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Wright, Darlene

From: Bill Hawkins [billlee123456@gmail.com]
Sent: Friday, May 03, 2013 1:50 PM
To: Bill Hawkins
Subject: Southern California San Onofre Billion Plus Dollors Sad Saga Continued

HAHN Baba – NRC/SCE/MHI/Independent Experts/Public Awareness Series

Sincere Thanks to NRC Chairman, Mr. Victor Dricks, Mr. Cale Young, Mr. Ryan Lantz, Mr. Randy Hall and entire NRC Staff. Thanks to NRC for posting this blog. Please excuse me for my grammatical and computer human performance errors.

NOTE: Blind Trust by NRC Commission in SCE's and Independent Experts Error Likely Conservative Assumptions, Unexplained Safety Explanations and False Public Safety Sermons and Hollow Assurances can Lead to a SONGS Unit 2 Reactor Meltdown, the unintended and adverse consequences of which will destroy Southern California, the land of one of the most majestic, entertaining, tourist and pristine places in this universe.

Reference: Nuclear Regulatory Commission [Docket No. 50-361; NRC-2013-00701, Application and Amendment to Facility Operating License Involving Proposed No Significant Hazards Consideration Determination; San Onofre Nuclear Generating Station, Unit 2]

SONGS Unit 2 Potential Nuclear Meltdown due to Loss of Offsite Power

Preface: Of particular concern with SONGS Unit 2 restart at reduced power are incubating circumferential cracks in tubes next to each other. When one circumferentially cracked tube ruptures, the additional stresses can cause multiple or cascading tube ruptures, which can result in a nuclear meltdown. SCE, MHI, AREVA, Intertek, Westinghouse and NRC are ignoring these cracks. The difference in management of Steam Generator Tube Rupture between Finland and France and USA is, that no primary coolant (liquid and steam) release to the environment is allowed in Finland, while in France and USA, primary steam releases are not forbidden for profits to conduct risky experiments with people's lives.

Conclusions: As shown below, transformer fires, lightening, offsite grid disturbances, main steam line break or other anticipated operational occurrences can result in automatic reactor, reactor coolant pump, feedwater pump and turbine trips. In these situations, all the nuclear power plants In USA can be safely shutdown using plant's automatic safety systems and timely operator actions except SONGS Unit 2. However, as shown below, that is not the case with San Onofre Unit 2 operating at reduced power as told by "The San Onofre Insider and Dr. Joram Hopenfeld" to Channel 10 Investigative Team on April 25, 2013. NRC Inspector General Reports show that NRC has allowed safety margins in nuclear power plants to decrease too far. Now, not after an accident in SONGS Unit 2, is the time to consider whether the NRC's position is prudent (safety overrides production), or political (Forget Barbara Boxer, Representative Ed Markey, Dr. Joram Hopenfeld & 8.4 Million Southern Californians concerns) on Unit 2 restart proposed SCE License Amendment.

A. Background Events:

1. March 15, 1994 - Los Angeles Times, Fire Follows Blast at San Onofre, March 15, 1994 - An electrical transformer blew out with a loud blast at the nuclear power plant here but caused no power interruptions, a Southern California Edison Co. spokesman said Monday.

2. February 05, 2001, Los Angeles Times, Fire Shuts Down San Onofre Unit Reactor – The Fire destroyed Unit 3 switchgear, turbine and the plant was shutdown for 5 months resulting in a loss of 100 Million Dollars.

3. September 8, 2011, SONGs Unit 2 began the inspection period at essentially full power. On September 8, 2011, the unit tripped due to an offsite electrical grid disturbance. Following restoration of the electrical grid, the unit returned to essentially full power on September 11, 2011, and remained there for the duration of the inspection period. Unit 3 began the inspection period at essentially full power. On August 6, 2011, power was reduced to approximately 65 percent to repair main feedwater pump turbine MK006. Following completion of repairs, the unit returned to full power on August 15, 2011. On September 8, 2011, the unit tripped due to an offsite electrical grid disturbance. Following restoration of the electrical grid, the unit returned to essentially full power on September 15, 2011, and remained there for the duration of the inspection period.

4. January 10, 2013: Fire in a main transformer resulted in a reactor trip and an unusual event declaration at a reactor near Houston Tuesday. Transformer at unit 2 of the South Texas Project failed at about 4:40 p.m., according to an event report filed with the Nuclear Regulatory Commission. Although the onsite fire brigade extinguished the resulting flames in the switchyard within 16 minutes, the incident took out power to busses supplying reactor systems, which the report indicated resulted in a partial loss of offsite power. The reactor tripped from full power, and two emergency diesel generators energized the affected circuits. According to the report, unit 2 was cooling down under natural circulation because of a loss of power to reactor coolant pumps. Auxiliary feed water systems functioned as needed, and heat was removed using steam generator atmospheric relief valves. A pressurizer power-operated relief valve momentarily opened and reclosed.

5. January 17, 2003: A transformer fire at a nuclear plant injured a security officer on Wednesday night and led to the automatic shutdown of one of the plant's two reactors. The fire at the Donald C. Cook Nuclear Plant in southwest Michigan also resulted in a brief activation of the site's emergency plan, the plant's owner, the American Electric Power Company, said. The security officer was treated for smoke inhalation. When the transformer, which is adjacent to the plant, failed, the plant's operating system automatically shut down the Unit 1 reactor, which was operating at full power. All safety systems responded appropriately, and the reactor was not damaged, the company said.

6. March 31, 2013: Easter Sunday and Arkansas Nuclear One: A 600-ton component was dropped from a crane while being moved out of the turbine building at Unit 1. At the time of the event, Unit 1 was in a refueling outage with all of the fuel still in the reactor vessel, safely cooled. The accident damaged some electrical equipment that supplies off-site power to the plant. The plant's emergency diesel generators started and power was quickly restored to the decay heat removal systems. Unit 2, which was operating at full power, automatically shut down when power was lost to a reactor coolant pump due to electrical equipment that was damaged when the component fell. At 9:22 a.m. offsite power to one electrical bus was lost because water from a fire main broken by the falling component caused a short circuit. An emergency diesel generator started up and is supplying power to key safety systems. Unit 2 is cooling down using natural circulation.

7. April 18, 2013 - Shippingport -- An Illinois nuclear power plant automatically shut down Wednesday after a lightning strike knocked out its offsite power, Nuclear Regulatory Commission officials said, an unusual event that the Beaver Valley Nuclear Power Station seems to have an added layer of protection against. The LaSalle nuclear power plant in Marseilles, Ill., declared an "unusual event" Wednesday afternoon after it lost offsite power to both of its Mark II reactors. According to an Exelon company statement, power from the switchyard into the site was interrupted during a severe thunderstorm.

8. April 26, 2013: Illinois — On April 17, a reported lighting strike caused off-site power to fail resulting in a chain of events. Units 1 and 2 were reported to have been vented, only one of which was through a filtered system. At this time it is unknown is radiation was released over the populace. At the time of venting the wind was blowing eastward away from the plant. LaSalle Unit 1 and LaSalle Unit 2 have

both experienced an automatic reactor scram, in conjunction with a loss of offsite power. This was caused by an apparent lightning strike in the main 345kV/138kV switchyard during a thunderstorm. 138kV line 0112 has been inspected in the field, and heavy damage has been noted on the insulators on two of the three phases on a line lightning arrestor line side.

B. Safety Significance of Transformers Fires

Fires represent half of the risk of core meltdowns at nuclear power plants in the United States, according to the Nuclear Regulatory Commission, or NRC. "In other words, the fire hazard equals all other hazards combined," said David Lochbaum, a nuclear engineer with the Union of Concerned Scientists. As one of the most watched-over industries in the world, nuclear power generating plants are required to abide by an abundance of regulations and standards to ensure that the facility, its employees, the environment and the local population are protected from potential hazards. One of the most ominous threats that every nuclear power generating facility faces is the risk of a fire developing within the plant and the associated consequences. There is no shortage of hazards within these facilities; the possibility for fires to ignite from sources such as lube oil, fuel oil or general combustibles within a warehouse are genuine concerns. However, one of the most common sources for ignition - and unfortunately one of the most dangerous as well - are the plant's transformers. It is no surprise that transformers are inherently high-risk, considering the hundreds of thousands of volts that they transfer on a continuous basis. There are a number of events that can trigger transformer fires, from weather-related incidents to failures stemming from equipment operating beyond its intended service life . While lightning and short circuits in electrical equipment can cause transformer failures, breakdowns in the insulation system are frequently found to be the source of failure. As the insulation material protecting the transformer deteriorates over time from exposure to natural elements, it puts the equipment at risk for failure and subsequently, fires.

C. Safety Significance of Loss of Offsite Power

The offsite power system of a nuclear power plant provides the preferred source of electrical power to all the station auxiliaries. Loss of offsite power condition results in a reactor/turbine/feedwater trip and Main Steam Isolation Valves close accompanied by an immediate shrinking of steam generator inventory below the low-low level setpoint for automatic initiation of auxiliary feed water. The turbine load rejection, the steam generator tube bundle uncovery, and the feed water instantaneous flashing into steam can over-pressurize the steam generators. Main steam atmospheric dump and safety valves will progressively open to prevent over-pressurization of the steam generators and transfer decay heat to the atmosphere. Steam generator tube uncovery is significant because, if the SG tube break locations becomes uncovered for 10 minutes (Westinghouse analysis), a direct path might exist for fission products contained in the primary coolant to be released to the atmosphere without partition with the secondary coolant. Source: NRC Bulletin No. 88-02: Rapidly Propagating Fatigue Cracks In Steam Generator Tubes.

D. Recent Steam Generator Tube Rupture Events

Even with the improved SG inspection programs, operating experience provides examples of tube flaws that were not detected by in-service tube inspections. These flaws were later discovered after accidents and did not satisfy the required structural and accident leakage integrity margins as observed in SONGS Unit 3. There have been five such occurrences from 1987 to 2012:

(1) On July 15, 1987, a steam generator tube rupture event occurred at North Anna, Unit 1 shortly after the unit reached 100% power. The rupture extended circumferentially 360ø around the tube. The cause of the tube rupture has been determined to be high cycle fatigue and flow-induced vibrations.

(2) Indian Point 2—SGTR event in February 2000. This represented a failure to meet structural and leakage integrity performance criteria.

(3) Comanche Peak 1—Failure to meet structural and leakage integrity performance criteria in Fall 2002, as determined by in-situ pressure testing during condition monitoring.

(4) Oconee 2—Failure to meet structural integrity performance criteria in fall 2002, as determined by in-situ pressure testing during condition monitoring.

(5) SONGS 3 —Failure to meet structural integrity performance criteria in 2012, as determined by in-situ pressure testing during condition monitoring.

Of these events, only the tube that leaked under normal operating conditions at SONGS 3 likely would had ruptured with 2 additional tubes, if an MSLB event had occurred during a several-month period preceding the SGTR event in January 2012. This experience indicates that the frequency at which SONGS 2 tubes may be vulnerable to rupture (or leakage from multiple tubes) under MSLB may be above the conditional probability value of 0.05 assumed in Westinghouse, AREVA and Intertek Operational Assessments.

E. Condition of Unit 2 steam Generators: SONGS Unit 2 & 3 RSGs are of the same design. Therefore, the description of unit 3 provided below is also applicable to Unit 2. SONGS Unit 3 RSGs' unprecedented tube failure and massive tube and AVB/TSP degradation occurred due to fluid elastic instability, flow-induced random vibrations, Mitsubishi Flowering Effect and high cyclic fatigue under the following unique circumstances:

(1) U-tube bundle areas with high dry steam will experienced double in-plane velocities (> 50 feet/sec, based on review of MHI Root Cause, Dr. Pettigrew and other research papers published between 2006-2011) compared with out-of plane velocities assumed (25 feet/sec) to have been predicted by Outdated Out-of-Plane Westinghouse /NRC /MHI /AREVA ATHOS Computer Models,

(2) Lack of positive in-plane restraints and zero damping,

(3) Large number of SONGS Units 2/3 RSG U-bends with tube clearances of only 0.05 inches (Design 0.25 inches, Industry Norm > 0.25 inches),

(4) Excessive number of tubes with narrow tube pitch to tube diameter,

(5) Low frequency small diameter retainer bars (56 HZ) installed to fit the excessive number of SCE requested tubes compared with other MHI SGs' higher frequency and retainer bars (120 HZ to 1200 HZ), which are not prone to vibrations due to fluid-induced vibrations.

(6) SONGS' tubes being much longer compared with Westinghouse Model 51 steam generators (Average length of heated tube = 730 inches) and other MHI SGs,

(7) MHI RSGs' unique floating tube bundle with degraded Retainer Bars can collapse due to 100% tube uncovery for 10 minutes under MSLB SG Depressurization, Multiple SGTR SG over-pressurization and lifting of SG Relief Valves, Combination of MSLB and SGTR Conditions, Release of 100% RCS Iodine to Environment,

(8) Large amount of uncertainties and unverified assumptions in MHI, AREVA, Westinghouse and Intertek's contact force modeling (zero for in-plane vibrations), calculation of impact wear coefficients and tube stress calculations (4.6 ksi versus 16-17 ksi) and computer and statistical modeling, and,

(9) Incomplete tube inspections in SONGS Unit 2. Incubating macroscopic circumferential cracks caused by fluid elastic instability, flow-induced random vibrations and high cycle thermal fatigue are

extremely difficult to detect and be accurately sized by nondestructive evaluation techniques including X-ray, ultrasonic, and eddy current based bobbin coil probes, mechanically rotating pancake coil (RPC), etc., which have been used in 170,000 SONGS Tube inspections. State-of-the-art systems: Zetec MIZ-80 iD system, Tecnatom TEDDY+, Circular TE and TM, transmit-receive eddy current array probe C-3 and other specialized radiographic probes capable of detecting sub-surface cracks caused by high cycle thermal fatigue have not been used in the 170,000 SONGS Tube Partial and Limited Inspections as shown below for Unit 2 due to access problems in the most problematic innermost sections of the U-Tube Bundle, the high cost, lack of availability of highly specialized tools and contractors, radiation doses, and time considerations in a rush to start Unit 2. The inspection scope defectively designed and degraded SONGS Unit 2 RSGs should have covered 100% hot leg and cold leg tube inspections, 100% of dents or dings, 100% of tube inspections in the tight radius U-bends, 100% area of the Top of the Tube Sheet and Tube Support Plates.

(10) SCE states, "Remote visual inspections were performed to confirm the integrity of the RBs. The results of these visual inspections are summarized below: (1) No cracking or degradation of RBs or RB-to-retaining bar welds was observed, and (2) No cracking or degradation of AVB end caps or end cap-to-RB welds was observed.

Note: Remote visual inspections do not ensure that retainer bars or RB-to-retaining bar, AVB end caps or end cap-to-RB welds are not cracked. Cracks in welds can only be detected by using advanced Remote Computer Controlled Low-Frequency Ultrasonic Methods.

F. SONGS and Offsite Emergency Plans

Current SONGS Updated FSAR, Emergency Plans, San Diego County Multi-hazard Regional Emergency Operations Plans, IPC/Orange County & Other Offsite/State of CA Plans and NRC Emergency Rules/Guidance, SONGS Drills and Exercises are based on a slow occurring Steam Generator Tube Leakage/Rupture caused by anticipated operational transients, which are significantly flawed based on the SONGS Unit 2 realistic scenario described below.

G. Loss of Offsite Power In Unit 2:

A potential accident causes loss of offsite power In SONGs Unit 2 operating at 70% power. This event causes a simultaneous reactor, turbine, feedwater and reactor coolant trips. Due to feedwater pump trip, the RSG U-bundle secondary water level will shrink and tubes will be uncovered for a period of at least 10 minutes and experience a sharp drop/increase in secondary side pressure. The entire sub-cooled feedwater inventory contained in the faulted RSG will instantaneously flash to high dry steam and over-pressurize the steam generators. Loss of Turbine load will also over-pressurize the steam generator. Main steam safety valves located outside the containment will progressively open to prevent over-pressurizing the steam generators and connect the faulty generators to the environment via open steam safety valves. In the midst of 100s of alarms and flashing trouble shooting windows, now for the next 10-15 minutes, the San Onofre Control Room is busy trying to trouble shoot and diagnose the changing plant and transient conditions and flipping through 1000 pages of cumbersome, mind boggling and complex Emergency, Abnormal, Post-Trip, Fire and Severe Management Accident Guideline procedures to determine the correct diagnpstic course of mitigation actions.

Meanwhile, in the plant, during the same 10 to 15 minutes, the combination of resonant, out-of-plane, in-plane vibrations, jet impingement forces, and RSG debris will cause large axial, bending, dynamic and cyclic loads on all the tubes, tube support plates, retainer bars and anti-vibration structure. The strength of the welded and mechanical connections of these low frequency retainer bars, retaining

bars and bridges have not been tested and analyzed for the effects of these cumulative loads to prevent AVB structure displacement, deformation or collapse during loss of offsite power. The displacement, deformation or collapse of AVB structure introduces new and significant axial, bending, dynamic and cyclic loads, which can potentially cause thousands of worn, cracked, plugged and stabilized tubes to exceed their high cycle fatigue stress levels several times than the allowed tube ASME Endurance Limit of 13.6 ksi. If this happens, multiple circumferential tube ruptures will occur at tube-support plates, mid-spans, free spans and tube-to-anti-vibration bar notched interfaces due to macroscopic circumferential cracks caused by tube-to-tube wear and high cycle thermal fatigue. Since all the steam from the RSG would escape to the environment, the iodine-131 from un-partitioned reactor coolant leaking out the rupture tubes will also escape to the environment in less than 10 minutes with 60 tons of radioactive coolant and steam. Consistent with Fukushima Task Force Lessons Learnt and NRC Commissioner Meeting Transcripts, this event will be considered as a beyond design basis event, and SONGS Operators will be unable to take any timely mitigation actions in a radiation/steam environment to stop a severe nuclear accident in progress and notify the Offsite Agencies.

If the prevailing winds are towards San Clemente, consistent with NRC Inspector General Reports, NRC and Government Studies and observations of SONGS Emergency Plan Drills for the last six years, SCE and Offsite agencies would not have time to respond, notify, evacuate, shelter or give Potassium Iodide to the affected residents within the 10-mile affected emergency planning zone. ODAC, Offsite field monitoring teams, Emergency Vehicles, Helicopters, Orange County Hospitals capabilities will be severely limited or non-functional in a high radiation environment to operate and rescue/transport/shelter disabled, sick, elderly, children, transients and other affected citizens. The casualties, and short, long-term cancer affects to the affected population and ingestion pathway will depend upon the iodine spiking factor and the duration of blowdown, but the offsite releases will significantly exceed the NRC approved SONGS Control Room limit of 5 Rem Total Effective Dose Equivalent (TEDE), and the Exclusion Area Boundary and Low Population Zone limit of 2.5 Rem TEDE.

NOTE: While this event is occurring, San Diego County, Orange County and Marine Corps Base Camp Pendleton would not be able to dispatch radiation monitoring teams into areas around the plant due to high radiation levels to locate the plume and take soil and air samples to determine the extent of the release off plant grounds. That offsite field monitoring data, along with the data from the plant would not be able to be transmitted to the Offsite Dose Assessment Center (ODAC) located in MESA Emergency Operations Facility for making Protective Action Determinations. The offsite plans are recommended to be revised and feasibility demonstrated via an Emergency Plan Drill using Alternate and Parallel Emergency Operation Facilities located in Irvine and San Diego. The Three Mile Island nuclear accident was not as serious as Chernobyl, but was very confusing and chaotic. 40,000 gallons of radioactive waste was released in the Susquehanna River. 140,000 pregnant women and small children were evacuated as a precautionary measure, but the effects of cancer risk are undetermined.

If the prevailing winds are towards the Pacific Ocean, the total immediate casualties, including SONGS workers, will be at a minimum, although exposures could still exceed the NRC approved SONGS Control Room limit of 5 Rem Total Effective Dose Equivalent (TEDE) and the Exclusion Area Boundary and Low Population Zone limit of 2.5 Rem TEDE, depending on the iodine spiking factor and the duration of blowdown.

If the prevailing winds are inland towards San Diego County, the immediate and long-term fatalities and cancer affects will significantly exceed the NRC approved SONGS Control Room limit of 5 Rem Total Effective Dose Equivalent (TEDE) and the Exclusion Area Boundary and Low Population Zone limit of 2.5 Rem TEDE. The impact within the 50 Mile Ingestion Pathway is undetermined.