

Last Energy White Paper: Hermetically Sealed Containment

Revision #1

Introduction:

The purpose of this document is to achieve alignment on our reactor's design criteria, which will form the basis of subsequent detailed technical submissions. We are not requesting feedback on how these criteria meet the current licensing requirements as the NRC has the ability to issue exceptions and will soon be undertaking a wholesale revision of their current rule set as per Presidential Executive Order. We seek confirmation that these criteria, in achieving total and complete isolation of radiohazards in all states of a reactor's lifecycle, will fully satisfy the NRC's mandate of national security, worker safety, environmental safety, and public safety.

Design Criteria:

- A reactor will sit inside of a hermetically sealed containment structure.
 - There are no penetrations, openings, or pathways for radiohazards to escape.
 - There is no provision for access or maintenance to the interior of containment.
- The shielding will be sufficient such that any radiation generated internally, when measured at any point of biological access, will be indistinguishable from naturally occurring levels of radiation.
- Detailed analysis will be provided that demonstrates such a structure ensures containment and shielding when subjected to any credible challenge to its integrity: from all external or internal forces or events including but not limited to mechanical, chemical, thermal, seismic, and environmental stresses.
- The structure, through the mass and strength of its materials, will be so secure as to eliminate any credible threat of unauthorized access, unauthorized transport, or proliferation risk.
- The containment structure will be situated on private property with no public access.
- Inspection and testing provisions will be made available prior to operation to certify these attributes.
- Preservation of the structure's shielding and containment functionality will be pre-funded and maintained indefinitely through the periodic addition of material.
- These qualities will be maintained in all states of the reactor's lifecycle, irrespective of any intended or unintended occurrence.

Our Claim:

A system with these design criteria, despite having only one safety critical component and being an alternative to defense in depth, will achieve total and complete isolation of radiohazards in all states of a reactor's lifecycle and thus fulfills the NRC's mandate of national security, worker safety, environmental safety, and public safety.

Feedback Requested:

Does the NRC concur with this claim? If not, please list the remaining concerns. If so, as a next step, we'd like to mutually decide on the minimum set of analysis necessary to substantiate the design implementation as listed.