

ANS 3.5 Working Group Meeting Minutes
Stars Alliance Building, Goodyear AZ
2013 April 1-5

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American Nuclear Society

STARS Alliance Building, Goodyear AZ

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1. **Visitors**

Visitor	Date	Affiliation	Email, Phone Fax
Mr. Tim Dennis	2013apr02	645 Lehigh Gap St. P. O. Box 119 Walnutport, PA 18088-0119	Email: a243@yahoo.com Phone: 610-767-0979 Fax: 610-767-7095
William Fraser Proxy for McCullough	2013apr02	Westinghouse Electric Company Nuclear Services I-70 Madison Exit 54, MB #20 Madison, PA 15663, USA	Email: fraserwa@westinghouse.com Cell: 717-304-6225 Work: 724-722-5777 Work: 724-722-5665
Bill Hendy Proxy for Koutouzis	2013apr02	INPO 700 Galleria Parkway, NW Atlanta, GA 30339-5957	Email: hendywr@inpo.org Work: 770-644-8863 Fax:
Warren Potter	2013apr02	Palo Verde	Email: wpotter@apsc.com Phone: 623-393-6165
William Hendricsen	2013apr03	Palo Verde	Email: William.hendricsen@aps.com Phone: 623-393-6585
Majid Saba	2013apr03	Palo Verde	Email: Phone: 623-393-5474

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2. Membership and Attendance

Present	Member	Address	Notes-Proxy	Email-Phone-Fax
Present	Jim Florence Chair	Nebraska Public Power District P. O. Box 98 Brownville, Nebraska 68321		Email: jbflore@nppd.com Phone: 402-825-5700 Fax: 402-825-5584
Present	Robert Felker Vice Chair	Western Services Corporation 7196 Crestwood Blvd Suite 300 Frederick, MD 21703		Email: felker@ws-corp.com Phone: 301-644-2520 Fax: 301-682-8104 Cell: 240-344-5889
Present	Keith Welchel Secretary	Duke Power Company Oconee Training Center- MC:ON04OT 7800 Rochester Hwy Seneca, SC 29672		Email: keith.welchel@duke-energy.com Phone: 864-885-3349 Fax: 864-885-3432
Present	F.J. (Butch) Colby Editor	L-3 MAPPS 8565 Cote-de-Liesse Quebec, Canada H4T 1G5		Email: butchcolby@comcast.net Email: butch.colby@l-3com.com Phone: (410) 961-7535 Fax: (410) 756-1954
Present	Lawrence (Larry) Vick Parliamentarian	US NRC, Office of Nuclear Reactor Regulation 07-G13 Washington, DC 20555		Email: lawrence.vick@nrc.gov Phone: 301-415-3181 Fax: 301-415-3061
Present/ Early Departure: Proxy: Fraser	George McCullough	GSE Systems, Inc. 2300 St. Marys Road Suite D St. Marys, GA 31558	Proxy: Fraser	Email: gsmccullough@gses.com Phone: 912-576-6730 Cell: 410-707-6946
Proxy: Bill Hendy	Dennis Koutouzis	INPO 700 Galleria Parkway, NW Atlanta, GA 30339-5957	Proxy: Hendy	Email: koutouzisjd@inpo.org Phone: 770-644-8838 Fax: 770-644-8120
Present	Frank Tarselli	129 Abbey Rd Sugarloaf, PA 18249		Email: frankt64@ptd.net Phone: 570.542.3717 Cell: 570-956-0303 Fax: 570.542.3855
Present	SK Chang	Dominion Nuclear Connecticut, Inc. Millstone Power Station L. F. Sillin, Jr. Nuclear Training Ctr. Rope Ferry Road Waterford, CT 06385		Email: Shih-Kao.Chang@dom.com Phone: 860-437-2521 Fax: 860-437-2671
Present	Robert Goldman	Entergy 1340 Echelon Parkway Jackson, MS 39213-8298		Email: rgoldma@entergy.com Phone: 601-368-5582 Fax:

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Present	David Goodman	Luminant PO Box 1003 Glen Rose, TX 76043		Email: david.goodman@luminant.com Phone: 254-897-5636 Fax: 254-897-5714
Present	Jody Lawter	VC Summer Nuclear Station PO Box 88 Jenkinsville, SC 29065		Email: jody.lawter@scana.com Phone: 803-345-4854 Fax: 803-931-5616
Present	Mac McDade	Progress Energy – Harris Nuclear Plant 3932 New Hill–Holleman Rd New Hill, NC 27562		Email: mac.mcdade@pgnmail.com Phone: 919-362-3319 Fax: 919-362-3346
Absent	Michael Petersen	Xcel Energy – Prairie island – Monticello 1660 Wakonade Drive West Welch, MN 55089	No Proxy	Email: Michael.petersen@xenuclear.com Phone: 651-388-1121 x 7253 Fax: 651-330-6282
Present	Pablo Rey	Tecnatom, s.a. Avda. Montes de Oca, 1 San Sebastian de los Reyes, 28703 - Madrid		Email: prey@tecnatom.es Phone: +346-079-99218 Fax: +349-165-98677
Present	James Sale	North Anna Power Station 11022 Haley Drive, PO Box 402 Mineral, Virginia 23117-0402		Email: jim.sale@dom.com Phone: 540-894-2464 Fax: 540-894-2931

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3. Action Items

3.1 Action Item Quick-look Table

Open				Complete		Carried to Next Standard			
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54						

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3.2 Action Items

No.	Status	Date	Assigned To:	Work Assignment
1		2010oct05	Florence Lawter Sale	Appoint new members for officer development (job shadow for position development). Parliamentarian Assist Lawter, Sale
2	2011nov17: Closed	2010oct06	Koutouzis McCullough	2009 AI-60 Define the Term Training Needs Assessment in such a manner that it is clear in intent to both Training and Simulator staff 2011nov17: The WG agreed the definition of “Training Needs Assessment” is adequate
3	2012Aug30: Closed	2010oct06	Vick Tarselli (BWR) Petersen (BWR) Rey (BWR) Goodman (PWR) McDade (PWR) Sale (PWR)	2009 AI-126 Consider adding Performance Test Program in next standard. New Appendix that gives example Performance Testing Program. 2012aug30: AI-3 is closed with the creation of AI-43 A draft Appendix was presented. AI-43 was created for additional consideration.

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4	2011jun08: Closed items - 1, 3, 4 2011nov16: Closed Item 2	2010oct06	Tarselli Vick Chang Fraser Felker	2009 AI-132 1. Review Malfunction Testing. 2011jun08 Closed 2. Are all list required? 3. What constitutes Malfunction testing is unclear 2011jun08 Closed 4. Better define Malfunction causes. 2011jun08 Closed 2011jun08 2. AI-4 remains open pending review of Section 3.1.4 List. The remaining issue is relevance of the Malfunction list in Section 3.1.4 to the 201x standard. Additional consideration is if the malfunction list in section 3.1.4 should remain, be deleted or moved. 2011nov16 Closed by Motion
5	2011jun08: Closed 2011nov16: Wording change.	2010oct06	McCullough Florence Tarselli Colby	2009 AI-134 Minimum testing Periodicity Build Periodicity into the standard 2011jun09 Closed with Motions Realtime/Repeatability testing periodicity moved to AI-10 2011nov16: Added the word capability: An instructor station capability test shall be conducted

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6	2012aug30: Closed	2010oct06	Welchel Lawter Petersen McDade Goodman	2009 AI-147 2009 AI-180 Non-fully integrated mode performance testing Where applicable run performance test off-line 2011jun08 Discussion 2011nov18 Welch New Definition and Sec. 3.4.3 change proposed for consideration. Discussion tabled 2012aug29 Motion Not Carried. AI-6 is not closed and will consider additional input based on the discussions and member feedback. 2012aug30 Motion Carried New AI-44: AI-6 Motion Carried Simple Majority: Consult ANS-21 (Maintenance Operations Testing & Training) subcommittee for determination if this change is a Substantive Change. 2012sep21: The following reply was received from Carl Mazzola: This is a substantive change. Another sentence was added with a shall statement. AI-6 passed with a 8-For and 7-Against. Substantative change requires Consensus requiring a 75% approval. Therefore AI-6 status is Not Carried. AI-6 minutes status has been updated to: Not Carried. 2012dec05: AI-6 is Closed
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7	2012aug30: Closed	2010oct06	Vick Goldman	2009 AI-150 Review the term Power Range for consistency Confusion about the term Power Range. 2012aug30 AI-7 is closed. Power range has been removed in 3 of 5 instances in the present draft standard. The remaining two instances are consistent.
8	2011jun09: Closed	2010oct06	Chang Tarselli Felker	2009 AI-162 Review Appendix B parameters against the standard body MANTG comments App. B parameters and std body are not consistent. 2011jun09 – A parliamentary issue regarding motion results. See AI-26 2011nov16: AI-8 was reviewed and changed to “Carried”. See Summer minutes Section 5.4.

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9	2012aug29: Closed	2010oct06	Felker Lawter McCullough Fraser Colby Goodman McDade Koutouzis Rey Sale	2009 AI-163 Next generation simulators New builds. Public review comments that the WG did not considered new builds. Examine unique issues with new builds. Review will ask if 3.5-2009 provides sufficient guidance for new builds. Focus: Transients (AI-9 Closed Granbury Resort) Malfunctions (Closed AI-4 VC Summer) Configuration management DCS Appendix D Review (Limited Scope applications) Lawter 2011jun10 – Info presented. Next meeting will propose the first of several anticipated standard changes. 2012Mar14 – Motion Rewrites Sections 3.4.3.1/4.4.3.1 and deleted Appendix B 2012aug29 – Working Group discussed Appendix D and agreed to no changes. The Working Group agreed to closed AI-9.
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10	2011nov16: Closed	2010oct06	McCullough Felker McDade Goldman	2009 AI-179 Real-time and Repeatability testing Periodicity 2009 Public review comments. Methodology to demonstrate real-time. 2011jun10 Carried from AI-5 Realtime/Repeatability -Establish Realtime/Repeatability Periodicity Testing Requirement 2011nov16 Closed by Motion.
11	2012Mar16: Closed	2010oct06	Goodman Vick Petersen Chang	2009 AI-181 Section 5 rewrite 2009 Westrain Comment #60 Configuration Management expectations needs strengthening Performance based. V&V is part of configuration mgt. (Section 4) possible a better fit in Section 5 2011nov15 – Section 5.4 references Section 4.4 and should reference 4.2 2012Mar16: Closed with three AI motions
12	2010oct22: Closed	2010oct06	Florence	Invite ANS-21 Chair to WG meeting ANS-21 Chair Gene Carpenter Two White Flint North Washington, DC 20555-0001 Mobile Ph: 202-579-5155 Work Ph: 301-415-7333 Email: gene.carpenter@nrc.gov

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13	2011jan28: Closed	2010oct06	Florence	Send letters of appointment to new working group members and their respective facility management Letter to new working group member and manager.
14	2011jan28: Closed	2010oct06	Florence	Coordinate next ANS-3.5 Meeting at the Crystal River Nuclear Power Plant in January 2011
15	2011jan28: Closed	2010oct06	Florence	2009 AI-185 Send a letter to the NEI in an effort to promote NEI participation in the ANS-3.5 Working Group and to develop a more collaborative relationship.
16	2012aug29: Closed	2011jan28	Sale Rey McCullough Tarselli Chang Koutouzis	Consider the option to include other uses of the simulator in footnote 1 on Page 1 of the Standard (e.g. - technical support). This was a consideration during the development of the scope statement in lieu of explicitly mentioning other uses of the simulator in the scope statement. 2012aug29 – Presentation and discussion. WG agreed to close AI-16 with no action.

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17	2012Mar14: Closed	2011jan28	McDade Tarselli Koutouzis Petersen	Consider placing language in Section 1.2 Background to insert “experience requirements”: “It is intended that in meeting the criteria of this standard, the simulator will be sufficiently complete and accurate to meet the training needs of the industry as well as the requirements of the NRC, as described in <i>Code of Federal Regulations</i>, Title 10, “Energy,” Part 55, “Operators' Licenses” (10CFR55) and station mandated experience requirements Consider language in Section 1.2 Background to add clarification regarding control manipulations allowed by 10CFR55.46 and how this standard supports it. 2012mar14 – team recommended closure. Standard is sufficient.
18		2011jan28	Florence Rey Holl Fraser	1) Contact ANS to determine international opportunities in Standard development. 2) Consider language in Section 1.2 Background to mention use of this standard by the international community. 3) Additional consideration in the Standard body for the international community. Acknowledge international regulatory authorities. 2012aug29: The recommended wording will be considered during the final read of the standard. The wording is to be inserted in the Foreword and its location will be determined at that time.

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19	2012nov18: Closed	2011jan28	Tarselli McCullough Goodman Chang Rey	Review the list below for inclusion into ANS 3.5 or other standards and basis for the recommendation: • Engineering Assist • Simulation Assisted Engineering • EP • DCS Logic Control Validation • HFE – Human Factors Engineering • Tech Training – I&C / Mechanical • PR Tours • Process Flow Diagrams • Spec. Operating Parameters • PRA • SAMG
20	2012aug30: Closed	2011jan28	McCullough Colby Tarselli Lawter Fraser	Identify areas in the standard that can be improved to address DCS 2012aug30: Closed by Motion
21	2011jun10: Closed	2011jan28	McCullough Felker Koutouzis Lawter Goodman	Evaluate the need for inclusion into the standard other simulation devices derived directly from the full scope control room simulator. 2011jun10 – Presentation and discussion. No additional discussion and action will be taken. This AI is closed.

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22	2012aug30: Closed	2011jan28	Lawter Sale Welchel Vick Felker	Review the recent regulatory cyber security guidance and OE to determine if cyber security should be included in the standard. 2012aug30: Power Point presentation. Recommendation to close AI-22. AI-22 is closed
23	2012aug28: Closed	2011jan28	Vick Tarselli Rey Sale Florence Chang	Evaluate the need for including into Section 3.3.1 a set of IC criteria for ICs that are to be used when conducting the performance tests required by this standard. 2011jun10 – Proposal made. Additional consideration required. 2012aug28: present requirements are sufficient.
24	2011feb01: Closed	2011jan28	Florence	Submit PINS Form to ANS Administrator 2011feb01 PINS has been submitted.

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25	2012mar13: Closed	2011jun10	Chang	The following Appendix B Steady State parameters were considered in AI-8. BWR - control rod drive hydraulic system flow and temperature - secondary plant heat balance data PWR - containment pressure - boron concentration - pressurizer temperature - control rod positions - secondary plant heat balance These parameters should be reviewed for inclusion into the standard body Steady State parameter list. 2012mar13: Closed by Motion
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26	2012dec05: Closed	2011jun10	Florence	Review and recommend modifications to the Rule of the Chair related to quorum in session. Interim Voting (Motions – Substantive Changes) shall be by Consensus (75% [rounded up] of quorum in session); Rule of the Chair for the remainder of the meeting: Interim Voting (Motions – Substantive Changes) shall be by Consensus (75% [rounded up] of voting membership present); 2011nov15: Additional consideration is needed to determine if previously “Not-carried” Motions are affected by the revised Rule of the Chair. 2012dec05: At the Granbury Resort Conference meeting, the Vick report (Section 5.10) concluded there are no Motions affected by the revised Rule of the Chair. AI-26 is Closed.
27	2011nov15: Closed	2011jun10	Florence	Define Substantive Change with regards to Motion “Carried” threshold. 2011nov15: Closed with AI-26 discussion.
28	2012aug30: Closed	2011jun10	Felker Chang Sale	Review and report to the WG the usage of the terms: If available versus As applicable. 2012aug30: Closed with AI-28 discussion.

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29	2011nov17: Closed	2011jun10	Rey Tarselli	Review Normal Operating procedures Surveillance testing with regards to periodicity testing. It should be clarified what Normal Evolutions defined in 3.1.2.2 shall be tested with the frequency established in 4.1.3.2 2011nov17: Closed by Motion: Carried Text substitution in section 4.1.3.2 Normal evolutions
30	2012Mar14: Closed	2011jun10	Sale	Review Appendix B Steady State section for deletion. 2012mar14 – AI-9 deleted Appendix. This AI is closed.
31	2011nov18: Closed	2011jun10	Petersen Chang	Review list nomenclature for consistency 2011nov18: Closed by Motion Carried.
32	2012dec11: Closed	2011nov17	McCullough	Verify testing periodicity terminology consistency across section 4. 2012dec11 McCullough lead a discussion reviewing the sections and consistency. There is consistency across Section 4.0. AI-32 is closed.

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33	2012aug30: Closed	2011nov18	Welchel	Review use and consistency of term Fully Integrated, partially-integrated and Non-integrated, and Standalone with regards to Sections 3 and 4. 2012aug30 – Review indicates the Section 5 rewrite consolidated these terms. AI-33 Closed.
34	2012Mar16: Closed	2012Mar14	Colby	AI-9 deleted Appendix B, this AI is to review/cleanup remaining references to Appendix B 2012mar16: Closed Two Column Document Rev 4 updated.
35	2012Mar15: Closed	2012Mar15	Felker Colby	AI-5 Review the usage of “preference” and “shall” in Section 5.1.2 2012mar15: Closed - The working group reviewed the definitions of “preference” and “precedence”. The list may be a precedence list but preference is adequate.
36	2012aug30: Closed	2012Mar15	McCullough Goodman	Consider replacing the opening paragraph in Section 5. With the following: A configuration management program shall be established to provide a means for demonstrating compliance with Sec. 3, “General Requirements.” Section 5.1 is for initial simulator construction or for re-baselining the simulator design, else use Section 5.2. 2012aug30: Closed with AI-36 discussion.
37	2012dec11: Closed	2012Mar15	Chang Fraser Goodman	Consider definitions for “benchmark” and “baseline”. 2012dec11 Recommendation is to close AI-37 with no action.

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38	2012aug30: Closed	2012Mar15	Rey Goodman	With the new Section 5 (AI-11 2012mar15), Section 5.3 Assessment of Deviations, review the assessment parameters for adequacy as they apply to operational performance. Previously, the items only applied to physical fidelity. 2012aug30: Closed with AI-38 discussion.
39	2012aug28: Closed	2012Mar15	Goodman Chang	Consider revising Section 5.1 to include verification and validation as it applies to initial simulator construction. 2012aug28 – Closed by agreement
40	2012Mar15: Closed	2012Mar15	Goodman	Section D.2 cleanup references to 3.2.1.4 and in Section D.3 cleanup references to 4.2.1.4. Closed by Motion
41	2012aug28: Closed		Goodman Welchel Dennis Felker	Additional review of Section 3.4.1/3.4.2/4.4.1/4.4.2 - Previous sections 3.4.1/3.4.2/4.4.1/4.4.2 use the word “Demonstrate”. The new words in Section 5 do not include the word “Demonstrate” - The new Background section no longer refers to V&V, and includes no reference to CM - Review IEEE and ANS 3.5 for alignment of V&V requirements - Review the redefined intent of testing. Is the purpose of testing to “ensure no noticeable differences exist” or is it to “identify noticeable differences that need to be resolved”. (responsibility Dennis) 2012aug28 – Closed by agreement

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42	2012aug30: Closed		Chang	Review the use of “Because” in the first paragraph of section 5.1.2 Simulator Performance Benchmark. Consider "If" or "When". Multiple baseline data are not always available and sometimes no data is available. 2012aug30: Editorial Change. AI-42 is Closed.
43	2013apr02: Closed by Motion	2012aug30 Avila Beach	Vick Lawter Rey Sale Tarselli Cupp Florence	Review the AI-3 proposed Appendix for possible integration into the draft standard. Also, explore ANS Guidelines as a means to distribute the Performance Testing guidance. 2012dec13 Several versions were presented and discussed. WG agreed to continue additional discussion. 2013apr02: Proposal #1 occupied the majority time of discussion. After several hours of discussion a straw poll indicated lack of support.

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44	2012sep21: Closed by Email from Carl Mazzola.	2012aug30	Florence	AI-6 Motion Carried Simple Majority: Consult ANS-21 (Maintenance Operations Testing & Training) subcommittee for possible Substantive Change. 2012sep21: The following reply was received from Carl Mazzola: This is a substantive change. Another sentence was added with a shall statement. AI-6 passed with a 8-For and 7-Against. Substantative change requires Consensus requiring a 75% approval. Therefore AI-6 status is Not Carried. AI-6 minutes status has been updated to: Not Carried. 2012dec05: AI-44 is Closed
45	2012dec11: Closed	2012aug31	Chang Rey Colby Vick	New definition for human-machine interface. 2012dec11 No definition is needed for human machine interface (HMI). New AI-49 changes HMI to HSI. AI-45 is closed.
46	2012dec11: Closed	2012aug31	Petersen Goldman Fraser Rey	Review evolution limitations and Limit of simulation for continued applicability. 2012dec11 A straw poll indicated no additional changes are required. AI-46 is closed.

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47	2012dec12: Closed	2012aug31	Mcdade Florence Felker	Review Scope statement to include additional exclusions. 2012dec12 Closed by Motion. Revised Section 1.2 Background
48	2012dec12: Closed	2012aug31	Chang Rey Gagnon	Review the standard for extended length scenarios and possible guidance. 2012dec12 Closed. New AI-50
49	2012dec11: Closed	2012dec11	McCullough	2012dec11 Reference AI-45 Update the standard changing all references of human machine interface to human system interface. Closed by Motion.
50		2012dec12	Florence Petersen Gagnon Rey Chang	2012dec12 Update the Foreword to assure the industry that consideration of events such as the Fukushima event, extended length scenarios, EP Drills, etc. i.e. non standard scope scenarios were discussed and determined not to be within the scope of the standard.
51	Closed: 2013apr03 by Motion	2012dec13	Goodman Rey Vick Cupp	2012dec13 New AI-51 – Possible revision to Section 4.4.3 Simulator reactor core performance testing. Closed: 2013apr03 by Motion. Replaced Section 4.4.3

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52			Felker Colby	2013apr05 Strengthen the comments: Appendix B deletion Section 3.1.4 Malfunction List deletion
53			Colby	2013apr05 Blank Appendix Allowed?
54			Goodman	2013apr05 Section 3.4 and 3.4.4 review for PEST testing requirement. Evaluate the requirement to perform PEST testing in section 3.4.4 in a fully integrated mode of operation.

4. Working Group Procedural Rules

4.1 Rules of the Chair

- Interim Voting (Motions – Substantive Changes) shall be by Consensus (75% [rounded up] of quorum in session);
- The Chair rules that no Motions will be accepted when not in session;
- Administrative issues by simple majority (quorum in session);
- The Chair shall be informed of absences;
- The absent member is encouraged to send a proxy;
- A Proxy shall have voting privileges;
- Members shall attend the full length of the meeting;
- Word 7.0 shall be the document format;
- The Host shall collect and send all handout material for absent members without proxy;
- Robert's Rules of Order shall be used as a general guide;
- Guest Individual Contributors may receive working copy of the draft standard based on need;
- Chair approval shall be required for distribution of working copies of the draft standard;
- Members shall not Vote against their own non-amended Motion;
- The WG will through the course of normal business, generate confidential documentation applicable to the WG charter. As a result of this business, documentation could be released to the public through approved minutes posted on the ANS 3.5 WEB site. Other information may be released to the public as deemed appropriate by the WG Chair or Vice-Chair. In addition, information may be supplied to non-working group members on a need-to-know basis for the purpose of review and comment;
- When Abstention Votes are present the Majority (> 50%), Super Majority (2/3), Consensus (75%) levels are recalculated by subtracting the Abstention Votes count from the Members Present count;
- Non-substantive change requires Majority Vote;
- Appendices changes are non-substantives;
- Substantive requires Consensus Vote;
- Substantive Change: A substantive change in a proposed American National Standard is one that directly and materially affects the use of the standard. Examples of substantive changes are below:
 - “shall” to “should” or “should” to “shall”;
 - addition, deletion or revision of requirements, regardless of the number of changes;
 - Addition of mandatory compliance with referenced standards.

4.2 Rules Enacted by the Working Group

Missing two consecutive meetings in a row without representation could result in loss of membership on the committee.

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5. Tuesday 2013 April 1 (0800)

5.1 Introduction (0800)

5.2 Roll Call

Members Present:

Jim Florence
Bob Felker
Keith Welchel
F.J. (Butch) Colby
Lawrence (Larry) Vick
George McCullough
Frank Tarselli
SK Chang
Robert Goldman
David Goodman
Jody Lawter
Mac McDade
Dennis Koutouzis - Proxy
Pablo Rey
Jim Sale

Proxy/Visitors:

Tim Dennis
William Fraser
Warren Potter
Bill Hendy (Proxy Koutouzis)

5.3 Consensus Level

- 16 - Voting members
- 15 - Voting members Present (1 Proxy Vote)
- 8 - Quorum (Majority Total Membership)
- 12 - Consensus ($\geq 75\%$ votes)
- 10 – Super Majority ($\geq 2/3$ Votes)
- 8 – Majority ($> 50\%$ votes)

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5.4 Motion (Carried): Shearon Harris Minutes Approval

Motion: Carried • 15 – For • 0 – Against • 0 – Abstained
Date 2013apr02 Motion: Approve Shearon Harris Minutes Approved version 10

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5.5 Motion (Carried): Agenda Approval

Motion: Carried • 15 – For • 0 – Against • 0 – Abstained
Date 2013apr02 Motion: Approve Agenda Rev 0

5.6 Officers reports

Florence (Chair)	No Report
Welchel (Secretary)	No report
Colby (Editor)	Official Two Column Document Rev 6-1
Chang (Style Editor)	No report
Vick (Parliamentarian)	No report

5.7 Industry Update

INPO	No Update
USUG Florence	No Update
Dennis	Standards Adoption Update: 53% - 2009 26% - 1985 21% - 1998

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	Projected Adoption by end of 2013 80% - 2009 20% - Other Use Permission Granted
WESTRAIN Goodman	No Update
NEI Petersen	No Update
SSNTA	No Update

5.8 New Membership Discussion

No action taken.

5.9 ACTION ITEM 43 Simulator Performance Test Program Guideline

The following was presented for discussion:

ACTION ITEM #43

TEAM AI 43: Larry Vick, Jody Lawter, Pablo Rey, Jim Sale, and Frank Tarselli [Scott Cupp, Jim Florence]

TEAM AI 3: Larry Vick, Mike Petersen, Dave Goodman, Pablo Rey, Mac McDade, Jim Sale, and Frank Tarselli

Background

AI #43 – “Review the AI-3 proposed Appendix for possible integration into the draft standard. Also, explore ANS Guidelines as a means to distribute the Performance Testing guidance.” [Refer to meeting minutes of 8/28-31, 2012, Avila Lighthouse Suite Conference Center, Avila Beach, CA. page 54.]

AI-#3 – “Consider adding Performance Test Program in [the] next standard. [Consider adding] new appendix that gives [an] example [a] Performance Testing Program.” WG’s AI #3 was closed with the creation of AI- #43. A draft

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was presented for discussion which resulted in AI #43 being created for additional consideration.

AI-#126 – “Consider adding Performance Test Program in [the] next standard. [Consider adding] new appendix that gives [an] example [a] Performance Testing Program.” WG’s AI #126 was closed with the creation of AI- #3.

Explore ANS Guidelines as a means to distribute a performance test program guidance document

The following guidance documents were reviewed for direction for publication and distribution of a guidance document developed by the ANS-3.5 WG outside of the standard’s development.

a) ANS BYLAWS - ARTICLE B10 – PUBLICATIONS AND PAPERS

B10.1 – Authorization – [page 16] The journals, proceedings, periodicals, books, pamphlets, reports, and other publications prepared under the auspices of the Society shall be issued in such manner as the Board of Directors may authorize.

R10.1.5 – Program Committee Review of Papers – [page 29] The manuscript for any paper to be presented at a meeting of the Society shall be submitted by the author for the consideration of the Program Committee, and shall be received not later than the date specified in the invitation to present papers. No paper shall be announced for presentation until after it has been accepted by the committee.

b) American Nuclear Society – Standards Committee – Rules & Procedures [March 14, 1985]

2.2 d. – Working Groups – [page 4] Subcommittees may establish working groups to develop proposed standards and maintain existing standards within their scope of responsibility.

c) ANSI Auditing Policy and Procedures [March 31, 2003]

2.2 d. – Working Groups – [page 4] Subcommittees may establish working groups to develop proposed standards and maintain existing standards within their scope of responsibility.

Comment

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There does not appear to be any specific guidance per se to publish guidance outside of a standard under the auspices of ANS. One possible success path is for the WG to independently develop a paper for presentation at the Society's meetings. However, this approach may be outside the WG PINS scope. Another path is for a WG member, as an individual, present such a paper.

Discussion

AI #43 is a carryover action item from work on the 2009 standard. It originated from AI #126 which in turn originated from AI #3. It has been on the WG's action item list since April 5, 2003. It was initially open to explore and consider adding (in the body or in the appendices) guidance for a simulator performance test program for inclusion in the 2009 standard, but was subsequently deferred to the 201X standard revision discussions.

During the week of August 28-31, 2012, (Avila Beach, CA WG meeting) the WG was presented with a proposal by Larry Vick to add to the standard an Appendix E, "Simulator Performance Test Program Guideline" in response to AI #3. The WG discussed the merits of the proposal and subsequently closed out AI #126(AI #3) and open new AI #43 to continue discussion as well as consider other approaches at the next WG meeting.

During the week of December 1-13, 2012, (Cary, NC WG meeting) the WG continued its discussion and consideration on AI #43 with no resolution or conclusions. A majority of members present voiced their strong support for adding, either in the body or in the appendices, some type of simulator performance test program guideline. Two additional proposal Appendix E approaches were presented to the group for discussion and consideration.

Proposals presented to the WG are:

- Proposal # 1 – Appendix E, "Simulator Performance Test Program Guideline" [Larry Vick]
- Proposal # 2 – Appendix E, "Simulator Performance Test Program" [Jim Florence, a.k.a. Group 1]
- Proposal #3 – Appendix E, "Simulator Test Program" [George McCullough/Frank Tarselli, a.k.a. Group 2]

Proposal Evaluation

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Proposal # 1 – Appendix E, “Simulator Performance Test Program Guideline”

This proposal recommends a semi comprehensive guideline approach for performance testing the simulated nuclear power plant in a manner that compares the simulator’s performance to the referenced unit’s performance (actual or predicted). No specific methodology for conducting any given tests is prescribed.

Strengths

- Mirrors, for the most part, actual performance tests found in facility licensee’s safety analysis reports and or commercial operations as well as certain accidents for which the referenced unit is designed against.
- Scope of the performance testing guideline demonstrates the full capability of the simulated nuclear power plant over the entire operating range for which operators and senior operators may encounter in the actual main control room while on duty or on their license initial or requalification operating tests.
- Provides the end user assurance that the simulated nuclear power plant is capable of demonstrating the performance and fidelity requirements of the standard as well as demonstrating [regulatory] expected plant response to operator input and to normal, transient, and accident conditions to which the simulator has been designed to respond.
- Has strong technical merit utilizing the same type of tests or evolutions performed/predicted on the referenced unit.
- Test Program is perpetual with periodicity already established by the standard.

Weaknesses

- Initial implementation may be time consuming [may not be if already performing tests identified in the guideline].
- May be construed [conjecture] as a requirement – even though it is not (it is provided as information only).
- May be construed as more comprehensive than current testing programs.

Proposal # 2 – Appendix E, “Simulator Performance Test Program”

This proposal recommends a guideline approach to performance testing the simulated nuclear power plant in a manner that only considers Section 3.4.3.1/4.4.3.1 through 3.4.3.4/4.4.3.4 for comparison of the simulator’s

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performance to the referenced unit's performance (actual or predicted). Specific tests frequency/periodicity is annotated. No specific methodology for conducting any given tests is prescribed.

Strengths

- Demonstrates some of the capability of the simulated nuclear power plant over a defined operating range for which operators and senior operators may encounter in the actual main control room while on duty or on their license initial or requalification operating tests.
- Provides the end user assurance that the simulated nuclear power plant is capable of demonstrating Section 3.4.3.1/4.4.3.1 through 3.4.3.4/4.4.3.4 of the standard's performance and fidelity requirements.

Weaknesses

- Very limited demonstration of simulator's capability and performance as a nuclear power plant
- May be construed [conjecture] as a requirement – even though it is not (it is provided as information only).
- May be construed as less comprehensive than current testing programs.

Proposal # 3 – Appendix E, “Simulator Test Program”

This proposal recommends a more robust approach [than Proposal #2] to performance testing the simulated nuclear power plant in a manner that only considers Section 3.4.3.1/4.4.3.1 through 3.4.3.4/4.4.3.4 plus Sections 3.1.1 through 3.1.3, 3.2.1.1 through 3.2.1.3, and 3.3.1 through 3.3.5. Specific tests frequency/periodicity is annotated. No specific methodology for conducting any given tests is prescribed.

Strengths

- Demonstrates some of the capability of the simulated nuclear power plant over a defined operating range for which operators and senior operators may encounter in the actual main control room while on duty or on their license initial or requalification operating tests.
- Provides the end user assurance that the simulated nuclear power plant is capable of demonstrating Section 3.4.3.1/4.4.3.1 through 3.4.3.4/4.4.3.4 of the standard's performance and fidelity requirements.

Weaknesses

- Very limited demonstration of simulator's capability and performance as a nuclear power plant
- May be construed [conjecture] as a requirement – even though it is not (it is provided as information only).
- May be construed as less comprehensive than current testing programs.
- Adds other non-operations types of testing [such as those describe in Section 3.1.1, 3.1.2, 3.2.1 through 3.2.1.3] and for which the operator and senior operator has no input but are unique to simulators.

PROPOSAL #1

Appendix E

(This appendix is not a part of American National Standard “Nuclear Power Plant Simulators for Use in Operator Training and Examination,” ANSI/ANS-3.5-2009, but is included for information purposes only.)

Simulator Performance Test Program Guideline

The purpose of this appendix is to provide a simulator performance test program guideline for demonstrating the functional requirements and criteria of the standard to which the full-scope simulator has been designed to respond as compared to actual or predicted reference unit performance. Implementation of this guideline ensures the simulator's demonstrated capability and performance is sufficient in scope and fidelity to allow conduct of evolutions associated with nuclear power plant operator licensing training and examinations applicable to the design of the reference unit.

A.1 Simulator Performance Test Program Overview

This simulator performance test program ensures that simulated components, equipment, and systems perform in accordance with reference unit design criteria; that nuclear and thermo-hydraulic behavior is observed and confirmed; and, that the simulated power plant can be safely started up from cold ambient conditions and brought to rated full power capacity and then safely shutdown under all expected operational conditions to which the simulator has been designed to respond.

During the conduct of evolutions described in this appendix, the simulated nuclear power plant is to be operated in the

same manner as the reference unit using relevant plant operating procedures and acceptance standards and criteria. Procedure administrative holds such as peer checking, approvals, and permissions are assumed given (e.g., waived) so that continued operation of the simulated power plant may be conducted in an expeditious manner. Operating procedure precautions and limitations should be adhered to at all times unless the scope of simulation precludes such compliance.

A.2 Test Personnel Qualifications, Functions, and Responsibilities

Test personnel used for the conduct of simulator performance tests should have the requisite knowledge, skills, and abilities to carry out the functions of a nuclear power plant operator and senior operator and to identify simulator performance discrepancies (both modeling and hardware discrepancies).

A.3 Pre-Testing Assumptions

This simulator performance test program assumes the full-scope simulator is in a “Ready-for-Training” state. The test program described in this appendix does not allowed nor credit any other type of performance testing such as off-line tests and or vendor factory acceptance tests. Only simulator initial condition sets developed and maintained from a validated base line initial condition set should be used when conducting the performance tests describe in this appendix. Simulated electrical power loads, instrument and station air loads, station closed cooling water and service water loads have been verified and validated beforehand. Finally, simulated local operator actions (e.g., remote functions) have been verified, validated, and properly aligned in all initial condition sets.

A.4 Tests Documentation

Simulator performance tests documentation should specify the test objective, applicable prerequisites, general test method, and acceptance criteria. For example, regarding general test method for XYZ system, verification of XYZ system capability is demonstrated by the integrated operation of the following: logic and interlocks as specified in system elementary diagrams, XYZ system pumps, including auto initiation; flow path verification, and annunciators.

B.1 Performance Testing Scope

Simulator performance testing is generally associated with the time period following fuel loading (may be initial and or subsequent fuel cycle) and extending through 100% power. For purposes of this guideline, the following types of

reference unit performance test items should be performed on the simulated nuclear power plant to which the simulator has been designed to respond:

B.1.1 Stability Tests

The following group of stability tests demonstrates expected overall plant stability in relation to minor perturbations caused by a step change in a controlled parameter of interest:

BWR

- Core-power-void mode (e.g., flux response to control rod movement)
- Pressure regulator set-point changes
- Pressure backup regulator change
- Reactor water level set-point changes
- Feedwater heater loss
- Turbine valve surveillance
- Reactor recirculation flow control

PWR (To be determined)

B.1.2 Major Transients Tests

The following group of major transient tests demonstrates expected overall plant performance t:

BWR

- Feedwater pump trip
- MSIV closure (one valve)
- MSIV closure (all valves)
- Turbine-generator (TG) stop valve fast closure
- Turbine-generator control valve fast closure
- Reactor recirculation pump trip (one)
- Reactor recirculation pump trip (two)
- Loss of TG and offsite power

PWR (To be determined)

B.2 Reference Plant Safety Analysis Related Tests

B.2.1 Abnormal Operational Occurrences (AOOs)

AOOs are conditions of normal operation expected to occur one or more times during the life of the plant.

B.2.2 Accidents

Accidents are postulated events that may affect one or more of the barriers to the release of radioactive material to the environs. These events are not expected to occur during the life of the plant but are used to establish the design basis for many systems.

B.2.3 Special Events

Special events are postulated occurrences analyzed to demonstrate different plant capabilities required by regulatory requirements and guidance, industry codes and standards, and licensing commitments applicable to the plant. (require failure assumptions in excess of AOOs and accidents / encompasses some events that are not considered credible)

B.3 Normal Plant Operations

B.3.1 Startup to rated full power conditions

B.3.2 Rated full power conditions to cold shutdown

B.4 Simulator Malfunction Performance Tests (stand-alone / scenario based testing)

B.5 Local Operator Actions Tests

B.6 Simulated Reactor Core Performance Testing

B.7 Miscellaneous Tests

PROPOSAL #2

Appendix E

(This appendix is not a part of American National Standard “Nuclear Power Plant Simulators for Use in Operator Training and Examination,” ANSI/ANS-3.5-201x, but is included for information purposes only.)

Simulator Performance Test Program

E.1 Purpose of Simulator Performance Test Program

The purpose of this appendix is to provide a uniform approach to demonstrate the functional and physical requirements described in Sec. 3.4 that corresponds to the testing and validation requirements described in Sec. 4.4.

E.2 Performance Test Program Overview

A performance test program provides an opportunity to identify noticeable differences between the simulator control room or simulated systems when evaluated against the control room or systems of the reference unit.

A performance test program ensures that the simulator performs in accordance with reference unit design criteria. The simulator is expected to operate in the same manner as the reference unit using applicable plant operating procedures and acceptance criteria.

E.3 Qualification and Responsibilities of Test Personnel

Test personnel selected to conduct simulator performance tests should have the requisite knowledge, skills, and abilities to identify simulator performance discrepancies (both modeling and hardware discrepancies).

E.4 Performance Test Prerequisites

The simulator shall be tested in a fully integrated mode of operation. Simulator initial conditions utilized for

performance testing should be developed from a validated baseline initial condition set.

E.5 Performance Test Documentation

The documentation of simulator performance criteria and simulator testing should follow direction provided in Appendix A, Section A.4, Simulator Test Documentation.

E.6 Performance Tests & Frequency

The following table identifies the performance tests and the required test frequency.

Performance Test Type	ANS-3.5-201x Reference	Test Frequency
Operability Tests (simulator steady-state and transient test performance)	Section 3.4.1/4.4.1	Once per reference unit fuel cycle.
Scenario-based Test	Section 3.4.2/4.4.2	(1) NRC Initial License Examination scenarios; (2) Licensed Operator Requalification annual examination scenarios; (3) scenarios used for reactivity control manipulation experience.
Reactor core performance test	Section 3.4.3/4.4.3	Each reference unit fuel cycle.
Post-event simulator test	Section 3.4.4/4.4.4	When a reference unit event generates relevant data for evaluating simulator performance.

PROPOSAL #3

Appendix E

(This appendix is not a part of American National Standard “Nuclear Power Plant Simulators for Use in Operator Training and Examination,” ANSI/ANS-3.5-201x, but is included for information purposes only.)

Simulator Test Program

E.1 Purpose of Simulator Test Program

The purpose of this appendix is to provide a uniform approach to demonstrate the functional and physical requirements described in Sec. 3 that corresponds to the testing and validation requirements described in Sec. 4.

E.2 Test Program Overview

A test program provides an opportunity to identify noticeable differences between the simulator control room or simulated systems when evaluated against the control room or systems of the reference unit.

A test program ensures that the simulator performs in accordance with reference unit design criteria. The simulator is expected to operate in the same manner as the reference unit using applicable plant operating procedures and acceptance criteria.

E.3 Qualification and Responsibilities of Test Personnel

Test personnel selected to conduct simulator performance tests should have the requisite knowledge, skills, and abilities to identify simulator performance discrepancies (both modeling and hardware discrepancies).

E.4 Test Prerequisites

The simulator shall be tested in a fully integrated, partially integrated, or stand-alone mode of system operation as noted in the table below. Simulator initial conditions utilized for testing should be developed from a validated baseline initial condition set.

E.5 Test Documentation

The documentation of simulator performance criteria and simulator testing should follow direction provided in Appendix A, Section A.4, Simulator Test Documentation.

E.6 Tests & Frequency

The following table identifies the performance tests and the recommended test frequency.

Section	Section 3.x	Section 4.x Frequency	Mode of Operation
3.1 Simulator capabilities	3.1.1 Real time and repeatability	1. upon completion of simulator initial construction; 2. once per reference unit fuel cycle	Fully Integrated
	3.1.2 Limits of simulation	1. upon initial implementation of limits of simulation; 2. whenever there is a change or modification to the limits of simulation	Any
	3.1.3 Steady-state and normal evolutions	Once per unit fuel cycle	Fully Integrated
	3.1.3.1 Steady-state operation	Once per unit fuel cycle	Fully Integrated
	3.1.3.2 Normal evolutions	1. upon completion of simulator initial	Fully Integrated

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		construction; 2. once per reference unit fuel cycle for items (1) through (3) listed in Sec. 3.1.3.2.		
	3.1.4 Malfunctions	1. upon initial implementation of a malfunction; 2. whenever there is a change or modification to a malfunction	Any	
3.2 Scope of simulation	3.2.1 Physical fidelity and human factors	1. upon completion of simulator initial construction; 2. once every four years	Any	
	3.2.1.1 Scope of operator interfaces			
	3.2.1.2 Instrumentation, controls, markings, and operator aids			
	3.2.1.3 Control room environment			
3.3 Simulator instructor station capabilities	3.3.1 Initial conditions	1. upon initial implementation of a simulator instructor station capability; 2. whenever there is a change or modification of an instructor station capability	Any	
	3.3.2 Malfunctions			
	3.3.3 Other features			
	3.3.4 Local operator actions			
	3.3.5 Data collection			
3.4 Simulator	3.4.1 Simulator	1. simulator steady-state	fully	

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performance testing	operability testing	performance; 2. simulator transient performance for a benchmark set of transients	integrated
	3.4.2 Simulator scenario-based testing	1. NRC Initial License Examination scenarios; 2. Licensed Operator Requalification annual examination scenarios; 3. scenarios used for reactivity control manipulation experience	fully integrated
	3.4.3 Simulator reactor core performance testing	each reference unit fuel cycle	fully integrated
	3.4.4 Post-event simulator testing	when a reference unit event generates relevant data for evaluating simulator performance	fully integrated

Benefits:

Propose a uniform approach to testing. Move the industry to a common approach.

Concerns

Prescriptive

Is this AI possibly moving in the areas simulator users groups (e.g. USUG, SSNTA, MANTAG, etc) have traditionally fulfilled.

A Standard is not a procedure.

Possibly develop new standard body language instead of adding a new appendix.

Tiger team will develop additional language.

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Performance Test Program Attributes

- Tests Identification
- Comparison to data (Section 5 list)
- Acceptance criteria
- Test periodicity
- Documentation
- Assumptions/simplifications
- Test personnel qualification

Testing presently required in the Standard

Capabilities	Performance
Malfunction	SBT
Real-time	PEST
Repeatability	Core
Limit of simulation	Operability
Instructor functions	• Steady State
Normal Evolutions	• Transient
Performance-based	
Mod-based	

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5.10 Motion: Close AI-43 with no additional discussion

Motion: Carried • 11 – For • 4 – Against • 0 – Abstained
Date 2013apr02 Motion: Close AI-43 with no further discussion. Reason: Proposal #1 occupied the majority time of discussion. After several hours of discussion a straw poll indicated lack of support.

Reason against:

- Additional discussion is valuable. A little more discussion could possibly add value to the standard.
- The discussion did not vet Proposal #2 and proposal #3.
- Industry could benefit with Test Program guidance

AI-43 is Closed.

5.11 AI-51 Goodman Core Performance Testing

Why is Core performance testing different:

- 10CFR 55.46 requires Simulator Core response to reference unit replication
- “Replication”
- Industry requesting additional standard for new regulatory language

A change to ANS 3.5 section 4.4.3 will be proposed at the ANS 3.5 Working Group meeting in Goodyear, Arizona on April 2, 2013. The intent of the proposed change is to better align core performance testing with regulatory requirements and standard industry practice. The following table contains the existing wording and proposed

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wording for each section:

4.4.3 Simulator reactor core performance testing

Existing Wording	Proposed Wording
Simulator reactor core performance testing shall be conducted each reference unit fuel cycle. Testing shall be performed in accordance with the reference unit procedures and shall be compared and demonstrated to replicate the response of the reference unit. It shall be demonstrated that the simulator response during conduct of simulator reactor core performance testing meets the reference unit procedures' acceptance criteria. A record of the conduct of this test and its evaluation shall be maintained.	Simulator reactor core performance testing shall be conducted each reference unit fuel cycle. Successful completion of simulator core performance testing is demonstrated when the test results agree with actual or predicted results within predetermined test acceptance criteria. A comprehensive set of tests shall be selected based on the ability to quantitatively measure important nuclear and thermal-hydraulics characteristics for which data is available accurate predictions from the core designer are available. When major changes are made in the core design, the selected tests shall should be reviewed to determine if core testing changes are required more extensive testing is needed. A record of the conduct of this test and its evaluation shall be maintained.

This change to ANS 3.5 section 4.4.3 is being proposed because the current requirement to use reference unit procedures for core performance testing:

- A. Is not consistent with regulatory requirements
- B. Is not consistent with standard industry practice prior to ANS 3.5 2009
- C. Is not adequate for simulator core model validation
- D. Creates an unnecessary burden on simulator owners

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E. Does not result in consistent validation across all facilities, and

Does not account for simulator core model pedigree

These reasons are discussed in more detail below.

Facility licensees that propose to use a plant-referenced simulator to meet the control manipulation requirements in Sec. 55.31(a)(5) must ensure that:

- i. The plant-referenced simulator utilizes models relating to nuclear and thermal-hydraulic characteristics that replicate the most recent core load in the nuclear power reference plant for which a license is being sought; and
- ii. Simulator fidelity has been demonstrated so that significant control manipulations are completed without procedural exceptions, simulator performance exceptions, or deviation from the approved training scenario sequence.

AI-51 discussion will resume on Wednesday.

5.12 Recessed: 1705

6. Wednesday 2013 April 3 (0800)

6.1 Roll Call

Members Present:

Jim Florence
Bob Felker
Keith Welchel
F.J. (Butch) Colby
Lawrence (Larry) Vick
George McCullough – Proxy
Frank Tarselli
SK Chang
Robert Goldman
David Goodman
Jody Lawter
Mac McDade
Dennis Koutouzis - Proxy
Pablo Rey
Jim Sale

Proxy/Visitors:

Tim Dennis
William Fraser (Proxy McCullough)
Bill Hendy (Proxy Koutouzis)
Majid Saba (Palo Verde)
William Hendriksen (Palo Verde)

6.2 Consensus Level

- 16 - Voting members
- 15 - Voting members Present (x Proxy Votes)
- 8 - Quorum (Majority Total Membership)
- 12 - Consensus ($\geq 75\%$ votes)
- 10 - Super Majority ($\geq 2/3$ Votes)
- 8 - Majority ($> 50\%$ votes)

6.3 AI-51 Goodman Core Performance Testing (continued)

Presentation and discussion:

4.4.3 Simulator reactor core performance testing

Existing Wording

Simulator reactor core performance testing shall be conducted each reference unit fuel cycle. Testing shall be performed in accordance with the reference unit procedures and shall be compared and demonstrated to replicate the response of the reference unit.

It shall be demonstrated that the simulator response during conduct of simulator reactor core performance testing meets the reference unit procedures' acceptance criteria.

Proposed Wording

Simulator reactor core performance testing shall be conducted each reference unit fuel cycle. Successful completion of simulator core performance testing is demonstrated when the test results agree with predicted results within predetermined test criteria.

A comprehensive set of tests shall be selected based on the ability to quantitatively measure important nuclear and thermal-hydraulics characteristics for which accurate predictions from the core designer are available. When major changes are made in the core design, the selected tests should be reviewed to determine if more extensive testing is needed.

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A record of the conduct of this test and its evaluation shall be maintained.

A record of the conduct of this test and its evaluation shall be maintained.

History – Core changes were not considered design change and therefore did not fall within the required testing for design changes.

One member discussed that changing fuel vendor causes significant changes in core flux maps.

Plant procedures, for core model testing, are not adequate for testing the simulator core. Plant procedures are not designed for validating a simulator core.

The MANTG Simulator Core Evaluation Criteria whitepaper was presented for observation by the working group of the significant number of changes the document underwent after the publication of ANS 3.5-2009.

The following was presented as points for consideration

This change to ANS 3.5 section 4.4.3 is being proposed because the current requirement to use reference unit procedures for core performance testing:

- F. Is not consistent with regulatory requirements
- G. Is not consistent with standard industry practice prior to ANS 3.5 2009
- H. Is not adequate for simulator core model validation
- I. Creates an unnecessary burden on simulator owners
- J. Does not result in consistent validation across all facilities, and
- K. Does not account for simulator core model pedigree

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William Fraser will Proxy for George McCullough. Consensus level remains the same:

- 16 - Voting members
- 15 - Voting members Present (2 Proxy Votes)
- 8 - Quorum (Majority Total Membership)
- 12 - Consensus ($\geq 75\%$ votes)
- 10 - Super Majority ($\geq 2/3$ V)

6.4 AI-51 () Motion Replace Section 4.4.3

Motion: • x – For • x – Against • x – Abstained
Name 2013apr03 Motion: Replace Section 4.4.3 with the following 4.4.3 Simulator reactor core performance testing Simulator reactor core performance testing shall be conducted each reference unit fuel cycle. A set of tests shall be selected based on the ability to quantitatively measure relevant nuclear and thermal-hydraulic parameters. Successful completion of simulator core performance testing is demonstrated when the test results agree with actual or predicted reference unit performance within predetermined acceptance criteria. A record of the conduct of this test and its evaluation shall be maintained.

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Reason:

This change to ANS 3.5 section 4.4.3 is being proposed because the current requirement to use reference unit procedures for core performance testing:

- Is not consistent with regulatory requirements
- Is not consistent with standard industry practice prior to ANS 3.5 2009
- Is not adequate for simulator core model validation
- Creates an unnecessary burden on simulator owners
- Does not result in consistent validation across all facilities, and
- Does not account for simulator core model pedigree

This motion was amended.

6.5 AI-51 (Carried) Amended Motion Replace Section 4.4.3

Motion: Carried • 14 – For • 1 – Against • 0 – Abstained
Name 2013apr03 Motion: Replace Section 4.4.3 with the following 4.4.3 Simulator reactor core performance testing Simulator reactor core performance testing shall be conducted each reference unit fuel cycle. Tests shall be established that quantitatively measure relevant nuclear and thermal-hydraulic parameters. It shall be demonstrated that simulator core performance meets actual or predicted reference unit performance within predetermined acceptance criteria. A record of the conduct of this test and its evaluation shall be maintained. Reason: The current wording may not provide adequate guidance for all reactor types.

Against: Current 4.4.3 wording is sufficient and does not require modification.

AI-51 is Closed.

6.6 (Not carried) Motion Replace Section 3.4

Motion: **Not Carried**

- 3 – For
- 9 – Against
- 3 – Abstained

Name
2013apr03

Motion:

Replace Section 3.4 with the following
3.4 Simulator performance testing

Simulator performance testing shall be conducted to identify noticeable differences between the simulator control room or simulated systems when evaluated against the control room or systems of the reference unit. Noticeable differences shall be assessed in accordance with Sec. 5.

Simulator performance testing comprises operability testing, scenario-based testing, reactor core performance testing, and post-event simulator testing.

Reason:

PEST does not necessarily require fully-integrated mode of operation.
SBT is the only test that requires a fully-integrated mode of operation.
Steady-state does not require hard panels i.e. fully-integrated mode of operation

Discussion:
I/O and stimulated devices integration and interaction
Operator issues
Testing is extensive

Against:

SBT requires the fully-integrated mode of operation.

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New design DCS stimulated systems represent a challenge for non-fully integrated mode of operation. Emulated systems are not sufficient.

Removing the requirement in 3.4 excludes this requirement for test that need the requirement.

This change is taking an axe and cutting the requirement out for all performance test. Some cases make sense, but a blanket removal is unwarranted.

Abstained:

Motion has merit but panels are needed for some evolutions.

6.7 (Carried) Add missing footnote to Section 4.4.3

Motion: **Carried**

- 14 – For
- 1 – Against
- 0 – Abstained

Name
2013apr03

Motion:

Add footnote to the last sentence in Section 4.4.3

Appendix A provides examples of acceptable simulator performance test documentation.

Reason:

The footnote was inadvertently excluded in the AI-51 Carried Motion.

Reason Against: The footnote is unnecessary

6.8 Recessed: 1640

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7. **Thursday 2013 April 4 (0800)**

7.1 Roll Call

Members Present:

Jim Florence
Bob Felker (Absent)
Keith Welchel
F.J. (Butch) Colby
Lawrence (Larry) Vick
George McCullough - Proxy
Frank Tarselli
SK Chang
Robert Goldman
David Goodman
Jody Lawter
Mac McDade
Dennis Koutouzis - Proxy
Pablo Rey
Jim Sale

Proxy/Visitors:

Tim Dennis
William Fraser (Proxy McCullough)
Bill Hendy (Proxy Koutouzis)
William Hendriksen (Palo Verde)

7.2 Consensus Level

- 16 - Voting members
- 14 - Voting members Present (x Proxy Votes)
- 8 - Quorum (Majority Total Membership)
- 11 - Consensus ($\geq 75\%$ votes)
- 10 – Super Majority ($\geq 2/3$ Votes)
- 8 – Majority ($> 50\%$ votes)

7.3 Draft Standard Preparation Assignments

Tech edit lead: Chang

Tech editing

7.4 (Chang) Technical Edits:

Two technical edits were presented and accepted by the Chair and incorporated into the Two Column Rev 7 document prior to today's read:

1. Sec. 3.3.3, last sentence

“For components that store historical data or whose performance is dependent on history, requirements for freeze, run, initial condition reset, snapshot, backtrack and exam security shall be included.” Change “exam security” to “examination security”.

Reasons: a. ” Examination” is formal, “exam” is not. The Standard is a formal document.

b. consistent with wording used elsewhere in the Standard.

2. Sec. 6

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“Code of Federal Regulations, Title 10, “Energy,” Part 55, “Operators’ Licenses,” available from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402”

Changed to

“Code of Federal Regulations, Title 10, “Energy,” Part 55, “Operators’ Licenses,” available from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402 or NRC public website

7.5 Consensus Level

- 16 - Voting members
- 15 - Voting members Present (2 Proxy Votes)
- 8 - Quorum (Majority Total Membership)
- 12 - Consensus ($\geq 75\%$ votes)
- 10 – Super Majority ($\geq 2/3$ Votes)
- 8 – Majority ($> 50\%$ votes)

7.6 (Carried) Formal Read

Motion: **Carried**

- 14 – For
- 1 – Against
- 0 – Abstained

Name
2013apr04

Motion:

**Conduct a Formal Read of Draft Standard Two Column Document Rev 7b:
TwocolumnChange2009-Rev7b-draft.doc**

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Reason:

Prepare for Single Column Document ready for approval.

7.7 Initial Read and Parking Lot Items:

- **Global**
 - Globally referencing sections by title consistency. Some have the name and some do not. (Goodman/Chang)
 - 1.2 – 10CFR55 reference allowed? Why? (Florence)
 - Passive failure is no longer used in the standard. Definitions Section review is required. (Goodman/Chang)
 - Reference unit: review use of “docket number” since docket number does not apply to international simulators. (Chang/Rey)
 - AI owners ensure detailed notes are incorporated so that an un-informed reader can understand. (Florence/Colby/Felker)
 - Definition Replay and Fasttime: Replay is the playback of a recorded session and not the recording of the session. (Lawter/Fraser)
 - Review and possibly expand stimulated components to include other types such as emulated, hybrid, etc. (Felker/Tarselli)
 - Why are Normal Evolutions required testing Once Per Fuel Cycle (Felker/Hendricsen)
 - Review all numbered list for correct format (e.g. 1) (1) 1.) (Fraser/Chang)
 - Review the use of parametric. Is it outdated. (Lawter/Fraser)
- **Definitions**
 - Initial Condition (Fraser/Tarselli)
 - ~~Reference Unit (Fraser)~~
 - Snapshot (Fraser/Tarselli)
 - “Benchmark” definition needed? (Hendy/Goodman) (Already covered AI-37)
 - Definition needed for “scenario” (Hendy/Vick)
- **Section 3**
 - ~~3.1, 3.1.4, 3.3.5, 4.3.5 “Testing Requirements.” should be changed to “Testing requirements.”~~
 - 3.1.3.2 - Why is “operator-conducted surveillance testing on safety related equipment or systems” in the list. (Colby/Felker)
 - 3.1.3/A.1.3 Item 4 Use of “reach, exceed and exceeded” use consistency (Chang)
 - 3.3.2 Delete everything starting with the word “and”. Modify the first sentence (Tarselli/Rey)
 - 3.3.2/4.3.4 remove the word “licensed” and just use “accredited operator training programs” (Tarselli/Rey/Hendy)

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- 3.2.2.1 change “describe” to “require” for consistency (Tarselli)
- ~~3.1.4 Semi colon needs at the end of bullet 1~~
- 3.1.4 INPO SOER is no longer used... IER. (Hendy/Vick)
- 3.1.4 Consider adding DCD, new Builds have DCD in addition to FSAR (Felker/Lawter)
- 3.2.2.2 Is a scoping section. The last sentence has nothing to do with the topic. Consider deleting the last sentence. (Felker/Fraser/Hendricsen)
- 3.3.4/4.3.4 Multi-unit interaction. No test criteria for Multi-Unit testing (Felker/Goodman)
- 3.4/5.2.3.2 Stand-alone mode may need a definition (Felker/Goodman/Tarselli)
- 3.4.2 Modify the last sentence to include “evaluated scenarios” (Hendy/Tarselli)
- 3.1.3 does instrumentation cover DCS HSI type devices (see 3.2.1.2 and 4.2.1.2) (Felker/Rey/Tarselli)
- Non-existent systems do not have number. No corresponding section 3 to 4 or 4 to 3. Example 4.1.3.1.1 and no 3.1..3.1.1 (Rey/Fraser)
- **Section 4**
 - ~~4.1.2 Add period at the end of bullet 2 in Section 4.1.2~~
 - 4.1.3.1.1 remove: Note: This was changed in later meetings; (Colby)
 - 4.1.3.1 are all parameters applicable to all designs (Florence/Goldman)
 - 4.1.3.1.4 two parameters in one bullet: “control rod drive system **flow** and **temperature**; (Tarselli)
 - ~~4.1.3.2 bullet 6 needs a period at the end of the sentence.~~
 - 4.4.3 Use of Predicted versus using Best Estimate that is defined. Predicted is not defined. (Hendy/Goodman)
 - ~~4.2.1 bullet 2 needs period~~
 - ~~4.3 missing period bullet 2~~
 - 4.3.3 Second paragraph, change defined to identified (Goodman)
 - 4.4. Second Paragraph, second sentence – “maintain records” is duplicated in the sub sections. It’s in three of the four. Make consistent. (Goodman/Welchel)
 - 4.1.3.1 Footnote 6 and 7 are incomplete (Goodman/Colby)
 - 4.3.5 the plot may no longer be a common use term. Review for possibly removal (Fraser/Goldman)
 - 4.3.2 reword for clarity. First line needs work. (Fraser/Goldman)
 - 4.2.2/4.1.3 No periodicity (Rey/McCullough)
 - 4.4.1/4.1.3.1 repeating testing requirements steady-state operation and for operability testing. Reference AI-9 (Rey/Vick/Felker)
 - 4.4.1/5.2.3.2 Second paragraph use “best estimate” versus “predicted” (Hendy/Goodman)

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- 4.3.4 Review for clarity: The introduction of the local operator action shall not alert the operators to pending events other than by indications that would occur in the reference unit. (Chang/Vick)
- 4.4 remove “NOTE: Moved from section 4.4.3” – (Colby)
- **Section 5**
 - ~~5.3 Item 6 start the sentence with “the” (Rey/Colby)~~
 - 5.1.1 was “Current approved software” intentionally deleted. Review the original motion (Goodman)
 - 5.3 item 6 add “knowledge and” before skills (Chang/Goodman)
 - 5.2.3.1 Should there be a statement that Verification testing is needed before use in operator training. (Chang/Goodman)
 - Review Section 5 for use of sub numbering: e.g. – (1) versus 1 (Sections 5.1.2, 5.2, 5.2.2. (Chang)
 - ~~Remove “periods” from section titles e.g. 5.2.3, 5.2.3.1, 5.2.3.2, 5.2.4, 5.3. (Colby)~~
 - 5.3 – is a TNA required for each discrepancy? (Florence/Goodman)
 - 5.2.2 – paragraph implies a plant modification could be considered a discrepancy (Florence/Goodman)
 - 5.2.3 – “affect” or “affects”? (Chang)
- **Appendices**
 - Review Appendix A for continued use
 - A.1 – should “evaluation” be “examination”? (Florence/Chang)
 - A.1.1 Items (1) through (3) – why? (Florence/Welchel)
 - Appendix A.2 review for clarity Structure (Rey); does it align appropriately with Section 5? (Florence)
 - A.3 – capitalization of items (1) through (3)?? Florence
 - Appendix A.3 Simulator documentation – The bullets need to be reviewed for correct grammar, punctuation. (Hendy/Chang)
 - Appendix A.2 the list may be outdated (e.g. annunciators book, process computer book). The list should be brought up to date. The Appendix A List in general need consideration (Felker/McDade)
 - ~~Appendix A.2 review for clarity. Structure. (Rey)~~
 - Re-designate Appendices. The content in Appendix B was deleted only. (Colby).
 - Appendix C – Examples: words following “,” should not be capitalized. Some grammatical restructuring may be required in this section. (Florence/Chang)
 - D.2 3.1.3 the word discussion is in () why? (Chang/Goodman)
 - D.1. Second paragraph third sentence change “analysis of training requirement” to “a training needs assessment.” (Lawter/Goodman)
 - D.2 Section 3.1.4: delete “list of malfunctions”. (Florence)
 - D.2 – Sections 3.2.1.1 and 4.2.1.1 – change title of this section. (Colby/Chang)

7.8 (Carried) Motion Replace Section 3.4

Motion: Carried • 10 – For • 3 – Against • 2 – Abstained
Name 2013apr04 Motion: Replace Section 3.4 with the following 3.4 Simulator performance testing Simulator performance testing shall be conducted to identify noticeable differences between the simulator control room or simulated systems when evaluated against the control room or systems of the reference unit. Noticeable differences shall be assessed in accordance with Sec. 5. Simulator performance testing comprises operability testing, scenario-based testing, reactor core performance testing, and post-event simulator testing. Operability testing, scenario-based testing, and post-event simulator testing shall be performed in a fully integrated mode of operation. Reactor core performance testing may be conducted in a fully integrated, partially integrated, or stand-alone mode of system operation. Reason: SBT is the only test that requires a fully-integrated mode of operation. Steady-state does not require hard panels i.e. fully-integrated mode of operation The new wording is an allowance and not a requirement to do off-line testing.

Against:

Contrary to regulations, simulator testing is a conduct of performance testing. The new wording does not constitute performance testing.
These tests require the panels/meters/lights to see the full simulator response.

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Abstained:

PEST also can be completed in a non-fully integrated mode. Not comfortable making this significant of a change at this time in the standards development.

7.9 (Carried) Resume Formal Read

Motion: Carried • 13 – For • 2 – Against • 0 – Abstained
Name 2013apr04 Motion: Conduct a Formal Read of Draft Standard Two Column Document Rev 7c: TwocolumnChange2009-Rev7c-draft.doc Reason: Prepare for Single Column Document ready for approval.

Reason Against: Unnecessary for an understanding of the draft standard.

7.10 Proposed Draft Standard Concerns - NRC Representative

As the NRC representative on ANS 3.5 WG, I have a responsibility to express views that are consistent with the agency views and strive to reconcile key issues between the WG and agency views on WG actions that could, if allowed to stand, impede agency agreement with or endorsement of a standard. My participation on the WG does not necessarily connote agency agreement with, or endorsement of, decisions reached by the WG. Standards are not approved for use within the NRC regulatory framework until they have been endorsed.

Before the WG completes actions on its proposed draft revision of the standard, the WG should be cognizant of the fact that the NRC

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reserves the right to apply conditions on the use of consensus standards that it uses in its regulatory process when, in its view, the consensus standard does not adequately address a specific regulatory issue, the standard is not sufficiently supported by relevant technical information, or it is inconsistent with current regulations or policy.

Based on a review of the WG meeting minutes and actions taken to date, there are three areas of concern with the proposed draft standard. They are:

- Reduction of ANSI/ANS-3.5-2009 scope in Section 1.1, “Scope”
- Deletion of ANSI/ANS-3.5-2009 required malfunctions in Section 3.1.4, “Malfunctions”
- Deletion of ANSI/ANS-3.5-2009 Appendix B, ‘Guidelines for the Conduct of Simulator Operability Testing”

Reduction of ANSI/ANS-3.5-2009 scope in Section 1.1, “Scope”

ANSI/ANS-3.5-2009 [as well as all previous versions: -1998; -1993; -1985; and; -1981], Section 1.1 scope applies to full-scope nuclear power plant control room simulators for use in operator training and examination. There is no scope applicability distinction between simulators that are or are not subject to regulatory bodies. However, the proposed draft standard Section 1.1, “Scope” statement significantly reduces the total number of simulators for which the current standard now applies to only domestic [US] simulators subject to NRC regulation. This is a substantial scope applicability reduction since international full-scope nuclear power plant control room simulators are excluded.

- ANSI/ANS-3.5-2009 Section 1.1, “Scope” statement reads: *This standard establishes the functional requirements for full-scope nuclear power plant control room simulators for use in operator training and examination...*
- Proposed draft standard Section 1.1, “Scope” statement reads: *This standard establishes the functional requirements for full-scope nuclear power plant control room simulators that are subject to U.S. Nuclear Regulatory Commission (NRC) regulation for use in operator training and examination...*
 - Refer to WG’s January 25-27, 2011 meeting minutes, Crystal River Nuclear Training Center, Crystal River, FL, / Section 6.3 regarding specific motion “carried” : 13 members voted “for”; 2 “against”; and 1 “abstained.

Concern

The proposed draft scope applicability statement is too narrowly focused because it excludes full-scope nuclear power plant (NPP) control room simulators not subject to U.S. NRC regulation. Technical standards approved by the ANS are also used and referenced by the international community. The community of NPP full-scope simulators is made up of domestic and international users.

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Recommendation

The WG should reconsider the proposed draft scope statement and revise it in such a manner that it is applicable to [all] full-scope nuclear power plant control room simulators.

Deletion of ANSI/ANS-3.5-2009 required malfunctions in Section 3.1.4, “Malfunctions”

ANSI/ANS-3.5-2009, as well as all previous versions [-1998, -1993, 1985, and -1981], established functional requirements in Section 3.1.4 regarding the scope of malfunctions to be included in a full-scope NPP control room simulator for use in operator training and examination. Specifically, Section 3.1.4, “Plant Malfunctions” [3rd paragraph on page 4] reads in part:

- *The malfunctions listed below shall be included:*

(1) *Loss of coolant;*

(*) ******;*

(25) *Reactor pressure control system failure including turbine bypass failure (BWR.)*

However, during the WG’s November 15-18, 2011 meeting at the V.C. Summer Nuclear Training Center in Cary, SC, the 3rd paragraph in Section 3.1.4, “Plant Malfunctions” was deleted from the proposed draft standard. The meeting minutes records the reason for the deletion as: “*The list of 25 is not sufficient to meet this standard’s scope...*” [See Section 6.6 of the minutes; the specific motion to delete was “carried” with 12 members voting “for”; 2 “against”; and 2 “abstained.”]

The assertion that the required malfunctions are not sufficient to meet the proposed draft standard scope is questionable since the -2009 standard (and all previously adopted versions) requires full-scope simulators to have the specified malfunctions. The required malfunctions have been a staple of scope and sufficiency for use in the training, requalification, and examination of nuclear power plant operators ever since the after-math of the Three Mile Island Unit 2 accident in 1979.

Beginning with ANS-3.5-1981, the NRC has periodically endorsed, via RG 1.149, the required malfunctions as part of the standard. Each of the following versions of ANS-3.5 identified the required malfunctions that shall be in the scope of simulation: 1) ANS-3.5-1981, endorsed by RG 1.149; 2) ANS-3.5-1985, endorsed by RG1.149, Rev 1; 3) ANS-3.5-1993, endorsed by RG1.149, Rev 2; 4)

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ANS-3.5-1998, endorsed by RG1.149, Rev 3; and, 5) ANS-3.5-2009, endorsed by RG1.149, Rev 4.

Concern

The deletion of required malfunctions is misguided because it undermines the basis and rationale for having a full-scope simulator in the first place. The protection of public health and safety requires that licensed operators not only be proficient in general operations but be able to safely cope with expected plant response to operator input and to normal, transients, and accident conditions to which the simulator has been design to respond. This means the simulator must be designed and implemented so that it is sufficient in scope and fidelity to allow conduct of the evolutions listed in 10 CFR 55.45 (a)(1) through (13), and 55.59(c)(3)(i)(A) through (AA), as applicable to the design of the reference plant. This regulatory nexus is lost in the proposed draft standard.

Recommendation

The WG should reconsider Section 3.1.4 and reinstate the required malfunctions in the scope of simulation.

The following table illustrates the nexus between Section 3.1.4 and 10 CFR 55.59.

ANSI/ANS-3.5-2009 Malfunctions vs. 10 CFR 55.59 Manipulations and Evolutions [Malfunctions]				
ANS-3.5 Reference	Standard Description	10 CFR 55.59 Ref.	Rule Description	Nexus Yes or No
3.1.4(1)	Loss of coolant: significant pressurized water reactor (PWR) steam generator tube leaks, inside and outside primary containment, large and small loss of coolant accidents (LOCA) demonstrating multiphase flow, and	G	Loss of coolant, including- (1) Significant PWR steam generator leaks (2) Inside and outside primary	Yes

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	failure of safety and relief valves;		containment (3) Large and small, including leak rate determination (4) Saturated reactor coolant response (PWR).	
3.1.4(2)	Loss of instrument air to the extent that the whole system or isolable portions can lose pressure and affect the reference unit's static or dynamic performance;	H	Loss of instrument air (if simulated plant specific).	Yes
3.1.4(3)	Degraded electrical power to the station, including loss of offsite power, loss of emergency power, loss of emergency generators, loss of power to the unit's electrical distribution buses, and loss of power to the individual instrumentation buses (including AC as well as DC) that provide	I	Loss of electrical power (or degraded power sources).	Yes

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	power to control room instrumentation or unit control functions affecting the unit's response;			
3.1.4(4)	Loss of forced core coolant flow due to single or multiple pump failure;	J	Loss of core coolant flow/natural circulation.	Yes
3.1.4(5)	Loss of condenser vacuum, including loss of condenser level control;	P	Loss of condenser vacuum.	Yes
3.1.4(6)	Loss of service water or cooling to individual components;	L	Loss of service water, if required for safety.	Yes
3.1.4(7)	Loss of shutdown cooling;	M	Loss of shutdown cooling.	Yes
3.1.4(8)	Loss of component cooling system or cooling to individual components;	N	Loss of component cooling system or cooling to an individual component.	Yes
3.1.4(9)	Loss of normal feedwater or normal feedwater system failure;	O	Loss of normal feedwater or normal feedwater system failure.	Yes
3.1.4(10)	Loss of all feedwater, both normal and emergency;	K	Loss of feedwater (normal and emergency).	Yes
3.1.4(11)	Loss of a protective system channel;	Q	Loss of protective system channel.	Yes

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3.1.4(12)	Control rod failure, including stuck rods, uncoupled rods, drifting rods, rod drops, and misaligned rods;	R	Mispositioned control rod or rod (or rod drops).	Yes
3.1.4(13)	Inability to drive control rods;	S	Inability to drive rods.	Yes
3.1.4(14)	Fuel cladding failure resulting in high activity in reactor coolant or off-gas and the associated high radiation alarms;	U	Fuel cladding failure or high activity in reactor coolant or offgas.	Yes
3.1.4(15)	Turbine trip;	V	Turbine or generator trip.	Yes
3.1.4(16)	Generator trip;	V	Turbine or generator trip.	Yes
3.1.4(17)	Failure in automatic control systems that affect reactivity and core heat removal;	W	Malfunction of an automatic control system that affects reactivity.	Yes
3.1.4(18)	Failure of reactor coolant pressure and volume control systems for PWRs;	X	Malfunction of reactor coolant pressure/volume control system.	Yes
3.1.4(19)	Reactor trip;	Y	Reactor trip.	Yes
3.1.4(20)	Main steam line break, as well as feed line break, both inside and outside containment;	Z	Main steam line break (inside or outside containment).	Yes
3.1.4(21)	Nuclear instrumentation	AA	A nuclear instrumentation	Yes

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	failures;		failure.	
3.1.4(22)	Process instrumentation, alarms, and control systems failures;	T	Conditions requiring use of emergency boration or standby liquid control system.	Yes
3.1.4(23)	Passive failures of components in systems, such as engineered safety features or emergency feedwater systems;	T	Conditions requiring use of emergency boration or standby liquid control system.	Yes
3.1.4(24)	Failure of the automatic reactor trip system;	W	Malfunction of an automatic control system that affects reactivity.	Yes
3.1.4(25)	Reactor pressure control system failure, including turbine bypass failure for boiling water reactors (BWRs).	X	Malfunction of reactor coolant pressure/volume control system.	Yes

10 CFR 55.59 Reference

10 CFR 55.59(c) (3) (i) regarding requalification and on-the-job training, requires that "...each licensed operator manipulate the plant controls and each licensed senior operator either manipulates the controls or directs the activities of individuals during plant control manipulations during the term of the licensed operator's or senior operator's license. For reactor operators and senior operators, these manipulations must consist of the following control manipulations and plant evolutions if they are applicable to the plant design... Those control manipulations which are not performed at the plant may be performed on a simulator...

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(G) Loss of coolant, including-

(1) Significant PWR steam generator leaks

(2) Inside and outside primary containment

(3) Large and small, including leak rate determination

(4) Saturated reactor coolant response (PWR).

(H) Loss of instrument air (if simulated plant specific).

(I) Loss of electrical power (or degraded power sources).

(J) Loss of core coolant flow/natural circulation.

(K) Loss of feedwater (normal and emergency).

(L) Loss of service water, if required for safety.

(M) Loss of shutdown cooling.

(N) Loss of component cooling system or cooling to an individual component.

(O) Loss of normal feedwater or normal feedwater system failure.

(P) Loss of condenser vacuum.

(Q) Loss of protective system channel.

(R) Mispositioned control rod or rods (or rod drops).

(S) Inability to drive rods.

(T) Conditions requiring use of emergency boration or standby liquid control system.

(U) Fuel cladding failure or high activity in reactor coolant or offgas.

(V) Turbine or generator trip.

(W) Malfunction of an automatic control system that affects reactivity.

(X) Malfunction of reactor coolant pressure/volume control system.

(Y) Reactor trip.

(Z) Main steam line break (inside or outside containment).

(AA) A nuclear instrumentation failure.

Deletion of ANSI/ANS-3.5-2009 Appendix B, ‘Guidelines for the Conduct of Simulator Operability Testing’

Although ANSI/ANS-3.5-2009 Appendix B, “Guidelines for the Conduct of Simulator Operability Testing” is not part of the standard, simulation facility users rely heavily on it as foundational guidance for their simulator operability testing program.

- “The purpose of this appendix is to provide examples of tests, parameters to be recorded, and time resolution for demonstration of simulator operability. The example tests documented herein will clarify the scope and intent of simulator operability testing required by Sec. 4.4.3.1 of the standard.”

During the WG’s March 13-16, 2012 meeting at the Granbury Conference Center, in Granbury, Texas Appendix B was deleted. The meeting minutes do not explain the reason or explanation for such a significant change. [Reference: Section 6.4 of the minutes indicates the motion as “carried” with 12 members voting “For”; “0” against, and “0” abstained.]

Concern

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The deletion of Appendix B with no alternative approach is questionable because it undermines user testing programs already in place for demonstrating scope and fidelity sufficiency.

Recommendation

The WG should reconsider Appendix B and reinstate it.

7.11 Recessed: 1740

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8. Friday 2013 April 5 (0800)

8.1 Roll Call

Members Present:

Jim Florence
Bob Felker (Absent)
Keith Welchel
F.J. (Butch) Colby
Lawrence (Larry) Vick
George McCullough - Proxy
Frank Tarselli
SK Chang
Robert Goldman
David Goodman
Jody Lawter
Mac McDade
Dennis Koutouzis - Proxy
Pablo Rey
Jim Sale

Proxy/Visitors:

Tim Dennis
William Fraser (Proxy McCullough)
Bill Hendy (Proxy Koutouzis)

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8.2 Consensus Level

- 16 - Voting members
- 14 - Voting members Present (1 Proxy Votes)
- 8 - Quorum (Majority Total Membership)
- 11 - Consensus ($\geq 75\%$ votes)
- 10 – Super Majority ($\geq 2/3$ Votes)
- 8 – Majority ($> 50\%$ votes)

8.3 Motion – Accept Koutouzis resignation

Motion: **Carried**

- 14 – For
- 0 – Against
- 0 – Abstained

Name

2013Apr05

Motion:

Accept Koutouzis resignation.

8.4 Consensus Level

- 16 - Voting members
- 15 - Voting members Present (2 Proxy Votes)
- 8 - Quorum (Majority Total Membership)
- 12 - Consensus ($\geq 75\%$ votes)
- 10 – Super Majority ($\geq 2/3$ Votes)
- 8 – Majority ($> 50\%$ votes)

8.5 Motion (Carried) – Cooper Inquiry Response

Cooper Inquiry:

What is the intent and purpose of “demonstrating” a verification test? What is expected for a verification test to be “demonstrated”?

Motion: **Carried**

- 13 – For
- 1 – Against
- 1 – Abstained

Name

2013apr05

Response to the Cooper inquiry

Motion:

Section 4.4.1 requirement explanation:

Verification testing is part of a structured software design and development process for changes to the simulator configuration. A demonstration that verification testing is performed is required whenever simulation models or computer systems are modified in a way that potentially affect simulator performance.

How the requirement is intended to be applied generically:

The extent of verification testing depends on the nature of the change; a demonstration that verification testing was performed may be as simple as an assertion of simulator conformance with the design requirements or as rigorous as a written document.

Reason: Working Group public response.

Reasons Against: Says nothing and does not answer the question

Reason Abstained: Says little

8.6 Parking Lot Item Assignments:

- **Global**
 - Globally referencing sections by title consistency. Some have the name and some do not. (Goodman/Chang)
 - 1.2 – 10CFR55 reference allowed? Why? (Florence)
 - Passive failure is no longer used in the standard. Definitions Section review is required. (Goodman/Chang)
 - Reference unit: review use of “docket number” since docket number does not apply to international simulators. (Chang/Rey)
 - AI owners ensure detailed notes are incorporated so that an un-informed reader can understand. (Florence/Colby/Felker)
 - Definition Replay and Fast time: Replay is the playback of a recorded session and not the recording of the session. (Lawter/Fraser)
 - Review and possibly expand stimulated components to include other types such as emulated, hybrid, etc. (Felker/Tarselli)
 - Why are Normal Evolutions required testing Once Per Fuel Cycle (Felker/Hendricsen)
 - Review all numbered list for correct format (e.g. 1) (1) 1.) (Fraser/Chang)
 - Review the use of parametric. Is it outdated. (Lawter/Fraser)
- **Definitions**
 - Initial Condition (Fraser/Tarselli)
 - Snapshot (Fraser/Tarselli)
 - “Benchmark” definition needed? (Hendy/Goodman) (Already covered AI-37)
 - Definition needed for “scenario” (Hendy/Vick)
- **Section 3**
 - 3.1.3.2 - Why is “operator-conducted surveillance testing on safety related equipment or systems” in the list. (Colby/Felker)
 - 3.1.3/A.1.3 Item 4 Use of “reach, exceed and exceeded” use consistency (Chang)
 - 3.3.2 Delete everything starting with the word “and”. Modify the first sentence (Tarselli/Rey)
 - 3.3.2/4.3.4 remove the word “licensed” and just use “accredited operator training programs” (Tarselli/Rey/Hendy)
 - 3.2.2.1 change “describe” to “require” for consistency (Tarselli)

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- 3.1.4 INPO SOER is no longer used... IER. (Hendy/Vick)
- 3.1.4 Consider adding DCD, new Builds have DCD in addition to FSAR (Felker/Lawter)
- 3.2.2.2 Is a scoping section. The last sentence has nothing to do with the topic. Consider deleting the last sentence. (Felker/Fraser/Hendricsen)
- 3.3.4/4.3.4 Multi-unit interaction. No test criteria for Multi-Unit testing (Felker/Goodman)
- 3.4/5.2.3.2 Stand-alone mode may need a definition (Felker/Goodman/Tarselli)
- 3.4.2 Modify the last sentence to include “evaluated scenarios” (Hendy/Tarselli)
- 3.1.3 does instrumentation cover DCS HSI type devices (see 3.2.1.2 and 4.2.1.2) (Felker/Rey/Tarselli)
- Non-existent systems do not have number. No corresponding section 3 to 4 or 4 to 3. Example 4.1.3.1.1 and no 3.1..3.1.1 (Rey/Fraser)
- **Section 4**
 - 4.1.3.1.1 remove: Note: This was changed in later meetings; (Colby)
 - 4.1.3.1 are all parameters applicable to all designs (Florence/Goldman)
 - 4.1.3.1.4 two parameters in one bullet: “control rod drive system **flow** and **temperature**; (Tarselli)
 - 4.4.3 Use of Predicted versus using Best Estimate that is defined. Predicted is not defined. (Hendy/Goodman)
 - 4.3.3 Second paragraph, change defined to identified (Goodman)
 - 4.4. Second Paragraph, second sentence – “maintain records” is duplicated in the sub sections. It’s in three of the four. Make consistent. (Goodman/Welchel)
 - 4.1.3.1 Footnote 6 and 7 are incomplete (Goodman/Colby)
 - 4.3.5 the plot may no longer be a common use term. Review for possibly removal (Fraser/Goldman)
 - 4.3.2 reword for clarity. First line needs work. (Fraser/Goldman)
 - 4.2.2/4.1.3 No periodicity (Rey/McCullough)
 - 4.4.1/4.1.3.1 repeating testing requirements steady-state operation and for operability testing. Reference AI-9 (Rey/Vick/Felker)
 - 4.4.1/5.2.3.2 Second paragraph use “best estimate” versus “predicted” (Hendy/Goodman)
 - 4.3.4 Review for clarity: The introduction of the local operator action shall not alert the operators to pending events other than by indications that would occur in the reference unit. (Chang/Vick)
 - 4.4 remove “NOTE: Moved from section 4.4.3” – (Colby)
- **Section 5**
 - 5.1.1 was “Current approved software” intentionally deleted. Review the original motion (Goodman)
 - 5.3 item 6 add “knowledge and” before skills (Chang/Goodman)
 - 5.2.3.1 Should there be a statement that Verification testing is needed before use in operator training. (Chang/Goodman)

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- Review Section 5 for use of sub numbering: e.g. – (1) versus 1 (Sections 5.1.2, 5.2, 5.2.2. (Chang)
- 5.3 – is a TNA required for each discrepancy? (Florence/Goodman)
- 5.2.2 – paragraph implies a plant modification could be considered a discrepancy (Florence/Goodman)
- 5.2.3 – “affect” or “affects”? (Chang)
- **Appendices**
 - Review Appendix A for continued use
 - A.1 – should “evaluation” be “examination”? (Florence/Chang)
 - A.1.1 Items (1) through (3) – why? (Florence/Welchel)
 - Appendix A.2 review for clarity Structure (Rey); does it align appropriately with Section 5? (Florence)
 - A.3 – capitalization of items (1) through (3)?? Florence
 - Appendix A.3 Simulator documentation – The bullets need to be reviewed for correct grammar, punctuation. (Hendy/Chang)
 - Appendix A.2 the list may be outdated (e..g. annunciators book, process computer book). The list should be brought up to date. The Appendix A List in general need consideration (Felker/McDade)
 - Re-designate Appendices. The content in Appendix B was deleted only. (Colby).
 - Appendix C – Examples: words following “;” should not be capitalized. Some grammatical restructuring may be required in this section. (Florence/Chang)
 - D.2 3.1.3 the word discussion is in () why? (Chang/Goodman)
 - D.1. Second paragraph third sentence change “analysis of training requirement” to “a training needs assessment.” (Lawter/Goodman)
 - D.2 Section 3.1.4: delete “list of malfunctions”. (Florence)
 - D.2 – Sections 3.2.1.1 and 4.2.1.1 – change title of this section. (Colby/Chang)

8.7 Next Meeting Tentative

July 22

Locations:

Pilgrim

8.8 Adjourned: 1100

9. **Attachment 1 - Style Guide Review (SK Change)**

201x Standard - Style Guide

1. ANSI Style Guide-sheet – 2003

Available at <http://www.ansi.org/>

A. General guide-lines

- Heavy emphasis on technical integrity (accurate, complete, consistent), a spelling error would only be a minor issue.
- Consistency throughout the document: format, capitalization, etc..

B. Strong recommendations:

- No requirements in foreword, scope, background, definitions, footnotes.
- Use of “shall” to indicate a requirement; use “should” to indicate a recommendation. Avoid use of “must”.
- References: full and complete. Annex is a preferred term to Appendix.
- Number the footnotes sequentially.

C. Completeness and consistency of document:

Pagination, indentation, punctuation, numbering of sections, footnotes, etc.: follow 2009 Standard.

2. ANSI Style manual, 8th edition, version 1.0, 3/1/91. [historical]

<http://www.new.ans.org/standards/resources/downloads/docs/ansi-stylemanual.pdf>

This has been replaced by the 2003 guide, but ANS keeps it for reference.

3. ANS NFSC Policy and Procedures Manual

<http://www.ans.org/standards/resources/downloads/docs/nfscpolicies.pdf>

Section 7.3 Specifying Requirements in a Standard (Shall, Should, and May) (approved Jan 2010).

Directions given in the standard shall use “shall”, “should”, and “may”:

Shall, to designate a mandatory action.

Should, to delineate a recommended action. “Should also indicates that the issue must be addressed and that either the recommended action shall be taken or an equivalent action shall be taken and a basis given for equivalency.”

May, to designate a permissive action.

Avoid “shall consider”, “shall, if possible” and equivalent phrases

Note: Three occurrences of “shall consider” or equivalent are found in the 2009 Standard. These may deviate from NFSC rules.

Section 3.2.1.2, end of 1st paragraph: “The following items shall be considered:”

Section 3.2.1.3, end of 1st paragraph: “The following items shall be considered:”

Section 4.4.3.2, end of 4th paragraph: “Evaluation of the test data shall consider.”

Section 7.4 Use of units SI units shall be used either parenthetically with English units or SI units exclusively (approved Nov 2004).

It refers to the NBS publication concerning SI units:

NBS Special Publication 330, "The International System of Units (SI)," U.S. Department of Commerce, 1977.

The current version is "NIST Special Publication 330. 2008 Edition; U.S. Department of Commerce, National Institute of Standards and Technology" available at

<http://physics.nist.gov/Pubs/SP330/sp330.pdf>

The 2008 edition has no impact on the SI units used in Appendix C of the Standard:
MPa and °C

4. Other References:

Google dictionary: <http://www.google.com/dictionary>
Merriam-Webster: <http://www.merriam-webster.com/>

The Chicago Manual of Style. Chicago: University of Chicago.

Webster's New International Dictionary of the English Language (Unabridged). Springfield, MA:
Merriam-Webster, Inc.

10. **Attachment 2 – Motion template**

Motion: Not Carried Amended Withdrawn • x – For • x – Against • x – Abstained
Name 2011 Nov 17 Motion: Reason:

Reasons Against: Text goes here...

Reason Abstained: Text goes here...