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Energy - Docket Optical System

From: Kravitz, Raquel@Energy
Sent: Monday, February 23, 2015 10:29 AM
To: Energy - Docket Optical System
Cc: Raitt, Heather@Energy
Subject: FW: Updated Comments for Docket # 15-IEPR-01 General/Scope
Attachments: CEC-2014-IEPRUpdated by RMORGAL.doc

Please docket this email and the attachment to 15-IEPR-01 General/Scope.

Thanks
Raquel

From: Rick Morgal [mailto:rmorgal@wildblue.net]
Sent: Sunday, February 22, 2015 1:35 PM
To: Kravitz, Raquel@Energy; Mills, Danielle@Energy
Cc: Donna Gilmore; Bonnie Morgal
Subject: Updated Comments for Docket # 15-IEPR-01 General/Scope

I received notice of the opportunity to submit comments at the last minute and provided a quick submission on the February 6th dead line.

Please accept my updated attached comments for Docket #15-IEPR-01 General/Scope.

Thank you,

Rick Morgal
760 788-4394

To: California Energy Commission February 22, 2015

RE: Docket # 15-IEPR-01 General Scope

The 2014 Integrated Energy Policy Report Update must address new information effecting California's nuclear power plants, nuclear waste and decommissioning of these power plants.

Recent NRC Decision allowing the extension of Continued On-Site Storage timelines has serious impacts to current dry storage canister technology.
On August 26, 2014, the NRC Final Rule for Continued Storage from Spent Nuclear Fuel at existing nuclear power facilities recognizes the containers used for storing spent nuclear fuel need to meet on-site requirements for short-term (60 years after plant shutdown), long-term (160 years after plant shutdown) and indefinitely.

http://pbadupws.nrc.gov/docs/ML1423/ML14238A326.pdf

Yet there are no NRC canister specifications that address the extended timelines of the new on-site storage requirement. How can the timeline be extended to an "indefinite" period of time without specifying canister attributes that would allow a spent nuclear fuel storage canister to endure for such a long period of time?

The term "indefinitely" is not acceptable because there is no known nuclear waste storage technology that will last indefinitely. Morally and ethically we cannot rely upon future generations to be capable and/or willing to address the dangerous task of maintaining the canisters holding our spent nuclear fuel.

There is significant data showing that the current thin walled canisters (1/2 to 5/8^{ths} of an inch thick, austenitic stainless steel) used as spent nuclear waste storage canisters in marine environments are susceptible to Stress Corrosion Cracking.

One data point is based upon an austenitic stainless steel pipe deployed at the San Onofre power plant site, which has been documented by the NRC, as experiencing a Stress Corrosion Crack growth rate of 1/100th of an inch per year over a 25 year period.

http://pbadupws.nrc.gov/docs/ML1425/ML14258A082.pdf page 9.

Also notice in the NRC slide link above, that an austenitic stainless steel pipe deployed at the Koeberg power plant on the Southern Atlantic Ocean experienced a Stress Corrosion Crack growth rate exceeding 1/30th of an inch per year on average, over a 17 year period.

Clearly there is variability to the rate of Stress Crack Corrosion experienced by austenitic stainless steel at power plants near the ocean. But from the above data, documented by the NRC, currently deployed austenitic stainless steel thin walled canisters containing spent nuclear fuel may not last 20 to 60 years in a marine environment, yet alone indefinitely.

NRC metallurgist Darrell Dunn, has stated that it could take as little as 16 years for a Stress Corrosion Crack to go all the way through the standard 5/8ths inch, thin walled spent nuclear fuel storage canister.

Read first paragraph on page 4 of this link:

https://sanonofresafety.files.wordpress.com/2013/06/ml14258a081-8-5-14meetingsummary.pdf

With hard field data indicating a thin walled canister could crack all the way through in 20 to 60 years and statements by an NRC metallurgist claiming it is possible that a through wall crack in a thin walled canister could occur in as little as 16 years after crack initiation; it appears as though canister replacement is going to be required to safely store spent nuclear fuel in thin walled canisters on the California coastline for periods beyond two decades.

The economics of storing spent nuclear fuel in thin canisters and the associated maintenance cost of replacing these canisters every two to three decades needs to be compared with the cost of storing this material in "thick walled ductile cast iron" casks that do not have these cracking issues. By performing a cost benefit analysis that includes the maintenance cost of the thin walled canisters in the life cycle costs of the current storage system, it should become apparent that the State of California cannot afford any more of the thin canister storage vessels holding spent nuclear fuel on our coastline indefinitely where the salt air accelerates degradation of the thin canisters.

The cost benefit analysis of the thin canisters versus thick casks needs to be performed before more than one billion dollars of public money is spent on thin walled canisters to store San Onofre's spent nuclear fuel. The cost benefit analysis should include infrastructure required to replace the thin walled canisters due to cracks or other degradation (since thin canisters cannot be repaired), cooling pool fabrication and operational costs required to replace the canisters. All compared to allowing the thick walled ductile cast iron casks to remain on the coast for without significant maintenance costs.

A particularly difficult portion of the cost benefit analysis will be to quantify the human and economic impacts associated with a Stress Corrosion Cracked thin walled canister releasing its radioactive contents into the surrounding environment. Given the mechanical stresses associated with moving these massive canisters during their required replacement and how quickly Stress Corrosion Cracks can initiate and grow in marine environments, it is unrealistic to believe there is no possibility of a cracked canister failure . With such a scenario being possible in our future, the State of California should be asking the NRC to quantify the following questions associated with short term, long term and indefinite storage of spent nuclear fuel on our coast:

What is the probability of a ruptured thin walled canister in relationship to years deployed on the California coastline due to Stress Corrosion Cracking during static storage?
What is the probability of a ruptured thin walled canister in relationship to years deployed on the California coastline due to Stress Corrosion Cracking during canister replacement tasks?

What is the predicted radiation released into the environment by a ruptured canister?
What is the cost (economic & social) of a radiation release caused by a ruptured canister?

As for the amount of radiation released into the surrounding environment due to a ruptured canister, there is very little data or reports available to the public that quantify this situation. One publically available data point on this subject is provided by Dr. Kris Singh, CEO of Holtec, the manufacturer of thin walled spent nuclear fuel storage canisters. While speaking as a nuclear fuel storage expert, to a Community Engagement Panel at a Southern California Edison sponsored meeting Dr. Singh stated,

"millions of Curies would be released when a microscopic crack breaches all the way through a spent nuclear fuel storage canister". This statement can be witnessed by listening in between 30 to 45 seconds into the following link:

https://www.youtube.com/watch?v=euaFZt0YPi4

Holtec's thin walled spent nuclear fuel storage canister system that Dr. Singh speaks of in the above youtube link and other similar thin walled canisters are currently deployed at most nuclear power plant sites across the United States.

FYI accidental release of radiation at Three Mile Island was documented by the NRC as approximately 43,000 Curies of radiation.

http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.html

Chernobyl has been estimated between 100 million and 5,000 million Curies by many differing sources, but these numbers provide a relative estimate for reference in this comment letter.

So a breach from one San Onofre thin walled canister releasing "millions of Curies of radiation" would be a significant radiation event. Given the fact that the thin walled canisters typically experience an internal pressure during normal conditions with helium being the interior gas, most of the released radiation will be air born affecting surrounding communities, nearby Interstate 5 and the rest of the country that is typically down wind of the prevailing winds.

When considering the relatively short timeline associated with Stress Corrosion Cracking through a thin walled canister and the recently announced long deployment time of these canisters anticipated by the NRC, it amazes me that their isn't more concern by the California Energy Commission, the California Public Utilities Commission, the California Coastal Commission and the State of California to get involved in the process of ensuring the spent nuclear fuel canisters deployed on our coastline are not an example of Federal regulation oversight failure similar to the financial conditions that lead to our country's recent recession.

All Californians deserve a cost benefit analysis be performed on thin canisters versus thick walled casks BEFORE over one billion dollars of public funds are allocated to purchase thin

canisters that have a higher life cycle costs when compared to thick walled ductile cast iron casks.

Currently San Onofre has 51 thin walled canisters holding spent nuclear fuel, being deployed on a narrow landmass between the Pacific Ocean and Interstate 5. These thin walled canisters were deployed beginning in October 2003, with no inspections performed (or planned in the near future) on the canisters since deployment to determine the integrity of the canisters. The NRC, SCE, the State of California, nor the public have any idea if any of these thin walled canisters have experienced Stress Corrosion Cracking. This fact is known to be true because there is no technology currently available to inspect thin walled canisters. The NRC has recently asked the nuclear industry to research and develop techniques to inspect thin canisters while entombed within their concrete encasement with a five-year development period just to develop the technology to inspect thin walled canisters.

In the current situation, it is possible that the Pacific Ocean's marine air has already induced Stress Corrosion Cracks over half way through several canister walls at San Onofre. It is not unreasonable to think that a medium sized Southern California earthquake could simultaneously rupture several of the 51 canisters (damaged by Stress Corrosion Cracking) currently holding spent nuclear fuel at San Onofre. Releasing multi-millions of Curies into the surrounding environment where over eight million people live in some of the most valuable real estate in the world.

In the above described earthquake scenario, once the SONGS plant is decommissioned, it could take months for a radiation leak associated with a cracked canister to be detected since no real time nuclear radiation monitoring equipment is required to be installed for the spent nuclear fuel storage canisters by SCE. This is because at a decommissioned power plant, real time radiation monitoring of spent nuclear waste storage canisters is NOT required by the NRC. What IS required by the NRC of a decommissioned plant's owner is to measure the radiation coming out of the storage cask's cooling vents four times a year.

Eight million Californians deserve real time monitoring of any spent nuclear fuel stored on our coastline and it is up to the State of California to ensure the NRC doesn't let SCE continue to get by without implementing real time monitoring of spent nuclear fuel canisters at San Onofre.

The NRC states that a thin canister is within NRC specifications if a crack is less than 75% of the way through the canister's overall wall thickness. Yet all simulation and analysis data used to determine a thin walled canister's survivability from an earthquake utilizes data for brand new canisters with no weld flaws and no Stress Corrosion Cracking present. The NRC has not made public any simulation/analysis results that show a thorough numerical simulation analysis technique, such as finite element analysis (FEA), has ever been used to predict how significantly Stress Corrosion Cracking impacts a thin wall canister's earthquake survivability.

Without a detailed thorough mathematical analysis that attempts to quantify the effects of cracks in thin canisters on earthquake survivability, the current NRC specification that allows

a crack up to 75% of the way through a thin wall canister should ONLY be applied to canisters under static (non-earthquake) conditions. Any other interpretation of current publically available NRC data related to the earthquake survivability of thin canisters related to Stress Corrosion Cracking is aiding and abiding the neglectful status of our society's lack of understanding of cracked thin walled canisters and their survivability during an earthquake.

Clearly coastal California needs additional safeguards to ensure that aged canisters that could be degraded by Stress Corrosion Cracking can survive all earthquakes of a reasonable magnitude over the duration of the spent fuel storage site's lifetime. Current NRC specifications are not sufficient to ensure that basic minimum level of safety, due to the unreasonable duration of the storage sites lifetime and the possibility of rapid Stress Corrosion Crack growth in marine environments.

To protect our coastline and public, the State of California should require the NRC to provide a seismic rating of a cracked canister. How much will an earthquake affect a thin walled canister that is 25%, 50% or 75% of the way through a thin walled canister? What will be the impact of a cracked canister including radiation released into the air, ground and nearby ocean?

The State of California needs to perform a cost benefit analysis between thin canisters and thick walled ductile cast iron casks BEFORE releasing funds to procure San Onofre's spent fuel storage containers.

The State of California must demand real time radiation monitoring of all canisters deployed in the State.

The State of California must require the NRC re-evaluate their thin canister specification that allows cracks up to 75% of the way through the thin canister to be within specification for regions prone to strong earthquakes.

Our great State awaits your action.

Respectfully Submitted by,

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