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RECIP.NAME RECIPIENT AFFILIATION
VARGA,S.A. Operating Reactors Branch 1

SUBJECT: Forwards response to request for addl info re accident evaluation for steam generator repair.

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FLORIDA POWER & LIGHT COMPANY

September 24, 1980
L-80-320

Mr. Steven A. Varga, Chief
Operating Reactors Branch #1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Varga:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Steam Generator Repair

Attached you will find Florida Power & Light Company's responses to the request for additional information regarding accident evaluation for the steam generator repair for Turkey Point. These questions were sent as Enclosure 1 of your letter of August 22, 1980.

Please advise us if you require further information.

Very truly yours,

W. S. Zucker

for Robert E. Uhrig
Vice President
Advanced Systems & Technology

REU/LFR/ah

Attachment

cc: Norman A. Coll, Esquire
Harold F. Reis, Esquire

A001 S 3/3

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(1) Section 3.3.3, Control of Airborne Radioactivity and Surface Contamination, states that airborne radioactivity will be controlled, monitored, and released via the vent stack. A slight negative pressure will be maintained in containment by means of the purge system, although the equipment, personnel and emergency hatches would be open.

QUESTION

(1) (a) "Provide an evaluation of the capacity of the purge system, particularly its capability to to maintain the negative pressure at all points in the containment."

ANSWER

The purge exhaust is 35,000 CFM capacity. An additional 18,000 CFM temporary exhaust fan utilizing the purge supply air penetration will increase the air flow rate across the open equipment and personnel hatches to approximately 300 fpm.

QUESTION

1 (b) If the hatches are open when the existing sampling station detects high airborne activity, the usual procedure of isolating input to the vent would not stop the release. What emergency procedure would be used to stop release outside containment and protect workers inside containment in case of unforeseen high airborne activity?

ANSWER

1 (b) The work activities that have a potential for producing significant airborne contamination will be enclosed and filtered. Consequently, no significant high airborne activity is expected in the containment.

The input would not be isolated from the vent but would be monitored and sent through roughing filters.

Workers in high airborne areas will be evacuated from the area or required to wear respiratory protection equipment.

QUESTION

1 (c) Will the equipment hatch remain open during most of the repair process, or only be opened when equipment is moving in or out? Specifically, will the equipment hatch be open when cutting or welding operations are in progress on the primary system components?

ANSWER

1 (c) The equipment hatch will remain open during most of the repair which includes cutting and welding operations on the primary system.

QUESTION

(2) Table 5.2-1 used to indicate activities in μCi, Revision 7 Table 5.2-1 gives activity in Ci. Further, the extrapolation is given for 9 years of commercial operation versus 7 years, although the values in the table are identical.

If the change in the column title is presumed to be a typographical error why is there no change in the values. What is the actual extrapolation operating period?

ANSWER

(2) The values in Table 5.2-1 are $\mu Ci/cm^2$. The μ symbol was inadvertently omitted in Revision 7.

The values shown in Table 5.2-1 Revision 7 are actually for 7 years accumulation without credit for decay. Calculations showed that use of these values is conservative for 9 years accumulation with credit for decay. Only the long lived isotopes Co-60, Mn-54, Cs-137, and Ce-144 will have different values at 9 years compared to 7 years. For the final three, 9 year values with decay are less than 7 year values without decay. For Ce-144 the 9 year value shown is higher than the 7 year value without decay. The net effect of using values without decay is conservative.

QUESTION

(3) Little detail is given of the actual operations for the replacement procedure. When will the metal plate be welded to the bottom of the lower assembly? Provide an evaluation of the lower assembly drop accident, including potential radiological consequences, if lifting is required before the top and bottom are welded shut.

ANSWER

(3) Once the lower assembly is separated from the channel head it will be lifted to Elevation 58'-0" and placed on the operating deck near the steam generator compartment. At this point the lower assembly cover plate will be attached.

The only potential radiological consequence of a lower assembly drop accident would be release of radioactivity to the containment. The majority of the radioactivity contained in the steam generator is on the primary side surfaces of the lower assembly in the form of extremely adherent film of metal oxides. The film is so adherent that in the article "Decontamination of a PWR Primary System, SENA Plant", Volume 33, Proceedings of the American Power Conference, 1971, stated:

> "Experience has shown that mechanical methods or simple solution techniques have negligible effects on the removal of contamination. The radioisotopes are absorbed on, or diffused into, the tenacious oxide film so strongly that it is impossible to remove the contamination without removing all of the protective corrosion film".

It may be further added that although a drop does have the potential of destroying piping in the steam generator compartment, the primary loop will be dry and no radiological consequences will occur from damaging these lines. Based on the above, it is concluded that there are no radiological accident considerations associated with the lower assembly drop accident.

QUESTION

(4) Are there any filters in the purge system between the containment and the existing vent monitor?

ANSWER

Roughing filters are located between the containment and the plant vent in the normal 35,000 CFM purge exhaust. The additional 18,000 CFM temporary fan will exhaust through a pre filter and HEPA filter to a discharge point above the plant roof. A separate radiation monitor will be provided on the temporary fan exhaust.

QUESTION:

(5) A decontamination factor of 12 was assumed for purposes of evaluating radiological consequences (page 5-21b). Although Section 3.3.5.3.2 is referenced as a description of the proposed alternatives for the decontamination process, it is not clear how decontamination can be accomplished prior to cutting the lower assembly from the channel head. Provide a clarification of the procedure to be used and evaluate the potential for accidental radiological releases due to that process.

ANSWER:

(5) Decontamination tests were performed on components that were exposed to a steam generator atmosphere. Decontamination factors on the order of 100 were observed. A conservative factor of 12 was assumed for purposes of evaluating radiological consequences.

Decontamination will be accomplished by plugging the hot and cold leg piping from the S.G. and attaching decontamination equipment to the manway. Decontaminated fluid will be circulated into the channel head and out again through the manway connections. One half of the channel head will be deconned and then the second half will be deconned. (i.e. the S.G. tubes will not be deconned except for about 12-18 inches up into the tubes.)

The decontamination equipment and associated piping will be designed and located to minimize the potential for accidental radiological releases.

QUESTION

(6) The X/Q values used for determining the radiological consequences of airborne releases was 1.02×10^{-6}. Chapter 11 of the Turkey Point Unit 3 Final Safety Analysis Report uses this value for evaluating routine releases, since it is an average over three years. An annual average X/Q is not appropriate for accident calculations. Provide dose calculations for radiological assessments using an appropriate (e.g., 2 hr., ground level) X/Q.

ANSWER

A X/Q value of 1.02×10^{-6} was used to determine the radiological consequences of potential releases from planned operations during the steam generator repair program. This value has not been used for accident calculations.