

DCS
FDP

JUL 23 1979

SGML 178
0-25

NOTE TO: Jim Partlow
 FROM: Harry Bartz
 THRU: Ron Brightsen
 SUBJECT: DECLADDING TESTS ON FERMI FUEL BY ENERGY SYSTEM GROUP

Rockwell International has proposed to try three different methods to remove zirconium cladding from irradiated Fermi fuel. A total of 668 grams U-235 will be needed for the test program. If the experiments are successful, ESG believes they will be given a contract to declad the entire Fermi core.

In their letter dated June 21, 1979, ESG advised the NRC of their experimental program and stated their opinion that no license amendment was needed under 10 CFR 70.51(e). The reviewer agrees in this opinion; for the research work only. Should ESG receive the follow-on work to declad the entire core, the work would be a production job and FMNC plan revisions would be necessary to describe the final process, measurement systems, and records.

NRC regulations for material control and accounting for reactor irradiated fuel are severely limited due to the inability to make reliable measurements on the SNM content. Normal measurement methods using gamma counting and gamma energy profiles produce unreliable results. Fission products present in spent fuel tend to show radiation levels which add to the peak energy levels normally expected from Uranium 235 and 238 and plutonium.

For the above, reasons, MC&A for reactor irradiated fuel depends on bulk measurements. A fuel bundle is sent to the licensee at calculated values for SNM based on burnup. ESG accepts shippers values for the DOE/NRC-741 form. ESG removes the desired material and carefully weighs this quantity. The fuel bundle is then removed from ESG using shippers original value less the quantity of SNM removed. This quantity is entered into the licensees record system.

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The SNM is then treated for purposes of the project. Material Control is based on weights or liquid weights on dissolver solution corrected for temperature and specific gravity. Admittedly, this procedure is not as accurate as standard methods for non-irradiated SNM. The NRC relies upon the nature of the material for additional protection. The radiation levels require the use of hot cells and shielded glove boxes. By their construction and method of use, a restricted access environment has been created.

Physical inventories are generally based on item check (container count) for material in process and is performed at the same intervals of other SNM held by the licensee. At the conclusion of the project, the SNM is generally sealed in approved containers and shipped to a licensed burial site.

The draft letter, attached, is intended to remind the licensee of additional NRC requirements for SNM control or production quantities.

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H. Bartz

Attachment:
as stated

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