

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

**Minutes of Meeting SC2-04-2  
Held October 7-8, 2004  
Las Vegas, Nevada**

Members Attending: See Table 3

Members Absent: See Table 3

Guests: Leigh Ann Aparicio, EPRI.  
Ken Artner, IST  
Yasutaka Eguchi, Mitsubishi Heavy Industry  
Dirk C. Hopp, Framatome ANP  
Kofi Korsah, ORNL  
Thomas Koshy, NRC  
Jim Notarfrancesco, Rockbestos Suprenant  
Jan Pirrong, Cablelan Products  
John Portillo, Nuclear Logistics  
Jon Quartly, IST  
Hsun Hun Tseng, INER  
Shian-Shing Shyu, INER

**1. Introduction**

The SC-2 Chairman, Satish Aggarwal, opened the meeting on Thursday October 7, 2004 at 8:35 am and welcomed everyone in attendance. This meeting was scheduled for 1½ days; concluding Friday October 8. A role call was taken and it was determined that a quorum was available, with 52 of 66 SC-2 members present, or represented by proxy.

The meeting agenda (**Attachment 1**) was reviewed and the following changes were noted:

- A request was made to add a presentation by Imaging and Sensing Technology on their camera systems
- The meeting start time for Friday was moved up to 8:00 am.

With the inclusion of these changes, a motion was made by John White to approve the meeting agenda. Garry Chapman 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 minutes of the previous SC-2 meeting 04-1 were opened for comment by the members. Hearing none, a motion was made to approve the minutes by Jim Gleason, seconded by Anup Behera 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 and the status 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-02-1-13	Identify an author to prepare a booklet containing biographical data of SC-2 members.	Satish Aggarwal	CLOSED
<i>Action Items from Meeting 03-2</i>			
AI-03-2-2	Send statement of position on 100-hour minimum aging requirement in IEEE Standard 323 to Jim Gleason.	Kjell Spang	CLOSED
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 member's book.	All SC-2 members	OPEN
AI-04-1-2	Provide comments on the SC-2 procedures manual.	All SC-2 members	CLOSED
AI-04-1-3	Prepare new PAR for Standard 382 on MOVs.	Pat McQuillan	CLOSED
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 December 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	CLOSED

Item No.	Description	Responsible	Status
<b>Action Items from Meeting 04-2</b>			
AI-04-2-1	Prepare Standard 344-D27 package for recirculation ballot.	Jim Parello	OPEN
AI-04-2-2	Request 6-month extension for Standard 344 PAR.	Satish Aggarwal	OPEN
AI-04-2-3	Prepare for a preview of Standard 334 to NPEC at the July 2005 meeting.	Bill Newel	OPEN
AI-04-2-4	Prepare a draft of the next revision to Standard 382 by December 2005.	Pat McQuillan	OPEN
AI-04-2-5	Prepare a draft of the next revision to Standard 572 for SC-2 review by October 2005.	Bill Hadovski	OPEN
AI-04-2-6	Obtain an electronic copy of all SC-2 Standards.	Satish Aggarwal	OPEN
AI-04-2-7	Prepare a draft PAR to develop a new IEEE standard for qualifying fiber optic cables and submit it to SC-2 for review by April 2005.	Jan Pirrong	OPEN
AI-04-2-8	Prepare and submit to IEC a request for a work item to develop a joint IEEE/IEC standard.	Kjell Spang	OPEN
AI-04-2-9	Provide a list of IEC delegates from foreign countries.	Kjell Spang	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. The previous balance after meeting 04-1 was \$380. A contribution of \$20.00 was requested from each of the members and guests for this meeting. Of the 45 members physically present at the meeting, 43 contributed the requested \$20. In addition, 1 member's proxy contributed \$20 for the absent member, and 7 guests contributed \$20. A total of \$1,020 was collected bringing the total fund to \$1,400.

The Chairman, SC-2 provided the following accounting of expenses from the fund up to the time these minutes were completed:

- Meeting 04-1 (New Orleans)
  - Gratuities to hotel staff \$ 20
- Meeting 04-2 (Las Vegas)
  - SC-2 meeting room rental (2 days) \$ 400
  - Audio/Visual equipment rental including 20% service fee \$ 398

Accounting for the above expenses, the fund balance is now at \$582. These funds are held by the Chairman, SC-2.

### 2.4 SC-2 Member's Biographical Data Booklet

Preparation of a booklet of biographical data on SC-2 members was discussed. The Secretary noted that a proposed format for the biographical data was distributed to all SC-2 members via e-mail and comments were received from several members. Based on the comments received, a form has been developed that can be used to collect the necessary biographical data from each member. The form is included in these minutes (**Attachment 2**). All members are requested to complete this form and submit it to the Secretary prior to the next meeting [AI-04-1-1]. A digital photo should be provided, if desired by the member.

### **3. SC-2 Chairman's Report**

#### **3.1 SC-2 Activities**

The Chairman reviewed the currently active working groups under SC-2, which are tabulated in Section 3.2. It was noted that new working groups might be added in the future as the need arises. It was requested that the proper name of the working group be used in all correspondence.

The Chairman then 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 was recently published. It also shows "2003" as the new version date. Standard 344 is nearing completion. The goal is to submit the revised standard for approval by December 2004.
- The goal now is to have all SC-2 standards revised by 2006. All working group chairs agreed that this goal is achievable.
- It was noted that the following list of names should appear in all published standards in the order noted:
  1. Working group chair and members responsible for developing the standard
  2. SC-2 members at the time the standard was approved
  3. NPEC members at the time the standard was approved
  4. Members that balloted on the standard
  5. Members of the IEEE Standard Board at the time the standard was approved

A copy of standard 383-2003 was then passed around for members to review and correct their names, as needed, if they are listed in the standard.

The following Vice-Chairman's report was then provided from Nissen Burstein:

- The SC-2 Organization and Procedures Manual was finalized as of June 2004. Copies are available from the Secretary or from the Vice Chairman.
- Activities related to 50.69 issues have been completed. Per AI-04-1-6, a letter was prepared for signature by the Chairman, NPEC that addressed the final position of the SC-2 Ad Hoc group. However, it was subsequently decided by the Chairman, SC-2, not to forward this letter since it was considered not to offer any additional insights beyond that already suggested to the NRC. The action item is considered closed.

- As a result of a PAR being prematurely submitted to IEEE HQ, information was distributed to the working group chairmen to clarify the process by which PARs are submitted to IEEE, which is via prior approvals by SC-2 and NPEC.

### 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

<b>Working Group Title*</b>	<b>Standard</b>	<b>Chairman</b>
Working Group on Equipment Qualification (SC 2.1)	IEEE-323	Jim Gleason
Working Group on Qualification of Motors (SC 2.2)	IEEE-334	Bill Newell
Working Group on Valve Operators (SC 2.3)	IEEE-382	Pat McQuillan
Working Group on Cables (SC 2.4)	IEEE-383	John White
Working Group on Seismic Qualification (SC 2.5)	IEEE-344	Jim Parello
Working Group on Connectors and Connections (SC 2.11)	IEEE-572	Bill Hadovski
Working Group on Battery Chargers/Inverters (SC 2.13)	IEEE-650	Dennis Dellinger
Working Group on Motor Control Centers (SC 2.14)	IEEE-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 membership will be extended for current members for the period 2005-2006 if at least one meeting has been attended in the past year. A letter of invitation will be sent out in the December-January time frame to each member. These letters must be completed and returned in order to accept the invitation to remain a member of SC-2.

### 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 San Diego, CA. The members were polled and it was decided that this would be the meeting location. The 3<sup>rd</sup> or 4<sup>th</sup> week of April was tentatively set for the next SC-2 meeting. It was noted that ICC meets April 17-19, so those dates should be avoided. The Chairman will coordinate the meeting arrangements, and a notice will be sent to all members once final arrangements have been made.

It was also noted that an NPEC meeting will be held in June 2005 in San Francisco, CA. The members were polled to determine interest in rescheduling the SC-2 meetings to coincide with the NPEC meetings. Results were 15-For and 15-Against; therefore, the Chairman decided that no changes will be made to the SC-2 meeting schedule at this time. This will be discussed again at the next meeting.

## **4. Working Group Reports**

### **4.1 Working Group 2.1 on Qualification (IEEE Standard 323)**

The Chairman of the working group, Jim Gleason, gave the following status report:

- The working group is currently discussing the next revision to standard 323. One issue is whether to expand the scope to include all equipment important to safety, including mechanical equipment.
- A discussion was held on the inclusion of mechanical equipment. It was noted that many people use IEEE Standard 323 for qualifying other than Class 1E equipment. For example, a recent NUREG report on spent fuel cooling systems notes that there are systems that must be qualified that are not Class 1E. The working group (2.1) is currently considering this issue. Some members feel that IEEE should not discourage the use of standard 323 for non-Class 1E equipment. Also, the issue of how to handle mechanical equipment should be addressed. The re-introduction of IEEE Standard 627 is also being considered.
- Current plans are to invite an ASME member familiar with qualification of mechanical equipment to the next working group 2.1 meeting to discuss these issues and get ASME's perspective on how to address them. A new PAR will not be pursued until a consensus is reached on how to proceed.

### **4.2 Working Group 2.2 on Motors (IEEE Standard 334)**

The Chairman of this working group, Bill Newell, provided the following status report:

- A draft of the revised standard will be ready for review by the working group this October 2004. A draft will be ready for review by SC-2 by April 2005.
- The changes being made are mainly to make the standard consistent with 323-2003, which are mostly editorial.
- A preview to NPEC of the revised standard is planned for July 2005. [AI-04-2-3] The Chairman, SC-2 will arrange this.
- A PAR is approved and is valid until 2006.
- The working group currently has 5 members. New members are welcome and should contact Bill Newell

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

The Chairman of this working group, Jim Parello, gave a presentation on the status of the standard (**Attachment 3**). It was noted that the revised standard was sent out for ballot and negative ballots were received. Efforts are still ongoing to resolve the comments. The current version is Draft 27. There was discussion regarding the technical issues remaining to be resolved and a motion was made by Jim Gleason to authorize the working group to prepare D27 for a recirculation ballot. Tom Hency seconded the motion. A roll call vote was taken and the motion was passed unanimously. The Chairman, SC-2 instructed the working group to prepare a clean copy of D27, a markup showing the differences from D26

to D27, and a list of the technical comments received. The working group should also prepare a letter explaining the process that was followed to arrive at D27 and noting that the technical issues were presented to SC-2. This package should be sent to the Chairman, SC-2, who will submit it for a recirculation ballot. [AI-04-2-1] Simultaneously, it will be submitted to the IEEE Standards Board for review and approval. A request to extend the PAR for this standard by 6 months will also be submitted. [AI-04-2-2]

#### **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:

- The standard was reaffirmed at the September 2004 IEEE Standard Board meeting.
- A request for a new PAR was prepared and submitted. IEEE indicated that a decision will be made by December 8, 2004.
- New members are needed for this working group and should contact Mr. McQuillan. Toni Wittamore and Nissen Burstein volunteered to join the working group. John Wheless volunteered a colleague, Jerry Daniels, to join the working group.
- The goal is to have a draft ready for review by December 2005, and ready for balloting by the September 2006 meeting [AI-04-2-4].

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

The Chairman of the working group, John White, noted that the standard was just revised and published in 2003. Activities will be initiated in three years to start looking at the next revision.

#### **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 was just reaffirmed.
- A new PAR is in place and will allow for a revision of the standard to make it consistent with 323-2003, as well as the addition of new types of connectors. The goal is to have a draft of the next revision ready for SC-2 review by October 2005. [AI-04-2-5]
- The Chairman, SC-2 suggested that the working group consider the inclusion of fiber optic connectors in the next revision of the standard.
- The working group currently has 5 members. New members are needed for this working group and should contact Bill Hadovski. Volunteers should have expertise with cables and connectors.

#### **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 recently completed the ballot cycle and 1 negative ballot was received, along with several comments. A recirculation ballot was performed and there was no change in the voting.

The standard was reaffirmed in September 2004.

- A new PAR is being pursued to revise the standard and address changes in 323. The goal is to have a new PAR request by December 2004. [AI-04-2-5] The Chairman, SC-2 plans to submit the PAR request to NPEC at the January 2005 meeting.
- The working group currently has 7 members, which is sufficient.

#### **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:

- The current version of the standard was reviewed by SC-2 and no comments were received.
- An electronic copy of the standard is not currently available, and is needed by the working group. The Chairman, SC-2 will look into getting an electronic copy of all SC-2 standards. [AI-04-2-6]
- The current PAR expires December 2005. The goal is to submit a draft of the revised standard to SC-2 for review by December 2004. [AI-04-1-5] A preview to NPEC is planned for January 2005, if an electronic copy is available.
- The working group currently has enough members.

### **5. Liaison Reports**

#### **5.1 NRC Liaison Report**

The Chairman, SC-2 provided an NRC liaison report, which is included as **Attachment 4**.

### **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:

*Thursday October 7,*

- Hsun Hua Tseng, Institute of Nuclear Energy Research, Taiwan, gave a presentation titled “EMC Compliance of Digital I&C to Electric Fast Transients.” A copy of the presentation is included as **Attachment 5**.
- Leigh Ann Aparicio, EPRI, gave a presentation titled “Accepting Supplier ISO-9000 Quality Programs.” A copy of the presentation is included as **Attachment 6**. In response to this presentation, Brij Bhartay noted that in dealing with products from ISO-9000 suppliers, complaints are followed-up very well. However, the vendor audit is not as comprehensive as for an Appendix B supplier.
- Glen Schinzel, South Texas Project, gave a presentation titled “Impact of 10 CFR 50.69.” A



copy of the presentation is included as **Attachment 7.**

- Van Stonehocker gave a presentation titled “Emergency Diesel Generator Controller Conversion.” A copy of the presentation is included as **Attachment 8.**
- Ken Gartner, Imaging and Sensing Technology, gave a presentation titled “Cameras???” A copy of the presentation is included as **Attachment 9.**
- Shian-Shing Shyu, INER, gave a presentation titled “Experience in Digital I&C System Upgrade for Taiwan’s NPP.” A copy of the presentation is included as **Attachment 10.**
- Craig Irish gave a presentation titled “Qualification of a Digital Trip Unit.” A copy of the presentation is included as **Attachment 11.**

*Friday October 8,*

- Tom Hency gave a presentation titled “IEEE Comparison to RCC-E Standards.” A copy of the presentation is included as **Attachment 12.**
- Marek Tengler gave a presentation titled “IEEE Comparison to KTA Standards.” A copy of the presentation is included as **Attachment 13.**
- Kjell Spang gave a presentation titled “Artificial Aging – Limitations and Solutions.” A copy of the presentation is included as **Attachment 14.**
- Dirk Hopp, Framatome, gave a presentation titled “Overview of Framatome Activities in Electrical, I&C Area.” A copy of the presentation is included as **Attachment 15.**
- Bill Newell gave a presentation titled “Motor Ratings and Qualified Life Issues.” A copy of the presentation is included as **Attachment 16.**

## **7. New Business**

### **7.1 Publication of Joint Standards**

The publication of joint IEEE and IEC standards was discussed. See Section 7.4.

### **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. See Vice-Chairman’s report in Section 3.1.

### **7.3 Special Working Group on Qualification of Fiber Optic Cables**

This special working group was formed by the Chairman, SC-2 at the 04-1 meeting to evaluate the issue of qualification of fiber optic cables. The Chairman of this special working group, Jan Pirrong, gave the following status report:

- The focus of the special working group has been to evaluate the need for a new standard for qualifying fiber optic cables.
- An e-mail survey was performed of the working group members, and 8 out of 9 responses indicated that a new standard is needed. Also, 8 out of 8 responses indicated that a separate standard would be better than an appendix to existing standard 383. As such, the special working group recommends that a PAR request be prepared and submitted to develop a new standard.
- The Chairman, SC-2 instructed the special working group to prepare a draft PAR and submit it to SC-2 for review by April 2005. [AI-04-2-7]
- It was noted that the IEEE ICC is responsible for a guide on fiber optic cable installation. It was suggested that a possible joint effort be considered to develop a new standard.
- It was also noted by M. van Uffelen that foreign efforts are also underway to address fiber optic cables. IEC has a guide for measuring the performance of fiber optic cables in radiation environments. Mr. van Uffelen volunteered to join this special working group.
- Bill Hadovski noted that he would like to discuss the inclusion of fiber optic connectors in the next revision to Standard-572.

#### **7.4 Special Working Group on Qualification of Microprocessor-based Equipment**

This special working group was formed by the Chairman, SC-2 at the 04-1 meeting to address the qualification of microprocessor-based equipment. The focus of this special working group is to review standards from other countries and compare them to the IEEE standard 323. The Chairman of this special working group, Jeff Chivers, gave a presentation on the status of this work. The presentation was not available electronically at the time these minutes were distributed.

The Chairman, SC-2 noted that he will take the lead to prepare a draft joint logo IEEE/IEC standard and send it to IEC for review. The goal is to complete this by the summer 2005.

Kjell Spang offered the following suggestions on how to proceed with the joint standard:

- IEC Standard 60780 is based on IEEE-323. The best approach is to work in parallel with IEC to revise 60780 to be consistent with 323. If IEEE-323 is first revised independently, and IEC endorsement is subsequently requested, this may not work.
- In order to revise IEC 60780, a new “work item” must be requested and approved. This can probably be achieved relatively easily. Five countries must commit to support the effort. A meeting of IEC is currently planned for the end of October in Switzerland on cable aging. This would be a good forum to request the necessary support from other countries.
- There will have to be some deviation in the 323 requirements to accommodate different countries. However, this should not be an obstacle and a joint standard is possible.

The Chairman, SC-2 noted that IEEE Standard 323 should not be revised until a joint effort is underway. The next revision to 323 should be based on a joint standard, including changes needed to accommodate the qualification requirements of foreign countries.

Kjell Spang offered to take the lead on requesting a new work item from IEC to prepare a joint standard. Mr. Spang will prepare a work item proposal and submit it to IEC. [AI-04-2-8] In addition, SC-2 representatives from foreign countries should talk to their IEC delegates to request their support in approving this work item. Mr. Spang will provide a list of IEC delegates from foreign countries. [AI-04-2-9]

#### **7.4 Special Working Group on ISO-9000**

Based on the presentation by L. Apparicio, the Chairman, SC-2 formed a special working group to evaluate the actions to be taken by IEEE related to ISO-9000 standards. Members of the special working group are the following:

- Sushant Kapur
- Bill Newell
- Leigh Ann Apparicio
- James Dean
- Tom Hincey, Chairman

The goal of this special working group is to make recommendations to SC-2, which will be carried to NPEC, on how IEEE should address ISO-9000.

At approximately 2:00 pm on Friday October 8, 2004 a motion was made to adjourn and meeting SC2-04-02 was adjourned.

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

#### List of Attachments:

1. SC-2 Meeting 04-2 Agenda
2. SC-2 Member's Biographical Data Form
3. Presentation by J. Parello on status of IEEE Standard 344
4. NRC Liaison Report
5. Presentation by H. Tseng on EMC Compliance
6. Presentation by L. Aparicio on ISO-9000
7. Presentation by G. Schinzel on the Impact of 50.69
8. Presentation by V. Stonehocker on Emergency Diesel Generator Controller Conversion
9. Presentation by K. Gartner on Cameras
10. Presentation by S. Shyu on Digital I&C System Upgrades in Taiwan
11. Presentation by C. Irish on Qualification of a Digital Trip Unit
12. Presentation by T. Hincey on IEEE Comparison to RCC-E Standards
13. Presentation by M. Tengler on IEEE Comparison to KTA Standards
14. Presentation by K. Spang on Artificial Aging – Limitations and Solutions
15. Presentation by D. Hopp on Overview of Framatome Activities in Electrical I&C
16. Presentation by B. Newell on Motor Ratings and Qualified Life Issues

**Table 3 Attendees of SC-2 Meeting 04-2 October 7-8, 2004 in Las Vegas, NV**

Name/Company	Address	Dates Attended	
		10/7	10/8
<b>Aggarwal, S. K. (Satish) – Chairman SC-2</b> U.S. Nuclear Regulatory Commission Tel. (301) 415-6005 Fax (301) 415-5074	Washington, DC 20555	X	X
<b>Alonso, Javier</b>  Tel. +34-91-659-8696 Fax +34-91-659-8677 (Proxy: Bohumil Bartonicek)	Avda. Montes de Oca 28709 San Sebastian de los Reyes Madrid, Spain	P	P
<b>Bartonicek, B. (Bohumil)</b> Nuclear Research Institute Rez plc Tel. +420-266-173579 Fax +420-266-173580	250 68 Husinec Rez 130 Czech Republic	X	X
<b>Baughman, P. D. (Paul)</b> ABS Consulting/EQE Tel. (603) 778-1144 Fax (603) 778-7495	118 Portsmouth Avenue Suite B302 Stratham, VA 03885	X	X
<b>Bharteey, Brij</b>  Tel. (518) 382-0056 Fax (518) 382-0283	112 Erie Blvd. Suite 3 Schnectady, NY 12305	X	X
<b>Behera, A. K. (Anup)</b> Kiran Consultants, Inc. Tel. (630) 515-2650, ext. 17 Fax. (630) 515-2654	1401 Branding Lane Suite 255 Downers Grove, IL 60515	X	X

**Table 3 Attendees of SC-2 Meeting 04-2 October 7-8, 2004 in Las Vegas, NV (continued)**

Name/Company	Address	Dates Attended	
		10/7	10/8
<b>Brewington, T. (Tom)</b> Wyle Laboratories Tel. (256) 837-4411, ext. 512 Fax (256) 837-3363 (Proxy: Robert Francis)	7800 Highway 20 West Huntsville, AL 35806	P	P
<b>Burstein,, N. M. (Nissen) – Vice Chairman SC-2</b> Framatome ANP Tel. (434) 832-2501 Fax (434) 832-2683	3315 Old Forest Rd. M/C OF54 Lynchburg, VA 24506-0935	X	X
<b>Butcher, C. (Craig)</b> Tennessee Valley Authority Tel. (423) 751-8250 Fax (423) 751-8247	1101 Market Street LP 4H Chattanooga, TN 37402-2801		
<b>Casadevall, S. (Steve)</b> ASCO Valve Inc. Tel. (973) 966-2512 Fax (973) 966-2624	50 Hanour Road Floham Park, NJ 07932	X	X
<b>Chapman, G. V. (Garry)</b> Trentec, Inc. Tel. (513) 528-7900 Fax (513) 528-9292	4600 East Tech Drive Cincinnati, OH 45245	X	X
<b>Channarasappa, S. (Suresh)</b> Westinghouse Electric Co. Tel. (724)-733-6587 Fax	1760 Golden Mile Hwy. Monroeville, PA 15746	X	X
<b>Chipkin M. (Marty)</b> Nine Mile Point Nuclear Station Tel. (315) 349-2825 Fax (315) 349-1579	P.O. Box 63 Lycoming, NY 13093		
		X	X

**Table 3 Attendees of SC-2 Meeting 04-2 October 7-8, 2004 in Las Vegas, NV (continued)**

Name/Company	Address	Dates Attended	
		10/7	10/8
<b>Chivers, J. (Jeff)</b> Rosemount Nuclear Tel. (952) 949-5377 Fax (952) 949-5147	8200 Market Blvd. Chanhassen, MN 55317		
<b>Choi, S. Y. (Sun Yeong)</b> Korea Atomic Energy Research Institute Tel. +82-(42) 868-8372 Fax +82-(42) 868-8256	Box 105, Yuseong Daejeon, 305-600 Korea		
<b>Dean, J. M. (James)</b> Applied Energy Services, Inc. Tel. (203) 730-0587 Fax (203) 744-5192	14 Eagle Rock Hill Rd. Bethel, CT 06801	X	X
<b>Delcea, L. N. (Liviu Nicolae)</b>  Tel. +40-241-80-1658 Fax +40-723-111-627	Medgidiei St. No. 1 C.P. 42, Cernavoda 08625 Constanta, Romania	X	X
<b>Dellinger, D. E. (Dennis)</b> Solidstate Controls, Inc. Tel. (614) 846-7500 Fax (614) 885-3990	875 Dearborn Drive Columbus, OH 43085	X	X
<b>Di Benedetto, P. (Philip)</b>  Tel. (978) 686-3561 Cell (978) 660-7662 (Proxy: Anup Behera)	123 French Farm Road North Andover, MA 01845	P	P
<b>Duong, Q. H. (Quang)</b> DTE Energy Tel. (734) 586-1813 Fax (734) 586-4911	6400 N. Dixie Hwy 125 EF2-TAC Newport, MI 48166	X	X
<b>Drumm, F. (Frank)</b>	Raychem GmbH		

**Table 3 Attendees of SC-2 Meeting 04-2 October 7-8, 2004 in Las Vegas, NV (continued)**

Name/Company	Address	Dates Attended	
		10/7	10/8
Tyco Electronics Tel. +49-89-6089-567 Fax +49-89-6089-445	Finsinger Feld 1 85 Ottobrunn, Germany		
<b>Fargo, W. D. (Wells)</b> Southern California Edison Co. Tel. (949) 368-2525 Fax (949) 368-2122	3214 Legendario San Clemente, CA 92673-3811		
<b>Faya, A. J. (Artur)</b> Canadian Nuclear Safety Commission Tel. (613) 996-0023 Fax (613) 943-1292	280 Slater Road Ottawa, Ontario K1C 5S9 Canada	X	X
<b>Francis, R. L. (Robert)</b> Wyle Laboratories Tel. (256) 837-4411 ext. 315 Fax (256) 837-3363	7800 Highway 20 West Huntsville, AL 35807	X	X
<b>Gleason, J. (Jim)</b> Bechtel Scientific Co. Tel. (702) 295-4561 Fax	1180 Town Center Drive Las Vegas, NV 89149	X	X
<b>Gove, P. (Patrick) – Assistant Secretary SC-2</b> Black & Veatch Tel. (913) 458-7834 Fax. (913) 458-2491	11401 Lamar Overland Park, KS 66213	X	X
<b>Hadovski, W. L. (William)</b> Westinghouse Electric Co. Tel. (860) 731-6258 Fax (860) 731-6256	2000 Day Hill Road Windsor, CT 06095	X	X
<b>Helander, P. (Peter)</b>	Dag Hammarskjolds vag 13		

**Table 3 Attendees of SC-2 Meeting 04-2 October 7-8, 2004 in Las Vegas, NV (continued)**

Name/Company	Address	Dates Attended	
		10/7	10/8
Tel. +46-18-51-1836 Fax +46-18-51-1894	752 37 Uppsala, Sweden		
<b>Hencey III, T. (Tom)</b> Scientech, Inc. Tel. (727) 669-3047 Fax (727) 669-3100	1393 Indian Trail N. Palm Harbor, FL 34683	X	X
<b>Henley, J. C. (Jerrell)</b>  Tel. (256) 379-2920 Fax. (256) 379-2920	1359 Old Winchester Road New Market, AL 35761		
<b>Horvath, D. (Dave)</b> 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	X	X
<b>Irish, C. S. (Craig)</b> Nuclear Logistics, Inc. Tel. (978) 250-1684 Fax (978) 250-0245	27 Linwood Street Chelmsford, MA 01824	X	
<b>Jagtiani-Krause, S. A. (Serena)</b> Trentec Inc. Tel. (513) 528-7900 ext. 121 Fax (513) 528-9292 (Proxy: Garry Chapman)	4600 East Tech Dr. Cincinnati, OH 45245	P	P
<b>Kapur, S. (Sushant)</b> Bechtel Power Corp. Tel. (301) 228-6057 Fax (301) 631-0841	5275 Westview Drive Frederick, MD 21703- 8306	X	X
<b>Khan, M. R. (Mohsin)</b> ARES Corp. Tel. (510) 645-5960	2101 Webster St. Suite 1650 Oakland, CA 94612		



**Table 3 Attendees of SC-2 Meeting 04-2 October 7-8, 2004 in Las Vegas, NV (continued)**

Name/Company	Address	Dates Attended	
		10/7	10/8
Fax (510) 656-5961			
<b>Leung, H. (Henry)</b> Tel. (905) 567-3332 Fax	4556 Credit Pointe Dr. Mississauga, Ontario Canada L5M 3L9	X	X
<b>Lofaro, R. J. (Bob) – Secretary SC-2</b> Brookhaven National Laboratory Tel. (631) 344-7191 Fax (631) 344-5569	P.O. Box 5000 Building 130 Upton, NY 11973-5000	X	X
<b>Lory, B. M. (Bruce)</b> 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
<b>Martin, D. R. (Darin)</b> Southern Testing Services, Inc. Tel. (865) 966-5330 Fax.(865) 675-5399	10627 Lexington Drive Knoxville, TN 37932		
<b>McQuillan, P. (Pat)</b> Limitorque Tel. (434) 845-9714 Fax (434) 845-9736	5114 Woodall Road Lynchburg, VA 24502	X	X
<b>Mikow, D (Daniel)</b> Framatome, ANP Tel. (724) 779-9800 ext. 1314 Fax (724) 779-9844 (Proxy: Nissen Burstein)	200 West Kensinger Drive Suite 600 Cranberry Township, PA 16066	P	P
<b>Mitton, T. (Todd)</b> RCM Technologies Tel. (905) 821-1616 Fax (905) 821-1613	6620 Kitimat Road, Unit 4 Mississauga, Ontario L5N 2B8 Canada	X	X

**Table 3 Attendees of SC-2 Meeting 04-2 October 7-8, 2004 in Las Vegas, NV (continued)**

Name/Company	Address	Dates Attended	
		10/7	10/8
<b>Mohiuddikn, A. (Asif)</b> Sargent & Lundy Tel. (312) 269-2752 Fax (312) 269-7041	%%E. Monroe 23C41 Chicago, IL 60603	X	X
<b>Mohtashemi, E. (Edward)</b> GE Nuclear Energy Tel. (408) 925-1844 Fax (408) 925-6261	175 Curter Avenue M/C 788 San Jose, CA 95125	X	X
<b>Monchy-Leroy, C. (Carole)</b> EDF Research and Development Tel. +33-1-60-73-6773 Fax +33-1-60-73-7407 (Proxy: Marc Kuntz)	Electrical Equipment Lab Les Renadières 77818 Moret sur Loing Cedex-France	P	P
<b>Newell, W. (Bill)</b> Schulz Electric Company Tel. (203) 562-5811 Fax (203) 562-1082	30 Gando Drive New Haven, CT 06513	X	X
<b>Parello, J. (James)</b> Westinghouse Electric Co., LLC Tel. (724) 722-5545 Fax (724) 722-5497	1000 Westinghouse Drive New Stanton, PA 15672-9606	X	X
<b>Pavsek, J. (Janez)</b> Milan Vidmar Electroinstitute Tel. +386-31-809-322 Fax +386-1-252-1359 (Proxy: Marek Tengler)	SI-1000 Ljubljana Hajdrihova 2, Slovenia	P	P
<b>Pomerening, D. J. (Daniel)</b> Southwest Research Institute Tel. (210) 522-2318 Fax (210) 522-4506	6220 Culebra Road San Antonio, TX 78238-5166	X	X

**Table 3 Attendees of SC-2 Meeting 04-2 October 7-8, 2004 in Las Vegas, NV (continued)**

Name/Company	Address	Dates Attended	
		10/7	10/8
<b>Robert Queenan</b> Scientech Tel. (208) 524-9311 Fax (208) 524-9238	220 South Woodruff Ave. Idaho Falls, ID 83401		
<b>Richards, J. M. (John)</b> Duke Energy Co. Tel. (704) 382-3916 Fax (704) 382-3993	Mail Stop EC09H P.O. Box 1006 Charlotte, NC 28201-1006	X	X
<b>Roy, F. (Fred)</b> Scientech Tel. (256) 722-8500 Fax (256)722-8533	125 West Part Loop Huntsville, AL	X	X
<b>Sandberg, S. (Steve)</b> Rockbestos-Surprenant W&C Tel. (860) 653-8360 Fax (860) 653-8412	20 Bradley Park Road East Granby, CT 06026	X	X
<b>Schinzel, G. E. (Glen)</b> South Texas Project Tel. (361) 972-7854 Fax (361)972-7073	P.O. Box289 Wadsworth TX 77483	X	X
<b>Simms, R. (Roderick)</b>  Tel. (269) 465-5901 ext. 3583 Fax (269) 466-3454	One Cook Place Bridgman, MI 49106		
<b>Spang, K. (Kjell)</b>  Tel. +46-31-298573 Fax +46-31-694594	KS Miltek Strandskarsvagen 9 SE-42658 Vastra Frolunda, Sweden	X	X

**Table 3 Attendees of SC-2 Meeting 04-2 October 7-8, 2004 in Las Vegas, NV (continued)**

Name/Company	Address	Dates Attended	
		10/7	10/8
<b>Starck, R. (Richard)</b> MPR Associates Tel. (703) 519-0511 Fax (703) 519-0224	320 King Street Alexandria, VA 22314		
<b>Tengler, M. (Marek)</b>  Tel.+42-0377-386961 Fax +42-0377-386961	Labhova 8/34 Pilsen 31806	X	X
<b>Van Uffelen, M. (Marco)</b>  Tel. +32 14-33-2638 Fax +32-14-31-1993	Boertang 200 Dept. Instrumentation Building BR3 B-2400, Mol, Belgium	X	X
<b>Varga, L. (Laszlo)</b> VEIKI-VNL, Ltd. Tel. +36-1-417-3157 Fax +36-1-417-3163	Vasgolyo u. 2-4. H-1158 Budapest, Hungary		
<b>Weber, C. E. (Carl)</b> Pacific Gas & Electric Co. Tel. (805) 545-4084 Fax (805) 545-6928	Diablo Canyon Power Plant P.O. Box 56 Avila Beach, CA 93424		
<b>Wheless, J. (John)</b> Southern Company Tel. (205) 992-6898 Fax (205) 992-0391	40 Inverness Center Pkwy. Bin BO57 Birmingham, AL 35242	X	X
<b>White, J. (John)</b> TXU CPSES Tel. (254) 897-6674 Fax (254) 897-0530	P.O. Box 1002 Glen Rose, TX 76043	X	X
<b>Toni Wittamore</b>	575 Mile Crossing Blvd.	X	X

**Table 3 Attendees of SC-2 Meeting 04-2 October 7-8, 2004 in Las Vegas, NV (continued)**

Name/Company	Address	Dates Attended	
		10/7	10/8
Rotork Controls, Inc Tel. (585)-328-1550, ext. 252 Fax (585) 328-5848	Rocchester, NY 14624		
<b>Wood, R. T. (Richard)</b> Oak Ridge National Laboratory Tel. (865) 574-5578 Fax (865) 576-8380	Bethel Valley Road P.O. Box 2008 Bldg. 3500, MS 6010 Oak Ridge, TN 37831-6010	X	X
<b>Yamamoto, T. (Toshio)</b> 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	X

X = Attended

P = Attended by Proxy