

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

**Minutes of Meeting SC2-04-1
Held April 21-22, 2004
New Orleans, LA**

Members Attending: See Table 3

Members Absent: See Table 3

Guests: Kofi Korsah, ORNL (Proxy for R. Wood)
Thomas Koshy, NRC
D.P. Moore, Southern Nuclear (April 21 only)
Jan Pirrong, Cablelan Products (April 21 only)
Randy G. Reynolds (Proxy for B. Bharteey)
Paul Shemanski, Consultant

1. Introduction

The SC-2 Chairman, Satish Aggarwal, opened the meeting on Wednesday, April 21, 2004 at 1:00 pm and welcomed everyone in attendance. This meeting was scheduled for 1½ days; concluding Thursday April 22. A role call was taken and it was determined that a quorum was available, with 40 of 68 SC-2 members present, including four by proxy.

The meeting agenda ([Attachment 1](#)) was reviewed, and the following change was noted:

- The start time of the meeting on Thursday April 22 was moved to 8:00 am.

With the inclusion of this change, a motion was made by Nissen Burstein to approve the meeting agenda. Jim Gleason seconded the motion and the SC-2 members approved the agenda unanimously.

2. Secretary's Report

2.1 Review and Approval of Previous Meeting Minutes

The floor was opened to comments on the minutes of the previous SC-2 meeting 03-1. Hearing none, a motion was made to approve the minutes by Phil Di Benedetto, seconded by Nissen Burstein and the minutes were approved unanimously.

2.2 Action Item Status

Action items from previous SC-2 meetings were reviewed at this meeting. Table 1 provides a listing of action items from past meetings, along with new action items identified at this meeting.

Table 1 List of Action Items

Item No.	Description	Responsible	Status
<i>Action Items from Meeting 02-1</i>			
AI-02-1-9	Submit the revised IEEE Standard 344 to IEEE for balloting.	Jim Parello	CLOSED
AI-02-1-13	Identify an author to prepare a booklet containing biographical data of SC-2 members.	Satish Aggarwal	OPEN
<i>Action Items from Meeting 03-1</i>			
AI-03-1-1	Identify procedures that should be developed to provide guidance on SC-2 activities.	Nissen Burstein	CLOSED
<i>Action Items from Meeting 03-2</i>			
AI-03-2-1	Send list of technical differences between IEEE 323 and IEC 6280 to Jim Gleason.	Richard Wood	CLOSED
AI-03-2-2	Send statement of position on 100-hour minimum aging requirement in IEEE Standard 323 to Jim Gleason.	Sjell Spang	OPEN
AI-03-2-3	Submit IEEE Standard 344 for publication in 2004.	Jim Parello	OPEN
<i>Action Items from Meeting 04-1</i>			
AI-04-1-1	Provide biographical data for SC-2 members book.	All SC-2 members	OPEN
AI-04-1-2	Provide comments on the SC-2 procedures manual.	All SC-2 members	OPEN
AI-04-1-3	Prepare new PAR for Standard 382 on MOVs.	Pat McQuillan	OPEN
AI-04-1-4	Prepare new PAR for Standard 649 on MCCs.	Robert Francis	OPEN
AI-04-1-5	Submit draft Standard 650 to SC-2 for review by October 1, 2004.	Dennis Dellinger	OPEN
AI-04-1-6	Send letter with SC-2 comments on the proposed 10 CFR 50.69 Rule to NRC by May 21, 2004.	Nissen Burstein	OPEN

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 contribution of \$5.00 was requested from each of the members and guests for this meeting and a total of \$210 was collected. The fund balance is now at \$380.

3. SC-2 Chairman=s Report

3.1 SC-2 Activities

The Chairman reviewed the goals and accomplishments of this Subcommittee, which are the following:

- In 2003 the goals were to publish updated versions of standards 323, 383 and 344. Standard 323 on qualification was completed and has been published. It shows “2003” as the new version date. Standard 383 was also completed and is in the publication process. It will also show “2003” as the new version date. Standard 344 is nearing completion; however, it is not yet ready for publication. It was sent out for ballot and several negative ballots were received. The negative ballots are being resolved. The goal now is to publish standard 344 in 2004. An attempt will be made to bring the revised standard before the IEEE Standards Board in June 2004.
- The goals for 2004 will be to start working on any standards under the purview of SC-2 that were last reaffirmed more than five years ago. Over the next 2 ½ years, the goal will be to bring all SC-2 standards up to date.

The floor was then opened for comments on the subcommittee goals; no comments were voiced.

Preparation of a booklet of biographical data on SC-2 members was discussed. The Chairman noted that this is being pursued. All members are requested to provide biographical data to him prior to the next meeting [AI-04-1-1]. The information should include a photograph (if available), the members name, a short biography (150 words) and a listing of activities related to IEEE work. The Chairman will provide a sample format.

Nissen Burstein then provided the Vice-Chairman’s report. He discussed the SC-2 operations manual, which was included with the minutes of the previous meeting (03-2). No comments had been received on the manual. The following comments were provided at the meeting:

- Regarding proxies, the requirements should be clarified as to whether a written notification is required. The Chairman noted that an e-mail to him is sufficient.
- Regarding meetings in Europe, it was noted that the requirement to attempt a meeting in Europe every 2 years may not be practical since many members would not be able to attend. It was suggested that perhaps only the SC-2 officers should go to update European members. Alternatively, adding a 5th meeting every two years was suggested. After discussion it was decided that the SC-2 procedures would be revised to attempt a meeting in Europe every five years and the quorum requirements will be waived for that meeting.

These comments will be incorporated into the manual. The SC-2 members were asked to review the draft, which is included herein as Attachment 2, and provide comments to Mr. Burstein by May 31 [AI-04-1-2]. If no further comments are received, the manual will be approved by default.

3.2 SC-2 Working Groups

The currently active working groups under SC-2, along with their chairmen, are shown in Table 2. No changes were made at this meeting.

Table 2 Summary of SC-2 Working Groups and Chairman

Working Group*	Area	Standard	Chairman
2.1	Qualification	323	Jim Gleason
2.2	Motors	334	Bill Newell
2.3	Valve Operators	382	Pat McQuillan
2.4	Cables	383	John White
2.5	Seismic	344	Jim Parello
2.11	Connectors	572	Bill Hadovski
2.13	Battery Chargers	650	Dennis Dellinger
2.14	Motor Control Centers	649	Robert Francis

* Working groups 2.6 to 2.10 and 2.12 are no longer active.

3.3 SC-2 Membership

The Chairman noted that the membership for 2004 is 68 members. Each member has a two-year appointment. New appointment letters will be sent out in 2005. Also, the officers have a two-year term, which can be renewed once. A decision was made by NPEC to renew the term of the current SC-2 officers for 2005 – 2006.

Regarding meeting attendance, the Chairman noted that this is a large group. In order to maintain a quorum at the meetings, attendance requirements will be strictly enforced. If two consecutive meetings are missed, an explanation must be provided to the Chairman; otherwise, membership will automatically be terminated. The following people were notified, and their names have been removed from the membership roster due to lack of attendance.

- Rufus Brown
- Jeffrey Esterman
- Keith Evans
- Thoma Kurt
- Victor Loczi
- Darin Martin

If a member cannot attend a meeting, a proxy should be identified and the Chairman should be notified prior to the meeting.

3.3 NPEC Activities

No report was provided on NPEC activities.

3.4 Future Meeting Locations

The subject of future meeting locations was opened for discussion. It was suggested that the next meeting take place in Las Vegas, Nevada since reasonable travel and meeting room rates are available. Also, Working Group 2.1 will be meeting there and this would allow the meetings to be combined. The members were polled and it was decided that this would be the meeting location. A tentative date of October 20-21, 2004 was set for the next SC-2 meeting. The Chairman will coordinate the meeting

arrangements, and a notice will be sent to all members once final arrangements have been made.

4. Working Group Reports

4.1 Working Group 2.1 on Qualification (IEEE Standard 323)

It was noted that IEEE Std. 323-2003 has been published and is now publicly available.

The Chairman of the working group, Jim Gleason, gave a presentation on the differences between IEEE Standard 323 and IEC Standard 60780 ([Attachment 3](#)), which was discussed at the last working group meeting. Publication of a joint standard is being pursued (see Section 7.1). A copy of 323-2003 will be sent to IEC for their review to determine the best approach for developing a joint standard.

Qualification of microprocessor-based equipment was also discussed at the working group meeting and it was determined that there is nothing in 323-2003 that would preclude its use for qualifying microprocessor-based equipment. No changes to 323-2003 have been identified related to this issue.

4.2 Working Group 2.2 on Motors (IEEE Standard 334)

The Vice-Chairman of this working group, James Dean, provided the following status report:

- The working group currently has 5 members. New members are welcome and should contact Bill Newell
- The group reviewed the 1994 version of the standard and identified four areas to focus on, which are
 - Seismic issues
 - Bearing issues
 - Lubrication issues
 - Consistency of definitions with 323
- The goal is to have a draft of the revised standard ready for the April 2005 meeting

4.3 Working Group 2.5 on Seismic Qualification (IEEE Standard 344)

The Vice-Chairman of this working group, Suresh Channarasappa, gave a presentation on the status of the standard ([Attachment 4](#)). It was noted that the revised standard was sent out for ballot and negative ballots were received. Efforts are ongoing to resolve the comments. There was discussion regarding the inclusion of regulatory type statements in the standard, which was the subject of one of the comments received. The SC-2 Chairman clarified that IEEE standards should not include regulatory type statements or be based on regulatory requirements. The content of the standards should be based solely on technical information, and should reflect the consensus opinion of the working group and SC-2 members, regardless of regulatory requirements.

4.4 Working Group 2.3 on Motor Operated Valves (IEEE Standard 382)

The Chairman of the working group, Pat McQuillan, provided the following status of Standard 382:

- This standard was last revised in 1996. A new PAR is needed for this standard.
- New members are needed for this working group and should contact Mr. McQuillan. James Dean volunteered to join the working group.
- The goal is to prepare a PAR by the October 2004 meeting [AI-04-1-3].

4.5 Working Group 2.4 on Cables and Splices (IEEE Standard 383)

The Chairman of the working group, John White, was not present. The SC-2 Chairman noted that this standard has been revised and is currently in the publication process. It will be published as a 2003 standard. Suggestions for new issues to be addressed in the next revision are welcome.

4.6 Working Group 2.11 on Connectors (IEEE Standard 572)

The Chairman of this working group, Bill Hadovski, provided the following status of this standard:

- The standard just went through the reaffirmation process and had one negative ballot related to the elimination of surge testing. A re-circulation ballot was successful and reaffirmation of the standard is now moving forward.
- A new PAR was recently approved and will involve significant changes for the next version of the standard, such as picking up qualification of connectors, which was deleted from 383.
- A plan for revising the standard will be developed over the next six months.
- New members are needed for this working group (7-10) and should contact Bill Hadovski. Volunteers should have expertise with cables and connectors. Fred Roy volunteered to join the working group.

4.7 Working Group 2.14 on Motor Control Centers (IEEE Standard 649)

The Chairman of this working group, Robert Francis, provided the following status of this standard:

- This standard is currently out for reaffirmation, which closes April 24. The ballot pool contained 42 people; 29 responses have been received with 1 negative.
- A new PAR will be pursued to revise the standard and address changes in 323. Provisions for solid-state equipment will also be added to the standard. The goal is to have a new PAR by the October 2004 meeting [AI-04-1-4].
- The goal is to have a draft of the revised standard by the April 2005 SC-2 meeting.

4.8 Working Group 2.13 on Battery Chargers and Inverters (IEEE Standard 650)

The Chairman of this working group, Dennis Dellinger, provided the following status of this standard:

- An approved PAR is currently open for this standard and is good until 2005. A summary of progress was presented and is included as [Attachment 5](#). Overviews of the standard and proposed changes were also presented, and are included as [Attachments 6 and 7](#).
- Work has been initiated on revising this standard. The SC-2 Chairman requested that the following schedule be the goal for publishing the revised standard.
 - A draft of the revised standard should be sent to SC-2 members for review by October 1, 2004 [**AI-04-1-5**].
 - A presentation on the changes made should be made at the October 2004 SC-2 meeting for SC-2 approval.
 - SC-2 comments should be addressed and the draft revised standard should be presented and submitted to NPEC at the January 2005 NPEC meeting
 - NPEC comments should be addressed and the revised standard submitted for balloting and publication in 2005

5. Liaison Reports

5.1 NRC Liaison Report

The SC-2 Chairman provided an NRC liaison report, which 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 that is being performed and is relevant to the work of the subcommittee. During the current meeting, the following technical presentations were given:

Wednesday April 21,

- Jan Pirrong gave a presentation on the qualification of fiber optic cables. A copy of the presentation is included as [Attachment 9](#).
- Jeff Chivers gave a presentation on the use and qualification of microprocessor-based instrumentation. A copy of the presentation is included as [Attachment 10](#).

Thursday April 22,

- Nissen Burstein gave a presentation on the qualification of an emergency diesel generator excitation system. A copy of the presentation is included as [Attachment 11](#).
- Janev Pavsek gave a presentation on qualification test profiles. A copy of the presentation is included as [Attachment 12](#).

- Paul Shemanski gave a presentation on the proposed 10 CFR 50.69 Rule. A copy of the presentation is included as Attachment 13. In response to the presentation, the SC-2 members were united in raising a significant problem with the current plan to exempt special treatment requirements on Risk Informed Safety Class-3 (RISC-3) components. The members indicated that in the absence of Appendix B requirements and 50.49 requirements on Safety Related Electrical Equipment, the performance requirements cannot be preserved. The components undergo frequent design changes and the manufacturers would not be maintaining material characteristics to sustain the qualified status that could withstand post accident environments. The SC-2 members discussed the possibility of exempting 10 CFR 50.49 equipment from this rule preventing the vulnerabilities noted above. Consequently, the committee was concerned that the low safety significant RISC-3 electrical components could suffer a common mode failure during/following the accident environment. The committee delegated the SC-2 Chairman to process a letter from the Nuclear Engineering Power Committee (of IEEE) to formally address this issue to the NRC and ACRS, and to be prepared to make presentations to the ACRS and NRC, as needed.
- R. Lofaro gave a presentation on a research program being performed at Brookhaven National Laboratory, sponsored by NRC on the effects of switchgear aging on energetic faults. A copy of the presentation is included as Attachment 14

7. New Business

7.1 Publication of Joint Standards

The publication of joint IEEE and IEC standards was discussed. The SC-2 Chairman noted that this is being pursued and two trial standards will be selected. The first trial standard will be 323 and the second will be a human factors related IEEE standard. The SC-2 Chairman noted that he is the official IEEE representative to the IEC. His goal is to get a joint standard published and various options will be considered to achieve this, including adding an Appendix to the IEEE standards, or adding new paragraphs to the IEEE standards that apply only to non-US nuclear power plants.

7.2 Special Working Group on Risk Informed Regulations

Nissen Burstein reported on the progress of the special working group preparing SC-2 comments on the proposed 10 CFR 50.69 Rule on Risk Informed Regulation. An overview of 50.69 was presented, along with the draft SC-2 comments on the proposed 10 CFR 50.69 rule. Copies of the overview and comments are included as Attachments 15 and 16. The SC-2 Chairman suggested that a letter be drafted transmitting the SC-2 comments to the NRC. This letter will be drafted by Mr. Burstein and sent to SC-2 members and NPEC for review by April 28. Comments will be requested by May 6 to Nissen Burstein. The goal is to send the final letter to the NRC Commissioner and the ACRS by May 21, 2004 [**AI-04-1-6**]. If necessary, an IEEE SC-2 spokesperson will give a presentation to the ACRS on this subject. Phil Di Benedetto volunteered to be the spokesperson for SC-2.

7.3 Special Working Group on Qualification of Fiber Optic Cables

Based on the presentation by Jan Pirrong, the SC-2 Chairman decided that a special working group would be formed to look into what activities SC-2 should take to address qualification of fiber optic cables, including modifications to 383 or the development of a separate new standard. It was noted that IEC

Standard 70093 addresses fiber optic cables. A report should be provided at the October 2004 SC-2 meeting on the progress of the special working group. The following people volunteered for the special working group:

- Jan Pirrong, Chair
- Phil Di Benedetto
- Kofi Korsah
- Marty Chipkin
- Jim Gleason
- Pat Gove
- Marco Van Uffelen
- John White (volunteered by Satish Aggawral)
- Kent Brown (volunteered by Craig Butcher)

This special working group will initiate efforts immediately and report their status at the next SC-2 meeting.

7.4 Special Working Group on Qualitication of Microprocessor-based Equipment

Based on the presentation by Jeff Chivers, the SC-2 Chairman formed a special working group to look into what activities SC-2 should take to address qualification of microprocessor-based equipment, including modifications to 323 or the development of a separate new standard. The group should also look into the differences between international standards on this subject, including IEEE, IEC, KTA and RCC standards, as well as EPRI guidance on this subject. A presentation should be given at the October 2004 SC-2 meeting on the progress of the group. The following people volunteered to join this special working group.

- Jeff Chivers, Chair
- Phil Di Benedetto
- Nissen Burstein
- Artur Faya
- Tom Hencey
- Marek Tengler
- Fred Roy
- Jim Gleason
- Kofi Korsah

This special working group will initiate efforts immediately and report their status at the next SC-2 meeting.

At approximately 3:00 pm on Thursday April 22, 2004 a motion was made to adjourn by Phil Di Benedetto. Tom Hencey seconded the motion and meeting SC2-03-02 was adjourned.

Minutes Prepared by:
Robert Lofaro
Secretary, IEEE/SC-2

List of Attachments:

1. SC-2 Meeting 04-1 Agenda
2. Draft 1 of SC-2 Procedures Manual
3. Presentation by J. Gleason on Comparing IEEE Standard 323 and IEC 60780
4. Presentation by S. Channarasappa on IEEE Standard 344 status
5. Presentation by D. Dellinger on the Status of IEEE Standard 650
6. Presentation by D. Dellinger on the Overview of IEEE Standard 650
7. Presentation by D. Dellinger on the Proposed Changes to IEEE Standard 650
8. NRC Liaison report
9. Presentation by J. Pirong on Qualification of Fiber Optic Cables
10. Presentation by J. Chivers on Microprocessor-based Equipment
11. Presentation by N. Burstein on Qualification of an Emergency Diesel Generator Excitation System.
12. Presentation by J. Pavsek on Qualification Test Profiles
13. Presentation by P. Shemanski on Proposed 10 CFR 50.69 Rule
14. Presentation by R. Lofaro on NRC Research on Switchgear Aging
15. Presentation by N. Burstein on 10 CFR 50.69 Overview
16. Presentation by N. Burstein on SC-2 Comments to 10 CFR 50.69

Table 3 Attendees of SC-2 Meeting 04-1in New Orleans, LA

Name/Company	Address	Dates Attended	
		4/21	4/22
Aggarwal, S. K. (Satish) – Chairman SC-2 U.S. Nuclear Regulatory Commission Tel. (301) 415-6005 Fax (301) 415-5074	Washington, DC 20555	X	X
Alonso, Javier Tel. +34-91-659-8696 Fax +34-91-659-8677	Avda. Montes de Oca 28709 San Sebastian de los Reyes Madrid, Spain	X	X
Bartonicek, B. (Bohumil) Nuclear Research Institute Rez plc Tel. +420-266-173579 Fax +420-266-173580	250 68 Husinec Rez 130 Czech Republic	X	X
Baughman, P. D. (Paul) ABS Consulting/EQE Tel. (603) 778-1144 Fax (603) 778-7495	118 Portsmouth Avenue Suite B302 Stratham, VA 03885	X	X
Bharteey, Brij Tel. (518) 382-0056 Fax (518) 382-0283 (Proxy: Randy G. Reynolds)	112 Erie Blvd. Suite 3 Schnectady, NY 12305	P	P
Behera, A. K. (Anup) Kiran Consultants, Inc. Tel. (630) 515-2650, ext. 17 Fax. (630) 515-2654 (Proxy: Philip DiBenedetto)	1401 Branding Lane Suite 255 Downers Grove, IL 60515	P	P

Table 3 Attendees of SC-2 Meeting 04-1 in New Orleans, LA (continued)

Name/Company	Address	Dates Attended	
		4/21	4/22
Brewington, T. (Tom) Wyle Laboratories Tel. (256) 837-4411, ext. 512 Fax (256) 837-3363	7800 Highway 20 West Huntsville, AL 35806	X	X
Brooks, C. (Candace) STP Nuclear Tel. (301) 972-8543 Fax (361) 972-7184	P.O. Box 289 MS305 Wadsworth, TX 77483		
Burstein,, N. M. (Nissen) – Vice Chairman SC-2 Framatome ANP Tel. (434) 832-2501 Fax (434) 832-2683	3315 Old Forest Rd. M/C OF54 Lynchburg, VA 24506-0935	X	X
Butcher, C. (Craig) Tennessee Valley Authority Tel. (423) 751-8250 Fax (423) 751-8247	1101 Market Street LP 4H Chattanooga, TN 37402-2801	X	X
Casadevall, S. (Steve) ASCO Valve Inc. Tel. (973) 966-2512 Fax (973) 966-2624	50 Hanour Road Floham Park, NJ 07932		
Chapman, G. V. (Garry) Trentec, Inc. Tel. (513) 528-7900 Fax (513) 528-9292	4600 East Tech Drive Cincinnati, OH 45245	X	X
Channarasappa, S. (Suresh) Westinghouse Electric Co. Tel. (724)-733-6587 Fax	1760 Golden Mile Hwy. Monroeville, PA 15746	X	X

Table 3 Attendees of SC-2 Meeting 04-1 in New Orleans, LA (continued)

Name/Company	Address	Dates Attended	
		4/21	4/22
Chipkin M. (Marty) Nine Mile Point Nuclear Station Tel. (315) 349-2825 Fax (315) 349-1579	P.O. Box 63 Lycoming, NY 13093	X	X
Chivers, J. (Jeff) Rosemount Nuclear Tel. (952) 949-5377 Fax (952) 949-5147	8200 Market Blvd. Chanhassen, MN 55317	X	X
Choi, S. Y. (Sun Yeong) Korea Atomic Energy Research Institute Tel. +82-(42) 868-8372 Fax +82-(42) 868-8256	Box 105, Yuseong Daejeon, 305-600 Korea		
Dean, J. M. (James) Applied Energy Services, Inc. Tel. (203) 730-0587 Fax (203) 744-5192	14 Eagle Rock Hill Rd. Bethel, CT 06801	X	X
Delcea, L. N. (Liviu Nicolae) Tel. +40-241-80-1658 Fax +40-723-111-627	Medgidiei St. No. 1 C.P. 42, Cernavoda 08625 Constanta, Romania		
Dellinger, D. E. (Dennis) Solidstate Controls, Inc. Tel. (614) 846-7500 Fax (614) 885-3990	875 Dearborn Drive Columbus, OH 43085	X	X
Di Benedetto, P. (Philip) Tel. (978) 681-9009 Fax (978) 681-8586	123 French Farm Road North Andover, MA 01845	X	X

Table 3 Attendees of SC-2 Meeting 04-1 in New Orleans, LA (continued)

Name/Company	Address	Dates Attended	
		4/21	4/22
Duong, Q. H. (Quang) DTE Energy Tel. (734) 586-1813 Fax (734) 586-4911	6400 N. Dixie Hwy 125 EF2-TAC Newport, MI 48166	X	X
Drumm, F. (Frank) Tyco Electronics Tel. +49-89-6089-567 Fax +49-89-6089-445	Raychem GmbH Finsinger Feld 1 85 Ottobrunn, Germany	X	X
Fargo, W. D. (Wells) Southern California Edison Co. Tel. (949) 368-2525 Fax (949) 368-2122	3214 Legendario San Clemente, CA 92673-3811		
Faya, A. J. (Artur) Canadian Nuclear Safety Commission Tel. (613) 996-0023 Fax (613) 943-1292	280 Slater Road Ottawa, Ontario K1C 5S9 Canada	X	X
Francis, R. L. (Robert) Wyle Laboratories Tel. (256) 837-4411 ext. 315 Fax (256) 837-3363	7800 Highway 20 West Huntsville, AL 35807	X	X
Gleason, J. (Jim) Bechtel SAIC Company, LLC. Tel. (702) 821-7788 Fax	1180 Town Center Drive Las Vegas, NV 89149	X	X
Gove, P. (Patrick) – Assistant Secretary SC-2 Black & Veatch Tel. (913) 458-7834 Fax. (913) 458-2491	11401 Lamar Overland Park, KS 66213	X	X

Table 3 Attendees of SC-2 Meeting 04-1 in New Orleans, LA (continued)

Name/Company	Address	Dates Attended	
		4/21	4/22
Hadovski, W. L. (William) Westinghouse Electric Co. Tel. (860) 731-6258 Fax (860) 731-6256	2000 Day Hill Road Windsor, CT 06095		X
Helander, P. (Peter) Tel. +46-18-51-1836 Fax +46-18-51-1894	Dag Hammarskjolds vag 13 752 37 Uppsala, Sweden		
Hencey III, T. (Tom) Scientech, Inc. Tel. (727) 669-3047 Fax (727) 669-3100	1393 Indian Trail N. Palm Harbor, FL 34683	X	X
Henley, J. C. (Jerrell) Tel. (256) 379-2920 Fax. (256) 379-2920	1359 Old Winchester Road New Market, AL 35761		
Horvath, D. (Dave) Advent Engineering Tel. (734) 930-7500 Fax (734) 327-7501	P.O. Box 555 24 Frank Lloyd Wright Blvd. Lobby C Ann Arbor, MI 48106		
Irish, C. S. (Craig) Nuclear Logistics, Inc. Tel. (978) 250-1684 Fax (978) 250-0245	27 Linwood Street Chelmsford, MA 01824		
Jagtiani-Krause, S. A. (Serena) Trentec Inc. Tel. (513) 528-7900 ext. 121 Fax (513) 528-9292	4600 East Tech Dr. Cincinnati, OH 45245	X	X

Table 3 Attendees of SC-2 Meeting 04-1 in New Orleans, LA (continued)

Name/Company	Address	Dates Attended	
		4/21	4/22
Kapur, S. (Sushant) Bechtel Power Corp. Tel. (301) 228-6057 Fax (301) 631-0841	5275 Westview Drive Frederick, MD 21703-8306		
Khan, M. R. (Mohsin) ARES Corp. Tel. (510) 645-5960 Fax (510) 656-5961	2101 Webster St. Suite 1650 Oakland, CA 94612		
Kulangara, J. M. (Jacob) Tel. +01-182-119-020-4232/01-182-312-894-232 Fax +01-182-312-894-272	737-28 Tower No. 1205 Hannam Dong Yong-San Gu Seoul, Korea		
Leung, H. (Henry) Tel. (905) 567-3332 Fax	4556 Credit Pointe Dr. Mississauga, Ontario Canada L5M 3L9		
Lofaro, R. J. (Bob) – Secretary SC-2 Brookhaven National Laboratory Tel. (631) 344-7191 Fax (631) 344-5569	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	123 West Madison Street, Suite 1300 Chicago, IL 60602	X	X
Martin, D. R. (Darin) Southern Testing Services, Inc. Tel. (865) 966-5330 Fax.(865) 675-5399	10627 Lexington Drive Knoxville, TN 37932		

Table 3 Attendees of SC-2 Meeting 04-1 in New Orleans, LA (continued)

Name/Company	Address	Dates Attended	
		4/21	4/22
Mc Quillan, P.G. (Patrick) Limitorque Tel. (434) 845-9714 Fax	5114 Woodall Road Lynchburg, VA 24502	X	X
Michel, W. (Wolfgang) Framatome ANP Tel. +49-9131-18-96469/+49-171-22-88-63671 (cell) Fax +49-9131-18-96362	GmbH, Electrical Systems NGL, Freyeslebenstrasse 1 P.O. Box 3220 91050 Erlangen, Germany		
Mikow, D. (Daniel) Framatome ANP Tel. (724) 779-9800 ext. 1314 Fax (724) 779-9844	200 West Kensinger Drive Suite 600 Cranberry Township, PA 16066	X	X
Mitton, T. (Todd) RCM Technologies Tel. (905) 821-1616 Fax (905) 821-1613	6620 Kitimat Road, Unit 4 Mississauga, Ontario L5N 2B8 Canada		
Mohiuddin, A. (Asif) Sargent & Lundy Tel. (312) 269-2752 Fax (312) 269-7041 (Proxy: Patrick Gove)	E. Monroe 23C41 Chicago, IL 60603	P	P
Mohtashemi, E. (Edward) GE Nuclear Energy Tel. (408) 925-1844 Fax (408) 925-6261	175 Curter Avenue M/C 788 San Jose, CA 95125	X	X
Monchy-Leroy, C. (Carole) EDF Research and Development Tel. +33-1-60-73-6773 Fax +33-1-60-73-7407	Electrical Equipment Lab Les Renadieres 77818 Moret sur Loing Cedex-France		

Table 3 Attendees of SC-2 Meeting 04-1 in New Orleans, LA (continued)

Name/Company	Address	Dates Attended	
		4/21	4/22
Newell, W. (Bill) Schulz Electric Company Tel. (203) 562-5811 Fax (203) 562-1082	30 Gando Drive New Haven, CT 06513		
Parello, J. (James) Westinghouse Electric Co., LLC Tel. (724) 722-5545 Fax (724) 722-5497	1000 Westinghouse Drive New Stanton, PA 15672-9606		
Pavsek, J. (Janez) Milan Vidmar Electroinstitute Tel. +386-31-809-322 Fax +386-1-252-1359	SI-1000 Ljubljana Hajdrihova 2, Slovenia	X	X
Pomerening, D. J. (Daniel) Southwest Research Institute Tel. (210) 522-2318 Fax (210) 522-4506	6220 Culebra Road San Antonio, TX 78238-5166		
Richards, J. M. (John) Duke Energy Co. Tel. (704) 382-3916 Fax (704) 382-3993	Mail Stop EC09H P.O. Box 1006 Charlotte, NC 28201-1006	X	X
Roy, F. (Fred) Scientech Tel. (256) 722-8500 Fax (256)722-8533		X	X
Sandberg, S. (Steve) Rockbestos-Surprenant W&C Tel. (860) 653-8360 Fax (860) 653-8412	20 Bradley Park Road East Granby, CT 06026	X	X

Table 3 Attendees of SC-2 Meeting 04-1 in New Orleans, LA (continued)

Name/Company	Address	Dates Attended	
		4/21	4/22
Starck, R. G. (Richard) MPR Associates, Inc. Tel. (703) 519-0511 Fax (703) 519-0224	320 King Street Alexandria, VA 22314	X	X
Simms, R. (Roderick) Tel. (269) 465-5901 ext. 3583 Fax (269) 466-3454	One Cook Place Bridgman, MI 49106		
Schinzel, G. E. (Glen) South Texas Project Tel. (361) 972-7854 Fax (361)972-7073	P.O. Box289 Wadsworth TX 77483	X	X
Spang, K. (Kjell) Tel. +46-31-298573 Fax +46-31-694594	KS Miltek Strandskarsvagen 9 SE-42658 Vastra Frolunda, Sweden		
Tengler, M. (Marek) Tel.+42-0377-386961 Fax +42-0377-386961	Labhova 8/34 Pilsen 31806	X	X
Van Uffelen, M. (Marco) Tel. +32 14-33-2638 Fax +32-14-31-1993	Boertang 200 Dept. Instrumentation Building BR3 B-2400, Mol, Belgium	X	X
Varga, L. (Laszlo) VEIKI-VNL, Ltd. Tel. +36-1-417-3157 Fax +36-1-417-3163	Vaszgolyo u. 2-4. H-1158 Budapest, Hungary		

Table 3 Attendees of SC-2 Meeting 04-1 in New Orleans, LA (continued)

Name/Company	Address	Dates Attended	
		4/21	4/22
Weber, C. E. (Carl) Pacific Gas & Electric Co. Tel. (805) 545-4084 Fax (805) 545-6928	Diablo Canyon Power Plant P.O. Box 56 Avila Beach, CA 93424		
Wheless, J. (John) Southern Company Tel. (205) 992-6898 Fax (205) 992-0391	40 Inverness Center Pkwy. Bin BO57 Birmingham, AL 35242	X	X
White, J. (John) TXU CPSES Tel. (254) 897-6674 Fax (254) 897-0530	P.O. Box 1002 Glen Rose, TX 76043		
Wittamore, T. (Toni) Rotork Controls, Inc. Tel. (585) 328-1550, ext. 252 Fax (585) 328-5848	575 Mile Crossing Blvd. Rochester, NY 14624		
Wood, R. T. (Richard) Oak Ridge National Laboratory Tel. (865) 574-5578 Fax (865) 576-8380 (Proxy: Kofi Korsah)	Bethel Valley Road P.O. Box 2008 Bldg. 3500, MS 6010 Oak Ridge, TN 37831-6010	P	P
Yamamoto, T. (Toshio) JAPEIC Tel. +81-47-380-8554 Fax +81-47-380-8556	Business Court Shin-Urayasu Bldg. 9-2 Mihama 1-Chome Urayasu-shi, Chiba 279-0011 Japan		

X = Attended

P = Attended by Proxy