ANS 3.5 Working Group Meeting Minutes

Entergy Headquarters
Courtyard Marriott
Jackson, Mississippi
2002 April 22-26

1 Index

2 Next Meeting

Location: AEP, Power Generation Learning Center, St Albans, WV
Date: Late July - August

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday

3 Motions

Welchel Accept 2001Aug 6 Minutes	Motion: Carried (Unanimous)
Dennis Accept Larry Vick as member	Motion: Carried (Unanimous)
AI-13 Motion for New Table 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; 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;	Motion: Carried (10 For 2 Against)
AI-14 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	Motion: Carried (Unanimous)

AI-42 Accept Items 1 and 2 of Handout.	Motion Carried 10 For 1 Abstain 1 Against - Very little impact, RG 1.149 Rev 3 covers and endorses V&V as written in the 1998 Standard)
Modify Section 3.1.4 as follows: The determination of the type and number of malfunctions to be simulated shall be part of a Systematic Approach to Training process for the design of performance-based operator training programs. The specific malfunction capability required of the simulator shall meet the requirements specified in the reference unit's accredited licensed operator training programs. • Keep the first paragraph as Written • Delete the last sentence in the first paragraph • Append the Next Paragraph to the First Paragraph • Delete the Table	Motion – Not carried 4 For 1 Abstain 7 Against – Possible confusion, reluctance to accept standard due to magnitude of change with little or no clarification on change, currently accepted by regulatory agency
AI-13 Delete the list of twenty five malfunctions and move to an Appendix • The list was developed before the SAT based programs were designed • Regulation no longer requires testing • The standard no longer needs to tell the user what malfunctions are needed	Motion – Not Carried 4-For 2-Abstained 6-Against – Change does not follow Mission Statement, Change too big for this standard revision
AI-13 Motion to move MWe from 4.1.3.1.1 to 4.1.3.1.2 and move MWe from 4.1.3.1.3 to 4.1.3.1.4 Based in industry feedback using Colby survey	Motion Carried 10-For 1-Against – Don't really see a problem with meeting the 1% criteria
AI-57	Motion Carried

Remove all references to ANS 3.1	Unanimous
AI-16 Accept changes to Deviation and Discrepancy with Difference per attachment	Motion Not Carried 1-For 1-Abstain 10-Against Current uses of Deviation and Discrepancy are acceptable for the purposes of this standard
In section 4.1.3.1 change “an additional deviation” to “an additional tolerance” to agree with Appendix C	Motion Carried 11-For 1-Against Using Tolerance here changes the intent.

4 Action Item Activity

77	Call Mike Wright and get a determination on standards organizational alignment and possible standards name change.	Tim Dennis
78	AI16 - Prepare a document for review by ANS members that shows the result of substituting Difference for Deviation/Discrepancy.	Keith Welchel
79	Bring to the committee recommendation for implementing Roberts Rules or Order. (i.e. Revisiting Motions Not-carried)	Larry Vick Kevin Cox Allan Kozak
80	2008 Copy and Paste RG 1.149 Rev 3 Section 1.5 into the 2008 Standard. (Software V&V)	Jim Florence
81	Get copy of ANS 3.1 for members review	Tim Dennis
82	Get copy of Letter of thanks to Robert Boire for members review	Tim Dennis
83	Compare 3.1.4 Malfunction List with 10 CFR Part 55.59	Butch Colby
84	Review 4.4.3.1 for clarity concerning SBT and to remove Certification reference	Jim Florence
85	Create another Bucket to place 2008 deferred AI's	Keith Welchel
86	Create Frank Collins Plaque for review membership	Butch Colby Jim Florence
87	Review MANTG Simulator Historical base-line data	Butch Colby
88	Review simulator Fidelity. Standard does not define Software Fidelity, only HW Fidelity	Kevin Cox
89	Review 4.4.3.1 "once per year on a calendar basis language"	Mike Shelly Larry Vick
90	Review all Section for alignment specifically Sections 3.4 and 4.4 and report and recommend new Section alignments	Not Assigned

5 Visitors

Visitor	Date	Affiliation	Email, Phone Fax
Rob A. Johnson	2002Apr22	Exitech Executive Vice President 102 East Broadway Maryville, TN 37804	Email: raj@exitech.com Phone: 865-983-9101 Fax: 865-983-9336
Jane Neis	2002Apr22	R.E. Ginna Nuclear Power Plant Training Center 1517 Lake Rd Ontario, NY 14519	Email: jane_neis@rge.com Phone: (716) 546-6646 Fax: (716) 524-8278
	2002Apr		Email: Phone: Fax:
	2002Apr		Email: Phone: Fax:

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: 601-368-5816
Present	Larry Vick	US NRC, Office of Nuclear Reactor Regulation 09-D24 Washington, DC 20555		Email: Lxv@nrc.gov Phone: 301-415-3181 Fax: 301-415-2222
Preset	George McCullough	American Electric Power 620 Sixth Ave. St. Albans, WV 25177-2964		Email: gsmccullough@aep.com Email: rifreyberg@aep.com Phone: 304-556-4043 Fax: 304-556-4049 Cell: 304-549-8761
Present	Hal Paris	GSE Systems 8930 Stanford Blvd. Columbia, MD. 21004		Email: hal.paris@gses.com Phone: 410-772-3559 Fax: 410-772-3595
Absent	Robert Felker	EXITECH Corporation 102 E. Broadway Maryville,TN 37804	Proxy: Rob Johnson	Email: rfelker@EXITECH.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
Absent(1)	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
Present	Kevin Cox	Exelon Generation Dresden Nuclear Power Station 6500 North Dresden Rd. Morris, IL 60450		Email: kevin.cox@exeloncorp.com Phone: 815-942-2920 x-2109 Fax: 815-941-7121
Present	SK Chang	Dominion Nuclear Connecticut, Inc. Millstone Power Station L. F. Sillin, Jr. Nuclear Training Ctr. Rope Ferry Road Waterford, CT 06385		Email: Shih-Kao_Chang@dom.com Phone: 860-437-2521 Fax: 860-437-2671
NA	Suriya Ahmad	Standards Administrator American Nuclear Society 555 North Kensington avenue La Grange Park, IL 60526-5592		Email: sahmad@ans.org 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

7.2 Action Items

No.	Status	Date	Assigned To:	Work Assignment
1	**Tim** 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 Tim Dennis will contact Mike Wright (ANS-3 chair). Are DOE issues referencing simulators? 2001Apr05 Dennis Tim 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. 2001Apr05 Contacted Sub-Committee-1 and Dennis needs to complete PINS forms;

13		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. 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 automatic action. Suggestion to replace Sections 4.1.3 and 4.1.4 with the language above. 2001Apr05 Felker – Tables that remain in the 2003 Std should updated or noted as Historical. Florence – Recommendation for wording in Section 3.1.3. See

				Notes in Minutes Body. 2001Apr04 Colby Presented the History of the Critical Parameters list. 2001
20		Priority 1 –	**Paris** **Colby** **Kozak**	Exploiting technology changes and future industry trends. What's coming around the corner; 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).
36		Priority 2	**Koutouzis** **Havens**	Questions from Review of INPO Documents: Timeline for incorporation of Plant design changes into the simulator Instructor Qualification Long Term Open Simulator Fidelity Issues This is an information AI 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
40		Priority 1	**Cox** **Vick** **Florence** **Collins** **McCullough**	Appendix Update for Scenario Based Testing Documentation. 2001Apr05 Draft a Scenario Based Testing Guideline (new) Appendix
44		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. 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**
57		Priority 1 -	**Dennis** **Vick** **Colby**	Remove all references to 3.1 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)

				WG still needs to verify correct wording in standard. 2002apr23 Dennis Get Copy of 3.1 for review. 2001Apr05 Dennis Deferred for later discussion.
70			**Florence**	Come up with a set of rules for use and what will go on the web site. 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.
79			**Vick** **Cox** **Kozak**	Bring to the committee recommendation for implementing Roberts Rules or Order. (i.e. Revisiting Motions Not-carried)
83			**Colby**	Compare 3.1.4 Malfunction List with 10 CFR Part 55.59
84			**Florence**	Review 4.4.3.1 for clarity concerning SBT and to remove Certification reference
85			**Welchel**	Create another Bucket to place 2008 deferred AI's
86			**Colby** **Florence**	Create Frank Collins Plaque for review membership
87			**Colby**	Review MANTG Simulator Historical base-line data
88			**Cox**	Review simulator Fidelity. Standard does not define Software

				Fidelity, only HW Fidelity
89			**Shelly Vick**	Review 4.4.3.1 "once per year on a calendar basis language"
90			**Not Assigned**	Review all Section for alignment specifically Sections 3.4 and 4.4 and report and recommend new Section alignments

8 Working Group Procedural Rules

8.1 Rules of the Chair

- Interim Voting (Motions) shall be by Consensus
- The Chairman rules that no Motions will be accepted when not in session
- Administrative issues by simple majority;
- 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;
- The two absent policy will be enforced;
- Word 7.0 will be the document format;
- The Host will collect and send all handout material for absent members without proxy;

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 2002Apr22 (Day 1)**

9.1 Opening Comments (Tim Dennis):

9.2 Roll Call

Absent Members:

- Dennis Koutouzis (1)
- Bob Felker (Proxy: Rob Johnson)

Review of Meeting minutes Dated 2001Aug06l

- Motion to Accept Minutes as Written
- Minutes Accepted

Review of the Agenda

Rob Johnson – Discussion on ANS 3.0 now ANS 21 and other committees. Need to determine if the ANS 3.5 Working Group is still ANS 3.5 of some other. Tim Dennis will call Mike Wright for a determination.

Handouts:

- Colby - Tables Survey Results and recommendations
- Shelly – 2001Aug06 Meeting Minutes Rev 12

9.3 AI–16 –(Welchel Deviation, Discrepancy and Deficiency

Welchel lead the discussion on replacing Deviation, Discrepancy with Difference.

Refer to Appendix for Deviation, Discrepancy presentation

Vick stated that we should consider Legal term Deviation and also stated that the word Deviation is used in regulation.

9.4 Vick Membership Status

Larry Vick gave a brief summary of his experience.

Motion to accept Larry Vick as Voting member.

- Motion Carried (Unanimous).

9.5 ANS 3.5 Proposed Mission Statement (Florence)

Jim Florence discussed the proposed mission statement that will be used as a guide future deciding how the Working Group will handle Action Items in the future. Working Group member were generally agreeable to this concept.

Proposed Mission Statement:

The ANS 3.5 Working Group will clarify various components of the existing standard and submit to ANS 21 by January 2003 for approval in 2003.

Action Item Screening Criteria:

If the action facilitates clarification of the existing document

THEN
If Clarification results in minimal impact to the 1998 standard

THEN
If work is doable by August 2002

THEN
ACCEPT Action Item for 2003

ELSE
TABLE Item until 2008

9.6 Standard Timetables Discussion (Tim Dennis)

- Statement of Standards 1 year extensions and Historical standards.
- 5yr to accomplish review and submittal of standards changes.
- NFSC – Balloting organization
- Rules are on the NFSC WEB site (www.ans.org)
- McCullough – Will the ANS 3.5 Standard change due to the change in ANS 3 to ANS 21. Tim will call ANS headquarters for a determination. Dennis – After discussing with Suriya Ahmad at ANS Headquarters ANS 3.5 will keep it's 3.5 designation. See AI-77

9.7 AI-13 – (Colby/Florence) Tables

Review of (Colby) Tables Survey Results handout

67 responses…Two(2) simulator sites did not respond

Colby reviewed handout:

- The "NO" column is that the respondent disagreed with the change for that section.
- The "N/A" column is probably where the respondent did not disagree but did not respond either.

3.13 Normal Evolutions table simplification

- Motion to accept Table 3.1.3 as shown below:

6. Unit startup from cold shutdown to rated power conditions; 7. Unit shutdown from rated power to cold shutdown conditions; 8. Load changes; 9. Operator-conducted surveillance testing on safety related equipment or systems; 10. 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;

- Motion Accepted (10 For – 2 Against)

9.8 Adjourned 2002Apr22: 1800

10 Tuesday 2002Apr23 (Day 2 8:00am)

Tim Dennis reviewed handling presentations.

Vick – Agreed to accept Parliamentarian and review Roberts Rule of Order.

10.1 AI-79

Bring to the committee recommendation for implementing Roberts Rules or Order. (i.e. Revisiting Motions Not-carried)

10.2 AI-14 Stimulated Devices (Hal Paris)

- Reviewed new definition of Stimulated Hardware.
- Motion to accept Proposed definition and.

  stimulated devices (Computer) processor based devices that are integrated to the simulator process via simulator inputs and/or outputs which perform their functions parallel to, and either independently of or synchronized with the simulation process

- Motion was withdrawn.
  A new definition will be developed that will incorporate the words Device and Components and the standard will be reviewed for uses …
- AI-14 will be discussed at a later time.
- 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

- Motion accepted (Unanimous)

10.3 AI-20

Distributed Control Systems

- AI-20 is not a clarification. Is considered a change to the standard and is not currently present in the standard.
- It has no definition
- Not related to NUPPSCO comment

10.4 AI-40 – Scenario Based Testing (Florence/Cox)

Motion to accept proposed wording for Section 4.4.3.2 (see above)

Welchel- Concerns that there is no requirement to actually do Scenario Based Test.

Motion withdrawn. Florence will distribute a modified proposed 4.4.3.2 and proposed Documentation form to members and will solicit feedback.

10.5 AI-42 - Clarify Validation and Verification (SK Chang)

Refer to Handout Titled " ANS 3.5 WG Written Comments on proposed V&V Changes"

Reviewed each item in the handout.

Discussion on Verification testing and is verification testing really done in a "standalone mode?"

Florence – Why are we discussing V&V? Because …Get more words from Florence

General consensus to accept handout Items 1 and 2.

See Appendix 14.3

Motion: Accept Items 1 and 2 of Handout.

Motion Carried (10 For; 1 Abstain; 1 Against – Very little impact, RG 1.149 Rev 3 covers and endorses V&V as written in the 1998 Standard)

Screened Criteria for Items 1 and 2 using Screening Criteria.

AI-42 Closed

10.6 AI-44

Paris – Presented information on repeatability and real-time.

Motion – Current Definition remain as is.

Motion Carried (11 For; 1 Dissent – Missed opportunity to clarify and simplify Repeatability "The capability of the simulator to have successive tests of its dynamic performance produce the same results within the limits required by this standard.")

10.7 AI-57 – Dennis

See AI 57 - "Motion to accept new scope passed (see tables and 14.11).

10.8 AI-58 - Dennis

See AI 58 - "Letter sent to Mr Boire (see AI #58 in tables).

10.9 AI-59 – USUG Operator's test Directors meeting Action Items (McCullough)

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.

10.10 AI-60 Define training needs Assessment (McCullough)

McCullough presented a history of Training needs Assessment and the differences in interpretation between Training Staff and Simulator Staff.

Sections (3, 4) and Section 5 do not agree in the use of Training needs Assessment

See Appendix for presentation

AI-60 is tabled and will be considered in the 2008 Standard revision due to the magnitude of change required to align all sections to a new definition of Training need Assessment.

10.11 AI-13 (Colby/Forence) Tables

Table 3.1.4 Malfunctions

Motion to modify Section 3.1.4 to read:

The determination of the type and number of malfunctions to be simulated shall be part of a Systematic Approach to Training process for the design of performance-based operator training programs. The specific malfunction

capability required of the simulator shall meet the requirements specified in the reference unit's accredited licensed operator training programs.

- Keep the first paragraph as Written
- Delete the last sentence in the first paragraph
- Append the Next Paragraph to the First Paragraph
- Delete the Table

Motion – (4 For; 1 Abstain; 7 Against – Possible confusion, reluctance to accept standard due to magnitude of change with little or no clarification on change, currently accepted by regulatory agency)

Table 3.1.4 List of malfunctions

Review of all the malfunctions in the Colby Survey

Motion – Delete the list of twenty five malfunctions and move to an Appendix

- The list was developed before the SAT based programs were designed
- Regulation no longer requires testing
- The standard no longer needs to tell the user what malfunctions are needed

Motion – Not Carried (4-For; 2-Abstained; 6-Against – Change does not follow Mission Statement, Change too big for this standard revision)

AI-83 - Compare 3.1.4 Malfunction List with 10 CFR Part 55.59-

Recommendation on moving MWe from 1% to 2%

Recommendation based on industry feedback using Colby Survey

Motion to move MWe from 4.1.3.1.1 to 4.1.3.1.2 and move MWe from 4.1.3.1.3 to 4.1.3.1.4 (McCullough)

Motion Carried (10-For; 1-Against – Don't really see a problem with meeting the 1% criteria)

Recommendation to move from 1% to 2%:

4.1.3.1.3 -- Move FW temperature after last FW Heater from 2% to 1%

NO Change decided for Boiler.

Recommendation for Normal Evolutions Section 4.1.3.2

Motion to revise the list in Section 4.1.3.2 to read:

- Be the same as the reference unit procedure acceptance criteria
- Require that the observable change in the parameters correspond in direction to those expected for a best estimate of normal unit operation
- Require that the simulator shall cause an alarm or automatic action if-and-only-if the reference plant would cause an alarm or automatic action

Rob Johnson- Power Uprate Modifications are doing significant testing and

This motion was not voted on before adjournment for the day. Voting will start the activities on

A motion to ""replace the 6 Items in 4.1.3.2 with the list above" is presently active at the end of the day. A vote was not taken.

10.12 Adjourned 2002Apr23: 1800

11 **Wednesday 2002Apr24 (Day 3) 0800**

11.1 AI-13 (Colby/Forence) Tables

Resumption of pending Motion to revise the list in Section 4.1.3.2

Many members express concern that the proposed wording does not capture both the positive and negative logic for this case.

Review of the wording of the survey question and how the question may bias the answer

Members reviewed the letter Colby sent to the industry and a lengthy discussion resulted about whether or not the feedback was swayed by the question.

An informal show of hands showed about seven members would not vote for this change. The motion was withdrawn.

11.2 AI-40 (Florence) Appendix Update for Scenario Based Testing Documentation

Proposed New Words for 4.4.3.2

Havens – the phrase "if credit is to be taken for testing." Conflicts with 4.4.3.1 third paragraph. Florence – Operability testing is a separate performance test and credit can be taken during training as long as Malfunctions, local operator actions… are tested prior to or using scenario-based testing.

AI-84 Review 4.4.3.1 for clarity concerning SBT and to remove Certification reference

Lengthy discussion on maintaining the lesson plan (conduct of the test) with the cover sheet. Some users stated that the Lesson Plan will not be kept with the SBT cover page and the will be filed in plant permanent records.

Vick expressed the NRC's agreement that the present wording of 4.4.3.2 should be maintained.

Reviewed modified SBT cover page.

Florence asked members to comment on the proposed new 4.4.3.2 wording.

11.3 AI-36 (Havens) Questions from Review of INPO Documents

Timeline for incorporation of plant changes

Issue already address with closed AI-33

Concern about plant modifications that do not go through the normal plant change design process.

5.1.2.2 – Twelve(12) month allowance

Neis – 24 month time frame is too long

Concerns expressed for long term open simulator fidelity issues

Havens – Mentioned that AI-34 was closed at a previous meeting. Still recommends that this AI remain open.

No Action at this time.

11.4 AI-25 (Dennis) Process Guidelines (Mods and Testing) ;Institutionalizing Procedures

Dennis reviewed experience at Millstone and related this experience to the standard

15 minute summary of Millstone History

NRC review of program was process driven and not performance

Dennis reviewed all of the ANS 3.5 standard SHALLS and matched these to the processes at Millstone.

The review revealed that the standard does not require a "**Discrepancy Resolution"** process

Did not use the word "**Procedure**"; User the word guideline and "**Software Problem Report**"

Recommendation to add a "**Simulator Discrepancy Resolution/Tracking System/Process "**to the standard:

Refer to Appendix for additional information.

11.5 AI-58 Send Robert Boire a note of thanks for his participation

Letter reviewed by members

AI closed

11.6 AI-57 Remove all references to 3.1

Removed all references to ANS 3.1 since 3.1 does not establish training criteria for use of simulators. Additionally, the ANS 3.1 chairman supports this change.

Vick and Colby will determine the changes necessary and bring these to the committee for approval.

Refer to Appendix

Motion to Accept changes

Motion Carried (Unanimous)

11.7 AI-69

Closed - Simulator rule is in effect Nov 16,2001 and SECY-01-0125 reference is now background info only.

11.8 AI-70

Handed out a set of rules for members to review

Vick - Concerns expressed that all of the 3.5 working group minutes should not be open to the public. Some sensitive information is in the minutes and that distribution of the minutes should be by request.

Florence – Password protect the ANS 3.5 WEB site and post amended ANS 3.5 WEB page use policy.

11.9 AI-71 (Dennis) Determine if ANS normally provides the minutes of group meetings

Provided by request by ANS.

Closed

11.10 AI-73 (Dennis) Send the clarification letter to ANS on the Scenario Based Testing

Published in the Nuclear Standards News, Vol. 33/No. 2 March-April 2002

Closed

11.11 AI-74 (Dennis) Contact ANS Standards Administer to determine if we can refer to documents other than ANS Standards

ANS Standards can reference other standards per the ANS WEB site (NFSC Policies)

If part of another standard is brought into this standard, deliberation is required.

Closed

11.12 AI-72 (Shelly)

This item was already closed and Dennis requested additional info be presented

Standard can be reaffirm if the Appendix is informative and additional words should be added to the Forward.

Appendix needs to be clarifying information only.

11.13 AI-75 (Florence)

Not sure what this was about therefore Florence recommend to close this item.

11.14 AI-76 (Colby,Paris)

Most International simulator customers refer to ANS 3.5 in their purchase spec.

Closed

11.15 Aging Hardware (Rob Johnson)

Simulators are aging and keeping one's self out of single point of failure mode is very important

Recommended to defer to 2008 as an advisory/appendix item.

11.16 Recognition of contributing members (Jim Florence)

Colby will create a plaque for Frank Collins contribution

Florence will write up the wording.

11.17 (Neis) MANTG Update

Core Cycle for BWP Updates

Every two years MANTG conducts instructor workshops.

MANTG will host an instructor workshop on Scenario based testing.
Next workshop is scheduled for the first week in June.
Contact Information:

Contact Tim Cassidy.

Check the MANTG WEB site.

Several sites questioning testing scenarios and scenario based testing all scenarios.

Discussion on maintaining the simulator by tagging out equipment in the simulator.

Cox – May tag out simulator equipment but they do not make software changes to accommodate.

Kozak – This is a training issue and responsibility.

Member agreement that this issue is not in ANS 3.5 standards space.

Havens – If one elects to tag out equipment, scenarios may need to be re-validated.

Unsure how much documentation to maintain for scenario based testing.

11.18 (Shelly) First WESTRAIN Simulator Sub-committee meeting

First WESTRAIN simulator subcommittee meeting May 7 & 8

Chair: Ron Barns (Grand Gulf)

11.19 (Florence) SCS/USUG Report

ANS 3.5 Power Point presentation given

ANS 3.5 panel Discussion

Felker presented PPT presentation on Scenario-based testing

11.20 (Cox) Excelon utility and ANS 3.5 1998

Exelon simulator will not adopt the ANS 3.5 Standard based on a cost estimate showing a significant cost increase to go with Scenario based Testing

Excelon represents 10 simulators

11.21 (Johnson) Issues of protecting Simulator Information

Is there industry guidance concerning protecting simulator database/design information.

Utility concerns that vendors protect utility information.

Vick – Are security scenarios needed?

11.22 (Colby) Question on Simulator database from MANTG

Question from the last MANTG meeting.

Under Documentation the committee should address the "historical" vender documentation issue. Many utilities do not update or maintain their original vendor supplied documentation but maintain a record in the

modification packages, in the simulator software code, or in new upgrade model vendor manuals. We need to address the age of this original documentation as some of it may not be on a current form of electronic media and cannot be updated. It should be considered as an historical reference with the current (evolved) design documentation may be in other forms.

AI-87 Review MANTG Simulator Historical base-line data (Colby)

11.23 AI-16 (Welchel) Deviation, Discrepancy Alignment

Lengthy discussion on replacing Deviation and Discrepancy with Difference.

After additional review, members generally concluded the present use of Deviation and Discrepancy are appropriate.

Members generally felt that Deviation and Discrepancy should be defined for the purposes of this standard.

Consensus was that "Difference" did not add sufficient clarity.

Motion: Accept proposed changes (See Attachment)

Motion: Not carried (1-For; 1-Abstain; 10-Against; 1 Current uses of Deviation and Discrepancy are acceptable for the purposes of this standard)

11.24 Deviation Tolerance Replacement

During the discussion of AI-16, it was noted that "an additional deviation" in section 4.1.3.1 would align better with Appendix C since both deal with Normal Evolutions.

Motion: Change "an additional deviation" with "an additional tolerance" in Section 4.1.3.1.

Motion: Carried (11-For; 1-Against Using "Tolerance" here changes the intent)

11.25 AI-13 Scenario Based testing

Review new proposed wording

Wordsmithed the proposed wording

Discussion will be resumed tomorrow.

11.26 Adjourned 2002Apr24: 1730

12 Thursday 2002Apr25 (Day 4) 0800

12.1 Review of sites that have committed to ANS 3.5 1998

Refer to Appendix

12.2 AI-40

Resumption of Discussion of Section 4.4.3.2

Discussion of the strikeout in Section 4.4.3.1 "on either a calendar or certification basis"

New wording for the first sentence in 4.4.3.1: "…shall be conducted once per year, on a calendar basis, to confirm overall simulator model…"

AI-89 - Review 4.4.3.1 "once per year on a calendar basis language"

Wordsmithed the new wording for Section 4.4.3.2

Discovered that 3.4 and 4.4 do not align section per section.

AI-90 Review all Section for alignment specifically Sections 3.4 and 4.4 and report and recommend new Section alignments

Neis – Can it be approved without having been tested. Yes, it is up to the

Vick , Dennis – Some scenarios have not been tested, but will be Grandfathered. These should be required to be tested before being used with the new language. In Paragraph 3 the "…previously approved…" should read "…previously tested and approved…". Maybe add a footnote for why we are not requiring users to re-test all scenarios not previously tested (Grandfathered Scenarios), ""

Motion to accept the change to Section 4.3.3.2 as written (Refer to Appendix)

Motion Accepted (10-For; 1-Against – JIT should be included, Need a requirement, Imposing requirements on the training program, requirement needs to be in section 3)

12.3 Adjourned 2002Apr25: 1200

13 Reports

13.1 Officers:

Dennis: Attended the SCS conference and reported the industries adopting the ANS 3.5 1998 Standard.

Welchel: Asked members to reply with No Comment or reply with Comment to distribution and review of minutes.

13.2 NRC (Larry Vick) 2002apr22

Larry Vick presented **10 CFR Part 55, "Operator Licenses" R.G. 1.149,"Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examinations".** The bullets below summarize the presentation. See the appendix for the full presentation or visit the NRC WEB site.

- Power Point Presentation outlining the recent simulator regulatory activity
- NRC is considering a checklist in IP-71111.11 for simulator inspections
- Editions of ANSI/ANS-3.5 that were previously endorsed by the NRC remain acceptable methods of meeting the regulations
- New rule does not require facility licensees to adopt the 1998 version of ANSI/ANS-3.5 or to modify existing simulator support programs or practices.
- New rule continues to require performance testing, whether or not facility licensees adopt the 1998 revised national standard
- Updating NUREG-1021, Revision 8, [Operator Licensing Examination Standards for Power Reactors].
- Updating IP-71111.11, [Licensed Operator Requalification Program Inspection Procedure] of the reactor oversight process.
- Provide guidance to NRC examiners and inspectors for determining compliance with the rule.

- Training of examiners/inspectors as appropriate.
- Planning a public meeting/workshop concerning the new rule.
- Important documents that are tightly coupled in the topical area of "plant-referenced simulators" are:
    - 10 CFR Part 55.46
    - R.G. 1.149, Revision 3
    - NUREG-1021, Revision 8
    - IP-71111.11
    - REQUAL SDP
    - ANSI/ANS-3.5-1998

Florence – If I can meet ANS 4.1.3 but my core does not replicate the latest Unit Core, can I use the simulator experience requirements. The consensus was that the simulator could not be used to experience requirements.

Shelly – Stated that the Nuclear Fuels Group would analyze the simulator response after a new simulator core data load.

Vick – The NRC does not consider ANS 3.5 Clarification statements.

Vick – Utilities do no have to inform the NRC that the simulator will be used to satisfy operator experience requirements.

13.3 INPO

13.3.1 MANTG – Mid Atlantic

-

13.3.2 NFSC/ANS-21

- Tim Dennis

13.3.3 EXITECH

-

13.3.4 CAE

-

13.3.5 Ginna

-

13.3.6 Excelon

-

13.3.7 Millstone

-

13.3.8 Oconee

- Keith Welchel
  - Steam Generator Replacements starting 2003 Qtr4.
  - Simulator upgrading all Fluid models, Electrical and Containment
  - Plant is implementing system refurbishment program that is touching virtually every system. Simulator is significantly impacted by many of these modifications.

13.3.9 Cooper

-

13.3.10 USUG

- Jim Florence

13.3.11 SCS

- Jim Florence
  - Discussed the activity at the SCS and USUG. Significant industry confusion over scenario based testing and having to validate all of the scenarios using SBT.
  - Bob Felker presented Power Point Presentation and discussed Scenario based testing and taking credit SBT in one's simulator testing program.

13.3.12 DOE

-

14 Appendix

14.1 NRC Presentation (Larry Vick) 2002apr22

14.2 AI-14

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

14.3 AI-42

1. **"verification testing" changed to "simulator verification testing" throughout section 4.4.1, including the title.**

WG Comments:

Looks OK to me. Your #4 comment below was actually for the 2nd Sentence of that paragraph.

OK. I have no problem with this...

I am amendable to making this change to this section. It may eliminate some resistance to the term V&V.

I agree with this change.

e. I'm OK with this change.

Summary: 5 out of 5 agree.

2. "validation testing" changed to "simulator validation testing" throughout section 4.4.2, including the title.

WG comments:

same as item #1.

OK. I have no problem with this...

I am amendable to making this change to this section also. It may eliminate some resistance to the term V&V

d. I agree with this change.

e. I'm OK with this change.

14.4 AI-44

#44 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.

2000Oct26:

Hal and Group will review the use of these terms and consistency

Source of comment: TVA comments from the 1998 NUPPSCO review process. The comment was very specific. The comment was:

"Page 14. Section 4.1.1 The last sentence is unacceptable. The last sentence. "…time base relationships, sequences, durations, rates, and accelerations are all items which are determined primarily by the quality of the software models, and are only consequentially affected if the simulation is not running in real time. If these items are to be addressed at all, the requirements should be in 4.1.3.2. As it stands now, 4.1.1 adds a substantial performance requirement to be 4.1.3.2, et.,al., which requires only that the"…observable change in the parameters correspond in direction to those expected…"

The term "real-time" is very specific and technical, and should be defined so as only to require that the simulation advances the time step no more or less the value of the time step.

This comment also applies t the "glossary" definition on page 6."

Page 14. The reference to repeatability should be removed unless it is clearly defined (and agreed upon) and specific acceptance criteria are given

DEFINITONS

repeatability. The capability of the simulator to have successive tests of its dynamic performance conducted in the same time base relationships, sequences, durations, rates, and accelerations which, in turn, produce the same results within the limits required by this

standard.

Proposed after motion passed to keep Definitions as-is:
repeatability. The capability of the simulator to have successive tests of its dynamic performance produce the same results within the limits required by this standard.

real time. Simulation of dynamic performance in the same time base relationships, sequences, durations, rates, and accelerations as the dynamic performance of the reference unit.

USAGES

REAL-TIME

initial condition. A set of data that represents the status of the reference unit from which real-time simulation can begin.

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.

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 exceed values indicative of events beyond the implemented simulation scope or expected reference unit behavior.

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.

4.3 Simulator Instructor Station Capabilities. It shall be demonstrated that initial conditions specified in 3.3.1 are administratively controlled and are representative of reference unit conditions.

It shall be demonstrated that the simulator includes features specified in 3.3.3, and that implementation of simulator control features does 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 hardware 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.

It shall be demonstrated that the simulator includes features specified in 3.3.3, and that implementation of simulator control features does 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 hardware 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.

REPEATABILITY

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.

4.4.2 Validation Testing.

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.

D2. Part-Task and Limited-Scope Simulator General Requirements. At a minimum, the following general requirements of the standard should apply in their entirety to part-task and limited-scope simulators.

3.1.1 Real Time and Repeatability

Part-Task and Limited-Scope Simulator Testing and Validation Requirements. At a minimum, the following testing and validation requirements of the standard should apply in their entirety to part-task and limited-scope simulators.

4.1.1 Real Time and Repeatability
4.1.2 Limits of Simulation

REPEATABILITY ISSUES

The main issue with repeatability arises from performing calculations in parallel in separate processors. If each module took exactly the same amount of time to perform each calculation and if each module started at exactly the same time, repeatability would not be an issue. However, neither case is true. First, advanced modeling makes extensive use of iterative solutions. That means that a value in one processor that may be solved before it is used in a calculation in another processor may not get solved until after that second calculation if a transient condition exists. The sequencing of calculations across processors

is not rigid. Second, Windows NT does not necessarily start calculations promptly when told to. In some cases, a 3-5 millisecond delay may exist and this delay is random across processors. This of course exacerbates the problem of calculation sequencing.

This problem does not affect calculations within a single processor because modules are always solved in a rigid order as called by the executive system. This is one solution to the repeatability problem – buy a fast enough processor so that you only need one to perform all of the model calculations. Unfortunately, models have the tendency to expand to exceed the capacity of any processor.

A second solution is to control the posting of results from a given processor into shared memory. If all new results are held in memory local to that processor until all processors have completed the current frame, then no cross processor changes will result from calculation timing. The scheme for this solution is as follows:

1. At loading time, each module is analyzed to determine what values are output from that module. A temporary local buffer is allocated to contain those values.

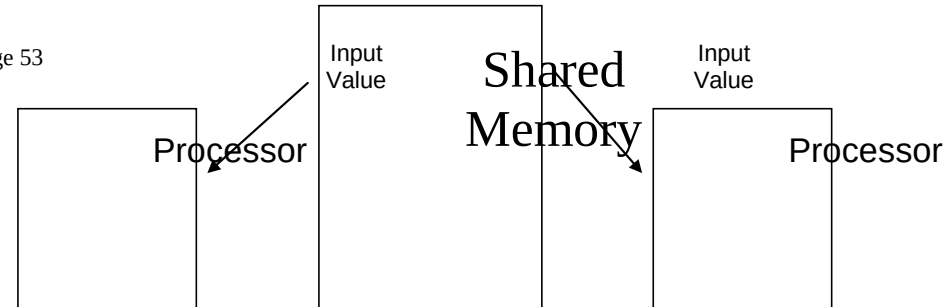
2. When a module is executed, it reads the inputs from shared memory which will by definition now be the results from the previous frame, performs its calculations, and place the results in a local buffer. Any calculations within that frame on that processor will have access to new results from that local buffer. Any calculations on any other processor will only have access to the previous frame data and any new local results from the respective processors.

3. At the completion of that frame for all processors, all new results are posted into shared memory. Once this is completed, the next frame can be started.

This may seem cumbersome and time consuming, but in actual computing time this only adds a few milliseconds to an individual frame.

Single Frame Flowchart

Recommendation:



1. Agree with the TVA analysis of the issue in regard to the quality of models, "…time base relationships, sequences, durations, rates, and accelerations, are more affected by the quality of the models. The problem gets much worse if you are also not in real-time. However the repeatability issue does not take away from the intent of the definition for whatever reason the cause models or lack of real-time operation. **No action for Repeatability**

2. Repeatability should only be a problem if the simulator is not operating in real-time or specific modeling techniques are employed to add variances for realism for operating training (setpoints intentionally and randomly varied around the setpoint). Their technical description of real-time by TVA is more accurate and specific. If the committee agrees that the definition needs to be more descriptive from a basic technical level and not from just observation, work with TVA to revise the comment.

Starting with their definition "The term "real-time" is very specific and technical, and should be defined so as only to require that the simulation advances the time step no more or less the value of the time step".

14.5 AI-60

A.I. 60 Define the Term **Training Needs Assessment** in such a manner that it is clear in intent to both Training and Simulator staffs.

1.0 Definitions

Standard - "**Training Needs Assessment** - an appraisal by a subject matter expert of a simulator deviation, deficiency, or modification, and its relative importance to the operator as

required tasks are performed." (ANS 3.5 Section 2)

INPO - "**Needs Analysis** - a process of identifying potential or existing training needs by examining gaps between performance requirements and existing or expected performance" (PRINCIPLES OF TRAINING SYSTEM DEVELOPMENT SUPPLEMENT ACAD 85-006 (Supplement) September 1993)

INPO - "Design - the training system development phase in which products of job and task analysis are used to develop specifications for training program development and implementation; includes developing job performance measures, selecting training settings, developing learning objectives and tests, determining expected trainee entry-level skills and knowledges, and formulating the training plan." (PRINCIPLES OF TRAINING SYSTEM DEVELOPMENT SUPPLEMENT ACAD 85-006 (Supplement) September 1993)

Standard - "Subject Matter Expert - an individual who possesses the appropriate education, license, experience, or unique qualifications to perform assessments and make recommendations in a particular subject area." (ANS 3.5 Section 2)

INPO - "Subject Matter Expert (SME) - a worker qualified and experienced in performing a particular task." (PRINCIPLES OF TRAINING SYSTEM DEVELOPMENT SUPPLEMENT ACAD 85-006 (Supplement) September 1993)

Discussion:

The definition of "Training Needs Assessment" from the standard (as I interpret it) is an evaluation of differences between the simulator and reference plant and the impact upon the operator's ability to perform tasks because of those differences. Given that interpretation, as you can see, the ANS and INPO documents are not in agreement in intent or practice. The INPO definition ***"identifies"*** *while the ANS definition* ***"evaluates"****. Both are manipulations of differences or gaps.*

The definitions of Subject Matter Expert are closer and somewhat interchangeable, although

the INPO definition is simpler and straightforward.

2.0 Usage In The Standard

(Section 3.2.1.4 Simulator Control Room Deviations.)

"Where deviations exist among the simulator control panels, the reference plant panels in instrumentation, and audio-visual cues provided to the operator, such deviations may remain if a training needs assessment is performed in accordance with 4.2.1.4."

Either/Or

(Section 4.2.1.1 Scope of Panel Simulation.)

"A comparison shall be performed to demonstrate that control 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."

Doesn't say if the differences can stay, just that you evaluate them.

(Section 4.2.1.2 Instrumentation, Controls, Markings, and Operator Aids.)

"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."

Doesn't say if the differences can stay, just that you evaluate them.

(Section 4.2.1.3 Control Room Environment.)

"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."

Either/Or

(Section 4.2.1.4 Assessment of Deviations.)

"A training needs assessment shall be performed for each deviation identified in 3.2.1.4 or 4.2. 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.

Evaluation Criteria

(Section 4.2.2.1 Systems Controlled or Monitored from the Control Room.)

"A training needs assessment shall be performed for each deviation identified in accordance with criteria provided in 4.2.1.4. Deviations that do not impact the actions to be taken by the operator or do not detract from training are acceptable."

Either/Or

(Section 4.2.2.2 Systems Controlled or Monitored External to the Control Room.)

"A training needs assessment shall be performed for each deviation identified in accordance with criteria provided in 4.2.1.4."

Doesn't say if the differences can stay, just that you evaluate them.

(Section 4.3 Simulator Instructor Station Capabilities.)

"For stimulated hardware 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."

I have no idea why this is in the Instructor Station Capabilities although stimulated

hardware differences should be evaluated.

(Section 5.2 Revision to the Scope of Simulation.)

"Determination of the need to incorporate related changes should be based primarily upon a training needs assessment."

Significant change in usage of (incorrect) the standard's definition for Training Needs Analysis. Revisions to the scope of simulation are dictated in part by the Design Phase (see definition) of the Training System Development.

(Section 5.3 Incorporation of Simulator Changes.)

"Changes in either category may precede actual changes to the reference unit based upon training needs assessment, e.g., control board modifications, new core fuel load."

Significant change in usage of (incorrect) the standard's definition for Training Needs Analysis. Revisions to the scope of simulation are dictated in part by the Design Phase (see definition) of the Training System Development.

(Section 5.3.1.1 Initial Upgrade.)

"Simulator modifications shall be implemented earlier if warranted by a training needs assessment."

Significant change in usage of (incorrect) the standard's definition for Training Needs Analysis. Revisions to the scope of simulation are dictated in part by the Design Phase (see definition) of the Training System Development.

(Section 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."

Significant change in usage of (incorrect) the standard's definition for Training Needs Analysis. Revisions to the scope of simulation are dictated in part by the Design Phase (see definition) of the Training System Development.

(Section 5.3.2 Performance-Based Simulator Changes.)

"Simulator changes that are based upon items such as revised reference unit performance data, student feedback, simulator performance tests, and LERs, and that are determined to be relevant to the training program as a result of a training needs assessment, shall be implemented based upon their training impact."

Significant change in usage of (incorrect) the standard's definition for Training Needs Analysis. Revisions to the scope of simulation are dictated in part by the Design Phase (see definition) of the Training System Development.

14.6 AI-25 (Dennis)

Millstone Recovery

Background:

Four simulators (as of 1996): Millstone 1 (GE BWR
Millstone 2 (CE PWR)
Millstone 3 (W PWR 2-loop)
Connecticut Yankee (W PWR 4-loop)

Approx 12 software and three hardware personnel plus one tester per simulator (Simulator Operations Assistant)

Directive to be fully proceduralized ➔
Nuclear Simulator Engineering Manual (NSEM)

Initiating Events (of many)

1 – Failure of license candidates for M1 (BWR)
2 – Spent Fuel Pool cooling calculations ➔ TIME magazine

Millstone Nuclear Oversight Committee (NOC)
16 Simulator issues found the simulator program "not defensible"

NOC Issue: Procedures were not reviewed according to procedure

5. Simulator Configuration Management

Configuration Management shall be established to provide a means for … demonstrating compliance to requirements of Section 3, General Requirements. Configuration management shall include:

(1) …
(2) A tracking system that identifies and documents differences between the simulator and its reference unit and resolution thereof; and
(3) Documentation to support simulator … maintenance.[1]

5.2 Revision to the Scope of Simulation. …
Simulator modifications, including resolution of identified performance discrepancies, shall be performed within the context of a ***structured process*** [n.b. emphasis added] for design …
Appendix A

A3. Simulator Documentation. The following simulator-specific documentation should be controlled and maintained:

(1) *Simulated systems documentation*. This documentation provides design details for each simulated system model, e.g., simulation diagrams, math model description, assumptions, simplifications.
(2) *Simulator software code*. The simulation software source code is considered to be documentation, and should be updated and detailed in accordance with administrative controls.
(3) …
SCREENING CRITERIA

Would add a new requirement

Recommend: Table for next revision!

[1] Appendix A provides examples of acceptable design … information.

14.7 AI-40 (Florence) New Appendix E

Appendix E

(This Appendix is not a part of American National Standard for Nuclear Power Plant Simulators for Use in Operator Training, ANSI/ANS-3.5-1998, but is included for information purposes only.)

Guidance on Acceptable Documentation for Scenario-based Testing

E1. The purpose of this appendix is to provide an acceptable means for demonstrating simulator conformance to Section 4.4.3.2 of the ANSI/ANS-3.5-1998 Standard. Section 4.4.3.2 requires that scenarios developed for the simulator, including the appropriate instructor interfaces and cueing, should 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.

E2. The following is an example of acceptable documentation for scenario-based testing.

14.8 SIMULATOR SCENARIO-BASED TESTING FORM

Scenario/Lesson Plan No.: Date Tested:

Scenario/Lesson Plan Title:

☐ The simulator was capable of being used to satisfy predetermined learning or examination objectives without exceptions, significant performance discrepancies, or deviation from the approved scenario sequence, including the appropriate instructor interfaces and cueing.

Scenario Validated by:

☐ The simulator was not capable of being used to satisfy predetermined learning or examination objectives without exceptions, significant performance discrepancies, or deviation from the approved scenario sequence, including the appropriate instructor interfaces and cueing. Discrepancies were documented and submitted to the simulator support staff for resolution, or;

☐ Minor simulator performance discrepancies were documented and submitted to the simulator support staff for resolution for which compensatory measures were taken to satisfy predetermined learning or examination objectives.

Discrepancy Report Number(s):

Discrepancy Report Initiator:

Note: Attach applicable Scenario/Lesson Plan documentation to this form and submit to the simulator support organization for documentation of test results.

14.9 AI-70 (Florence)

Use of the ANS-3.5 Working Group WebPages

Access to the ANS-3.5 Working Group Website will be password protected when accessed through American Nuclear Society WebPages at www.ans.org or through the Utility Simulator Users Group Website at www.usug.com with a username and password.

The following information may be posted on the ANS-3.5 Web Pages:

- Working Group Membership/Contact List
- Approved Meeting Minutes/Action Items
- Next meeting location/agenda
- Photographs
- Feedback Mechanism

The following items shall not be posted on the ANS-3.5 Web Pages:

- Information of a sensitive nature
- Working Group membership issues
- Draft Documents

Use of the Internet or E-mail for the following purposes are prohibited:

- Product advertisement
- Commercial activities
- Receipt or transmittal of threatening, sexual, racial or obscene material
- Political lobbying
- Transmitting chain letters or "junk" mail
- Transmission of confidential and proprietary information unless expressly approved by management
- Solicitations for commercial ventures, religious or political causes, outside organizations or other non-work related causes

14.10 AI-72 (Shelly)

Action 72 asked the question, Can an appendix be added and still be able to reaffirm the standard as written.

I contacted Suriya with this question, and her 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.

14.11 AI-57 (Remove all references to 3.1)

Action item 57

1. Scope and Background

This standard does not establish criteria for application of

simulators in training programs. Training criteria are established in American National Standard for Selection, Qualification, and Training of Personnel for Nuclear Power Plants, ANSI/ANS-3.1-1993 [1].[2]

Recommend removing all reference to ANS-3.1 within the Standard due to 3.1 does not establish training criteria for use of simulators. This change was supported by the chairman for 3.1.

Recommend removing the last sentence.

"Training criteria are established in American National Standard for Selection, Qualification, and Training of Personnel for Nuclear Power Plants, ANSI/ANS-3.1-1993"

Recommend removing reference to reference 1

1.2 Background.

It is intended that in meeting the criteria of this standard, the simulator will possess a sufficient degree of completeness and accuracy to meet the training needs of industry and the requirements of the NRC, as described in ANS-3.1 [1] and Title 10, "Energy," Code of Federal Regulations, Part 55, "Operators' Licenses" [2] [1]. These requirements provide guidance in determining the content and setting for training and examination purposes.

This standard allows the use of a training needs assessment in several areas where the standard may require features in excess of the requirements of ANS-3.1 [1] and 10CFR55 [2] [1].

Recommend removing the following name: ANS-3.1 from both paragraphs in section 1.2.

[2] Numbers in brackets refer to corresponding numbers in Section 6, References.

Recommend replacing reference 2 with 1 to Title 10, "Energy," Code of Federal Regulations, Part 55, "Operators' Licenses" [1] and 10CFR55 [1]

6. References

[1] American National Standard for Selection, Qualification, and Training of Personnel for Nuclear Power Plants, ANSI/ANS-3.1-1993.

Recommend removing reference to reference 1 and following associated sentence with reference to ans-3.1.

[2] [1] Title 10, "Energy," Code of Federal Regulations, Part 55, "Operator's Licenses."

Recommend replacing reference 2 with 1.

14.12 AI-13 (Florence) Proposed Scenario Based Testing Wording

4.4.3 Simulator Performance Testing. Simulator performance testing shall be conducted as specified below. A record of the conduct of these tests, and data comparison that the results meet reference unit data, shall be maintained. Simulator performance testing shall be conducted in a fully integrated mode of operation.

Simulator performance testing comprises operability and scenario-based testing.

4.4.3.1 Simulator Operability Testing. A simulator operability test shall be conducted once per year on a calendar basis to confirm overall simulator model completeness and integration.

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

The intent of the operability test is to demonstrate the following:

(1) Overall simulator model completeness and integration;
(2) Simulator steady-state performance; and
(3) Simulator transient performance for a benchmark set of transients.

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 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.

4.4.3.2 Scenario-based Testing. Scenarios developed for the simulator, including the appropriate instructor interfaces and cueing, shall be tested before use for operator training and -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.

The intent of scenario-based testing is to demonstrate that the simulator is capable of producing the expected reference unit response in support of predetermined learning or examination objectives for operator training and examination.

Performance testing credit may be taken for scenarios previously approved [3] for use in operator training and examination. When the configuration of simulation has been modified significantly since the scenario was last tested, the affected portion of the scenario shall be re-

[3] Previously approved denotes those scenarios approved prior to the adoption of this Standard.

tested.

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.

Foot note: Previously approved denotes those scenarios approved prior to the adoption of this Standard.

14.13 AI-16 (Welchel) Proposed Deviation, Discrepancy Presentation

15 Occurrences of Deviation

(1) Definition - **training needs assessment**
(3) 3.2.1.4
(1) 4.1.3.1
(4) 4.2.1.4
(2) 4.2.2.1
(1) 4.2.2.2
(1) 4.4.3.2
(1) Appendix D2
(1) Appendix D3

2 Occurrences of Discrepancy (preceded by the word **Performance**)

(1) 4.4.3.2
(1) 5.2

1 Occurrence of Deficiency

(1) Definition - **training needs assessment**

American Heritage Dictionary Definitions:

Deviation

1. The act of deviating or turning aside. **2.** An abnormality; a departure: *"Vice was a deviation from our nature"* (Henry Fielding). **3.** Deviant behavior or attitudes. **4.** Divergence from an accepted political policy or party line. **5.** Deflection of a compass needle caused by local magnetic influence, especially on a ship. **6.** *Statistics*. The difference, especially the absolute difference, between one number in a set and the mean of the set.

Discrepancy

1. Divergence or disagreement, as between facts or claims; difference. 2. An instance of divergence or disagreement.

Deficiency

1. The quality or condition of being deficient; incompleteness or inadequacy. **2.** A lack or shortage, especially of something essential to health; an insufficiency: *a nutritional deficiency*.

Difference

1. The quality or condition of being unlike or dissimilar. **2.** An instance of disparity or unlikeness. A degree or amount by which things differ. A specific point or element that distinguishes one thing from another. **3.** A noticeable change or effect: *Exercise has made a difference in her health.* **4.** A disagreement or controversy. A cause of a disagreement or controversy. **5.** Discrimination in taste or choice; distinction. **6.** *Mathematics*. The amount by which one quantity is greater or less than another. The amount that remains after one quantity is subtracted from another. **7.** *Archaic*. A distinct mark or peculiarity.

Recommendation:

Replace Deviation and Discrepancy with Difference and wordsmith to ensure clarity

14.14 AI-16 (Welchel) Proposed Deviation, Discrepancy Wording

2. Definitions

training needs assessment. An appraisal by a subject matter expert of a simulator ~~deviation~~difference, deficiency, or modification, and its relative importance to the operator as required tasks are performed.

3.2.1.4 Simulator Control Room ~~Deviation~~Differences. Where ~~deviation~~differences exist among the simulator control panels, the reference plant panels in instrumentation, and audio-visual cues provided to the operator, such ~~deviation~~differences may remain if a training needs assessment is performed in accordance with 4.2.1.4.

4.1.3.1 Steady-State Operation.

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~~tolerance may be allowed up to the documented value of the reference unit instrument error.[4] The simulator instrument error shall be no greater than that of the comparable meter, recorder, and related instrument system of the reference unit.

4.2.1.4 Assessment of ~~Deviation~~Differences. A training needs assessment shall be performed for each ~~deviation~~difference identified in 3.2.1.4 or 4.2. ~~Deviation~~Differences 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~~difference has an impact

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

on the actions to be taken by the operators:

4.2.2.1 Systems Controlled or Monitored from the Control Room. It shall be demonstrated that the systems of the reference unit that are within the scope of simulation are adequate to perform the evolutions required by 3.1.3 and the malfunctions required by 3.1.4. It shall be demonstrated that the scope of simulation includes system interactions with other simulated systems so as to provide a total integrated unit response. A training needs assessment shall be performed for each ~~deviation~~difference identified in accordance with criteria provided in 4.2.1.4. ~~Deviation~~Differences that do not impact the actions to be taken by the operator or do not detract from training are acceptable.

4.2.2.2 Systems Controlled or Monitored External to the Control Room. It shall be demonstrated that systems operated or monitored external to the control room, and necessary to perform the evolutions required by 3.1.3 and the malfunctions required by 3.1.4, are simulated. It shall be demonstrated that the operator is able to interface with the remote activity in a similar manner as in the reference unit. A training needs assessment shall be performed for each ~~deviation~~difference identified in accordance with criteria provided in 4.2.1.4.

4.4.3.2 Simulator Scenario-Based Testing. 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~~differences, 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.

3.2.1.4 Simulator Control Room ~~Deviation~~Differences

4.2.1.4 Assessment of ~~Deviation~~Differences

5.2 Simulator modifications, including resolution of identified performance ~~discrepancies~~ differences, shall be performed within the context of a structured process for design and testing.

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14.15 List of Simulator that have Committed to ANS 3.5 1998 (Dennis)

Reference Unit	Owner	ANSI/ANS-3.5-1998 Adoption
Callaway	AmergenUE	mid 2000 pilot program
Diablo Canyon	PG&E	Dec2001 by NRC-474 form, start jan2002 per Jim
Millstone 2	Dominion	2001
Millstone 3	Dominion	2001
Seabrook	NHY ➔ FP&L	01jan2002 by procedure change

Brunswick	**CP&L**	**Letter to NRC per Ed**	
St. Lucie	**FP&L**	**01jan2002 procedure change per Jim M**	
DC Cook	**AEP**	**Proposed jun2002 per Tim V, using sim for ILT op exp**	
Susquehanna	**PP&L**	**Proposed sep2002 by procedure change**	
Pilgrim	**Entergy Nuclear NE**	**Proposed to management**	
Waterford	**Entergy Nuclear S**	**Proposed corporate procedure**	
ANO Unit1	**Entergy Nuclear S**	**Proposed corporate procedure**	
ANO Unit 2	**Entergy**	**Proposed**	

	Nuclear S	**corporate procedure**
Grand Gulf	**Entergy Nuclear S**	**Proposed corporate procedure Proposed corporate procedure**
Riverbend	**Entergy Nuclear S**	**Proposed corporate procedure**

Reference Unit	**Owner**	**ANSI/ANS-3.5-1993 Adoption**
Salem	**PSE&G**	**Jim S**
Hope Creek	**PSE&G**	**Jim S**
Wolf Creek	**KG&E**	

All others at 1985 revision.

15 Action Items Carried to 2008 Standard

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
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 personel view Training Needs Assesments Differently; Training Needs Analysis and Training Needs Assessment are npot 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**		**Dennis**	Is ANS 3 considering that the standard may address other

	Status: Closed **Dennis**			simulators not specific to NRC Regulatory Commission licensing? 2001Apr05 Dennis - No - per SubCommittee-1 Tamp Meeting Tim will verify with Mike concerning additional scope (adding DOE facilities into 3.5). 2001Apr05 Dennis - No - per SubCommittee-1 Tamp Meeting **2000mar09** Tim 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: Closed**		**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: Closed** **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: Closed**			Intentionally Left Blank
14	**Closed:** **2002apr23** **Motion**	Priority 1 –	**Paris** **Felker** **Florence**	2001Aug 09 SK Chang proposes including *synchronization* in the new

			Chang	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 New Definitions: Suggested choices for new definitions: **stimulated hardware.** Components or devices that are integrated to the simulator process via simulator inputs and/or outputs which perform their functions independently of and parallel to the simulation process". **stimulated components.** Hardware or software components that are integrated to the simulator process via simulator inputs and/or outputs which perform their functions independently of and parallel to the simulation process". **stimulated components.** Components or devices that are integrated to the simulator process via simulator inputs and/or outputs which perform their functions independently of and parallel to the simulation process". **stimulated components.** Hardware or software components that perform their functions independently of and parallel to the simulation process" and Change Stimulated Hardware to Stimulated Device Originator: NUPPSCO comments 1998 review process and in Butch's survey **2000mar09** Determine the source of this comment
15	**Date: 2000mar09**		**Collins**	Numerous uses of Training Needs Assessment (TNA)

	Status: Complete Presentation by Allan Kozak		**(Vick) Kozak McCullough**	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** **Closed** **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: Closed**		**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		**Kozak** **Shelly** **Cox** **Havens**	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

	need to put some boundaries as to the limits simulator**)**		**Florence**	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: Closed** (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: Closed**		**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 lead 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 - Tim 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. Tim checked with ANS Headquarters and this issue was discussed in detail		**Dennis**	1985 ANS 3.5 Standard is Historical Standard; Tim 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: Closed**		Collins(Vick) Dennis Koutouzis	(JFC/TD) Possible cross-pollination with other standards. Frank and Tim 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: Closed**		**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: Closed**	**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: Closed**	**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: Closed** **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: Closed**	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: Closed**	2000mar08	**McCullough** **Florence**	Consider differentiating validation of Requal and Initial License Scenarios

			Felker	2001Apr05 McCullough {Add LTI Document Here}
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:** **Change 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
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: Closed**		**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**	2000mar09	**Colby**	Send Thank You notes to all Survey Participants

	Status: Complete			
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: Closed** **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: Closed**		**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**
58	**Closed:** **2002apr24**	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	**Closed** **2002apr23**	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: Closed**		Koutouzis	Send Meeting Materials to Absent members;
63	**Date: 2001Aug09** **Status: Closed**		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**		Florence	Florence to prepare W. DeLuca letter for T. Dennis signature;

	Status: Closed		Dennis	
65	Date: 2001apr03 Status: Complete		Welchel	NUPPSCO comment to Kevin Cox (Complete)
66	**Date: 2001Aug09** **Status: Closed**		Havens	Scan NRC Form 398 and Email to WG members
67	**Date: 2001Aug09** **Status: Closed**		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 without imposing additional training program requirements. 2. How does scenario-based testing interface with simulator performance testing? ANS-3.5 Working Group answer: Simulator performance testing comprises Operability and Scenario Based Testing and establishes a test program to ensure simulator performance for the use in operator training and examination. 3. Do simulator users have to test each scenario before every use, including those utilized to support initial license candidate training programs? Can training programs that utilize simulators currently certified to previous editions of the standard take testing credit for simulator performance testing and simulator scenarios previously developed and approved for use in operator training or examination? ANS-3.5 Working Group answer: Users of the standard are encouraged to take testing credit for simulator performance testing and simulator scenarios previously developed and approved for use in operator training or examination. This does not imply that a scenario shall be tested before every use, however

				the following items should be considered before subsequent use of the approved scenario developed for operator training or examination: * If the training process requires revalidation of the scenario; * Whenever models or simulator capabilities are changed or modified in a way that affects the scenario performance. If any of the above items have occurred and impact the scenario, the scenarios shall be re-tested before use for operator training or examination. I would appreciate a clarification statement from the ANS-3.5 Working Group. Thank you for your attention to my request. Sincerely, James B. Florence Simulator Supervisor Nebraska Public Power District Cooper Nuclear Station Brownville, NE 68321 Phone: 402-825-5700 Pager: 402-977-3692 Fax: 402-825-5584 Email: jbflore@nppd.com
68	**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 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	**Closed** **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.
71	**Closed** **2002apr24**		**Dennis**	Determine if ANS normally provides the minutes of group meetings 2002apr24 Dennis Provided by request by ANS.
72	**Date: 2001Nov27** **Status: Closed**		**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	**Closed** **2002apr24**		**Tim**	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	**Closed** **2002apr24**		**Tim**	Contact ANS Standards Administer to determine if we can refer to documents other than ANS Standards 2002apr24 Dennis
75	**Closed**		**Jim**	Contact the industry

	2002apr24		**Florence**	2002apr24 Florence does not know what this is about. Recommend to close .
76	**Closed 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	**Closed: 2002apr22 Tim Dennis**		**Tim Dennis**	Determine if the ANS 3.5 Working Group name will change due to the ANS 3 to ANS-21 name change. Closed 2002apr22 Tim Dennis contacted Suriya Ahmad at ANS headquarters and no change is planned for ANS 3.5.
78	**Closed 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.
81	**Closed: 2002Apr24**		**Dennis**	Get copy of ANS 3.1 for members review **2002Apr24 Closed Dennis Copy of ANS-3.1 obtained from ANS Standards Secretary.**

				Copy given to requesting Working Group member for review.
82	**Closed** **2002apr24**		**Dennis**	Get copy of Letter of thanks to Robert Boire for members review 2002apr24 Dennis Members reviewed letter