SAN ONOFRE

San Diego Regional Water Quality Control Board

June 20, 2018

Brought to you PUBLIC WATCHDOGS by



Charles Langley Executive Director

OVERVIEW

- Why San Onofre failed
- Unreported radiation exposure impacts our environment
- True costs of radiation coverup
- Questionable cans buried above water table
- How San Diego RWQCB's 'Permit to Discharge' endangers the public's water

Edison's "Like for Like" replacements

 Southern California Edison's (SCE) Steam generators wore out

 Reported replacement intent to Nuclear Regulatory Commission (NRC)

"Like for Like" Replacement
 Steam Generators (RSG)

SAFETY

- Eliminated a stabilizing trycylinder
- Eliminated anti-vibration bars
- Told the NRC they were "improvements"
- ADDED more steam tubes
- Water Hammers shook generators apart
- Radiation Leak withheld from public for 17 days by Southern California Edison

SCE's VP WATER

HAMMER WARNING!



Dwight E. Nun

November 30, 2004

Mr. Akira Sawa General Manager Mitsubishi Hasay Industries, LTD Kobe Shipyard & Mackinsey Works 1-1, Wadasaki-Cho 1-Chome Hyogo-Ku Robe 652-6565 Janon

Dear Mr. Sewe:

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

Since I was unable to participate in the Replacement Steam Generator contract signing in September due to emergent problems at our facility, let me now express my appreciation for Mitsubishi Heavy Industries' willingness to partner with us on providing the replacement steam generators for San Onoffe. This is an extremely important undertaking, not just for San Onoffe, but for the entire Southern California Edison Company. Our detailed and unhautive evaluation convinced us that Mitsubishi Heavy Industries was the heat match for our needs.

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 beyon 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 riaks 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, San Onofre has made it a goal to partner with Mitsubishi Heavy Industries and maintain a close relationship with your engineering and fabrication organization to sasist them in this design evolution. To this end we are performing detailed, intrusive evaluations of your design documentation and your approach to design evolution on this job. A recent example of successful cooperation between our engineers is the design of the feedwater distribution system. San Onofire's concern with potential water hammer as a result of the design of the distribution ring has been address by Mitsubishi Heavy Industries by utilizing the J-tube design. Prudent questioning by San Onofre followed by an exhaustive evaluation by Mitsuhishi Henvy Industries led to a design revision to address a potential risk to the success of the project. However, we recognize that we are not designers of steam generators and there are limitations to the assistance we can provide. Notwithstanding this fact and after working with your organization for almost two months, we have some observations that we'd like to share with you.

P.O. Box 128 San Clomeste, CA 93674-0128 949-368-1480 Say 949-923-1490



What really happened ...

Old Steam Generator

New Steam Generator

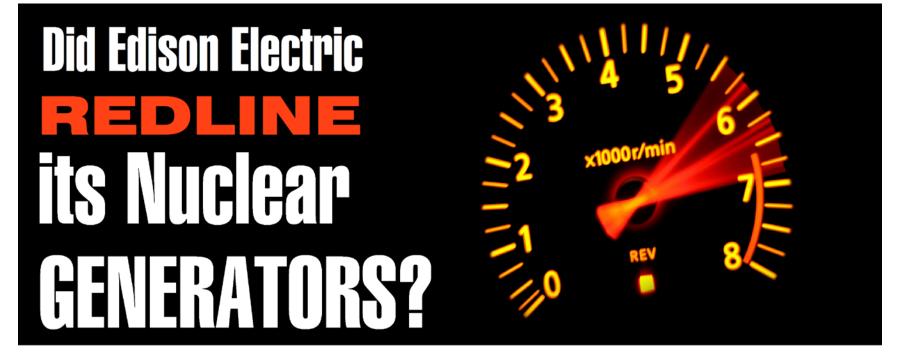


Old Steam Generator, before design modifications



Replacement Steam Generator, after modifications

WHISTLEBLOWEK REPORT



DID IT CAUSE THE RADIATION LEAK?

Too HOT, too HARD,

too FAST
SONGS, the San Onofre Nuclear Generating Station failed because the

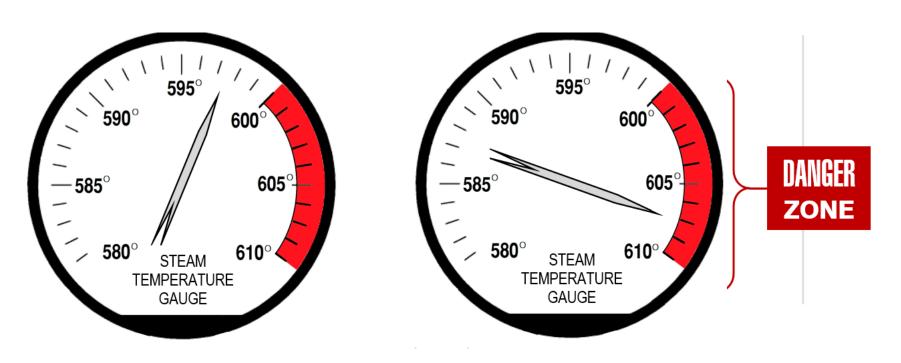
 SONGS, the San Onofre Nuclear Generating Station failed because the operators ignored the instruction manuals (50.59 Screen Orders) for the Replacement Steam Generators (RSGs)

The RSGs are qualified to operate in the Thot range from 598 to 611oF, which corresponds to the Tcold range from 541.3 to 555.4oF. However, NECP 800071703 and this 50.59 screen only allows the plant to operate up to Thot <= 598oF, as additional analyses are required to be performed to evaluate the rest of the RCS and support systems' ability to operate above Thot > 598oF.

SCE's Operators pushed the Replacement Steam Generators beyond their engineered "redlines" specified in their own Screen Orders. In simple terms, Southern California Edison...

- Ran the RSGs at steam temperatures that were too high (too hot)
- Forced too much steam pressure through the system (too hard)
- Created excess steam velocity and pressures (too fast).

SCREIN ORDERS VIOLATED



A difference of Degree Steam Temperature too high

STEAM PRESSURE TOO HIGH

- January 31, 2012: radiation sirens blew
- Hot, radioactive dry steam escaped from generator
- Unit #3 vented Radioactive dry steam into our atmosphere
- SCE withheld notice from the public for 17 days
- SCE then claimed 'small leak'
- June 8, 2013 SONGS shuttered
- SCE 'Dilute & Discharge' policy and water quality







THE COVERUP

- Ex Parte Meetings revealed
- CPUC President met Edison in Warsaw Poland
- Warsaw Notes = What Edison should be paid by the ratepayers for their "losses"
- Determine if Edison was at fault later
- Stalled, stonewalled delayed all hearings until case was settled quietly out of court
- All Public Hearings circumvented

RESULTS

- \$4.7 Billion Estimated cost to close San Onofre (SONGS)
- \$3.3 Billion approved by regulators to be paid by customers instead of Edison stockholders
- \$775 Million settlement shaved off \$3.3 Billion customers not to pay in future
- \$2.525 Billion remaining SONG closing costs customers will pay instead of Edison stockholders

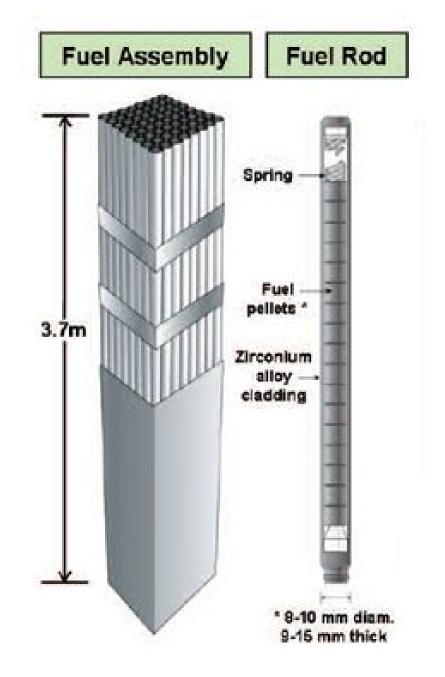
FUEL WAS SCHEDULED TO BE INTERRED IN DECEMBER



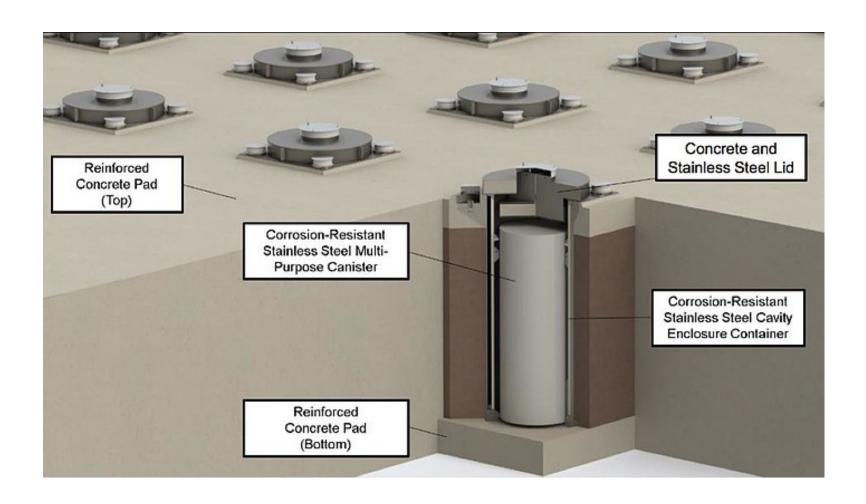
Fuel Offload Schedule

Action	Timing
ISFSI pad construction complete	August 2017
Security building complete	October 2017
Final SCE reviews and NRC inspections	November 2017
Start offload from wet to dry storage	December 2017
All fuel in passive dry storage	Mid-2019

This is the fuel they are offloading

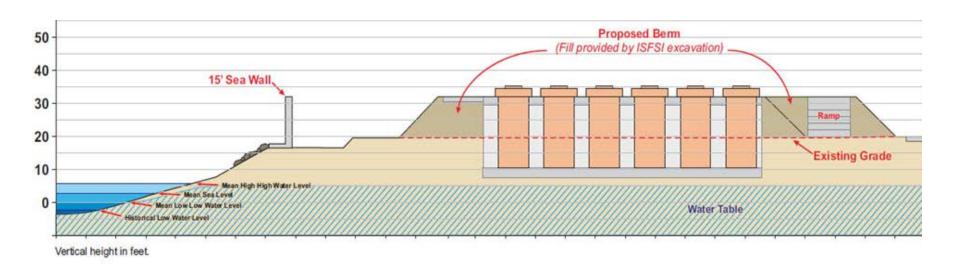


The Silos

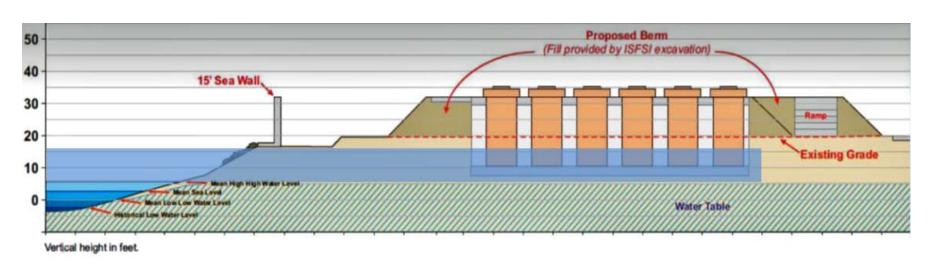


MANUFACTURER'S SIDE VIEW

Current Sea Level



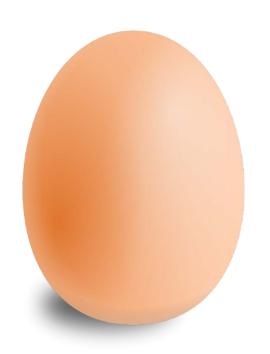
Projected Sea Level by 2050, James Hansen, NASA





Proportional Mathematics

• 5/8" on full size cask = "Eggshell Thin"

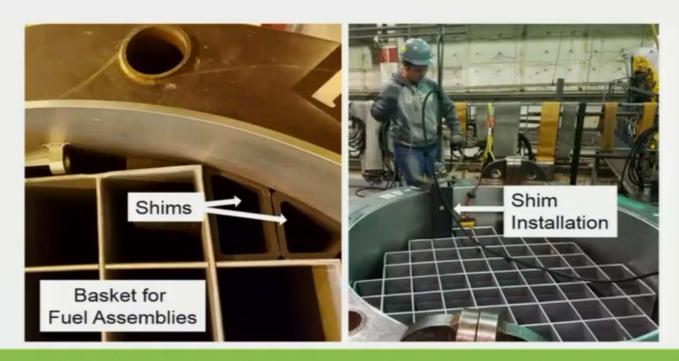




DEFECTIVE SHIMS



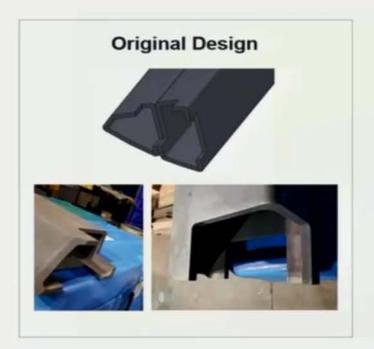
Basket Shims







Shim Designs

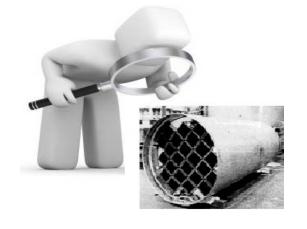






CA Coastal Commission GRANTS EDISON PERMIT

- October 6, 2015 CA Coastal Commission grants Edison burial permit
- Granted under 'Special Conditions'
- Aging Management Program required by the NRC
- Special Condition #2 of permit



STILL NO WAY TO INSPECT

- Special Condition #2 requires Edison implement an Aging Management Program
- Underground Monitoring needed to:
 - -evaluate environmental conditions
 - -inspect cask for structural integrity
 - -performance delivered as designed
 - -allow for safe transport as promised

Publicity is justly commended as a remedy for social and industrial diseases. Sunlight is said to be the best of disinfectants; electric light the most efficient policeman.

"

Louis Brandeis, Supreme Court Justice