Definition of Reliability Program Plans	3.3	S. Honecker	1					Reaffirmation approved by Stds Bd 12/08/04. PAR submitted to ADCOM 08-02 and approved by StdBd Nov 7, 2008. First ballot of 933-2011_D4_20110124.pdf completed as of 3/1/2011; resolving review comments.
P1819	New		Dec. 2014	Standard for Risk-Informed Categorization and Treatment of Electrical Equipment in Nuclear Facilities	3.1	Y. Williams				WIP		PAR electronicaly approved by ADCOM and submitted to NesCom for Jan 2010 meeting. PAR approved by StdBD March 25, 2010.

Color Code ;	
Green - Document 0 to 2 years old	6
Aqua - Document 3 years old	0
Yellow - Document 4 Years old	0
Red - Document 5 or more years old.	2
	8

IEEE SC3 Meeting **July 24, 2012**

ASME Liaison Report

Glen E. Schinzel - STARS

ASME Special Committee on Standards Planning

The ASME OM Special Committee on Standards Planning last met on July 19, 2012. This Committee is completing the review all currently published ASME OM (Operations & Maintenance) Parts, Guides, and Standards to determine:

- If they are still useful
- If the requirements are current
- The value of updating out-dated requirements
- If other industry standards can replace the out-dated requirements

This review activity has identified a number of standards which require updated information and has identified that certain Guides would be better served as Standards. The effort to update these documents continues. The Committee also considers the international usage of the ASME Standards and has integrated international members onto the Committee.

Two strategic areas that ASME is assessing:

- The need for testing requirements to be established in standards for components that have been exposed to Beyond Design Basis conditions and now must be validated for continued functionality. This consideration is being driven by the recent seismic event at the North Anna power station in August 2011.
- The need to integrate more performance-based methods into existing standards. Currently, a number of ASME standards integrate condition-based monitoring methods into the guidance provided. Over recent years, the methodology for performance-based methodology continues to evolve, and the application of condition-based insights into decision-making is increasingly expected. So, ASME is reviewing existing standards to validate that performance-based approaches are properly addressed.

From an IEEE perspective, it is important that SC3 be self-critical during the Standard review process and consider the attributes that ASME integrates during the review process. Also, consideration of guidance for component functionality beyond design basis conditions may be useful for industry users. Finally, a review of IEEE standards to ensure that performance-based approaches are properly considered may add value.

New Reactors

ASME has established a Task Group on New Reactors to effectively consider new reactor designs and technologies into the ASME OM Code. This Task Group has primarily focused on validating current standards to support new nuclear construction, to develop new standards to support this new construction where deficiencies in existing standards are noted, and in validating the use of ASME standards in the international marketplace. ASME is also focused on the next generation of nuclear plant development and developing the necessary standards to support these new technology applications. It appears that most of the current standards are supportive of the expected and planned construction efforts, but this review continues to proactively assess the needs of the industry to ensure that necessary standards are available when required.

With the emergence of the Small Modular Reactor designs and interest in the SMR application, the Task Group on New Reactors is in the process of reviewing over 60 different SMR designs for potential updates to the ASME OM Code.

Post-Fukushima

ASME was approached by the Chair of IEEE SubCommittee 2 (Qualifications) to collaboratively consider updates to Standards to address potential equipment qualification issues resulting from the Fukushima accident in Japan. ASME has named a point of contact within QME to serve as this interface with IEEE. It is expected that representatives from SC2 and QME will collaboratively discuss the potential need to enhance the qualification language in existing standards.

Other

A new edition of OM Code on Operations and Maintenance of Nuclear Power Plants is due for publication by end of 2012.

U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Licensing and Construction of New and Advanced Reactors

David B. Matthews
Director
Division of New Reactor Licensing
Office of New Reactors

May 14, 2012

U.S.NRC
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Overview

- Vogtle & Summer COLs issued – First Steps of Part 52 Demonstrated: ESPs—DCs—COLs

- Fukushima Lessons Learned ... in progress
  - Recommendations – SECY-12-0025
  - Tier 1 orders and requests for information – March 2012
  - For applications not yet approved or submitted – expect applicants to address Commission-approved Fukushima actions

Overview (continued)

- NRC's Advanced Reactor Program
  - continues to mature
  - Division of Advanced Reactors and Rulemaking (DARR)
- Progress on developing infrastructure
- Progress on resolving policy/technical issues
- Emphasis on preparation for review of iPWRs
  - Pre-application interactions
  - Design-specific review standards

LLWR New Reactor Applications [5/14/2012]

- 18 Combined License Applications – 10 Active
- 3 Design Certification (DC) Applications
  - GE-H Economic Simplified Boiling Water Reactor (ESBWR)
  - AREVA Evolutionary Power Reactor (EPR)
  - Mitsubishi U.S. Advanced Pressurized Water Reactor (US APWR)
- 2 Early Site Permits
  - Victoria County Station
  - PSEG

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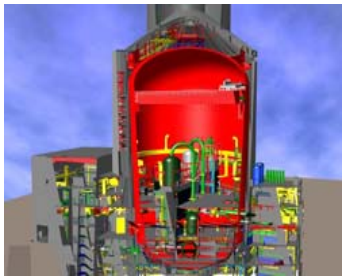
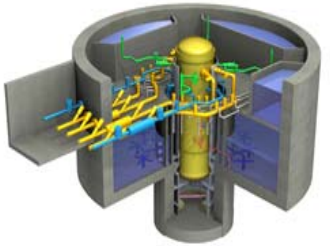
New Reactor Applications Under Review – Large LWRs+

ABWR

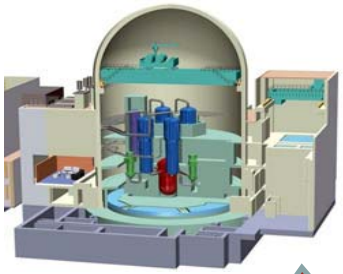


AP1000

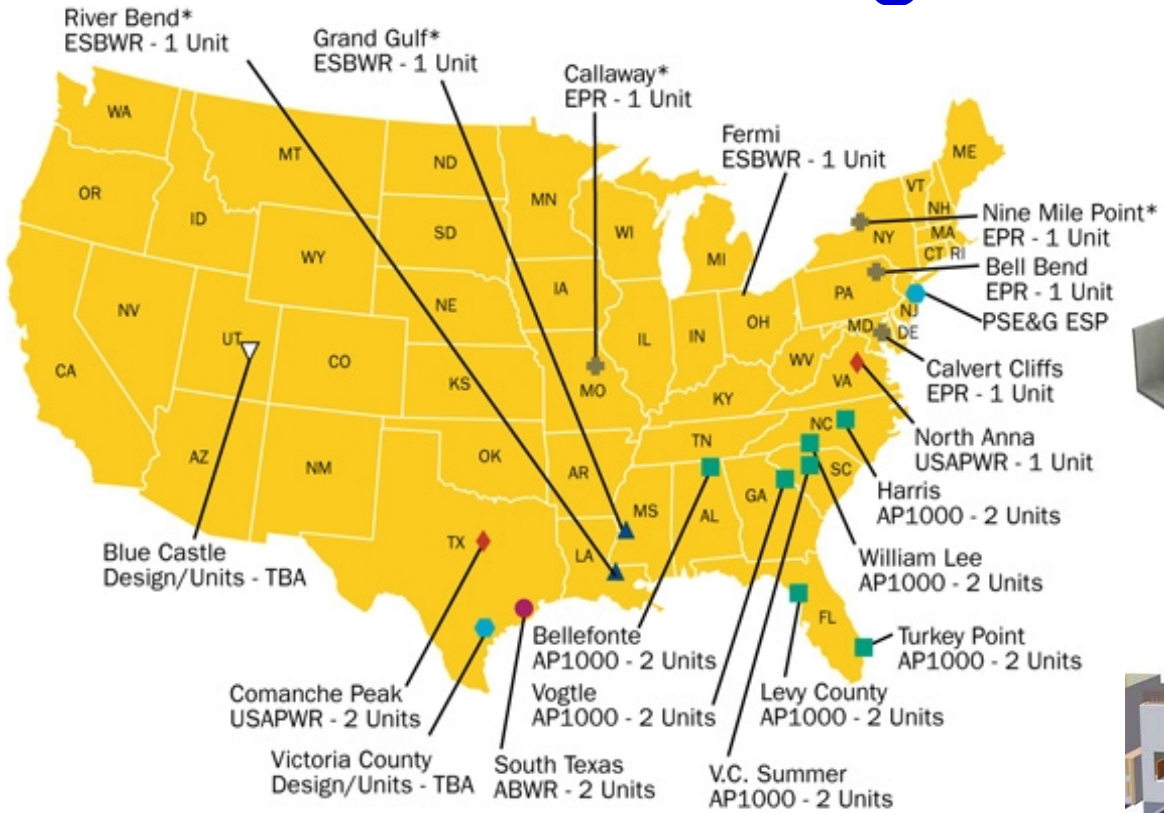
EPR



ESBWR



USAPWR



*Review Suspended by Applicant

+Large LWRs-- Large Light-Water Reactors, generally of the order of 1000 MW(e) or more

Advanced Reactor Program

- SMRs fall into three broad groups based on reactor technology
  - High Temperature Gas-Cooled Reactors
    - NGNP (prismatic)
  - Small Pressurized Water Reactors
    - NuScale
    - mPower
    - Holtec HI-SMUR 140
    - Westinghouse SMR
  - Liquid Metal-Cooled Fast Reactors
    - GE Hitachi PRISM
    - Toshiba 4S
    - Gen4 Energy Gen4 Module (Hyperion)
    - Advanced Reactor Concepts ARC-100

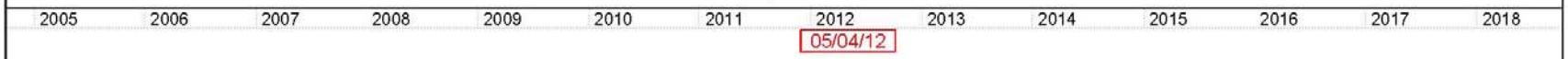
Integral Pressurized Water Reactors

- Technology
  - Pressurized Water Reactors with nuclear steam supply components within the reactor vessel for most designs

- Current iPWR designs being discussed:
  - Domestic
    - NuScale Power – NuScale (45 MWe)
    - B&W – mPower (180 MWe)
    - Westinghouse (>225 MWe)
    - Holtec International - HISMUR (145 MWe)
  - International
    - CNEA & INVAP, Argentina - CAREM (27 MWe)
    - KAERI, South Korea – SMART (100 MWe)

New Reactor Licensing Applications

Schedules By Calendar Year



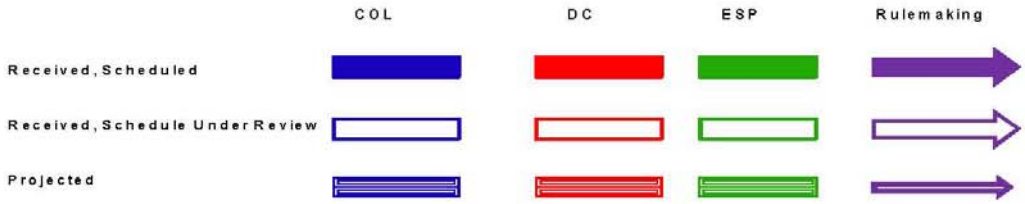
Schedules depict completion of staff safety and environmental reviews. COL and ESP Projects marked as "SCHEDULED" reflect four months additional time to complete mandatory hearings. Issuance of license is dependent upon completion of hearing process as well as design certification rulemaking for the selected design. Rulemaking date listed reflects date of publication in the federal register.

Schedule begin date is reflected as docketing date, or expected docketing date, following staff acceptance review.

Schedules depicted for future activities represent nominal assumed review durations based on submittal time frames in letters of intent from prospective applicants.

Where applicable, actual schedules are used, based on schedules as shown on NRC public web pages. For schedules under review, projected schedules are based on schedules as estimated by the NRC given the latest information the staff has. Schedules for COLs representing design certifications that are under schedule review will be adjusted once DC schedule is finalized.

Numbers in () next to COL name indicate number of units/site.



ABWR DESIGN CENTER REVIEW

SOUTH TEXAS PROJECT (2) — SCHEDULE UNDER REVIEW

STP AIA DC AMENDMENT — SAFETY REVIEW COMPLETED

RULEMAKING — EFFECTIVE JANUARY 17, 2012

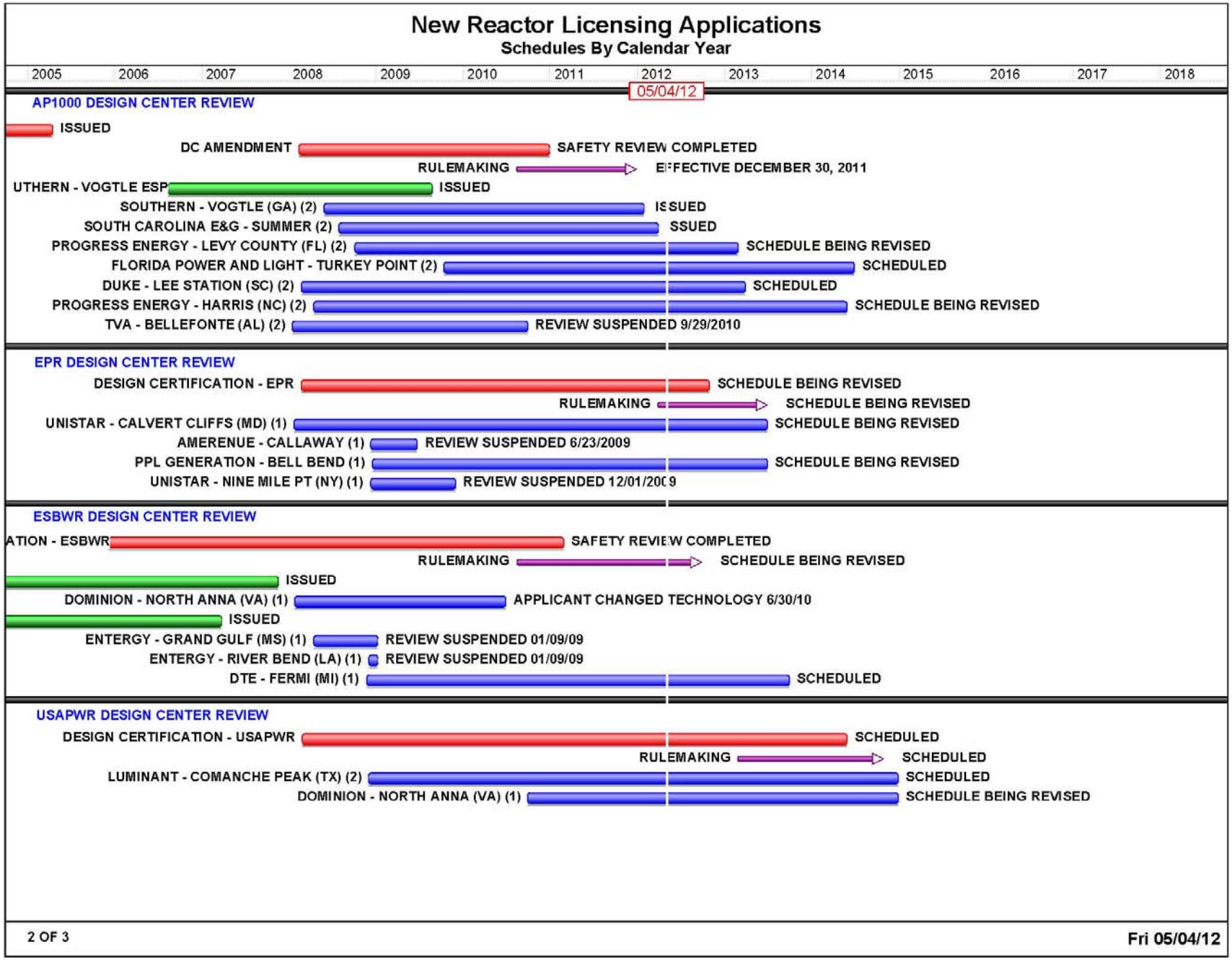
ABWR DESIGN CERTIFICATION RENEWAL

TOSHIBA DC RENEWAL — NOT SCHEDULED

RULEMAKING — NOT SCHEDULED

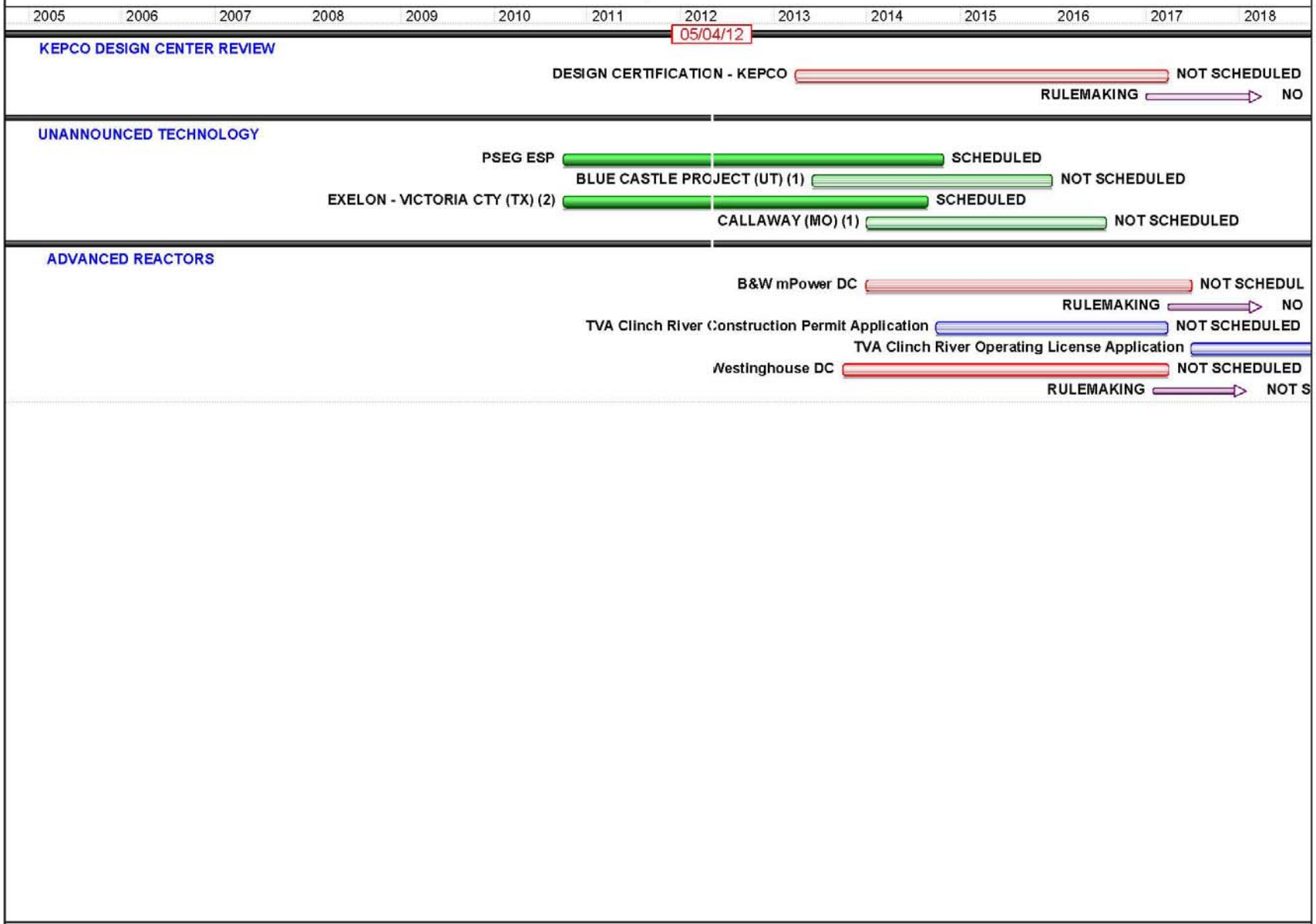
GE-HITACHI DC RENEWAL — NOT SCHEDULED

RULEMAKING — NOT SCHEDULED


New Reactor Licensing Applications
Schedules By Calendar Year
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
05/04/12
AP1000 DESIGN CENTER REVIEW
ISSUED
DC AMENDMENT
SAFETY REVIEW COMPLETED
RULEMAKING
EFFECTIVE DECEMBER 30, 2011
UTHERN - VOGTLE ESP
ISSUED
SOUTHERN - VOGTLE (GA) (2)
ISSUED
SOUTH CAROLINA E&G - SUMMER (2)
SSUED
PROGRESS ENERGY - LEVY COUNTY (FL) (2)
SCHEDULE BEING REVISED
FLORIDA POWER AND LIGHT - TURKEY POINT (2)
SCHEDULED
DUKE - LEE STATION (SC) (2)
SCHEDULED
PROGRESS ENERGY - HARRIS (NC) (2)
SCHEDULE BEING REVISED
TVA - BELLEFONTE (AL) (2)
REVIEW SUSPENDED 9/29/2010
EPR DESIGN CENTER REVIEW
DESIGN CERTIFICATION - EPR
SCHEDULE BEING REVISED
RULEMAKING
SCHEDULE BEING REVISED
UNISTAR - CALVERT CLIFFS (MD) (1)
SCHEDULE BEING REVISED
AMERENUE - CALLAWAY (1)
REVIEW SUSPENDED 6/23/2009
PPL GENERATION - BELL BEND (1)
SCHEDULE BEING REVISED
UNISTAR - NINE MILE PT (NY) (1)
REVIEW SUSPENDED 12/01/200 9
ESBWR DESIGN CENTER REVIEW
ATION - ESBWR
SAFETY REVIEW COMPLETED
RULEMAKING
SCHEDULE BEING REVISED
ISSUED
DOMINION - NORTH ANNA (VA) (1)
APPLICANT CHANGED TECHNOLOGY 6/30/10
ISSUED
ENTERGY - GRAND GULF (MS) (1)
REVIEW SUSPENDED 01/09/09
ENTERGY - RIVER BEND (LA) (1)
REVIEW SUSPENDED 01/09/09
DTE - FERMI (MI) (1)
SCHEDULED
USAPWR DESIGN CENTER REVIEW
DESIGN CERTIFICATION - USAPWR
SCHEDULED
RULEMAKING
SCHEDULED
LUMINANT - COMANCHE PEAK (TX) (2)
SCHEDULED
DOMINION - NORTH ANNA (VA) (1)
SCHEDULE BEING REVISED

New Reactor Licensing Applications

Schedules By Calendar Year



Fri 05/04/12

U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

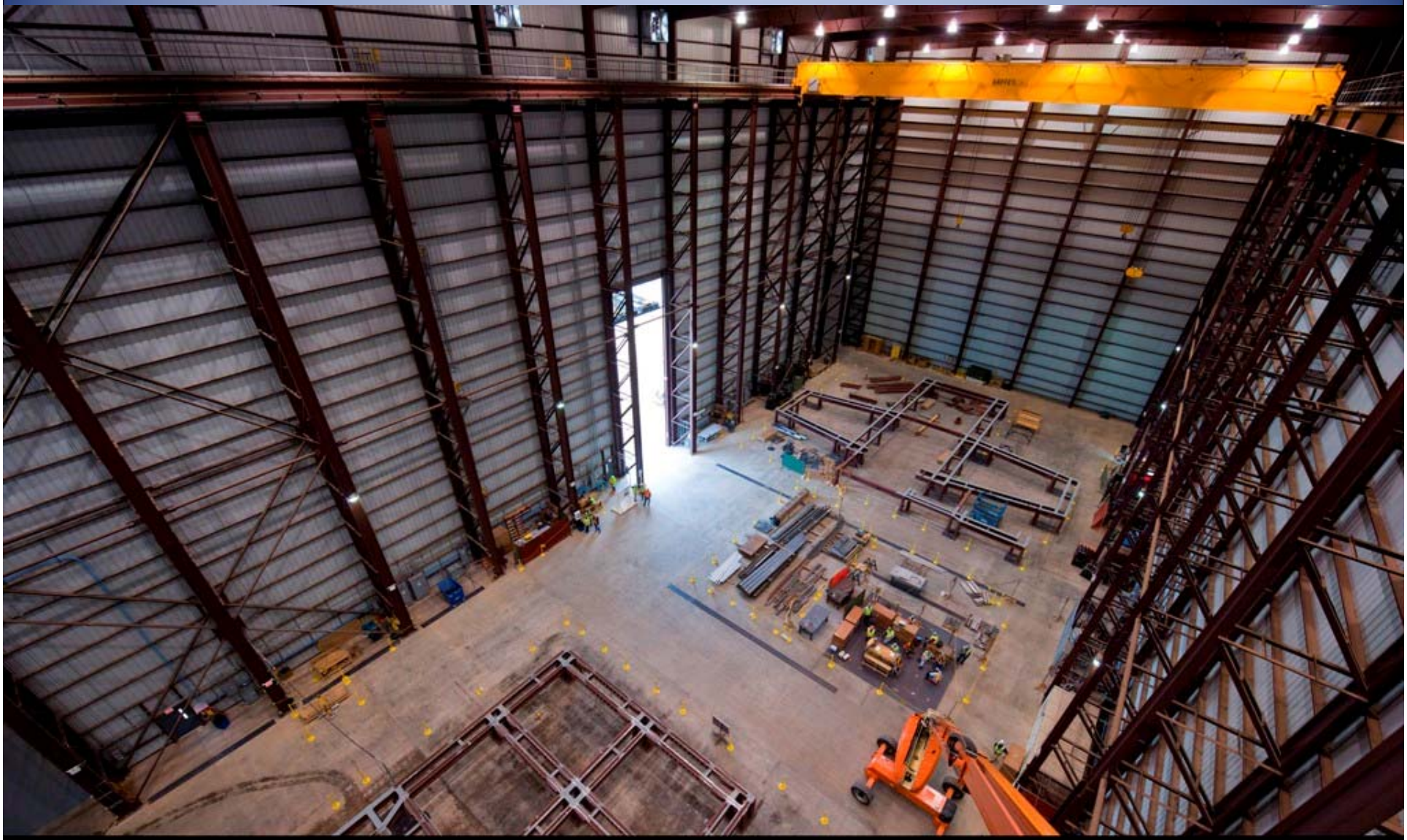
Looking Forward

- ITAAC verification and closure
- Transition from initial licensing to construction and beyond

TOPICAL/LAR/PAR TRACKING NO.	DESCRIPTION	TAC NO.	LEAD BRANCH	PROJECT NO.	LAR/PAR SUBMITTAL DATE	ACCEPTANCE LTR. DATE	REQUESTED COMPLETION DATE	COMMITTED DATE	FRN DATE	STATUS
LAR 12-002	Technical Specifications Upgrade License Amendment Request	RP9402	BPTS	52-025 52-026	L 2/24/12	L 4/11/12	L 12/31/12	N/A	??	Tech Branches preparing RAIs.
PAR 12-003 LAR 12-003	Vogtle Electric Generating Plant Units 3 and 4 Request for License Amendment - Supplemental Information: Nuclear Island Basemat Thickness Tolerance (LAR-12-003)	RP9403	SEB1	52-025 52-026	P 4/30/12 L 4/12/12-resubmittal requd	P TBD TBD L	P 6/1/12 L 10/6/12	N/A	??	In AR.
PAR 12-004 LAR 12-004	Changes to the Structures and Layout of the Annex Building, Turbine Building, and Radwaste Building	RP9404	SEB1	52-025 52-026	P 4/5/12 L 4/5/12	P TBD TBD L	P 9/30/12 L 9/30/12	N/A	??	In AR.
PAR 12-005 LAR 12-005	Additional Containment Electrical Penetration Assemblies	RP9406	SCVB	52-025 52-026	P 4/23/12 L 4/23/12	P TBD TBD L	P 11/12/12 L 11/12/12	N/A	??	In AR.

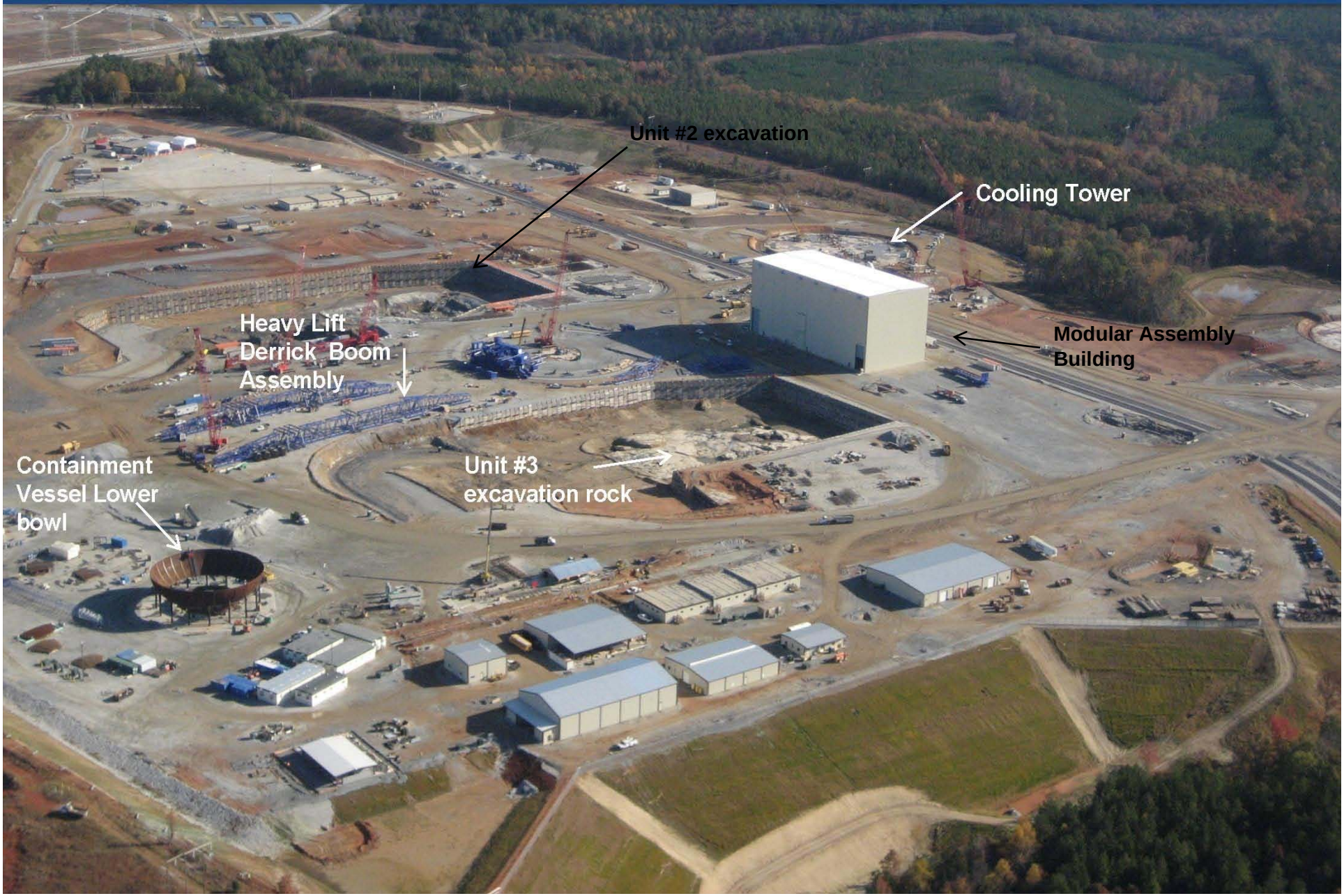
TOPICAL/LAR/PAR TRACKING NO.	DESCRIPTION	TAC NO.	LEAD BRANCH	PROJECT NO.	LAR/PAR SUBMITTAL DATE	ACCEPTANCE LTR. DATE	REQUESTED COMPLETION DATE	COMMITTED DATE	FRN DATE	STATUS
WCAP-17577	Piping Fatigue Analysis Utilizing the WESTEMS TM Computer Code	RP8500	EMB	794	2/29/12	not yet sent	10/12/12	TBD	NA	W informed of non-acceptance.
WCAP-17254	AP1000 Core Reference Report (Proprietary/Non-Proprietary)	RP8200	SRSB	793	3/6/12	not yet sent	3/13/12	TBD	NA	AR to be complete by about 5/4
WCAP-17584	Measurement, Test, and Inspection Plan	RP9700	EMB	795	4/13/12	N/A	7/12/12	TBD	NA	In AR.
WCAP-17534	Predictive Analysis Plan	RP9700	EMB	795	4/13/12	N/A	7/12/12	TBD	NA	In AR.
PAR 12-001 LAR 12-001	Containment Internal Structural Module	RP9401	SEB1	N/A	P 3/12/12 L 3/12/12	P in conc L 3/20/12	P 7/31/12 L 8/31/12	N/A	04/17/2012	Tech Branches preparing RAIs.

Vogtle Construction Update



Inside the Plant Vogtle 3 and 4 module assembly building; two frames in place for use in assembling large structural modules. September 21, 2011

VCS 2 & 3 Aerial View - October 2011



Nuclear Risk Management Coordination Committee (NRMCC)
February 24, 2012
St. Petersburg Marriott Clearwater

Attendees	Present	Absent
Ralph Hill, Co-chair, ASME	X	
Charles (Chuck) Moseley, Co-chair, ANS	X	
Victoria Anderson (NEI)	X	
George Ballassi (IEEE)	X*	
Robert Bari (BNL)	X	
Sidney (Sid) Bernsen	X	
Robert Budnitz, (ANS-RISC)	X	
Ken Canavan (EPRI)		X
Mary Drouin (NRC)	X*	
Bryan Erler		X
C. Rick Grantom (ASME-CNRM)	X	
Donnie Harrison (NRC)	X	
Greg Krueger (BWROG RMSC)		X
Pamela Nelson (UNAM)	X	
James O'Brien (DOE)	X*	
Steven Unikewicz (Alion Science & Tech)	X	
Jeff Stone (PWROG RMSC)		X
Michael G. Stamatelatos (NASA)		X
Rick Swayne (ASME BNC&S Chair)	X*	
Oliver Martinez (ASME Staff)	X*	
Pat Schroeder (ANS Staff)	X*	

**Participated remotely.*

1) Introductions and Announcements

Introductions were made. NRMCC Co-chair Chuck Moseley informed the committee that the charter for merging the American Nuclear Society (ANS) Risk Informed Standards Committee (RISC) and the American Society of Mechanical Engineers (ASME) Committee on Nuclear Risk Management (CNRM) had been approved creating the ASME/ANS Joint Committee on Nuclear Risk Management (JCNRM). Rick Swayne confirmed that the charter was approved by the highest ASME committee. The next step was to review the procedures previously drafted and amend to reflect changes and make sure the procedures complied with the American National Standards Institute (ANSI). Sid Bernsen suggested that an addendum could be prepared to incorporate procedural differences. Swayne reported that Kevin Ennis offered to revise the procedures.

2) Approval of Agenda

The agenda was approved as presented with the addition of an item by Ralph Hill for discussion of the Risk Management Milestone Schedule.

3) Approval of Meeting Minutes – June 6, 2011, Teleconference

The minutes were approved as presented.

4) ASME/ANS Joint Committee on Nuclear Risk Management Update

a) Status of JCNRM

Members were informed earlier during announcements that the merger of RISC and CNRM had been approved creating the ASME/ANS JCNRM. JCNRM Co-chair Rick Grantom explained that JCNRM meetings were held this week starting with the JCNRM Executive Committee meeting Monday afternoon. The JCNRM had three subcommittees and numerous subordinate groups. Additional members were needed to support the inquiry committee.

Grantom reported that an appeal was held on Addendum B of ASME/ANS Ra S-2008, "Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications," this year. He explained that there were some format differences between the ANS standards versus ASME standards they called cross-cutting issues. Much time had been devoted to deciding how to make the standard consistent. Because it is felt that much work needed to be done, Grantom would like to use grant funds to hire a technical editor to go through the standard and make it consistent. Grantom believed that there were many disgruntled members, including the U.S. Nuclear Regulatory Commission, that cross-cutting issues had not been resolved. Swayne stated that editorial/format issues should not be a priority; technical issues needed to be corrected.

Grantom informed members that input was received from Institute of Nuclear Power Operators (INPO) that the JCNRM was too involved in Large Early Release Frequency and core damage frequency. He suggested that industry groups sponsor the development of a guidance standard to address these issues.

Grantom reported that his term as chair would expire this June. A vote was taken at the meeting to reappoint him and Pamela Nelson as vice chair for another term. With the re-election, Grantom and Robert Budnitz would serve as JCNRM co-chairs; Nelson as vice chair.

b) JCNRM Schedule and Milestone Plan – See Attachment A
Grantom reviewed the JCNRM schedule and milestone chart that was provided and explained that the schedule included time for a readiness review prior to ballot and a regulatory impact review. Eighteen months were estimated for a trial use or pilot period. Standards would then seek ANSI approval. Grantom stated that an attempt was made to coordinate meetings with the ASME Board of Nuclear Codes and Standards (BNCS) meetings, and they would consider scheduling some meetings to coincide with ANS meetings. Robert Budnitz stated that the schedule would need to be managed and may need to be prioritized.

Ralph Hill explained that there are a lot of other activities at the board level. The BNCS would like these activities combined into a project management tool. While more complex, they see an integrated schedule beneficial, but a caretaker was needed to manage the schedule. The following motion was made:

> **MOTION:** To incorporate all of the ANS and ASME risk activities into one milestone schedule.

Members were in agreement that one coordinated document would be beneficial but questioned a commitment from a caretaker.

The motion was amended as follows:

> **AMENDED MOTION:** To incorporate significant ANS and ASME risk activities into one milestone schedule contingent on available resources.

The motion passed unanimously.

Action Item 02/12-01: Ralph Hill to confirm resources to maintain milestone schedule.

Action Item 02/12-02: Pat Schroeder to provide Ralph Hill a schedule for ANS, non JCNRM risk related standards in development and a contact name for an NRMCC interface.

5) NRMCC Strategic Plan

a) Role of NRMCC in support of JCNRM
Chuck Moseley reported that a suggestion was made at the JCNRM meeting for the NRMCC to meet the prior to the PIII Subcommittee on Monday mornings. Members agreed that this would be beneficial. It was agreed that the NRMCC provided a necessary outside perspective on the JCNRM activities; a sort-of outside peer review.

b) Communication with other agencies, organizations
Interactions with other standards development organizations (SDOs) and other agencies besides the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Department of Energy (DOE) were discussed. Cross SDO communication and issue identification/resolution function would attempt to be tracked by in a combined milestone schedule. Ralph Hill questioned whether NRMCC could aid in coordination with International Atomic Energy Agency**.** Members recognized the benefit of international coordination as well as the difficulty.

c) Other activities
In discussion of the scope of activities beyond probabilistic risk assessments (PRAs), Sid Bernsen suggested that the NRMCC focus on application of risk information and realistic quality assurance. Grantom saw it very difficult to get design engineering to incorporate PRAs. Bernsen felt that this coordinating committee could be the interface to encourage incorporation of PRA. Mary Drouin stated that the NRC issued for comment “Incorporating Risk Concepts into the Risk Structure” in the Federal Register. The NRC would the hold a meeting to discuss these comments.

Steven Unikewicz questioned whether the NRMCC should include petrochemical. Robert Bari mentioned that the Federal Aviation Agency uses PRA heavily. A suggestion was made to consider other groups that used PRA and to invite a representative to provide a presentation.

Action Item 2/12-03: Steven Unikewicz to provide names and contact information for individuals from other disciplines that use PRAs to the NRMCC co-chairs to extend invitation to attend NRMCC meeting and make a presentation.

6) Fukushima Standards, PRA, and Risk Related Activities

a) Nuclear Energy Institute (NEI)
Victoria Anderson explained that NEI felt it was prudent to wait for NRC’s response to Fukushima before they determined how to react. She reported that NEI was involved in much work on screening in tier two as the path was unclear; PRA may be the best method. Although it was important to respond to lessons learned from Fukushima, it was important to stay focused on other risk work for U.S. operating plants.

b) U.S Nuclear Regulatory Commission (NRC)
Mary Drouin provided a report on NRC activities. She explained that they saw the completion of Addendum B as a high priority so focus could be placed on correcting cross-cutting issues in the next edition by the end of 2013. The NRC felt that the next priority would be completion of draft standard ANS-58.22, “Low Power Shutdown PRA Methodology.” Drouin stated that ANS and

ASME would be invited to a meeting to discuss the possibility a low power and shutdown pilot. Interim staff guidance would be prepared to communicate the NRC position.

Drouin informed members that Regulatory Guide 1.174 had been revised to better explained defense-in-depth principals. She expected the guide to be issued for public comment in the April/May time frame.

Ralph Hill requested a schedule for NRC PRA activities to incorporate into the combined milestone schedule.

Action Item 2/12-04: Mary Drouin to provide Ralph Hill a schedule for NRC PRA activities for the combined milestone schedule.

c) U.S. Department of Energy (DOE)
With difficulties hearing speakers/communication via the teleconference, James O'Brien submitted a written report. See Attachment B for more details. Members reviewed the report and added insight if known.

Action Item 2/12-05: Chuck Moseley to request James O'Brien to provide the presentation from DOE PRA Workshop.

d) Institute of Electrical and Electronics Engineers (IEEE)
George Ballassi submitted a report of IEEE PRA activities. The report is available as Attachment C.

Action Item 2/12-06: Pat Schroeder to request TEPCO reports/presentations from George Ballassi.

e) ASME/ANS Joint Committee on Nuclear Risk Management
Much discussion of JCNRM activities occurred thorough the meeting. Robert Budnitz added that Part 8 of ASME/ANS RA-S included external flooding. They believe it could be expanded to add tsunami hazards. Rick Grantom expressed concerns with satisfying conflicting industry priorities.

f) Other ASME
Ralph Hill used a slide entitled "Task Group Design Basis and Severe Accident Response" to explain the structure and efforts of a multiple SDO task group (ASME, ANS and others) formed to work with and review Japanese Society of Mechanical Engineering documents related to changes in codes and standards as a result of Fukushima-daichi. The slide and additional details are available as Attachment D. To date, the task group has reviewed a guidance document on Severe Accident Management. A majority of the comments were incorporated. It should be publically available at the end of March. A sub-task group is being formed to review JSME draft guidance on Containment Structural Integrity.

Action Item 2/12-07: Ralph Hill to provide Pat Schroeder Task Group slide.

Rick Swayne explained that the committee was initially set up with just a steering committee that had become several task groups. They report to the ASME BNCS through the ASME Council. Several task groups had been identified and were being populated. Swayne said that this was not a nuclear unique event. Rick Grantom commented that risk analysis needed to play a part of this.

7) PRA and Risk Related Activities (not Fukushima related)

a) ANS

Chuck Moseley reported that ANS was considering reorganizing its consensus committees. A consensus committee for risk-based standards outside the scope of the JCNRM was being considered. Robert Budnitz confirmed that the proposed scope would not overlap the JCNRM.

Rick Grantom suggested an interface function with any committee using risk insights. Ralph Hill believed that the milestone schedule could provide this link.

b) ASME

Ralph Hill reviewed a roadmap of Nuclear Systems Code which with the aid of a presentation prepared for the BNCS. A copy of the presentation is attached providing more details – See Attachment E. He explained the conceptual risk-informed design process as a tool (page 12 of presentation.)

Action Item 2/12-08: Ralph Hill to provide BNCS presentation used to show Nuclear Systems Code roadmap.

Budnitz explained that ANS was developing generic design criteria in two standards -- ANS-50.1, "Nuclear Safety Criteria for the Design of Stationary Light Water Reactor Plants," and ANS-54.1, "General Safety Design Criteria for a Liquid Sodium Reactor Nuclear Power Plants."

Rick Swayne explained that he just learned that two plants were switching back from risk informed to deterministic because it was too costly to upgrade their PRAs. Rick Grantom thought that the cost to upgrade the PRA was minor in comparison to the cost of the consequences. Grantom planned to follow up with the plants.

Action Item 2/12-09: Rick Grantom to contact Gerry Forster and Tom Hook to confirm plants moving back to deterministic.

8) Old Business

There was no old business to discuss.

9) New Business

No requests were made for new business.

10) Action Items

Action items from the meeting were reviewed.

11) Next Meeting

The next NRMCC meeting was tentatively scheduled for Monday, September 10, 2012, in Denver prior to the JCNRM meetings.

12) Adjournment

The meeting was adjourned at 12:39pm eastern.

P692

Submitter Email: [redacted]
Type of Project: Revision to IEEE Standard 692-2010
PAR Request Date: 13-Jul-2012
PAR Approval Date:
PAR Expiration Date:
Status: Unapproved PAR, PAR for a Revision to an existing IEEE Standard

1.1 Project Number: P692
1.2 Type of Document: Standard
1.3 Life Cycle: Full Use

2.1 Title: Standard Criteria for Security Systems for Nuclear Power Generating Stations

Changes in title: ~~IEEE~~ Standard Criteria for Security Systems for Nuclear Power Generating Stations

3.1 Working Group: Security Systems Working Group (PE/NPE/WG_3.2)
Contact Information for Working Group Chair
Name: David Horvath
Email Address: [redacted]
Phone: 734-930-7500
Contact Information for Working Group Vice-Chair
None

3.2 Sponsoring Society and Committee: IEEE Power and Energy Society/Nuclear Power Engineering (PE/NPE)
Contact Information for Sponsor Chair
Name: S Aggarwal
Email Address: [redacted]
Phone: 301-424-8111
Contact Information for Standards Representative
Name: Paul Yanosy
Email Address: [redacted]
Phone: 724-316-5946

4.1 Type of Ballot: Individual
4.2 Expected Date of submission of draft to the IEEE-SA for Initial Sponsor Ballot:
4.3 Projected Completion Date for Submittal to RevCom:

5.1 Approximate number of people expected to be actively involved in the development of this project:
5.2 Scope: The standard provides criteria for the design, testing, and maintenance of security system electrical, instrumentation, and control equipment for nuclear power generating stations. Such equipment includes permanently or temporarily installed systems, subsystems, and components used by the security force for physical protection of the station against security threats. It includes equipment for security-related detection, assessment, surveillance, access control, communication, and data acquisition.

Changes in scope: The standard provides criteria for the design, testing, and maintenance of security system electrical, instrumentation, and control equipment for nuclear power generating stations. Such equipment includes permanently or temporarily installed systems, subsystems, and components used by the security force for physical protection of the station against security threats. It includes equipment for security-related detection, assessment, surveillance, access control, communication, and data acquisition.

5.3 Is the completion of this standard dependent upon the completion of another standard:
5.4 Purpose: This standard establishes criteria for the design of an integrated security system for nuclear power generating stations. These criteria assist in the selection and application of equipment to detect, monitor, display, and record security conditions and events.

5.5 Need for the Project: This revision is needed to address industry feedback from stakeholders on critical areas of the standard based on recent changes and clarifications in security approaches. Making these changes will allow a path for future regulatory endorsement. This revision also changes the scope of the previous revision to clarify that the standard applies to electrical, instrumentation, and control equipment. In addition, this revision will:
a. Maintain flexibility and consistency with any other ongoing industry and regulatory initiatives,
b. Consider any relevant technological developments in the security area since the previous revision, and
c. Review and incorporate any other user feedback on IEEE Std 692.

5.6 Stakeholders for the Standard: The stakeholders are nuclear plant owners, plant security departments, engineering support staff, and other related augmented support personnel.

Intellectual Property
6.1.a. Is the Sponsor aware of any copyright permissions needed for this project?: No
6.1.b. Is the Sponsor aware of possible registration activity related to this project?: No

7.1 Are there other standards or projects with a similar scope?: No
7.2 Joint Development
Is it the intent to develop this document jointly with another organization?: No

8.1 Additional Explanatory Notes (Item Number and Explanation): This project began as an amendment based on approved PAR P692a; however, at the first working group meeting it became clear that the number of needed changes were too extensive to use the amendment process. Therefore, this PAR supersedes PAR 692a approved 10 September 2011.

Work in Progress Presentation – P352

July 2012 (NPEC 12-2)

By Sharon Honecker (WG-3.3 Chair)

"Guide for General Principles of Reliability Analysis for Nuclear Power Generating Stations and Other Nuclear Facilities"

Work in Progress – P352

- IEEE Std 352 was last updated in 1987. Since that time, there have been advances in the ability to accurately model systems, structures, and components. Many of these advances are due to the rapid increase in computing capability during the last few decades.
- This document provides general guidance on reliability methods.
- PAR was approved March 29, 2012.

Work in Progress – P352

- Add purpose and scope statements to the document.
- Expand the section on system-level failure data analysis to include basic reliability growth analysis.
- Expand the application section to include an explanation of discrete event simulation theory and provide an example to show how it can be used to model more complex and realistic situations than analytical methods.
- Update the list of established databases
- Update the bibliography
- Review and update the equations and text of the document.

Work in Progress – P352

Working Group Members:

Sharon Honecker – Chair
G. Singh Matharu – Vice Chair
Vish Patel – Secretary

Gopal Aravapalli
George Ballassi
John Beatty
Tom Carrier
Tom Crawford
Hamid R. Heidarisafa
David A. Horvath
Jacob Kulangara
Bob Lane
James K. Liming
Kirklyn Melson
Joseph Napper
James Parello
Ted Riccio
Glen E. Schinzel
John A. Stevens
Yvonne Williams
Peter J. Kang

Work in Progress – P352

Old Title: IEEE Guide for General Principles of Reliability Analysis of Nuclear Power Generating Station Safety Systems

New Title: Guide for General Principles of Reliability Analysis for Nuclear Power Generating Stations and Other Nuclear Facilities

Work in Progress – P352

- *New Purpose: This guide provides the designers, operators, and regulators with a common and consistent framework for performance of reliability and availability analyses of nuclear power generating stations and other nuclear facilities.*
- *New Scope: This guide contains general reliability and availability analysis methods that can be applied to structures, systems, and components (SSCs) in nuclear power generating stations and other nuclear facilities.*

Work in Progress – P352

- 1987 version imported into current IEEE Style Guide
  - Verified 69 numbered equations in the body and annex of the standard and numerous other unnumbered equations
  - Updated 15 tables in the body and annex of the standard
  - Updated 13 figures in the body and annex of the standard

Work in Progress – P352

High Level Elements Remaining Unchanged:

- Basic Analysis Tools
  - Failure Modes and Effect Analysis
  - Fault Tree and Cut Sets
  - Reliability Block Diagram
  - Reliability Allocation
- Basic Mathematical Methods
  - Distributions
  - Cut Sets

Work in Progress – P352

New Elements:

- Basic Analysis Tools
  - Failure Modes and Effect Analysis
  - Fault Tree and Cut Sets
  - Reliability Block Diagram
  - Reliability Allocation
  - Reliability Growth
- Basic Mathematical Methods
  - Distributions
  - Cut Sets
  - Discrete Event Simulation

Work in Progress – P352

Future work:

- Intend to add an informative Annex to show numerical example of reliability growth.
- Intend to add an informative Annex to show numerical example of discrete event simulation.
- Update list of established reliability databases
- Update bibliography