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October 16, 1984

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

Subject: Byron Generating Station Units 1 and 2
Braidwood Generating Station Units 1 and 2
Radwaste Solidification Syste
NRC Docket Nos. 50-454/455 and 50-456/457

References (a): April 25, 1984 letter from B. J. Youngblood to D. L. Farrar.

(b): December 5, 1983 letter from T. R. Tramm to H. R. Denton.

(c): October 12, 1984 letter from T. R. Tramm to H. R. Denton.

Dear Mr. Denton:

This letter provides additional information regarding the Byron/Braidwood process control program and polymer waste solidification systems. This information is provided in response to NRC questions transmitted in reference (a).

Enclosed with this letter are the responses to FSAR questions 321.54 through 321.74. Some of these responses refer to revision 1 of the cement PCP which has been provided for NRC review. In reference (c) Commonwealth Edison provided revision 2 of that document which also contains the changes discussed in these responses. These responses will be incorporated into the FSAR in the next amendment. Please address questions regarding this matter to this office.

One signed original and fifteen copies of this letter and the enclosure are provided for NRC review.

Very truly yours,

T. R. Tramm

T. R. Tramm
Nuclear Licensing Administrator

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QUESTION 321.54

"Provide the process control program for the polymer waste solidification system at Byron, Unit Nos. 1 and 2, as required in Section 3/4 11.3 of Byron, Unit Nos. 1 and 2, Technical Specifications."

RESPONSE

Copies of the polymer waste solidification system process control program were provided to the NRC by letter dated October 11, 1984 from T. R. Tramm to H. R. Denton. Revisions to this document will be available for inspection at Byron Station.

QUESTION 321.55

"Section 20.311 of 10 CFR 20 became effective on December 27, 1983 and it establishes requirements for the transfer of radioactive waste destined for disposal at a land disposal facility. Specifically, Section 20.311 requires that any licensee who transfers radioactive waste to a land disposal facility or to a licensed waste collector or processor must classify the waste according to Section 61.55 of 10 CFR 61. In addition, Section 20.311 also requires that Class B and Class C wastes are subject to waste stability requirements which are set forth in Section 61.56 of the rule. Licensees must also conduct a quality control program to assure compliance with the waste classification and waste stability requirements.

Provide your detailed description of current program plans for the cement and polymer solidified wastes to comply with:

(a) Classification requirements set forth in Section 61.55 of 10 CFR 61.

(b) Waste form requirements set forth in Section 61.56 of 10 CFR 61.

(c) Quality control program set forth in Section 20.311 of 10 CFR 20 to assure compliance with the waste classification and waste stability requirements.

(d) Sample analysis program for the radionuclides required to be identified by 10 CFR 61.

(e) Incorporate these current program plans into your PCP."

RESPONSE

See Byron Station Process Control Program - Cement System (BAP-300-35, Revision 1).

QUESTION 321.56

"In Section C.1, you state that Byron station will utilize a radwaste solidification system supplied by Stock Equipment Company, and made reference to their licensing topical report, 'Stock Equipment Company Solid Radwaste System Topical Report No. SRS-001-NP,' dated March 1979. We have reviewed this topical report and forwarded a set of our licensing questions to Stock Equipment Company in September 1982, and we have not received their responses to our questions. Therefore, the solid radwaste solidification system described in the Stock Equipment topical report has not been approved at the present time. List and describe explicitly any differences in Section III, 'Process Description' of the referenced Stock Equipment Company topical report, and that of Section 11.4, 'Solid Waste Management System' in the Byron, Unit Nos. 1 and 2, Final Safety Analysis Report (Amendment 38 dated May 1982)."

RESPONSE

The reference to the "Stock Equipment Company Solid Radwaste System Topical Report No. SRS-001-NP," dated March 1979 has been removed from Byron Station Process Control Program - Cement System (BAP 300-35) by Revision 1 of that document. Therefore, this question is no longer applicable.

QUESTION 321.57

"List any deviations and/or exceptions taken from Section IV, 'Process Control Program' in the Stock Equipment Company topical report and state your justifications for such deviations and exceptions."

RESPONSE

The reference to the "Stock Equipment Company Solid Radwaste System Topical Report No. SRS-001-NP," dated March 1979 has been removed from Byron Station Process Control Program - Cement System (BAP-300-35) by Revision 1 of that document. Therefore, this question is no longer applicable.

QUESTION 321.58

"Identify the following in your PCP:

5.1 Plant system interfaces (e.g., liquid, gaseous and ventilation systems) with equipment and components provided by Stock Equipment Company.

5.2 Equipment provisions (interlocks, alarms, monitors, etc.) which are required to be functional before solidification process can commence.

5.3 Administrative controls to assure that operating procedures will be followed."

RESPONSE

5.1 Refer to FSAR Table 11.4-3.

5.2 Equipment provisions such as interlocks, alarms, and monitors, are required to be functional before the solidification process can commence. Points are scanned and verified prior to processing. Key operational parameters are visually displayed on the control console and can be visually observed during the drumming operation.

5.3 See Byron Station Process Control Program - Cement System (BAP-300-35, Revision 1).

QUESTION 321.59

"Identify process parameters which provide boundary conditions within which the solid radwaste solidification system should be operated (slurry settling times, drum mixing times, solidification time, waste temperature, oil content, pH, and cement to waste ratio)."

RESPONSE

Refer to Byron Station Process Control Program - Cement System (BAP-300-35, Revision 1).

QUESTION 321.60

"The Byron Station PCP (BAP-300-35, Revision 0) should explicitly state that it is the PCP for the cement solidification of the solid radwastes only and does not include the PCP for polymer waste solidification unless you incorporate the polymer waste solidification portion into the Byron PCP."

RESPONSE

Revision 1 of the Byron Station PCP (BAP-300-35, Revision 0) indicates that it is solely for the cement solidification system and that the polymer solidification system PCP will be described separately.

QUESTION 321.61

"The following wording is suggested to add in Section A, 'Statement of Applicability' of the Byron Station PCP.

The purpose of the Process Control Program for Byron Generating Station, Unit No. 1, is to establish a set of process parameters which provide reasonable assurance of complete solidification of various liquid radioactive 'wet wastes' including resin slurries and evaporator bottoms in accordance with applicable Department of Transportation (DOT), State of Illinois Regulations, and Nuclear Regulatory Commission (NRC) and licensed burial facility's acceptance criteria for packaging and shipment to an approved offsite burial site."

RESPONSE

Wording similar to that suggested has been incorporated into Revision 1 of the Byron Station PCP.

QUESTION 321.62

"State explicitly that the PCP will comply with applicable DOT regulations, state regulations, NRC and burial facility acceptance criteria, and 10 CFR 20.311, 'Transfer for Disposal and Manifests.'"

RESPONSE

Refer to Byron Station Process Control Program - Cement System (BAP-300-35, Revision 1).

QUESTION 321.63

"List the Byron Station Operating Procedures that will be utilized for waste solidification, classification, packaging, labeling, manifesting, transporting, reporting, and record-keeping operations at Byron Station. These procedures should be cross-referenced to meet licensing commitment.

RESPONSE

Refer to Byron Station Process Control Program - Cement System (BAP-300-35, Revision 1).

QUESTION 321.64

"Provide the procedure that will be used for solidifying spent filters and filter cartridges."

RESPONSE

Refer to Byron Station Process Control Program - Cement System (BAP-300-35, Revision 1).

QUESTION 321.65

"Provide the processing capacity of the polymer waste solidification system and compare it with the expected total dry salt input to the system at Byron Station, Unit Nos. 1 and 2, during normal operation, including anticipated operational occurrences."

RESPONSE

The dry product processing capacity is one drum per hour at 500 pounds per drum. Thus, during an 8 hour shift, 4,000 pounds could be processed. The total expected dry product input to the polymer solidification system is 70 pounds per hour, or 1,680 pounds during a 24-hour day.

QUESTION 321.66

"Provide tables showing how the equipment and components of the polymer waste solidification system, and structures housing the system comply with the applicable criteria of Regulatory Guide 1.143, Revision 1, October 1979, 'Design Guidance for Radioactive Waste Management Systems, Structures and Components Installed in Light-Water-Cooled Nuclear Power Plants,' and Branch Technical Position ETSB 11-3, Revision 2, July 1981, 'Design Guidance for Solid Radioactive Waste Management Systems Installed in Light-Water-Cooled Nuclear Power Plants.'"

RESPONSE

a. Vessels are designed and fabricated per ASME Code, Section VIII, Division 1, but are not stamped.

b. Materials that form pressure boundaries and contact radwaste are selected from ASME Code, Section II.

c. Welder qualification and procedures are per ASME Code, Section IX.

d. Vessels are inspected and tested per ASME Code, Section VIII, Division 1.

e. Process piping and process valves are designed, fabricated, inspected, and tested per ANSI B31.1.

QUESTION 321.67

"Describe the operating procedure(s) and inspection program to ensure that promoter, catalyst and polymer binder are maintained at proper quality during the time they are stored."

RESPONSE

Dow Waste Solidification Binder 101 has a storage life of 6 to 12 months. The polymer filling station circulates and aerates the binder to maximize the storage life. Promoter and catalyst have a storage life in excess of one year. A small scale solidification test can be performed, without waste, to verify the solidification process with chemicals on hand. The polymer fill station has an installed filter and the differential pressure across the filter is alarmed and annunciates at the control console. Excessive differential pressure is an indication of potential binder deterioration and the binder should be checked for quality.

The polymer drum filling station has a vent which vents all aspects of the atmosphere of the station into the HVAC system. The vent is alarmed and annunciated at the fill station control panel. This feature is provided for both fire protection and worker safety. The vent must be functioning properly to operate the station.

QUESTION 321.68

"Describe the fire protection measures incorporated into the polymer waste solidification system design, and provide fire hazard analysis that demonstrates how safety related systems, if any, will be protected from possible fires associated with the combustibles contained in the system."

RESPONSE

An automatic wet pipe sprinkler system has been provided to protect the general areas occupied by the waste solidification system. Manual hose stations and portable extinguishers are also provided in these areas. There is no safety-related equipment in these areas, therefore, a fire in these areas will not affect safety-related equipment.

QUESTION 321.69

"Provide a drawing(s) showing the drum processing vessel with shield wall, drum, pivot and lifting device, drum capper/uncapper, fill nozzle, in-drum mixing hardware, mixing tube, mixer drive, control system of pressure balance sensors, and pipes and nozzles for emergency internal washdown."

RESPONSE

The following polymer drumming station drawings for Byron/ Braidwood provide the requested information: D19642 Sheets 1 and 2 of 2, D19643 Sheet 1 of 1, and D20278 Sheet 1 of 2. These drawings were forwarded to NRC under separate cover.

QUESTION 321.70

"In Section 11.4.4.1.5 of the FSAR, you state that the fill nozzle has a venting system incorporated into it to exhaust polymer fumes and displaced air. Show the plant HVAC system which interfaces with this fill nozzle vent in appropriate P&ID's, including flame arrester system."

RESPONSE

There is no provision to connect the venting pipe from the polymer filling station's fill nozzle to the HVAC system. The wrong statement about connection to the HVAC system on P&ID M-48, Sheet 41, has been corrected and the venting pipe from the fill nozzle will be connected to the flame arrester.

QUESTION 321.71

"Provide a typical exotherm characteristics of the polymerization process as a function of time after process. Describe your remote thermal sensor to detect a temperature increase."

RESPONSE

The requested information from Stock Equipment Company is proprietary and will be provided in a separate transmittal.

QUESTION 321.72

"Provide a description of the process and effluent monitoring and sampling provisions associated with the polymer solidification system."

RESPONSE

The polymer solidification system isolation hopper interfaces directly with the VR system. There are three level probes in the isolation hopper. The level is monitored by the microprocessor system and the level is automatically maintained to a prespecified range. Should a high level be tripped, a signal is sent to the Aerojet control system as there remains about one hour of additional operation before the Aerojet system must be shut down. The temperature is also monitored such that the entire isolation hopper is maintained about 200 F while the Aerojet system is in operation. This is done to maintain the temperature above the ash dew point. System pressure is also monitored.

The storage hopper for longer term storage of the ash product has level, temperature, and pressure monitors.

The blower station is fixed with the flow, temperature, and pressure sensors to detect proper operation of the pneumatic aspects of the system.

The polymer drumming is affixed with radiation detectors that are utilized to monitor the radiation level of the drum during processing and a second radiation monitor utilized to detect a radiation contamination of the top surface of the drum. A weight scale is provided to weigh the filled drum to ensure that the filling process was properly completed. A pyrometer is utilized to detect and monitor the drum exotherm as solidification is ongoing. A torque sensor is monitored during mixing and torque measurement is a positive indication of catalyst dispensing and when the available polymer has been utilized.

In summary, level indicators, temperature monitors, pressure sensors, flow sensors, torque, weight, and radiation are all monitored. Key indicators are visually displayed on the control console and automatically monitored by the microprocessor.

No sampling provisions for the volume reduction system product have been included in the polymer solidification system design. They were not provided because of ALARA considerations involved in the handling of a dry powder. However, sampling provisions

for the liquid feed to the volume reduction system have been provided. The results of the analyses of the samples obtained from the volume reduction system feed solution and scrubber solution can be used to synthesize an analysis for the volume reduction system product.

QUESTION 321.73

"In Section 11.4.4.3.2 of the FSAR you state that the fill nozzle and processing vessel are vented to the plant off-gas system. Indicate the plant off-gas system that interfaces this venting system in the appropriate plant off-gas P&IDs."

RESPONSE

The venting pipe from the fill nozzle and processing vessel of the salt filling station is connected to the radwaste charcoal filter unit OVW10S and it is shown on P&ID's M-114, Sheet 2, and M-48, Sheet 42.

QUESTION 321.74

"Provide design and operating pressures of the drum processing vessel."

RESPONSE

The requested design parameters for the polymer drumming station enclosure are:

Design Pressure - 10 psig and

Operating Pressure - Atmospheric to -4 psig.