

From: Richard Barrett, *NRR*
To: Diane Jackson, Gareth Parry, Glenn Kelly, Mark ...
Date: Wednesday, June 02, 1999 01:35 PM
Subject: Re: RG 1.174

I tend to agree with Gareth, but with a little different twist. Safety principle 4 says that increases in "CDF and risk" should be small and consistent with the safety goal. It seems reasonable to use fuel damage as a surrogate for core damage and fatalities (latent or prompt) as the risk measure. As Gareth points out, the consequence analysis supports a conclusion that EP doesn't make much difference in either.

One must also consider safety principles 2 (defense in depth) and 3 (maintain margins). It seems to me that the extra time required for fuel damage (thermal inertia) is a margin issue. Regarding D-I-D, we discussed the idea of distinguishing between the situation with more (less) than 7 feet of water above the fuel.

Keeping all of this in mind, I think there is an important distinction to be made between drain-down events and boil-down events. Drain-down events tend to bypass the defense-in-depth aspect of the 7 foot criterion. They also take away a lot of the margin (time) inherent in fuel pool accidents. If the public perceives that all it takes is a dropped cask to set off a sequence of events that results in evacuation of their families and contamination of their town, they will not be impressed with some argument about small delta-risk. Come to think of it, I wouldn't either.

--Rich

>>> Gareth Parry 06/02 8:38 AM >>>

I'm not sure there's much of a distinction to be made between the effects of slow versus fast fuel damage events. The slower developing events give a greater chance of recovery, but that should already be factored into the frequencies. They also give an increased likelihood of successful evacuation but the early fatality risk seems small anyway, and the latent fatalities are not much affected by evacuation. Remember LERF is a surrogate for early fatalities, and is supposed to take into account the effectiveness of the barriers (containment, EP) as well as the frequency of core damage. Since there is no effective containment and the benefits of EP are small, perhaps the focus should be on prevention, i.e., keeping the frequency of zircalloy fires as low as possible. In other words, LERF does not apply, but rather an equivalent to CDF. However, the CDF goal may not be the correct value to use for the pool. It seems to me you could use latent fatalities as the basic risk measure, and work backwards to establish what is the acceptable level of zircalloy fire events that meets the latent fatality safety goal.

CC: Gary Holahan

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