

Outlier Events in Perspective | May 2020

There are no accident scenarios involving dry spent fuel storage at the San Onofre Nuclear Generating Station (SONGS) that result in an offsite radiological release due to damage to a canister, which is supported by the analysis performed by the Nuclear Regulatory Commission under NUREG-1140. Accident scenarios that involve an operating nuclear reactor are simply not possible at SONGS, where the reactors have been defueled for years. We should take comfort in that.

[NUREG-1140](#), "A Regulatory Analysis on Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees," analyzed potential accidents for 15 types of fuel cycles and other radioactive material licensees.

The criterion for deciding whether an accident was significant is whether a release could cause a person outside the plant on the plume centerline to receive an effective dose equivalent of more than 1 rem[1,000 millirem]... (1 rem is also the Alert notification threshold for radiological release [EALs](#). Note: there are zero EALs involving an offsite radiological release from spent fuel in dry storage).



The Holtec UMAX spent fuel storage system at SONGS.

One of the 15 types of fuel cycle facilities analyzed was spent fuel storage (p. 61). The accident assumed for this analysis was the removal of the lid of a dry cask in which all the fuel rods have been damaged. The gaseous activity in the gap between the fuel and cladding is assumed to be released. *From NUREG-0575¹ 10% of the krypton-85 and 1% of the iodine-129 activities are assumed to be in the gap. The cask is assumed to hold 24 PWR spent fuel assemblies. The fuel is assumed to be less than 5% by weight uranium-235. The fuel burnup for this analysis is assumed to be 33,000 megawatt-days per metric ton of uranium. The fuel is assumed to have been removed from the reactor core 5 years earlier. Using these assumptions the activity released from a cask would be 8,000 curies of krypton-85 and 0.004 curies of iodine-129.*

Using the assumptions above, the projected dose at 100 meters from the ISFSI is 3 millirem, which is one-third of what you'd receive in a routine dental X-ray. This also is well below the NRC and SONGS limits for dose to the public, which is safely set at 100 millirem. Also note that 100 meters is within the SONGS exclusion area boundary.

The report concludes: "Therefore offsite emergency preparedness is not necessary for spent fuel storage either in dry casks or in pools." (p. 62)

Even so, SCE maintains and values its strong partnerships with emergency responders in the vicinity of SONGS, including Camp Pendleton, local counties and local cities.

¹ NUREG-0575, op. cit., [Volume 1](#), p. 4-18