ANS 3.5 Working Group Meeting Minutes
Exelon – Kennett Square, PA

2003 Oct 27-31

1 Index

2 Next Meeting

Location: DS&S, Fredrick, MD
Airport:
Date: April 5-8, 2004

- Monday 8:30pm-5:30pm
- Tuesday 8:30am-5:30pm
- Wednesday 8:30am-5;30pm
- Thursday 8:30am-5:30pm
- Friday 8:30am – 12pm

3 Motions

McCullough AI-101 **2003Oct28** Revise Section 3.1.3 and Remove Bullet 5	Motion: **Not Carried** • 8 – For • 4 – Against • 1 – Abstained
Florence Accept 2003Jul21 Minutes as recorded in Rev 12 Short Description **2003Oct28** Accept 2003Jul21 Minutes as recorded in Rev 12	Motion: **Carried** • 13 – For • 0 – Against • 0 – Abstained
Paris AI-110 Modify Sections 3.2.1.1 and 4.2.1.1 **2003Oct28** Make Section 3.2.1 and 4.2.1 consistent. Operational and Control Panel were removed for consistency	Motion: **Carried** • 13 – For • 0 – Against • 0 – Abstained
Paris AI-110 Modify Sections 3.2.1.2 and 4.2.1.2 **2003Oct28**	Motion: **Carried** • 12 – For • 1 – Against • 0 – Abstained

Move the List from 4.2.1.2 to 3.2.1.2 and better align the reading of Sections 3.2.1.1 and 3.2.1.2	
Paris AI-110 Amend Sections 3.2.1.3 and 4.2.1.3 **2003Oct28** Move the List from 4.2.1.3 to 3.2.1.3	Motion: **Carried** • 12 – For • 1 – Against • 0 – Abstained
Paris AI-110 Amend Sections 3.2.1.4 and 4.2.1.4 **2003Oct28** No change to Section 3.2.1.4. Section 4.2.1.4 did not reference all sections, therefore references to sections were removed	Motion: **Carried** • 12 – For • 1 – Against • 0 – Abstained
Kozak Amend Sections 3.1.3 and 4.1.3 **2003Oct29** Eliminate the concern that the wording has been over restricted for long test	Motion: **Carried** • 9 – For • 1 – Against • 2 – Abstained
Kozak Amend Sections 3.1.3 and 4.1.3 **2003Oct29** General agreement Sections 3 and 4 are better aligned	Motion: **Not Carried** • 6 – For • 6 – Against • 0 – Abstained

Neis Sections 3.3 and 4.3 comparison Amend Sections 3.3 and 4.3 **2003Oct29** New wording better aligns Sections 3.3 and 4.3.	Motion: **Carried** • 12 – For • 0 – Against • 0 – Abstained
Havens Amend Sections 3.1.3 and 4.1.3 **2003Oct30** Better align Sections 3.1.3 and 4.1.3. Section 4.1.3 had several subsections and Section 3.1.3 was divided to align the two sections	Motion: **Carried** • 11 – For • 0 – Against • 0 – Abstained
Felker Amend Sections 3.0/4.0 and 3.1/4.1 **2003Oct30** Clarification of intent	Motion: **Carried** • 11 – For • 0 – Against • 0 – Abstained
Florence Amend Section 3.4, 3.3.5/4.3.5, 3.4/4.4 **2003Oct28** Moved electronic data collection requirements in Section 3.4 and created a modified Data Collection Section requirement 3.3.5 and a corresponding testing and validation requirement in new 4.3.5. Ref: Action Item 115. Developed the requirements in Sections 3.3 & 3.4 for the testing and validation requirements in Sections 4.3 & 4.4 (alignment of Sections 3.3 to 4.3 & 3.4 to 4.4.). Ref: Action Item 116.	Motion: **Carried** • 9 – For • 0 – Against • 2 – Abstained
Felker	Motion: **Carried** • 11 – For

Eliminate Appendix A1.4 and renumber **2003Oct31** Plant procedures should be used in the simulator	• 0 – Against • 0 – Abstained
Colby Replace **Simulated hardware** and **Stimulated Devices** with **Stimulated Component** **2003Oct31** Consistency	Motion: **Carried** • 11 – For • 0 – Against • 0 – Abstained

4 Action Item Activity

114	SBT Resolution. Revise and clarify section 4.4.3 specifically SBT. Define the scope of SBT. Quantify the annual SBT testing. Using Rev 13 of the Draft Standard. Evaluate 3.4.3.2 and 4.4.3.2 alignment	Felker - Lead Florence Neis Havens Wyatt
115	Find a home the existing wording of Section 3.4 Create Data Collection Section	McCullough
116	Develop the requirements, Section 3.4 for Section 4.4 that better defines the requirements for V&V	Koutouzis Florence
117	Review and evaluate references to Section 3.1.3 to determine if the correct linkage is still maintained	Havens
118	Examine Stimulated Hardware references to determine modification to Stimulated Components	Colby
119	Investigate the impact of removing "or initial condition" in paragraph one of Section 3.1.3	Kozak

5 Visitors

Visitor	Date	Affiliation	Email, Phone Fax
Frank Tarselli	2003Oct27-31	PO Box 467 Berwick, PA 18603	Email: fatarselli@pplweb.com Phone: 570.542.3551 Fax: 570.542.3855
Mike Wyatt	2003Oct27-31	Exelon 200 Exelon Way Kennett Square, PA	Email: micheal.wyatt@exeloncorp.com Phone: 610.765.5659 Fax: 610.755.5807

6 Roll Call

Present	Member	Address	Notes-Proxy	Email-Phone-Fax
Present	Timothy Dennis **Chairman**	P. O. Box 119 645 Lehigh Gap St. Walnutport, PA 18088-0119		Email: a243@yahoo.com Phone:610-767-0979 Fax: 610-767-7095
Present	Jim Florence **Vice Chairman**	Nebraska Public Power District P. O. Box 98 Brownville, Nebraska 68321		Email: jbflore@nppd.com Phone: 402-825-5700 Fax: 402-825-5584
Present	Keith Welchel **Secretary**	Duke Power Company Oconee Training Center- MC:ON04OT 7800 Rochester Hwy Seneca, SC 29672		Email: kwelchel@duke-energy.com Phone: 864-885-3349 Fax: 864-885-3432
Present	F.J. (Butch) Colby **Editor**	CAE Inc. 8585 Cote-de-Liesse P.O, Box 1800 Saint-Laurent Quebec, Canada H4L 4X4		Email: butchcolby@cs.com Email: butch.colby@cae.com Phone: (410) 381-3557 Fax: (410) 381-2017
Present	William M. (Mike) Shelly **Style Editor**	Entergy Services, Inc. 1340 Echelon Parkway Jackson, MS 39213-8298		Email: wshelly@entergy.com Phone: 601-368-5861 Fax: 601-368-5799
Present	Larry Vick **Parliamentarian**	US NRC, Office of Nuclear Reactor Regulation 09-D24 Washington, DC 20555		Email: Lxv@nrc.gov Phone: 301-415-3181 Fax: 301-415-2222
3 days	George McCullough	American Electric Power One Cook Place Bridgman, MI 49106		Email: gsmccullough@aep.com Phone: 269-466-3343 Fax: 269-466-3388 Cell: 269-449-5481
2 days	Hal Paris	GSE Systems 8930 Stanford Blvd. Columbia, MD. 21004		Email: hal.paris@gses.com Phone: 410-772-3559 Fax: 410-772-3595
Present	Robert Felker	EXITECH Corporation 102 E. Broadway Maryville,TN 37804		Email: felker@ws-corp.com Phone: 410-461-4295 Fax: 410-730-4008
Present	Allan A. Kozak	Dominion Generation North Anna power Station P.O. Box 402 Mineral, VA 23117-0402		Email: allan_kozak@dom.com Phone: 540-894-2400 Fax:540-894-2441
Present	Dennis Koutouzis	INPO 700 Galleria Parkway, NW Atlanta, GA 30339-5957		Email: koutouzisjd@inpo.org Phone: 770-644-8838 Fax: 770-644-8120

Present	Oliver Havens, Jr	PSEG Power Hope Creek Generating Station, NTC 244 Chestnut St. Salem, NJ 08079		Email: Oliver.Havens@pseg.com Phone: 856-339-3797 Fax: 856-339-3997
Proxy	Kevin Cox	Exelon Generation Dresden Nuclear Power Station 6500 North Dresden Rd. Morris, IL 60450	Mike Wyatt	Email: kevin.cox@exeloncorp.com Phone: 815-942-2920 x-2109 Fax: 815-941-7121
Absent	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	Jane Neis	R.E. Ginna Nuclear Power Plant Training Center 1517 Lake Rd Ontario, NY 14519		Email: jane_neis@rge.com Phone: (585) 771-6646 Fax: (585) 724-8278
NA		Standards Administrator American Nuclear Society 555 North Kensington avenue La Grange Park, IL 60526-5592		Email: Phone: 708-579-8269 Fax: 708 352 6464

7 Action Item List

7.1 Action Item Quick-look Table

Open	Complete	Carried to 2008

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~~	~~55~~	~~56~~	~~57~~	~~58~~	~~59~~	~~60~~
~~61~~	~~62~~	~~63~~	~~64~~	~~65~~	~~66~~	~~67~~	~~68~~	~~69~~	~~70~~
~~71~~	~~72~~	~~73~~	~~74~~	~~75~~	~~76~~	~~77~~	~~78~~	~~79~~	~~80~~
~~81~~	~~82~~	~~83~~	~~84~~	~~85~~	~~86~~	~~87~~	~~88~~	~~89~~	~~90~~
~~91~~	~~92~~	~~93~~	~~94~~	~~95~~	~~96~~	~~97~~	~~98~~	~~99~~	~~100~~
~~101~~	~~102~~	~~103~~	~~104~~	~~105~~	106	~~107~~	~~108~~	~~109~~	~~110~~
~~111~~	~~112~~	113	114	~~115~~	~~116~~	117	118	119	

7.2 Action Items

No.	Status	Date	Assigned To:	Work Assignment
1	**Dennis** contacted Mike Wright. No Input from Mike. The Scope change should be approved soon. 2001Apr05 Scope statement will be revised based on SubCommittee-1 comments that ANS 3.1 is not Training Criteria	Priority 1 – PINS form will be completed by next meeting (15min)	**Dennis**	DOE Nuclear Facility vs. Power Plant Simulators – Check with ANS 3. Inquire as to whether other simulator issues are addressed/referenced in other ANS 3 standards Dennis will contact Mike Wright (ANS-3 chair). Are DOE issues referencing simulators? 2001Apr05 Dennis Dennis attended the SubCommittee-1 meeting and was informed the PINS form needs to be completed. Additionally, the scope statement states ANS 3.1 establishes Training Criteria, but does not. Accepted 3.5 Scope change and Appendix D **2000mar09** Chandler Comments (NUPPSCO) relating to DOE simulators. We need to resolve Open NUPPSCO comments from the 1998 standards approval process.

8		Priority 1 – PINS form will be completed by next meeting (15min)	**Dennis**	Contact Mike Wright about the scope change Scope and Background submitted to Shawn and Mike. No schedule at present for ANS-3 to review scope change. 2002Oct29 PINs form completed and ready to send to ANS. 2001Apr05 Contacted Sub-Committee-1 and Dennis needs to complete PINS forms;
106			**Shelly-Lead Committee**	Working Group will review tech Editing markup Marked up version was distributed to committee members Comments to Shelly by 2003Sep01 **2003Oct31** **Determine use of the term "NOTE" in the standard.** 2003Jul24 Initial Action Item

113			**Havens** **McCullough** **Tarselli** **Kozak**	Appendix B Revision to Appendix B will address requirements as a result of AI-100 Update Appendix B with Core Performance as a result of adding Core Performance Testing in the Standard **2003Oct31** **Havens presented a revised Appendix B. Havens will review and make another recommendation at the next meeting.** 2003Jul24 Initial Action Item
114			**Felker** **Florence** **Neis**	SBT Resolution Felker will review section 4.4.3 and recommend a resolution to the SBT and checklist problem. **2003Oct28**
117			**Havens**	Review and evaluate references to Section 3.1.3 to determine if the correct linkage is still maintained **2003Oct30** **Initial AI**
118			**Colby**	Examine Stimulated Hardware references to determine modification to Stimulated Components **2003Oct30** **Initial AI**

119			**Kozak**	Investigate the impact of removing "or initial condition" in paragraph one of Section 3.1.3 **2003Oct30** **Initial AI**

8 Working Group Procedural Rules

8.1 Rules of the Chair

- Interim Voting (Motions – Substantive Changes) shall be by Consensus (75% [rounded up] of quorum in session)
- The Chairman 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 not have voting privileges;
- Members attend the full length of the meeting;
- Word 7.0 will be the document format;
- The Host will collect and send all handout material for absent members without proxy;
- Robert's Rules of Order will be used as a general guide;
- Guest Individual Contributors may receive working copy of the draft standard based on need;
- Chair approval required for distribution of working copies of the draft standard;
- Members cannot Vote against their own non-amended Motion;

8.2 Rules Enacted by the Working Group

Missing two consecutive meetings in a row with out representation could result in loss of membership on the committee.

9 **Monday 2003Jul21 (Day 1 8:30AM)**

9.1 Introduction to Exelon (Wyatt)

Introduction and Welcome

9.2 Opening Comments (Dennis):

- Called Meeting to order
- Welcomed Visitors
- 13 Voting members
- 10 Members for consensus (75% Rule of the Chair)
- WG 3.5 has requested a one year extension through ANS-21 to NFSC. No justification is required for a one year extension. Requesting another year, will require written justification. The Standard is valid for 10 years from the date of issue unless replaced by a new revision. Maintenance cycle is 5 years. The WG will need to finish business by calendar year 2003 in order for approval bodies to complete the necessary work.

9.3 Roll Call

Absent Members (1):

Sk Chang (1)

Voting: 75% of 13 members present requires 10 for consensus.

9.4 Review of Meeting minutes Dated 2003Jul21

- 2003Jul21 minutes were reviewed and additional modifications were completed. The working group will review the modifications as the first order of business Tuesday.

9.5 Officers:

Officer Reports:

- Dennis
  - Attended MTNG meeting
  - NFSC Nov 17 meeting in New Orleans
  - Dec MTNG meeting at Pilgrim
- Florence:
  - Simulator is becoming more important in the day-to-day plant operational activities and is utilized more often in predicting and analyzing plant response.
  -
- Welchel:
  - Nothing to report
- Shelly:
  - Style comments received to date by NRC, INPO and committee members
- Vick:
  - Nothing to report
- Colby:
  - Revision 12 presently active
  - All comment have been incorporated
  - Summary of changes document available

9.6 Review of Mission Statement: (Dennis)

Action Item Screening Criteria:

Committee agreed to use the screening criteria for considering standard language changes.

If the action facilitates clarification of the existing document

AND
If Clarification results in minimal impact to the 1998 standard

AND
If work is doable by December 31, 2003

THEN
ACCEPT Action Item for 2004

ELSE
TABLE Item until 2009

9.7 IP 71111.11 Feedback and needs from Working Group (SIMWORLD 2003) – Vick

- Trimble – Handles Policy Side
  - Trimble presented Power Point Presentation
- Vick – Handles Technical Side
  - Utilities do NOT have to adopt the 1998 standard in order to use the simulator Experience Requirements
  - Colby – The industry is unsure of the requirements for SBT documentation and is looking for guidance
  - Colby – Can a utility go back to the 1985 standard
    - Vick – Outside the scope of this discussion
    - General agreement that this is outside the scope of the working group
    - Unsure of documentation requirements

9.8 NRC presentation at MANTG meeting (Tarselli)

- Training managers have lack of basic simulator testing understanding
- Unsure what level of documentation is required
- Why such a lack of knowledge
    - Training managers rotate through more often
    - Inadequate simulator staff and training managers communication
- Vick – Sites visited lately
    - Sequoia
    - Susquehanna
    - Salem
    - St Lucie
    - Cooper
    - Oyster Creek
    - IP 2
- A short discussion developed concerning DCS and using the simulator to validate plant control systems.
    - No simulator industry guidance

9.9 Technical Editing (Shelly)

- Using Standard modification rev 12
- Shelly led the Technical Editing discussion
- Combined the INPO and NRC markups
    - Updated Lists formatting (ANSI style guide)
    - Removed passive voice where applicable

- Rev 12 incorporates committee members comments

Motion:
Accept the technical editing to Rev 12 of the Draft Standard

The floor was open for comment:

- Section 4.4.3 footnote 4 was changed from Examples to Samples and the working group interprets Sample and Example to mean the same.
- The WG has not had an opportunity to review the final version as modified by Shelly.
- The WG members individually reviewed the proposed technically edited draft standard Rev 12.

The motion was withdrawn due to inconsistency between the Emailed technical edited version Rev 12 and the technically edited version Rev 12 distributed today.

Shelly will revise the controlled Draft Standard Rev 12 (Colby) for review by working group members on Wednesday

9.10 AI-107 Acceptable Performance Testing Documentation (Wyatt)

- See Appendix 12.3 for Handout
- SBT one page checklist is not sufficient
- Basic question
  - Guidance on performance test evaluation expectation
  - Acceptable comparison data
  - Data maintenance

- Little guidance in other industry documents
- Koutouzis:
  - Discussion on two scenarios where Utility 1 adopts SBT and finds many DR's over a time period; Utility 2 does not adopt SBT and finds few DR's in their testing program, but finds DR's in their training program.
  - Neis – Problems are discovered in the 1985 testing methods.
- Neis reviewed the proposed modification to Appendix E Guideline for Acceptable Documentation of Scenario-based testing and Section 4.4.3.2, Simulator Scenario based testing
- **Motion**
  Replace Section 4.4.3.2 and Appendix E as defined below:

4.4.3.2 Simulator Scenario-Based Testing.
The intent of scenario-based testing is to ensure the simulator is capable of producing the expected reference unit response to satisfy predetermined learning or examination objectives by utilizing the existing training and examination scenario validation process.

Performance testing credit may be taken for a scenario developed for the simulator, provided that the following conditions are satisfied:

(1) the scenario is tested prior to use for operator training and examination including the appropriate instructor interfaces, operator actions, and operator cues;

(2) the simulator response is evaluated by comparison to the expected reference unit response without procedural exceptions, significant performance discrepancies, or deviation from an approved scenario sequence;

A record of the conduct of these tests and evaluation of test results shall be maintained.[2]

Comment [BC1]: Approved change of deleting the word "Simulator" from the title of this section from April 22-25 meeting. Action item #40. This defines the testing as Scenario-based and not simulator testing per say.

Comment [bjc2]: Approved change of adding the word "Simulator" to the title of this section from October 28-31 meeting.

Comment [bjc3]: Approved change of adding the word "procedural" to section 4.4.3.2 scenario based- testing section (2) from the March 10-13 meeting. This action was taken to incorporate the wording in Sec. 55.46 Simulation facilities subsection **c (2) (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."

[2] Footnote: Appendix E provides an example of an acceptable means of documenting scenario-based testing.

Appendix E

(This Appendix is not a part of American National Standard for Nuclear Power Plant Simulators for Use in Operator Training and Examination, ANSI/ANS-3.5-2003, but is included for information purposes only.)

Guideline for Acceptable Documentation of Scenario-based Testing

The purpose of this Appendix is to provide an acceptable means for demonstrating simulator conformance to the requirements of Section 4.4.3.2 of the Standard. It is intended that documentation be provided to the extent necessary to form a sufficient basis for verification of simulator performance.

TEST CONDUCT includes the following:

- Initial conditions, malfunctions, local operator actions, and environmental parameters used for the scenario are defined in the scenario and are executed as defined in the scenario.
- Evolutions and operator actions in response to malfunctions are performed using reference unit procedures defined in the scenario without procedural deviation.

DOCUMENTATION retained includes the following:

- Scenario
- Operator procedures with place-keeping noted
- Alarm logs
- Key parameter trends

EVALUATION of Performance vs. Expected Reference Unit Response includes the following:

- Key parameters responded in the proper direction and order of magnitude expected of the reference plant.
- Plant equipment responded as expected, including automatic actions and response to manual operation.

Comment [bjc4]: Approved change from October 2002 meeting. Action item #40. Added Appendix E to the standard as an acceptable means for documenting simulator conformance to Section 4.4.3.2 of the Standard.

- Simulator response was as expected in the reference unit to achieve learning or examination objectives.
- Scenario execution was as planned without deviation in sequence, timing, operator interface, or instructor interface
- Simulator response was absent inappropriate operator cues, alarms, or automatic actions that may contribute to negative training.
- Identified deficiencies are documented for resolution.

The floor was open for discussion

- Training departments will find it difficult to adopt the new words
- Training will find it difficult to use this as their normal way of doing business.
- A lengthy discussion ensued concerning whether SBT should remain in the standard and if SBT is/will be a burden for training departments.

Motion was withdrawn after several hours of discussion.

Several members are unsure that SBT should remain in the standard. SBT scenarios are not being validated to level required by the standard's performance testing.

AI-107 is Closed.

9.11 Adjourned 2003Oct27 at 1700

10 **Tuesday 2003Oct28 (Day 2 8:30am)**

10.1 SBT (Felker)

Felker gave a 15 minute review of Section 4.4.3 and summarized (concluded) that the lead in paragraph basically states what is required for documentation for section 4.4.3.2 and that no more is needed other than considering a reorganization of 4.4.3.2 in section 4.4.3.

AI-114 SBT Resolution

10.2 Core Performance Testing (McCullough)

- Reviewed Section 3.1.3 and that Bullet 5 (1998) changed from Core Performance Testing (1993 – 3.1.3 Bullet 9) to Unit Performance Testing in the 1998 standard.
- The discussion centered around deleting Section 3.1.3 Bullet 5.

Motion

Modifiy 3.1.3 to remove Bullet 5

Add the word "to" in paragraph 4.1.3.2 after "… on the simulator shall be compared"

3.1.3 (1) Unit startup from cold shutdown to rated power conditions; (2) Unit shutdown from rated power to cold shutdown conditions; (3) Load changes; (4) Operator-conducted surveillance testing on safety related equipment or systems. 4.1.3.2 Normal Evolutions. The performance of procedures on the simulator shall be compared **to** and demonstrated to

represent correctly the response of the reference unit at the same power level consistent with reference unit procedures and data availability.

Felker recommended adding a bullet to 3.1.3 for Steady State considerations (Power Operations).

Florence recommends removing the Bullets in 3.1.3 and the utility would define the list in 3.1.3

Florence alternate wording -

4.1.3.2 Normal Evolutions. The performance of the simulator compared to the reference unit shall correctly represent the response of the reference unit consistent with reference unit procedures and data availability.

McCullough amended motion -

3.1.3

(1) Unit startup from cold shutdown to rated power conditions;
(2) Unit shutdown from rated power to cold shutdown conditions;
(3) Load changes;
(4) Operator-conducted surveillance testing on safety related equipment or systems.

4.1.3.2 Normal Evolutions. The performance of the simulator shall be compared **to** and demonstrated to represent the response of the reference unit at the same power level consistent with reference unit procedures and data availability.

McCullough amended motion #2 -

3.1.3

(1) Unit startup from cold shutdown to rated power conditions;
(2) Unit shutdown from rated power to cold shutdown conditions;
(3) Load changes;
(4) Operator-conducted surveillance testing on safety related equipment or systems;

Reason: The 1985 Standard had Core Performance in section 3.1.3 and we have addressed Core Performance Testing in Section 3.1.5. Unit Performance testing is not defined in the draft standard.

Vote:

For – 8
Against – 4
Abstained – 1

Not Carried

Negative Vote Comment - Limiting opportunities for Unit Integrated testing and comparing to Plant Data. List has been reduced and the value of the list is questioned.

10.3 AI-99 (Vick/Koutouzis)

Technical review has been completed and presented to working group.

AI-99 is Closed

10.4 Accept 2003Jul21 minutes

Additional last minute changes were made and reviewed.

Motion
Accept 2003Jul21 Rev 12 minutes as reviewed.

Vote
For – 13
Against – 0
Abstained – 0

Carried

10.5 AI-110 - Section 3.2 to 4.2 Comparison (Paris)

Paris is proposing no changes for Section 3.2 and 4.2

- See Appendix 12.4 for Comparison
- No changes unless there are new requirements
- Discussion centered on removing term “Operational” from both sections 3.2.1.1 and 4.2.1.1. Operational seemed redundant.
- **Motion to modify Section 3.2.1.1 and 4.2.1.1 as amended below**

3.2.1 Physical Fidelity and Human Factors	4.2.1 Physical Fidelity and Human Factors
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 3.1.3 and respond to the malfunctions of 3.1.4.	**4.2.1.1 Scope of Panel Simulation.** A comparison shall be performed to demonstrate that panels, consoles, and operating stations which are simulated as required by 3.2.1.1 replicate the size, shape, color, and configuration of those of the reference unit; that noticeable differences are documented; and that a training needs assessment has been conducted in accordance with the criteria provided by 4.2.1.4.

The floor was open for discussion:

- Havens – Removing "Operational" is captured by the needs assessment that is required.

Vote:
Approved – 13
Against – 0
Abstained – 0

Carried

Reason: Make 3.2.1 consistent with 4.2.1. "Operational" and "Control panel" were removed for consistency.

Section 4.2.1.2 Modification

Motion to modify Sections 3.2.1.2 and 4.2.1.2

3.2.1.2 Instrumentation, Controls, Markings, and Operator Aids. Meters, recorders, switches, annunciators, controllers, plant computer interface hardware, and other components or displays on the panels, consoles, and operating stations, that are used during normal, abnormal, off-normal, and emergency evolutions shall be included in the simulator. The following items shall be considered: •Switches •Controllers •Meters •Recorders •Mimics •Demarcation lines •Engravings •Color •Panel layout •General appearances •Plant computer capabilities •Lights •Annunciators •Labels •Tactile cues •Display systems	**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 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 documented and that a training needs assessment has been conducted in accordance with the criteria provided by 4.2.1.4.

The floor was open for discussion

Discussion center on keeping or removing Stimulated Components. The only location that "Stimulated Components" is used in this section - **Amended Motion to modify Sections 3.2.1.2 and 4.2.1.2**

•

Amended Motion to modify Sections 3.2.1.2 and 4.2.1.2

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: •Switches •Controllers •Meters •Recorders •Mimics •Demarcation lines •Engravings •Color •Panel layout •Plant computer •Lights •Annunciators •Labels •Tactile cues •Display systems	**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 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 documented and that a training needs assessment has been conducted in accordance with the criteria provided by 4.2.1.4.

Amended Motion #3 to modify Sections 3.2.1.2 and 4.2.1.2

Remove General Appearance

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: •Switches •Controllers •Meters •Recorders •Mimics •Demarcation lines •Engravings •Color •Panel layout •Plant computer •Lights •Annunciators •Labels •Tactile cues •Display systems	**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 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 documented and that a training needs assessment has been conducted in accordance with the criteria provided by 4.2.1.4.

The definition of tactile was read.

Vote:
For – 12
Against – 1
Abstained – 0

Carried

Reason – Move the List from 4.2.1.2 to 3.2.1.2 and better align the reading of Sections 3.2.1.1 and 3.2.1.2

Reason Against – The list should have stayed in section 4.2.1.2. List serves a better place marker in general in criteria rather than a strong requirement in Section 3. The list is not all inclusive.

Section 3.2.1.3 and 4.2.1.3

Motion to amend Section 3.2.1.3 and 4.2.1.3

3.2.1.3 Control Room Environment. The reference unit control room environmental features that support normal, abnormal, off-normal, and emergency evolutions shall be simulated. Communication systems that an operator would use to direct remote reference unit activities shall be operational at least to the extent that the instructor, when performing these activities, is able to communicate over the appropriate operator's communication system. The following items shall be considered •Floor plan •Lighting characteristics •Communications •Furnishings •General appearance •Audible cues •Obstructions.	**4.2.1.3 Control Room Environment.** A comparison shall be performed to demonstrate that the simulator control room environment replicates the reference unit control room in accordance with 3.2.1.3. 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 4.2.1.4.

Vote:
For – 12
Against – 1
Abstained – 0

PASSED

Reason – Move the List from 4.2.1.3 to 3.2.1.3

Reason Against – The list should have stayed in section 4.2.1.3. List serves a better place marker in general in criteria rather than a strong requirement in Section 3. The list is not all inclusive.

Section 3.2.1.4 and 4.2.1.4

Motion to amend Section 3.2.1.4 and 4.2.1.4

3.2.1.4 Simulator Control Room Deviations. Where physical fidelity and human factors deviations exist between the reference unit and the simulator, such deviations may remain if a training needs assessment is performed in accordance with 4.2.1.4.	**4.2.1.4 Assessment of Deviations.** A training needs assessment shall be performed for each identified deviation. Deviations that do not impact the actions to be taken by the operator or do not detract from training are acceptable. The following parameters should be evaluated to determine if the deviation has an impact on the actions to be taken by the operators: (1) The human-system interface required for normal, abnormal, or emergency procedures; (2) The differences in performing the task on the simulator versus performing the task in the reference unit control room; (3) The differences in operator cues, auditory and visual information presented to the operator, and the critical decisions and actions required of the operator; (4) The function of the equipment and the potential for impacting reference unit safety, tripping the reference unit, or damaging reference unit equipment; (5) The differences required by the team response to normal, abnormal, or emergency actions; (6) Review of operational experience to identify the potential for operator error or the necessity for reinforcement of the skills required for the task.

The floor was open for discussion. No discussion.

Vote:

For – 12
Against – 1
Abstained – 0

Carried

Reason – No change to Section 3.2.1.4. Section 4.2.1.4 did not reference all section, therefore references to sections were removed

Reason Against – Change for no apparent reason

3.2.2.1 and 4.2.2.1 - **No Change**

3.2.2.2 and 4.2.2.2 - **No Change**

10.6 AI-109 Section 3.1.3 and Section 3.1.4 Comparison (Havens)

Section 3.1.3 and 4.1.3

Title mismatch between Section 3.3 and 4.3

Havens led the WG through the changes 3.1.3 and 4.1.3. Havens presented new wording and organization to Sections 3.1.3 and 3.1.4.

Havens proposed revision split Steady-State and Normal Evolutions.

Some members were concerned the whole section will require a rewrite.

The WG devoted the remainder of the day discussing and developing new wording. See Appendix 12.5

Discussion of 3.1.3 and 3.1.4 will continue on Wednesday

10.7 Adjourned 2003Oct28 at 1715

11 Wednesday 2003Oct29 (Day 3 8:30am)

11.1 12 members present – 9 Votes constitutes Consensus

11.2 Section 3.1.4 and 4.1.4

Discussion of Sections 3.1.3 and 3.1.4 continued. See Appendix 12.5 for the original 3.1.3 and 4.1.3 recommendation from Havens.

- Havens presented an alternate modification to Sections 3.1.3 and 3.1.4 which recombined Steady-State and Normal Evolutions.
- The WG discussed at length the organization of sections 3.1.3 and 3.1.4.
- Using the Havens alternate, Florence recommended another version. The WG discussed and made additional modifications.
- The WG reviewed the Standard Scope Background, Section 1.2,and discussed whether to continue the one for one aligning of Sections 3 and 4. It was decided to continue with the one-for-one alignment but there is a difference of opinion as to how

Motion (Havens)

New Section 3.1.3 and 4.1.3 Sections.

3.1.3 – No Change

3.1.3.1 – New Section

3.1.3.2 – New Section

3.1.3 Steady-State and Normal Evolutions. The simulator shall support the conduct of the	**4.1.3 Steady-State and Normal Evolutions** It shall be demonstrated that the reference unit

Comment [ohh5]: Add the words for steady-state here and in the introductory paragraph to align with the divisions in 4.1.3

reference unit evolutions listed in this section in a continuous manner, without any mathematical model or initial condition changes. The simulator shall calculate system parameters corresponding to particular operating conditions, display these parameters on the appropriate instrumentation, and provide proper alarms and protective system actions. **3.1.3.1 Steady-State Operation.** The simulator shall correctly represent the response of the reference unit within the operating range for which reference unit data is available.	evolutions are conducted in a continuous manner without any mathematical model or initial condition changes. **4.1.3.1 Steady-State Operation.** It shall be demonstrated that the simulator correctly represents the response of the reference unit at three different power levels spanning at least 50% of the operating range for which reference unit data is available. The simulator power levels at which the comparison is performed shall have been attained through continuous operation over the power range. The recorded computed values of the parameters shall be compared with the reference unit data and shall be demonstrated to be within the tolerances noted below. The computed values of parameters not itemized below, and considered to be relevant to steady-state operation, shall be demonstrated to match reference unit data within 10% of the reference unit instrument loop range. In making comparisons between the simulator computed values and the reference unit data, an additional deviation may be allowed up to the documented value of the reference unit instrument error.[1] The simulator instrument error shall be no greater than that of the comparable meter, recorder, and related instrument system of the reference unit. **4.1.3.1.1.** It shall be demonstrated that the

[1] Appendix C provides several example steady-state tolerance calculations.

	following PWR parameters match reference unit data within 1% of the reference unit instrument loop range: • Temperature (T)-average • T-hot • T-cold • Core MWt • Power range nuclear instrumentation readings • Reactor coolant system pressure • Steam generator pressure • Pressurizer level. **4.1.3.1.2.** It shall be demonstrated that the following PWR parameters match reference unit data within 2% of the reference unit instrument loop range: • Steam generator feed flow • Reactor coolant system flow • Steam generator level • Letdown flow • Charging flow • Steam flow • Turbine first stage pressure • MWe **4.1.3.1.3.** It shall be demonstrated that the following BWR parameters match reference unit data within 1% of the reference unit instrument: • Core MWt • Reactor pressure

Comment [bjc8]: Approved change of moving MWe from table 4.1.3.1.1 to table 4.1.3.1.2 from April 20-25 meeting. Action item #13. This was also the consensus of the industry peer group based on a survey conducted by the ANS Working Group.

	• Reactor wide range pressure • Total core flow. **4.1.3.1.4.** It shall be demonstrated that the following BWR parameters match reference unit data within 2% of the reference unit instrument loop range: • Average power range monitor readings • Feedwater temperature (after last feedwater heating stage) • Total steam flow • Individual recirculation loop flows • Total feedwater flow • Turbine steam flow • Condenser vacuum • Individual calibrated jet pump flow • Narrow range reactor water level • MWe **4.1.3.2 Normal Evolutions.** The performance of procedures on the simulator, such as heat balance and determination of shutdown margin, shall be compared and demonstrated to represent correctly the response of the reference unit at the same power level consistent with reference unit procedures and data availability. It shall be demonstrated that simulator response during conduct of the normal evolutions identified in 3.1.3.2 meet the following acceptance criteria: (1) Be the same as the reference unit startup test procedure acceptance criteria. (2) Be the same as the reference unit
3.1.3.2 Normal Evolutions. The minimum evolutions that shall be supported by the simulator, using only operator action normal to the reference unit, are as follows:	

Comment [bjc9]: Approved change of moving MWe from table 4.1.3.1.3 to table 4.1.3.1.4 from April 20-25 meeting. Action item #13. This was also the consensus of the industry peer group based on a survey conducted by the ANS Working Group.

Comment [ohh10]: Change reference to be consistent with new 3.1.3 numbering

Comment [ohh6]: Add title for 4.1.3.2 – corresponds to 4.1.3.2. Separated this paragraph from other stead-state words

(1) Unit startup from cold shutdown to rated power conditions; (2) Unit shutdown from rated power to cold shutdown conditions; (3) Load changes; (4) Operator-conducted surveillance testing on safety related equipment or systems; and (5) Unit performance testing such as heat balance, determination of shutdown margin, and measurement of reactivity coefficients and control rod worth through the use of permanently installed instrumentation For evolutions not listed above, such as reactor core end-of-cycle coastdown, mid-loop operations, refueling operations, or evolutions where the reactor vessel head is removed, conditions may be achieved in a non-continuous manner and mathematical model or initial condition changes are permitted.	surveillance procedure acceptance criteria. (3) Be the same as the reference unit normal operating procedure acceptance criteria. (4) Require that any observable change in simulated parameters correspond in direction to those expected from **actual** or best estimate response of the reference unit. (5) Require that the simulator shall not fail to cause an alarm or automatic action if the reference unit would have caused an alarm or automatic action under identical circumstances. (6) Require that the simulator shall not cause an alarm or automatic action if the reference unit would not cause an alarm or automatic action under identical circumstances.

Comment [bjc7]: Approved change of 3.1.3 items 1 trough 5 from April 22-25, 2002: Action item #13. The new words in Item 1 includes the intent of old items #1, 2, 3, 5, 7, and 10 and as a result has replaced them. Old item # 8 wording changed in new item #2 to be consistent with wording in new #1. Old item # 4, # 6 and #9 were not changed and are now new item #3, 4, and 5. The main reason for the change is to eliminated unnecessary wording contained within various tables of the Standard and to make them a little more in tune with the industry as it exist in today's environment. This was also the consensus of the industry peer group based on a survey conducted by the ANS Working Group.

Motion to Amend (Kozak)

Ammend Section 3.1.3 and 4.1.3 to read

3.1.3 Steady-State and Normal Evolutions. The simulator shall support the conduct of the reference unit evolutions listed in this section in a continuous manner, without any mathematical model changes.	**4.1.3 Steady-State and Normal Evolutions** It shall be demonstrated that the reference unit evolutions are conducted in a continuous manner without any mathematical model changes.

Comment [ohh11]: Add the words for steady-state here and in the introductory paragraph to align with the divisions in 4.1.3

Vote:
For – 9
Against – 1
Abstained – 2

Carried

Reason – Eliminate the concern that the wording has been overly restricted for long test.

Against Reason – Removing IC Condition changes may allow user to go back to the old way of doing business.

Amended Motion to Modify Sections 3.1.3 and 4.1.3

3.1.3 Steady-State and Normal Evolutions. The simulator shall support the conduct of the reference unit evolutions listed in this section in a continuous manner, without any mathematical model changes. The simulator shall calculate system parameters corresponding to particular operating conditions, display these parameters on the appropriate instrumentation, and provide proper alarms and protective system actions. **3.1.3.1 Steady-State Operation.** The simulator shall correctly represent the response of the reference unit within the operating range for which reference unit data is available.	**4.1.3 Steady-State and Normal Evolutions** It shall be demonstrated that the reference unit evolutions are conducted in a continuous manner without any mathematical model changes. **4.1.3.1 Steady-State Operation.** It shall be demonstrated that the simulator correctly represents the response of the reference unit at three different power levels spanning at least 50% of the operating range for which reference unit data is available. The simulator power levels at which the comparison is performed shall have been attained through continuous operation over the power range. The recorded computed values of the parameters shall be compared with the reference unit data and shall be demonstrated to be within the tolerances noted below. The computed values of parameters not itemized below, and considered to be relevant to steady-state operation, shall be

Comment [ohh12]: Add the words for steady-state here and in the introductory paragraph to align with the divisions in 4.1.3

	demonstrated to match reference unit data within 10% of the reference unit instrument loop range. In making comparisons between the simulator computed values and the reference unit data, an additional deviation may be allowed up to the documented value of the reference unit instrument error.[2] The simulator instrument error shall be no greater than that of the comparable meter, recorder, and related instrument system of the reference unit. **4.1.3.1.1.** It shall be demonstrated that the following PWR parameters match reference unit data within 1% of the reference unit instrument loop range: • Temperature (T)-average • T-hot • T-cold • Core MWt • Power range nuclear instrumentation readings • Reactor coolant system pressure • Steam generator pressure • Pressurizer level. **4.1.3.1.2.** It shall be demonstrated that the following PWR parameters match reference unit data within 2% of the reference unit instrument loop range: • Steam generator feed flow • Reactor coolant system flow

[2] Appendix C provides several example steady-state tolerance calculations.

	• Steam generator level • Letdown flow • Charging flow • Steam flow • Turbine first stage pressure • MWe **4.1.3.1.3.** It shall be demonstrated that the following BWR parameters match reference unit data within 1% of the reference unit instrument: • Core MWt • Reactor pressure • Reactor wide range pressure • Total core flow. **4.1.3.1.4.** It shall be demonstrated that the following BWR parameters match reference unit data within 2% of the reference unit instrument loop range: • Average power range monitor readings • Feedwater temperature (after last feedwater heating stage) • Total steam flow • Individual recirculation loop flows • Total feedwater flow • Turbine steam flow • Condenser vacuum • Individual calibrated jet pump flow • Narrow range reactor water level • MWe **4.1.3.2 Normal Evolutions.** The performance of

Comment [bjc15]: Approved change of moving MWe from table 4.1.3.1.1 to table 4.1.3.1.2 from April 20-25 meeting. Action item #13. This was also the consensus of the industry peer group based on a survey conducted by the ANS Working Group.

Comment [bjc16]: Approved change of moving MWe from table 4.1.3.1.3 to table 4.1.3.1.4 from April 20-25 meeting. Action item #13. This was also the consensus of the industry peer group based on a survey conducted by the ANS Working Group.

3.1.3.2 Normal Evolutions. The minimum evolutions that shall be supported by the simulator, using only operator action normal to the reference unit, are as follows: (1) Unit startup from cold shutdown to rated power conditions; (2) Unit shutdown from rated power to cold shutdown conditions; (3) Load changes; (4) Operator-conducted surveillance testing on safety related equipment or systems; and (5) Unit performance testing such as heat balance, determination of shutdown margin, and measurement of reactivity coefficients and control rod worth through the use of permanently installed instrumentation For evolutions not listed above, such as reactor core end-of-cycle coastdown, mid-loop	procedures on the simulator, such as heat balance and determination of shutdown margin, shall be compared and demonstrated to represent correctly the response of the reference unit at the same power level consistent with reference unit procedures and data availability. It shall be demonstrated that simulator response during conduct of the normal evolutions identified in 3.1.3.2 meet the following acceptance criteria: (1) Be the same as the reference unit startup test procedure acceptance criteria. (2) Be the same as the reference unit surveillance procedure acceptance criteria. (3) Be the same as the reference unit normal operating procedure acceptance criteria. (4) Require that any observable change in simulated parameters correspond in direction to those expected from **actual** or best estimate response of the reference unit. (5) Require that the simulator shall not fail to cause an alarm or automatic action if the reference unit would have caused an alarm or automatic action under identical circumstances. (6) Require that the simulator shall not cause an alarm or automatic action if the reference unit would not cause an alarm or automatic action under identical circumstances.

Comment [ohh17]: Change reference to be consistent with new 3.1.3 numbering

Comment [ohh13]: Add title for 4.1.3.2 – corresponds to 4.1.3.2. Separated this paragraph from other stead-state words

Comment [bjc14]: Approved change of 3.1.3 items 1 trough 5 from April 22-25, 2002: Action item #13. The new words in Item 1 includes the intent of old items #1, 2, 3, 5, 7, and 10 and as a result has replaced them. Old item # 8 wording changed in new item #2 to be consistent with wording in new #1. Old item # 4, # 6 and #9 were not changed and are now new item #3, 4, and 5. The main reason for the change is to eliminated unnecessary wording contained within various tables of the Standard and to make them a little more in tune with the industry as it exist in today's environment. This was also the consensus of the industry peer group based on a survey conducted by the ANS Working Group.

operations, refueling operations, or evolutions where the reactor vessel head is removed, conditions may be achieved in a non-continuous manner and mathematical model or initial condition changes are permitted.	

Vote:
For – 6
Against – 6
Abstained - 0

Not carried

Reason For – General agreement Sections 3 and 4 are better aligned

Reason Against - More words add confusion; Unnecessary words; Section is already aligned; Not contradictory Sub-numbering; Power ops is normal evolution and Steady-state is not a normal evolution; Missed where the plant spends 98% percent of the time FPSS; How does one prove that the testing was completed in a continuous manner.

The WG agreed to continue discussing the Section 3.1.3/4.1.3 comparison. The Chair ruled that another Section 3.1.3/4.1.3 Motion may be considered.

The WG listed the important points of contention (i.e. change must meet these criteria):

- Requirement & Criteria on the Correct Side
- Is the numbering consistent
- Do corresponding Sections Contents Match

Little progress has been made on this comparison, therefore the WG agreed to move on to the next topic.

11.3 Section 3.4 and 4.4 Comparison (Florence)

Florence led the discussion of revising 3.4 and 4.4

Florence presented an amendment for Section 3.4 and 4.4.

The WG basically agrees that the requirements in Section 3.4 and the Criteria in 4.4 do not match. Section 3.4 is really not requirements for validation, but is a requirement to have the capability to record data.

New AI-115

- Find a home for the existing wording of Section 3.4. Consider Section 3.3.5. (McCullough)

A new Section 3.4 now must be developed

New AI-116

- Develop the requirements, Section 3.4 for Section 4.4 that better defines the requirements for V&V Probable consideration for 2008 (Koutouzis)

11.4 Section 3.3 and 4.3 Comparison (Neis)

Neis led the discussion for revising Sections 3.3 and 4.3

Neis presented a revised Section 3.3.1 and 4.3.1

Motion to Amend Sections 3.3 and 3.4

3.3 Simulator Instructor Station Capabilities	**4.3 Simulator Instructor Station Capabilities**
3.3.1 Initial Conditions. The simulator shall include storage capacity for a sufficient number of initial conditions to support the evolutions identified	**4.3.1 Initial Conditions.** It shall be demonstrated that the simulator has sufficient capacity for storing various initial conditions to support the operator training and

in 3.1.3. A set of initial conditions that support the operator training and examination program shall be identified and administratively controlled. This set shall provide a variety of the reference unit operating conditions that encompass various power operating conditions, major evolutions during startup and shutdown, effects of different times during the core life cycle, and fission product poison concentrations.	examination program, and that they are representative of reference unit conditions and are administratively controlled.
3.3.2 Malfunctions. The simulator shall be capable of initiating the malfunctions required in 3.1.4 and as required by the accredited licensed operator training program. The simulator shall include the capability to initiate and, as appropriate, terminate single, simultaneous, or sequential malfunctions. Event-triggered, as well as time-triggered, malfunction initiation should be included. Provision shall be made for incorporating additional malfunctions.	**4.3.2 Malfunctions.** It shall be demonstrated that the capabilities exist as required in 3.3.2. The initiation of malfunctions shall not alert the operators to pending events other than by indications that would occur in the reference unit.
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.	**4.3.3. Other Features.** It shall be demonstrated that the simulator includes features specified in 3.3.3. The implementation of simulator control features shall not alert the operator to pending events other than those features that cause departure from real-time execution of the models or notification of reaching a limit of simulation. For stimulated components it shall be documented that noticeable differences have been defined and that training needs assessments have been performed in accordance with 4.2.1.4.

Comment [BC18]: Approved change from Training Needs Assessment to Training Impact Assessment from March 08-10, 2000 - Action item #48. The term Needs may have other meanings based on the reader. The term Needs carries additional baggage and has other connotations. The working group agreed that the word impact better describes the intent of requiring a Training Value Assessment. NOTE: The Training Needs Assessment is based on whether training decides that simulation is the best way to teach according to guidance provided by the accredited training program. Approved change back to Training Needs Assessment from October 25-26, 2000 meeting. Action item #48.

3.3.4 Local Operator Actions. The simulator shall permit the instructor to act in the capacity of an individual performing local actions external to the control room in support of 3.1.3 and 3.1.4. Examples of local actions to be supported include changing the position of valves, circuit breakers, or other locally operated equipment. In addition, other features to enhance the instructor's control over the simulation of the reference unit external environment may be implemented; e.g., air temperature and circulating water temperature. For multi-unit plants, and where not otherwise provided, the instructor shall have the capability to control common resources, such as steam, air, and electrical power available from the other unit or units which impact operator response on the reference unit.	**4.3.4 Local Operator Actions.** It shall be demonstrated that the capability exists to reproduce the local operator actions required in 3.3.4 and by the accredited licensed operator training program. 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. It shall be demonstrated that the simulator permits the instructor to act in the capacity of the required individuals performing local operations external to the control room, as required by 3.3.4.

Vote:
For – 12
Against – 0
Abstained – 0

Passed

Reason – New wording better aligns Sections 3.3 and 4.3.

11.5 AI-115 New Section data Collection (McCullough)

Motion (McCullough)

- **Remove the following words in Section 3.4**

The simulator shall have the capability to capture selected simulated parameters electronically, and to provide hard copy data of these parameters in the form of either plots or printouts for the required reference unit parameters during the evolutions specified in 3.1.3 and the malfunctions specified in 3.1.4. A means to compare electronically the simulated parameters with reference unit data may be used. Test data collection capability shall provide sufficient parametric and time resolution to allow determination of compliance with the testing criteria of Section 4, Testing Requirements.

- **Add Sections 3.3.5 and 4.3.5**

3.3.5 Data Collection. The simulator shall have the capability to capture selected simulated parameters electronically and to provide hard copy data of these parameters in the form of either plots or printouts. Data collection capability shall provide sufficient parametric and time resolution to allow determination of compliance with the testing criteria of Section 4, Testing Requirements.	**4.3.5 Data Collection.** It shall be demonstrated that the capability exists to electronically capture selected simulated parameters, provide hard copy data of these parameters in the form of either plots or printouts, and provide sufficient parametric and time resolution to allow determination of compliance with the testing criteria of Section 4, Testing Requirements.

The floor was open for discussion.

Several members were not comfortable with removing Section 3.4 and leaving Section 3.4 without text .

The motion was withdrawn.

11.6 Revisit Section 3.1.3 and 3.1.4 Comparison

Havens led the discussion revisiting another revised 3.1.3 and 4.1.3.

Motion to amend Sections 3.1.3 and 4.1.3 as follows

3.1.3 Steady-State and Normal Evolutions. The simulator shall support the conduct of reference unit steady-state operation and the normal evolutions listed in this section in a continuous manner, without any mathematical model or initial condition changes. The simulator shall calculate system parameters corresponding to particular operating conditions, display these parameters on the appropriate instrumentation, and provide proper alarms and protective system actions.	**4.1.3 Steady-State and Normal Evolutions**
3.1.3.1 Steady-State Operation. The simulator shall be capable of supporting steady-state operating conditions.	**4.1.3.1 Steady-State Operation.** It shall be demonstrated that the simulator correctly represents the response of the reference unit at three different power levels spanning at least 50% of the operating range for which reference unit data is available. The simulator power levels at which the comparison is performed shall have been attained through continuous operation over the power range. The recorded computed values of the parameters shall be compared with the reference unit data and shall be demonstrated to be within the tolerances noted below. The computed values of parameters not itemized below, and considered to be relevant to steady-state operation, shall be demonstrated to match reference unit data within 10% of the reference unit instrument loop range. In making comparisons between the simulator computed values and the reference unit data,

Comment [ohh19]: Add the words for steady-state here and in the introductory paragraph to align with the divisions in 4.1.3

	an additional deviation may be allowed up to the documented value of the reference unit instrument error.[3] The simulator instrument error shall be no greater than that of the comparable meter, recorder, and related instrument system of the reference unit.
	4.1.3.1.1. It shall be demonstrated that the following PWR parameters match reference unit data within 1% of the reference unit instrument loop range: • Temperature (T)-average • T-hot • T-cold • Core MWt • Power range nuclear instrumentation readings • Reactor coolant system pressure • Steam generator pressure • Pressurizer level. **4.1.3.1.2.** It shall be demonstrated that the following PWR parameters match reference unit data within 2% of the reference unit instrument loop range: • Steam generator feed flow • Reactor coolant system flow • Steam generator level • Letdown flow • Charging flow • Steam flow • Turbine first stage pressure • MWe
	4.1.3.1.3. It shall be demonstrated that the following BWR parameters match reference unit data within 1%

Comment [bjc20]: Approved change of moving MWe from table 4.1.3.1.1 to table 4.1.3.1.2 from April 20-25 meeting. Action item #13. This was also the consensus of the industry peer group based on a survey conducted by the ANS Working Group.

[3] Appendix C provides several example steady-state tolerance calculations.

	of the reference unit instrument: • Core MWt • Reactor pressure • Reactor wide range pressure • Total core flow.
	4.1.3.1.4. It shall be demonstrated that the following BWR parameters match reference unit data within 2% of the reference unit instrument loop range: • Average power range monitor readings • Feedwater temperature (after last feedwater heating stage) • Total steam flow • Individual recirculation loop flows • Total feedwater flow • Turbine steam flow • Condenser vacuum • Individual calibrated jet pump flow • Narrow range reactor water level • MWe
3.1.3.2 Normal Evolutions. The simulator shall be capable of supporting the minimum evolutions, using only operator action normal to the reference unit, as follows: (1) Unit startup from cold shutdown to rated power conditions; (2) Unit shutdown from rated power to cold shutdown conditions; (3) Power operations and load changes; (4) Operator-conducted surveillance testing on	**4.1.3.2 Normal Evolutions.** The performance of procedures on the simulator, such as heat balance and determination of shutdown margin, shall be compared and demonstrated to represent correctly the response of the reference unit at the same power level consistent with reference unit procedures and data availability. It shall be demonstrated that simulator response during conduct of the normal evolutions identified in 3.1.3.2 meet the following acceptance criteria:

Comment [bjc21]: Approved change of moving MWe from table 4.1.3.1.3 to table 4.1.3.1.4 from April 20-25 meeting. Action item #13. This was also the consensus of the industry peer group based on a survey conducted by the ANS Working Group.

Comment [ohh22]: Add title for 3.1.3.1 – corresponds to 4.1.3.1

Comment [ohh24]: Change reference to be consistent with new 3.1.3 numbering

safety related equipment or systems; and (5) Unit performance testing such as heat balance, determination of shutdown margin, and measurement of reactivity coefficients and control rod worth through the use of permanently installed instrumentation For evolutions not listed above, such as reactor core end-of-cycle coastdown, mid-loop operations, refueling operations, or evolutions where the reactor vessel head is removed, conditions may be achieved in a non-continuous manner and mathematical model or initial condition changes are permitted.	(1) Be the same as the reference unit startup test procedure acceptance criteria. (2) Be the same as the reference unit surveillance procedure acceptance criteria. (3) Be the same as the reference unit normal operating procedure acceptance criteria. (4) Require that any observable change in simulated parameters correspond in direction to those expected from actual or best estimate response of the reference unit. (5) Require that the simulator shall not fail to cause an alarm or automatic action if the reference unit would have caused an alarm or automatic action under identical circumstances. (6) Require that the simulator shall not cause an alarm or automatic action if the reference unit would not cause an alarm or automatic action under identical circumstances.

Comment [bjc23]: Approved change of 3.1.3 items 1 trough 5 from April 22-25, 2002: Action item #13. The new words in Item 1 includes the intent of old items #1, 2, 3, 5, 7, and 10 and as a result has replaced them. Old item # 8 wording changed in new item #2 to be consistent with wording in new #1. Old item # 4, # 6 and #9 were not changed and are now new item #3, 4, and 5. The main reason for the change is to eliminated unnecessary wording contained within various tables of the Standard and to make them a little more in tune with the industry as it exist in today's environment. This was also the consensus of the industry peer group based on a survey conducted by the ANS Working Group.

The floor was open for discussion. No discussion.

The discussion will be resume on Thursday.

11.7 Adjourned 2003Oct29 at 1745

12 **Thursday 2003Oct30 (Day 4 8:30am)**

12.1 11 members present – 9 Votes constitutes Consensus

12.2 Continuation of the discussion Section 3.1.3 and 3.1.4 Comparison (Havens)

Felker led the discussion on adding Power Operations as a Normal Evolution. Several plants have procedures that are used for "Power Operations" and therefore should be considered as a Normal Evolution. Steady-State does not adequately address "Power Operations". Load changes are perturbations to "Power Operations"

Some members discussed that "Startup to rated Power Conditions" covers "Power Operations".

Some Plant do not have a "Power Operations" procedure.

Felker - Power Operations is a switch in the state of the machine.

Power Operations is not just FPSS, but includes lower power conditions

Wyatt – Questioned the performance criteria required for Power Ops. Feels this opens up a Pandora's Box. How much testing has to be completed for Power Ops.

Florence – There is no periodic testing requirement for Normal Evolutions.

Havens – Other operating procedures should cover "Power Operations"

Other members – The Wyatt concern is there regardless of the presence of "Power Operations"

A question was raised – What is Steady-State?

Havens – Steady-State is sitting at a power plateau

Point of order – This Section has previously been voted on and the vote did not pass.

"Suspend the Rules" will require a 2/3 vote margin

"Motion to Reconsider" will require a 2/3 vote margin

The initial Motion failed on a 50/50. The only option now is to suspend the rules.

Motion to Suspend the Rules to Allow the Motion to be considered

Vote:
For – 11
Against – 0
Abstained – 0

Carried

Felker – Several sections in the standard refer to Section 3.1.3. Those should now be modified to reflect the new organization of Section 3.1.3.

Motion

Accept New wording for Sections 3.1.3 and 4.1.3. See wording from Wednesday afternoon.

Amended Motion

Remove the following words "or initial condition " in Section 3.1.3.

These words were removed in the Amended Motion for the Motion that failed earlier

After discussion, several members were concerned that removing "or initial condition" opened the door to doing business the old way… changing the IC in mid stream to continue.

The Amended Motion was withdrawn

The original Motion was placed before the WG.

Vote:

For – 11
Against – 0
Abstained – 0

Carried

Reason – Better align Sections 3.1.3 and 4.1.3. Section 4.1.3 had several subsections and Section 3.1.3 was divided to align the two sections.

12.3 Section 3.0 and 4.0 Comparison (Felker)

Felker led the discussion in aligning Sections 3.0 and 4.0

In Section 3.0 change the "shall" to "may" in the provision for exam security. The simulator itself does not have this capability, and is implemented using a procedure.

A bit of history was discussed on how the Exam Security issue was added to the standard. Exam security became a hot topic during an earlier revision and the provision was added as a catch all.

The discussion centered on which verb to use "shall, should, may". Several members were concerned that "may" is not strong enough.

The WG agreed to change "may" to "should".

Section 3.0 – Change "shall to "Should"

Section 3.1.2 – add "reach or" before exceed

Section 4.1.2 – add "reached or" before exceeded

Motion to accept Section 3.0/4.0 and 3.1/4.1 as follows

3. General Requirements A nuclear power plant simulator is intended to be used as a training device in support of initial and requalification training, as well as a device for the examination of operators. The simulator shall be referenced to a specific unit. The scope of simulation shall be such that the operator is required to take the same action on the simulator to conduct an evolution as on the reference unit, using the reference unit operating procedures. The scope of simulation shall permit conduct of all of the evolutions required in this section until a stable condition is obtained. A process incorporating structured software design and testing concepts shall be provided to control simulator modifications. The overall simulator design **should** incorporate provisions for examination security. Simulator verification and validation testing, performance testing, and configuration management capabilities shall also be provided.	**4. Testing Requirements** The intent of the following verification, validation, and performance testing criteria is to ensure that no noticeable differences exist between the simulator control room or simulated systems when evaluated against the control room or systems of the reference unit. The requirements for the evaluation of each of the major elements of a simulator are set forth in 4.1 through 4.4.
3.1 Simulator Capabilities. The response of the simulator resulting from operator action, no operator action, improper operator action, automatic reference unit controls, and inherent operating characteristics shall be realistic and shall	**4.1 Simulator Capabilities Criteria**

not violate the physical laws of nature, such as conservation of mass, momentum, and energy, within the limits of the verification, validation, and performance testing criteria of Section 4, Testing Requirements.	
3.1.1 Real Time and Repeatability. The simulator shall, in a repeatable manner, operate in real time while conducting any of the evolutions required by this section.	**4.1.1 Real Time and Repeatability.** It shall be demonstrated that the simulator performs the capabilities defined in 3.1, completes execution within the designed time interval, and is repeatable. In addition, it shall be demonstrated that between successive simulator tests no noticeable differences exist with respect to time base relationships, sequences, durations, rates, and accelerations.
3.1.2 Limits of Simulation. Mathematical models of physical phenomena are sometimes simplified to meet real-time simulation requirements. Such simplification can limit the conduct of certain evolutions on the simulator. In addition, it is sometimes possible to create events on a simulator that progress beyond reference unit design limits. Simulation could be inaccurate beyond these limits. Examples of such events include primary containment failure and gross core degradation. To reduce the potential for negative training, automatic or administrative controls shall be provided to alert the instructor when model parameters **reach or** exceed values indicative of events beyond the implemented simulation scope or expected reference unit behavior.	**4.1.2 Limits of Simulation.** It shall be demonstrated that the limits of simulation are identified as part of the simulator design data base, and that automatic or administrative means are in place for notification to the instructor that the limits of simulation have been **reached or** exceeded.

Vote:
For – 11
Against – 0
Abstained – 0

Carried

Reason – Clarification of intent

12.4 AI-116 and AI-115 New wording for Section 3.4 (Florence)

Florence led the discussion for new wording for Section 3.4

Motion

Remove the following words in Section 3.4

The simulator shall have the capability to capture selected simulated parameters electronically, and to provide hard copy data of these parameters in the form of either plots or printouts for the required reference unit parameters during the evolutions specified in 3.1.3 and the malfunctions specified in 3.1.4. A means to compare electronically the simulated parameters with reference unit data may be used. Test data collection capability shall provide sufficient parametric and time resolution to allow determination of compliance with the testing criteria of Section 4, Testing Requirements.

Add Sections 3.3.5 and 4.3.5

3.3.5 Data Collection. The simulator shall have the capability to capture selected simulated parameters electronically and to provide hard copy data of these parameters in the form of either plots or printouts. Data collection capability shall provide sufficient	**4.3.5 Data Collection.** It shall be demonstrated that the capability exists to electronically capture selected simulated parameters, provide hard copy data of these parameters in the form of either plots or printouts, and provide sufficient parametric and time resolution to allow determination of compliance with the testing criteria of Section 4, Testing Requirements.

parametric and time resolution to allow determination of compliance with the testing criteria of Section 4, Testing Requirements.	

Motion for New wording for Section 3.4 and 4.4
(blue is new wording) (red is existing wording)

3.4 Simulator Testing. Verification, validation, and performance testing **shall be performed** to ensure that no noticeable differences exist between the simulator control room or simulated systems when evaluated against the control room or systems of the reference unit.	**4.4 Simulator Testing.** **It shall be demonstrated that** verification, validation, and performance testing **is** performed to ensure that no noticeable differences exist between the simulator control room or simulated systems when evaluated against the control room or systems of the reference unit.
3.4.1 Simulator Verification Testing. Simulator verification testing is a form of software development testing. Simulator verification testing **shall be conducted** by comparison of simulated component or system software design to the original requirements to ensure that each step in the software development process completely incorporates all requirements of the previous step.	**4.4.1 Simulator Verification Testing.** **It shall be demonstrated that** simulator verification testing **is** performed prior to initially integrating new or modified software with the remainder of the software used for operator training and examination. The extent and nature of the testing performed shall be based on the design of the software and its effects on simulator fidelity. Modifications to software may be tested in a non-integrated environment on a computer system other than the simulator. It shall be demonstrated that simulator verification testing is performed as part of the initial structured software design and development process, and when changes or modifications are made to any of the following:

	•Computer platforms •Operating systems and run-time utilities •Interface systems •Instructor stations •Models. Each simulation facility organization should ensure that the necessary software design documentation is generated and updated.
3.4.2 Simulator Validation Testing. Simulator validation testing is a form of software development testing. Simulator validation testing **shall be conducted** by comparison of simulated component or system results against actual or predicted reference unit performance data in either a stand-alone or integrated fashion.	**4.4.2 Simulator Validation Testing.** **It shall be demonstrated that** simulator validation testing **is** performed by comparison of simulator model results to actual or predicted reference unit data as defined by Section 3, General Requirements. Section 4, Testing Requirements, provides the criteria to ensure these requirements are met. Simulator validation testing may be conducted in a fully integrated, partially integrated, or standalone mode of system operation. Each simulation facility organization shall ensure that the validation test documentation is generated. The order of preference for data comparison shall be as stated in 5.1.1. A record of the conduct of this test, the test's results, and the test's evaluation shall be maintained. Validation tests shall be conducted prior to the simulator's use in training and examination for the following situations: (1) Completion of simulator initial construction. (2) Whenever models are changed or modified in a way that potentially affects fidelity relative to the reference unit. (3) Whenever there are changes which have the potential to affect simulator capabilities or

	repeatability, including changes to computer platforms, operating systems and run-time utilities, interface systems, or instructor stations.
3.4.3 Simulator Performance Testing. Simulator performance testing comprises operability and scenario-based testing. Simulator performance testing shall be performed in a fully integrated mode of operation.	**4.4.3 Simulator Performance Testing.** **It shall be demonstrated that** simulator performance testing **is** conducted as specified below in a fully integrated mode of operation. A record of the conduct of these tests, and data comparison that the results meet reference unit data, shall be maintained.[4]
3.4.3.1 Simulator Operability Testing. Simulator operability testing [1] shall be conducted to confirm overall simulator model completeness and integration by testing the following: (1) Simulator steady-state performance; (2) Simulator transient performance for a benchmark set of transients, and; (3) Simulator Reactor Core Performance.	**4.4.3.1 Simulator Operability Testing.** **It shall be demonstrated that** simulator operability testing [1] **is** conducted on a frequency as indicated below to confirm overall simulator model completeness and integration: (1) Simulator steady-state performance once per year on a calendar basis; (2) Simulator transient performance for a benchmark set of transients once per year on a calendar basis, and; (3) Simulator Reactor Core Performance each reference unit fuel cycle Simulator operability testing credit may be taken for having performed those normal evolutions, malfunctions, local operator actions, and other features exercised by the scenario during scenario-based

Comment [BC25]: Approved addition of the words, "overall simulator model completeness and integration by testing the following:" from the July 21-24 meeting. Action Item #100. This change will better define the type of testing to be performed.

Comment [BC26]: Approved change of adding a time reference to each item 1, 2, and 3 from July 21 – 24 meeting. Action item #100. This will beer define the time sequence with both the plant and simulator taken in to consideration as to when these tests should be performed.

[4] Appendix A provides examples of acceptable simulator performance test documentation.

	testing or operator training, provided that both of the following conditions are satisfied: (1) The evolutions are performed in accordance with reference unit procedures. (2) The scenario-based testing results are evaluated and documented. A record of the conduct of this test and its evaluation shall be maintained.

3.4.3.2 Simulator Scenario-Based Testing. Scenario-based testing shall be conducted utilizing the existing training and examination scenario validation process. The intent of scenario-based testing is to ensure the simulator is capable of producing the expected reference unit response to satisfy predetermined learning or examination objectives by utilizing the existing training and examination scenario validation process.	**4.4.3.2 Simulator Scenario-Based Testing.** **It shall be demonstrated that** scenario-based testing **is** conducted utilizing the existing training and examination scenario validation process. Performance testing credit may be taken for a scenario developed for the simulator, provided that the following conditions are satisfied: (1) the scenario is tested prior to use for operator training and examination including the appropriate instructor interfaces, operator actions, and operator cues; (2) the simulator is capable of producing the expected reference unit response without procedural exceptions, significant performance discrepancies, or deviation from an approved scenario sequence; A record of the conduct of these tests, typically in the form of a completed scenario checklist, and the evaluation of the test results, shall be maintained. [2]

Note: Existing footnotes as defined in Standard Rev 12 shall be used.

The floor was open for discussion.

[2] Footnote: Appendix E provides an example of an acceptable means of documenting scenario-based testing.

Vote:
For - 9
Against - 0
Abstention – 2

Carried

Reason – Moved electronic data collection requirements in Section 3.4 and created a modified Data Collection Section requirement 3.3.5 and a corresponding testing and validation requirement in new 4.3.5. Ref: Action Item 115.

Developed the requirements in Sections 3.3 & 3.4 for the testing and validation requirements in Sections 4.3 & 4.4 (alignment of Sections 3.3 to 4.3 & 3.4 to 4.4.). Ref: Action Item 116.

Abstention Reason – Not comfortable with the overall design of the testing.

12.5 AI-113 - Appendix B Adding Core PerformanceTesting (Havens)

Havens led the discussion on modifying Appendix

An hour was devoted and some word engineering was completed. The revised Appendix B wording was distributed to member for review for continued discussion on Friday.

12.6 Modification of STIMULATED HARDWARE on Standard (Colby)

Colby reviewed with members three locations where “Stimulated Hardware” is used.

- 3.2.1.2
- 4.2.1.2

- 4.3

12.7 Felker – Use of Control Copies of Simulator Plant Procedures

Queried utility members if they use Controlled Plant procedures in the Simulator. All member stated they use controlled plant procedures.

Appendix A.1.4 indicates that there may be difference between Simulator and Plant Operating procedures.

12.8 Adjourned 2003Oct30 at 1800

13 **Friday 2003Oct31 (Day 5 8:30am)**

13.1 AI-113 Appendix B Continued (Havens)

Havens presented Rev 2 of the Appendix B modification.

Shelly – How does a utility handle acceptance criteria that is lax enough to allow the core to be deemed in-tolerance, but allow for noticeable difference.

Florence – The utility would decide what is acceptable

Havens – The performance deficiency (difference) should be analyzed if noticeable differences cause operators to take different actions.

Koutouzis – This is solely a Simulator Core vs Reference Unit Core validation and bringing operators into the validation should not happen. It's not apparent what operator observations could provide. Operators are currently expected to and do feedback if they perceive differences. This validation is unique, appears to be looking beyond an SME's ability to perceive differences and is solely for Experience Requirements.

Some members felt the format of recommended changes in Appendix B were not correct and consistent with the remainder of the Appendix.

Several members recommended that the Core Performance Testing and Criteria should be in the body of the Standard - not in an Appendix.

Havens will make additional recommendations at the next meeting.

13.2 Simulator Operating Procedures Appendix A1.4 Removal (Felker)

Recommended the removal of section A1.4 in Appendix A. Simulator users should be using unmodified plant procedures. The standard requires the use of THE plant procedures.

Motion:

Eliminate Appendix A1.4. Renumber accordingly.

Vote:
For – 11
Against – 0
Abstained – 0

Carried

Reason – Plant procedures should be used

13.3 AI-114 SBT (Felker)

Felker led the discussion on revising Sections 4.4.3, 4.4.3.1 and 4.4.3.2

Started with the 1998 4.4.3 Section

Changes:

- Revised 4.4.3 paragraph and added list
- Moved part of Section 4.4.3.1 to 4.4.3.2
- 4.4.3.2 – Adds Note "Use the simulator as it will be used"
- New 4.4.3.2 paragraph 2
- Used ACAD wording for testing scenarios (4.4.3.2 Bullet 1)
- Appendix A A4 Bullet 3 and 5 modification
- Delete Appendix E. Part of Appendix E is moved into Appendix A A4.
- Take testing credit has been changed to gather data and analyze it

Discussion centered on capturing data, and when and how it is analyzed. Either the data is analyzed during the validation or

Test Run Results are done either while the test is in progress of during subsequent analysis… using plots or data.

What is testing Credit?

Starting with a reliable Base. The scenario has been run and evaluated to be correct. Now the data collected can be analyzed for correctness. Concerns that the evaluation will not happen before the scenario is used in training.

Havens – Revision presented is better, but also relaxes the requirement for SBT.

General comments… this is the right direction to proceed, but additional work may be needed

13.4 Stimulated Hardware to Stimulated Components Discussion (Colby)

Colby – Led the discussion of changing Stimulated Hardware/Devices to Stimulated Components

The following Sections were affected:

- 3.2.1.2 – Stimulated Hardware
- 4.2.1.2 – Stimulated Devices
- 4.3 – Stimulated Hardware
- 3.3 – Stimulated hardware

Motion to replace Stimulated Hardware and Stimulated Devices in sections to be consistent with definition of "Stimulated Component" in the standard:

- **3.2.1.2 – Stimulated Hardware**
- **4.2.1.2 – Stimulated Devices**
- **4.3 – Stimulated Hardware**

- **3.3.3 – Stimulated hardware**
- **3.3.3 - Make Store singular**

Vote:
For - 11
Against - 0
Abstained – 0

Carried

Reason – Consistency

13.5 AI-105 Technical Editing Continued (Shelly)

Shelly – led the discussion of Active and Passive voice writings.

Mixture of Active and Passive is allowed.

Examples:

- (Passive) Criteria are established
- (Active) The standard establishes criteria

Terms and Abbreviations

abbreviate after using the term the first time… Nuclear Regulatory Commission (NRC)

A quick review of several technical changes made to date.

13.6 Adjourned 2003Oct30 at 1800

14 Appendix

14.1 NRC Power Point presentation (Dave)

PPT is not incorporated in the meeting minutes

14.2 NRC Power Point presentation (Vick)

PPT is not incorporated in the meeting minutes

15 Action Items Carried to 2008 Standard

20	**Date: 2002oct29** **Status: Deferred to 2008**	Priority 1 –	**Paris** **Colby** **Kozak**	Exploiting technology changes and future industry trends. What's coming around the corner; 2002oct29 Paris Deferred to 2008. Additional technologies will need to be considered (e.g. Virtual reality, DCS, WEB based training) 2001Apr05 Paris Presentation: What is Around the Corner (See Attachments Section) **2001Aug09** Paris Presentation – Distributed Control Systems scope needs to be considered in the standard (Hal will e-mail his presentation to Butch).
25	**Moved to 2008**	Priority 2 –	**Dennis**	Process Guidelines (Mods and Testing) ;Institutionalizing Procedures 2002apr24 Dennis Gave presentation on Millstone experience Defer AI-25 to 2008 2001Apr05 Dennis Deferred
36	**Date: 2003Mar10** **Status: Deferred until 2008**	Priority 2	**Koutouzis** **Havens**	Questions from Review of INPO Documents:

				• Timeline for incorporation of Plant design changes into the simulator • Instructor Performance • Long Term Open Simulator Fidelity Issues This is an information AI **2003Mar10** **Koutouzis** **No INPO statements on Simulator Fidelity.** **INPO is primarily focused on performance based issues, but will address programmatic issues.** 2002Apr24 Havens – Keep this AI open pending additional input and data. Koutouzis is gathering additional data. Recommends to do nothing right now No Update 2001Apr05 Koutouzis No Update Related AI: 34
60	**Moved to 2008**	Priority 1	**McCullough Shelly**	Define the Term **Training Needs Assessment** in such a manner that it is clear in intent to both Training and Simulator staffs 2002apr23 McCullough History presentation of Training Need Assessment. See Appendix

				2001Apr05 McCullough Trainers and Simulator personal view Training Needs Assesments Differently; Training Needs Analysis and Training Needs Assessment are not used consistently. McCullough will revisit this item in a future date; Reference: ACAD-85-006 "A Suppliment to Principles of Training Systems Development"
80	**Moved to 2008**		**Florence**	2008 Copy and Paste RG 1.149 Rev 3 Section 1.5 into the 2008 Standard. (Software V&V)

16 Closed Action Items

No.	Status	Date	Assigned To:	Work Assignment
2	**Date: 2000oct25** **Status:** Additional Editorial Review Required **Date: 2000mar09** **Status: Complete**		**Colby** **Welchel**	Obtain a Master Copy of the ANS 3.5 standard in Dual Column (working/1998) format. The WordPerfect copy from Shawn does not port into WORD correctly Assigned to Butch Colby.
3	**Date: 1999sep14** **Status: Complete**		**Welchel**	Get NUPPSCO comments to members
4	**Date: 1999sep14** **Status: Complete**		**Welchel**	Send copy of meeting minutes 1998Nov04 and 1999Mar02-03 to Jim Florence
5	**Date: 1999sep14** **Status: Complete**		**Florence**	Jim will look at creating a survey on the USUG WEB concerning the Action Items and for soliciting info from the industry
6	**Date: 1999sep14** **Status: Complete**		**Dennis**	Jeff will contact ANS about ANSI Historical standards Cataudella-Spoke with ANS Standards Secretary, Shawn Coyne-Nalbach Historical Standards: Past standards are retired and are only available as historical standards. 1979, 1981, 1985, and 1993 are no longer endorsed by ANSI and ANS only the 1998 standard is endorsed.
7	**Date: 2001Aug9** **Status: Complete**		**Shelly** **Vick** **Dennis**	Talk to ANS about use of footnotes, asterisks, etc in standards To review style guide. 2001Apr05 Shelly Shelly will call Shawn.

9	**Date: 2001Apr05** **Status: Complete** **Dennis**		**Dennis**	Is ANS 3 considering that the standard may address other simulators not specific to NRC Regulatory Commission licensing? 2001Apr05 Dennis - No - per SubCommittee-1 Tamp Meeting Dennis will verify with Mike concerning additional scope (adding DOE facilities into 3.5). 2001Apr05 Dennis - No - per SubCommittee-1 Tamp Meeting **2000mar09** Dennis will check at the next ANS 3 meeting

10	**Date: 2001Apr04** **Status: Awaiting Kozak conversation with Chandler and Mallay** **Date: 2001Aug09** **Status: Closed Pending input from Alan Kozak** **Date: 2001Aug27** **Status: Complete**		**Kozak** **Collins (Vick) McCullough**	Propose security criteria for Simulators operating in Exam Mode 2001aug27 Kozak Contact was made with James Mallary (NUPPSCO) to clarify the comment concerning "non-prescriptive" His concern was the inclusion of further details within the body and stated that if this was not the case then he has no further comment. Contact could not be made with Harish Chandler. Information gathered via the ANS survey presents the fact that all of the responding sites are applying Exam Security measures that meet the requirements of their training programs and review from other agencies, i.e. NRC, INPO. It can be safely assumed that non responders are doing like wise. Based on this information no further action should be needed for this AI. 2001Apr04 Kozak PPT Presentation outlining several Security concerns. The presentation is included in the AI-10 documentation dated 2001Apr04. Final conclusion was that the current wording is sufficient. AI Originator: Parking Lot Issue 2001Apr05 Kozak Two NUPPSCO comments: NUPPSCO supporting comment: James: Mallay stated that this item should be non-prescriptive. NUPPSCO supporting comment: Harish Chandler Kozak will call Chandler and Mallay and discuss their NUPPSCO **2000mar09** Determine source of Exam Security comment

11	**Date: 2001Apr05** **Status: Complete** **Moved to AI 13**		**Felker** **Collins** **(Vick)**	Standard Section 3.1.4 - Add information notices and any other information; establish threshold of documents to be reviewed. Correspondences change over time. Discuss at next meeting with Felker present. Origin: Parking Lot List 2001Apr05 Deferred for later discussion pending more important issues
12	**Date: 2001Aug09** **Status: Complete**			Intentionally Left Blank

13	**Date: 2002oct29** **Status: Complete**	Priority 1 – Waiting input from Florence on feedback from industry	**Felker** **Florence** **Colby**	Standard Section 3.1.3(7) - Rated coolant Flow - are BWR's OK with this? Review entire list in section 3.1.3 for applicability. Review present parameter list. Colby has additional information for discussion at the next meeting. Consider instrument accuracy relating to different plant types. 2002OCT29 Florence Approved change of 3.1.3 items 1 trough 5 from April 22-25, 2002: Action item #13. The new words in Item 1 includes the intent of old items #1, 2, 3, 5, 7, and 10 and as a result has replaced them. Old item # 8 wording changed in new item #2 to be consistent with wording in new #1. Old item # 4, # 6 and #9 were not changed and are now new item #3, 4, and 5. The main reason for the change is to eliminated unnecessary wording contained within various tables of the Standard and to make them a little more in tune with the industry as it exist in today's environment. This was also the consensus of the industry peer group based on a survey conducted by the ANS Working Group. Origin: Parking Lot List Review all List; Combined with the 3.1.3(7) item (Moved from 23); Standard Section 3.1.4 - Add information notices and any other information; establish threshold of documents to be reviewed. Correspondences change over time. Discuss at next meeting with Felker present. Note: Review associations between removal of List and Appendix. 2001Apr05 Moved AI 11 to AI 13 Deferred for later discussion pending more important issues Felker: The Simulator shall cause an alarm or automatic action only if the reference plant would have caused an alarm or

14	**Closed:** **2002apr23** **Motion**	Priority 1 –	**Paris** **Felker** **Florence** **Chang**	2001Aug 09 SK Chang proposes including *synchronization* in the new definition for stimulated device. Hal Paris and SK Chang to provide working group a revised document regarding stimulated devices in one month. Members shall respond within 30 days. Review guidance on stimulated devices. Combine stimulated hardware and stimulated devices. Issues relating to various stimulated device functions and compatibility with the simulator (e.g. Run/Freeze, History retention and Recalls/Backtracks, software revision control) 2002apr23 Motion: Change Definition of Stimulated Hardware to Stimulated Components with the definition of Stimulated Components: • **stimulated components** Hardware/software components that are integrated to the simulator process via simulator inputs/outputs which perform their functions parallel to, and either independently of or synchronized with the simulation process • Replace Stimulated hardware and Stimulated Device with Stimulated Components 2001Apr04 Paris Recommends new definition: Old Definition: "**Stimulated hardware.** Components or devices that perform their functions independently of and parallel to the simulation process" 2001Apr05 Paris Considerations for new definitions for later review

15	**Date: 2000mar09** **Status: Complete** Presentation by Allan Kozak		**Collins** **(Vick)** **Kozak** **McCullough**	Numerous uses of Training Needs Assessment (TNA) Collins - Add paragraph in Section 3.0 detailing TNA and then remove all other references to TNA. Training Needs Assessment was changed to Training Impact Assessment **2000mar09** Determine Source of this comment
16	**2002apr24** **Status: Complete** **Motion No Carried**	Priority 1 –	**Welchel** **Dennis**	Coordinate use of Discrepancy and Deviation. Consider Yoder #12. NUPPSCO Comment 2002apr24 Welchel Prepared and presented Deviation/Discrepancy and Differences replacement. Closed – Motion Not Carried **2001apr03** Welchel Discrepancy is used in sections 4.4.3.2 and 5.2. Webster's definition: Discrepancy-inconsistency Deviation – diverge

17	**Date: 2001Aug09** **Status: Complete**		**Dennis Welchel**	Get feedback from industry on actually how the 1998 standard is actually used. Use USUG meetings. Cataudella – Seabrook MANTG meeting (Aug-1999) comments: How to document Scenario Based Testing? Expand on what is V&V and what is necessary. Shelly – User feedback is not available for inclusion at this time. Develop Mission statement for working group. Cataudella – Problems implementing Scenario Based Testing. Benchmarking of various sites has shown use of V&V and scenario validation. **2000mar09** Welchel – Add relevant SSNTA meeting minutes to WG minutes. Wait for industry experience 2001Apr05 Industry Feedback Callaway has implement the 1998 Standard and presently reports no concerns. **2001apr03** Welchel As of Jan 2001, Callaway (Scott Halverson) is the only simulator presently implementing the 1998 standard. The industry consensus, as expressed at the 2001 USUG meeting, is that implementing Scenario based testing for License Class Simulator Scenarios is unworkable. It is generally agreed that the Regulatory carrot for using the simulator for License Candidate Reactivity Manipulations, is a significant positive for adopting the 1998 3.5 ANS standard. Activity: MANTG Mar 2001 SSNTA Jan 2001 SCS Jan 2001 USUG Jan 2001

18	**Date: 2000mar09** **Status:** **Closed Statement (**Do we need to put some boundaries as to the limits simulator**)**		**Kozak** **Shelly** **Cox** **Havens** **Florence**	Part-Task – Should Part-Task become part of the standard or remain as an appendix. Possibly look at tying the Standard body to the Appendix; Application of Full Scope Simulators. Outside interest are asking for uses of simulators that are not related to Operator Training. ~~Do we need to put some boundaries as to the limits simulator;~~(Closed 2001Apr05) Origin: Scope Change at Oconee Meeting 2001Apr05 Florence Moved from AI 22 Look at the use of Simulator, Simulation Facility; Definitions change Simulation Facility becomes Simulator; Simulation Facility is now defined as the collection of Simulators; Coordinate use of Simulator and Simulation Facility. 2001Apr05 Kozak Close the Boundry issue *Do we need to put some boundaries as to the limits simulator;* 2001Apr05 Kozak See Minutes Body **2000mar09** Presentation of Virginia Power Classroom/Part-task trainer at the 2000mar09 meeting Related AI: 41

19	**Date: 2001apr05** **Status: Complete** (This Item will be ask on Survey#2)		**Colby** **Florence**	Using the simulator for other than Operator Training. Uses in predictive analysis and design mods, SAMGS procedures changes; 2001Apr05 Colby Include this as part of Survey #2 and Closed **2000mar09** Scope change. This will require approval from ANS-3
21	Date: 2000mar10 Status: Complete Keith Welchel wanted to dismiss this item. The WG agreed.		**Collins (Vick)** **Welchel** **Chang**	(JFC/KPW/JS) Hybrid Simulators. Hybrid Simulator refers to a simulator that implements many different technologies, source code vendors, different operating systems, integration vendors, etc. Maybe we need to have words that stipulate that testing needs to cover all the other changes we make to the simulator that may affect the operation of the simulator: Instructor Console, Operating Systems, New I/O, etc. (Voted to Dismiss-Consensus) Comments on regulation - The Working Group will not comment on regulations. The Standards Working Group is working in Working Group space. **2000mar10** Keith Welchel moved to dismiss this item. Jim Florence Seconded;

22	**Date: 2001apr05** **Status: Complete**		**Florence Kozak**	~~Workshops on Testing Philosophy (what are the benefits? testing that provides results); USUG participation;~~ ~~Schedule workshop during USUG at SCS in Jan. 1999. Develop materials for handout. Florence led material development.~~ Closed 2001Apr05 Complete Look at the use of Simulator, Simulation Facility; Definitions change Simulation Facility becomes Simulator; Simulation Facility is now defined as the collection of Simulators Coordinate use of Simulator and Simulation Facility. Closed Moved to AI 18 Jim gave a presentation at the 2000 SCS conference during the USUG meeting.
23				Intentionally Left Blank
24	**Date: 2000mar09** **Status: Complete** **No Action.** Real-time at this time does not seem to be an industry concern at this time. Committee members had no issues with the definition or Section 4.1.1. Therefore, this AI was Closed.		**Dennis DeLuca**	Real Time - Dennis will give further consideration and he will look at industry standards; Measuring Real-Time;

26	**Date: 2000mar10** **Status: Complete** Historical information was presented at the SCS conference. Dennis checked with ANS Headquarters and this issue was discussed in detail		**Dennis**	1985 ANS 3.5 Standard is Historical Standard; Dennis will follow up with Shawn and Mike Wright about Historical/Active Standards and how the present process does not follow the five year; How should we handle or should we comment that the 1985 ANS/ANSI 3.5 standard is now an Historical standard and is no longer in the ANSI catalog. Does the ANS 3.5 Working Group need to comment on this issue; Utilities would need to take exception by treating Certification as other; Mark up the Form 474 and state the other that you are going to do. Scenario Based testing (> 25%/yr.); Performance Based testing Plan Dennis will call Mike Wright confirming ANS-3 understands the Historical Standard issue
27	**Date: 2001Aug09** **Status: Complete**		Collins(Vick) Dennis Koutouzis	(JFC/TD) Possible cross-pollination with other standards. Frank and Dennis will contact others 2001Apr05 Dennis Reference: ANSI/ISA–77.20–1993 Fossil Fuel Power Plant Simulators – Functional Requirements Reviewed FAA WEB Site: www.faa.gov/nsp Simulator Qualifications: www.faa.gov/nsp/ac.htm Colby –To research Navy Simulator Systems Colby – To research Germany regulatory standards
28	**Date: 1999sep15** **Status: Complete**		**Florence**	Suggested a letter to Jim Stavely asking for a commitment to attend meetings along with 02Mar1999 meeting minutes; however, Jim Stavely resigned and submitted replacement resume Oliver Havens, Jr;

29	**Date: 2000mar10** **Status: Complete**		**Florence** **Dennis**	Vice-chair prepare letter to Jim Davis asking for commitment to attend meetings along with 02Mar1999 meeting minutes; Chair to sign and send. Chair to send letter to Jim Davis and Ken Rach thanking them for their past participation and asking them for substitute resumes.
30	**Date: 2001Apr05** **Status: Complete**		**Florence** **Welchel**	Jim Florence suggested that the following information be placed on the USUG Web Page: ANSI-3.5 Membership List, approved meeting minutes, meeting schedules and meeting agendas. Florence/Welchel will ensure WEB page is updated Florence: Check with Shawn (ANS) for WEB space. Check with USUG for WEB Space 2001Apr05 Florence Membership List Minutes Meeting Schedules Will not use ANS WEB Site All future approved ANS WG minutes will be placed on the USUG WEB site.
31	**Date: 1999sep15** **Status: Complete**		**Dennis**	Mission statement for Working Group for the 2003 standard. AI #31 added 1999sep14 **1999sep15:** Voted not to complete

32	**Date: 2001Apr04** **Status: Closed by Motion**	**1999sep15**	**Colby** **Collins** **Koutouzis** **Havens** **Felker** **McCulough**	Description: Multi-Units. Application of reference unit simulators to non-referenced units. Butch has offered to survey the industry. INPO will assist by supplying information from their databases; Misc Info: Reg Guide 1.149 refers to Multi-Unit Plant, but 3.5 does not. Felker - Simulators other than the referenced unit are not covered by this standard; 2001Apr04 The WG, by Motion, closed AI 51 and 32. There was agreement that the 3.5 Standard does not cover simulator configured for Multi-Unit use. The Multi-Unit issues are basically training related and are not minimum reference unit Standard's space. Additional Survey questions will be directed by AI 50. The WG approved a motion to delete AI 32 and AI 51 and Colby will still ask survey questions concerning multi-unit plants. **2000Oct26:** **Butch will request bullets on Multi-Unit from the Group for next meeting**

33	**Date: 2001Apr04** **Status: Complete**		**Havens** **Kozak** **Shelly** **Welchel**	Change 24-month design change limit to some shorter period. **2001apr03** Welchel Proposed new wording: ***5.3.1.2 Subsequent Upgrade.*** *Following the initial upgrade, reference unit modifications determined to be relevant to the training program shall be implemented on the simulator within 24 months of their reference unit in-service dates, or earlier if warranted by a training needs assessment.* Requiring that a determination of the relevance to training and that a training needs assessment be completed should be sufficient. Recommendation is that the "24 months" be removed and that section 5.3.1.2 should read: ***5.3.1.2 Subsequent Upgrade.*** *Following the initial upgrade, reference unit modifications determined to be relevant to the training program shall be implemented on the simulator based on training needs assessments in accordance with the criteria provided in 4.2.1.4.* ***5.1.2.2 Subsequent Update.*** *Following the initial update, new data shall be reviewed, and the simulator design data base appropriately revised, once per calendar year. Modifications made to the reference unit shall be reviewed for determination of the need for simulator modification within 12 months.* ***5.1.2.2 Subsequent Update.*** *Following the initial update, new data shall be reviewed, and the simulator design data base appropriately revised, once per calendar year. Modifications made to the reference unit shall be implemented on the simulator based on training needs assessments in accordance with the criteria provided in 4.2.1.4.* . WG agreed to close this AI with no further discussion. The 12 and 24 month timelines could be used to ensure the modifications.

34	**Date: 2001Apr05** **Status: Complete**	**1999sep15**	**Welchel** **McCullough** **DeLuca** **Koutouzis**	Present standard does not address software bugs, discrepancies, and enhancements. Time limits only relate to plant design changes, no time limits are associated for simulator fidelity and enhancements. Origin: Welchel 2001Apr05 Closed – Other issues are handled with the Simulator Configuration Process Related AI: 36
35	**Date: 2001Apr05** **Status: Complete**	**2000mar08**	**McCullough** **Collins(Vick)**	Review the double column Draft Working Document prepared by Butch Colby 2001Apr05 McCullough Reviewed and recommend no changes at this time. Footnotes in the side-by-side format do not agree with the original document but this should clear up when the double format is deleted. Additional editorial work may be needed to ensure the footnotes align correctly.
37	**Date: 2001Apr05** **Status: Complete** **Group agreed to closed this item. No additional information required.**	2000mar08	**Koutouzis** **Collins(Vick)**	Five Required Control Manipulations Clarification 2001Apr05 Koutouzis No Update

38	**Date: 2001Apr05** **Status: Complete**	2000mar08	**Dennis**	Discuss the ANS definitions and process of Clarification and Interpretation 2001Apr05 Refer to Meeting Minutes {find the meeting minutes and place here}
39	**Date: 2001Apr05** **Status: Complete**	2000mar08	**McCullough** **Florence** **Felker**	Consider differentiating validation of Requal and Initial License Scenarios 2001Apr05 McCullough {Add LTI Document Here}
40	**Date: 2002oct31** **Status: Complete**	Priority 1	**Cox** **Vick** **Florence** **Collins** **McCullough**	Appendix Update for Scenario Based Testing Documentation. 2002oct31 Florence New Appendix E Accepted See Minutes Appendix 2001Apr05 Draft a Scenario Based Testing Guideline (new) Appendix

41	**Date: 2000Oct26** **Status**: **Complete**	2000mar08	**DeLuca** **Colby**	Appendices consideration up-front and not as an after thought. Tie documentation and Testing to the Standard Body Related AI: 18 **Resolution (2000Oct26 – Colby)**: Continue using Appendices A and B as is Recommendation to revisit appendices content Consider moving Appendix D (Part-Task) into standard main body Related AI-18

42	**Closed:** **2002apr23** **Motion**	Priority 1 -	**Chang** **Felker** **Cox**	Use of Verification and Validation Origination: Colby Survey **2002apr23** **Closed by Motion** **2000Oct26:** **Chang to look at Survey and determine the issues with Verification and Validation and bring to next meeting** **Origin: ANS 3.5 WG Survey #1** **2001Apr05** **Felker** **The use of V&V as espoused through the IEEE 7xxx standards for SW Validation. We have outside documentation regarding the use of the term SW Validation &Verification;** **It is not V&V as defined in the Nuclear Industry.** **2001Aug09** **SK will put out a revised document on V&V in one week. Members shall respond within 30 days.**
43	**Date: 2001Apr03** **Status: Complete**	2000mar08	**Welchel**	Send 1998 Standard NUPPSCO comments to: Hal Paris Bob Felker Bud Havens **2001apr03** Welchel - Delivered 2001apr03

44	**Date: 2002oct29** **Status: Complete**	Priority 1 -	**Paris** **Havens** **Chang**	Clarify Simulator Repeatability wrt to Real-time and not Scenario Based Testing. Repeatability is not specified for Scenario Based Testing but is related to Real-time. 2002oct29 Paris Closed Refer to 2002apr motion to leave wording as is. This item is closed (originated form 1998 NUPSCO comments TVA) 2001Apr05 Paris Concern: What is Repeatability? Further review is needed. See Attachment for AI 44 **2000Oct26:** **Hal and Group will review the use of these terms and consistency**
45	**Date: 2000Oct26** **Status: Complete**	2000mar08	**Shelly** **Chang** **Havens**	Clarify Overrides do not have to be tested like Malfunctions and are not Malfunctions. (Survey Comment 3.15 p20) **2000Oct26:** **Non-issue because it's related to CFR and not the standard** Not all Overrides need to be tested Only Overrides in Scenarios need to be tested AI45 Originated from Colby survey Confusion between the CFR about 25%/yr and the 98 standard linking Overrides to Malfunctions Recommend that this is a non-issue and should be closed because its not an issue with the standard but is with the 10CFR Part 55

46	**Date: 2001Aug09** **Status: Complete**		**Committee**	Request members review the other parts of the survey and comment. Members are ask to review and submit two bullets that they consider important for further ANS3.5WG consideration
47	**Date: 2000Oct26** **Status: Complete**	2000mar09	**Colby**	Send Thank You notes to all Survey Participants
48	**Date: 2000Oct26** **Status: Complete**	2000mar09	**Colby**	Modify DCD Training Needs Assessment to Training Impact Assessment **2000Oct26:** **Deleted due to Motion by Felker being Carried** **WG decided to revert back to Training Needs Assessment**
49	**Date: 2000Oct26** **Status: Complete**	2000mar09	**Kozak**	Determine source of Training Needs Assessment Related AI: 15 **2000Oct26:** **Could not determine the Source of Training Needs Assessment**
50	**Date: 2001Apr04** **Status: Complete** **Redundant to AI 10**	2000mar09	**Colby**	Additional survey concerning Exam Security Concerns 2001Apr05 Colby Close redundant to AI 10. Closed 2001Apr04 Kozak presented a PPT presentation outlining and defining security issues Closed based on better understanding of NUPPSCO.

51	**Date: 2001Apr04** **Status: Closed by Motion**	2000mar09	**Colby**	Send out another survey concerning Multi-unit questions and will try to target Simulator, Training, and OPS 2001Apr04 The WG, by Motion, closed this AI 51 and 32. There was agreement that the 3.5 Standard does not cover simulator configured for Multi-Unit use. The Multi-Unit issues are basically training related and are not minimum reference unit Standard's space. Additional Survey questions will be directed by AI 50. The WG approved a motion to delete AI 32 and AI 51 and Colby will still ask survey questions concerning multi-unit plants;
52	**Date: 2000Oct26** **Status: Complete**	2000mar09	**Felker**	Locate previous Multi-Unit work completed by the 1993 WG. Bob will contact Bill Geiss **Resolution**: 2000Oct26 Felker Material does not exist.
53	**Date: 2001Aug09** **Status: Complete**		**Colby**	Review the Appendix A – A(3) (BOM). Consider removal of the BOM list and replace with I&C list 2001Apr05 Colby March 2000 meeting minutes Working Doc Editor to remove BOM from Appx A
54	Date: 2000Apr05 **Status: Complete**	2000mar09	**Vick**	Aquire US Government Style Guide 2001Apr05 Style manual given to Style Editor.
55	Date: 2000Oct25 **Status: Complete**	2000oct25	**Dennis**	Distribute Robert Boire work assignments 2001Oct25 Completed

56	Date: 2000Oct26 **Status: Complete**	2000oct25	**Colby**	Contact Mr. Cox (Com Ed) for 3.5 WG participation. **2000Oct26** **Colby called Mr Cox but Mr Cox is out until 2000Oct30.** **Terrill Laughton attended on behalf of Mr Cox**
57	**Date: 2002Oct29** **Status: Complete**	Priority 1 -	**Dennis** **Vick** **Colby**	Remove all references to 3.1 2002oct29 Dennis - Closed Verified by working group in Standard Draft Rev 6. 2002apr24 Dennis Vick and Colby will determine the changes necessary and bring these to the committee for approval. Revised wording presented to Working Group. One negative comment resolved by personal review of ANS-3.1; Motion passed to accept wording (see 14.11 2002apr22 minutes) 2002apr23 Dennis Get Copy of 3.1 for review. 2001Apr05 Dennis Deferred for later discussion.

58	**Date: 2002apr24** **Status: Complete**	Priority 1	**Dennis**	Send Robert Boire a note of thanks for his participation 2002apr24 Dennis Closed Letter reviewed by members. 2002apr23 Dennis Letter sent. Get copy of letter for members review. 2001Apr05 Dennis Letterhead not available. Florence will contact Shawn at ANS and request letterhead.
59	**Date: 2002apr23** **Status: Complete**	Priority 1	**Florence McCullough**	Develop a list of Action Items for 3.5-WG resulting from the 2000Oct26 USUG Ops Test Directors Meeting at DC Cook 2002apr23 Closed Closed – Items were reviewed by WG in the Oct 2000 meeting and they were incorporated into the Working Groups public comment to the NRC's proposed rule change. 2001Apr05 Florence Deferred until Florence communicates with McCullough
61	**Date: 2001apr03** **Status: Complete**	2000oct26	Welchel Dennis	Write letter to NRC concerning the WG comments on the proposed rule change 2001apr03 Welchel – Letter Written and mailed to NRC stating the three issues regarding the proposed rule change.

62	**Date: 2001Aug09** **Status: Complete**		Koutouzis	Send Meeting Materials to Absent members;
63	**Date: 2001Aug09** **Status: Complete**		Dennis	Address the problem of other standards placing requirements on the ANS 3.5 Standard without our knowledge. (NFSC Sub-Committee I);
64	**Date: 2001Aug09** **Status: Complete**		Florence Dennis	Florence to prepare W. DeLuca letter for T. Dennis signature;
65	**Date: 2001apr03** **Status: Complete**		Welchel	NUPPSCO comment to Kevin Cox (Complete)
66	**Date: 2001Aug09** **Status: Complete**		Havens	Scan NRC Form 398 and Email to WG members

67	**Date: 2001Aug09** **Status: Complete**		Dennis	Contact Shawn concerning Clarification Statement 2001jul11 Ms. Shawn M. Coyne-Nalbach NFSC Secretary American Nuclear Society 555 North Kensington Avenue La Grange Park, IL 60526-5592 Dear Ms. Coyne-Nalbach: Subject: Request for Clarification Reference: ANSI/ANS-3.5-1998 Standard Document, Section 4.4.3.2 I am a supervisor for the Nebraska Public Power District's Cooper Nuclear Station responsible for maintaining the functional requirements for our full-scope nuclear power plant control room simulator used for operator training and examination. I am writing this letter to your organization to request a clarification to the reference document in regards to Simulator Scenario-Based Testing. Section 4.4.3.2 of the reference document states that scenarios developed for the simulator, including the appropriate instructor interfaces and cueing, shall be tested before use for operator training or examination. The simulator shall be capable of being used to satisfy predetermined learning or examination objectives without exceptions, significant performance discrepancies, or deviation from the approved scenario sequence. A record of the conduct of these tests, typically in the form of a completed scenario or lesson plan checklist, and the evaluation of the test results, shall be maintained. I am concerned that the Standard requires scenarios developed for the simulator shall be tested before use for operator training or examination. It appears that this requirement may not be achievable with all operator training programs, namely initial license candidate training programs. Please clarify the preceding paragraph by addressing the following questions: 1. What is the intent of scenario-based testing? Does scenario-based testing impose additional training program requirements? ANS-3.5 Working Group answer: Scenario Based Testing is intended to best utilize, to the extent possible, the existing training scenario development process

68	**Date: 2003Mar11** **Status: Complete** **Date: 2002oct30** **Status: Re-Opened** **Closed** **2002apr24**	Priority 1	**Colby** **Shelly** **Felker**	Survey #2 Multi-Unit Different OPS Procedures Fuel Cycles Time Delay loading Sim Fuel load Unit Procedure Differences and Training **2003Mar11** **Colby** **Presented list of survey results.** **Motion:** **Delete Malfunction List Table in Section 3.1.4 and move to Appendix A** **2003Mar10** **Colby** **Presented list of survey results.** **This item was originally discussed in AI-83.** **2002oct30** **Reopened to consider additional Survey data.** **Consider AI-83 - Malfunctions List and Survey Results** 2002apr24 Colby Recommend Closing due to information will be handled by future Action Items. 2002apr23 Colby Nothing here that would be changed in the 2003 standard. 2001AUG7 All survey's have not been received, so the final results of the survey will be discussed at our next meeting in March.

69	**Status: Complete** **2002apr24**		**Vick**	Check out and report information on SECY-01-0125 2002apr24 Vick Simulator rule is in effect Nov 16,2001 and SECY reference is now background info only.
70	**Date: 2002oct29** **Status: Complete**		**Florence**	Come up with a set of rules for use and what will go on the web site. **2002oct29** Florence Closed WEB Site Changes: • Only latest minutes will be posted • Contact Keith Welchel to request previous minutes • ANS 3.5 WEB will not be password protected • Remove membership contact info accessible by general public 2002apr24 Florence Handout presented to members for review. AI-70 will be closed when the ANS 3.5 WEB site is password protected. Password protect the ANS 3.5 WEB site and post amended ANS 3.5 WEB page use policy.
71	**Date: 2002apr24** **Status: Complete**		**Dennis**	Vary if ANS normally provide the minutes of group meetings 2002apr24 Dennis Provided by request by ANS.

72	**Date: 2001Nov27** **Status: Complete**		**Shelly**	Check if we can add an appendix and still reaffirm **2001Nov27** **Shelly** I contacted Suriya with this question, and his response was that a standard can be reaffirmed if the appendix/annex will be informative. If the additional appendix is informative, then you should supply a statement in the foreword regarding this informative piece. The statement in the forward is NOT required but highly recommended. The standards can not be reaffirmed if the additional appendix will be normative. In this case the standard will have to be considered under the revision process through ANSI. According to Webster's, NORMATIVE means "of, relating or conforming to, or prescribing norms". Based on this, we could add an appendix to the standard and still reaffirm the current standard, but we must ensure the appendix contains clarifying information and doesn't prescribe any new requirements or parameter limits. I consider this action closed unless someone knows of a need for further research on this issue.

73	**Status: Complete 2002apr24**		**Dennis**	Send the clarification letter to ANS on the Scenario Based Testing 2002apr24 Dennis Published in the Nuclear Standards News, Vol. 33/No. 2 March-April 2002
74	**Status: Complete 2002apr24**		**Dennis**	Contact ANS Standards Administer to determine if we can refer to documents other than ANS Standards 2002apr24 Dennis
75	**Status: Complete 2002apr24**		**Jim Florence**	Contact the industry 2002apr24 Florence does not know what this is about. Recommend to close .
76	**Status: Complete 2002apr24**		**Butch & Hal**	To research Germany regulatory standards and navy standards 2002apr24 Colby Most International simulator customers refer to ANS 3.5 in their purchase spec
77	**Status: Complete 2002apr22 Dennis**		**Dennis**	Determine if the ANS 3.5 Working Group name will change due to the ANS 3 to ANS-21 name change. Closed 2002apr22 Dennis contacted Suriya Ahmad at ANS headquarters and no change is planned for ANS 3.5.

78	**Status: Complete** **2002apr24**		**Keith** **Welchel**	AI16 - Prepare a document for review by ANS members that shows the result of substituting Difference for Deviation/Discrepancy. 2002apr24 Colby Prepared summary of all Deviation/Discrepancy and Difference replacements and reviewed with members.
79	**Date: 2002oct30** **Status: Complete**		**Vick** **Cox** **Kozak**	Bring to the committee recommendation for implementing Roberts Rules or Order. (i.e. Revisiting Motions Not-carried) **2002Oct30** **Cox** **Consensus that Robert's Rules of Order will used a general guide**
81	**Date: 2002Oct29** **Status: Complete**		**Dennis**	Get copy of ANS 3.1 for members review. **2002oct29** **ANS 3.1 is no longer referenced in ANS 3.5; No need for ANS 3.1.** **2002Apr24 Closed** **Dennis** **Copy of ANS-3.1 obtained from ANS Standards Secretary.** **Copy given to requesting Working Group member for review.**
82	**Status: Complete** **2002apr24**		**Dennis**	Get copy of Letter of thanks to Robert Boire for members review 2002apr24 Dennis Members reviewed letter

83	**Date: 2002oct30** **Status: Complete**		**Colby**	Compare 3.1.4 Malfunction List with 10 CFR Part 55.59 **2002oct30** **Colby** **Reviewed items that are in 10CFR55.59 but are not in the Standard. This item was discussed before.** **This item may be discussed in AI-68.** 2002oct29 Colby Reviewed 10CFR55.59 List (See Appendix AI-83)
84	**Date: 2002oct29** **Status: Complete**		**Florence**	Review 4.4.3.1 for clarity concerning SBT and to remove Certification reference **2002oct29** **Florence** Complete Refer to AI-40 AI-84 was completed at Jackson meeting via AI-40. Cannot find reference in past minutes why this AI was created. AI-84 has been completed and is thus Closed.
85	**Date: 2002Oct28** **Status: Complete**		**Welchel**	Create another Bucket to place 2008 deferred AI's **2002Oct28 Closed** **Welchel** **New Section and Table to Hold Deferred Action Items**
86	**Date: 2002oct29** **Status: Complete**		**Colby** **Florence**	Create Frank Collins Plaque for review membership 2002oct29 Colby Colby create a plaque for the group to consider. Plaque is mahogany base with Brass ANS Logo and wording.

87	**Date: 2002oct29** **Status: Complete**		**Colby**	Review MANTG Simulator Historical base-line data 2002oct29 Colby Closed – Reference Section 5.1 "Current Simulator"
88	**Date: 2003Mar10** **Status: Complete**		**Cox**	Review simulator Fidelity. Standard does not define Software Fidelity, only HW Fidelity **2003Mar10** **Vick** **New AI - Recommends having Document Edited by a Technical Editor** **Complete – No need to define SW fidelity.** 2002oct30 Cox Cox and Vick will recommend new definition.
89	**Date: 2002oct29** **Status: Complete**		**Shelly** **Vick**	Review 4.4.3.1 "once per year on a calendar basis language" **2002oct29** **Shelly** **Defeated on Motion**

90	**Date: 2003Mar12** **Status: Complete**		**Florence** **Colby** **Cox** **Chang**	Review all Section for alignment specifically Sections 3.4 and 4.4 and report and recommend new Section alignments **2003Mar12** **Colby** **Report to committee complete** **AI-Closed** **Refer to AI-102** **2003Mar11** **Colby** **Motion: Defer AI-90 to 2008 Standard** **Motion withdrawn pending further discussions** 2002oct30 Colby Action deferred to next meeting. See AI-90 meeting minutes 2002oct30.
91	**Date: 2003** **Status: Complete**		**Dennis**	Call Mike Wright and get a determination on standards organizational alignment and possible standards name change **2003Mar11** **Dennis** **Refer to AI-77** **No further change from NFSC Nov 2002 meeting** 2002oct28 Dennis

92	**Date: 2003Mar11** **Status: Complete**		**Florence** **Colby** **Kozak**	Improve Definition of Simulation facility to include Part-task and limited scope. (coordinate with Scope State) **2003Mar11** **Colby** **Motion:** **Revise Scope Statement**
93	**Date: 2003Mar10** **Status: Complete**		**Shelly**	Appendix and Standard Dates referencing Are Appendices required to reference the standard's published date. **2003mar10** **Shelly** **Contacted Suriya Ahmad of ANS.** **Response: The appendix reference to the standard's published date is part of the ANSI's format when publishing a standard. Therefore, it can not be removed.**
94	**Date: 2003Mar10** **Status: Complete**		**Colby**	Align Appendix Header dates to Appropriate Published Standard Date **2003Mar11** **Colby:** **Presented New Appendix Wording**

95	**Date: 2003Mar11** **Status: Complete**		**Felker** **Florence** **Kozak**	Section 4.4.3.2 New 4.4.3.2 wording and/or integrate 4.4.3.1 and 4.4.3.2 **2003Mar11** **McCullough** **Motion to add procedural in Section 4.4.3.2 and Appendix E.** **Modify Paragraph Numbered Item (2) Section 4.4.3.2** (2) the simulator is capable of producing the expected reference unit response without procedural exception, significant performance discrepancies, or deviation from an approved scenario sequence; **Modify paragraph after "Scenario Lesson Plan Title:" in Appendix E** This test verifies that the simulator may be used to satisfy predetermined learning or examination objectives without procedural exception, significant performance discrepancies or deviation from the approved scenario sequence, including the appropriate instructor interfaces, operator actions, and operator cues.
96	**Date: 2002Oct30** **Status: Complete**		**Kozak** **Chang**	Locate a copy of INPO document concerning pre-running Scenarios and determine what validation is required. **2002Oct30** **ACAD 90-022 – "Guidelines for Simulator Training"** **The document uses the word "should" to validate scenarios before use in operator training.** **This document is only a guide.**

97	**Date: 2003Jul24** **Status: Complete**		**Dennis**	Determine reference usage within ANS Standards. Can the 3.5 Standard reference an INPO document? **2003Jul24** **Dennis presented minutes from NFSC meeting. It was noted that INPO documents are generally available to the public at large and should be avoided. But, may be used if required.** 2003Mar11 Dennis Researching using documents not available to general public.
99	**Status:** **Complete** **2003Oct28**		**Vick Koutouzis**	Vick and Koutouzis will have Standard reviewed by Technical Editors for consistency 2003Oct28 Complete Technical Review completed and present to working group. 2003Mar10 Initial Action Item.

100	**2003Jul24** **Status: Complete**		**<u>PWR</u>** **McCullough - Lead** **Neis** **Chang** **Kozak** **Welchel** **<u>BWR</u>** **Havens - Lead** **Felker** **Florence** **Panfil** **Tarselli** **Vick - Coordinator**	Create two subcommittee's (PWR and BWR) that will investigate Core Performance testing inclusion into the Standard. • Review Section 3.1.3 "Normal Evolutions" Item 9 ANS 3.5 1998 with regard to Core Performance testing for PWR and BWR types. • Should Core Performance be in Section 3.1.3 Is Unit Performance Testing the correct term or did the committee mean Core Performance Testing. **2003Jul24** **Closed** After significant lengthy discussions, to the point of beating a dead horse, and a failed motion to delete Section 3.1 Bullet 5 and Modify Section 4.1.3.2, the working group was unable to come to a consensus for Core Performance Testing. 2003Mar10 Initial Action Item.
101	**2003Jul24** **Status: Complete**		**Neis** **Felker** **Kozak**	Review 3.2.1.4 for language clarification **2003Jul24** **Neis** **Proposed new Wording** **Passed by Amended Motion** 2003Mar10 Initial Action Item.

102	**Status:** **2003Oct30** **Complete**		**Colby** **Paris** **Dennis** **Koutouzis** **Shelly** **Cox** **Vick - Coordinator**	Review Sections 3, 4, 5 and 6 for alignment and consistency and possible merge. **2003Jul21** **Colby** **Distributed comparison and groups were formed to review and report next meeting** Inform Tim Cassidy that Sections are under review. Options: • This Standard • Next Standard Formatting • Keep the Sections separate but aligned • Merge the Sections **2003Mar10** **Initial Action Item.**
103	**Status:** **2003Oct28** **Complete**		**Colby**	Will create two Revised Standards Versions Version 1 1998 versus 2003 No History Version 2 1998 versus 2003 with Revision History **2003Oct28** **WG is not sure what the reason for this AI. The WG recommend closing this AI. Colby can deliver this information at a later time.** 2003Mar10 Initial Action Item.

104	**Status:** **2003Oct28** **Complete**		**Vick**	Review the parliamentarian procedure for motion approval (75% Consensus Rule of the Chair) Rule of the Chair: Interim Voting (Motions) shall be by Consensus Action: Vick will review and advise at future meetings **2003Oct28** **Rule of the Chair is 75% for consensus motions. 75% for consensus is from ANS.** 2003Jul24 Initial Action Item
105	**Status:** **2003Oct28** **Complete**		**Shelly Neis Koutouzis**	Incorporate technical writing editor modifications for committee review Refer to Colby AI-102 handout (Comment 1 and 2) concerning technical editor review and suggested changes **2003Oct28** **Complete** **Delivered to WG via Email. AI-106 will continue Tech Editing Review.** **2003Jul24** **Initial Action Item**

107	**Status:** **2003Oct27** **Complete**		**Wyatt-Lead** **Neis** **Vick** **Koutouzis** **Havens** **Florence**	Determine what may be acceptable performance test documentation and evaluation test results documentation to take credit for a scenario-based test. Provide a white paper to the Working group for discussion at the next meeting. **2003Oct27** 2003Jul24 Initial Action Item
108	**Status:** **2003Oct30** **Complete**		**Felker** **Vick**	Review Section Comparison Section 3.0 Section 3.1 Section 3.1.1 Section 3.1.2 Format of change: • Reline changes (Track Changes) • Add "why change is made" comment for each change • Email changes to Florence for consolidation by 2003Oct01 Be prepared to present to WG at next meeting **2003Oct30** 2003Jul24 Initial Action Item

109	**Status:** **2003Oct28** **Complete**		**Havens** **McCullough**	Review Section Comparison Section 3.1.3 Section 3.1.4 **2003Oct28** **Amended Sections:** 2003Jul24 Initial Action Item
110	**Status:** **2003Oct28** **Complete**		**Welchel** **Paris/Noe**	Review Section Comparison Section 3.2 **2003Oct28** **Amended Sections:** **3.2.1.1 – 4.2.1.1** **3.2.1.2 – 4.2.1.2** **3.2.1.3 – 4.2.1.3** **3.2.1.4 – 4.2.1.4** 2003Jul24 Initial Action Item
111	**Status:** **2003Oct30** **Complete**		**Neis** **Kozak**	Review Section Comparison Section 3.3 **2003Oct30** 2003Jul24 Initial Action Item

112	**Status:** **2003Oct30** **Complete**		**Florence** **Tarselli** **Chang**	Review Section Comparison Section 3.4 **2003Oct30** 2003Jul24 Initial Action Item
115	**Status:** **2003Oct30** **Complete**		**McCullough**	Find a another home the existing wording of Section 3.4 Create Data Collection Section **2003Oct30** **Removed all wording Section 3.4 and added new Section 3.3.5 and 4.3.5 Data Collection** **AI-115 and AI-115 were considered at the same time and Accepted by Motion** **2003Oct29** **Initial AI**
116	**Status:** **2003Oct30** **Complete**		**Koutouzis** **Florence**	Develop the requirements, Section 3.4 for Section 4.4 that better defines the requirements for V&V **2003Oct30** **2003Oct30** **New wording for Section 3.4** **AI-116 and AI-115 were considered at the same time and Accepted by Motion** **2003Oct29** **Initial AI**