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Date: March 18, 2005

( )

Southern California Edison

( )

Subject: Replacement Steam Generators
San Onofre Nuclear Generating Station, Unit 2 & 3

Ref: Your letter dated November 30, 2004

Dear ( )

Thank you for your letter of November 30, 2004 concerning RSG design and other topical issues. We also appreciate Edison's assistance and comments through the last Design Review and Management Meetings.

Edison and MHI had productive meetings from December 13 to 17 in MHI Kobe and ( ) and discussed the issues related to your concerns. Also we had Executive Meeting on February 9 followed by a design review meeting. Based on the discussions in both meetings, we are pleased to update you with direction for resolution and current status.

1. RCS flow evaluation

   We understand RCS flow is one of the important issues for SONGS. Our preliminary evaluation results required us to modify primary nozzle (inlet nozzle) diameters to restrict RCS flow and thereby change the pressure drop and flow rate across the RSGs as shown in Figure 1. To support MHI's design effort, Edison was asked to provide the best estimate operational flow data. This topical discussion is continuing.

   To crosscheck the reliability of RCS flow rate evaluation, MHI also agreed to do a more detailed RCS loop flow analysis, following Edison's suggestion. This work will be done by utilising ( ), because they have RCS loop model information including pumps, pipes, core, etc. MHI requires ( ) to estimate the pressure drops in both original SG (OSG) and

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replacement SG (RSG) independently. Now( )is developing RCS model based on MHI supplied data and will report preliminary results to Edison as well as MHI, in the coming April 7 meeting at SONGS. The engineering schedule for the RCS flow issue is shown in Table 1.

Additionally, we are now preparing a mock-up test in Takasago R&D Center to verify the flow resistant factors of inlet and outlet nozzles. The outline of the mock-up test is shown in Figure 2. This mock-up test is being performed by MHI as part of its own effort to enhance the validity of the MHI design. After the tests and analysis, we will finalize the nozzle design and configuration, well before starting the machining of the nozzle part in approximately August 2005.

2. Anti-Vibration Bar design

Anti-Vibration Bar (AVB) design is one of the most critical design issues in the SONGS RSG design. We are aware of recent US experience of tube wear in the AVB design in large size replacement steam generators. We understand that it is a very important area for design and fabrication which we will carefully address. Edison and MHI mutually agreed to review available data related to the cause of the tube wear event. We will modify and improve our AVB design from our conventional design developed for smaller RSGs than SONGS, based on this review result. A typical AVB design is shown in Figure 3. V-shape AVB bars are inserted to prevent fluid induced vibration (fluid-elastic instability) during operation. The engineering schedule for AVB design is shown in Table 2.

Fabrication of AVBs will start from January 2006. Before that we will study previous MHI design and fabrication experience, which utilized a similar tube specification and tube manufacturer (( )). We will also get the critical dimensional and tolerance data of SONGS specific tubing through the PPQ (Pre-Production Qualification test) process, which will start in June 2005. PPQ test results will allow MHI to confirm the adequacy of the design for the SONGS AVBs. The verification procedure as well as design concept itself will be discussed with Edison's Design Team in the coming few weeks.

Along with PPQ test, we will reflect the actual gap measurement of a preceding RSG project. The data will be available at the end of July 2005.

Additionally, we are attempting to utilise an AVB design specialist in the US to assist MHI in the design efforts.

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3. Seismic Issues

For SONGS the seismic issue is more important than for other plants in the US because California is a high seismic region. The seismic analysis is collaboration work of Edison, MHI, and( ). The Flow chart of seismic work is shown in Figure 4.
After the discussion with Edison in November of 2004, MHI accelerated the modeling of RSGs for seismic issues and has already submitted a stick mass model of the RSGs to Edison in December of 2004 for review. The modeling procedure itself was discussed between Edison's seismic experts and our engineers, and agreement was reached on the particulars of the model. We have updated the MHI documents to incorporate the Edison comments. The stick mass model was also crosschecked by( )structural engineers, and the RCS flow model with RSG stick mass model was finalized in this March.

The next step is RCS loop structural model analysis to confirm the applicability of the OSG design spectra. The RCS loop model analysis is being carried out by( ). A preliminary RCS seismic analysis result shows that here will be no major impact on seismic loads compared to previous loads with OSGs. Therefore, there should be no critical concerns regarding material procurement of major forgings that we have already started. These preliminary results will be presented in the coming Edison/MHI/( )meeting scheduled in April 2005.

MHI is also performing other design work prior to the final RCS analysis by( ). MHI is developing draft RSG seismic analysis using floor response spectra for the structural design of the RSG internals. MHI has closely maintained the center of gravity and overall RSG mass to that of the OSGs. This has allowed MHI, with Edison's concurrence, to use the OSG floor response spectra. Therefore, MHI seismic experts predict that there will be no major change in dynamic response of the RSG internals. Table 3 shows the engineering schedule for seismic (structural) analysis issue.

4. Moisture separator design

Since the design of moisture separators is not critical at this time, we have not had detailed discussion with Edison Design Team on this issue. MHI's design is a multi-separators system. MHI has conducted basic performance testing for a full size unit separator at( ), to get several conditions' moisture carry over output data, under several combinations of inlet steam and water flow, for actual operating conditions. And, MHI has conducted detailed 3-dimensional thermal and hydraulic analysis to evaluate detailed inlet steam and water flow

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distribution to each separator unit for SONGS. Then, MHI has evaluated total outlet moisture carry over (with large margin) by using the above experimental data and calculation results. Therefore, MHI is looking forward to having detailed discussions on the design of RSG internals this summer. Further, MHI is contracting with an outside consultant familiar with the separator design similar to RSGs of the SONGS size.

5. Third party review

One of your suggestions was to utilize a third party design review by knowledgeable RSG design engineers. MHI has contacted several candidates in the US who have experience in designing large scale RSGs. While the experts should be familiar with the whole RSG design, our focus is on the tube bundle design, so we have chosen ( )as an expert in this area. He joined the last design review meeting with SCE in February 2005. We also retain( )who is knowledgeable about AVB design from June to August 2005.

6. Engineering Resources (Additional Information)

In order to meet the challenging schedule requirements for the SONGS RSG project, MHI and Edison have worked together intensively on this RSG project since October 2004. We reviewed our design progress last several months, and we are increasing our engineering resources. This activity is for accelerating our design itself as well as to meet Edison's expectation in design quality.

We have already added 3 engineers in February 2005 and will increase another 6 engineers by the beginning of April 2005. By this effort, we believe we can catch up the schedule by this summer.

Again, on behalf of the entire organization, I would like to thank you for giving us the opportunity to serve your plant.

Sincerely yours,

( )

Kobe Shipyard & Machinery Works
Mitsubishi Heavy Industries Ltd.

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Figure 1. Primary nozzle design for RCS flow restriction

Table 1. Schedule of RCS flow rate evaluation

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Figure 2. Schematic view of mock-up test for RCS flow evaluation

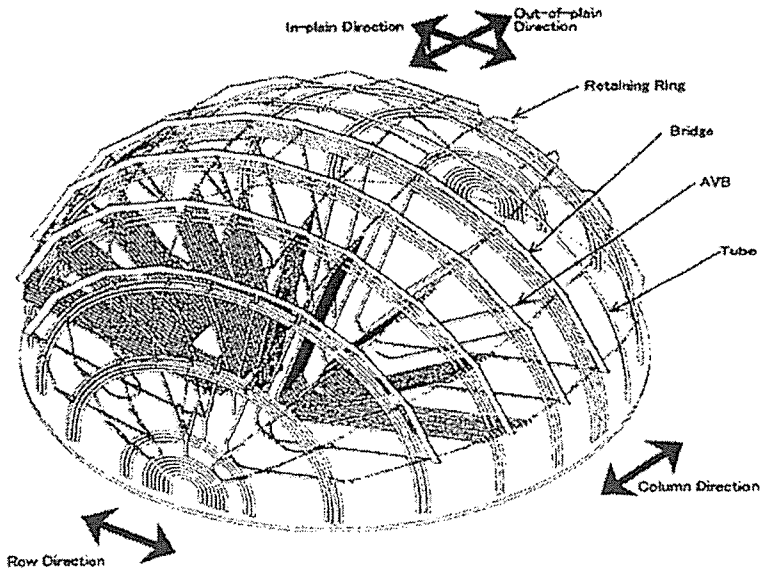

Figure 3. Typical AVB design by MHI

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Table 2. Schedule of Anti-Vibration Bar Design

Figure 4. Work flow of seismic evaluation

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Table 3. Schedule of seismic analysis and evaluation