From:	Iyengar, Raj
To:	Arce, Jeannette
Subject:	FW: Docket ID NRC-2010-0267: IEER Comments on Reprocessing Rulemaking
Date:	Thursday, July 07, 2011 4:02:09 PM
Attachments:	IEER comments to the NRC on reprocessing rulemaking 7 July 2011 Docket ID NRC-2010-0267.pdf

-----Original Message-----
From: Rulemaking Comments
Sent: Thursday, July 07, 2011 3:56 PM
To: Iyengar, Raj; Sulima, John
Subject: FW: Docket ID NRC-2010-0267: IEER Comments on Reprocessing Rulemaking

-----Original Message-----
From: Lois Chalmers/IEER [mailto:lois@ieer.org]
Sent: Thursday, July 07, 2011 3:47 PM
To: Rulemaking Comments
Cc: Arjun Makhijani
Subject: Docket ID NRC-2010-0267: IEER Comments on Reprocessing Rulemaking

Dear NRC staff:

Arjun Makhijani asked that I send you the following (attached) file:

IEER comments to the NRC on reprocessing rulemaking 7 July 2011 Docket ID NRC-2010-0267.pdf

Sincerely yours, Lois Chalmers

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Institute for Energy and Environmental Research (IEER) Comments on Docket ID NRC–2010–0267: NRC "Draft Regulatory Basis for a Potential Rulemaking on Spent Nuclear Fuel Reprocessing Facilities"

by

Arjun Makhijani, President, IEER

7 July 2011

On June 10, 2011, the NRC published in the Federal Register the latest notice concerning development of regulations for future facilities engaged in the reprocessing of spent, or irradiated, nuclear fuel. This comment is in response to that notice.

I attended the NRC workshop on the development of reprocessing regulations on September 7 and 8, 2010, at the NRC's invitation. My comments during that workshop provide more detail on some of the points made below.

A. This rule making is premature and should be postponed

Existing generic rules for public health and environmental protection already cover all fuel cycle facilities. There is no need for a new rulemaking on that ground. Specifically, the EPA's 40 CFR 190.10(a) provides dose limits for members of the public and existing NRC rules provide that exposure should be kept as low as reasonably achievable. There is no need to revisit these rules and no need for a rulemaking.

The appeal for a new rulemaking on the industry's part is to clarify the situation after a long hiatus in licensing a reprocessing facility in the United States. The matter is very specific to the

reprocessing facility and the downstream implications, such as mixed oxide (or other plutonium-uranium fuel) fuel fabrication, new types of low-level waste that might be created, and the interim and long-term management of the spent fuel that would result from MOX (or other plutonium) fuel use. It is simply not sensible to do this without a detailed specification of a technology.

A generic rule-making would be inappropriate. As noted, to the extent that rules for nuclear facilities are needed on health grounds, they already exist. Rules for safety, such as criticality control, to the extent that they are not generally specified in existing rules, are highly technology and configuration dependent. For instance, Areva's reprocessing plant at La Hague in France has tanks in which liquid high-level waste is stored. These tanks pose very specific risks in the case of a loss of cooling for a period of a few days since such an incident could result in an explosion and a catastrophic release radioactivity. The potential environmental consequences of such a release were explored by the Norwegian radiation protection authority in 2010. This risk does not exist in non-aqueous processes, which would pose their own challenges. Also criticality risks in the high-level waste tanks at Savannah River Site are different from those at La Hague even though both used the PUREX process. This is because of different high-level waste management methods.

Further, if the PUREX process, used at La Hague and elsewhere, is to be modified, the modifications have to be specified in detail and the safety case made for them. How does the NRC propose to make regulations for processes that are not yet fully specified? Other than generic safety and health issues, which are already covered by existing regulations, how can a single set of rules apply to technologies as different as PUREX (and its derivates) and electrometallurgical reprocessing?

Given that licensing of a plant has not occurred in over four decades, a reprocessing rulemaking is utterly premature in the absence of a detailed proposal for a plant.

Further, the matter of spent fuel management is being considered by the Blue Ribbon Commission on America's Nuclear Future. Preliminary indications, based on Subcommittee draft reports, are that the BRC is leaning in the direction of recommending continued storage of spent fuel coupled with research on advanced reactors and fuel cycle technologies, given that there is simply no business case for reprocessing. Independent researchers have also generally concluded that there is no foreseeable business case for reprocessing. The mere assertion by an interested party that such a business case exists cannot be the justification for spending very scarce public resources on a rulemaking that could become obsolete before it is done. Public resources are set to become more scarce. Given that Fukushima and reactor safety issues loom large, the NRC would do well to conserve its resources to address real and immediate problems rather than embarking on a rulemaking adventure for a hypothetical plant unlikely to be built.

Please refer to the transcript of the September 7, 2010, workshop for further amplification of some of the above points.

Recommendation: This rulemaking should be postponed at least until it is clear how Congress is going to proceed on the recommendations of the BRC – which will be well into 2012 and

probably beyond and until the studies and the PEIS recommended below are complete (whichever comes later).

B. Each technology group should have its own rule

Reprocessing, fuel fabrication, reactor safety issues, high-level waste management risks, and proliferation considerations will be particular to each technology, reactor, and fuel type. While there are some common considerations such as protection of fissile material, the various technologies are different enough that different rules will be required. At the very least, a different set of rules will be needed for the set of aqueous technologies based on PUREX and one for the possible variations of pyroprocessing.

Neither set has been specified in enough detail for a rulemaking. Indeed, such specification would be premature because technologies other than PUREX are not yet fully developed in the sense of adequate design testing and operational experience.

At some future time when industry proposals are more specific and a business case is more plausible, the NRC could take up a rule making that is specific to the technology or at least the group of technologies provided the other conditions discussed here are met before that.

C. No one-step licensing

Reprocessing is unique enough in the fuel cycle that there should be no one-step licensing. The case for a combined construction and operating license is highly dependent on the notion that many units of the same type would be built. This is plausible for reactors (in theory), but not for reprocessing plants, each of which would handle spent fuel from many facilities. And in cases, such as the on-site reprocessing associated with liquid fuel reactors or the Integral Fast Reactor, both siting and technology considerations would come into play. Specifically, the whole matter of collocating a reprocessing plant with a reactor (or a few reactors) would have to be addressed. This is especially important in light of the events at Fukushima.

D. Minimize secrecy

Secrecy needs to be minimized. As I noted during the September 7 and 8, 2010, workshop, secrecy can actually compromise safety by promoting an insular culture that believes it is immune from direct public oversight. I also provided an example, directly relevant to management of highly radioactive waste from reprocessing at Savannah River Site (pages 103 to 105, September 7, 2010, transcript).

E. Review recent civil reprocessing experience

There is extensive experience with civil sector reprocessing in the past few decades in Britain, France, Russia, India, and Japan since the U.S. West Valley plant was shut in 1972. The NRC should undertake a detailed evaluation of that experience from the points of view of operation, safety, accident potential and incident records, risk assessment, proliferation potential, worker and population exposures, waste management, and business case before it starts to draft its own

rules. In particular, the French experience in reprocessing is not as positive as it is generally portrayed. The wholesome image of reprocessing as "recycling" comes directly from French use of MOX fuel. In fact, such use only increases the use of the original fresh fuel from about 4.7 percent to about 5.5 percent.[1] It creates more waste volume. It has resulted in pollution of the ocean all the way to the Arctic and also in higher costs. To call a process that deals with one percent or less of the spent fuel and creates a much larger volume of waste in the process (low-level, liquid, and transuranic) is a travesty and a real misuse of the term. It may befit industry propaganda, but is highly inappropriate as government terminology.

The decommissioning experience of the West Valley Plant should be a part of this study.

F. Review the issue of MOX fuel use

The NRC must do a thorough technical study for public comment and review on the issue of whether there are any U.S. reactors suitable for MOX fuel use and what modifications to the reactors would have to be made to ensure that safety would not decline.

G. Do a Programmatic EIS before a reprocessing rulemaking

Reprocessing spent fuel would be a departure of immense importance from U.S. practice of more than 30 years for nuclear power economics, non-proliferation, safety, environment, waste management, and security. A programmatic Environmental Impact Statement should be done prior to the start of a rulemaking.

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[1] Arjun Makhijani, *The Mythology and Messy Reality of Nuclear Fuel Reprocessing*, April 2010. See Figure 2 and associated discussion. Even with repeated reprocessing and reenrichment of all the recovered uranium, the maximum use of the initial fuel would be about six percent, as compared to 4.7 percent for once through use.