

NPEC Subcommittee SC-3, Operations, Maintenance, Aging, and Testing

**Meeting S02-1
Tuesday March 12, 2002
Las Vegas, NV**

Members Present:	Paul Colaianni	Henry Leung
	Wally Colvin	John Taylor
	Surin Dureja	Jit Vora
	Dave Horvath	Burl Williams
	Sonny Kasturi	

Members Absent:	George Ballassi	Jacob Kulangara
	Brij Bharteey	Steve Parsons
	Lamis Fleischer	Mansoor Sanwarwalla
	Preston Dougherty	

Other Attendees: Bob Lofaro

1.0 Introduction

Dave Horvath welcomed everyone in attendance and reiterated that we were meeting in conjunction with NPEC in order to take advantage of the NEI sponsored trip to the Yucca Mountain Proposed nuclear waste repository site. Dave commented that for those IEEE members who belong to more than one subcommittee, it is difficult to meet in conjunction with NPEC due to difficulties attending subcommittee meetings and the various working group meetings. Dave also presented the agenda, and proposed 2 changes: 1) adding a discussion by Angelo Marino regarding the NRC risk informed review strategy as potentially relating to periodic testing, and 2) that John Taylor would be providing the W.G. 3.1 report in George Ballassi's absence. The changes were adopted and the agenda is included as [Attachment 1](#).

2.0 Secretary's Report

2.1 Meeting S01-2 Minutes

The minutes from S01-2 were approved, without modification, by acclamation.

2.2 Action Item Status

AI-01-2-1 was closed, because Jit Vora will act as NRC liason to W.G. 3.1 until another NRC liason is selected. AI-01-2-2 and AI-01-2-4 have been completed and are considered closed. New action items are identified in the table and discussed in the text of these minutes.

SC-3 Meeting S02-1 Minutes (Continued)

Item No.	Description	Status
AI-01-2-1	Jit Vora to solicit an NRC representative for WG 3.1	Closed
AI-01-2-2	Arrange Meeting S02-1 [J. Taylor]	Closed
AI-01-1-4	Send out update of IEEE Stds Status spreadsheet. [D. Horvath will provide to J. Taylor for distribution to SC-3 members.]	Closed
AI-02-1-1	Arrange meeting S02-2 (Dave Horvath)	Open
AI-01-2-3	WG-3.4 to obtain review / comments on NPEC Goal #6 report from SC-3 and provide report to NPEC	Closed

Note (repeated from prior minutes): It is expected that P323 (Equipment Qualification) will be up for a ballot within the next year. Any IEEE and SA member can request consideration for addition to the NPEC ballot group by completing the form at <http://standards.ieee.org/db/balloting/ballotform.html>. It may be advantageous to add a comment at the bottom of the form that the request is for IEEE 323 only if appropriate. One can then confirm the success of this approach (if so inclined) by contacting IEEE staff: Carol Buonfiglio [REDACTED].

2.3 Alligator Fund

The Alligator Fund is made up of voluntary contributions from SC-3 members to defray the cost of meeting rooms, refreshments, etc. The balance after S02-1 is \$100.00.

2.4 Membership Table

SC-3 and the working groups are fairly well staffed. We are still looking for a member for WG 3.1 with risk based ASME Boiler and Pressure Vessel Code Section XI experience.

The subcommittee members who have not attended 2 or more consecutive meetings will be pulsed by John Taylor about their intentions to remain as a member.

The updated membership roster will be included as an attachment to the minutes (See [Attachment 2](#)). The current SC-3 and working group rosters are also on the IEEE/NPEC website at URL: <http://grouper.ieee.org/groups/npec/private/sc3/sc-3.html>; user name: [REDACTED] password: [REDACTED]. This member roster is also now available as an Access data base for those so inclined. Contact Caprice Warren at [REDACTED].

The current breakdown of members by category is as follows:

<u>Utility</u>	<u>AE/Consultant</u>	<u>Gov't/National Labs</u>	<u>Other</u>	<u>Total</u>
7	6	2	1	16

SC-3 Meeting S02-1 Minutes (Continued)

3.0 SC-3 Chair's Report

3.1 NPEC Activities

Dave summarized the results of NPEC Meeting N01-2. A summary of the NPEC meeting is included as [Attachment 3](#).

3.2 Future Meeting Locations

It was decided that the next SC-3 and working group meetings would be held in Ann Arbor, Michigan during the week of either 8/26 (1st choice) or 8/12 (2nd choice); a notice will be sent when the arrangements are finalized. John Taylor will arrange the meetings with the assistance of Dave Horvath and advise the membership [AI-01-2-2]. As a special arrangement, the current meeting was held in conjunction with NPEC – however the SC3 members felt that as a general rule we would rather meet in the Winter and Summer to avoid the outage season for our utility members.

4.0 Working Group 3.1 (Testing) Report

John Taylor subbed for George Ballassi who could not attend the meeting. The schedule ([Attachment 4](#)) for the revisions of IEEE Standards 336 and 338 was revised based on prior comments and presented to the Working Group at the meeting; the schedule was subsequently accepted at the meeting. A new streamlined outline of IEEE Std 336 was developed at the meeting after reviewing a strawman draft from Burl Williams. Post-modification and post-maintenance testing will be included, and the standard will be more user-friendly. Burl will develop a preliminary draft by June 2002. Sonny Kasturi suggested checking INPO requirements in regards to post-modification testing. IEEE Std 338 is being revised to incorporate industry experience, lessons-learned, and the use of risk based methodologies for determining test intervals. Wally Colvin developed a strawman revision. After review and discussion, a task action group was formed to further develop an annex example of risk-based applications for test interval determination. The TAG consists of Wally, Dave, and possibly Ted Riccio (South Texas Project). The next Working Group meeting will be in conjunction with SC3 in August.

5.0 Working Group 3.2 Report

The working group is actively pursuing a revision of IEEE Std 692. New design basis subsections have been drafted for 11 of the 13 design-related sections of the standard. These 13 sections represent the 13 major electrical / electronic elements of an effective security system. The two remaining design basis subsections will be discussed at the working group meeting scheduled to follow the subcommittee meeting.

The working group intends to have a meeting in June or July of 2002 at the offices and manufacturing facility of Holophane, a major manufacturer of security lighting. John Green of Holophane, an active member of WG-3.2 will host this meeting. SC-3 and other working groups are welcome to attend this meeting.

SC-3 Meeting S02-1 Minutes (Continued)

6.0 Working Group 3.4 (Aging) Report

Wally Colvin was being carried as a prospective member and WG 3.4 Members in attendance (Paul Colaianni, Dave Horvath, Henry Leung, Robert Lofaro) unanimously voted Wally in as a Member of WG 3.4. Jit Vora, U.S. NRC, and John Taylor, Brookhaven National Lab, were also present at the meeting as guests. WG 3.4 had a membership roundtable as a new agenda item where each member around the table goes over the activities they have been involved in since the last WG meeting that have to do with aging assessments and electrical equipment aging issues. Paul Colaianni provided an update on the status of the Duke McGuire/Catawba license renewal application review. Bob Lofaro discussed his current review of medium-voltage power cable and connection operating experience and how this data relates to qualification standards. Henry Leung discussed his current involvement in a PVC cable study, investigating cable condition monitoring methods and working on electrical design standards.

Copies of the NPEC Goal 6 Report that had been finalized by Dave Horvath and sent to NPEC the previous week were handed out for review and was accepted as is by the working group. Paul later presented the report to and received acceptance by NPEC at their meeting on March 14. The NPEC Goal 6 task by WG 3.4 is complete. Plans for the next meetings were discussed which mainly centered around what would interest members to come to a WG 3.4 meeting now that IEEE Std. 1205 is revised and NPEC Goal 6 is complete. Some suggestions were (a) Build up ideas for the next revision of Std. 1205 such as including other annexes for “passive” electrical components reviewed for license renewal, (b) Presentations by someone currently involved in some type of aging assessment work or equipment evaluations related to aging and equipment stressors, and (c) Networking opportunities that would be of interest to the members.

7.0 Liaison Reports

Jit Vora provided the NRC Liason Report, which is included as [Attachment 5](#).

8.0 New Business

Angelo Marino, NRC/NRR stopped into the SC3 meeting to discuss NRC evaluations of test interval relaxation requests. Angelo stated that some test and inspection interval relaxations have been approved, but the utility must have good statistical data to substantiate the request. Angelo was requested and he agreed to seek an NRC representative from his group to join WG-3.1.

The SC3 meeting was held in conjunction with an NPEC/NEI sponsored trip to the Yucca Mountain Waste Project Site. We were able to tour the tunnel, the science center, learn about the test projects, and see some of the equipment that was used in the tunnel boring. It was a rewarding experience – thanks to Alex Marion!

The meeting was adjourned.

Prepared by

SC-3 Meeting S02-1 Minutes (Continued)

John Taylor

List of Attachments

1. [Agenda](#)
2. [Combined SC-3 and Working Group Roster](#)
3. [Summary for NPEC Meeting 01-1](#)
4. [IEEE 336/338 Revision Schedule](#)
5. [NRC Liaison Report](#)

**IEEE Subcommittee 3 Meeting S02-1
Agenda
Tuesday, March 12, 2002
Las Vegas, Nevada**

- 1. Introduction – D. Horvath**
 - Opening Remarks – D. Horvath
 - Meeting Agenda – D. Horvath
- 2. Secretary’s Report – J. Taylor**
 - S01-2 Minutes
 - Action Items Status
 - Alligator fund
 - SC-3 Membership
- 3. SC-3 Chair’s Report – D. Horvath**
 - NPEC Activities
 - Future Meeting Locations and Frequency
- 4. WG 3.1 Report – J. Taylor**
 - P336 Update
 - P338 Update
- 5. WG 3.2 Report – D. Horvath**
 - P692 Update
- 6. WG 3.4 Report – P. Colaianni**
 - NPEC Goal 6 Update and Any Other Activities
- 7. Liaison Reports**
 - NRC – J. Vora
- 8. New Business (Open for Input)**
 - Angello Marino – NRC Test Internal Review’s

**IEEE - Nuclear Power Engineering Committee
Subcommittee SC-3 Membership List
Operations, Maintenance, Aging, and Testing**

Name/Company	Address	Assignment
BALLASSI, G. (GEORGE) GENERAL DYNAMICS/ ELECTRIC BOAT CORP. [REDACTED]	[REDACTED]	SC-3 (M) WG-3.1(C) WG-3.4(M)
BHARTEY, B.M. (BRIJ) SPECTRUM TECHNOLOGIES USA INC. [REDACTED]	[REDACTED]	[REDACTED]-3(M) WG-3.1(M) WG-3.4(M)
COLAIANNI, R.P. (PAUL) DUKE ENERGY [REDACTED]	[REDACTED]	SC-3(M) WG-3.4(C)
COLVIN, W. J. (WALLY) FIRST ENERGY CORP. [REDACTED]	Perry Nuclear Power Plant [REDACTED]	SC-3 (M) WG-3.1(M) WG-3.4 (M)
FLEISCHER, L.Q. (LAMIS) EXELON CORP. [REDACTED]	Peach Bottom Nuclear Station [REDACTED]	SC-3(M) WG-3.4(M)
DOUGHERTY P. (PRESTON) DOMINION GENERATION [REDACTED]	Innsbrook Technical Center [REDACTED]	SC-3 (M) WG-3.4 (M)
DUREJA, S.K. (SURIN) CONSTELLATION NUCLEAR [REDACTED]	Calvert Cliffs Nuclear Power Plant [REDACTED]	SC-3 (M) WG-3.1 (M)
HORVATH, D.A. (DAVE) ADVENT ENGINEERING SERVICES, INC. [REDACTED]	[REDACTED]	SC-3(C) WG-3.1(M) WG-3.2(C) WG-3.4(PC)
KASTURI, S. (SONNY) MOS [REDACTED]	[REDACTED]	SC-3(PC)

Name/Company	Address	Assignment
LEUNG, C.W. (HENRY) ATOMIC ENERGY OF CANADA LIMITED [REDACTED]	[REDACTED]	SC-3(M) WG-3.4(M)
PARSONS, S.Z. (STEVE) AMERICAN ELECTRIC POWER [REDACTED]	DC Cook Nuclear Power Station [REDACTED]	SC-3(M)
SANWARWALLA, M.H. (MANSOOR) SARGENT & LUNDY [REDACTED]	[REDACTED]	SC-3 (M) WG-3.4 (M)
TAYLOR, J.H. (JOHN) BROOKHAVEN NATIONAL LAB [REDACTED]	[REDACTED]	SC-3(S) WG-3.1(M)
VORA, J.P. (JIT) US NUCLEAR REGULATORY COMMISSION [REDACTED]	Office Of Nuclear Regulatory Research [REDACTED]	SC-3(M) WG-3.1 (M)
WILLIAMS, B. (BURL) ENERGY OPERATIONS [REDACTED]	Arkansas Nuclear One [REDACTED]	SC-3 (proposed) WG-3.1 (M)

**IEEE - Nuclear Power Engineering Committee
Working Group WG-3.1 Membership List
Testing
Standard IEEE Stds 336 and 338**

Name/Company	Address	Assignment
BALLASSI, G. (GEORGE) GENERAL DYNAMICS/ ELECTRIC BOAT CORP. [REDACTED]	[REDACTED]	SC-3 (M) WG 3.1(C) WG-3.4(M)
BHARTEY, B.M. (BRIJ) SPECTRUM TECHNOLOGIES USA INC. [REDACTED]	[REDACTED]	SC-3(M) WG-3.1(M) WG-3.4(M)
COLVIN, W. (WALLY) FIRST ENERGY CORP. [REDACTED]	Perry Nuclear Power Plant [REDACTED]	SC-3 (M) WG-3.1(M) WG-3.4 (M)
DUREJA, S.K. (SURIN) CONSTELLATION NUCLEAR [REDACTED]	Calvert Cliffs Nuclear Power Plant [REDACTED]	SC-3 (M) WG-3.3 (C) WG-3.1 (M)
HORVATH, D.A. (DAVE) ADVENT ENGINEERING SERVICES, INC. [REDACTED]	[REDACTED]	SC-3(C) WG-3.1(M) WG-3.2(C) WG-3.4(PC)
KULANGARA, J.A. (JACOB) [REDACTED]	[REDACTED]	WG-3.1 (M)
TAYLOR, J.H. (JOHN) BROOKHAVEN NATIONAL LAB [REDACTED]	[REDACTED]	SC-3(S) WG-3.1(M)
VORA, J.P. (JIT) US NUCLEAR REGULATORY COMMISSION [REDACTED]	Office Of Nuclear Regulatory Research [REDACTED]	SC-3(M) WG-3.1 (M)
WILLIAMS, B.E. (Burl) ENTERGY [REDACTED]	Arkansas Nuclear One [REDACTED]	WG-3.1 (M) WG-3.2 (M)

**IEEE - Nuclear Power Engineering Committee
Working Group WG-3.2 Membership List
Security Systems
Standard IEEE Std 692**

Name/Company	Address	Assignment
BOTTOM, PhD, N.R. (NORMAN) PRIVATE CONSULTANT [REDACTED]	[REDACTED]	WG-3.2(M)
GREEN, J (JOHN) HOLOPHANE LIGHTING [REDACTED]	[REDACTED]	WG-3.2 (M)
HORVATH, D.A. (DAVE) ADVENT ENGINEERING [REDACTED]	[REDACTED]	SC-3 (C) WG-3.1 (M) WG-3.2 (C) WG-3.4 (M)
LINDE, BRIAN NUCLEAR MANAGEMENT CO. [REDACTED]	[REDACTED]	Proposed WG-3.2 (M)
PEARSON, EINAR W. (BILL) NIAGARA MOHAWK [REDACTED]	Nine Mile Point Nuclear Station [REDACTED]	WG-3.2 (M)
PHELPS, P.A. (PAUL) DOMINION GENERATION [REDACTED]	Surry Power Station [REDACTED]	WG-3.2 (M)
SHAFFER, ROMAN US NUCLEAR REGULATORY COMMISSION OFFICE OF NUCLEAR REGULATORY RES. [REDACTED]	[REDACTED]	Proposed WG-3.2
SIMS, J (JERRY) SOUTHERN NUCLEAR OPERATING CO. [REDACTED]	[REDACTED]	WG-3.2 (M)
WORRELL, T. M. (TOM) DOMINION GENERATION [REDACTED]	Surry Power Station [REDACTED]	WG-3.2 (S)

Name/Company	Address	Assignment
WILLIAMS, B.E. (BURL) ENTERGY 501-858-4728 FAX: 501-858-4679 [REDACTED]	Arkansas Nuclear One [REDACTED]	WG-3.1 (M) WG-3.2 (M)

**IEEE - Nuclear Power Engineering Committee
Working Group WG-3.4 Membership List
Assessing, Monitoring, And Mitigating Aging Effects On Npqs Equipment
Standards: IEEE Std 1205**

Name/Company	Address	Assignment
BALLASSI, G. (GEORGE) GENERAL DYNAMICS/ ELECTRIC BOAT CORP. [REDACTED]	[REDACTED]	SC-3 (M) WG 3.1(C) WG-3.4(M)
BHARTEY, B.M. (BRIJ) SPECTRUM TECHNOLOGIES USA INC. [REDACTED]	[REDACTED]	SC-3(M) WG-3.4(M)
COLAIANNI, R.P. (PAUL) DUKE ENERGY [REDACTED]	[REDACTED]	SC-3(M) WG-3.4(C)
DOUGHERTY P. (PRESTON) DOMINION GENERATION [REDACTED]	Innsbrook Technical Center [REDACTED]	SC-3 (M) WG-3.4 (M)
FLEISCHER, L.Q. (LAMIS) EXELON CORP. [REDACTED]	Peach Bottom Nuclear Station [REDACTED]	SC-3(M) WG-3.4(M)
HORVATH, D.A. (DAVE) ADVENT ENGINEERING SERVICES, INC. [REDACTED]	[REDACTED]	SC-3(C) WG-3.1(M) WG-3.2(C) WG-3.4(PC)
LEUNG, C.W. (HENRY) ATOMIC ENERGY OF CANADA LIMITED [REDACTED]	[REDACTED]	SC-3(M) WG-3.4(M)
LOFARO, R.J. (ROBERT) BROOKHAVEN NATIONAL LAB [REDACTED]	[REDACTED]	WG-3.4(M)
SANWARWALLA, M.H. (MANSOOR) SARGENT & LUNDY [REDACTED]	[REDACTED]	SC-3 (M) WG-3.4 (M)

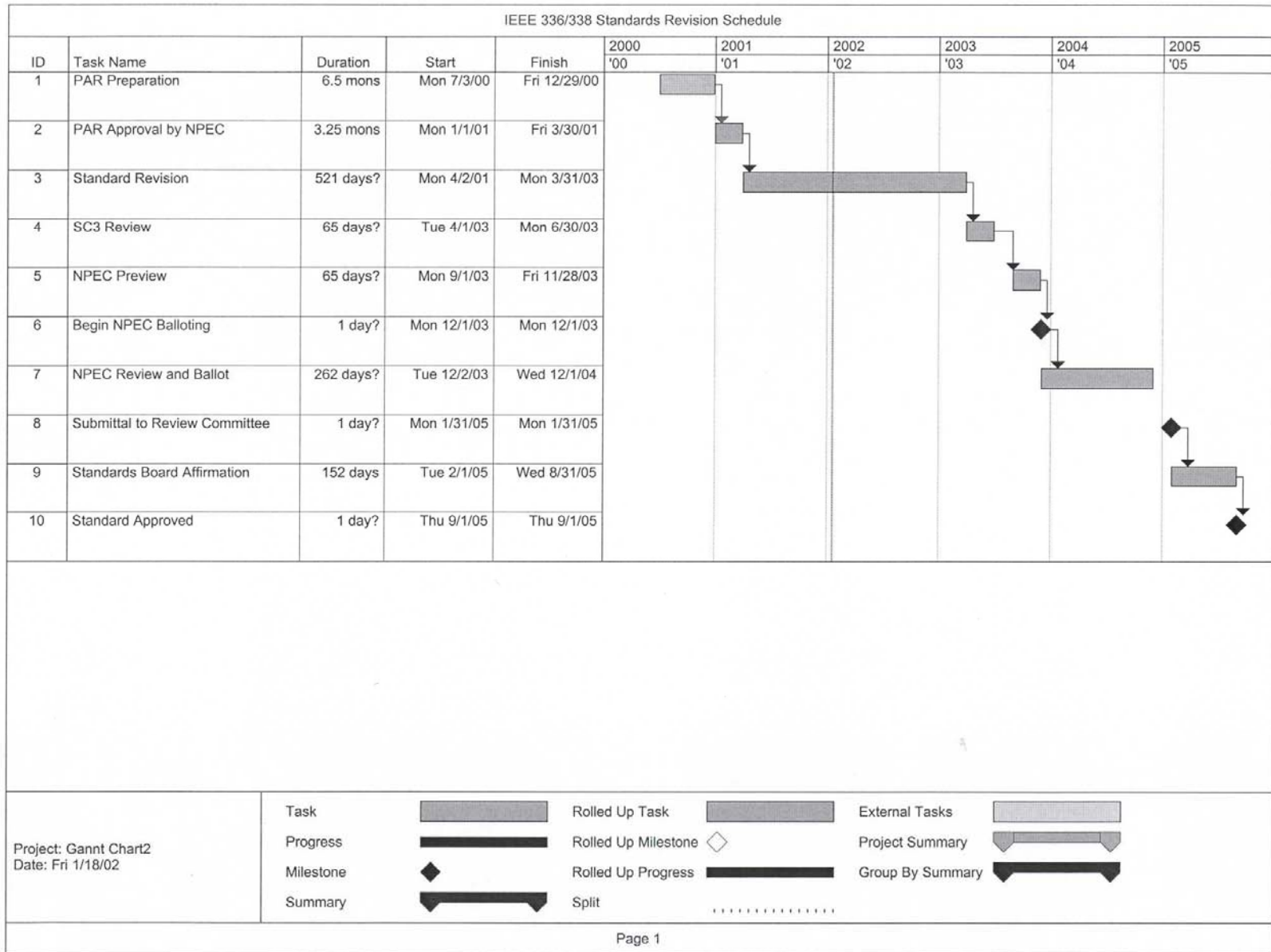
Name/Company	Address	Assignment
SHEMANSKI, P.C. (PAUL) US NUCLEAR REGULATORY COMMISSION [REDACTED]	[REDACTED]	WG-3.4(S)

NPEC SUMMARY FOR MEETINGS A01-2 and N01-2

1. NPEC met in San Diego, CA on November 6-7, 2001
2. NPEC is one of 17 technical committees and six (non-technical) standing committees that report to the IEEE Power Engineering Society (PES) Technical Council. The Technical Council is presently composed of the Chairpersons of the PES Technical Committees, plus the Chairpersons of Standing Committees and is chaired by the Power Engineering Society's Vice President of Technical Activities.
3. Vince Bacanskas has replaced Gary Toman as Chair of SC-2. Before resigning, Gary Toman prepared a response for IEEE to NRC GSI-168 on low voltage I&C cable EQ.
4. IEEE now offers an Internet E-conferencing option (combination conference call for audio and website based visual document view) for committee meetings. Contact is Lenore Johnson (██████████) at ██████████. Software is available at www.placeware.com/cc/ieee. [NPEC AdCom A02-1 was held this way on March 5.]
5. Standards balloting is now in *.pdf format and via website only. *The Standards Bearer* is now available on the IEEE website only.
6. P7.4.3-2 (Design Requirements for Computers in Nuclear Power Stations) was previewed by Charlie Roslund of Westinghouse and approval to ballot was subsequently determined by email. The meeting did not have a quorum.
7. Paul Johnson of Vermont Yankee gave a presentation on Grid Reliability. Potentially 40 cases of degraded bus voltage noted by PG&E during 1985-1995.
8. Standards Coordinator Report (NPEC Standards status) is not on the NPEC Web page.
9. SC-2 (Qualification) had no report. SC-3 (Operations, maintenance, Aging, and Testing): work continues on P336, P692, and NPEC Goal 6.
10. SC-4 (Auxiliary Power): 628 approved, 387 and 1290 reaffirmed, 317 and 741 being reaffirmed, 308 and 765 recirc ballot complete, and P833 approved for ballot.
11. SC-5 (Human Factors & Reliability): 577 was reaffirmed but work to update will now begin. Work on P1023, P1574, P1586, and P1587 continue. WG-5.2 will host conference and next NPEC meeting in Phoenix in October.
12. SC-6 (Safety Systems): P497 recirc ballot complete, P379 was approved, P7-4.3.2 was approved to ballot, P420 was approved, and work beginning on 384 revision.
13. ICC Liaison Report has many interesting topics on cable activities. (See NPEC website.)
14. Future NPEC Meetings:
 - 02-2 will be in Phoenix, AZ - SC5 (SC5 Conference on Human Factors) (Sept. 15-19)
 - 03-1 New Orleans – Vince Bacanskas has lead.
 - 03-2 with ANS Meeting in Columbus, OH – Jim Thomas has lead.
 - 04-1 Augusta, GA possible tour of Savannah River Facility, TJ Voss has lead

Prepared by

David A. Horvath



9.0

**Liaison Report
J. P. Vora
Office of Nuclear Regulatory Research
March 2002**

The following U.S. NRC activities and other relevant information would be of interest.

GSI-168, Environmental Qualification of Low-Voltage I&C Cables

In my last report I had identified four technical issues for which the NRC staff was seeking industry inputs for the resolution of GSI-168. Both, IEEE NPEC and NEI provided significant insights useful to address the issues. Their efforts is very much appreciated. Our tentative plan is to meet with the Advisory Committee on Reactor Safeguards (ACRS) during summer and discuss with the Committee the progress that the staff has made.

Research Related to Power Cables and Splices

The overall program at Brookhaven National Laboratory is progressing well. We have completed aging assessment of safety-related power cables and cable splices used in commercial nuclear power plants. The studies are based on the reviews of operating experience and equipment information and performance exchange databases. The results of the phase I aging assessment will be used to evaluate EQ practices for power cables and cable splices. Interim technical reports on research results have been issued by BNL. The reports are: (1) TR-6822 11-19-01, "Interim Report on Evaluation of Aging Effects on Power Cables Used in Nuclear Power Plants. (2) TR-6822-01-03-02, "Interim Report on the Evaluation of Aging Effects in Cable Splices Used in Nuclear Power Plants."

NRC Information Notice 2002-01: Metalclad Switchgear Failures and Consequent Losses of Offsite Power

IN 2002-01 was issued on January 8, 2002 to inform addresses of electrical equipment failure modes and design vulnerabilities of switchgear equipment. An electrical fault occurring in medium voltage switchgear enclosure can cascade, causing collateral damage within the switchgear and consequent loss of multiple circuits. When both safety trains are supplied from the same offsite supply with common upstream circuit=breaker, one fault in the supply circuit can disable offsite power to both redundant trains.

International Conference on Wire System Aging

The conference will be held April 23-25, 2002 at Double Tree Hotel in Rockville, Maryland. The announcement was mailed to the members of the SC-3 and its working groups and to NPEC. Please register if you plan to attend.

Technical Issues Related to License Renewal (LR)

The following two technical issues related to license renewal would be of interest.

(1) Station Blackout (SBO). Members of the NRC staff is continuing its discussions with the representatives of the industry on the scope of the SBO equipment relied on to meet the SBO rule that should be within the scope of license renewal. The scope of discussion remains on whether some long-lived passive components and structures associated with offsite power should be in the scope of license renewal for compliance with the SBO rule.

(2) Treatment of non-EQ cables. There are non-EQ cables within the scope of the license renewal. As such, they need to be identified and aging management reviews are required during the period of renewed license. Staff guidance is provided in the GALL report (NUREG-1801).