

NORTH CAROLINA STATE UNIVERSITY AT RALEIGH

SCHOOL OF ENGINEERING

DEPARTMENT OF NUCLEAR ENGINEERING
NUCLEAR REACTOR PROGRAM
Box 5636 ZIP 27650



April 1, 1982

NRP-RGC-82-73

Mr. Peter B. Ericson
Operating Reactors Branch #4
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: Facility License R-63
Docket No. 50-111

Dear Mr. Ericson:

The purpose of this letter is to bring you up-to-date on the decommissioning of the R-3 reactor at North Carolina State University in Raleigh.

On June 1, 1981, NCSU was authorized by the NRC to dismantle the R-3 reactor. Our objective is to complete the decontamination and dismantling of the facility during the summer of 1982 and shortly thereafter have Facility License R-63 terminated. Last Fall, the NCSU Nuclear Reactor Program staff began dismantling the R-3. This included making many measurements of the radioactive contamination in the reactor and removal of components that did not require special equipment for their removal. Such components included graphite from the thermal column, piping, pump, heat exchanger, electrical wiring, etc. Every item that was removed was measured for radioactivity and where its level exceeded the NRC requirements, the material was drummed for burial at a low-level waste site. In December, 1981, 25 drums were shipped to the U. S. Ecology site at Hanford, Washington. This shipment went out with the routine low-level waste shipment processed by the NCSU Radiation Protection Office.

Except for a control rod that measured about 1 R/hr, the hottest metallic component that was removed was the tank that held the core, and it measured about 20 mR/hr at its hottest spot. Most of the metallic material was non-radioactive and was discarded through the NCSU Physical Plant's normal process.

The NCSU Health Physics staff has checked the level of contamination in the embedded drain pipes in the floor of the reactor bay and found them to be uncontaminated. A general survey of the R-3 bay using a Micro-R meter showed the radiation level to be approximately 20 μ R/hr near the tile covered walls and approximately 12 μ R/hr near the outside surface of the R-3 biological shield. Inside the biological shield near the spot where the reactor core was located, the radiation level at the surface of the concrete measured approximately 70 mR/hr. Samples of concrete taken from this area indicate approximately 0.12 μ Ci/g due primarily to Eu-152. The contamination is much less in other parts of the reactor.

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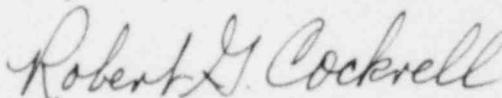
In December, 1981, the Director of the Nuclear Reactor Program (Bob Cockrell) and the Reactor Health Physicist (Bob Cross) met with the NRC Region II staff in Atlanta and discussed plans for decommissioning. In the presentation they discussed the work performed as of that date, the radiation measurements that had been made, and plans for completion of the work. They also showed Region II staff a videotape showing NCSU staff and students dismantling the reactor. Region II found no problems with the approach that NCSU is taking. In early February, an inspector from Region II spent a day with Bob Cross on campus. The inspector was here principally to discuss how NCSU is going to determine that the NRC criteria had been satisfied for cleaning up the R-3 Bay to the point where the radiation level does not exceed 5 μ R/hr above natural background. He brought along a radiation instrument (an Eberline Micro-R Meter) similar to the one that Bob Cross uses, and the instruments were compared. They were in close agreement. The inspector then made measurements in the reactor building and in another building on campus of similar construction and vintage. On the basis of these measurements, he recommended to Region II that natural background be set at 20 μ R/hr and on February 22, NCSU received a letter confirming this recommendation. NCSU thinks this is a reasonable value for background.

As of April 1, 1982, the technical provisions for a bid request had been prepared and submitted to the NCSU Physical Plant Engineering Department for review and final preparation of the bid request documents. Nine national companies and three local companies have asked to be put on the bidders list. The request for bids should be mailed out some time in April. The contracted work is scheduled to begin in July. The contracted work will be limited to demolition and disposal of the concrete biological shield. A set of disassembly drawings have been prepared along with a descriptive text recommending the order of disassembly and identifying contaminated areas.

Work currently in progress by the NCSU staff includes servicing of the 6-ton polar crane in the R-3 bay and upgrading of the ventilation and filtration system to handle the higher than normal dust that may be generated.

If you need additional information, please feel free to call me at any time. (919/737-2321)

Very truly yours,



Robert G. Cockrell
Director,
Nuclear Reactor Program

RGC:lpe

cc: Robert D. Cross, NCSU
William Peery, NRC Region II