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

Meeting S03-01
Thursday Jan. 23, 2003
Houston, Texas

Members Present:	George Ballassi	Dave Horvath
	Paul Colaianni	John Taylor
	Surin Dureja	
Members Absent:	Brij Bharteey	Henry Leung
	Wally Colvin	Mansoor Sanwarwalla
	Preston Dougherty	Burl Williams
	Sonny Kasturi	Jit Vora
	Hamid Heidarisafa	
Other Attendees:	Glen Schinzel	Ted Riccio
	Bob Lofaro	

1.0 Introduction

John Taylor welcomed everyone to the Sub Committee 3 meeting, which was a continuation of WG 3.1 meeting in the morning. The agenda for the SC3 meeting was approved without any change and is included as Attachment 1.

2.0 Secretary's Report

2.1 Meeting S02-2 Minutes

The minutes from S02-2 were approved, without modification, by acclamation.

2.2 Action Item Status

All outstanding action items are closed. New action items are identified in the table and discussed in the text of these minutes.

Item No.	Description	Status
AI-02-2-1	Identify ASME Risk Member/Liaison	Closed
AI-02-2-2	Arrange Meeting SC3-1 (J.Taylor/T. Riccio)	Closed
AI-02-2-3	Identify SC-2 Liaison	Closed
AI-02-2-4	Identify EPRI/NEI Liaison	Closed
AI-03-1-1	Arrange S03-2 John/Surin	Open
AI-03-1-2	Draft briefing sheet for inducting new members -J. Taylor (See Attachment 6)	Closed
AI-03-1-3	Present emerging risk issue to NPEC- John	Closed
AI-03-1-4	Recruit new members - All	Open

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 S03-01 meeting is $191.00.

2.4 Membership Table

SC-3 and the working groups are fairly well staffed. Glen Schinzel, and Bob Lofaro were accepted as SC-3 members. Glen Schinzel also agreed to be SC-3 liaison with ASME and EPRI. Bob Lofaro agreed to be the liaison with SC-2.

SC-3, and WG -3.1 would seek new members with expertise in PRA. John Taylor will draft a briefing sheet to be used by members to induct new members.

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]. The current breakdown of members by category is as follows:

Utility	AE/Consultant	Gov't/National Labs	Other	Total
8	4	4	1	17

3.0 SC-3 Chair's Report

3.1 NPEC Activities

Dave summarized the results of NPEC Meeting N02-1, N02-02 and information from the upcoming NPEC meeting, Pre N03-01. A summary of the NPEC meeting is included as Attachment3.

3.2 Future Meeting Locations

It was decided that the next SC-3 and working group meetings will be held in Boston, MA in conjunction with the next NPEC meeting. SC-3 and the WGs will meet during the period July 28-29, and NPEC will meet on July 30.

4.0 Working Group 3.1 (Testing) Report

In order to continue the revision process for IEEE Std 336 it was agreed earlier in the Working Group meeting that any additional comments will be incorporated into existing Draft C, and circulated to SC3 and the working group by 3/31/03, for approval. Draft D, would then be presented by George Ballassi, at the next NPEC meeting in July 2003, for NPEC Approval to Ballot.

The WG addressed the proposed revision to IEEE Std. 338 on 1/22/03 and morning of 1/23/03. There was extensive discussion on contents and format for revision of IEEE Std.338.

The Working Group agreed the first step in achieving the above goal should be to develop an annex to IEEE Std 338. This annex would provide a bases and guidance on using Risk-informed

approaches for changing Technical Specification Surveillance Testing Requirements. Action Item was assigned by the Working Group to prepare the draft for the annex.

There were excellent presentations made by Ted Riccio and Glen Schinzel from STP. Key Points of their presentations were:

- A separate "Owner Controlled Program" should be developed to replace the existing Instrumentation surveillance requirements from each plant's Tech Specs.
- Similar programs exist for ASME code In Service Testing, and Fire Protection Programs.
- Other groups like BWR Owners Group and EPRI are working on a similar goal.
- The testing program for electrical equipment should be coordinated with mechanical equipment being tested in accordance with ASME.
- ASME is using Risk Informed Techniques for testing program

  A conference call with Wayne Harrison of STP clarified licensing issues.

  The complete presentation by Ted Riccio was attached with the meeting minutes for SC3.1 Working Group.

  Glen Schinzel from STP provided an overview presentation of the STP's approved exemption of the Special Treatment Requirements imposed by 10CFR Parts 21, 50 and 100. A copy of the complete presentation was attached with the meeting minutes for SC3.1 Working Group.

- This presentation was previously given to the NRC.
- Their proposed process involves categorization of plant components based on the risk-informed approach that will result in reduced burden for the plant, and regulator, and improve overall safety.
- The components are placed into one of the four categories as follows:
  - HSS - High Safety Significant
  - MSS - Medium Safety Significant
  - LSS - Low safety significant
  - NRS - not risk significant

So far 20,000 of the 50,000 components categorized by STP to date are safety related (when they are categorized, the safety classification does not change). Most of the functions associated with these safety-related components are active functions (however, STP also categorizes passive functions). Concerning electrical components, most end-point components (i.e., motors for pumps and valves, in addition to switches, controllers, etc.) have already been categorized.

Some questions arose while categorizing breakers, MCCs, load centers, etc. where it is not easy to obtain a clear consensus on the final categorizations. IEEE - NPEC, SC-3 is being requested to provide the guidance in providing a standard or guidance that can be used uniformly by all the plants, and be acceptable to the regulators as well.

Copies of their presentations were sent with the minutes of SC-3.1, working group meeting minutes.

The Working Group agreed that an annex be issued to standard at this time, providing guidance to use Risk-informed approach changing Technical Specification Surveillance Testing Requirements.

On IEEE Std. 336 it was agreed earlier in the Working Group meeting that any additional comments will be incorporated in existing Draft C, and circulated to SC3 and the working group by 3/31/03, for approval. Draft E, would then be presented by George Ballassi, at the next NPEC meeting in July 2003, for NPEC Approval to Ballot.

WG 3.1 is responsible for maintenance of IEEE Std 336, *"Guide for Installation and Testing for Class 1E Power, Instrumentation, and Control Equipment at Nuclear facilities"* and IEEE Std. 338, *"Standard Criteria for the Surveillance Testing of Nuclear Power Generating Station Safety Systems".*

5.0 Working Group 3.2 Report

WG-3.2 did not meet because of busy post 9-11 schedule of group members. The Working Group plans to have its next meeting in May 2003.

WG 3.2 is responsible for maintenance of IEEE Std 692, *"IEEE Standard Criteria for Security Systems for Nuclear Power Generating Stations".*

6.0 Working Group 3.4 (Aging) Report

WG 3.4 approved the minutes from the last meeting. Paul Shemanski from NRC, who was acting as Secretary to the Working Group, retired from NRC in Jan. 03.
Working Group will start working for the next revision or reaffirmation, based on NPEC goal of keeping standards to be reviewed at least on 5-year cycle.

WG 3.4 is responsible for maintenance of IEEE Std 1205 "*Guide for Assessing, Monitoring, and Mitigating Aging Effects on Class 1E Equipment Used in Nuclear Power Generating Stations".*

7.0 Liaison Reports

Jit Vora could not attend the meeting due to personal reasons, but he did provide an NRC Liaison report (Attachment 4).

Bob Lofaro made an excellent presentation regarding Fuse Aging Study. Bob's presentation is included as Attachment 5.

Hopefully, at the next SC-3 meeting liaison reports will be provided for ASME/Risk and EPRI by Glen and SC-2 by Bob.

8.0 New Business

SC-3 has been approached by South Texas Project to provide guidance in the form of IEEE standard, for using risk-informed approaches as a basis for changing Technical Specification Surveillance Testing Requirements for Electrical components. SC-3 believes it has the authorization for making this type of change to IEEE Std 338 based on its existing PAR. The existing PAR directs WG-3.1 to incorporate risk-informed approaches into the next revision of IEEE Std 338.

John Taylor announced that Surin Dureja has accepted the position of Secretary of SC3, effective this meeting, since John Taylor has assumed the responsibility as Chair of SC3.

The meeting was adjourned at 5 PM.

Prepared by

Surin Dureja
Sc-3 Secretary

List of Attachments

1. Agenda
2. IEEE - Nuclear Power **Engineering Committee**
   Subcommittee SC-3 Membership List
3. Summary for NPEC Meeting 02-2
4. NRC Liaison Report
5. Fuse Aging Study Presentation
6. SC-3/WG 3.1 Conversation Points for Telephone Invitations:
7.

IEEE Subcommittee 3 Meeting S03-1
Agenda
Thursday, January 23, 2003
Houston, Texas

1. Introduction – J. Taylor
    a. Opening Remarks – J. Taylor

    b. Meeting Agenda – J. Taylor

2. Secretary's Report – J. Taylor

    a. S02-2 Minutes

    b. Action Items Status

    c. Alligator fund

    d. SC-3 Membership

3. SC-3 Chair's Report – J. Taylor

    a. NPEC Activities

    b. Future Meeting Locations and Frequency

4. WG 3.1 Report – George Ballassi

    a. P336 Update

    b. P338 Update

5. WG 3.2 Report – D. Horvath
    a. P692 Update

6. WG 3.4 Report – P. Colaianni
    a. NPEC Goal 6 Update and Any Other Activities

7. Liaison Reports

    a. NRC – J. Vora
    b. Need ASME Risk Laison

8. Presentation: Fuse aging Study – R. Lofaro

9. New Business (Open for Input)

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)
BHARTEEY, B.M. (BRIJ) SPECTRUM TECHNOLGIES USA INC. [redacted]	[redacted]	SC-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)
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 (S) WG-3.1 (S)
HEIDARISAFA, HAMID R. AMERICAN ELECTRIC POWER [redacted]	[redacted]	SC3 (M) SC3.1 (M)
HORVATH, D.A. (DAVE) ADVENT ENGINEERING SERVICES, INC. [redacted]	[redacted]	SC-3(PC) 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)
LOFARO, ROBERT (BOB) BROOKHAVEN NATIONAL LAB [redacted]	[redacted]	SC3 (M) WG -3.1 (M)
RICCIO, TED South Texas Project Electric Generating Station [redacted]	[redacted]	SC3 (M) WG 3.1 (M)
SANWARWALLA, M.H. (MANSOOR) SARGENT & LUNDY [redacted]	[redacted]	SC-3 (M) WG-3.4 (M)
SCHINZEL, GLENN South Texas Project Electric Generating Station [redacted]	[redacted]	SC3 (M) WG-3.1 (M)
TAYLOR, J.H. (JOHN) BROOKHAVEN NATIONAL LAB [redacted]	[redacted]	SC-3(C) 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 (M) 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)
BHARTEEY, B.M. (BRIJ) SPECTRUM TECHNOLGIES 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 (S) WG-3.1 (S)
HORVATH, D.A. (DAVE) ADVENT ENGINEERING SERVICES, INC. [redacted]	[redacted]	SC-3(PC) WG-3.1(M) WG-3.2(C) WG-3.4(PC)
LOFARO, ROBERT (BOB) BROOKHAVEN NATIONAL LAB [redacted]	[redacted]	SC3 (M) WG -3.1 (M) WG 3.4 (M)
RICCIO, TED South Texas Project Electric Generating Station [redacted]	[redacted]	SC3 (M) WG 3.1 (M)
SCHINZEL, GLENN South Texas Project Electric Generating Station [redacted]	[redacted]	SC3 (M) WG-3.1 (M)
TAYLOR, J.H. (JOHN) BROOKHAVEN NATIONAL LAB [redacted]	[redacted]	SC-3(C) WG-3.1(M)

Name/Company	Address	Assignment
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		WG-3.2(M)
GREEN, J (JOHN) HOLOPHANE LIGHTING		WG-3.2 (M)
HORVATH, D. A. (DAVE) ADVENT ENGINEERING		SC-3 (PC) WG-3.1 (M) WG-3.2 (C) WG-3.4 (M)
PEARSON, EINAR W. (BILL) NIAGARA MOHAWK	Nine Mile Point Nuclear Station	WG-3.2 (M)
PHELPS, P.A. (PAUL) DOMINION GENERATION	Surry Power Station	WG-3.2 (M)
SIMS, J (JERRY) SOUTHERN NUCLEAR OPERATING CO.		WG-3.2 (M)
WORRELL, T. M. (TOM) DOMINION GENERATION	Surry Power Station	WG-3.2 (S)
WILLIAMS, B.E. (BURL) ENTERGY	Arkansas Nuclear One	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 Npgs 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)
BHARTEEY, B.M. (BRIJ) SPECTRUM TECHNOLGIES USA INC. [redacted]	[redacted]	SC-3(M) WG-3.4(M) SC3.1 (M)
COLAIANNI, R.P. (PAUL) DUKE ENERGY [redacted]	[redacted]	SC-3(M) SC3.1 (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]	SC3 (M) WG3.1 (M) WG-3.4(M)
SANWARWALLA, M.H. (MANSOOR) SARGENT & LUNDY [redacted]	[redacted]	SC-3 (M) WG-3.4 (M)

NPEC Summary for Meetings A02-2, N02-2, and Pre-A03-1

1. NPEC AdCom met "virtually" by telephone on August 13, 2003 and AdCom and the full committee met in Phoenix, AZ on September 17-18, 2003. There was also an AdCom "virtual" meeting on December 17, 2002.

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 chairs of Standing Committees and is chaired by the PES VP of Technical Activities.

3. Satish Aggarwal (Chair, SC-2) and Jim Gleason (P323 Chair) are leading a new effort to update IEEE 323.

4. At future meetings, subcommittee chairs will be asked to discuss emerging issues under their cognizance in their reports. This request will be handled as a roundtable approach.

5. One new proposed NPEC goal is to pursue a more aggressive management of the standard development and review cycle. The five-year period is to be mapped out with milestones in advance and prior to PAR approval.

6. A second proposed NPEC goal is to improve Succession Planning. Starting February 1, 2003, the names of subcommittee officers will be submitted annually to the NPEC Chair. This submission is to include term of office (suggest 2 to 5 years) and a succession path. WG officer succession planning is the responsibility of the SC Chair.

7. New NPEC officers effective January 1, 2003 are Jack Carter (Stone & Webster), Chair; John Disosway (Dominion Energy), Vice Chair; and Dave Horvath (Advent Engineering), Secretary.

8. AdCom believes that technical papers should be pursued as a forerunner to more formal documents.

9. At the December 2002 "virtual" meeting, NPEC membership was noted to be SC-2 (3%), SC-3 (12%), SC-4 (33%), SC-5 (9%), SC-6 (27%), and unassigned (15%).
   Another breakdown is: Gov't – 3, Producers – 7, AE/Consultants – 11, and Utility – 12.
   The NPEC Chair desires to even out this apparent imbalance by asking the SC Chairs to recommend appropriate additional appointments at the next NPEC meeting.

10. Future NPEC Meetings:

    03-1 New Orleans – John MacDonald has lead.
    03-2 Boston – Jack Carter has lead.
    04-1 Augusta, GA possible tour of Savannah River Facility, TJ Voss has lead
    04-2 Chicago, IL Neil Smith has lead

Prepared by

David A. Horvath

NRC Liaison Report

J. P. Vora
Office of Nuclear Regulatory Research
January 2003

Happy, Peaceful and Prosperous New Year!

The following topics and activities would be of interest to the members of the IEEE/NPEC SC-3, "Operations, Maintenance, Aging and Testing."

Paul Shemanski Retires
After some 30 years of distinguished government service, Paul Shemanski has retired. His experience and knowledge base in the areas of environmental qualification and aging of long-lived passive electrical equipment will be very much missed. Paul was an active member of the working group 2.0, Qualifying Class 1E Equipment and 3.4, Assessing, Monitoring, and Mitigating Aging Effects.

GSI-168, Environmental Qualification of Low-Voltage I&C Cables
Based on the technical assessment the staff is continuing its effort to develop a Generic Communication as a part of the GSI resolution process.

Proceedings of the International Conference on Wire System Aging
NUREG/CP-0179 has been published and distributed to the members of NPEC, SC-3 and its working groups. As a follow-on activity, the Office of Nuclear Regulatory Research (RES) is pursuing collaborative research on advanced diagnostic and condition monitoring method that involves scanning of an entire length of a installed wire system. That is, detect and locate incipient defects prior to failures. Some interesting and promising concepts were discussed at the conference in Technical Session 4: Prognostics and Diagnostics for Installed Wire Systems

Cable Insulation Resistance Measurements Made During Cable Fire Tests
NUREG/CR-6776 would be of interest. The report discusses a insulation resistance measurement system that is able to identify the changes in insulation resistance occurring between the separate conductors and the conductors to ground in cable bundles as they were being exposed to fires. The results obtained by the insulation resistance measurement system during these tests showed that cables would fail during a fire in one of three ways. No incidents of fire induced open circuits were noted. The report provides an analysis of the insulation resistance data and current loop results for the 18 tests run in the industry test program.

Evaluation of Aging and Qualification Practices for Cable Splices Used in Nuclear Power Plants
NUREG/CR-6788 has been issued. The report describes the evaluation of aging and environmental qualification practices for safety-related cable splices used in commercial nuclear power plants and determine the effects of aging degradation. Issues and concerns related to cable splices have been reviewed. Predominant aging characteristics are identified and potential condition monitoring techniques are evaluated. In addition, cable splices that were pre-aged and exposed to simulated accident conditions in a previous NRC/RES program were

disassembled and inspected to gain insights into splice performance and potential failure mechanisms under harsh environment.

Status of Emerging/Evolving Issues for License Renewal
In the electrical area there are two issues of current interest:

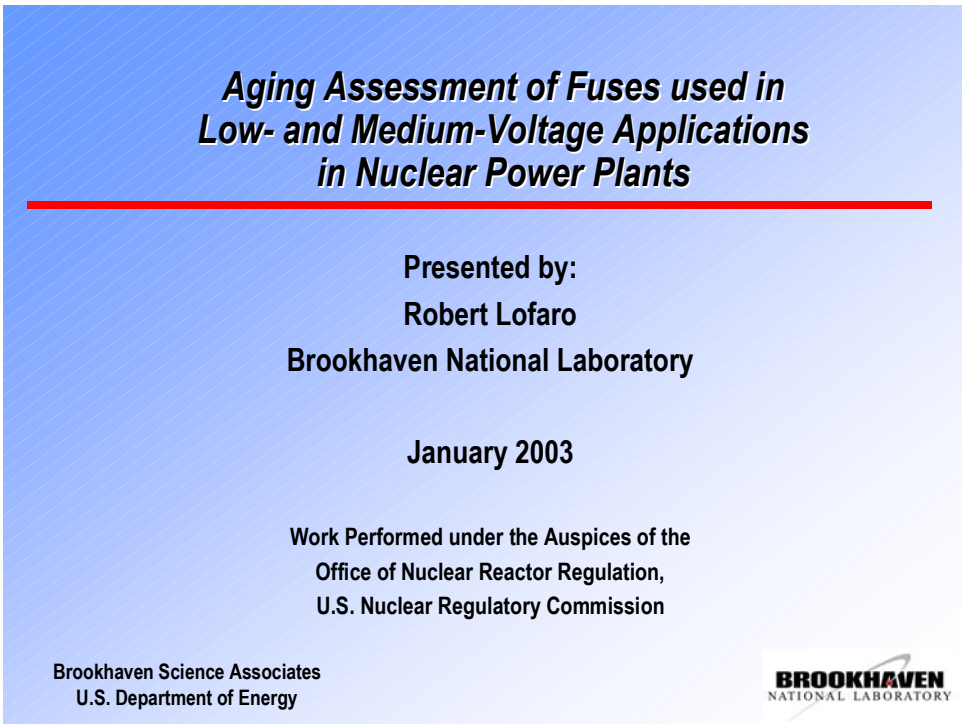
1) Treatment of non-EQ cables

The staff met with the IEEE working group 3.4 on October 9, 2002, to discuss an aging management program (AMP) as described in GALL report Chapter XI regarding the calibration test vs. visual inspection of instrumentation circuits for non-EQ cables. The industry has agreed to revisit this issue and NEI will submit the industry position for staff review in January 2003

2) Fuse Holders

In December the staff prepared a revised fuse holder position that includes two aging management programs. One for metallic clips and other for fuse block. Interim staff guidance (ISG) is under preparation. Since the current version of the GALL report does not include an AMP for metallic portion of the fuse holder, there is a need to develop such an AMP.

Fuse Aging Study Presentation



(Click on the slide to see complete presentation)

SC-3/WG 3.1 Conversation Points for Telephone Invitations:

This is an invitation to join IEEE Working Group 3.1 Nuclear Testing, which is responsible for IEEE Standard 336 (Installation, Inspection, and Post-Modification Testing) and IEEE Standard 338 (Periodic Testing). Both of these standards are undergoing major revisions.

Just for background, WG 3.1 is part of Subcommittee 3 (Operations, Testing, Aging and Maintenance), which is part of the Nuclear Power Engineering Committee (NPEC), a group that is responsible for about 40 electrical and electronic standards used at nuclear stations. It is not necessary to be a member of IEEE to be a member of WG 3.1. However, later if you wish to become part of the balloting process, it would be necessary to join IEEE and its Standards association. George Ballassi is the current Chair of WG 3.1 and John Taylor is the current Chair of SC-3. We require one year of active membership on a working group before joining SC-3 but working group members are permitted to attend SC-3 meetings as guests.

The Project Authorization Requests (PARs) defining the scope of the revisions has been approved and are on our website (http://grouper.ieee.org/groups/npec/private/sc3/WG31.html User name: [redacted] pw= [redacted]). Standards revisions are a 4 year process and we are about one year into the current revisions. Working groups and the subcommittee meet twice each year, and the next meeting is scheduled for Boston in late July/early August 2003. An exact meeting date will be finalized by mid February.

IEEE Contacts:

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IEEE WG 3.1
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