

Joosten, Sandy

From: Bill Hawkins <billlee123456@gmail.com>
Sent: Sunday, June 16, 2013 12:17 PM
To: CHAIRMAN Resource; CMRAPOSTOLAKIS Resource; CMROSTENDORFF Resource; CMRMAGWOOD Resource; Dorman, Dan; Leeds, Eric; Benney, Brian; Borchardt, Bill; Lantz, Ryan; Hall, Randy; Howell, Art; R4ALLEGATION Resource; Walls, William; Freedhoff, Michal
Subject: SONGS Shutdown not due to ASLB and Public hearings, because its Unit 2 Return Reports were Full of Errors & Risks

NRC Job is Public Safety and not fighting with ASLB for SONGS Profits/Production of Nuclear Energy, NEI Job is Promotion of Nuclear Energy. INPO Job is Operational Excellence, EPRI is Research

NRC Considers Voiding Key Ruling On San Onofre

Friday, June 14, 2013

By Alison St John

Federal Nuclear Regulatory Commission staff wants to void a ruling that played a significant role in Southern California Edison's decision to shut down the San Onofre Nuclear Generating Station.

Edison decided shut the nuclear power plant down for good partially because the Atomic Safety Licensing Board ruled there should be public hearings before any restart plan would have been approved by the Federal Nuclear Regulatory Commission.

The ASLB is a panel of judges, an arm of the NRC. The group Friends of the Earth pushed for those public hearings.

Now, Kendra Ulrich of FOE said NRC staff are preparing to wipe the judges' ruling from the record. Ulrich said the regulatory agency is too closely allied with the companies they are regulating.

“That’s why they want to vacate this order,” she said. “They want to make sure that this very comfortable relationship that they have established is maintained.”

Lessons From Fukushima For San Onofre

Tuesday, June 4, 2013

The former head of the Nuclear Regulatory Commission said plans to restart San Onofre at 70 percent power do not inspire him with confidence. Gregory Jaczko and former Japanese prime minister Naoto Kan spoke in San Diego at a seminar.

Jaczko said the melt down at Fukushima was a wake-up call that made him realize the industry needs a new way to measure risk.

“What I’ve come to realize,” Jaczko said, “is that the usual ways of analyzing this with risk analysis is not very useful. Because most of the time things don’t happen and don’t go wrong, but when the one thing does go wrong that nobody can predict, the consequences are tremendous.”

Jaczko said the cost benefit approach that says it is not worth investing in something that is unlikely to happen means the nuclear industry is chronically underprepared for accidents. He said he learned from Fukushima that the industry and regulators have to pay much more attention to the economic and personal consequences of an accident.

Arnie Gundersen, a consultant with the group Friends of the Earth said the probability of a nuclear power plant accident is in fact much higher than estimates, because five units have melted down in the past 35 years: one at Three Mile Island, one at Chernobyl and three at Fukushima.

“We are dealing with a technology that can have 40 great years and one bad day,” Gundersen said, “and that one bad day can destroy a country.”

Peter Bradford, a commissioner with the NRC at the time of the Three Mile Island accident, said the regulatory agency pledged to become more transparent but in fact the opposite has happened. He pointed out little was done after Fukushima to improve safety at U.S. power plants, whereas there was heightened security after the Boston bombings.

Bradford called for appointing nuclear regulatory commissioners who have a record of protecting public safety, as well as a record of technical experience with the industry.

A question specifically about the proposal to restart the San Onofre nuclear power plant elicited a skeptical response from Jaczko. The plant has been offline since January 2012 after a small radiation leak and the NRC is currently considering a proposal to restart one reactor at 70 percent for five months. “Just looking at it as an outsider now,” Jaczko said, “the approach that is being taken is not one that instills tremendous confidence in me because the approach is for operation at reduced power. In principal, what you should see is design modifications and changes that allow operations at the licensed power levels.”

Lessons Learnt for NRC Commission from San Onofre RSG 10CFR 50.59

Dwight Nunn, SCE Vice President in 2004 wrote to MHI, “This will be one of the largest steam generators ever built for the United States and represents a significant increase in size from those

that Mitsubishi Heavy Industries has built in the past. It will require Mitsubishi Heavy Industries to evolve a new design beyond that which they currently have available. Such design evolutions require a careful, well thought approach that fully evaluates the risks inherent in creating a new and significantly larger steam generator. Such design evolutions tend to challenge the capability of existing models and engineering tools used for proven steam generator designs. Success in developing a new and larger steam generator design requires a full understanding of the risks inherent in this process and putting in place measures to manage these risks. Understanding the difficulty in transitioning from the standard Mitsubishi Heavy Industries steam generator design to a new and larger two-loop design. A. anti-Vibration Bar design (and installation) is by far one of the most challenging tasks that will face Mitsubishi Heavy Industries and San Onofre; in fact, it is in our opinion the single most significant task facing the industry for steam generators of our size today. Since the San Onofre steam generators are one of the largest steam generators ever built and large steam generators appear more susceptible to wear (in fact, our current steam generators have experienced a high percentage of plugged tubes due to wear), it is a paramount concern of ours that we ensure a reliable support design. We consider this engineering challenge perhaps the most critical issue at this time. Recent industry experience with Anti Vibration Bar supports has demonstrated the difficulty in developing a successful design (the recent experience at a United State's plant emphasized this point when more that 180 tubes were found to have wear indications after only one cycle of operations, some of these indications were up to 20% through wall). Our discussions with Mitsubishi Heavy Industries to date have not resulted in a plan that will successfully address this industry concern. Both San Onofre and Mitsubishi Heavy Industries are having difficulty in formulating such a plan. Consequently, the design of the new steam generators is currently proceeding using the existing steam generator seismic response based on a like-for-like replacement concept (although the old and new steam generators will be similar in many respects they aren't like-for-like replacements). Based upon these observations, I am concerned that there is the potential that design flaws could be inadvertently introduced into the steam generator design that will lead to unacceptable consequences (e.g., tube wear and eventually tube plugging). This would be a disastrous outcome for both of us and a result each of our companies desire to avoid. In evaluating this concern, it would appear that one way to avoid this outcome is to ensure that relevant experience in designing larger sized steam generators be utilized. It is my understanding the Mitsubishi Heavy Industries is considering the use of Westinghouse in several areas related to scaling up of your current steam generator design (as noted above)."

Dwight Nunn, SCE Vice President in 2005 wrote to MHI, "In our joint technical meeting, we also learned more about certain thermal-hydraulic aspects (void fraction) of the RSG design. Void fraction is an important thermal-hydraulic parameter, related to the probability of tube dry out occurring during power operation (the higher the void fraction, the higher the probability of dry out). Tube dry out is an undesirable phenomenon as it may eventually result in tube cracking. The information presented to Edison in the most recent Technical Meeting, indicated that for the SONGS RSG the expected void fraction is very high. Consequently, Edison requests that MHI launch a consolidated effort aimed at addressing high void fraction in the RSG.

MHI Root Cause states, "Thus, not using ATHOS, which predicts higher void fractions than FIT-III at the time of design represented, at most, a missed opportunity to take further design steps, not directed at in-plane FEI, that might have resulted in a different design that might have avoided in-plane FEI. However, the AVB Design Team recognized that the design for the SONGS RSGs resulted in higher steam quality (void fraction) than previous designs and had considered making changes to the design to reduce the void fraction (e.g., using a larger downcomer, using larger flow slot design for the tube support plates, and even removing a TSP). But each of the considered changes had unacceptable consequences and the AVB Design Team agreed not to implement them. Among the difficulties associated with the potential changes was the possibility that making them

could impede the ability to justify the RSG design under the provisions of 10 C.F.R. §50.59. Thus, one cannot say that use of a different code than FIT-III would have prevented the occurrence of the in-plane FEI observed in the SONGs RSGs or that any feasible design changes arising from the use of a different code would have reduced the void fraction sufficiently to avoid tube-to-tube wear. For the same reason, an analysis of the cumulative effects of the design changes including the departures from the OSG's design and MHI's previously successful designs would not have resulted in a design change that directly addressed in-plane FEI."

From: August, JW **Sent:** Tuesday, June 11, 2013 3:35 PM **To:** August, JW **Cc:** 'Maureen.Brown@sce.com' **Subject:** response to 10News questions for SONGS story

We requested a response to our story from Southern California Edison on the issues raised in our report of June 12th. Maureen Brown the Media Relations Project Manager at SCE provided us a transcript of the news conference of CEO Mr. Craver in which, she says, he responds to two or our questions. The transcript for the entire conference is provided for your review. We have taken excerpts from the conference that pertain to our questions and HAVE included them below.

10News questions - A SCE document describes the RSG as very similar to the generators they were replacing....quoting in part.... a "replacement in kind, in terms of an overall fit, form and function, with no, or minimal" modifications. Is this still the position of SCE? Can you elaborate on why your employer believes this to be true?

SCE response to 50.59 Questions: You know, this term of like for like is actually something - I'm not really exactly sure whether that's even grown up. It's not in the 50.59 regulation. There's no such term like for like. The term is really that the new equipment has to be of a similar form, fit and function to the equipment that it's replacing. So there is no like for like and in this case in the nuclear industry steam generators have had a - an issue really across all of the plants or the vast majority of the plants, what they call cracking and corrosion of the tubes. It was determined many years ago that the principal cause of that was the alloy, the type of metal that was used in steam generator tubes, so-called INCONEL alloy 600. So that was - it was determined that the way you could solve the cracking and corrosion problem in the nuclear steam generators was to use an improved metal, the INCONEL alloy 690. However the - that tube metal also does not conduct heat as well as the previous metal. So all of the steam generator replacements that have been done in the industry over the last many years really are to improve a problem with the metal and the cracking and corrosion. So you certainly wouldn't want to put the same, you know, the same stuff back into the steam generators because you're just going to have the same problem, and that's where the improvements in the metal were made.

Again because the metal doesn't conduct heat as well, really you end up having to put additional tubes in there so that you can get the same type of heat transfer in the steam generators. So really our - there's no additional power consideration here. It was really to address a cracking and corrosion problem. In fact in our case the two steam generator - or the two units, Unit 2 and 3 - had we not replaced the steam generators one of those units would have shut down in 2012, and the other unit would've had to shut down in 2015. So they were really at a critical point where you could no longer, you know, plug the tubes and maintain safety. So they had to be replaced and that's what we did with the improved

10News questions - Does SCE stand behind its decision to portray the changes to the plant as falling under 50.59 designation? Critics say SCE should have used the 50.90 process but instead chose the 50.59

SCE response to 50.59 Questions: The whole process that's been used for replacing steam generators in the industry is a pretty well traveled path. After the first few were done several years ago at other plants, the so-called 50.59 process was established. And essentially I like to think of it as a test. It basically says, "If you have essentially the same form, fit and function as the previous steam generators then you can go forward with the so-called 50.59 process." When we went through that analysis, which takes quite some time to do, we determined that much of it was really standard and could go through the - a - the 50.59 process. But we actually did need to obtain some license amendments to our technical specifications in our license. So it's - the 50.59 process is basically a - as I say it's a - it's kind of a test. If you go through that analysis and you determine that yes, what you're proposing is essentially the same form, fit and function as what you had in there before, then you can go forward with the replacement. Anything that's outside of that has to go through a license amendment process. So as I said we actually had a little bit of both in our case.

SONGS Insider Response to SCE Comments: A like-for-like replacement is defined as the replacement of an item with an item that is identical. For example, the replacement item would be identical if it was purchased at the same time from the same vendor as the item it is replacing, or if the user can verify that there have been no changes in the design, materials, or manufacturing process since procurement of the item being replaced. If differences from the original item are identified in the replacement item, then the item is not identical, but similar to the item being replaced, and an evaluation (Such as 10CFR 50.59, Changes, Tests or Experiments) is necessary to determine if any changes in design, material, or the manufacturing process could impact the functional characteristics and ultimately the component's ability to perform its required safety function. If the licensee cannot demonstrate that the replacement item is identical and differs in design, or results in a design change, new test or experiment, which adversely affects RSG's functional characteristics (High Void fractions, High steam flows, Wrong AVBs for FEI) and ultimately the RSGs tubes ability to perform its required safety function (RCS Barrier), then the licensee needs to inform NRC ASAP and proceed safely for a NRC Approved 50.90 License Amendment like Palo Verde.

The OSGs operated for 28 years at a void fraction of ~ 96% and fluid velocities of ~ 22 feet/sec, steam side pressure of 900 psi and a circulation ratio of 3.3. Under these conditions, OSGs experienced only flow-induced random or out-of-plane vibrations, but not fluid elastic instability. That is why, the RSGs AVBs were only designed for out-of-plane vibrations.

SCE added 11% heat transfer area (377 new tubes plus equivalent addition of more than 670 tubes by increasing the average length of heated tubes by ~ 50 inches, increased RCS and feedwater flows, reduced steam side flow area and changed the void fraction of OSG of 96% to 99.6% in the RSGs. Despite warnings from Dwight Nunn and SCE/MHI Joint AVB team to reduce high void fractions, SCE/MHI decided to live with the unacceptable consequences of increased void fractions by relying on the new AVB Design to perform miracles in countering the effects of high void fractions. SCE Management did not make any efforts to decrease the void fractions, because it would have reduced the thermal output and profits from RSGs, delayed the construction /installation schedule and triggered a NRC 50.90 License Amendment and Public Hearings. The increased void fractions with a new AVB design by SCE/MHI Joint AVB team was a new test/experiment, which caused fluid elastic instability and tube leak in Unit 3. Defective and evasive 10CFR 50.59 for both units were

prepared by one SCE Engineer and approved by another SCE Engineer during 2008 - 2009. These SCE Engineers should have known about Dwight Nunn's Letters and SCE/MHI Joint AVB team recommendations to reduce high void fractions, but did not address the effects of these changes as required by 10CFR 50.59. Call it ignorance, greed, negligence or management direction, but the most important design function of OSGs of void fractions and AVB design was changed. Hence any engineer with common sense in elementary heat transfer should have seen the adverse consequences of high void fractions and then applied for a 50.90 License Amendment. Another point, the OSGs installed in 1983 had a thermal rating of 1705 MWt and RSGs had a thermal rating of 1729 MWt, so steam flows were also changed. It is not about the same steam flows as SCE understands, but it is about change in a design function caused by change in tube material to have higher steam flows. So now changed steam flows, increased heat transfer area, high void fractions, increased RCS flows, untested AVB Design and addition of more tubes to have higher steam flows and higher profits affected safety, vibrations or structural integrity of the tubes. The defective design of RSGs and 10CFR 50.59 shutdown San Onofre Units 2 & 3 forever.

A review of NRC 10CFR 50.59 inspection manual indicates, that the preparer has to answer many questions about the effect of these changes, which SCE/MHI avoided and are still in a denial about the effects of the changes and their legal obligation to inform NRC. NRC Commission has very smart thermal-hydraulic engineers and if they would have known about it, they would have 100% guaranteed caught the adverse effect of these changes in time. Probably, SCE 50.59 was examined by a NRC Inspector, who did know about these things and said OK. NRC AIT Team was also wrong about SONGS 50.59. See Arnie Gundersen, John Large, Dr. Joram Hopenfeld's Testimony and ASLB Ruling.

10News questions - Did SCE ever consider designing a generator in the same manner as Palos Verdes? Our experts say that your firm owns a percentage of the plant and would have had access to information that would allow you to duplicate was apparently has been successful in Arizona. Any comment on this?

SCE Response: to 10 Questions: We don't have access to all the bid process information for this period so we can't provide you with a lot of specific information. Instead, I can say that SCE conducted a thorough competitive bid process and selected a company that was most appropriate for this job. There are sister designs throughout the industry but each plant has its own unique requirements.

SONGS Insider Response to SCE Comments: - Palo Verde is larger than San Onofre, but basically the same Design. Palo Verde Units 1, 2 & 3 are single independent units. San Onofre Units 2 & 3 are mirror image of each other and share Common Control room and Some Systems. But the original steam generators at San Onofre and Palo Verde were of identical design. Dwight Nunn told MHI to work with Westinghouse to resolve problems with high void fractions, but MHI never consulted Westinghouse. At the time of the contract signing in September 2004, Mitsubishi had a quality assurance program in place that had been approved by the licensee, by taking credit for other utilities' reviews of Mitsubishi's quality assurance program. The licensee informed Mitsubishi that once enough fabrication was underway to support an evaluation, the licensee would perform an audit to confirm that their quality assurance program was operating properly. Then came Dwight Nunn's Warning Letters in 2004 & 2005. SCE selected a cheap and inexperienced company that was not qualified for this job.

We now know the adverse results of that SCE/MHI missed opportunity, destruction of a \$1 Billion Dollars in Steam Generators and the Number 1 US Public Safety Concern/Nuclear Scandal, Controversy and Cover-up involving NRC, CPUC, SCE, MHI, Westinghouse, AREVA, Intertek and others. Dr. Pettigrew, the Worlds authority on fluid elastic instability and flow-induced vibrations told Dr. Macfarlane and the other NRC Commissioners that MHI's AVBs simply do not provide a positive restraint against FEI.

SONGS Insider Unit 3 True Root Cause not published by NRC:

High Void fractions of 99.6%, high steam flows (film boiling), higher thermal reactor power per RSG (RCS Flows, 76 Million lbs./hr, 1737 MWt plus), high in-plane fluid velocities (35-50 feet/sec), circulation ratios of 3.3, narrow tube to pitch tube diameter, excessive number of 9,727 tubes, extremely tall tubes (average length of heated tube increased by 50 inches, equivalent to the addition of ~650 tubes), 116,000 square feet of tube heat transfer area (increased from 104,000 in the OSGs), lack of positive in-plane restraints, steam generator operation at too low a pressure (833 psi), insufficient tube-to-AVB contact forces (< 1N per MHI) and loose supports (larger tube-to-AVB Gaps, Based on SCE Incomplete ECT Results) caused FEI, Flow-Induced Random Vibrations and Mitsubishi Flowering Effect in Unit 3 @100%RTP. The flow regime in Unit 3 changed from nucleate boiling to film boiling because the Unit 3 RSG heat transfer coefficient was exceeded and the change was attributed to more than 5MWt of SG output in Unit 3 in 4% of the SG U-tube bundle high region of wear on the hot-leg side due to higher RCS flows and lower SG Pressure Operation in Unit 3 RSGs.

SONGS Insider Unit 2 True Root Cause not published by NRC: -

Moderate Void fractions of (98-98.9%), lower steam flows compared to Unit 3 (nucleate boiling), lower thermal reactor power per RSG compared to Unit 3 (RCS Flows, 74 Million lbs./hr, 1727 MWt plus), high out-of-plane fluid velocities (25 feet/sec), circulation ratios of 3.3, narrow tube to pitch tube diameter, excessive number of 9,727 tubes, extremely tall tubes (average length of heated tube increased by 50 inches, equivalent to the addition of ~650 tubes), 116,000 square feet of tube heat transfer area, lack of in-plane restraints, steam generator operation at 942 psi (consistent with NRC AIT Report and SONGS SGM procedure) and questionable tube-to-AVB contact forces (~ 2N per MHI) and better supports (smaller tube-to-AVB Gaps, Based on SCE Incomplete ECT Results) caused Flow-Induced Random Vibrations and Mitsubishi Flowering Effect in Unit 2 @100%RTP.

3. Even though SCE, MHI and AREVA claim that operating and thermal-hydraulic conditions were the same in both units, Unit 2 did not experience tube-to-tube wear because of lower reactor thermal power and higher steam generator pressure operation and NOT double tube-to-AVB contact forces and better supports because of inadvertent accidental Unit 2 AVB design as explained by SCE and MHI. FEI did not occur in Unit 2, which is consistent with Westinghouse report. **The NRC AIT Report is incomplete and erroneous, based on SCE Supplied Faulty Information and needs to be redone to clear the Public Record and Establish NRC Independence.**

Joosten, Sandy

From: Bill Hawkins <billlee123456@gmail.com>
Sent: Monday, June 17, 2013 2:39 PM
To: CHAIRMAN Resource; CMRAPOSTOLAKIS Resource; CMROSTENDORFF Resource; CMRMAGWOOD Resource; Benney, Brian; Borchardt, Bill; Hall, Randy; Howell, Art; Lantz, Ryan; R4ALLEGATION Resource; Dorman, Dan; Freedhoff, Michal; Grant_Cope@epw.senate.gov; Walls, William
Subject: San Onofre - NRC AIT Report/SCE San Onofre 50.59 are erroneous and require revision for Future NRC Independence & Credibility.

Please Excuse ME for Spelling, Editing , Grammatical Or Computer Errors.

America is a Democratic Country and NRC Commission Solemn Duty is Public Safety/Licensing, Protection of Workers from Retaliation/Discrimination and Safe Decommissioning of power plants and not vacating ASLB SONGS Ruling under NEI/Industry Pressure for Profits/Production from Unsafe Nuclear Energy. NEI Job is Interpretation of NRC Rules For Safe and Reliable Production of Nuclear Energy. INPO Job is measuring Operational Excellence of Nuclear Plants, and EPRI is Research.

SONGS Original Combustion Steam Generators (OSGs) lasted for 28 years at a void fraction of 96%, fluid velocities of 22 feet/sec and 900 psi and did not suffer fluid elastic instability. In 2001, SONGS up-rated the power (steam Flows) of these OSGs from 1705 MWt to 1729 MWt for profits, reduced steam pressures and increased the flow-induced vibrations. The increased steam flows and reduced steam pressures increase flow-induced vibrations and increase fluid velocities > 22 feet/sec, and increased tube wear and plugging rates in OSGs. Low steam pressures and increased steam flows produce high void fractions for more power, but are detrimental for tube vibrations, tube wear and structural integrity.

According to SONGS Insider Documents (Useless Now, Since SONGS is being Decommissioned) , Edison Specified, "Edison intends to replace the steam generators under the 10 CFR 50.59 rule. Consequently, Edison requests that the RSGs be as close as possible to the existing steam generators in form, fit, and function, subject to additional requirements and limitations stated elsewhere in this [Redacted]. The Supplier shall prepare and submit for Edison's approval a Licensing Topical Report demonstrating compliance of the RSG design with all SONGS licensing requirements. The report shall include an engineering evaluation, including all necessary analyses and evaluations, justifying that the RSGs can be replaced under the provisions of 10 CFR 50.59 (without prior NRC approval). The report format shall follow the guidelines of in order to facilitate preparation of the 10 CFR 50.59 evaluation. The 10 CFR 50.59 evaluation shall be performed by Edison. Steam Generator Thermal Rating @100% Reactor Power - OSGs -1705 MWt - RSGs - 1729 MWt, Heat Transfer Area, sq. ft (0% tubes plugged) - OSGs 105,000 - RSGs - 116,100, Steam Pressure@100% Power - OSGs -900 psi - RSGs - 833 psi, Circulation ratio - OSGs - 3.2 -RSGs 3.3, RCS Design Flow, gpm (0%Tubes Plugged) OSGs -198, 000 - RSGs - 209,880, Feedwater Flows, gpm, OSGs - 7,414,000 - RSGs - 7,588,000. The service life of the RSGs shall be 40 calendar years from the date of startup following their installation and this duration is to be used as the basis for fatigue analyses and for determining the effects of corrosion, erosion, fretting, wear, and the number of chemical cleanings. Edison desires that from the perspective of performance, the RSGs be designed as large as possible within the dimensional and other limitations imposed."

SCE/MHI ignored the Dr. Pettigrews warning on flat bar AVBs, Dwight Nunn's warning on high void fractions and SCE/AVB Joint Team recommendations to reduce void fractions. It is the personal opinion of the author since Edison did not comply with the recommendations of Dwight Nunn and SCE/MHI AVB Joint Team to reduce high void fractions, the performance warranties and Liquidated Damages of RSGs will be contested in California Courts for years until resolved mutually and peacefully by SCE/MHI by Arbitration and NRC Assistance.

The NRC AIT Report is incomplete and erroneous, based on SCE Supplied Faulty Information and needs to be redone to clear the Public Record and Establish NRC Independence. NRC Commission independently needs to interview under oath SONGS Root Cause Team Members and assign a qualified thermal-hydraulic expert to review the complete SG, FW, RCS and other operational records for Units 2 & 3 for Cycle 16 to determine the true causes for Units 2 & 3 FEI, and the role of Mitsubishi Flowering Effect and RSG Manufacturing Differences. Based on interpretation of data published in NRC AIT Reported and SONGS SGM Procedure in 2012, Unit 2 had a steam pressure of 942 PSI and RCS Flows of 74 million lbs./Hr. and Unit 3 had a steam pressure of 833 PSI and RCS Flows of 76 million lbs./Hr. All the other Unit 2 Return to service reports had identical operating condition for both Units. Based on Hand calculations, only 5 MWt more in Unit 3 was required to change the flow from nucleate boiling to film boiling (Void fractions 99.0% ~ 99.6%) in 4% area of the Hot-Leg region of high wear. Mr. Ryan Lantz of San Onofre Special SONGS Panel was made aware of these discrepancies, but no action by the AIT Team Leader has been taken to date resolve these discrepancies. Mitsubishi Testing data indicates a tube-to AVB contact force between 10-30N is required to prevent FEI in Unit 2, whereas Unit 2 tube-to AVB contact force was only 2N. This force of 2 N was not sufficient to prevent occurrence of FEI given the benefit of doubt that operational condition were identical in both Units. The tube-to AVB contact force reported in Unit 3 was only <1N, which caused FEI. Based on Dr. Pettigrew and John Large Reports, MHI flat-bars untested, innovative and experimental MHI AVBs did not provide a positive restraint (sufficient contact forces) against in-plane FEI. (high steam flows, high void fractions > 99.6% and fluid velocities 35-50 feet/sec)

Courtesy of Los Angeles Times with Editing: The decision to decommission the San Onofre nuclear power plant doesn't end its saga, which instead promises to drag on for decades. There are long-term uncertainties about where to find replacement power for Southern California Edison customers and how long to allow the plant to take up beach space in Camp Pendleton before demolishing it. Before that, though, the state's Public Utilities Commission will have to decide who should pay for the fiasco that led to San Onofre's early retirement.

The answer is as clear as the imposing double domes of shuttered Units 2 and 3: The bulk of the financial responsibility belongs to Edison, starting with most of the \$670 million that the plant's new steam generators cost to buy and install. Design flaws introduced by Edison For more Profits/Power (OSGs – 1705 MWt) without understanding the basic and elementary principles of nucleate boiling, film boiling, high void fractions, poor circulation ratios, low steam pressures, higher Reactor Coolant Flows, 11% increase in the tube heat transfer area and reduction of 11% reduction in the steam flow areas, and the design of untested out-of-plane AVBs for protection of in-plane fluid elastic instability in the replacement generators (RSGs – 1729 MWt) led to unprecedented wear on their tubes, causing the plant's initial shutdown in early 2012. Before they were purchased, though, Edison won PUC approval to have its customers pay a small monthly fee for the new equipment, which was supposed to see the plant at least to the expiration of its current licenses in 2022. The current SONGS Senior Leadership lead by Site Manager were responsible of preparation and approval of SONGS Defective RSGs 10CFR 50.59, avoidance of a Full Scale Management and NRC review of this 50.59, Preparation of Defective and Conflicting SONGS Unit 2 & 3 Unit 2 Return to Service Reports, which ultimately led to the shutdown of SONGS Units 2 & 3, because these documents did not meet the

Confirmatory Action Letter Action 1 and did not pass the Safety Test of SONGS Insider Steam Generator Investigator, Dr. Joram Hopenfeld, Other EX-NRC Chiefs, Arnie Gundersen, John Large and NRC's own Atomic Safety Licensing Board. In addition, the Site Manager assisted by the Nuclear Oversight Director indulged in systematic discrimination and retaliation of the injured Steam Generator Investigator for reporting steam generator, cyber security and Lack of solid teamwork and alignment concerns. Other Departments including operations, fire services and project management organization have reported retaliation by the Site Manager. If NRC Wants Pete Dietrich to stay in-charge of the SONGS 2 & 3 Decommissioning Project, then NRC has to ensure that the entire Senior Leader Ship Time led by the Site Manager has to be fired by Ted Craver and replaced with a new team with creditability with the Public, Workers, CPUC and NRC.

But ratepayers aren't supposed to foot the bill for power they're not getting. Once the plant had been dark for nine months, its closure triggered a PUC investigation that concluded the generator cost should not be included in ratepayers' bills, according to commission President Michael R. Peevey.

There are no such clear guidelines about who should pay for the additional \$400 million or so in expenses that Edison incurred trying to fix the problem. Had it been caused by an unavoidable event such as a freak storm, such costs might have been fairly borne by customers. But that's not what happened. Instead, the company managed to avoid the kind of regulatory oversight that the new generators should have received by convincing the U.S. Nuclear Regulatory Commission that they were essentially the same as the old generators. Clearly, they weren't. In addition, Edison signed a contract with Mitsubishi Heavy Industries — which built the generators and, according to an NRC investigation, was responsible for the AVB design error — that limited Mitsubishi's liability to \$135 million. Edison must bear the cost of those poor decisions.

That leaves the cost of decommissioning the plant. Ratepayers were going to have to pay for the plant's retirement sooner or later; in fact, Edison already has \$2.7 billion stashed away in a special ratepayer-funded account for this very purpose. But the cost could be considerably higher. Part of it might reasonably be charged to customers. But because Edison's mistakes led to the premature retirement of the plant — which means customers will have also have to buy expensive replacement power — ratepayers should not take on the full cost.

Edison thinks Shutting San Onofre and dipping into 2.7 Billion Dollar Decommissioning Fund will silence Public, Critics, Barbara Boxer, NRC Office of Inspector General/Investigations. IF Edison thinks that they can continue to reap their profits with the help of CPUC and enjoy/party their life in their Multi-Million Dollar Beach Glass Homes with Decommissioning Funds, they are Wrong Again?

Decontamination, Demolition, Dismantling and Decommissioning San Onofre and handling of radioactive waste is a very serious business, which requires the right management, procedures, contractors and strict NRC Oversight. Based on the last 10 years of observations at SONGS for SGRP, all these factors are missing at San Onofre now. Therefore, a 3rd neutral party with competent oversight organization with Decontamination, Demolition, Dismantling and Decommissioning experience of a NPP and reporting directly to a very Strict NRC Resident Inspector is needed to do the job right first time following the INPO Principles of Excellence. Ratepayers cannot afford by Edison another Multi-Billion Dollar Mess.

Lessons Learnt for NRC Commission/FEOC for Davis-Besse RSGs from from Defective San Onofre RSG 10CFR 50.59

Dwight Nunn, SCE Vice President in 2004 wrote to MHI, "This will be one of the largest steam generators ever built for the United States and represents a significant increase in size from those that Mitsubishi Heavy Industries has built in the past. It will require Mitsubishi Heavy Industries to evolve a new design beyond that which they currently have available. Such design evolutions require a careful, well thought approach that fully evaluates the risks inherent in creating a new and significantly larger steam generator. Such design evolutions tend to challenge the capability of existing models and engineering tools used for proven steam generator designs. Success in developing a new and larger steam generator design requires a full understanding of the risks inherent in this process and putting in place measures to manage these risks. Understanding the difficulty in transitioning from the standard Mitsubishi Heavy Industries steam generator design to a new and larger two-loop design. A. anti-Vibration Bar design (and installation) is by far one of the most challenging tasks that will face Mitsubishi Heavy Industries and San Onofre; in fact, it is in our opinion the single most significant task facing the industry for steam generators of our size today. Since the San Onofre steam generators are one of the largest steam generators ever built and large steam generators appear more susceptible to wear (in fact, our current steam generators have experienced a high percentage of plugged tubes due to wear), it is a paramount concern of ours that we ensure a reliable support design. We consider this engineering challenge perhaps the most critical issue at this time. Recent industry experience with Anti Vibration Bar supports has demonstrated the difficulty in developing a successful design (the recent experience at a United State's plant emphasized this point when more that 180 tubes were found to have wear indications after only one cycle of operations, some of these indications were up to 20% through wall). Our discussions with Mitsubishi Heavy Industries to date have not resulted in a plan that will successfully address this industry concern. Both San Onofre and Mitsubishi Heavy Industries are having difficulty in formulating such a plan. Consequently, the design of the new steam generators is currently proceeding using the existing steam generator seismic response based on a like-for-like replacement concept (although the old and new steam generators will be similar in many respects they aren't like-for-like replacements). Based upon these observations, I am concerned that there is the potential that design flaws could be inadvertently introduced into the steam generator design that will lead to unacceptable consequences (e.g., tube wear and eventually tube plugging). This would be a disastrous outcome for both of us and a result each of our companies desire to avoid. In evaluating this concern, it would appear that one way to avoid this outcome is to ensure that relevant experience in designing larger sized steam generators be utilized. It is my understanding the Mitsubishi Heavy Industries is considering the use of Westinghouse in several areas related to scaling up of your current steam generator design (as noted above)."

Dwight Nunn, SCE Vice President in 2005 wrote to MHI, "In our joint technical meeting, we also learned more about certain thermal-hydraulic aspects (void fraction) of the RSG design. Void fraction is an important thermal-hydraulic parameter, related to the probability of tube dry out occurring during power operation (the higher the void fraction, the higher the probability of dry out). Tube dry out is an undesirable phenomenon as it may eventually result in tube cracking. The information presented to Edison in the most recent Technical Meeting, indicated that for the SONGS RSG the expected void fraction is very high. Consequently, Edison requests that MHI launch a consolidated effort aimed at addressing high void fraction in the RSG.

MHI Root Cause states, "Thus, not using ATHOS, which predicts higher void fractions than FIT-III at the time of design represented, at most, a missed opportunity to take further design steps, not directed at in-plane FEI, that might have resulted in a different design that might have avoided in-plane FEI. However, the AVB Design Team recognized that the design for the SONGS RSGs

resulted in higher steam quality (void fraction) than previous designs and had considered making changes to the design to reduce the void fraction (e.g., using a larger downcomer, using larger flow slot design for the tube support plates, and even removing a TSP). But each of the considered changes had unacceptable consequences and the AVB Design Team agreed not to implement them. Among the difficulties associated with the potential changes was the possibility that making them could impede the ability to justify the RSG design under the provisions of 10 C.F.R. §50.59. Thus, one cannot say that use of a different code than FIT-III would have prevented the occurrence of the in-plane FEI observed in the SONGs RSGs or that any feasible design changes arising from the use of a different code would have reduced the void fraction sufficiently to avoid tube-to-tube wear. For the same reason, an analysis of the cumulative effects of the design changes including the departures from the OSG's design and MHI's previously successful designs would not have resulted in a design change that directly addressed in-plane FEI."

From: August, JW Sent: Tuesday, June 11, 2013 3:35 PM To: August, JW Cc: 'Maureen.Brown@sce.com' Subject: response to 10News questions for SONGS story

We requested a response to our story from Southern California Edison on the issues raised in our report of June 12th. Maureen Brown the Media Relations Project Manager at SCE provided us a transcript of the news conference of CEO Mr. Craver in which, she says, he responds to two or our questions. The transcript for the entire conference is provided for your review. We have taken excerpts from the conference that pertain to our questions and HAVE included them below.

Channel 10 San Diego News questions to SCE - A SCE document describes the RSG as very similar to the generators they were replacing....quoting in part.... a "replacement in kind, in terms of an overall fit, form and function, with no, or minimal" modifications. Is this still the position of SCE? Can you elaborate on why your employer believes this to be true?

SCE response to 10NEWS 50.59 Questions: You know, this term of like for like is actually something - I'm not really exactly sure whether that's even grown up. It's not in the 50.59 regulation. There's no such term like for like. The term is really that the new equipment has to be of a similar form, fit and function to the equipment that it's replacing. So there is no like for like and in this case in the nuclear industry steam generators have had a - an issue really across all of the plants or the vast majority of the plants, what they call cracking and corrosion of the tubes. It was determined many years ago that the principal cause of that was the alloy, the type of metal that was used in steam generator tubes, so-called INCONEL alloy 600. So that was - it was determined that the way you could solve the cracking and corrosion problem in the nuclear steam generators was to use an improved metal, the INCONEL alloy 690. However the - that tube metal also does not conduct heat as well as the previous metal. So all of the steam generator replacements that have been done in the industry over the last many years really are to improve a problem with the metal and the cracking and corrosion. So you certainly wouldn't want to put the same, you know, the same stuff back into the steam generators because you're just going to have the same problem, and that's where the improvements in the metal were made.

Again because the metal doesn't conduct heat as well, really you end up having to put additional tubes in there so that you can get the same type of heat transfer in the steam generators. So really our - there's no additional power consideration here. It was really to address a cracking and corrosion problem. In fact in our case the two steam generator - or the two units, Unit 2 and 3 - had we not replaced the steam generators one of those units would have shut down in 2012, and the other unit

would've had to shut down in 2015. So they were really at a critical point where you could no longer, you know, plug the tubes and maintain safety. So they had to be replaced and that's what we did with the improved

Channel 10 San Diego News questions to SCE

- Does SCE stand behind its decision to portray the changes to the plant as falling under 50.59 designation? Critics say SCE should have used the 50.90 process but instead chose the 50.59

SCE response to 10NEWS 50.59 Questions:

The whole process that's been used for replacing steam generators in the industry is a pretty well traveled path. After the first few were done several years ago at other plants, the so-called 50.59 process was established. And essentially I like to think of it as a test. It basically says, "If you have essentially the same form, fit and function as the previous steam generators then you can go forward with the so-called 50.59 process." When we went through that analysis, which takes quite some time to do, we determined that much of it was really standard and could go through the - a - the 50.59 process. But we actually did need to obtain some license amendments to our technical specifications in our license. So it's - the 50.59 process is basically a - as I say it's a - it's kind of a test. If you go through that analysis and you determine that yes, what you're proposing is essentially the same form, fit and function as what you had in there before, then you can go forward with the replacement. Anything that's outside of that has to go through a license amendment process. So as I said we actually had a little bit of both in our case.

SONGS Insider Response to SCE Comments: A like-for-like replacement is defined as the replacement of an item with an item that is identical. For example, the replacement item would be identical if it was purchased at the same time from the same vendor as the item it is replacing, or if the user can verify that there have been no changes in the design, materials, or manufacturing process since procurement of the item being replaced. If differences from the original item are identified in the replacement item, then the item is not identical, but similar to the item being replaced, and an evaluation (Such as 10CFR 50.59, Changes, Tests or Experiments) is necessary to determine if any changes in design, material, or the manufacturing process could impact the functional characteristics and ultimately the component's ability to perform its required safety function. If the licensee cannot demonstrate that the replacement item is identical and differs in design, or results in a design change, new test or experiment, which adversely affects RSG's functional characteristics (High Void fractions, High steam flows, Wrong AVBs for FEI) and ultimately the RSGs tubes ability to perform its required safety function (RCS Barrier), then the licensee needs to inform NRC ASAP and proceed safely for a NRC Approved 50.90 License Amendment like Palo Verde.

The OSGs operated for 28 years at a void fraction of ~ 96% and fluid velocities of ~ 22 feet/sec, steam side pressure of 900 psi and a circulation ratio of 3.3. Under these conditions, OSGs experienced only flow-induced random or out-of-plane vibrations, but not fluid elastic instability. That is why, the RSGs AVBs were only designed for out-of-plane vibrations.

SCE added 11% heat transfer area (377 new tubes plus equivalent addition of more than 670 tubes by increasing the average length of heated tubes by ~ 50 inches, increased RCS and feedwater flows, reduced steam side flow area and changed the void fraction of OSG of 96% to 99.6% in the RSGs. Despite warnings from Dwight Nunn and SCE/MHI Joint AVB team to reduce high void fractions, SCE/MHI decided to live with the unacceptable consequences of increased void fractions by relying on the new AVB Design to perform miracles in countering the effects of high void fractions. SCE Management did not make any efforts to decrease the void fractions, because it would have reduced the thermal output and profits from RSGs, delayed the construction /installation schedule and triggered a NRC 50.90 License Amendment and Public Hearings. The increased void fractions with a new AVB design by SCE/MHI Joint AVB team was a new test/experiment, which caused fluid elastic instability and tube leak in Unit 3. Defective and evasive 10CFR 50.59 for both units were prepared by one SCE Engineer and approved by another SCE Engineer during 2008 - 2009. These SCE Engineers should have known about Dwight Nunn's Letters and SCE/MHI Joint AVB team recommendations to reduce high void fractions, but did not address the effects of these changes as required by 10CFR 50.59. Call it ignorance, greed, negligence or management direction, but the most important design function of OSGs of void fractions and AVB design was changed. Hence any engineer with common sense in elementary heat transfer should have seen the adverse consequences of high void fractions and then applied for a 50.90 License Amendment. Another point, the OSGs installed in 1983 had a thermal rating of 1705 MWt and RSGs had a thermal rating of 1729 MWt, so steam flows were also changed. It is not about the same steam flows as SCE understands, but it is about change in a design function caused by change in tube material to have higher steam flows. So now changed steam flows, increased heat transfer area, high void fractions, increased RCS flows, untested AVB Design and addition of more tubes to have higher steam flows and higher profits affected safety, vibrations or structural integrity of the tubes. The defective design of RSGs and 10CFR 50.59 shutdown San Onofre Units 2 & 3 forever.

A review of NRC 10CFR 50.59 inspection manual indicates, that the preparer has to answer many questions about the effect of these changes, which SCE/MHI avoided and are still in a denial about the effects of the changes and their legal obligation to inform NRC. NRC Commission has very smart thermal-hydraulic engineers and if they would have known about it, they would have 100% guaranteed caught the adverse effect of these changes in time. Probably, SCE 50.59 was examined by a NRC Inspector, who did know about these things and said OK. NRC AIT Team was also wrong about SONGS 50.59. See Arnie Gundersen, John Large, Dr. Joram Hopenfeld's Testimony and ASLB Ruling.

Channel 10 San Diego News questions to SCE -

— Did SCE ever consider designing a generator in the same manner as Palos Verdes? Our experts say that your firm owns a percentage of the plant and would have had access to information that would allow you to duplicate what was apparently has been successful in Arizona. Any comment on this?

SCE response to 10NEWS 50.59 Questions:

We don't have access to all the bid process information for this period so we can't provide you with a lot of specific information. Instead, I can say that SCE conducted a thorough competitive bid process and selected a company that was most appropriate for this job. There are sister designs throughout the industry but each plant has it's own unique requirements.

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ONGS Insider Response to SCE Comments:

- Palo Verde is larger than San Notre, but basically the same Design. Palo Verde Units 1, 2 & 3 are single independent units. San Notre Units 2 & 3 are mirror image of each other and share Common Control room and Some Systems. But the original steam generators at San Notre and Palo Verde were of identical design. Dwight Nunn told MHI to work with Westinghouse to resolve problems with high void fractions, but MHI never consulted Westinghouse. At the time of the

contract signing in September 2004, Mitsubishi had a quality assurance program in place that had been approved by the licensee, by taking credit for other utilities' reviews of Mitsubishi's quality assurance program. The licensee informed Mitsubishi that once enough fabrication was underway to support an evaluation, the licensee would perform an audit to confirm that their quality assurance program was operating properly. Then came Dwight Nunn's Warning Letters in 2004 & 2005. SCE selected a cheap and inexperienced company that was not qualified for this job.

We now know the adverse results of that SCE/MHI missed opportunity, destruction of a \$1 Billion Dollars in Steam Generators and the Number 1 US Public Safety Concern/Nuclear Scandal, Controversy and Cover-up involving NRC, CPUC, SCE, MHI, Westinghouse, AREVA, Intertie and others. Dr. Pettigrew, the Worlds authority on fluid elastic instability and flow-induced vibrations told Dr. Macfarlane and the other NRC Commissioners that MHI's AVBs simply do not provide a positive restraint against FEI.

High Void fractions of 99.6%, high steam flows (film boiling), higher thermal reactor power per RSG (RCS Flows, 76 Million lbs./hr., 1737 MT plus), high in-plane fluid velocities (35-50 feet/sec), circulation ratios of 3.3, narrow tube to pitch tube diameter, excessive number of 9,727 tubes, extremely tall tubes (average length of heated tube increased by 50 inches, equivalent to the addition of ~650 tubes), 116,000 square feet of tube heat transfer area (increased from 104,000 in the OSGs), lack of positive in-plane restraints, steam generator operation at too low a pressure (833 psi), insufficient tube-to-AVB contact forces (< 1N per MHI) and loose supports (larger tube-to-AVB Gaps, Based on SCE Incomplete ECT Results) caused FEI, Flow-Induced Random Vibrations and Mitsubishi Flowering Effect in Unit 3 @100%RTP. The flow regime in Unit 3 changed from nucleate boiling to film boiling because the Unit 3 RSG heat transfer coefficient was exceeded and the change was attributed to more than 5MWt of SG output in

Unit 3 in 4% of the SG U-tube bundle high region of wear on the hot-leg side due to higher RCS flows and lower SG Pressure Operation in Unit 3 RSGs.

[REDACTED] - Moderate Void fractions of (98-98.9%), lower steam flows compared to Unit 3 (nucleate boiling), lower thermal reactor power per RSG compared to Unit 3 (RCS Flows, 74 Million lbs./hr., 1727 MT plus), high out-of-plane fluid velocities (25 feet/sec), circulation ratios of 3.3, narrow tube to pitch tube diameter, excessive number of 9,727 tubes, extremely tall tubes (average length of heated tube increased by 50 inches, equivalent to the addition of ~650 tubes), 116,000 square feet of tube heat transfer area, lack of in-plane restraints, steam generator operation at 942 psi (consistent with NRC AIT Report and SONGS SGM procedure) and questionable tube-to-AVB contact forces (~ 2N per MHI) and better supports (smaller tube-to-AVB Gaps, Based on SCE Incomplete ECT Results) caused Flow-Induced Random Vibrations and Mitsubishi Flowering Effect in Unit 2 @100%RTP.

CONCLUSIONS:

Even though SCE, MHI and AREVA claim that operating and thermal-hydraulic conditions were the same in both units, Unit 2 did not experience tube-to-tube wear because of lower reactor thermal power and higher steam generator pressure operation and NOT double tube-to-AVB contact forces and better supports because of inadvertent accidental Unit 2 AVB design as explained by SCE and MHI. FEI did not occur in Unit 2, which is consistent with Westinghouse report. The Unit 2 Return to Service Engineering Reports, Computer Calculations, Testing Data and Tube Inspections prepared by SCE and its World Class Independent Consultants are full of errors, inconclusive and based on invalidated assumptions. The reports are Confusing, Conflicting and full of Smoking Mirrors. SONGS Inside Steam Generator Investigator, DAB Safety Team, Arnie Gundersen, John Large and Dr. Joram Hopenfeld showed ASLB and in other numerous public forums that these reports are incomplete, full of errors and Unit 2 Restart at 70% power is an Unsafe Experiment to keep Edison in Business. Edison was afraid of public scrutiny and sworn Testimony certifying the safety of these reports. So, afraid of these investigations, they chose to safely shutdown San Onofre Units 2 & 3 blaming on ASLB ruling, Environmentalists and Rate Payers.

[REDACTED]

[REDACTED]

Joosten, Sandy

From: Bill Hawkins <billlee123456@gmail.com>
Sent: Saturday, June 22, 2013 4:21 PM
To: CHAIRMAN Resource; CMRAPOSTOLAKIS Resource; CMRMAGWOOD Resource; CMROSTENDORFF Resource; Borchardt, Bill; Benney, Brian; Leeds, Eric; Lantz, Ryan; R4ALLEGATION Resource; Walls, William; Hall, Randy
Subject: San Onofre Sad Saga Continued - SCE/MHI/NRC/Public Awareness Series - Pl. Release All Reports (See News Article Below)

SCE, MHI, and NRC each had multiple opportunities and could have prevented the Billions of Dollars SONGS Replacement Generator fiasco. But complacency, negligence and Profits prevailed over Public Safety

What were the missed opportunities? Pete Dietrich very cleverly dodged Unit 2 FEI Questions by Honorable NRC Commissioner Dr. Apostolakis. (Dwight Nunn's Letters, MHI Root Cause to Reduce Void Fraction, Industry and Academic Benchmarking, Interview of SCE/MHI Design Engineers, Interview of SCE/MHI AVB Team Engineers, etc.)

What were the factors that resulted in their being missed?

(SCE Mismanagement, Lack of Critical Questioning & Investigative Attitude, Avoidance of 10CFR 50.59 & Public Hearings, SCE Complacency, Negligence, Bad Oversight of MHI and False Safety Sermons)

What are the lessons to be learned?

Need a Joint Task Force Investigation by US Justice Department, NRC OIG & OII and Senator Barbara Boxer's Office as recommended in 2012 by the San Onofre Steam Generator Investigator.

A nuclear power fiasco anywhere increases the costs of nuclear power everywhere?

SCE can mismanage the Decommissioning Funds. NRC/CPUC are advised to give this contract to an outside qualified vendor with oversight NRC/CPUC. Public has no trust in SCE. Can you believe that SCE did not inform NRC, their buddy officially for the last 8 years about announcing the sudden shutdown. The reasons given by SCE Officers are to avoid prosecution and not persuasive (e.g, Regulatory Hurdles, Friends of the Earth, Economics). SCE Officers were afraid of testifying under oath to the Joint Task Force Investigation by US Justice Department, NRC OIG & OII and Senator Barbara Boxer's Office as recommended in 2012 by the San Onofre Steam Generator Investigator. SCE never published the true Root Cause of Unit 3 RSG tube-to-tube wear. SCE Unit 2 return to service reports supplemented by Three Independent OAs, MHI Root Cause evaluation and Technical Reports were Significantly flawed. Unit 2 Return to Service at 70% power for for 5 months was a dangerous, risky and unapproved experiment as characterized by ASLB and FOE. NRC needs to issue a Safety Evaluation Report on Unit 2 SCE Unit 2 return to service reports supplemented by Three Independent OAs, MHI Root Cause evaluation and Technical Reports.

The \$742 Million Question:

Who should pay the extra \$742 Million Decommissioning money, not yet collected?

Once the operators of San Onofre made the financial decision to shut it down prematurely, all decommissioning fees not already

c Collected for Units 2 and 3 by 01/31/12, should be paid by the operators of San Onofre, not ratepayers!

Decommissioning Costs as of 1/1/2012	SONGS 1 \$ Million	SONGS 2 \$ Million	SONGS 3 \$ Million
Radiological Costs	183.3	1,273.6	
Site Restoration	10.7	417.0	
Fuel Storage (Including ISFSI Decommissioning)	11.2	385.3	
Estimated Total Budget 2009 (See Note 2)	N/A	1,791	
Total Collected 10/31/12 (See Note 1)	291.4	1,638.1	
Total Projection 1/1/2012	205.2	2,079.5	
Estimated Loss Due To Poor RSG Design/Operation	86.2 Previously Overbilled	441.4 Shortfall	300.8

1- SCE Letter To NRC (2012)

2- SCE Testimony to CPUC (2009)

Tussle Over Nuclear Plant Documents May Sink N.R.C. Appointment

By MATTHEW L. WALD

The botched repair job that doomed a California nuclear plant has created a political whirlpool that may be close to claiming another victim: the chairwoman of the Nuclear Regulatory Commission.

The issue is no longer the plant itself, San Onofre, which the majority owner, Southern California Edison, announced on June 7 it would permanently close. The problem now is that Senator Barbara Boxer, Democrat of California, who is chairwoman of the Senate Environment and Public Works Committee and a longtime critic of nuclear power, has been seeking documents from the Nuclear Regulatory Commission about the work the utility did and how the commission oversaw that work.

The chairwoman of the commission, Allison M. Macfarlane, agreed during her confirmation hearing to a blanket request to provide documents. Opponents of nuclear power say that some of the San Onofre documents could raise safety issues about plants that are still running. Ms. Boxer's office said they could also influence California regulators as they decide who should pay the nearly \$1 billion cost of addressing the failed repair.

The Senate committee and the nuclear commission are locked in a dispute over the documents, and Dr. Macfarlane's term ends on June 30. President Obama — who appointed her to fill out the term of the previous chairman, Gregory B. Jaczko, who resigned under pressure last year — has nominated Dr. Macfarlane for a full five-year term, but Ms. Boxer is refusing to have the committee vote on the nomination until the argument over the documents is settled.

The Senate has only three meeting days left before June 30. Dr. Macfarlane, a geologist, has told friends that she has been offered a university teaching position and will accept it if she is not confirmed for a full term.

According to both sides, negotiations between the nuclear commission and the committee are continuing. The commission has been tight-lipped about the nature of the requests and the dispute. Eliot Brenner, a spokesman for the agency, said that Senator Boxer had asked for a variety of documents and that the commission had been “working diligently to provide her what we can.”

According to a spokeswoman for the Senate committee, some of the documents would come from investigations by the nuclear commission's Office of Investigations and its inspector general, both of which could result in criminal charges. The commission is particularly circumspect about releasing such documents, but Congressional aides maintain that oversight committees have full access to them.

The commission says that some of its members have not approved the release of the documents, according to Senate committee staff members. Collegiality has been a particular goal of Dr. Macfarlane as she attempts to show a deliberate contrast to her predecessor, Dr. Jaczko, who was accused of acting unilaterally. But the extent to which she, as chairwoman of the commission, needs the concurrence of the other commissioners is also disputed.

One of the issues in the demise of San Onofre is the system that the nuclear commission uses to supervise major repair projects. If the new equipment has the same form and function as the old equipment, the review is far less deep than if it is a new type of equipment. In the San Onofre case, giant heat exchangers called steam generators were replaced, and the new generators differed enough from the original ones that they developed vibrations and one of them leaked.

Dozens of reactors have replaced their steam generators, and many more will probably do so in the future. Some nuclear advocates fear that if the documents cast doubt on the oversight process at San Onofre, they will also raise questions about safety at other reactors.

The prospect of losing Dr. Macfarlane has created an odd dynamic, and some experts with a long history of criticizing nuclear power are alarmed by the prospect. "I think that Macfarlane is the best thing to happen to the N.R.C. in a long time," said Peter G. Crane, a former official in the commission's legal office who has pressed the commission on several emergency preparedness and radiation safety issues. He praised Dr. Macfarlane's openness and said, "The dispute over the San Onofre documents is of too little importance in the greater scheme of things for the chairmanship to stand or fall because of it."

Of the other four members of the commission, two are Democrats and thus probably in line to be appointed chairman if necessary. The senior member is George E. Apostolakis, a risk assessment expert and nuclear engineer from the Massachusetts Institute of Technology.