ANS 3.5 Working Group Meeting Minutes
American Nuclear Society
Avila Lighthouse Suite Conference Center
2012 August 28-31

1. Visitors

Visitor	Date	Affiliation	Email, Phone Fax
Mr. Tim Dennis Proxy for Jim Florence	2012aug28	645 Lehigh Gap St. P. O. Box 119 Walnutport, PA 18088-0119	**Email**: a243@yahoo.com **Phone**:610-767-0979 **Fax**: 610-767-7095
Mr. Bill Fraser Proxy for Frank Tarselli	2012aug28	Westinghouse Electric Company Nuclear Automation PO Box 158-Waltz Mill Site Interstate 70, Exit 54 Madison, PA 15663, USA	**Email**: fraserwa@westinghouse.com **Cell**: 717-304-6225 **Work**: 724-722-5665
Steve White Proxy for McCullough		GSES 190 The Foothills Young Harris, GA 30582	**Email**: steven.white@gses.com **Phone**:678-378-1028
Vincent Gagnon		L-3 MAPPS 8565 Cote-de-Liesse Montreal, Quebec H4T1G5 Canada	Email: vincent.gagnon@l-3com.com Work: 514-787-4927 Cell: 760-638-3348
Charlie Brooks Proxy for Koutouzis		INPO 700 Galleria Parkway Atlanta, GA	**Email**: brookscr@inpo.org **Phone**: 770-644-8398
John Becerra		Diablo Canyon PO Box 56 Avila Beach, CA 93422	**Email**: jmbi@pge.com **Phone**:805-545-4006 **Fax**: 805-545-4004
Tom Luniewski		Diablo Canyon PO Box 56 Avila Beach, CA 93422	**Email**: txl4@pge.com **Phone**:805-545-3905 **Cell:** 805-305-3031 **Fax**: 805-545-3339

2. Membership and Attendance

Present	Member	Address	Notes-Proxy	Email-Phone-Fax
Absent	Jim Florence **Chair**	Nebraska Public Power District P. O. Box 98 Brownville, Nebraska 68321	Proxy Tim Dennis	**Email**: jbflore@nppd.com **Phone**: 402-825-5700 **Fax**: 402-825-5584
Present	Robert Felker **Vice Chair**	Western Services Corporation 7340 Executive Way, Suite A Frederick, MD 21704		**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
Absent	George McCullough Proxy Steve White	GSE Systems, Inc. 2300 St. Marys Road Suite D St. Marys, GA 31558	Proxy Steve White	**Email**: gsmccullough@gses.com **Phone**: 912-576-6730 **Cell**: 410-707-6946
Absent	Dennis Koutouzis Proxy	INPO 700 Galleria Parkway, NW Atlanta, GA 30339-5957	Proxy Charlie Brooks	**Email**: koutouzisjd@inpo.org **Phone**: 770-644-8838 **Fax**: 770-644-8120
Absent	Frank Tarselli	129 Abbey Rd Sugarloaf, PA 18249	Proxy Bill Fraser	**Email**: frankt64@epix.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**:
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
Present	Michael Petersen	Xcel Energy – Prairie island – Monticello 1660 Wakonade Drive West Welch, MN 55089		**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

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		

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.

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

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 Welchel 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

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.

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.

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

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.

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 *Code of Federal Regulations*, 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.

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.

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.

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

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.

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		2011nov17	**McCullough**	Verify testing periodicity terminology consistency across section 4.
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		2012Mar15	**Chang** Fraser Goodman	Consider definitions for "benchmark" and "baseline".
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 "indentify noticeable differences that need to be resolved". (responsibility Dennis) 2012aug28 – Closed by agreement
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		2012aug30 Avila Beach	**Vick** Lawter Rey Sale Tarselli	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.

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		2012aug31	**Chang** Rey Colby Vick	New definition for human-machine interface
46		2012aug31	**Petersen** Goldman Fraser Rey	Review evolution limitations and Limit of simulation for continued applicability.
47		2012aug31	**Mcdade** Florence Felker	Review Scope statement to include additional exclusions.
48		2012aug31	**Chang** Rey Gagnon	Review the standard for extended length scenarios and possible guidance.

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.

5. Tuesday 2012 August 28 (0800)

5.1 Introduction (0800)

John Becerra - Diablo Canyon

5.2 Roll Call

Members Present:

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

5.3 Consensus Level

16 - Voting members (4 proxy)
16 - Voting members Present
9 - Quorum (Majority Total Membership)
12 - Consensus (≥ 75% votes)
11 – Super Majority (≥ 2/3 Votes)
9 – Majority (> 50% votes)

Proxy/Visitors:

Tim Dennis (Florence Proxy)
Bill Fraser (Tarselli Proxy)
Steve White (McCullough Proxy)
Charlie Brooks (Koutouzis Proxy)
John Becerra
Tom Luniewski

5.4 Standard Completion Schedule:

Felker presented a schedule for discussion:

ID	Task Name	Start	Duration
131	ANS 3.5 Standard Draft Changes Complete	2013Feb01	1 Day
132	Outstanding Issues Meeting	2013Jun14	5 Days
133	Prepare/Submit proposed standard: • ANS-21 • NFSC • Public Review	2013Nov15	1 Day
134	Address/Resolution Comments Meeting	2014Mar10	1 Day
135	Outstanding Issues Meeting	2014Jun16	1 Day
136	5 Yr Maintenance Activities End	2014Sep04	1 Day

5.5 Motion (Carried): Granbury Minutes Approved

Motion: **Carried** • 16 – For • 0 – Against • 0 – Abstained
Date 2012 aug28 **Motion**: Approve Granbury Minutes Draft rev 12

5.6 Project Schedule Approval (Felker)

A summary was presented outlining the remaining open action items. Conclusion is that this standard can be concluded per the project schedule i.e. this meeting plus two additional meetings (2012Dec, Spring of 2013). By the fall the standard should be ready for the approval mode.

5.7 Motion (Carried): Agenda Rev 1 Review and Approval

Motion: **Carried** • 16 – For • 0 – Against • 0 – Abstained
Date 2012 aug28 **Motion**: Agenda Rev 1 with changes discussed.

5.8 Officers reports

Florence (Chair)	Absent
Welchel (Secretary)	No report
Colby (Editor)	Document – New rev 5 Working Document
Chang (Style Editor)	Presented Style Editing Reminder
Vick (Parliamentarian)	Additional clarification is required for Abstain Pass/Fail count

5.9 Industry Update

INPO	INPO and Japan Update

INPO Charles Brooks	SAMG and Simulators CPE is not driving SAMG Recommendation ANS 3.5 follow industry Fukashima activity.
USUG Florence	No report
Dennis	Standards approval timeline may be longer than 5 years. Additional review may be warranted.
Dennis	2009 Standards adoption status: 28% (20) - 1985 33% (24) - 1998 39% (28) - 2009
Dennis	Standards approval timeline may be longer than 5 years. Additional review may be warranted.
WESTRAIN Goodman	WESTRAIN feedback: Should ANS provide additional guidance for CPE and SAMG scenarios? Some WESTRAIN members expressed concern over new Normal Evolutions test periodicity.
NEI Petersen	NEI: No activity Vick: New Builds AI initiative, new draft inspection procedure. New IP (training procedure 4000 series) is applicable for both legacy and new builds.
SSNTA	No activity
Dennis	Monitor API1000 owners group.

5.10 AI 39 & 41 (Goodman)

AI 39 - Consider revising Section 5.1 to include verification and validation as it applies to initial simulator construction.
AI 41 - 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 “indentify noticeable differences that need to be resolved”. (responsibility Dennis)

AI-41
1. (Demonstrate): No change required.

Felker-The word "Demonstrate" implied a broad application allowing a user defined "Demonstrate"
Goodman-Section 5.2.2 contains a more rigorous process for resolution of discrepancies that includes the use of written procedures and more detailed documentation than previously required. The wording of section 5 meets or exceeds the original requirements to "demonstrate" and no further changes are required

2. (Background): Already addressed in the last sentence in the Background section. No change required.
3. (IEEE and V&V): V&V should stay in CM versus in testing. No reference to IEEE needed.
4. (Noticable Difference): No change required.

Goal is that discrepancies are identified and placed in the CM system and not that all discrepancies are resolved..
Brooks-Question in 5.2.1 How does one demonstrate applicability.
Goodman-Following discussion, the Working Group determined that the current wording is preferable to the previous wording in that testing is performed to identify discrepancies. Otherwise, tests cannot be accepted and closed until all discrepancies are resolved.
The working group agreed to close AI-41 with no additional actions.

AI-39

A lengthy discussion on the applicability of adding V&V to section 5.1. Input was varied.

The working group agreed to close AI-39 with no additional actions.

5.11 Motion (Carried) Section Numbering Alignment

Motion: **Carried** • 16 – For • 0 – Against • 0 – Abstained
Goodman 2012aug28 **Motion**: Change the first sentence in 5.1.2 from:

The simulator performance benchmark comprises the reference data necessary for the completion of operability testing defined in Sec. 4.4.3.1 at the time the simulator is approved for use in operator training and examination. to: The simulator performance benchmark comprises the reference data necessary for the completion of operability testing defined in Sec. 4.4.1 at the time the simulator is approved for use in operator training and examination. **Reason**: Section numbering alignment as a result of changes to Section 4.	5.12

Motion (Carried) Section Numbering Alignment

Motion: **Carried** • 16 – For • 0 – Against • 0 – Abstained
Goodman 2012aug28 **Motion**: Change the first sentence in 5.2.4 from: The simulator performance benchmark comprises the reference data necessary for the completion of operability testing described in Sec. 4.4.3.1. to: The simulator performance benchmark comprises the reference data necessary for the completion of

operability testing described in Sec. 4.4.1.

Reason: Section numbering alignment as a result of changes to Section 4.

5.13 Motion () AI-6 Non-integrated Mode Testing

Motion: **Not Carried Amended Withdrawn**

- xx – For
- xx – Against
- xx – Abstained

Peterson
2012aug28

Motion:

New Definition:

baseline comparative analysis: An analysis performed comparing the fully integrated mode test baseline and the results achieved through an other than fully-integrated mode of testing for the purpose of determining any differences.

Replace the last paragraph in Section 3.4 with the following wording:

Simulator performance testing comprises operability testing, scenario-based testing, reactor core performance testing, and post-event simulator testing. Simulator performance testing should be performed in a fully integrated mode of operation. Other than fully-integrated mode performance testing credit may be taken when a baseline comparative analysis results in no comparative difference.

Reason: Current standard does not allow other than fully-integrated mode performance testing.

Reasons Against: Text goes here…

5.14 Amended Motion (Withdrawn) AI-6 Non-integrated Mode Testing

Motion: **Not Carried Amended Withdrawn**

- xx – For
- xx – Against
- xx – Abstained

Peterson
2012aug28

Motion:

New Definition:

baseline comparative analysis: An analysis performed comparing the fully integrated mode test baseline and the results achieved through a non-fully-integrated mode of testing for the purpose of determining noticeable differences.

Replace the last paragraph in Section 3.4 with the following wording:

Simulator performance testing comprises operability testing, scenario-based testing, reactor core performance testing, and post-event simulator testing. Simulator performance testing shall be performed in a fully integrated mode of operation. Simulator performance testing may be performed in a non-fully-integrated mode of operation when a baseline comparative analysis results in no noticeable differences.

Reason: Current standard does not allow other than fully-integrated mode performance testing.

Possible issues with the amended motion were discussed. The motion was withdrawn.

5.15 AI-23 IC Jim Sale

The following presentation was presented and discussed.

ACTION ITEM #23 PRESENTATION (TEAM VICK)

TEAM: Vick, Tarselli, Rey, Sale, Florence, and Chang

ACTION: 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.

STATUS: The team made a proposal at the JUNE 2011 WG meeting for consideration. WG discussion and consideration is in progress. In general, members acknowledge the need for adding initial condition criteria in the standard.

DISCUSSION: The standard defines the term "initial condition" as "A set of data that represents the status of the reference unit from which real time simulation can begin." Section 3.3.1, "Initial Conditions," is silent on the nature of and type of initial conditions that should be established and used for conducting performance tests required by Section 3.4.3.

The following initial condition sets should be considered for use for all full scope nuclear power plant simulators that meet the scope and fidelity requirements of the standard. The use of a standard set of initial conditions for conducting ANS-3.5 simulator performance testing would enhance the reliability and validity of test results.

REVISED PROPOSAL: The following revised proposal should be discussed and considered for the next standard.

3.3.1 Initial conditions

The simulator shall include storage capacity for a sufficient number of initial conditions to support the simulator performance tests identified in Sec. 3.4.3. This set of initial conditions shall be identified and administratively controlled. A baseline set of initial conditions, from which subsequent performance test initial conditions are developed, shall be established.

The baseline initial condition set shall be established subsequent to completion of each reference unit core reload and reflect the reference unit in either a cold shutdown condition or a 100% steady state power condition. The baseline initial condition set shall be validated using applicable core reload design data and available reference unit data.

Initial conditions that reflect operation of the reference unit at power levels below 100% shall be developed starting with a baseline initial condition. The unit startup or unit shutdown shall be accomplished in real time using station approved procedures. The evolution shall be performed in a continuous manner from either a 100% steady state power condition to a cold shutdown condition or from a cold shutdown condition to a 100% power condition. Momentary freezes in simulation are allowed for saving less than 100% power initial conditions.

Initial conditions used to satisfy the steady state test described in Sec. 3.4.3.1 shall be selected from the baseline initial condition set and/or the initial conditions developed as described in the preceding paragraph. The initial conditions utilized shall be the same as the reference unit operating conditions following either power ascension or power reduction to the power levels chosen. It is permissible to accelerate the time at which core poison concentrations reach equilibrium.

Core performance testing described in Section 3.4.3.3.shall be performed using an initial condition that places the simulator in a condition that the same as the reference unit conditions prior to initial startup.

All subsequent initial conditions used for performance testing, except as described below, shall be established from the baseline initial condition and developed as a result of real time operation of the simulated nuclear power plant using plant operating procedures.

Initial condition sets developed and maintained for different reactor core life cycles (eg. initial core loading, beginning of cycle (BOC), middle of cycle (MOC), and end of cycle (EOC)) may be established by means other

than real time operation. Initial condition set(s) established in this manner shall fully support plant operation in real time over the entire spectrum of power operations using plant operating procedures.

After a lengthy discussion, the working group agreed that the Section 4.3.1 requirement "ICs shall be administratively controlled" is adequate.

AI-23 is closed.

5.16 Recessed: 1700

6. Wednesday 2012 August 29 (0800)

6.1 Roll Call

Members Present:

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

6.2 Consensus Level

16 - Voting members
16 - Voting members Present
9 - Quorum (Majority Total Membership)
12 - Consensus (≥ 75% votes)
11 – Super Majority (≥ 2/3 Votes)
9 – Majority (> 50% votes)

Proxy/Visitors:

Tim Dennis (Florence Proxy)
Bill Fraser (Tarselli Proxy)
Steve White (McCullough Proxy)
Charlie Brooks (Koutouzis Proxy)

6.3 AI-9 McDade – Next Generation Simulators Appendix D

Felker – Short history of Appendix D

- Not intended to be used to define PTT requirements
- 10CFR55.46 required two
  - Full scope plant referenced simulator
  - Simulation Facility
- What is a Simulation Facility – Possibly Appendix D defines a Limited Scope Simulator

AI-9 Charge

- Review present Standard Sections
- Solicit industry feedback on Cold License Training

Dennis – NEI worked with NRC to get Appendix D approved for Cold License use. NRC Document ML082950140 - Final Safety Evaluation for Topical Report NEI 06-13A "Template for an Industry Training Program Description," Revision 1

Lawter – New build FSARs reference Appendix D. Cold License training will be conducted on a Limited Scope simulator in accordance with ANS 3.5 2009 Appendix D

Simulator uses:

- Engineering Assist
- E Plan
- HMI Development
- Procedure Development

Vick – The Scope statement must be modified to incorporate Appendix D into the Standard body.

Recommendation is to leave Appendix D.

AI-9 is closed.

6.1 Motion (Not Carried) AI-6 Non-integrated Mode Testing

Motion: **Not Carried** • 7 – For • 8 – Against • 1 – Abstained
Peterson 2012aug29 **Motion**: **Replace the last paragraph in Section 3.4 with the following wording:** Simulator performance testing comprises operability testing, scenario-based testing, reactor core performance testing, and post-event simulator testing. Simulator performance testing shall be performed in a fully-integrated mode of operation unless acceptable simulator performance has been assured when testing is performed in a non-fully-integrated mode of operation. **Reason**: Current standard does not allow other than fully-integrated mode performance testing.

Difficult to determine assure performance testing in the Non-fully-integrated mode.

Several examples were given detailing possible testing schemes. All utilized a detailed analysis comparing Fully-Integrated and Non-Fully-Integrated modes.

Reason No:

- Open ended, may not pass regulatory scrutiny
- Ability to achieve the same results and no periodicity
- No assurance performance NIMO is the same as Full-Integrated mode
- Will not demonstrate Regulatory compliance
- Regulatory issue
- Inappropriate sentence, Do this unless Do that
- Too open ended, more criteria needed. Limit to Operability testing
- No assurance the whole simulator is tested

Reason Abstention: Conceptually agree

Some members request AI-6 is not closed. The chair request that the AI-6 Tiger team consider the additional input based on discussions and stated No Vote reasons.

6.2 AI-20 Colby DCS

Presentation:

Section 2 Definitions

Distributed Control System (DCS) –
(1) A Distributed Control System (DCS) is a control system method that is spread, or distributed, among several different unit processes. Controller elements are not central in location but are dispersed throughout the system with each component sub-system controlled by one or more controllers. The entire system of controllers is connected by a network for communication and monitoring. DCS is typically a solution that includes multiple redundant process controllers, an HMI, a Process Historian, and configuration software.
(2) A Digital Control System (DCS) is a programmable logic system typically with its own man machine interface that is used in the NPP to control and monitor plant processes. (Note: from IAEA document)
Human Machine Interface (HMI) - A software application (typically using a Graphical User Interface or GUI) that presents information to the operator about the state of a process, and to accept and implement the operators control instructions.
Programmable Logic Controller (PLC) - A control device that employs the hardware architecture of a computer and relay ladder diagram language.
Historian - A historian is a type of database designed to archive automation and process data.

Source: OPC Training Institute http://www.opcti.com/default.aspx
Hybrid – Something having two kinds of components that produce the same or similar results.
Emulation – Implementation of a reference plant system or subsystem typically by migration of the plant system software to run in the simulator operating environment. The performance and physical fidelity of the emulated system should be identical to the reference plant system.
Source: IAEA-TECDOC-1500 Guidelines for upgrade and modernization of nuclear power plant training simulators http://www-pub.iaea.org/MTCD/publications/PDF/te_1500_web.pdf
While the definitions above should be included in the standard in some degree, the minimum inclusion should be the definitions for DCS, HMIs and Emulation as these are commonly used industry terms.

WG survey on legacy simulator installed DCS indicated no issues with meeting the present standard

6.3 Motion (Withdrawn) AI-20 Colby DCS

Motion: **Not Carried Amended Withdrawn**
- x – For
- x – Against
- x – Abstained

Name
2012 Aug 29

Motion:

Change 3.2.1.1 from

3.2.1.1 Scope of panel simulation

The simulator shall include those panels, consoles, and operating stations required to provide the controls, instrumentation, alarms, and other human-system interfaces used by operators in the reference unit to conduct the normal evolutions of Sec. 3.1.3.2 and respond to the malfunctions of Sec.

3.1.4.

To

3.2.1.1 Scope of operator interface

The simulator shall include those panels, consoles, operating stations, and HMIs required to provide the controls, instrumentation, alarms, and other human-system interfaces used by operators in the reference unit to conduct the normal evolutions of Sec. 3.1.3.2 and respond to the malfunctions of Sec. 3.1.4.

Change section 3.2.1.2 from

3.2.1.2 Instrumentation, controls, markings, and operator aids

The simulator panels, consoles, and operating stations shall include instrumentation, controls, markings, operator aids, and other components or displays that are used during normal, abnormal, off-normal, and emergency evolutions. The following items shall be considered:

To

3.2.1.2 Instrumentation, controls, markings, and operator aids

The simulator panels, consoles, operating stations, and HMIs shall include instrumentation, controls, markings, operator aids, and other components or displays that are used during normal, abnormal, off-normal, and emergency evolutions. The following items shall be considered:

Change section 3.3.3 from:

3.3.3 Other features

The simulator shall include freeze, run, snapshot, backtrack, control room panel hardware override, and initial condition reset.

Other features, such as replay, slow time, fast time, component failure capabilities, operator performance monitoring, monitoring of parameters, and plotting capabilities, should be included.

For stimulated components that store historical data or whose performance is dependent on history, requirements for freeze, run, initial condition reset, snapshot, and backtrack shall be included.

To

3.3.3 Other features

The simulator shall include freeze, run, snapshot, backtrack, simulator input/output override, and initial condition reset.

Other features, such as replay, slow time, fast time, component failure capabilities, operator performance monitoring, monitoring of parameters, and trending capabilities, should be included.

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

Change section 4.2.1.1 from

4.2.1.1 Scope of panel simulation

A comparison shall be performed to demonstrate that panels, consoles, and operating stations that are simulated as required by Sec. 3.2.1.1 replicate the size, shape, color, and configuration of those of the reference unit; that noticeable differences are corrected or that a training needs assessment has been conducted in accordance with the criteria provided by Sec. 5.

To

4.2.1.1 Scope of operator interface

A comparison shall be performed to demonstrate that panels, consoles, operating stations, and HMIs that are required by Sec. 3.2.1.1 replicate the size, shape, color, and configuration of those of the reference unit; that noticeable differences are corrected or that a training needs assessment has been conducted in accordance with the criteria provided by Sec. 5.

Change section 4.2.1.2 from

4.2.1.2 Instrumentation, controls, markings, and operator aids

A comparison shall be performed to demonstrate that instrumentation, controls, markings, and operator aids that are on panels, consoles, and operating stations, which are simulated in accordance with Sec. 3.2.1.2, replicate the size, shape, color, configuration, feel, and dynamic functioning of those of the reference unit. Components located on simulated panels but not used by the operator during training may be visually simulated hardware. It shall be demonstrated that information is displayed to the operator in the same format and engineering units as in the reference unit control room. It shall be demonstrated that noticeable differences are corrected or that a training needs assessment has been conducted in accordance with the criteria provided by Sec. 5.

To

4.2.1.2 Instrumentation, controls, markings, and operator aids

A comparison shall be performed to demonstrate that instrumentation, controls, markings, operator aids and HMIs which are simulated in accordance with Sec. 3.2.1.2, replicate the size, shape, color, configuration, feel, and dynamic functioning of those of the reference unit. Components located on simulated panels but not used by the operator during training may be visually simulated hardware. It shall be demonstrated that information is displayed to the operator in the same format and engineering units as in the reference unit control room. It shall be demonstrated that noticeable differences are corrected or that a training needs assessment has been conducted in accordance with the criteria provided by Sec. 5.

Reason:

After a lengthy discussion, several changes to the motion were requested to clarify what is being changed.

Motion is withdrawn.

6.4 AI-16 Sale Other uses of the Simulator

ACTION: 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.

DISCUSSION: From its inception, ANS-3.5 was developed as a standard by which nuclear utilities could demonstrate that their plant-referenced simulators were of sufficient scope and fidelity to permit their use for licensed operator training and examination. As such, the standard's design provides a satisfactory method for demonstrating that a plant-referenced simulator is in compliance with 10CFR55.46, "Simulation facilities."

Aside from license operator training and examination, utilities have found other processes for which their plant-referenced simulator could be used. One of these alternative uses is associated with engineering assistance.

PROPOSAL: Given that ANS-3.5 was specifically designed to accommodate simulator usage in the training and examination of licensed operators, it is proposed that Section 1 of ANS-3.5, "Scope and Background" make no reference to

alternative simulator usage. This includes footnotes.

JUSTIFICATION:

• ANS-3.5 should not restrict a utility's ability to use their simulator for purposes that are outside the bounds of operator training and evaluation.

• ANS-3.5 is specifically designed to establish a standard that pertains to a simulator's use for training and examining licensed operators.

• ACAD-00-002, "Selected Enhanced Training Approaches" provides appropriate guidance and cautions for use of the simulator in training programs other than licensed operator training programs.

• In the event that a need to control usage of the simulator for purposes other than operator training and evaluation is identified, it should be left up to the utility to control these applications by station administrative procedures and/or departmental training.

• Expanding the scope of ANS-3.5 would detract from its original intent which is to establish the "functional requirements of full-scope nuclear power plant control room simulators for use in operator training and examination." This could lead to confusion between satisfying SAT based objectives for operators and satisfying the needs of other uses of the simulator, such a modification assumptions and other predictive applications such as procedures development.

Scope statement change will require a PINS document change.

Recommendation is to not add a Scope section footnote.

AI-16 is closed.

6.5 AI-18 Rey International use

> Operating and training practices may differ among the various domestic and international organizations that operate nuclear power reactors; the common goals, however, are to ensure safety, equipment availability, and efficient operations. The application of this standard provides flexibility in the design and use of domestic and international nuclear power plant simulators in meeting these common goals. 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 domestic and international communities. It is recognized that the application of this standard may be utilized by international nuclear power plant simulator organizations that are subject to regulatory authorities. It is the responsibility of international nuclear power plant simulator organizations to decide the degree of application of this standard.

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.

6.6 Recessed: 1710

7. Thursday 2012 August 30 (0800)

7.1 Roll Call

Members Present:

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

7.2 Consensus Level

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

Proxy/Visitors:

Tim Dennis (Florence Proxy)

Bill Fraser (Tarselli Proxy)
Steve White (McCullough Proxy)
John Becerra

7.3 AI-3 Vick – Add Performance Testing guideline to the appendices

Appendix X

(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

The discussion presented a draft Appendix. The draft appendix was reviewed.

One member recommended a new AI to review this draft for possible integration into the draft standard.

New 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. (www.new.ans.org/standards/resources/downloads/docs/policy-manual0612.pdf)

The working group recommendation is to close AI-3.

AI-3 is Closed.

7.4 AI-7 Vick - Review Power Range for consistency

The working group reviewed the term Power Range usage.

4.1.3.1 Steady-state operation -through continuous operation over the power range.
4.1.3.1.1 - power range nuclear instrumentation readings (new wording: nuclear instrumentation power indication)
4.1.3.1.4 - average power range monitor readings
B.2.1 Steady-state test parameters - average power range monitor readings (deleted in current draft)
B.3.1 Steady-state test parameters - power range instrumentation readings (deleted in current draft)

Power range has been removed in 3 of 5 instances in the present draft standard. The remaining two instances are consistent.

The working group recommendation is to close AI-7.

AI-7 is Closed.

7.5 AI-6 Petersen – Non-fully-integrated mode

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

event simulator testing. Simulator performance testing shall be performed in either a fully-integrated or non-fully-integrated mode of operation. When testing is performed in a non-fully-integrated mode of operation an analysis shall have been performed to assure that the use of the non-fully-integrated mode of operation will not result in unidentified noticeable differences.

The proposed wording above was discussed.

Members are concerned about the analysis the assure the non-fully-integrated mode

7.6 Motion(Carried) AI-6 – Petersen – Non-fully-integrated Mode Performance Testing

Motion: ~~**Carried**~~ **(2012sep21: Not Carried per Carl Mazzola Email)** • 8 – For • 7 – Against • 0 – Abstained
Name Petersen 2012 Aug 30 **Motion**: Replace the last paragraph in Section 3.4 with the following: Simulator performance testing comprises operability testing, scenario-based testing, reactor core performance testing, and post-event simulator testing. Simulator performance testing shall be performed in either a fully-integrated or non-fully-integrated mode of operation. When testing is performed in a non-fully-integrated mode of operation an analysis shall have been performed to assure that the use of the non-fully-integrated mode of operation will not result in unidentified noticeable differences. **Reason**: The current standard does not allow the use on non-fully-integrated mode of operation for Performance Testing which is desired by members of the industry.

Reasons Against:
- Problematic obtaining regulatory support. Simulator performance exception due to its not being hooked up to the panels.
- All testing modes are not applicable
- Is not applicable to SBT
- SBT cannot be completed in NIMO
- Too broad and too many tests.
- NIMO does not adequately test the simulator
- Substituting one unnecessary requirement for two unnecessary requirements
- Some simulator performance tests performed in the non-fully-integrated mode would not be appropriate

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.

The previous requirement is still in this language, plus an alternative.

7.7 Motion (Carried) AI-20 Colby DCS

Motion: **Carried** • 14 – For • 1 – Against • 0 – Abstained
Name Colby 2012 Aug 30 **Motion**: 1. Replace the header of section 3.2.1.1 - “Scope of panel simulation” with “Scope of operator interfaces”. 2. Replace section 3.2.1.1 paragraph with the following: “The simulator shall include those panels, consoles, operating stations, and other human-machine interfaces (HMIs) required to provide the controls, instrumentation, alarms, and other human-system

interfaces used by operators in the reference unit to conduct the normal evolutions of Sec. 3.1.3.2 and respond to the malfunctions of Sec. 3.1.4."

3. Replace section 3.2.1.2 Instrumentation, controls, markings, and operator aids with the following:

"The simulator panels, consoles, operating stations, and other HMIs shall include instrumentation, controls, markings, operator aids, and other components or displays that are used during normal, abnormal, off-normal, and emergency evolutions. The following items shall be considered:"

- Switches;
- controllers;
- meters;
- recorders;
- mimics;
- demarcation lines;
- engravings;
- color;
- panel layout;
- plant computer;
- lights;
- annunciators;
- labels;
- tactile cues;
- other human-machine interfaces.

4. Replace section 3.3.3 - Other features with the following:

The simulator shall include freeze, run, snapshot, backtrack, operator interfaces, override, and initial condition reset.

Other features, such as replay, slow time, fast time, component failure capabilities, operator

performance monitoring, monitoring of parameters, and trending capabilities, should be included.

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.

5. Replace the header of section 4.2.1.1 - “Scope of panel simulation” with “Scope of operator interfaces”.

6. Replace section 4.2.1.1 paragraph with the following:

“A comparison shall be performed to demonstrate that panels, consoles, operating stations, and other HMIs that are required by Sec. 3.2.1.1 replicate the size, shape, color, and configuration of those of the reference unit; that noticeable differences are corrected or that a training needs assessment has been conducted in accordance with the criteria provided by Sec. 5.”

7. Replace section 4.2.1.2 paragraph with the following:

“A comparison shall be performed to demonstrate that instrumentation, controls, markings, operator aids that are on panels, consoles, operating stations, and other HMIs which are simulated in accordance with Sec. 3.2.1.2, replicate the size, shape, color, configuration, feel, and dynamic functioning of those of the reference unit. Components located on simulated panels but not used by the operator during training may be visually simulated hardware. It shall be demonstrated that information is displayed to the operator in the same format and engineering units as in the reference unit control room. It shall be demonstrated that noticeable differences are corrected or that a training needs assessment has been conducted in accordance with the criteria provided by Sec. 5.”

Reason:

Reason 1&2: In the revised section 3.2.1.1 title, panel was deleted because the panel is no longer the only operator interface. In addition the word simulation is deleted because stimulated options exist in regards to the HMIs and the choice should not be limited to simulation only.

Reason 3: In the revised section 3.2.1.2, HMIs were added as well as other humnan-machine

interfaces which are industry standard terms.

Reason 4: In the revised section 3.3.3 control room panel hardware was deleted and simulator input/output (as used previously in the standard) override was added because the I/O override capability should no longer be limited to hardware but should also include DCS I/O override. Plotting was deleted and trending added because plotting is a term no longer commonly used. Finally, stimulated was deleted because the requirement should not be limited to only stimulated devices but common to all components described and specifically to the DCS. Exam Security was added based on regulatory OE concerning left over historical data.

Reason 5&6: Section 4.2.1.1 was revised to match the changes to section 3.2.1.1.

Reason 7: Section 4.2.1.2 revised to match the revised section 3.2.1.2

Reason Against: Does not meet the intent of AI-20. Does not add to the current words. DCS is composed of two items: HIS and the control.

AI-20 is Closed.

7.8 AI-22 Lawter Cyber Security

A Power Point presentation was presented.

- ☐ Cyber Security
- ☐ **August 31, 2012**
- ☐ History
  - ☐ At Crystal River Meeting in January, 2011AI #22 was added:
  - ☐ Review the recent regulatory cyber security guidance and OE to determine if cyber security should be included in the standard.
- ☐ Tiger Team:

- Jody Lawter
- Keith Welchel
- Larry Vick
- Jim Sale
- Bob Felker

- Background (NRC web site)
- The purpose of cyber security is to detect and then eliminate or mitigate vulnerabilities in the digital system that could be exploited either from outside or inside of the digital system protected area. The process of defending against this class of failures is made more challenging by the rapidly evolving "industry" that continues developing new attack methods. Various individuals and undocumented organizations develop viruses, worms, and associated computer programs. Others concentrate on developing methods for gaining access to protected data and systems with the intent to disrupt system operations or illegally obtain information from the systems.
- Background
- Other Documents that cover Plant Cyber Security
  - **NEI-08-09** - Protection of Digital Computer and Communication Systems and Networks
  - **Reg Guide 5.71**- Cyber Security Programs for Nuclear Facilities
  - **10CFR73.54** - Protection of digital computer and communication systems and networks
  - **10CFR2.390** - Public inspections, exemptions, requests for withholding
  - **IN 2007-39** - Control of Simulation Software Categorized as Sensitive Unclassified Nonsafeguards Information
- Background
- 10 CFR 73.54(a)(2): Critical Digital Assets (CDA)
  - safety-related and important-to-safety functions
  - security functions
  - emergency preparedness functions, including offsite communications, and
  - support systems and equipment which, if compromised, would adversely impact safety, security, or emergency preparedness functions.
- USUG Cyber Security Surveys
- May 2012 (31 respondents)
- July 2011 (13 respondents)
  - Overwhelmingly report that the Simulator is <u>not</u> considered a Critical Digital Asset (CDA)
    - Exception: XCEL (Scott Whitson) => Simulator PPC is CDA
- USUG Cyber Security Surveys
- No new requirements reported except SUNSI
- " I believe it will be inevitable that nuclear power plant simulators are considered under a cyber security umbrella" –Jim

Florence
- ☐ No comments suggesting a need to include cyber-security in the standard
- ☐ Simulator Impact Examples
- ☐ Firewall Requirements (Data Diodes)
- ☐ Removable Media Restrictions
- ☐ Anti-virus Requirements
- ☐ Microsoft Security Updates
- ☐ Control of Sensitive Unclassified Non-Safeguards Information (SUNSI)
  - ☐ 10CFR2.390
  - ☐ Information Notice 2007-39
- ☐ Summary
- ☐ Other documents/organizations govern and supply guidance for Cyber Security
  - ☐ NRC
  - ☐ NEI
  - ☐ Utility IT or Plant Engineering
  - ☐ Site Procedures
- ☐ Recommendation
- ☐ Close this action item with no further action

Cyber security falls outside the standard and should not be considered.

Section 3.0 includes provisions for Exam Security. Consideration for Cyber Security may also be a consideration.

The recommendation is to close AI-22.

AI-22 is closed.

7.9 AI-28 Felker – review "If available" and "As applicable" Usage

If available - is only found in Appendix B which has been deleted

As applicable – Use in section D.1 item 6 (unique requirements as applicable)

Recommend deleting "as applicable" in D1 (6)

7.10 Motion (Carried) AI-28 Delete As Applicable in section D.1 (3)

Motion: **Carried** • 14 – For • 1 – Against • 0 – Abstained
Name Felker 2012 Aug 30 **Motion**: Delete "as applicable" in Section D.1 (3) **Reason**: No added clarification

Reason Against: Unnecessary to delete

AI-28 is closed.

7.11 AI-33 Welchel Review Fully Integrated, partially-integrated and Non-integrated, and Standalone Usage

AI-33
Review use and consistency of term Fully Integrated, partially-integrated and Non-integrated, and Standalone with regards to Sections 3 and 4.

3.4	Simulator performance testing comprises operability testing, scenario-based testing, reactor core performance testing, and post-event simulator testing. Simulator performance testing shall be performed in either a fully-integrated or

	non-fully-integrated mode of operation. When testing is performed in a non-fully-integrated mode of operation an analysis shall have been performed to assure that the use of the non-fully-integrated mode of operation will not result in unidentified noticeable differences.	
4.4.1	Simulator transient performance shall be demonstrated through the comparison of transient performance response to actual or predicted reference unit performance. The intent of simulator transient performance testing is to verify integrated simulator response and not to test malfunctions. Sec. 4.1.4, items (2) through (4) define the acceptance criteria for the simulator transient performance tests. The minimum set of parameters to be monitored for each selected transient performance test shall be those parameters required to evaluate integrated simulator performance.	
5.2.3.2	Change validation shall be performed by comparing the performance of modified simulated components or systems to actual or predicted behavior. Validation shall be completed prior to using the proposed change in the conduct of operator training or examination. Simulator validation may be performed in a fully integrated, partially integrated, or stand-alone mode of system operation.	

The Section 5 motion consolidated "fully integrated, partially integrated, or stand-alone mode" of system operation usage.

Recommendation is to close AI-33.

AI-33 is closed.

7.12 AI-36 White Section 5.1 Opening Paragraph replacement.

Discussion centered on re-baselining and possible scenarios, basically moving the simulator back in Section 5.1 space.

Unsure 5.1 is structured for re-baselining.

Section 5.1 is not designed for re-baselining.

Re-baselining is not defined.

Recommendation is to close with no additional actions.

AI-36 is closed.

7.13 AI-42 Chang Section 5.1.2 use of Because

Reason for Action: Several members of the WG suspected the use of "Because " in Sec. 5.1.2 (first paragraph, 2nd sentence) may not be appropriate during the Granbury meeting. There are cases only one data source is available. The use of "Because" implies multiple baseline sources are available.

Current: (5.1.2, 1st paragraph)

The simulator performance benchmark comprises the reference data necessary for the completion of operability testing defined in Sec. 4.4.3.1 at the time the simulator is approved for use in operator training and examination. Because multiple sources of baseline data are available, the order of preference to ensure simulator fidelity shall be as follows:

1. data collected directly from the reference unit;
2. data generated through engineering analysis with a sound theoretical basis;
3. data collected from a plant which is similar in design and operation to the reference unit;
4. data from subject matter expert estimates;
5. other data sources.

Proposed Editorial Change:

The simulator performance benchmark comprises the reference data necessary for the completion of operability testing defined in Sec. 4.4.3.1 at the time the simulator is approved for use in operator training and examination. When multiple

sources of baseline data are available, the order of preference to ensure simulator fidelity shall be as follows:

1. data collected directly from the reference unit;
2. data generated through engineering analysis with a sound theoretical basis;
3. data collected from a plant which is similar in design and operation to the reference unit;
4. data from subject matter expert estimates;
5. other data sources.

In Section 5.1.2 - Simulator performance benchmark, the working group agreed to change the word "Because" to "When".

This change is considered an editorial change.

AI-42 is closed.

7.14 AI-38 Rey AI-11 Consistency

After review, consistency of AI-11 is correct. No concern.

AI-38 is closed.

7.15 Recessed: 1650

8. **Friday 2012 August 31 (0800)**

8.1 Roll Call

Members Present:

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

8.2 Consensus Level

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

Proxy/Visitors:

Tim Dennis (Florence Proxy)

Bill Fraser (Tarselli Proxy)
Steve White (McCullough Proxy)
John Becerra

8.3 New AI-45 Definition for HMI

New definition for human-machine interface (HMI).

This is related to AI-20 Motion that was Carried this session.

Members: Chang, Rey, Colby

8.4 New AI-46 Review evolution limitations and Limits of Simulations for continued applicability

Petersen led a discussion regarding use of MELCOR and SAMG type scenarios.

Driven by Fukushima / SAMG type scenarios

Members: Petersen, Goldman, Fraser, Rey

8.5 New AI-47 Review Scope Statement to include additional exclusions.

The discussion centered on other uses of the simulator and possibly developing a buyer beware language for other uses such as Engineering, etc. Presently Training is mentioned in the last sentence.

Members: Mcdade, Florence, Felker

8.6 New AI-48 Review the standard for extended length scenarios and possible guidance

Members: Chang, Rey, Gagnon, Vick

8.7 Next meeting:

Host: Shearon Harris

Tentative Date: 2012dec11 - 14

8.8 Adjourned: 1024

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…