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December 1, 2009

MEMORANDUM TO: Michael R. Johnson, Director
Office of New Reactors

FROM: Glenn Tracy, Director */RA John Tappert for/*
Division of Construction Inspection
& Operational Programs
Office of New Reactors

SUBJECT: FOREIGN TRIP REPORT ON UNITED STATES NUCLEAR
REGULATORY COMMISSION STAFF VISIT TO CHINA FOR
MEETINGS WITH THE NATIONAL NUCLEAR SAFETY
ADMINISTRATION OF CHINA AND VISITS TO AP1000
MANUFACTURING AND CONSTRUCTION SITES

From October 20 through November 1, 2009, Glenn Tracy, Juan Peralta, and Jeffrey Jacobson, DCIP, along with Richard Croteau, Region II, visited China to advance cooperation with the National Nuclear Safety Administration (NNSA) in the areas of construction and vendor inspection. The delegation also observed ongoing construction activities of the Westinghouse AP1000 reactor at the Sanmen Nuclear Power Station, observed module fabrication at the Shandong Nuclear Equipment Manufacturing Company, and observed fabrication of reactor vessel internals at the Shanghai Electric Industrial Park and Nuclear Power Equipment and Heavy Industry Group.

As a result of this trip, NNSA agreed to begin cooperation in the vendor inspection area with joint observations of vendor inspections in the U.S.A. and China relative to the manufacture of components for the AP1000. NNSA also agreed to begin a construction inspector exchange program, commencing with one individual from NNSA coming to Region II in January 2010 and one or two NRC inspectors going to NNSA in March 2010 to observe AP1000 construction. This exchange program will allow the NRC to obtain important insights into the construction and inspection of the AP1000. The NRC agreed to provide support to NNSA in the form of one staff person for a few weeks early in 2010 to help NNSA prioritize inspection resources for the AP1000 using insights gained from development of the NRC's construction inspection program, including oversight of the Inspection, Tests, and Acceptance Criteria (ITAAC) closure process.

The delegation also obtained important insights with regard to module/component fabrication and ongoing construction of the AP1000 reactor. The delegation met with representatives and toured the Shandong Nuclear Power Equipment Manufacturing

Enclosures: As stated

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Company (SNPTC), the Shanghai Electric Nuclear Power Equipment Co. and the Sanmen AP1000 nuclear construction site. (b)(4)

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The enclosed trip report will likely be of interest to the NRC Commission.

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DATE	11/25/2009	12/1/2009	12/1/2009	12/1/2009

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NRC Final Trip Report

Subject

Meetings with National Nuclear Safety Administration of China and visits to AP1000 manufacturing and construction sites.

Travel Dates, Countries and Organizations Visited

October 20 through November 1, 2009. Beijing, Qingdao, Haiyang, Shanghai, Ningbo, Sanmen, China. National Nuclear Safety Administration of China (NNSA), Shandong Nuclear Power Equipment Manufacturing Co., Shanghai Electric Industrial Park and Nuclear Power Equipment and Heavy Industry Group, CNNC Sanmen Nuclear Power Co.

Author/Title/Agency Affiliation

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Background/Purpose

The primary purposes of this trip were: (1) to advance cooperation with the National Nuclear Safety Administration of China (NNSA) in the areas of construction and vendor inspection; (2) to observe ongoing construction activities of the Westinghouse AP1000 reactor at the Sanmen Nuclear Power Station; and (3) to observe module fabrication at the Shandong Nuclear Equipment Manufacturing Company and steel forging and fabrication at the Shanghai Electric Industrial Park and Nuclear Power Equipment and Heavy Industry Group.

Abstract: Summary of Pertinent Points/Issues

As a result of this trip, the NRC delegation successfully advanced cooperation with NNSA in the areas of vendor inspection and construction inspection. During meetings with the delegation, NNSA agreed to begin cooperation in the vendor inspection area with joint observations of vendor inspections in the U.S.A. and China relative to the manufacture of components for the AP1000. NNSA also agreed to begin a construction inspector exchange program, commencing with one individual from NNSA coming to Region II in January 2010 and one or two NRC inspectors going to NNSA in March 2010 to observe AP1000 construction. This exchange program will allow the NRC to obtain important insights into the construction and inspection of the AP1000. The NRC agreed to provide support to NNSA in the form of one staff person for a few weeks early in 2010 to help NNSA prioritize inspection resources for the AP1000 using insights gained from development of the NRC's construction inspection program, including oversight of the Inspection, Tests, and Acceptance Criteria (ITAAC) closure process.

The delegation obtained important insights with regard to module/component fabrication and ongoing construction of the first AP1000 reactor. The delegation met with representatives and toured the Shandong Nuclear Power Equipment Manufacturing Co.

(SNPTC), the Shanghai Electric Nuclear Power Equipment Co., and the Sanmen AP1000 nuclear construction site. (b)(4)

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DISCUSSION

Vendor Inspection

On October 23, 2009, the delegation met with NNSA's Northern Regional Office (NRO) in Beijing. It is through this office that NNSA conducts their vendor inspection program. Among those in attendance were Deputy Director General Li Zongming, Deputy Director Yan Tianwen and their inspection managers. In addition, several technical experts from outside NNSA participated in the meeting. During the meeting, there was a significant exchange of information regarding Chinese regulations, vendor inspection programs and process, domestic vendor licensing program and foreign vendor registration and oversight, and environmental qualification and testing programs.

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The NRC delegation provided an overview of its construction inspection and vendor inspection programs, including our FY10 inspection plans and we invited NNSA to join the NRC in several activities, as resources permit, highlighting those involving AP1000 components. Among the inspections discussed was the upcoming Engineering Design Verification (EDV) Inspection at Westinghouse tentatively planned for late FY 2010. The EDV will assess the adequacy of the design translation through a "vertical slice" review of two safety systems. (b)(4)

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Module Fabrication

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On October 26, the delegation met with officials of Shandong Nuclear Power Equipment Manufacturing Company (SNPEMC) including Deputy General Manager Tang Chuanle and QA Manager Yao Kelun. This facility is located in a new industrial zone outside of Haiyang about 10 minutes from the Haiyang AP1000 currently under construction. The entire facility was built in 10 months and they are currently fabricating structural and containment vessel modules for the AP1000s at Sanmen and Haiyang. SNPEMC received their ASME N and NPT stamps in May of this year, and are now one of fourteen ASME certificate holders in China. The delegation toured the manufacturing facilities and observed ongoing construction of the AP1000 CA 20 module for Sanmen 2 and other components.

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Construction Inspection Cooperation

On October 28, the delegation met with Wang Zhontang, Director General of NNSA's Shanghai Regional Office, responsible for the AP1000 reactors under construction at Sanmen and Haiyang. Also in attendance were John Liu, Vice-Director, Chen Weiping, Deputy Director, and Feng Jian-Ping, Director of Surveillance and AP1000 projects. The

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NRC delegation was also joined by Mr. Joeseeph Sepulveda from the U.S. Department of State's Embassy in Beijing. Mr. Sepulveda accompanied the delegation for the remainder of the trip.

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During the meeting the delegation provided to NNSA an overview of the NRC's construction inspection program, focusing on ITAAC, and how ITAAC are an integral part of the NRC's new Part 52 licensing process. (b)(4)

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The delegation explained that it is through ITAAC that the license will confirm, and the NRC staff will selectively inspect, that the licensing commitments made in the design certification have actually been fulfilled.

As part of its presentation, the delegation explained how the NRC staff has prioritized the approximately 900 ITAAC for the AP1000, and how we ultimately plan to inspect a significant portion of the ITAAC. (b)(4)

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Regarding joint cooperation on construction inspection, NNSA was fully supportive in all respects, including beginning an inspector exchange program starting in early 2010. This would commence with one of the six NNSA staff already slated to come to the NRC being stationed at Region II in January 2010 and one or two NRC inspectors to the Shanghai Regional Office in March 2010.

Shanghai Electric Equipment Manufacturing

On October 29, the delegation toured the Shanghai Electric Industrial Park and Nuclear Power Equipment and Heavy Industry Group. This location and another forging facility 7 kilometers away, fabricate many of the nuclear components for the nuclear power plants indigenous to China. This facility was part of a huge new industrial complex built on land

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recently reclaimed from the sea. The complex was completed in 2008 and was developed over a four year time period. The Shanghai Nuclear Power Equipment and Heavy Industry Group recently received their ASME NPT and N stamps and are planning to expand their facility despite having just opened it. (b)(4)

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Sanmen Nuclear Power Station

On October 30, the delegation toured the AP1000 construction site at the Sanmen Nuclear Power Station and met with Gu Jun, President of China National Nuclear Corporation (CNNC), Sanmen Nuclear Power Company. This is a "greenfield" site and is designed for six AP1000 units, the first two of which are currently under construction. During the visit, Mr. Gu provided the delegation a detailed briefing on the construction project. (b)(4)

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Pending Actions/Planned Next steps for NRC



- Identify NRC candidates for inspector exchange program with NNSA
- Identify NRC candidate(s) for 2-4 week assignment to help NNSA prioritize inspection resources using NRC inspection program development activities including insights gained from prioritization of ITAAC

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- Plan for observation of NNSA's vendor inspection at Curtis Wright
- Supplement NRC/NNSA MOA with agreed upon areas of cooperation
- Continue discussions with NNSA regarding the status of NRC's review of AP1000 shield building design

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