

Palisades New Concern

After the closure of the Nuclear Regulatory Commission's Palisades public comment period, the NRC released new, critically important, safety related information concerning the damaged fuel assembly at Palisades. I am aware that Mr. Alan Blind quickly submitted comments on those new revelations and I support his comments.

However, Mr. Blind has not identified one critical area which needs to be included in the public discussion of the potential for radioactive releases before Palisades attempts a Band-Aide fix to remove its damaged fuel assembly. I am uniquely qualified to discuss this new issue as I hold a patent based on the elastic and plastic deformation of metals (Energy Absorbing Turbine Missile Shield: U.S. Patent #4,397,608: August 9, 1983).

Specifically, on page 3 of 3 of PNP 2026-055, Holtec states that the damaged fuel assembly has experienced an unknown amount of plastic deformation and that Holtec is unable to assess the extent of the deformation as the fuel assembly is currently tilted and bowing.

Once DD41 is placed on the FTC pedestals, the extent of plastic deformation and overall assembly alignment will be confirmed using cameras before lowering the canister lid.

That the fuel assembly is bowed indicates that each of the several hundred nuclear fuel rods within the fuel assembly is experiencing both longitudinal compressive and tensile stress. These stresses on the zircalloy clad must obviously be transferred to the fuel pellets within. Holtec acknowledges that the assembly has been plastically deformed which means that each fuel rod has been bent beyond its elastic limit. The fuel assembly will not spring back to magically become straight when removed from its present location.

Holtec Palisades then assumes that the fuel assembly will not degrade as it is moved from its current, tilted position stating:

Based on a review by our fuel vendor, the assembly is expected to straighten out without risk of fuel cladding failure

Holtec provides no analysis to support its assertion rather than claiming that its fuel vendor “expects” there to be no damage as the assembly is lifted and as the stresses are redistributed.

While a competent fuel vendor may have analyzed the stress/strain characteristics of new, unirradiated nuclear fuel, the experience of Holtec’s fuel vendor in assessing potential plastic deformation damage in irradiated fuel needs to be appraised before the assembly is lifted, not afterward. There is very little peer reviewed data on the plastic deformation of irradiated fuel. I do not intend to perform the NRC’s plastic deformation safety analysis for the NRC, but I do note that the literature contains references that indicate that irradiated nuclear fuel and its structural cladding undergo significant changes in plastic deformation behavior due to neutron bombardment. This is precisely the conditions that exist within the Palisades bent fuel assembly currently.

Rather than relying on the unsupported and unsupportable “expectations” of Holtec, an extensive public airing of the analysis is required through public participation in the proposed changes to the Palisades license. Both the NRC and Holtec acknowledge that there is no radioactive “emergency” requiring the immediate removal of the damaged assembly. While Holtec has obvious financial incentives to move quickly, the NRC’s role is to protect the public and not Holtec’s bottom line.

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