



IEEE



**国家核电
SNPTC**

***Forum on Severe Accidents &
Condition Based Qualification***

and

***IEEE Subcommittee On Qualification
IEEE/NPEC/SC 2 Meeting 13-02***

October 14-17, 2013, Shanghai China



IEEE/SNPTC Forum on Severe Accidents and Condition Based Qualification and IEEE Subcommittee on Qualification IEEE / NPEC / SC 2 Meeting 13-02

With more than a dozen operating nuclear power plants and a large number of nuclear power plants under construction in China, the industry will soon realize a greater demand for Equipment Qualification (EQ) and the development of related technologies. As a result, Condition-based Qualification and Equipment Survivability under Severe Accidents is becoming increasingly important.

To meet this specific need of the industry, the State Nuclear Power Technology Corporation (SNPTC) together with IEEE Power & Energy Society/Nuclear Power Engineering Committee/Subcommittee 2 (NPEC/SC 2) on Equipment Qualification are holding a forum on Condition-based Qualification and Severe Accidents. This topic is particularly relevant in light of the Fukushima accident, as the concerns on the survivability of equipment under severe accidents are being emphasized more, especially when designing and qualifying new plants.

The forum will discuss state of the art improved methods for EQ, which are intended to increase confidence in equipment performance and provide a more reliable and flexible way of tracking degradation. Operating plants are required to carry out aging management for the entire life cycle of NPPs to manage the condition of the operating equipment and for life extension efforts, while new plants are considering the use of Condition-based Qualification at the initial EQ stage.

State Nuclear Power Technology Corporation (SNPTC) is the promoter of AP1000 technology and the developer of standard CAP1000 design and the state-of-the-art GIII passive plant CAP1400 design.

This forum is open to all Power & Energy members but will be of greatest value to the nuclear power-oriented engineer with experience with such requirements, but it can also be an aid to engineers, consultants, manufacturers or regulators of the nuclear power industry.

Following the forum, NPEC/SC 2 will also be holding their Subcommittee meeting, which is also open to all forum attendees.

Sponsors

State Nuclear Power Technology Corporation (SNPTC)

Shanghai Nuclear Engineering Research and Design Institute (SNERDI)

Shanghai Power Equipment Research Institute (SPERI)

State Nuclear Power Engineering Company Limited (SNPEC)

State Nuclear Power Automation System Engineering Corp. (SNPAS)

State Nuclear Power Plant Service Company (SNPSC)

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Meeting Highlights

SUNDAY, OCTOBER 13, 2013

13:00—20:00 **Meeting Registration Hours**

MONDAY, OCTOBER 14, 2013

8:00—17:00 **Meeting Registration Hours**

9:00—18:00 **IEEE & SNPTC EQ Technical Forum**

TUESDAY, OCTOBER 15, 2013

8:30—12:00 **Meeting Registration Hours**

9:00—16:30 **IEEE NPEC SC 2 Working Group Meetings**

17:00—22:00 **Huangpu River Cruise (dinner on board) ***

WEDNESDAY, OCTOBER 16, 2013

9:00—16:00 **IEEE NPEC SC 2 Meeting 2013-2 ****

16:15—20:00 **Tour SNERDI and Dinner at SNERDI**

THURSDAY, OCTOBER 17, 2013

9:00—12:00 **IEEE NPEC SC 2 Meeting 2013-2 ****

* All attendees and their spouses/guests are welcome to attend this event.

** All attendees to the forum are also welcome to attend the SC 2 meeting.

Meeting Officials

Chair:

John L White Jr,
True North Consulting
001 (817) 578 4070

Co-Chair:

Shenjie Gu
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Condensed Schedule-1

| IEEE/SNPTC Forum on Severe Accidents and Condition Based Qualification | | | |
|--|--|---|------------------------|
| October 14, 2013 (Monday) | | | |
| Ballroom II, Renaissance Shanghai Caohejing Hotel, Shanghai China | | | |
| Time | Subject | Entity/Organization | Speaker |
| 09:00—09:05 | Introduction | IEEE / NPEC / SC2 | <i>J.White</i> |
| 09:05—09:50 | Welcome Speech | Shanghai Nuclear Engineering Research & Design Institute (SNERDI) | <i>Mingguang Zheng</i> |
| 9:50—10:30 | IEEE and IEEE Standards Association | Institute of Electrical and Electronics Engineers (IEEE) | <i>Ning Hua</i> |
| 10:30—10:50 | Mid-Morning Break | | |
| 10:50—11:30 | Quality Requirements of Equipment for Severe Accident Mitigation | National Nuclear Safety Administration (NRSC) | <i>Zaozhan Sun</i> |
| 11:40—13:30 | Lunch at BLD All Day Dining | | |
| 13:30—14:10 | Condition Based Qualification | Marmon Innovation & Technology Group | <i>Robert Konnik</i> |
| 14:10—14:50 | Optical Fiber Cable Environmental Qualification | CableLAN Products, Inc. | <i>Jan S. Pirrong</i> |
| 14:50—15:30 | TBD | Mitsubishi Heavy Industries, Ltd. | <i>Yasutaka Eguchi</i> |
| 15:30—15:50 | Mid-Afternoon Break | | |
| 15:50—16:30 | Overview of IEC Activities on Instruments Condition Monitoring | SNERDI Representing IEC SC45A | <i>Daowei Bi</i> |
| 16:30—17:10 | Condition-Based Qualification and DCS Equipment Testability | China Techenergy Co., Ltd. (CTEC) | <i>Tao Bai</i> |
| 17:10—17:50 | Thinking of Instrument Survivability under Severe Accident | Nuclear Power Institute of China (NPIC) | <i>Junhui Yu</i> |
| 17:50—18:00 | Adjournment | | <i>Shenjie Gu</i> |

10 minutes for Q&A has also included for each presentation.

Condensed Schedule-2

| IEEE SC2 October 15, 2013 Working Group Meetings | | |
|--|--------------------------------------|---------|
| Meeting Room I, Renaissance Shanghai Caohejing Hotel, Shanghai China | | |
| Time | Subject | Speaker |
| 9:00—11:00 | IEEE 383/IEEE 1682 | |
| 11:00—13:00 | <i>Lunch at Smoki Moto</i> | |
| 13:00—16:30 | IEEE 323 IEC 60780 | |
| 17:00—22:00 | Social Event Huangpu River Cruise | |

Drink and snacks are served.

Condensed Schedule-3

| IEEE SC2 October 16, 2013 | | |
|--|---|------------------------------------|
| Meeting Room I, Renaissance Shanghai Caohejing Hotel, Shanghai China | | |
| Time | Subject | Speaker |
| A. Business | | |
| 9:00—11:00 | 1.Call to order | <i>J. White</i> |
| | 2.Introductions, Approval of Agenda <ul style="list-style-type: none"> a. Roll Call - <i>E. Mohtashemi</i> b. Identification of Guests - <i>J. White</i> c. Approval of Agenda and General Remarks - <i>J. White</i> d. Meeting Fee - \$50 – This includes all Working Group meeting room fees and social event. | <i>J. White</i> |
| | 3.Secretary's Report <ul style="list-style-type: none"> a. Approval of Previous Meeting Minutes b. Status of Action Items c. Status of SC 2 Membership 2013 d. Report of SC 2 Financial Status/Alligator Fund SC-2 (13-1) Meeting May 2012 Qualtech, NP Balance Prior to Meeting - \$2,299.22 Collected at meeting – \$2700 Cost of Meeting - \$2700 Balance (6/6/13) - \$2,299.22 | <i>E. Mohtashemi</i> |
| | 4.Chairman's Report <ul style="list-style-type: none"> a. Summary of SC 2 ADCOM b. Introduction of 2013/2014 SC officers | |
| | 5. Vice-Chairman's Report <ul style="list-style-type: none"> a. Meeting Schedule 14-1 Tampa, FL Date - TBD 14-2 Phoenix, AZ Date - TBD | <i>R. Konnik</i> |
| | 6. Previews None | |
| | 11:00—13:00 | Lunch at BLD All Day Dining |
| B. Presentations | | |
| 13:00—16:00 | 1. IEEE Certification | <i>Ravi Subramaniam</i> |
| | 2. Equipment Dependability Issues for Severe Accidents | <i>Shenjie Gu</i> |
| | 3. NPP Digital I&C Equipment Qualification Practice | <i>Ying Wang</i> |
| | 4. Severe Accident Considerations | <i>Jim Gleason</i> |
| | 5. CPR1000 Equipment Survivability Assessment Under Severe Accident | <i>Dongyu He</i> |
| | 6. Utilization of Nanoindentation Methods for Evaluation of Degradation Rate of Polymeric Materials and Definitions of Condition Monitoring Indicators | <i>Marek Tengler</i> |
| | 7. TopWorx | <i>Greg Merrifield</i> |
| 16:15—20:00 | Tour SNERDI and Dinner at SNERDI | |

Condensed Schedule-4

| IEEE SC2 October 17, 2013 | | |
|--|--|--|
| Meeting Room I, Renaissance Shanghai Caohejing Hotel, Shanghai China | | |
| Time | Subject | Speaker |
| C. Working Group and Liaison Reports | | |
| 9:00—12:00 | SC2.1: IEEE Std 323 (Electric Equip EQ) | <i>J. Gleason</i> |
| | SC 2.2: IEEE Std. 334 (Motors) | <i>J. Dean / B. Newell</i> |
| | SC 2.3: IEEE Std. 382 (Valve Operators) | <i>E. Mohtashemi</i> |
| | SC 2.4: IEEE Std. 383 (Cables) | <i>J. White</i> |
| | SC 2.5: IEEE Std. 344 (Seismic) | <i>J. Parello</i> |
| | SC 2.6: C37.98 (Relays Seismic Qual) | <i>S.Channarasappa / M. Neimer</i> |
| | SC 2.10: IEEE 627 (Overall EQ) | <i>D. Horvath</i> |
| | SC 2.11: IEEE Std. 572 (Connectors) | <i>F. Roy</i> |
| | SC 2.13: IEEE Std. 650 (Battery Chargers) | <i>D. Dellinger</i> |
| | SC 2.14: IEEE Std. 649 (Motor Control Centers) | <i>R. Francis</i> |
| | SC 2.15: IEEE 1682 (Fiber Optic Cable) | <i>J. Pirrong</i> |
| | EPRI Liaison Report | <i>C. Abernathy</i> |
| | ASME Liaison Report | <i>G. Schinzel</i> |
| | NRC Liaison Report | <i>M. McConnell</i> |
| IEEE/ASME NQA-1 Liaison Report | <i>N. Burstein</i> | |
| D. Wrap-Up | | |
| 9:00—12:00 | 1. Old Business | |
| | 2. New Business | |
| | 3. Next Meeting | |
| | 4. Adjournment | |
| 12:00—13:00 | <i>Lunch at BLD All Day Dining</i> | |

Information

ACCOMMODATIONS/HOTEL

The Renaissance Caohejing Hotel is the meeting location, where the EQ forum and IEEE NPEC SC2 meetings will take place.

The Ramada Plaza Shanghai Caohejing Hotel and Shanghai Ruite Hotel are also recommended.



The Renaissance Caohejing Hotel is located at 397 Tianlin Road, Caohejing Hi-Tech Park, Shanghai, China.

T(86 21) 33258951 F (86 21) 33258999

The Ramada Plaza Shanghai Caohejing Hotel is located at 509 Caobao Road, Xuhui District, Shanghai, China.

The Shanghai Ruite Hotel is located at 1888 Yishan Road, Xuhui District, Shanghai, China.

TRANSPORTATION

As for attendees not stay in the Renaissance Caohejing Hotel, shuttle service will be provided twice a day as following schedule between Ramada and Renaissance, and between Ruite and Renaissance.

Shuttle Departure Time:

| | Ramada | Ruite | Renaissance |
|------|--------|-------|-------------|
| Mon. | 7:45 | 7:45 | 18:15 |
| Tue. | 8:30 | 8:30 | 17:00 |
| Wen. | 8:30 | 8:30 | 16:15 |
| Thu. | 8:30 | 8:30 | 13:30 |

The shuttle buses will wait at the main entrances of the hotel.

You can take taxi to the meeting location,

Or choose walking if the weather is good (please refer to the walking maps in page 10).

SERVICE

Service staffs are identified by orange rim at the top of badge. Please contact them for any help.



REGISTRATION

Registration and information desk will be located at the lobby of the Renaissance Caohejing Hotel, Sunday, October 13, 2013 - Thursday, October 17, 2013. Meeting registration is required for all attendees. Badges are required for admission to the forum, SC 2 meeting, lunch, shuttle buses, and other events. Please refer to the "Meeting Highlights" for detail registration hours.

Registration Fee: \$50 or ¥300.

(Should be paid at the Registration Desk)

HUANGPU RIVER CRUISE

The Huangpu River is the mother river of Shanghai. Nanpu Bridge, Yangpu Bridge and Oriental Pearl TV Tower compose of a huge picture scroll. The Bund is the cultural section of Shanghai that best represents the blending of ancient and modern influences. This renowned waterfront district is the city's most famous landmark. Local people honor the Huangpu River as Mother River, and as you view the lights and spectacle from the deck of your evening cruise, you will understand why.

Between the stately colonial edifices along the Bund, the glittering skyscrapers on the eastern shore of Pudong, and the unceasing river traffic, there is plenty to keep your eyes from ever resting. Besides offering a privileged view of the bridges that span the Huangpu, the cruise boats also offer an excellent view of the famous colonial-era buildings that make up the Bund, buildings such as the Peace Hotel with its unique pyramid roof in blazing green and the Customs House with its large clock tower.



TOUR SNERDI

All attendees are welcome to visit SNERDI scheduled in late afternoon in Wednesday upon close of the day session. The location is only 2 miles east of Renaissance Caohejing Hotel. A brief introduction of the Institute including multimedia presentations of CAP1400 is to be offered, which will be followed by a dinner party. Those who are interested should confirm their participation when registration.

Walking Maps

Walking Map from Ramada Hotel to Renaissance Hotel***

Distance in length: 1700 meters



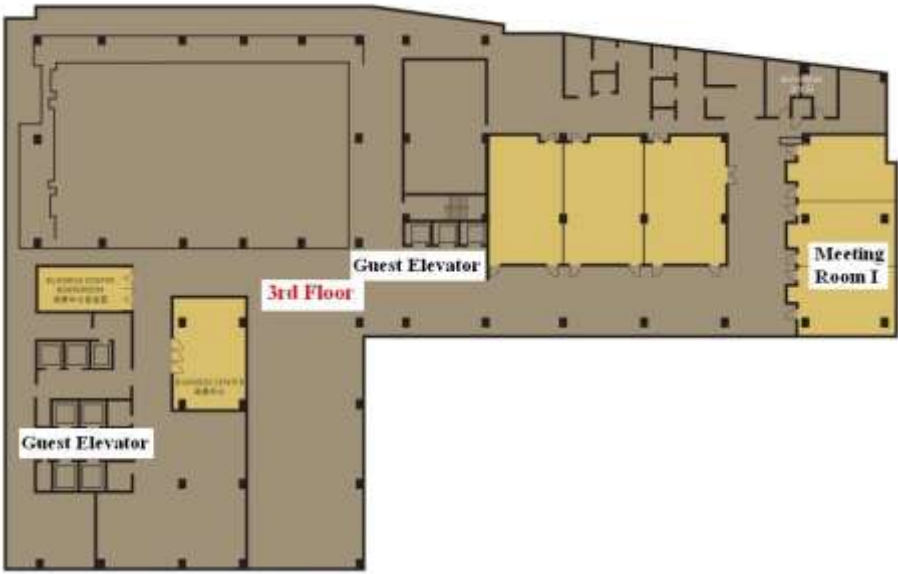
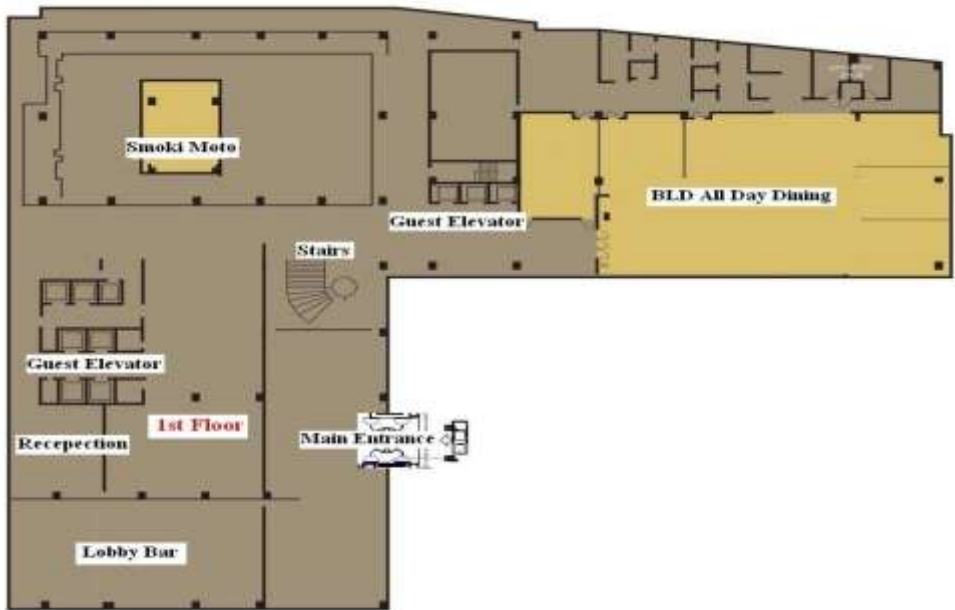
Walking Map from Ruite Hotel to Renaissance Hotel***

Distance in length: 1600 meters



***PLEASE NOTE THE TRAFFIC LIGHTS WHEN CROSSING THE ROAD.

Floor Plan



Sponsors-1

Shanghai Nuclear Engineering Research and Design Institute (SNERDI)

Established in February of 1970, the Shanghai Nuclear Engineering Research and Design Institute (SNERDI), a high-tech enterprise and subsidiary of the State Nuclear Power Technology Corporation since June of 2007, is a key research and design institute with expertise in nuclear electric power technology. It has been at present granted by the national competent authority more than twenty qualification certificates, some of which are State Class A Certificate of Engineering Design, Certificate of Approval for Enterprises with Foreign Trade Rights, Certificate of Foreign Economic Cooperation.



SNERDI has turned out to be a leading technology research and design institute for nuclear electric power in China. Upon completion of the self-design of the first Nuclear Power Plant, the Qinshan NPP, in mainland China, SNERDI has performed again excellent design of Chashma Nuclear Power Plants (CHASNUPP unit 1 and 2) in Pakistan followed by nuclear engineering services. Since the founding of SNERDI, more than 300 research and design projects have been awarded by the State and Ministry not only for the progress made in science and technology but also for excellent design, inter alia, the design of Qinshan 300MWe Nuclear Power Plant has won the Top Grade Prize of the State

Science and Technology Achievement (SSTA) and Special Prize of the Best National Engineering Design.

There are over 1200 employees at present, among which more than 1000 are technically skilled professionals with expertise of nuclear electric power. The business scope of SNERDI is as plant design, EPC contracting, project consulting, equipment research and design, project management, equipment procurement, technology development and engineering services.

At present, SNERDI is both committed to introduction, digestion, absorption and innovation of Generation III technology, and responsible for the overall design of Sanmen and Haiyang nuclear power self-reliance supporting projects while performing plant design of Gen. II plus Nuclear Power Plants as well. Besides, SNERDI has also engaged with AP1000 follow-up projects and Advanced Large Size PWR projects.

With 'Customer the First, Reputation the Highest' as its business objective, SNERDI is open with good reputation and service to domestic and overseas market both in the aspect of nuclear and civil engineering services.

Sponsors-2

Shanghai Power Equipment Research Institute (SPERI)



Shanghai Power Equipment Research Institute (SPERI) was founded in 1959, with the original name of Turbine & Boiler Research Institute. It is the development and application research institute of the power plant manufacturing industry in China. SPERI is a new-high technology corporation and subsidiary of the State Nuclear Power Technology Corporation since October of 2011, and established the State Nuclear Power Equipment & Material Qualification and Consultation Center (SNEQC) in February of 2012.

SPERI mainly engages in research on the key and common technologies of large-scale fossil power and nuclear power equipments and their automatic systems. Combining the scientific experiment research and technical service, design and general contracting projects, and the supervision and management over the equipment and construction of projects, and provides high-tech automatic control products and auxiliary products as well as electromechanical integration products, also provide nuclear power equipment and material qualification service.

SPERI is an affiliated unit of the China Society of Power Engineering a, the secretary-general unit of China Standardization Committee on Steam Turbines as well as its director commissioner, the secretary-general unit of the Boiler Branch of China Standardization Committee on Boilers and Pressure Vessels as well as its director commissioner, the State Quality Supervision and Testing Center for Thermal Power Equipment.

SPERI keeps in close conjunction with SNPTC's development strategy and follows the state's development strategy. It takes "developing environmental-friendly, economic and credible power generation equipment and technology for society" as its mission, and insists on the core value of "sharing, pursuit of truth, benefits, responsibility and innovation", constantly improving its independent innovative ability and actively making contributions to the scientific and technological progress of the power equipment industry of China.



Sponsors-3

State Nuclear Power Engineering Company Limited (SNPEC)

Established in 2007 and headquartered in Shanghai, State Nuclear Power Engineering Company Limited (SNPEC) is a wholly-owned subsidiary of State Nuclear Power Technology Corporation (SNPTC), one of the key state-owned enterprises directly administrated by the Central Government of China.

SNPEC, the Chinese party responsible for the execution of the third generation AP1000 Self-Reliance Supporting Projects and participating all around in the AP1000 Joint Project Management Organization (JPMO), is an entity of professional nuclear power project management and platform for nuclear power self-reliant implementation. We're now engaged in the project management of 4 units of two AP1000 Self-Reliance Projects, Sanmen and Haiyang Nuclear Power Plant (NPP).

Developed by Westinghouse, the AP1000 pressurized water reactors (PWRs) of Sanmen and Haiyang NPP represent state-of-the-art nuclear power technology internationally. Unit 1 of Sanmen is the first AP1000 unit ever commenced in the world and its progress attracts worldwide attention.

SNPEC is also the project management company of the CAP1400 Demo Project, one of the Key National Special Science & Technology Demo Projects, and AP1000 Follow-Up Projects.

The establishment of SNPEC is of critical importance for China to develop nuclear power through “standardized design, factory prefabrication, modular construction, professional management and self-reliant development”. These innovative concepts are coming into reality through technology introduction, digestion, absorption and reinvention under the leadership of SNPTC.



Sponsors-4

State Nuclear Power Automation System Engineering Corp. (SNPAS)

State Nuclear Power Automation System Engineering Corp. (SNPAS) was established with investment from State Nuclear Power Technology Corporation Ltd (SNPTC) and Shanghai Automation Instrumentation Corporation Ltd (SAIC). On March 30th, 2008, SNPAS held an inauguration ceremony in Shanghai.

The main business scope of SNPAS includes: NPP engineering I&C system design, integration, installation and commissioning and other engineering technical service; NPP I&C equipments complete supply; NPP I & C equipments research and development; NPP I&C system spare parts and operational technical support; System simulation, plant management system, weak current engineering and medium-low voltage electrical equipments and other nuclear power related business.

SNPAS would conform to the guideline “Specialization, Self-reliance, Standardization, Serialization, and Internationalization”, upholds the corporate culture “Nuclear oriented, Cooperation highlighted and Harmony grounded”, and base on the AP1000 technology transfer, provide control system, measurement instruments, actuating mechanisms and other full-scope line products and technical service for nuclear power engineering at home and abroad.



Sponsors-5

State Nuclear Power Plant Service Company (SNPSC)



State Nuclear Power Plant Service Company (SNPSC), which is a wholly-owned subsidiary by State Nuclear Power Technology Corporation Ltd. (SNPTC), was founded on March 26, 2008. She, based on the Nuclear Non-destructive Testing Centre (NNC), is a specialized company adhere to the direction of innovation and technology development for nuclear power plant operation technical support.

The company is located in Caohejing High-tech Park, Shanghai. The company has a reasonable level of specialized technology and management staff team, modern office facilities, advanced NDT training classrooms and other laboratories.

SNPSC keep firmly to the specialized orientation, pursue scientific and technological innovation and maintain enterprising spirit. SNPSC will make arduous efforts to built herself into a specialized company with advanced technology, good equipment and rapid response to emergency State Nuclear Power Plant Service Company will make arduous efforts to built herself into an innovated high-tech company which can rank as a leading company in nuclear power operation services company with business authority, specialized personnel and international platform.