SNUPPS
Standardized Nuclear Unit
Power Plant System

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Nicholas A. Petrick
Executive Director

June 26, 1981

SLNRC 81- 53 FILE: 0541
SUBJ: NRC Request for Additional Information - Chemical Technology

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

Docket Nos: STN 50-482, STN 50-483, and STN 50-486

Reference: NRC (Tedesco) letter dated May 26, 1981 to Union Electric (Bryan) and Kansas Gas and Electric (Koester): Same Subject

Dear Mr. Denton:

The referenced letter requested information concerning chemical technology. The enclosure to this letter provides the requested information and will be incorporated in the SNUPPS FSAR in Revision five.

Very truly yours,

Nicholas A. Petrick

RLS/mtk

Enclosure

cc: J. K. Bryan UE
G. L. Koester KGE
D. T. McPhee KCPL
T. E. Vandel USNRC/WC
W. Hansen USNRC/CAL

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281.1 Indicate the total amount of protective coatings and organic materials (including conduit covered and uncovered cable insulation) used inside the containment that do not meet the requirements of ANSI N101.2 (1972) and Regulatory Guide 1.54. Evaluate the generation rates vs. time of combustible gases that can be formed from these unqualified organic materials under DBA conditions. Also evaluate the amount (volume) of solid debris that can be formed from these unqualified organic materials under DBA conditions that can reach the containment sump. Provide the technical basis and assumptions used for this evaluation.

RESPONSE

Table 6.1-3 provides the qualification information for coating materials used inside containment. As shown by the table, only a very small fraction of these coatings is not qualified to the requirements of Regulatory Guide 1.54.

Table 6.1-10 identifies the quantity of organic lubricants found inside containment. The quantity of electrical cable insulation inside containment is less than 50,000 pounds.

If it is assumed that the above organic materials, excluding coatings (which were included in the analysis for Section 6.2.5), can be considered as unsaturated hydrocarbons, Reference 1 indicates that they would have a G value for hydrogen of 1 molecule per 100 ev of energy absorbed and a G value for methane of 0.01 to 0.4. The integrated DBA dose that this material could be subjected to would be $< 3.0 \times 10^7$ Rads over a one year period following an accident.

Applying these conservative assumptions, approximately 1.7 lb.-moles of hydrogen and approximately 0.7 lb.-moles of methane could be potentially released from these sources over the one year period.

This quantity of hydrogen is not considered to be a significant contribution compared to the sources identified in Figure 6.2.5-4, and is not included in the evaluation in Section 6.2.5. Likewise, the small amount of methane that might be produced is not considered a significant contributor to combustibility.

The quantities of organic lubricants given in Table 6.1-10 are those quantities subject to be released into the containment. Due to the environmental qualification requirements for the cable insulation used inside containment, it is expected to essentially maintain its mechanical stability and not contribute any debris that might reach the containment sumps.

Reference 1 :Effects of Radiation on Materials and Components, J.F.Kircher and R.E. Bowman, 1964

281.2 Regarding the fuel pool cooling and cleanup system, indicate the sampling frequency and criteria for filter and/or ion exchanger resin replacement. Items to be addressed should include (1) decontamination factor; (2) radiation level and (3) differential pressure.

RESPONSE The spent fuel pool cleanup system will be operated as required to maintain clarity of water in the spent fuel pool and radiation levels in the Fuel Building equal to or less than 2.5 mrem/hr, in the areas designated "B" in Figure 12.3-2. As described in 9.1.3.2.3.2 operation of this system is expected to be intermitent, depending on the radiation level and clarity of the spent fuel pool water. It is expected that the replacement criterion for the filters and demineralizer resin will be differential pressure. However, if the system is unable to maintain sufficient clarity of the pool water and radiation levels adjacent to the pool when operated continuously, the filter and/or resin will be replaced. No set radiation sampling frequency has been established for the pool water. In general, sampling will be more frequent during and immediately after a refueling or if pool water radiation levels are higher than at other times.

Design parameters for the spent fuel pool cleanup system are as follows:

	FILTER	DEMINERALIZER
1. Decontamination Factor		
Iodine	1	100
Cesium and Rubidium	1	10
Other Nuclides	1	100
2. Radiation Level (See section 12.2.1.3.2)	NA	NA
3. Differential Pressure	25PSI @ 150GPM	15PSI @ 300GPM

281.3 Describe the provisions to meet the requirements of post-accident sampling of the primary coolant and containment atmosphere. The description should address all the requirements outlined in Section II.B.3 of Enclosure 3 in NUREG-0737 (Clarification of TMI Action Plan Requirements) and should include the appropriate P & ID's. In addition, if gas chromatography is used for reactor coolant analysis, special provisions (e.g., pressure relief and purging) should be provided to prevent high-pressure carrier gas from entering the reactor coolant. With respect to clarification (4) in Section II.B.3 of NUREG-0737, if the chloride concentration in the reactor coolant samples exceeds the limit in the Technical Specification, verification that oxygen is less than 0.1 ppm will be mandatory. Provide also either (a) a summary description of procedures for sample collection, sample transfer or transport, sample analysis and analytical accuracy or (b) copies of procedures for sample collection, sample transfer or transport, sample analysis and analytical accuracy.

RESPONSE

The provisions to meet the guidance of NUREG-0737 for post-accident sampling of reactor coolant, containment sump, and containment atmosphere are discussed in Section 18.2.3. The SNUPPS system provides both online isotopic analysis and chemical analysis with systems designed to operate in the accident environment. Provisions have also been included for taking undiluted and diluted grab samples. Accuracies of the online chemical analyzers will be comparable to those available from commercial grade analyzers.