# IEEE SUBCOMMITTEE ON QUALIFICATION IEEE/NPEC/SC-2 Meeting 09-01

## Four Points Sheraton Knoxville Cumberland House 1109 White Ave. Knoxville TN 37916

April 7-8, 2009 Meeting Minutes

Tuesday, April 7, 2009: 8:00 am to 5:00 pm

#### A. BUSINESS

1. Call to order J. Parello

The meeting was called to order at 8:10 am. James discussed the 'Inappropriate Topics for IEEE WG Meetings. The following items were specifically mentioned:

- Don't discuss licensing terms or conditions
- Don't discuss product pricing, territorial restrictions or market share
- Don't discuss on going litigation or threatened litigation
- Don't be silent if inappropriate topics are discussed... do formally object.
- 2. Introduction of Members and Guests

J. Parello

2.1 Quorum Roll Call and IEEE Student Branch

There were 38 members present. The meeting had a Quorum. Special thanks were extended to Wyle labs for sponsoring the reception, and Synergy Energy for sponsoring the Coffee Break.

2.2 Identification of Guest

Jodi Haasz was recognized has a representative from IEEE. She is the Senior Program Manager, International Standards Programs, and made a presentation on Dual Logo standards.

- 3.3 General Remarks
- 3. Approval of Agenda

A motion was made by Jim Gleason to approve the meeting agenda. The motion was 2<sup>nd</sup> by Tom Hency. The Motion was unanimously approved.

Group member and guest introductions were made.

J. White

#### 4.1 Approval of Previous Meeting Minutes (08-02)

A motion was made by Walt Emerson to approve the meeting minutes. The motion was 2<sup>nd</sup> by Tom Hency. The motion was unanimously approved.

### 4.2 Review of Action Items

Item No.	Description	Responsible	Status
Action Items	from Meeting 07-2		
AI-07-2-2	A PAR extension needs to be issued for P1682 (Fiber Optic Cables, Connectors, Splices).	Jan Pirrong	Open
AI-07-2-3	Invite local IEEE chapter of the town in which we are meeting to an evening speech at the next meeting.	Nissen Burstein	Closed
AI—07-2-5	Check situation regarding joint logos and report back to SC and NPEC.	Nissen Burstein	Closed
AI-07-2-6	Verify ballot process w/NPEC, particularly regarding P-627 and P-1682	Nissen Burstein	Closed
Action Items	from Meeting 08-1		
AI-08-01	Review P627 by 4-23-08 and send comments to Dave Horvath	All	Closed
AI-08-02	Preview P1682 at SC-2 08-02	Jan Pirrong	Closed
AI-08-03	Prepare revision to SC-2 O&P manual	SC-2 Vice- Chairman	Open
Action Items	from Meeting 08-2		
AI-08-03	Evaluate CM for Joint IEC/IEEE and Prepare PAR	Jim Gleason	Open
AI-08-03	Evaluate EQ for Joint IEC/IEEE and Prepare PAR	Jim Gleason	Open
Action Items	from Meeting 09-01		
AI-09-01	WG presentation on P1682 status - preview	Jan Pirrong	Open
AI-09-02	Preview P1682 at SC-2 09-02	Jan Pirrong	Open
AI-09-03	Hotel information Germany, Paris, Frankfurt	Nissen Burstein	Open
AI-09-04	Hotel information Sweden	Kjell Spang	Open
AI-09-05	Hotel information in conjunction with SC 45A	Jim Gleason	Open
AI-09-06	Hotel information Germany	Frank Drumm	Open
AI-09-07	Hotel information London	Tom Hency	Open
AI-09-08	Begin Reaffirmation process for IEEE 334	Bill Newell	Open
AI-09-09	Determine Host for 10-01 reception	James Parello	Open
AI-09-10	Consider an update of IEEE 650 standard for UPS	Dennis Dellinger	Open

### 4.3 Status of NPEC and SC2 Membership (2009)

The current NPEC membership is approx. 35. Dean Dillinger was added to NPEC. Nissen Burstein is the Technical Coordinator for NPEC, and the Liaison to the ASME QA committee.

We have been asked to identity errors in PARs. NPEC has asked us to give this issue more attention, and correct errors as soon as they are identified. Jim is currently having a problem with the purpose statement being incorrect for IEEE 323.

#### **NPEC**

Three members were added to SC2 Sean Foley, Chris Peege, and Rebecca Steinman. Three members were removed Carl Mallete, Art Faya and Gordon Clefton. The members were removed as part of the annual review due to non-attendance at previous SC2 meetings.

4.4 Report of SC Financial Status / Alligator Fund (Meeting fee N09-1: U.S. \$ 40.00)

The financial report was presented. As of 12/31/08 the closing balance of the Alligator Fund was \$854.55

## 5. Chairman's Report

J. Parello

- 5.1 Summary of SC-2 ADCOM
- 5.2 Summary of NPEC Meetings (N-09-01)

#### 6. Vice-Chairman's Report

J. Gleason

6.1 Reception

The reception is being sponsored by Wyle Labs and will be held at 7:00 pm.

6.2 SC-2 Member's Biographical Data

Fred Roy will attempt to get biographical data from the new SC2 members.

6.3 Meeting Schedule

09-2	November 2009	Lido Beach, Sarasota FL
10-1	Mid-May 2010	Las Vegas
11-1	Mid-May 2011	Proposed locations: Phoenix, San Francisco, San
		Jose, Myrtle Beach, Pittsburg, and an International
		location.

There was limited interest in holding a meeting on a Cruise ship. This will be explored. There was unanimous interest for a meeting in Europe. This is also in line with SC2 goals to have a meeting in Europe every five years. Action items were assigned to investigate hotel rates in specific European locations.

#### 7. PARS AND PREVIEWS

J. Parello

7.1 PAR for IEEE 344 Reaffirmation

James stated that the ballot pool for the reaffirmation is still open. The balloting will start after 4/15/09.

#### **B. DISCUSSIONS AND UPDATES**

1. EQ Data Sources, Status Report

Tom Hencey

Deferred to Chris Abernathy's discussion.

2. QA / Non-USA Standards AdHoc WG, Status Report

Nissen Burstein

Nissen Burstein is the Technical Coordinator for NPEC, and the Liaison to the ASME NQA committee.

3. IEC/IEEE Dual Logo Agreement

Jodi Haasz, IEEE Stds Activities Senior Program Manager, International Std's Programs

Jodi Haasz, Senior Program Manager, International Standards Program, made a presentation on IEC / IEEE Dual Logo standards. The presentation is attached to the meeting minutes.

4. Status of Dual Logo CM Standard

Kjell Spang

Kjell presented the status of project 62582 on condition monitoring. The presentation is attached to the meeting minutes.

5. Status of IEEE 323 and IEC 60780

Richard Wood/Jim Gleason

Interface with the Stationary Battery Committee on IEEE 535 and new passive plant requirements for battery qualification. A PAR for revision of IEEE 535 is proposed.

Interface with IEC on harmonization between IEEE 323 and IEC 60780. A PAR for revision of IEEE 323 is proposed.

Interface with IEC on new projects for Condition Monitoring of Electrical Equipment. PARs for the new CM joint IEC/IEEE standards were proposed.

Update on Forsmark and discussion of Uninterruptible Power.

Update on NQA-1 and Commercial Grade Dedication

6. FORSMARK Safety Systems Overview

Thomas Koshy

Tom stated prior to his presentation that an IEEE standard is need for the qualification battery chargers. Tom's presentation presented an overview of recent industry events. His presentation is attached to the meeting minutes.

7. Status of IEEE 7-4.3.2 and IEEE 323-2003

Jim Gleason

#### C. WORKING GROUP AND LIAISON REPORTS

1. SC 2.1: IEEE Std. 323 (Electric Equip EQ)

Jim Gleason

Discussed the group work on clarifying the difference in equipment qualification and dedication. IEEE 323 was reaffirmed in 2008. The WG focus will be the coordination of IEEE 323 and IEC 60780. The current work is on the PAR development for the combined logo standard. The WG is also intending to address cyber security within the working group to address any qualification impacts.

2. SC 2.2: IEEE Std. 334 (Motors)

Bill Newell/James Dean

The standard will begin the reaffirmation process in the next couple of weeks. The WG is investigating a white paper on seismic ruggedness of motors. The paper will be part of the basis

for the ruggedness argument. Bill requested support from IEEE 344 working group to help to support the ruggedness of motors.

3. SC 2.3: IEEE Std. 382 (Valve Operators)

Ed Mohtashemi

The standards last revision was a significant change. Waiting to determine if the NRC is going to issue a Regulatory Guide. There are no current plans for any paper to be issued on the standard.

4. SC 2.4: IEEE Std. 383 (Cables)

John White

On April 4 the ACRS met. It appears the Regulatory Guide will be issued. It will include a requirement for condition monitoring of all safety related cables. The Regulatory Guide should be issued by the end of the year. Tom stated that the purpose was not purely a qualification issue. The purpose is to ensure that the insulation remains intact for the next duty cycle and will survive a LOCA. Because of cable failures there is not assurance-installed cables will perform their intended function during a LOCA.

5. SC 2.5: IEEE Std. 344 (Seismic)

Jim Parello

James stated that the ballot pool for the reaffirmation is still open. The balloting will start after 4/15/09. The WG is reviewing industry documents for potential impact on qualification. Once the Regulatory Guide and working sub-group will be assembled to determined if any revisions to the standard will be reviewed at that time.

6. SC2.6: Relays Seismic Qualification

Marie Nemier / S. Channasarappa

The WG has had several meetings over the past several months. The standard has begun the revision process. The current PAR is valid thru 2012. The standard is a joint standard between NPEC and PSRC.

7. SC 2.10: IEEE P-627 (Overall EQ)

Dave Horvath

P627 was recently balloted. The ballot closed on Nov. 24, 2007. There were 74 ballots in the ballot pool. 90% response rate. Greater than the required 75%. There was 93% approval rate. This was also greater than the 75% required. There were 56 comments. 4 negative ballots which represented approximately 30 comments that need to be satisfied. There were no "show stoppers". Expect the next ballot within 2 months and then to Rev Com.

8. SC 2.11: IEEE Std. 572 (Connectors)

William Hadovski

No report.

9. SC 2.13: IEEE Std. 650 (Battery Chargers)

Dennis Dellinger

No report.

10. SC 2.14: IEEE Std 649 (Motor Control Centers)

Robert Francis

The NRC issued their draft guidelines. The WG is waiting on the Regulatory Guide to be issued. The affirmation will begin after the first of next year.

11. SC 2.15: IEEE P-1682 (FO Cable Qualification)

Jan Pirrong

Jan had a presentation that presented an update for standard P1682. The WG has been through multiple drafts. The current revision is D1B. The slides from the presentation are attached. The presentation discussed the effort to resolve the comments at the WG meeting held on 4/6/09 in conjunction with this meeting. Jim Gleason asked if there was any consideration that the scope of the standard should be limited to mild environment qualification. Jan stated that he did not believe that the standard would be delayed due to the harsh

environmental qualification. If the harsh environmental qualification became an issue it would be addressed at that time.

12. NRC Liaison Report

Thomas Koshy

Tom provided a presentation on current NRC / Industry issues. The presentation is attached.

13. ASME Liaison Report

Glen Schinzel

Glen Schinzel provided the ASME Liaison report. The report addressed Risk-Informed IST, Treatment standard for Low Safety Significant SSC, NQA committee, O&M committee and the NRMCC. Glen's detailed notes are provided in an attachment.

14. EPRI Liaison Report

Chris Abernathy

Chris identified the following on-going EPRI efforts effecting EQ:

2008 Project Work Results / Wrap-Up:

- Guidance For Managing The Impact Of Procured Item Quality Issues On Generating Asset Economic Performance (Report ID: 1016693)
- Medium Voltage Cable Aging Management Guide (Report ID: 1016689)
- Seismic G-STERI Guidance Document (Report ID: 1016691)
- Seismic G-STERI Equipment Evaluations (Report ID: 1016694)
- Engineering Fundamental Courses
- Engineering Technical Training Modules
- Continued Development Of "The Copper Book" (comprehensive transformer guidance document with multi-sector input from Nuclear & Power Generation sectors of EPRI and utilities)
- Obsolescence Management Guide (Report ID: 1016692)

2009 Project Schedule / Planning (Continuing & New Project Work):

- EPRI/NEI/NRC workshop on cable (March 18th 19th, 2009)
- Medium Voltage Cable Aging Management Guide (continued updates)
- Medium Voltage Cable Research and Development
- Long-Term Cable Strategies and Replacement Concepts
- Development of Common Medium Voltage Cable Specification
- In-Plant Demonstration of Line Resonance Analysis
- Low Voltage Cable System Aging Management Guideline
- Equipment Qualification Reference Manual Update
- Form-Wound EQ Motor Rewind System
- Random-Wound Motor Rewind System
- Update to Guideline on Nuclear Safety-Related Coatings
- Inspection Templates for Procured Items
- Obsolescence Management Program Implementation and Lessons Learned
- Critical Spare Parts Guidance

- Counterfeit and Fraudulent Items

2009 EPRI Training Courses:

- Low Voltage Cable Aging Management Course (June 9th 10th, 2009) (Charlotte, NC)
- Coating Training Course (June 15th 19th, 2009) (Charlotte, NC)
- Equipment Qualification Training Course (June 23rd 25th, 2009) (Charlotte, NC)
- Medium Voltage Cable Aging Management Course (July 14th July 16th, 2009) (Charlotte, NC)

## Wednesday, April 8, 2009: 8:00 am to 12:00 noon

## Jim Parello called the meeting to order at 8:00 am with 30 members present.

Room: Parkview A

#### D. PRESENTATIONS

Scientech (Generation 3 QDC Qualification Status)

- The presentation is attached to the meeting minutes.

Draka (Long term life of Nuclear Fiber Optic Cables)

- The presentation is attached to the meeting minutes.

General Cable (Environmental Qualification – Strategy and Progress)

- The presentation is attached to the meeting minutes.

Nexans (Worldwide Experience with halogen Free IEEE 383 Qualified Cables)

- The presentation is attached to the meeting minutes.

Okonite (Class 1E Cable Qualification to the Latest IEEE Standards)

- The presentation is attached to the meeting minutes.

Rockbestos-Surprenant (New Plant Cable Issues)

- The presentation is attached to the meeting minutes.

#### E. INDUSTRY DEVELOPMENTS AND UPDATES

- 1. W-AP1000 EQ Program Update
- 2. GE-ESBWR/ABWR EQ Program, Update
- 3. US EPR EQ Program, Update
- 4. NPEC /NRC Presentation

S. Channarasappa / Jim Parello

Ed Mohtashemi / Jim Gleason

Nissen Burstein

Satish Aggrawal

Satish extended greetings from NPEC and his desire to have a joint SC2 and NPEC meeting. Satish provided an update on Regulatory Guide 1.211 He also stated that that a Regulatory Guide on condition monitoring would be issued later this year. Satish also indicated that the staff may be considering a possible requirement for combined thermal and radiation aging.

### F. WRAP-UP

- Old Business
- 2. New Business
- Next Meeting
- 4. Adjournment

	Name/Company	Address	04/07	04/08
1	Abernathy, Chris Duke Energy Co. Tel: 704-875-4486 Email: cdabernathy@duke-energy.com	McGuire Nuclear Station M/C: MG05EE 12700 Hagers Ferry RD Hntersville, NC 28078	х	Х
2	Akhtar, Saleem KCI Consultants Tel: 630-515-2650 x 20 Fax: 630-515-2654 Email: s.akhtar@comcast.net saleemakhtar@kciconsultants.com	1401 Branding Lane Suite 255 Downers Grove, IL 60515	х	х
3	Benson, D. Steven RCM Technologies, Engr Services Tel: 289-290-3647 Fax: 905-821-1613 Email: steve.benson@rcmt.com	6620 Kitimat Road, Unit 4 Mississauga, Ontario L5N 2B8 Canada	Х	х
4	Brewington, T. (Tom) Wyle Laboratories Tel. (256) 716-4512 Fax (256) 837-3363 Email: tom.brewington@wyle.com	7800 Highway 20 West Huntsville, AL 35806	Х	Х
5	Burstein, N. M. (Nissen) – Chairman SC-2 AREVA NP, Inc. Tel. (434) 832-2501 Fax (434) 832-2683 Email: nmb@ieee.org	3315 Old Forest Rd. M/C OF54 Lynchburg, VA 24506-0935	х	Х
6	Casadevall, S. (Steve) ASCO Valve Inc. Tel. (973) 966-2512 Fax (973) 966-2624 Email: scasadevall@asco.com	50 Hanour Road Florham Park, NJ 07932		х
7	Channarasappa, S. (Suresh) Westinghouse Electric Co. Tel. (724)-733-6587 Email: <a href="mailto:channas@westinghouse.com">channas@westinghouse.com</a>	1760 Golden Mile Hwy. Monroeville, PA 15746	X	X
8	Dean, J. M. (James) SC 2.2 - 334 (co w/Newell) Applied Energy Services, Inc. Tel. (203) 888-1536 Fax (203) 888-1538 Email: jamesdean@aesnuclear.com	66 Chestnut Tree Hill Rd Oxford, CT 06478	Х	X

	Name/Company	Address	04/07	04/08
9	Dellinger, D. E. (Dennis) SC 2.13 - 650 Solidstate Controls, Inc. Tel. (614) 846-7500 Fax (614) 885-3990 Email: dennis.dellinger@Ametek.com	875 Dearborn Drive Columbus, OH 43085	х	Х
10	DiBenedetto, Phil Email: Philip.didenedetto@shawgrp.com			
11	Dougherty, M. (Mike) Rosemount Nuclear Emerson Process Tel: 208-865-1112 Fax: 208-865-1115 Email: mike.dougherty@emersonprocess.com	502 Fourth of July Creek Rd North Fork, ID 83466	х	х
12	Drumm, F. (Frank) Tyco Electronics Tel. +49-89-6089-567 Fax +49-89-6089-445 Email: fdrumm@tycoelectronics.com	Tyco Electronics Raychem GmbH Finsinger Feld 1 85521 Ottobrunn, Germany		Х
13	Emerson, Walter Shaw Stone & Webster Tel. (617) 589-2686 Fax (617) 589-5501 Email: walter.emerson@shawgrp.com	100 Technology Center Dr Stoughton, MA 02072	Х	
14	Fargo, W. D. (Wells) Southern California Edison Co. Tel. (949) 368-9552 Fax (949) 368-9552 Email: wells.fargo@sce.com	3214 Legendario San Clemente, CA 92673- 3811		X
15	Foley, Sean Email: sean.foley@afltele.com		Х	
16	Francis, R. L. (Robert) SC 2.14 - 649 Wyle Laboratories Tel. (256) 716-4315 Fax (256) 837-3363 Email: robert.francis@wyle.com	7800 Highway 20 West Huntsville, AL 35806	Х	Х
17	Gleason, J. (Jim) SC 2.1-323/Sec'y SC-2 General Electric Hitachi Nuclear energy Tel. (910) 819-4786 Fax NA Email: james.gleason@ge.com	3901 Castle Hayne Rd, Wilmington, NC 28401	х	

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18	Gove, P. (Patrick) Black & Veatch Tel. (913) 458-7834 Fax. (913) 458-2491 Email: Govepa@bv.com	11401 Lamar Overland Park, KS 66213	X	X
19	Hadovski, W. L. (William) SC 2.11 - 572 Westinghouse Electric Co. Tel. (860) 731-6258 Fax (860) 731-6256 Email: william.l.hadovski@us.westinghouse.com	2000 Day Hill Road Windsor, CT 06095		
20	Hencey III, T. (Tom) Scientech, division of Curtiss-Wright Tel. (727) 669-3047 Fax (727) 669-3100 Email: <a href="mailto:thencey@curtisswright.com">thencey@curtisswright.com</a>	1393 Indian Trail N. Palm Harbor, FL 34683	X	X
21	Hopp, Dirk C. Areva NP NLEC-G Tel. 49-9131-900-2766 Email: dirk.hopp@areva.com	Paul-Gossen-SHA00 Erlangen, 91052 Germany	Х	Х
22	Horvath, D. (Dave) SC 2.10 – P627 Advent Engineering Tel. (734) 930-7500 Fax (734) 327-7501 Email: dah@adventengineering.com	P.O. Box 555 24 Frank Lloyd Wright Blvd., Lobby C Ann Arbor, MI 48106		
23	Korsah, Kofi Email: korashk@ornl.gov		Х	
24	Krause, Serena Trentec, Division Curtiss-Wright Tel. (513) 528-7900 x 121 Fax (513) 528-9292 Email: skrause@curtisswright.com	4600 East Tech Drive Cincinnati, OH 45245		Х
25	Koshy, Thomas U.S. Nuclear Regulatory Commission Tel. 301-415-5828 Fax: 301-415-5074 Email: Thomas.koshy@nrc.gov	USNRC Office of Research MS T-10M05 Washington, DC 20555	х	Х
26	Lory, B. M. (Bruce) Stevenson & Associates Tel (847) 795-0500	4350 DiPaolo Center Suite H Glenview, IL 60025		Х
27	Martin, Darrin Email: darrin@synergyqualfifcations.com			

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28	Mikow, Daniel Email: Daniel.mikow@areva.com		Х	
29	Mohiuddin, A. (Asif) Sargent & Lundy Tel. (312) 269-2752 Fax (312) 269-7041 Email: asif.mohiuddin@sargentlundy.com	55E. Monroe 23C41 Chicago, IL 60603	х	х
30	Mohtashemi, E. (Edward) GE Nuclear Energy Tel. (408) 925-1844 Email: edward.mohtashemi@ge.com	175 Curter Avenue M/C 788 San Jose, CA 95125	Х	Х
31	Mohr, Charles (Chuck) Enercon Tel. (678) 354-8354 Fax: Email: cmohr@enercon.com	1345 Ridgeland Pkwy Suite 130 Alpharetta, GA 30004	Х	
32	Nemier, Marie Email: mnemier@curtisswright.com		Х	
33	Newell, W. (Bill) SC 2.2 – 334 (co w/Dean) Electric Motor & Contracting Tel. (757) 487-2121 Fax (757) 487-5983 Email: wgnewell@att.net	3703 Cook Blvd. Chesapeake, VA 23323	Х	
34	Parello, J. (James) SC 2.5 – 344/Vice-Chair SC-2 Westinghouse Electric Co., LLC Tel. (724) 722-5545 Fax (724) 722-5497 Email: parellj@westinghouse.com	1000 Westinghouse Drive New Stanton, PA 15672- 9606	x	х
35	Pavsek, J. (Janez) Siemens Slovenija, I&S Tel. 044-39-746-221 Fax 044-1-474-6106 Email: janez.pavsek@siemens.com	Bratislavska 5 S1-1000 Ljubijana, Slovenia		
36	Pegge, Chris Email: cpegge@strantech.com		Х	
37	Pirrong, Jan S. SC 2.15 – P 1682 CableLAN Tel. (617)-803-0489 Fax (508)- 384-7811 Email: jpirrong@cablean.com	8 Sherwood Drive PO Box 196 Norfolk, MA	Х	

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38	Queenan, Robert Scientech Tel. (208) 524-9311 Fax (208) 524-9238 Email: rqueenan@curtisswright.com	200 S Woodruff Ave Idaho Falls, ID 83401	Х	Х
39	Roy, F. (Fred) Parker Hannifin Corporation Tel. 256-885-3811 Email: fred.roy@parker.com	Instrumentation Products Division 1005 A Cleaner Way Huntsville, AL 35805	Х	
40	Sandberg, S. (Steve) Rockbestos-Surprenant W&C Tel. (860) 653-8360 Fax (860) 653-8412 Email: steve.sandberg@r-scc.com	20 Bradley Park Road East Granby, CT 06026	Х	Х
41	Schinzel, G. E. (Glen) South Texas Project Tel. (361) 972-7854 Fax (361) 972-7073 Email: geschinzel@stpegs.com	P.O. Box289 Wadsworth TX 77483	Х	X
42	Späng, K. (Kjell) KS Miltek Tel. +46-31-298573 Fax +46-31-694594 Email: kjell.spang@swipnet.se	Strandskarsvagen 9 SE-42658 Vastra Frolunda, Sweden	х	Х
43	Steinman, Rebecca Advent Engineering Services, Inc. Tel. (734) 930-7500 Fax (734) 327-7501 Email: RLS@adventengineering.com	Prairie House, Domino Farms P.O. Box 555 Ann Arbor, Michigan 48106	Х	X
44	Tengler, M. (Marek) Stevenson & Associates Tel.+420 377-350 233 Fax +420 377-350 230 Email: tengler@stevenson.cz	VEJPRNICKA 56 Pilsen 34800	Х	Х
45	Van Uffelen, M. (Marco) Tel. +32 14-33-2638 Fax +32-14-31-1993 Email: mvuffele@sckcen.be	Boertang 200 ANS-ARI Building BR3 B-2400, Mol, Belgium	Х	Х
46	Weber, C. E. (Carl) Pacific Gas & Electric Co. Tel. (805) 545-4084 Fax (805) 545-6928 Email: cew2@pge.com	Diablo Canyon Power Plant P.O. Box 56 Avila Beach, CA 93424		Х

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47	Wheless, J. (John) Southern Nuclear Operating Company Tel. (205) 992-6898 Fax (205) 992-0391 Email: <u>imwheles@southernco.com</u>	40 Inverness Center Pkwy. Bin BO57 Birmingham, AL 35242	Х	
48	White, J. (John) SC 2.4 - 383 TXU, CPSES Tel. 254-897-6674 Fax 254-897-0530 Email: <u>i.l.white@ieee.org</u>	PO box 1002 Glen Rose, TX 76043	Х	Х
49	Wood, R. T. (Richard) Oak Ridge National Laboratory Tel. (865) 574-5578 Fax (865) 576-8380 Email: woodrt@ornl.gov	Bethel Valley Road P.O. Box 2008 Bldg. 3500, MS 6010 Oak Ridge, TN 37831-6010	Х	
50	Yamamoto, T. (Toshio) JNES Tel. +81-3-4511-1743 Fax +81-3-4511-1897 Email: yamamoto-toshio@jnes.go.jp	Business Court Shin-3-17-1 Toranomon, Minato-ku, Tokyo, 105-001 Japan	Х	х

X = Attended