

**IEEE Nuclear Power Engineering Committee
Subcommittee SC-2, Qualification**

**Draft Minutes of Meeting SC2-02-1
Held September 16-17, 2002
Scottsdale, Arizona**

Members Attending: See Table 1

Members Absent: NA

Guests: Neil Smith, NPEC Chairman

1. Introduction

Satish Aggarwal opened the meeting on Monday September 16, 2002 and welcomed everyone in attendance. The meeting agenda ([Attachment 1](#)) was reviewed, and the following changes were proposed:

- Item 4 - Previous SC-2 meeting minutes were unavailable, therefore, this item will be deleted
- Item 6 - Bob Smith was unable to attend the meeting, therefore, Satish will provide an overview and the status of IEEE Standard 323
- New item - A presentation on qualification of microprocessor equipment by Richard Wood of Oak Ridge National Laboratory will be added

With the inclusion of these changes, the agenda was approved.

Opening remarks were made by Neil Smith, Chairman of NPEC, in which he announced that Satish Aggarwal has been appointed as the new Chairman of SC-2. Neil also noted that there are several outstanding issues related to the IEEE standards on qualification that need to be addressed. The goal of this subcommittee should be to resolve these issues and proceed with publication of the revised standards.

Satish then noted that the charter of SC-2 is qualification of equipment for nuclear plant applications. There is no requirement to be an IEEE member to participate as a member of SC-2 or its working groups; one only needs to be a recognized expert in the field. However, to participate in the balloting of any of the IEEE standards developed, it is required that you be an IEEE member and a member of the IEEE Standards

Association. Membership information and applications are available on-line at www.ieee.org.

Satish noted that each IEEE standard has a 5-year life, after which it must be reaffirmed or revised. He provided the following status summary for the IEEE SC-2 standards:

Standard	Last Reaffirmed	Due	Comment
IEEE Std. 323-1983	1996	Dec. 2005	Goal is to publish revision in 2003. PAR was approved in March 1997.
IEEE Std.334-1994	1999	Dec. 2004	Work should be initiated now.
IEEE Std.344-1987	1993	Dec. 2004	PAR approved June 2000. Goal is to publish revision in 2003.
IEEE Std.381-1996	N/A	N/A	Standard withdrawn in 1994.
IEEE Std.382-1996	N/A	2002*	Work must be initiated now. New PAR is needed.
IEEE Std.383-1974	1992	2003*	Goal is to publish revision in 2003.
IEEE Std.572-1985	1992	2002*	New PAR is needed.
IEEE Std.627-1980	N/A	N/A	Standard withdrawn 2002.
IEEE Std.649-1991	1999	2004	New PAR is needed.
IEEE Std.650-1990	1998	2003	PAR approved March 2001.
* Due date reflects extension past 5-year life.			

The near term goals of this subcommittee are to finalize the revisions to IEEE Standards 323, 344, and 383, and publish them in 2003.

4. Secretary's Report

Note: Since this subcommittee has not met in some time, there is currently no active secretary for this subcommittee. Therefore, a formal secretary's report was not available.

2.1 Review and Approval of Previous Meeting Minutes

The minutes of the previous SC-2 meeting were unavailable for review and approval at this meeting.

2.2 Action Item Status

Action items from previous SC-2 meetings were unavailable for review at this meeting.

The following new action items were identified at this meeting.

Item No.	Description	Responsible	Status
AI-02-1-1	Send out invitations to prospective new SC-2 members by December 2002.	Satish Aggarwal	OPEN
AI-02-1-2	Appoint new officers for SC-2, and the working groups, by December 2002.	Satish Aggarwal	OPEN
AI-02-1-3	Coordinate arrangements for the 1 st SC-2 meeting in April 2003 (meeting SC2-03-1).	Satish Aggarwal	OPEN
AI-02-1-4	Review draft of IEEE Standard 323 and provide any comments to Jim Gleason by October 15, 2002	All SC-2 members	OPEN
AI-02-1-5	Submit revised draft of IEEE Standard 323 to SC-2 members by November 15, 2002.	Jim Gleason	OPEN
AI-02-1-6	Prepare and present preview of IEEE Standard 323 to NPEC in January 2003.	Jim Gleason	OPEN
AI-02-1-7	Submit to IEEE the revised IEEE Standard 323 in 2003 for balloting	Jim Gleason	OPEN
AI-02-1-8	Resolve outstanding comments and prepare IEEE Standard 344 for balloting in 2003 including a Preview to NPEC..	Jim Parello	OPEN

AI-02-1-9	Submit to IEEE the revised IEEE Standard 344 in 2003 for balloting.	Jim Parelo	OPE N
AI-02-1-10	Finalize editing, have a recirculation review, and submit Draft 19 of IEEE Standard 383 for recirculation or rebaloting by December 2002.	John White	OPE N
AI-02-1-11	Submit to IEEE the revised IEEE Standard 383 in 2003.	John White	OPE N
AI-02-1-12	Confirm status of PAR for revising IEEE Standard 383 and write letter to Standards Board requesting an extension, if necessary.	John White	OPE N
AI-02-1-13	Identify an author to prepare a booklet containing biodata of SC-2 members.	Satish Aggarwal	OPE N

2.3 Alligator Fund

The alligator fund is made up of voluntary contributions from SC-2 members to defray the cost of meeting rooms, refreshments, and other meeting expenses. A \$5.00 contribution was requested from each member, and a total of \$195 was collected at this meeting.

2.4 Membership

It was noted that this subcommittee, as well as its working groups, have not met for some time and many of the previous members have left or lost contact with the group. Therefore, all attendees at this meeting, as noted in Table 1, were appointed ad hoc members of SC-2 for the remainder of 2002. Formal invitations to join the subcommittee will be sent out before the end of the year **[AI-02-1-1]**. New members are typically selected at the beginning of each calendar year and serve for a term of 1 year. An attempt will be made to contact previous members not present at this meeting to determine if they are still interested in participating in the subcommittee. New officers for SC-2, and the working groups, will be appointed by the next meeting **[AI-02-1-2]**. Satish requested that Bob Lofaro to act as Secretary for this meeting.

Satish also noted that there is great international interest in the activities of this subcommittee. As such, a number of prospective new members from foreign countries are expected to attend the next meeting.

All SC-2 members are encouraged to participate in at least one working group, and volunteers to participate in the various working groups were solicited at this meeting. Members should consider which working group they are interested in joining and let

Satish know, if they have not done so already. Proposed new members identified at this meeting are discussed later in the individual sections dealing with each of the specific working groups. It was noted that no group may have more than 50% of its membership from any one area of industry for balloting at the sponsor's level (i.e., at the NPEC level).

5. SC-2 Chairman's Report

3.1 NPEC Activities

It was noted that the next NPEC meeting will be in January 28-29, 2003 in New Orleans.

3.2 Future Meeting Locations

Various meeting locations were suggested by all attendees and a vote was taken. It was decided that the next SC-2 meeting would be held in San Francisco. A tentative date of April 24-25, 2003 was set. Satish Aggarwal will coordinate the meeting arrangements, and a notice will be sent to all members once final arrangements have been made **[AI-02-1-3]**. Having the next meeting in conjunction with the NPEC meeting in January was discussed; however, it was decided that April would be more appropriate to allow additional time to complete the current action items.

6. Working Group Reports

4.1 Working Group on IEEE Standard 323 (Qualification)

It was announced that the previous chairman of this working group, Bob Smith, has resigned and Jim Gleason was appointed as the new Chair. The working group has been working on a revision to this standard for the past 3 years, and the standard is nearly ready for balloting. A copy of the latest draft of the standard was distributed at the meeting, and is included herein as Attachment 2. A request was made for all SC-2 members to review this draft and provide any comments or suggestions for future revisions to Jim Gleason by October 15, 2002 **[AI-02-1-4]**. After incorporating any comments received, Jim will send another draft of the standard to SC-2 members by November 15, 2002 **[AI-02-1-5]**. A 2-week review period will be provided and this will be considered as the SC-2 ballot. Current plans are to give a preview of the revised standard to NPEC in January 2003 **[AI-02-1-6]** and publish the revised standard in 2003 **[AI-02-1-7]**. If we cannot meet January 2003 commitment, an internet meeting can be used for the March preview (see Section 7 - New Business).

Jim Gleason provided an overview of some of the changes he would like to see made to the current draft, and they are the following:

- Address digital upgrades and NRC DG-1077;
- Reinsert the discussion addressing the fact that the Arrhenius method is a useful

- and acceptable approach for modeling thermal aging;
- Clarify the different types of radiation exposure in actual nuclear applications and the acceptable methods of addressing them;
- Strengthen the acceptance criteria;
- Re-evaluate the need for the section on maintaining qualification; and
- Re-evaluate the requirements in the section on document files.

Several comments were received from the attendees on the draft standard. The following is a summary of the comments provided:

- Section 4.2 - Recommended revising the statement regarding equipment with no significant aging mechanisms since it is confusing and could indicate that no action is required.
- Section 5.2.1 - Recommended that additional guidance be provided on what is appropriate for extending the qualified life (e.g., for aging, post accident profile, etc.).
- Section 6.1.5 - The requirements for specifying service conditions for EMI/RFI could be problematic and should be reviewed.
- Section 6.3.1.2 - The deletion of the 2nd peak in the LOCA simulation was discussed and differing opinions were presented. Some felt it was appropriate to delete it since past research has shown the 2nd peak does not add any margin. Others felt that NRC objections would be received, similar to those obtained in the past for attempts to delete the 2nd peak.
- Section 6.3.1.2 - Recommended that the discussion on simulated test profiles be clarified with regard to acceptable ramp rates for temperature and pressure.
- Section 6.3.1.7 - Recommended that clarification on the acceptable sequence for thermal and radiation aging be included in the standard; however, it was noted that the intent of the standard is not to specify a specific sequence but to provide one acceptable sequence that can be used. The sequence used should be determined by the user and should represent the worst-case scenario for which the equipment is being qualified.
- Section 6.3.1.11 - Regarding energizing of equipment, it is recommended that this requirement be reworded since, for software based systems, the current wording does not necessarily require the system to be performing its safety function during the test.

- Section 6.3.1.9 - Simulation of radiation aging was discussed and the basis for limiting the acceleration factor to 500 in the current draft of the standard was questioned. It was noted that this factor, as well as the factor for thermal aging, was included to be more consistent with European standards, and that it is expected that both factors would be deleted in the next draft of this standard since they are not appropriate.
- Section 8.2 - Recommended that additional guidance on documentation format be provided; however, it was noted that this is governed by a plant's quality assurance program, and should not be specified in this standard.
- Recommended referencing EPRI report 102323 in the standard; however, it was noted that this is not a publically available document.
- Recommended including clarification with regard to the requirements for humidity aging.
- Recommended reviewing the definition of DBE for consistency with the definition in 10 CFR 50.49; however, it was noted that the IEEE definition of DBE has been used in all past versions of this standard.
- Addressing digital equipment in the standard was discussed and differing opinions were presented. Some felt it should be included, while others felt that additional experience is needed before including it in a standard. One suggestion that seemed to be favorable was to make a separate standard to address digital equipment.
- Recommended that some discussion on the uncertainty in the calculation of the accident profile be included, and that clarification be added to point out that margin should be added on top of the uncertainty.
- The requirement for an operating time margin of 10% or 1 hour was discussed. It was decided that this requirement is not appropriate since not all equipment is needed for 1 hour. Also, it was noted that this requirement was in the standard previously and was deleted.
- A discussion was held on whether the intent of the standard was to address only design basis events, or whether severe accidents were also included. It was noted that the scope of the standard is only DBEs.
- A comment was made that ANS 3.2 is being revised and the issue of equipment specification has come up. The question raised was whether this standard should also address this issue. It was decided that this would be addressed in future revisions.

It was requested that all comments be submitted in detail to Jim Gleason by the commentor via e-mail. The working group will then address each comment. A web site has been established at <http://www.glseq.com/ieee323> for working group members to provide comments on the standard.

Membership was discussed and volunteers to join this working group were requested. A total of 21 people volunteered to join the group, as noted in Table 2.

4.2 Working Group on IEEE Standard 334 (Motors)

There is currently no formal working group active for this standard, therefore, no report was provided.

Membership was discussed and volunteers to join this working group were requested. A total of 6 people volunteered or were nominated to join the group, as noted in Table 3.

4.3 Working Group on IEEE Standard 344 (Seismic)

The current Chairman of this working group, Jim Parello, gave an overview of the status of the standard. A report on past progress on the standard was reviewed, and is included as Attachment 3. A recent ballot of the standard was unsuccessful, and there are currently 74 outstanding comments to resolve. The group is now working to resolve these comments, finalize the standard and resubmit it for balloting first within SC2 and then at the NPEC level [AI-02-1-8]. The revised standard is to be published in 2003 [AI-02-1-9]. It was noted that the PAR has been extended to 2004. The working group will be meeting immediately following the conclusion of this SC-2 meeting. A copy of the latest draft of the standard is included as Attachment 4.

Currently, the group has a request for clarification on OBE aging as it relates to extending from 40 years to 60 years. This will be addressed by the group.

It was noted that a good working relationship has been maintained between this working group and the ASME working group on seismic. Both the IEEE and ASME standards should be consistent and should use the same approach, therefore, this relationship is valuable and should continue.

Membership was discussed and it was noted that two members have resigned, including the ASME liaison. Currently, there are 20 members in the working group, with approximately 12-13 of them active. New members are needed including a new ASME liaison. Volunteers to join the group were requested and 3 people volunteered, as noted in Table 4.

4.4 Working Group on IEEE Standard 382 (Motor Operated Valves)

There is currently no formal working group active for this standard, therefore, no report was provided.

Membership was discussed and volunteers to join this group were requested. A total of 14 people volunteered or were nominated to join the group, as noted in Table 5.

4.5 Working Group on IEEE Standard 383 (Cables and Splices)

The current Chairman of the working group, John White, provided a summary of the status of this standard. He noted that the group has been working on this standard since the mid-1990s and a great deal of effort has been put into it. Draft 18 was completed and balloted in 2000. Several negative votes were received, and they were resolved. The group currently has a consensus on Draft 19, and it is ready to be sent to the IEEE editors; it should be sent in the next two weeks. The editors have 30 days to complete their work, after which the draft will be reballoted. The goal is to have a re-circulation review by November 2002. If recirculation is not feasible, then submit Draft 19 for re-balloting by the end of 2002 **[AI-02-1-10]**. The revised standard is to be published in 2003 **[AI-02-1-11]**.

An overview of the changes made to the standard for the current draft was then provided. These include the following:

- Clarification of several definitions were made, including factory splice and representative splice, as well as type test;
- The requirements for mild environment were addressed;
- Clarification on several aspects of splice tests were addressed, including the mandrel bend test;
- The section on “Ongoing Qualification” was re-titled to “Extending Qualified Life” to more accurately reflect the current IEEE position on this issue;
- The section on test procedures was modified to provide additional guidance;
- The use of dumbbell samples was clarified;
- The voltages for megger testing of multi-axial cables was clarified;
- The section on seismic testing was re-titled to “Retained Flexibility” to more accurately reflect the purpose of this section; and

The section on flame testing was deleted since it is now addressed in IEEE Standard 1202

A copy of the current Draft 19 is included as Attachment 5. SC-2 members are encouraged to review this draft and provide any comments or suggestions for future revisions to John White.

The question was asked if the standard includes any guidance on fiber optic cables. John responded that this was considered, however, it was not felt to be appropriate at this time. It will be considered for future revisions.

Satish noted that the PAR for revising this standard was approved in 1994 and is due to expire in December 2002. Satish requested that John White confirm this with the Standards Coordinator, Jim Thomas, and write a letter to the board requesting an extension, if necessary [AI-02-1-12].

Membership was discussed and it was noted that new members for this working group are not needed at this time.

4.6 Working Group on IEEE Standard 572 (Connectors)

There is currently no formal working group active for this standard, therefore, no report was provided.

Membership was discussed and volunteers to join this group were requested. A total of 3 people volunteered or were nominated to join the group, as noted in Table 6.

4.7 Working Group on IEEE Standard 649 (Motor Control Centers)

There is currently no formal working group active for this standard, therefore, no report was provided.

Membership was discussed and volunteers to join this working group were requested. A total of 6 people volunteered to join the group, as noted in Table 7.

4.8 Working Group on IEEE Standard 650 (Battery Chargers and Inverters)

The current Chairman of this working group gave a summary of the status of this standard. This group has an approved PAR to revise the standard and has been working on it. Currently, they are waiting for 323 and 344 to be completed before proceeding with the revision to this standard.

Membership was discussed and volunteers to join this group were requested. A total of 3 people volunteered or were nominated to join the group, as noted in Table 8.

5. Liaison Reports

5.1 NRC Lisison Report

Satish Aggarwal provided the NRC liaison report, which summarized activities related to qualification of electrical equipment in nuclear plants. A copy of the report is included as Attachment 6.

Satish also noted that the NRC Office of Nuclear Regulatory Research (RES) completed a technical assessment of Generic Safety Issue 168, which deals with environmental qualification. The RES assessment concluded that monitoring of plant environments is essential for license renewal purposes. The GSI is now with the NRC Office of Nuclear Reactor Regulation for resolution. A copy of the Technical Assessment report is included as Attachment 7 to these minutes. It was noted that NEI recently submitted a response to the RES assessment on GSI-168; a copy of the NEI response was circulated at the meeting.

Several years ago, the NRC commissioned a review of current environmental qualification practices by an individual with no experience in this area. The objective was to provide an unbiased opinion of the qualification practices currently being used. A report was developed as part of this review that identified a number of problems and concerns with the current qualification practices. In response to this report, the NRC staff prepared a "Team Report" that addressed each of the concerns identified, and concluded that there are no outstanding concerns with the qualification process. A copy of the Team Report was circulated at the meeting. Anyone interested in receiving a copy should contact Satish Aggarwal.

In another project sponsored by the NRC, a scoping study was performed by Brookhaven National Laboratory to evaluate the impact on plant risk due to the failure of I&C cables in nuclear power plant applications. The study looked at a limited number of generic plant applications for one BWR design and one PWR design, and found that certain cable failures could adversely impact plant risk. It was recommended that further evaluations be performed to determine the impact on risk for plant specific applications. A copy of this report is included as Attachment 8.

6. Technical Presentations

Periodically, technical presentations are included on the SC-2 meeting agenda. The purpose of these technical presentations is to keep members abreast of new research being performed that is relevant to the work of the sub-committee. During the current meeting, the following technical presentations were given:

- On Monday September 16, Bob Lofaro of Brookhaven National Laboratory gave a presentation entitled “Evaluation of Aging and Environmental Qualification of Cable Splices and Power Cables Used in Nuclear Power Plants.” This work was sponsored by the U.S. Nuclear Regulatory Commission, Office of Nuclear Regulatory Research. A copy of the presentation is included as Attachment 9.
- On Monday September 16, Richard Wood of Oak Ridge National Laboratory gave a presentation entitled “DG-1077: An Approach to Qualification of Microprocessor-Based Safety-Related Systems.” This work was sponsored by U.S. Nuclear Regulatory Commission. A copy of the presentation is included as Attachment 10.

7. New Business

Neil Smith noted that the IEEE is now supporting internet meetings to help expedite group activities. Instead of traveling to a common meeting location, groups can now use the internet, in combination with telephone conference calls, to conduct meetings. Presentation material is shown interactively on the internet while participants converse over the phone. Additional information is available from Lenore E. Johnson, IEEE (voice: 732.981.3441/fax: 732.981.3427). Lenore will take the information about the call and provide presenter and attendee invitations with all the necessary information to make the call work. It is recommended that the committee members try out the software before the call. The system works with both high speed connections and with dial in modems. The people on modems see a little delay but say that it is quite acceptable. Lenore will provide all the help our committees need in setting up the calls.

A suggestion was made to prepare a booklet containing the biodata of SC-2 members to assist in identifying the current members of the subcommittee, as well as help members get to know each other. The booklet would include a photo of the member, along with a short biography and contact information. The booklet would be made available only to SC-2 members. This suggestion received a favorable response and will be pursued. An author will be identified by Satish Aggarwal **[AI-02-1-13]**, and a request for input will be sent out to the SC-2 members. One suggestion was to bring a digital camera to the next meeting, along with a form for each member to complete with biographical information.

The meeting was adjourned at about 11:00 AM on Tuesday, September 17, 2002.

Minutes Prepared by:
Robert Lofaro
Acting Secretary, IEEE/SC2

List of Attachments:

1. SC-2 Meeting Agenda
2. Draft of IEEE Standard 323
3. IEEE/PES NPEC Summary Report from Working Group on IEEE Standard 344
4. Draft of IEEE Standard 344
5. Draft of IEEE Standard 383
6. NRC Report to IEEE/NPEC
7. NRC/RES Technical Assessment of GSI-168
8. Scoping Study on Cable Failure Impact on Plant Risk
9. Presentation by R. Lofaro, Brookhaven National Laboratory
10. Presentation by R. Wood, Oak Ridge National Laboratory

Table 1 Attendees of SC-2 Meeting in Scottsdale, Az.

Name/Company	Address	Dates Attended	
		9/16	9/17
Aggarwal, S. K. (Satish) U.S. Nuclear Regulatory Commission Tel. (301) 415-6005 Fax (301) 415-5074 E-mail: sa@ieee.org	15555 Rockville Pike Rockville, Md. 20852	X	X
Baughman, P. D. (Paul) ABS Consulting/EQE Tel. (603) 778-1144 Fax (603) 778-7495 E-mail: pdb@eqe.com	118 Portsmouth Avenue Stratham, NH 03885	X	X
Behera, A. K. (Anup) Kiran Consultants, Inc. Tel. (630) 515-2650, ext. 17 Fax. (630) 515-2654 E-mail: abehera@kciconsultants.com	1401 Branding Lane Suite 255 Downers Grove, IL 60515	X	X
Brewington, T. (Tom) Wyle Laboratories Tel. (256) 837-4411, ext. 512 Fax (256) 837-3363 E-mail: tbrewing@hnt.wylelabs.com	7800 Highway 20 West Huntsville, AL 35802	X	X
Brooks, C. (Candace) STP Nuclear Tel. (301) 972-8543 Fax E-mail: clbrooks@stpegs.com	P.O. Box 289 Wadsworth, TX 77483	X	X
Burstein,, N.M. (Nissen) Framatome ANP Tel. (434) 832-2501 Fax (434) 832-2683 E-mail: nissen.burstein@framatome-anp.com	P.O. Box 10935 Lynchburg, VA 24506-0935		X

Table 1 Attendees of SC-2 Meeting in Scottsdale, Az. (continued)

Name/Company	Address	Dates Attended	
		9/16	9/17
Chapman, G. V. (Garry) Trentec, Inc. Tel. (513) 528-7900 Fax (513) 528-9292 E-mail: qualify@trentec.com	4600 East Tech Drive Cincinnati, OH 45245	X	X
Chen, P.Y. (Pei-Ying) U.S. Nuclear Regulatory Commission Tel. (301) 415-2789 Fax (301) 415-2444 E-mail: pyc@nrc.gov	11555 Rockville Pike Mail Stop O9 D3 Rockville, MD 20852		X
Dean, J. M. (James) Applied Energy Services, Inc. Tel. (203) 730-0587 Fax (203) 744-5192 E-mail: aes@idsi.net	P.O. Box 60 Fishkill, NY 12524	X	X
Dellinger, D. E. (Dennis) Solidstate Controls, Inc. Tel. (614) 846-7500 Fax E-mail: ddelling@solidstatecontrolsinc.com	875 Dearborn Drive Columbus, OH 43085	X	X
Di Benedetto, P. (Philip) Constellation Nuclear Services, Inc. Tel. (410) 793-3454 Fax E-mail: philip.dibenedetto@nuclearservicesinc.com	2200 Defense Highway Suite 405 Crofton, Md. 21114	X	X
Dougherty, M. (Michael) Rosemount Nuclear Instruments, Inc. Tel. (952) 828-5626 Fax. E-mail: mike.dougherty@emersonprocess.com	12001 Technology Drive Eden Prairie, Mn. 55344	X	X
Duong, Q. H. (Quang) DTE Energy Tel. (734) 586-1813	125 EF2-TAC 2000 Second Avenue Detroit, MI 48226	X	X

Table 1 Attendees of SC-2 Meeting in Scottsdale, Az. (continued)

Name/Company	Address	Dates Attended	
		9/16	9/17
Fax (734) 586-4911 E-mail: duongq@dteenergy.com			
Evans, K. (Keith) Manager Technical Studies Atomic Energy of Canada Tel. (905) 823-9060, ext. 6170 Fax. E-mail: evansk@aecl.ca	2251 Speakman Drive Mississauga, Ontario L5K 1B2 Canada	X	X
Fargo, W. D. (Wells) Southern California Edison Co. Tel. (949) 368-2505 Fax (949) 368-2122 E-mail: fargowd@songs.sce.com	P.O. Box 128 (G50B) 5000 Pacific Coast Hwy San Clemente, CA 92674	X	X
Faya, A. (Art) Canadian Nuclear Safety Commission Tel. (613) 996-0023 Fax E-mail: fayaa@cnsccsn.gc.ca	280 Slater Road Ottawa, Ontario K1C 5X9 Canada	X	X
Francis, R. L. (Robert) Scientech Tel. (256)722-8500 Fax (256) 722-8533 E-mail: rfrancis@scientech.com	125 West Park Loop Suite 200 Huntsville, AL 35806	X	X
Gleason, J. (Jim) GLS Enterprises, Inc. Tel. (256) 881-9868 Fax (256) 881-4498 E-mail: jim@glseq.com	1819 Cross Creek Road Huntsville, AL 35802	X	X
Gove, P. (Patrick) Black & Veatch Tel. (913) 458-7834 Fax. E-mail: govepa@bv.com	11401 Lamar Overland Park, KS 66213	X	X

Table 1 Attendees of SC-2 Meeting in Scottsdale, Az. (continued)

Name/Company	Address	Dates Attended	
		9/16	9/17
Hencey, T. (Tom) Scientech, Inc. Tel. (727) 669-3047 Fax (727) 669-3100 E-mail: hencey@scientech.com	2650 McCormick Drive Clearwater, FL 33754	X	X
Henley, J. C. (Jerrell) Tel. (256) 379-2184/2920 Fax. E-mail: jehenley@earthlink	1359 Old Winchester Road New Market, AL 35761	X	X
Irish, C. S. (Craig) Nuclear Logistics, Inc. Tel. (978) 250-1684 Fax (978) 250-0245 E-mail: cirish@nuclearlogistics.com	27 Linwood Street Chelmsford, MA 01824	X	X
Kamel, S. I. (Sherif) Tyco Electronics Corp. Tel. (919) 557-8917 Fax (919) 557-8595 E-mail: skamel@tycoelectronics.com	8000 Purfoy Road Fuquay-Varina, NC 27526	X	X
Kapur, S. (Sushant) Bechtel Power Corp. Tel. (301) 228-6057 Fax (301) 631-0841 E-mail: sxkapur@bechtel.com	5275 Westview Drive Frederick, MD 21703-8306	X	X
Khan, M. R. (Mohsin) Altran Corp. Tel. (415) 543-6111, ext. 257 Fax (415) 543-0565 E-mail: khan@altran.com	250 4 th Street, 2 nd Floor San Francisco, CA 94103	X	X
Kopecky, G. R. (Gene) Fort Calhoun Nuclear Station Tel. (402) 533-6765 Fax. (402) 533-7390	FC 2-4 Admin. Building P.O. Box 550 Fort Calhoun, NE	X	X

Table 1 Attendees of SC-2 Meeting in Scottsdale, Az. (continued)

Name/Company	Address	Dates Attended	
		9/16	9/17
E-mail: gkopecky@oppd.com (Bus.) gkopecky@cox.net (Home)	68023-0550		
Lofaro, R. J. (Bob) Brookhaven National Laboratory Tel. (631) 344-7191 Fax (631) 344-5569 E-mail: lofaro@bnl.gov	P.O. Box 5000 Building 130 Upton, NY 11973-5000	X	X
Lory, B. M. (Bruce) Engineering & Management Specialists, Inc. Tel. (312) 327-0920, ext. 119 Fax (312) 327-0925 E-mail: bruce@emsexcel.com	123 West Madison Street, Suite 1300 Chicago, IL 60602	X	X
Martin, D. R. (Darin) Southern Testing Services, Inc. Tel. (865) 966-5330 Fax. E-mail: sts@sts-testing.com	10627 Lexington Drive Knoxville, TN 37932	X	X
Mitton, T. (Todd) RCM Technologies Tel. (905) 821-1616 Fax (905) 821-1613 E-mail: todd.mitton@rcmt.com	6620 Kitimat Road Mississauga, Ontario L5N 2B8 Canada	X	X
Mohtashemi, E. (Ed) GE Nuclear Energy Tel. (408) 925-1844 Fax E-mail: edward.mohtashemi@gene.ge.com	175 Curtner Avenue M/C 788 San Jose, CA 95125	X	X
Morris, R. L. (Ralph) Tel. (256) 747-8833 Fax. E-mail: rmo.999@aol.com	511 County Road 4024 Arley, AL 35541	X	X

Table 1 Attendees of SC-2 Meeting in Scottsdale, Az. (continued)

Name/Company	Address	Dates Attended	
		9/16	9/17
Newell, W. (Bill) Schulz Electric Company Tel. (203) 562-5811 Fax (203) 562-1082 E-mail: wgnewell@worldnet.att.net	30 Gando Drive New Haven, CT 06513	X	X
Parello, J. (James) Westinghouse Electric Co., LLC Tel. (724) 722-5545 Fax (724) 722-5497 E-mail: parellj@westinghouse.com	1000 Westinghouse Drive New Stanton, PA 15672-9606	X	X
Pomerening, D. (Daniel) Southwest Research Institute Tel. (210) 522-2318 Fax E-mail: dpomerening@swri.org	6220 Culebra Road San Antonio, TX 78238	X	X
Richards, J. M. (John) Duke Energy Co. Tel. (704) 382-3916 Fax E-mail: jimricha@duke-energy.com	Mail Stop EC09H P.O. Box 1006 Charlotte, NC 28201- 1006	X	X
Rosztoczy, Z. (Zoltan) Zeetech, Inc. Tel. (520) 297-2131 Fax E-mail: zoltan@zeetechinc.com	13542 Pl. Montanas De Oro Tucson, AZ 85737	X	X
Sandberg, S. (Steve) Rockbestos-Surprenant W&C Tel. (860) 65308360 Fax (860) 653-8308 E-mail: steve.sandberg@r-scc.com	20 Bradley Park Road East Granby, CT 06026	X	X
Smith, N. P. (Neil) Exelon Nuclear Generation Tel. (630) 657-3901	4300 Winfield Road Warrenville, IL 60555	X	

Table 1 Attendees of SC-2 Meeting in Scottsdale, Az. (continued)

Name/Company	Address	Dates Attended	
		9/16	9/17
Fax E-mail: neil.smith@exeloncorp.com			
Starck, R. G. (Richard) MPR Associates, Inc. Tel. (703) 519-0200 Fax (703) 519-0224 E-mail: rstarck@mpra.com	320 King Street Alexandria, VA 22314	X	X
Weber, C. E. (Carl) Pacific Gas & Electric Co. Diablo Canyon Power Plant Tel. (805) 545-4084 Fax (805) 545-6928 E-mail: cew2@pge.com	P.O. Box 56 Avila Beach, CA 93424	X	
Wheless, J. (John) Southern Company Tel. (205) 992-6898 Fax E-mail: jmwheles@southernco.com	P.O. Box 2625 Birmingham, AL 35202	X	X
White, J. (John) TXU CPSES Tel. (254) 897-6674 Fax (254) 897-0530 E-mail: j.l.white@ieee.org	P.O. Box 1002 Glen Rose, TX 76043	X	X
Wood, R. T. (Richard) Oak Ridge National Laboratory Tel. (865) 574-5578 Fax (865) 576-8380 E-mail: woodrt@ornl.gov	Bethel Valley Road P.O. Box 2008 Oak Ridge, TN 37831-6010	X	X

Table 2 Proposed New Members for Working Group on
IEEE Standard 323 (Environmental Qualification)

Name/Company	Address	Proposed Assignment C=Chair VC=Vice Chair S=Secy. M=Member
Aggarwal, S. K. (Satish) U.S. Nuclear Regulatory Commission Tel. (301) 415-6005 Fax (301) 415-5074 E-mail: sa@ieee.org	15555 Rockville Pike Rockville, Md. 20852	M
Behera, A. K. (Anup) President Kiran Consultants, Inc. Tel. (630) 515-2650, ext. 17 Fax. (630) 515-2654 E-mail: abehera@kciconsultants.com	1401 Branding Lane Suite 255 Downers Grove, IL 60515	M
Brewington, T. (Tom) Wyle Laboratories Tel. (256) 837-4411, ext. 512 Fax (256) 837-3363 E-mail: tbrewing@hnt.wylelabs.com	7800 Highway 20 West Huntsville, AL 35802	M
Burstein,, N.M. (Nissen) Framatome ANP Tel. (434) 832-2501 Fax (434) 832-2683 E-mail: nissen.burstein@framatome-anp.com	P.O. Box 10935 Lynchburg, VA 24506-0935	M
Chapman, G. V. (Garry) Trentec, Inc. Tel. (513) 528-7900 Fax (513) 528-9292 E-mail: qualify@trentec.com	4600 East Tech Drive Cincinnati, OH 45245	M
Dean, J. M. (James) Applied Energy Services, Inc. Tel. (203) 730-0587 Fax (203) 744-5192 E-mail: aes@idsi.net	P.O. Box 60 Fishkill, NY 12524	M

**Table 2 Proposed New Members for Working Group on
IEEE Standard 323 (Environmental Qualification) (continued)**

Name/Company	Address	Proposed Assignment C=Chair VC=Vice Chair S=Secy. M=Member
Dougherty, M. (Michael) Rosemount Nuclear Instruments, Inc. Tel. (952) 828-5626 Fax. E-mail: mike.dougherty@emersonprocess.com	12001 Technology Drive Eden Prairie, Mn. 55344	M
Duong, Q. H. (Quang) DTE Energy Tel. (734) 586-1813 Fax (734) 586-4911 E-mail: duongq@dteenergy.com	125 EF2-TAC 2000 Second Avenue Detroit, MI 48226	M
Evans, K. (Keith) Manager Technical Studies Atomic Energy of Canada Tel. (905) 823-9060, ext. 6170 Fax. E-mail: evansk@aecl.ca	2251 Speakman Drive Mississauga, Ontario L5K 1B2 Canada	M
Fargo, W. D. (Wells) Southern California Edison Co. Tel. (949) 368-2505 Fax (949) 368-2122 E-mail: fargowd@songs.sce.com	P.O. Box 128 (G50B) 5000 Pacific Coast Hwy San Clemente, CA 92674	M
Faya, A. (Art) Canadian Nuclear Safety Commission Tel. (613) 996-0023 Fax E-mail: fayaa@cnsccsn.gc.ca	280 Slater Road Ottawa, Ontario K1C 5X9 Canada	M
Francis, R. L. (Robert) Scientech Tel. (256)722-8500 Fax (256) 722-8533 E-mail: rfrancis@scientech.com	125 West Park Loop Suite 200 Huntsville, AL 35806	M
Gleason, C. (Chris) GLS Enterprises, Inc. Tel. (256) 881-9868	1819 Cross Creek Road Huntsville, AL 35802	M

**Table 2 Proposed New Members for Working Group on
IEEE Standard 323 (Environmental Qualification) (continued)**

Name/Company	Address	Proposed Assignment C=Chair VC=Vice Chair S=Secy. M=Member
Fax (256) 881-4498 E-mail: chris@glseq.com		
Gleason, J. (Jim) GLS Enterprises, Inc. Tel. (256) 881-9868 Fax (256) 881-4498 E-mail: jim@glseq.com	1819 Cross Creek Road Huntsville, AL 35802	C (Affirmed)
Gove, P. (Patrick) Black & Veatch Tel. (913) 458-7834 Fax. E-mail: govepa@bv.com	11401 Lamar Overland Park, KS 66213	M
Hencey, T. (Tom) Scientech, Inc. Tel. (727) 669-3047 Fax (727) 669-3100 E-mail: hencey@scientech.com	2650 McCormick Drive Clearwater, FL 33754	M
Kapur, S. (Sushant) Bechtel Power Corp. Tel. (301) 228-6057 Fax (301) 631-0841 E-mail: sxkapur@bechtel.com	5275 Westview Drive Frederick, MD 21703- 8306	M
Lofaro, R. J. (Bob) Brookhaven National Laboratory Tel. (631) 344-7191 Fax (631) 344-5569 E-mail: lofaro@bnl.gov	P.O. Box 5000 Building 130 Upton, NY 11973-5000	M
Mohtashemi, E. (Ed) GE Nuclear Energy Tel. (408) 925-1844 Fax E-mail: edward.mohtashemi@gene.ge.com	175 Curtner Avenue M/C 788 San Jose, CA 95125	M
Wheless, J. (John) Southern Company	P.O. Box 2625 Birmingham, AL 35202	M

**Table 2 Proposed New Members for Working Group on
IEEE Standard 323 (Environmental Qualification) (continued)**

Name/Company	Address	Proposed Assignment C=Chair VC=Vice Chair S=Secy. M=Member
Tel. (205) 992-6898 Fax E-mail: jmwheles@southernco.com		
White, J. (John) TXU CPSES Tel. (254) 897-6674 Fax (254) 897-0530 E-mail: j.l.white@ieee.org	P.O. Box 1002 Glen Rose, TX 76043	M

Table 3 Proposed New Members for Working Group on
IEEE Standard 334 (Motors)

Name/Company	Address	Proposed Assignment C=Chair VC=Vice Chair S=Secy. M=Member
Behera, A. (Anup) Kiran Consultants, Inc. Tel. (630) 515-2650, ext. 17 Fax. (630) 515-2654 E-mail: abehera@kciconsultants.com	1401 Branding Lane Suite 255 Downers Grove, IL 60515	C
Brewington, T. (Tom) Wyle Laboratories Tel. (256) 837-4411, ext. 512 Fax (256) 837-3363 E-mail: tbrewing@hnt.wylelabs.com	7800 Highway 20 West Huntsville, AL 35802	M
Dean, J. M. (James) Applied Energy Services, Inc. Tel. (203) 730-0587 Fax (203) 744-5192 E-mail: aes@idsi.net	P.O. Box 60 Fishkill, NY 12524	C
Di Benedetto, P. (Philip) Constellation Nuclear Services, Inc. Tel. (410) 793-3454 Fax E-mail: philip.dibenedetto@nuclearservicesinc.com	2200 Defense Highway Suite 405 Crofton, Md. 21114	M
Newell, W. (Bill) Schulz Electric Company Tel. (203) 562-5811 Fax (203) 562-1082 E-mail: wgnewell@worldnet.att.net	30 Gando Drive New Haven, CT 06513	C
Newing, S. (Steve)* EMC Tel. (757) 487-2121 Fax E-mail: steve.newing@emc-co.com		M

* Not in attendance at this meeting; nominated by a colleague.

Table 4 Proposed New Members for Working Group on
IEEE Standard 344 (Seismic)

Name/Company	Address	Proposed Assignment C=Chair VC=Vice Chair S=Secy. M=Member
Lory, B. M. (Bruce) Engineering & Management Specialists, Inc. Tel. (312) 327-0920, ext. 119 Fax (312) 327-0925 E-mail: bruce@emsexcel.com	123 West Madison Street, Suite 1300 Chicago, IL 60602	M
Martin, D. R. (Darin) Southern Testing Services, Inc. Tel. (865) 966-5330 Fax. E-mail: sts@sts-testing.com	10627 Lexington Drive Knoxville, TN 37932	M
Pomerening, D. (Daniel) Southwest Research Institute Tel. (210) 522-2318 Fax E-mail: dpomerening@swri.org	6220 Culebra Road San Antonio, TX 78238	M

Table 5 Proposed New Members for Working Group on
IEEE Standard 382 (Motor Operated Valves)

Name/Company	Address	Proposed Assignment C=Chair VC=Vice Chair S=Secy. M=Member
Baughman, P. D. (Paul) ABS Consulting/EQE Tel. (603) 778-1144 Fax (603) 778-7495 E-mail: pdb@eqe.com	118 Portsmouth Avenue Stratham, NH 03885	M
Burstein,, N.M. (Nissen) Framatome ANP Tel. (434) 832-2501 Fax (434) 832-2683 E-mail: nissen.burstein@framatome-anp.com	P.O. Box 10935 Lynchburg, VA 24506-0935	M
Chapman, G. V. (Garry) Trentec, Inc. Tel. (513) 528-7900 Fax (513) 528-9292 E-mail: qualify@trentec.com	4600 East Tech Drive Cincinnati, OH 45245	M
Dean, J. M. (James) Applied Energy Services, Inc. Tel. (203) 730-0587 Fax (203) 744-5192 E-mail: aes@idsi.net	P.O. Box 60 Fishkill, NY 12524	M
Di Benedetto, P. (Philip) Constellation Nuclear Services, Inc. Tel. (410) 793-3454 Fax E-mail: philip.dibenedetto@nuclearservicesinc.com	2200 Defense Highway Suite 405 Crofton, Md. 21114	M
Hussain, B. (Badar)* President Kiran Consultants, Inc. Tel. (630) 515-2650, ext. 17 Fax. (630) 515-2654 E-mail: bhussain@kciconsultants.com	1401 Branding Lane Suite 255 Downers Grove, IL 60515	M

* Not in attendance at this meeting; nominated by a colleague.

**Table 5 Proposed New Members for Working Group on
IEEE Standard 382 (Motor Operated Valves) (continued)**

Name/Company	Address	Proposed Assignment C=Chair VC=Vice Chair S=Secy. M=Member
Morris, R. L. (Ralph) Tel. (256) 747-8833 Fax. E-mail: rmo.999@aol.com	511 County Road 4024 Arley, AL 35541	M
Kapur, S. (Sushant) Bechtel Power Corp. Tel. (301) 228-6057 Fax (301) 631-0841 E-mail: sxkapur@bechtel.com	5275 Westview Drive Frederick, MD 21703-8306	M
Kopecky, G. R. (Gene) Fort Calhoun Nuclear Station Tel. (402) 533-6765 Fax. (402) 533-7390 E-mail: gkopecky@oppd.com (Bus.) gkopecky@cox.net (Home)	FC 2-4 Admin. Building P.O. Box 550 Fort Calhoun, NE 68023-0550	M
McQuillan, P. (Pat)* Limitorque Tel. Fax E-mail:		M
Mitton, T. (Todd) RCM Technologies Tel. (905) 821-1616 Fax (905) 821-1613 E-mail: todd.mitton@rcmt.com	6620 Kitimat Road Mississauga, Ontario L5N 2B8 Canada	M
Newell, W. (Bill) Schulz Electric Company Tel. (203) 562-5811 Fax (203) 562-1082 E-mail: wgnewell@worldnet.att.net	30 Gando Drive New Haven, CT 06513	M
Walker, T. (Tom)* MPR Associates, Inc. Tel. (703) 519-0200	320 King Street Alexandria, VA 22314	M

**Table 5 Proposed New Members for Working Group on
IEEE Standard 382 (Motor Operated Valves) (continued)**

Name/Company	Address	Proposed Assignment C=Chair VC=Vice Chair S=Secy. M=Member
Fax (703) 519-0224 E-mail: twalker@mpra.com		
Young, P. (Philip)* Altran Corp. Tel. (415) 543-6111, ext. 257 Fax (415) 543-0565 E-mail: young@altran.com	250 4 th Street, 2 nd Floor San Francisco, CA 94103	M

* Not in attendance at this meeting; nominated by a colleague.

Table 6 Proposed New Members for Working Group on
IEEE Standard 572 (Connectors)

Name/Company	Address	Proposed Assignment C=Chair VC=Vice Chair S=Secy. M=Member
Elam, G. (Gary)* Scientech Tel. (256)722-8500 Fax (256) 722-8533 E-mail: gelam@scientech.com	125 West Park Loop Suite 200 Huntsville, AL 35806	M
Kopecky, G. R. (Gene) Fort Calhoun Nuclear Station Tel. (402) 533-6765 Fax. (402) 533-7390 E-mail: gkopecky@oppd.com (Bus.) gkopecky@cox.net (Home)	FC 2-4 Admin. Building P.O. Box 550 Fort Calhoun, NE 68023-0550	M
White, J. (John) TXU CPSES Tel. (254) 897-6674 Fax (254) 897-0530 E-mail: j.l.white@ieee.org	P.O. Box 1002 Glen Rose, TX 76043	M

* Not in attendance at this meeting; nominated by a colleague.

Table 7 Proposed New Members for Working Group on
IEEE Standard 649 (Motor Control Centers)

Name/Company	Address	Proposed Assignment C=Chair VC=Vice Chair S=Secy. M=Member
Behera, A. K. (Anup) President Kiran Consultants, Inc. Tel. (630) 515-2650, ext. 17 Fax. (630) 515-2654 E-mail: abehera@kciconsultants.com	1401 Branding Lane Suite 255 Downers Grove, IL 60515	M
Dean, J. M. (James) Applied Energy Services, Inc. Tel. (203) 730-0587 Fax (203) 744-5192 E-mail: aes@idsi.net	P.O. Box 60 Fishkill, NY 12524	C
Duong, Q. H. (Quang) DTE Energy Tel. (734) 586-1813 Fax (734) 586-4911 E-mail: duongq@dteenergy.com	125 EF2-TAC 2000 Second Avenue Detroit, MI 48226	M
Francis, R. L. (Robert) Scientech Tel. (256)722-8500 Fax (256) 722-8533 E-mail: rfrancis@scientech.com	125 West Park Loop Suite 200 Huntsville, AL 35806	C
Irish, C. S. (Craig) Nuclear Logistics, Inc. Tel. (978) 250-1684 Fax (978) 250-0245 E-mail: cirish@nuclearlogistics.com	27 Linwood Street Chelmsford, MA 01824	M
Kapur, S. (Sushant) Bechtel Power Corp. Tel. (301) 228-6057 Fax (301) 631-0841 E-mail: sxkapur@bechtel.com	5275 Westview Drive Frederick, MD 21703-8306	M

Table 8 Proposed New Members for Working Group on
IEEE Standard 650 (Battery Chargers and Inverters)

Name/Company	Address	Proposed Assignment C=Chair VC=Vice Chair S=Secy. M=Member
Fargo, W. D. (Wells) Southern California Edison Co. Tel. (949) 368-2505 Fax (949) 368-2122 E-mail: fargowd@songs.sce.com	P.O. Box 128 (G50B) 5000 Pacific Coast Hwy San Clemente, CA 92674	M
Irish, C. S. (Craig) Nuclear Logistics, Inc. Tel. (978) 250-1684 Fax (978) 250-0245 E-mail: cirish@nuclearlogistics.com	27 Linwood Street Chelmsford, MA 01824	M
Harris, D. (Dave)* MPR Associates, Inc. Tel. (703) 519-0200 Fax (703) 519-0224 E-mail: dharris@mpra.com	320 King Street Alexandria, VA 22314	M

* Not in attendance at this meeting; nominated by a colleague.