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AUTH.NAME AUTHOR AFFILIATION
TUCKER,H.B. Duke Power Co.
RECIP.NAME RECIPIENT AFFILIATION
DENTON,H.R. Office of Nuclear Reactor Regulation, Director
STOLZ,J.F. Operating Reactors Branch 4

SUBJECT: Forwards response to 841120 questions re onsite disposal of five slightly contaminated pressure feedwater heaters,per 840918 application.Approval by end of Nov 1984 will enable use of preferred approach of onsite disposal.

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DUKE POWER COMPANY
P.O. BOX 33189
CHARLOTTE, N.C. 28242

HAL B. TUCKER
VICE PRESIDENT
NUCLEAR PRODUCTION

TELEPHONE
(704) 373-4531

November 28, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. John F. Stolz, Chief
Operating Reactors Branch No. 4

Re: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287

Dear Mr. Denton:

By a September 18, 1984 letter, Duke Power submitted an application, pursuant to 10 CFR 20, §20.302, for on-site disposal of five very slightly contaminated pressure feedwater heaters. Following an initial review by the Staff, a list of questions concerning the submittal was developed. On November 6, 1984, a conference call was held in which Duke personnel provided informal responses to the Staff's questions.

Subsequently, on November 20, 1984, the Oconee Project Manager transmitted to Duke a list of questions which included those for which responses were given during the November 6th conference call. This letter submits Duke's responses to these questions in the form of the accompanying attachment.

As mentioned in the September 18th letter of submittal, NRC approval by the end of November 1984 will enable Duke to use the preferred approach of on-site burial for this waste. The Staff's continued cooperation in assisting Duke's efforts to efficiently manage this radwaste issue is acknowledged and appreciated.

Very truly yours,

H.B. Tucker/slb

Hal B. Tucker

RFH:slb

Attachment

cc: Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

A001
1/1

cc: Mr. J. C. Bryant
NRC Resident Inspector
Oconee Nuclear Station

Ms. Helen Nicolaras
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Duke Power Company
Oconee Nuclear Station
Response to Request for
Additional Information

1. Request: On p. 1, the measured concentrations of radionuclides in two samples of the scrappings from the heater tubings are listed; however, the representativeness of these values is not discussed. Why were only 2 samples taken? State whether these values are representative of the material that is to be disposed, and why the values are representative. Briefly describe the method that was used to select these samples as opposed to samples from other parts of the feedwater heaters. If the reported values are not representative of the material to be disposed, then the licensee should take enough samples to provide either a representative value or a conservative value for estimating doses.

   Response: In actuality, five samples were taken, one from each of the five feedwater heaters. These samples consisted of scrapings from the exterior surfaces of selected tubes from each of the five sets of tube bundles. This sampling location was appropriate, since secondary-side coolant (the source of contamination) flows past these tube bundles on the shell side. These sample scrapings were selected only after the smear and instrument surveys (see page 1 of the submittal) had been performed and a good general indication of the contamination levels had been established. Qualitative indications of the variation of contamination level with location were available from the surveys, and the sample scrapings were considered to be representative based on these indications.

   Only two samples are referred to in the submittal, because two of the five sample scrapings were combined to form one sample, and the other three sample scrapings were combined to form the other sample. Since contamination levels were generally similar for all five feedwater heaters, this combining of samples was not considered to affect the validity of the information based on the samples.

2. Request: Is the reported activity considered total surface activity, or removable surface activity?

   Response: The reported activity is the <u>total</u> surface activity.

3. Request: On p. 2, the waste volume is listed as 4525 ft^3; however, the submittal does not state whether this is the volume before or after cutting and segregation. Specify: (1) the total volume and weight prior to cutting and segregation; (2) the total

volume and weight estimated to be disposed through "normal material section procedures" at the time of disposal; and (3) the total volume and weight estimated to be disposed as contaminated material on-site.

Response: The volume specified (4525 ft^3) is that volume estimated to be obtained after cutting and segregation. The volumes of the feedwater heaters are estimated from the approximate exterior cylindrical dimensions. One of the feedwater heaters weighs 58 tons and is approximately 7.5 feet in diameter by 41 feet in length yielding a volume estimate of about 1800 ft^3. The remaining four heaters, all of the same type, weigh 50 tons each and are approximately 8.1 feet in diameter by 41 feet in length yielding a volume estimate of about 2100 ft^3 per heater, or about 8400 ft^3 for all four heaters. Accordingly:

1) The total volume and weight prior to cutting and segregation are approximately 10,500 ft^3 and 258 tons.

2) Since Duke proposes to clean the heater shells and dispose of these as "clean" scrap, the enclosed volume would be the same as for 1) above, since removal of the tube bundles does not affect enclosed volume. (The actual volume of the material, if it were compacted, is obviously much less). The weight of the material to be disposed of through "normal material section procedures", or as "clean" scrap, is approximately 98 tons.

3) That material to be disposed of as contaminated material on-site includes the tube bundles from the feedwater heaters and any contaminated cleaning media, etc. The volume of the material, as stated above, is approximately 4525 ft^3 and its weight is estimated as 160 tons.

4. Request: Provide: (1) estimates of the total activity (nuclide by nuclide) and concentrations of nuclides (nuclide by nuclide) to be disposed through "normal material section procedures"; (2) estimates of the total activity (nuclide by nuclide) and concentrations of nuclides (nuclide by nuclide) to be disposed as contaminated material on-site.

Response: 1) Any material to be disposed of through "normal material section procedures" will have been determined to be "uncontaminated" according to the provisions of IE Circular No. 81-07. Since this is considered to be "clean" material, statistically significant nuclide-by-nuclide total activities and concentrations are not applicable.

2) The values for the total activity and nuclide concentration, both quantities given on a nuclide-by-nuclide basis, are specified in the following table:

NUCLIDE	CONCENTRATION(pCi/gm)	TOTAL ACTIVITY (mCi)
Mn-54	0.35	0.18
Co-60	10.08	5.08
Cs-134	0.52	0.26
Cs-137	1.86	0.94

5. Request: On p. 2, it is stated that IE Circular No. 81-07 Guidance will be used to segregate materials into two categories: (1) normal materials section procedures; and (2) disposal on-site. The referenced Guidance applies to surface contamination, rather than volume contamination; the submittal does not state that only surface contamination is expected. If only surface contamination is expected, then this should be clearly stated and the basis briefly given. If volume contamination is expected, then the submittal should state why the referenced Guidance is applicable.

   Response: Only surface contamination is of concern for this case. The feedwater heaters are constructed of carbon steel, but subsurface migration of radioactive contaminants in the process of corrosion, is considered negligible. Some calculations within the submittal assume uniform volume contamination, but this is done only for purposes of conservatism in the calculational results, not because such is the actual case. Guidance offered in the form of IE Circular No. 81-07 is, therefore, clearly applicable.

6. Request: The submittal provides estimates of the annual dose to an individual "occupying the area" after disposal; however, the submittal does not address any potential long-term problems associated with the proposed disposal. The submittal should address the following types of questions: (1) Is it likely that the disposed material would be dug up at a latter date by unauthorized persons? (2) What would the dose be to the various body organs of an individual exposed to the uncovered material at several times after disposal (e.g., 1, 10, 30 and 50 years) and at several distances? (3) Would the buried material be attractive for salvage? (4) What barriers (physical and administrative) exist to prevent the recycling of the disposed material?

   Response: The likelihood that the discarded material would be unearthed during the remaining life of the facility (approximately 30 years) is very low. The burial site is within the company controlled area. This area is encircled by a security fence. The only other material which is to be buried at the site is contaminated sand, and the NRC is currently considering the application for this disposal case, also.

The only credible hazard connected with this waste is direct whole-body exposure. As such, doses to various body organs are not considered. As indicated above, short-term exposures, due to unearthing the material, are very unlikely. A calculation performed for the case of an individual digging up the material, after 20 years, showed that the dose rate to the whole body would be approximately 3.0×10^{-3} millirem per hour at the surface of the material (i.e. the person would receive only 3 millirem after 1000 hours in direct contact with the material). This dose rate is comparable to the average dose rate due to background radiation. For consideration of intervals greater than 20 years, the dose rate is even less significant.

7. Request: Provide a description of the "normal material section procedures" referenced on p. 2 of the submittal.

Response: The "clean" scrap is transported to a designated on-site location; when sufficient scrap has accumulated to amount to at least one truckload, it is transported off-site by Duke Power's broker (Carolina Scrap Consultants) to be sold as scrap.