

From: Diane Jackson *NR*
 To: Charles Tinkler, *RES* Edward Throm, *NR* George Hubbard, *NR* ...
 Date: Mon, Aug 21, 2000 1:27 PM
 Subject: Re: 3.5 cores for SFP accidents

GSI-82 assumed that all fuel in the spent fuel pool was involved in the fire. At the time, this was about 11 cycles or 3.5 cores for the plants that were studied.

Two factors went into the decision to keep the 3.5 cores.

1) The main factor was that the source term amounts in GSI-82 was for 3.5 cores and RES said this would make their calculations faster and easier. In the timeframe of our 3-month study, we were looking for ways to come up with answers and use as much of the existing information as we could

2) From the T/H side, we thought it was on the larger side of a fire but acceptable since it was conservative. Also, we thought it was not "that" far off. If it was a unscheduled shutdown: One full core final offload, with a possible 1/3 core very recently shutdown, 2/3 of a core from refueling offloads in the past two years - that takes us to two cores. Plus, we knew that the critical decay time would be longer than 2 years, so older fuel could get involved.

Diane

>>> Edward Throm 08/21 9:53 AM >>>

Tim:

Actually you would add the last two refuelings to a total (last) core offload at end-of-license to get between a 1.4 to 1.6 core equivalent value (2.0 would likely be a good upper bound number if more fuel is being off loaded at newer plants with longer fuel cycles).

The last 1-2 years came from the SFUEL studies which indicated that fuel as old as two years could reach the zirc-fire temperature through the additional radiation heat transfer from burning fuel if the older fuel was stored next to the newer fuel. In SFUEL the loading pattern was fixed such that the new fuel was always stored next the last discharged fuel (conservative).

>>> Timothy Collins 8/21/2000 9:12:07 AM >>>

Ed,

Thanks, but some clarification please: If only the last two years could be involved in the fire, then I get for Ginna $2*24/121 = 0.4$ cores; and for Millstone: $2*173/580 = 0.6$ cores.

Also, you indicated that GI-82 "concluded" that only the last 1-2 years of fuel would be involved.... What drove that conclusion?

Tim

>>> Edward Throm 08/21 7:57 AM >>>

Ref: NUREG/CR-4982, Appendix A

The inventories used for GI-82 were based on the actual loadings at Ginna and Millstone 1 when the report was written.

Ginna: 428 assemblies in the pool / 121 assemblies in core: **3.5 core equivalents**

Millstone: 1653 assemblies in the pool / 580 assemblies in core: **2.9 core equivalents**

GI-82 "concluded" that only the last one to two years of discharged fuel would be involved in a zirc-fire.

Ginna discharged 24 assemblies per refuel, and Millstone 173 assemblies per refuel.

>>> George Hubbard 8/18/2000 1:17:17 PM >>>

Tim asked the question as to the origin of using 3.5 cores in determining the source term and

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consequences for spent fuel pool accidents. In particular this is important since Joe says in his appendix that fire propagation is probably limited to less than two cores (Section 1.7 of T/H Appendix, page A1-9, last paragraph of February Report). Does anyone know the answer?

Diane, if we don't know the answer can you do some research to determine why? Note that Ed Throm is out of the office until August 28.

Thanks,

George Hubbard
2870

CC: Glenn Kelly, Joseph Staudenmeier, Mark Rubin, M...