EDO Principal Correspondence Control

FROM: DUE: 09/03/04 EDO CONTROL: G20040512
DOC DT: 07/12/04
FINAL REPLY:

David Lochbaum
Union of Concerned Scientists

TO:

Brian Holian

FOR SIGNATURE OF : ** GRN ** CRC NO:

Reyes, EDO

DESC:

NON-RISK-INFORMED SPENT FUEL STORAGE PLANS AT INDIAN POINT

DATE: 07/29/04

ASSIGNED TO: CONTACT:

NRR Dyer

ROUTING:

Reyes
Norry
Virgilio
Kane
Collins
Dean
Burns/Cyr
Zimmerman, NSIR
Miller, RI
Strosnider,NMSS

SPECIAL INSTRUCTIONS OR REMARKS:

Commission to review response prior to dispatch.
Add Commission on for concurrence.

Comments require coordination with G20040504.

Ref. G20040478 & G20040504.

Template: EDO-01

E-RIDS: EDO-001

Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

July 12, 2004

Brian E. Holian, Deputy Director
Division of Reactor Projects
United States Nuclear Regulatory Commission Region I
475 Allendale Road
King of Prussia, PA 19406-1415

SUBJECT: NON-RISK-INFORMED SPENT FUEL STORAGE PLANS AT INDIAN POINT

Dear Mr. Holian:

I regret that my schedule precludes me from attending the NRC public meeting on Thursday evening, July 15th about the proposed storage of spent fuel in an independent spent fuel storage installation (ISFSI) at the Indian Point Energy Center. It is a subject of considerable interest to me. As you may know, concerns about spent fuel storage at another facility in NRC Region I started me down the road that ultimately brought me to the Union of Concerned Scientists. Along that path, I also authored a book on the matter, *Nuclear Waste Disposal Crisis*, published in 1996.

One of the reasons I had wanted to attend this week's meeting was to gain additional insights to the spent fuel storage plans at Indian Point. Since joining UCS, I have personally visited the ISFSIs at Calvert Cliffs, North Anna, and Maine Yankee and have reviewed the licensing and use of ISFSIs at many other facilities. I hope, but do not expect, that Indian Point will be the exception to the rule of ISFSIs not being risk-informed.

As you know, the NRC has been moving further and further towards risk-informed regulation. Given all of the agency's arguments why this move is prudent and the vast resources expended on many movements in other arenas, it amazes me that the NRC steadfastly refuses to move an inch towards risk-informing spent fuel storage. All of the agency's arguments for risk-informed regulation apply to spent fuel storage. Now is the time for the NRC to stand behind its words.

The fundamental flaw with ISFSIs to date and the reason they violate the basic tenet of risk-informed regulation is that the onsite storage of spent fuel in dry casks adds to the overall risk profile for the site. It does not need to and would not do so if spent fuel storage were risk-informed.

Currently, plant owners turn to dry cask storage when their spent fuel pools are filled or close to being filled. They essentially transfer spent fuel into dry casks placed in the ISFSIs as needed to keep the pools just below the point of being filled. From a risk perspective, this practice makes no sense.

Risk is defined as the probability of an accident times the consequences from that accident. For spent fuel storage, the "accident" is loss of integrity of the fuel rod(s) with release of the radioactivity contained therein. For spent fuel stored in pools, the probability of an accident is dominated by the inventory of spent fuel assemblies discharged from the reactor within the past five years. This freshly discharged spent

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fuel is the hottest and therefore dictates water inventory loss/cooling system impairment accident scenarios. The "older" spent fuel in the pool contributes negligibly to the accident probability.

The consequences of a spent fuel pool accident depend on the inventory of radioactivity in the pool. Simply put, the more there is, the more that can be released. Thus, the "older" spent fuel in the pool may have little impact on the probability of an accident but it has considerable impact on the consequences from an accident.

The risk from a spent fuel pool loaded to near-capacity approaches its maximum value. The freshly discharged spent fuel defines the accident's probability while the collective sum of spent fuel in the pool defines the accident's consequences. That risk is maximized when the pool is maintained near full capacity.

The ISFSIs add to the spent fuel pool risk by introducing another spent fuel storage accident scenario; namely, the damage to spent fuel assemblies located in the dry casks. The dry cask risk is also the product of the probability of an accident times the consequences. The probability of a dry cask accident increases with the number of casks loaded and placed in the ISFSI. The consequences, however, are limited to the radioactivity inventory from a single cask unless some scenario is postulated that causes more than a single cask to fail. We have been repeatedly told that a terrorist attack on any nuclear plant site is so unlikely as to be considered negligible. If the NRC continues to stand behind this assertion, it would be hard to postulate a scenario involving more than a single cask failure. Thus, the risk from an ISFSI containing a single cask is nearly the same as the risk from an ISFSI containing 100 or 200 casks.

If spent fuel storage were risk-informed, the amount of spent fuel residing in the pools would be minimized and kept closer to the five-year cooling period rather than closer to filled capacity of the pools. By this prudent measure, the spent fuel pool accident's probability would be essentially the same but its consequences would be very significantly reduced. If SFP-FULL represents the risk of a spent fuel pool accident when the pool is maintained nearly full and SFP-FIVE represents the risk of a spent fuel pool accident when the pool is maintained at the five-year discharge inventory, then:

$$\text{SFP-FIVE} << \text{SFP-FULL}$$

The risk reduction (i.e., SFP-FULL – SFP-FIVE) should be significantly less than the risk increase from the onsite spent fuel storage in dry casks. If SF-CASK represents the risk of an accident of the spent fuel in dry casks:

$$\text{SFP-FIVE} + \text{SF-CASK} < \text{SFP-FULL}$$

As you can see, this method of ISFSI operation would actually result in an overall lowering of the spent fuel storage risk in Indian Point. The facility would be safer than it is now without the ISFSI – at least with regard to spent fuel storage.

But all prior ISFSIs have actually resulted in raising the risk profile of the facility:

$$\text{SFP-FULL} + \text{SF-CASK} = \text{UNNECESSARY PUBLIC RISK}$$

The risk from a spent fuel pool near full capacity has been retained and supplemented by the risk from spent fuel placed into dry casks and stored onsite. Clearly, this practice is the very antithesis of risk-informed regulation. In fact, it is a bad idea under prescriptive regulation and a worse idea under risk-informed regulation. It makes no sense from any regulatory perspective one chooses.

It is our hope that Entergy and the NRC will apply risk-informed regulation to spent fuel storage at the Indian Point Energy Center and break the tradition of ISFSIs producing an unnecessary increase in risk to the public.

Sincerely,

<ORIGINAL SIGNED BY>

David Lochbaum
Nuclear Safety Engineer
Washington Office