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August 24, 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
Volume Reduction System
NRC Docket Nos. 50-454/455 and 50-456/457

Reference (a): July 19, 1984 letter from L. N. Olshan to D. L. Farrar.

Dear Mr. Denton:

This letter provides additional information regarding the volume reduction systems at Byron and Braidwood stations. NRC review of this information is necessary to close Outstanding Item 15 of the Byron SER.

Enclosed with this letter are responses to the NRC questions transmitted in reference (a). They have been assigned FSAR question numbers 321.75 through 321.99 and will be included in the FSAR in the next amendment.

One signed original and fifteen copies of this letter and the attachments are provided for NRC use.

If you have any further questions regarding this matter, please contact this office.

Very truly yours,

B. Rybak

for T. R. Tramm
Nuclear Licensing Administrator

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QUESTION 321.75

"How will CECo ensure that the quantity of halogenated plastics in the feed to the incinerator is limited to 1% by weight and the heat rate is limited to 700,000 Btu/hr?"

RESPONSE

CECo will institute a set of controls to limit the amount of halogenated plastics that will be processed in the dry waste processor.

They may include:

a. Sorting waste before it is processed to remove PVC for compaction.

b. Procurement controls may also be used; however, the use of PVC in the plant will not be eliminated.

The feed rate of combustible materials to the dry waste processor is adjusted to maintain the excess oxygen content in the dry waste processor at approximately 10% to 12%, as recorded on O_2 R107. This corresponds to 700,000 Btu per hour heat release rate since the air flow rates to the dry waste processor are controlled or regulated to maintain a uniform gas velocity in the vessel. High and low oxygen concentration alarms are provided. The operator can adjust the trash feed rate by using controllers SC 126 or SC 127 to adjust speed of the trash feed screws.

QUESTION 321.76

"How will CECo limit the concentration of sulfur to 1000 ppm and chlorides to 5000 ppm in the incoming dry active waste and the sulfur concentration in contaminated oil limited?"

RESPONSE

The waste oil will be sampled and analyzed for sulfur periodically. Sulfur and chlorides in the dry active waste will be controlled by the methods discussed in the response to Question 321.75.

QUESTION 321.77

"How is CECo anticipating decontaminating the trash hoppers (H-3A and H-3B)?"

RESPONSE

Decontamination of the trash hoppers (OVR08TA and OVR08TB) can be accomplished as follows:

a. Screw conveyor operable - Screw conveyor transfers trash to a container for temporary storage. The residual material is removed by a vacuum creating device. The interiors of the trash hoppers are then manually cleaned.

b. Screw conveyor inoperable - The trash is removed by a vacuum creating device. The interiors of the trash hoppers are then manually cleaned.

CECo has experience with vacuuming as a decontamination process.

QUESTION 321.78

"What type of training has been provided to CECo in preparation of the operation of Volume Reduction (VR) system? Was training provided on a prototype unit, full scale model, or a simulator?"

RESPONSE

Formal training was provided by AECC personnel at the site and some CECo personnel have visited the prototype facility. The training program was videotaped for future use. No simulator training was used.

Additional training will be provided by AECC personnel during the startup and checkout testing of the system when simulated waste will be used in the system at the Byron Station.

Redundant crew backup training will be provided during operation of the system by CECo.

QUESTION 321.79

"Regulatory Position 1.2 of Regulatory Guide 1.143, October 1979, discusses the requirements to prevent uncontrolled releases of liquids. Items discussed include level indicators, alarms, and routing of spills to the liquid radwaste system. Based upon a visit to Byron, neither the design nor the as-built system seemed to comply with these requirements, e.g., contaminated oil storage tank. The system design and the as-built system at Byron should be modified to comply with this regulatory position, and CECo should review the design and the as-built system to ensure that it conforms to the regulatory position of this regulatory guide."

RESPONSE

A review of the design of the volume reduction system shows that it conforms to Regulatory Position 1.2 of Regulatory Guide 1.143, October 1979, with the following exceptions:

a. Those exceptions listed in Topical Report No. AECC 4-P(NP) including amendments.

b. No high level alarm has been provided for the contaminated oil tank (OVR04T) because the switches that allow the tank to be filled are mounted locally and it requires approximately 2 minutes to fill the tank.

c. No high level alarm has been provided for the flush water recovery tank (OVR09T). The high level switch starts the flush water recovery tank pump (OVR30M).

QUESTION 321.80

"Address the radioactivity associated with contaminated oil which will be incinerated."

RESPONSE

CECo experience from the Zion Station shows that between 800 and 1200 gallons/year of contaminated oil may be produced and this oil will contain activity ranging from 1×10^{-5} to 1×10^{-6} μCi/gm.

QUESTION 321.81

"It is the staff's position that decontamination solutions containing organics should not be processed in evaporators unless the plant has a chemical oxygen demand monitor (COD). The reason being that, in the past, the decontamination solutions sent to various radwaste treatment systems have been recycled to reactor water storage tanks. When the organics made it into the reactor, the organics decomposed and played havoc with reactor instrumentation, e.g., incidents at the Brunswick and Hatch plants. CECo should address how they will nandle the decontamination solutions associated with the VR system."

RESPONSE

CECo does not plan to use organic decontamination solutions for the VR system.

QUESTION 321.82

"Discuss differences in the Byron/Braidwood VR system design compared to that contained in the AECC-2-P(NP) topical report. Explain the reason for the differences in the design."

RESPONSE

See the response to Question 321.15.

QUESTION 321.83

"Your FSAR for Byron/Braidwood discusses the plant's conformance to Regulatory Guides 1.140, 1.1.43 and 8.8. From some non-conforming items identified in your VR system design, it is not clear whether the conformance addressed in the FSAR included the VR system. Identify those areas of the VR system which do not conform to these regulatory guides."

RESPONSE

The design of the volume reduction system conforms to Regulatory Guides 1.140, 1.143, and 8.8 with the following exceptions:

a. The 0-15 psig tanks were designed, fabricated, inspected and tested per the requirements of ASME Code Section VIII, Division 1, including the ASME Code Stamp. See the answer for Question 79 to Topical Report No. AECC-2-NP, Amendment 2 for further information.

b. No provisions have been made to route spills of contaminated oil to the liquid radwaste treatment system. See the answer for Question 55 in Topical Report No. AECC-2-NP, Amendment 2 for further information.

c. The contaminated oil tank does not have a high level alarm. See the response to Question 321.79 for further information.

d. Compliance with Regulatory Guide 1.140 is discussed in Questions 63 and 80 in Topical Report No. AECC-2-NP, Amendment 2.

QUESTION 321.84

"Discuss the conformance of the VR system solids product to meet the requirements of 10 CFR Part 61 and the branch technical position papers on waste form and waste classification."

RESPONSE

See Dow Topical Report DNS-RSS-200 (June 26, 1984).

QUESTION 321.85

"It would appear that a high level alarm should be included on the contaminated oil storage tank. The high level alarm would prevent potential spills."

RESPONSE

A high level switch has been installed on the contaminated oil tank. It causes the tank's inlet valve to close and the feed pumps to stop when it is activated. Also see the answer for Question 55 to Topical Report No. AECC-2-NP, Amendment 2 for further information.

QUESITON 321.86

"Shouldn't the valve in the vent line from the waste liquid storage tank to the auxiliary building filtered vent header be in the open position and not closed, as shown in sheet 33 of drawing M-48?"

RESPONSE

Yes. The P&ID will be revised to show these vent valves as normally open.

QUESTION 321.87

"Shouldn't the flow rate to the secondary scrubber and the ΔP across the scrubber be part of the instrumentation information available to the VR system operator?"

RESPONSE

Secondary scrubber performance is a function of the pressure drop across the scrubber unit. Therefore, the ΔP across the secondary scrubber is indicated by PDI 310. The flow rate can be adjusted to maintain the ΔP across the scrubber at 60 inches water column, via a hand operated throttling valve.

QUESTION 321.88

"Why does a portion of the exhaust flow from the gas/solids separator sent directly to the portion of the scrubber preconcentrator above the mist eliminator?"

RESPONSE

All exhaust flow from the gas/solids separator goes directly to the venturi scrubber preconcentrator. There may be some confusion on instrumentation lines running to the ΔP cell denoted as PDTSAHL 67 (Reference FSAR Figure 11.4-7, Sheet 2).

QUESTION 321.89

"The flush water recovery tank should meet the requirements of Regulatory Guide 1.143. Does this tank meet these requirements?"

RESPONSE

The flush water recovery tank (OVR09T) meets the requirements of Regulatory Guide 1.143 except the high level switch does not actuate an alarm; however, it does start the flush water recovery tank pump OVR30M. Provisions for indicating this pump's operation have been installed.

QUESTION 321.90

"Inlet air filters (0VR0 3M and 0VR0 2M) in drawing M-48, sheets 34 and 36 contains no P instrumentation to inform the operator that the filter is clogged or that there is no flow or reduced flow. This filter should contain such instrumentation."

RESPONSE

Both of these filters are expected to operate about 3,000 hours before plugging. These filters will be visually inspected and serviced by washing during the VR system's annual maintenance. In the worst case, if the filter did plug, the system would safely shut down on loss of gas flow or low pressure. The filter could then be changed and the system restarted. It takes about 1/2 hour to service the blower inlet filters.

QUESTION 321.91

"For what parameter does the metal detector alarm high?"

RESPONSE

The metal detector can detect metal objects as small as a single metal staple. The unit is equipped with adjustable sensitivity level. The detector measures a change in the flux density of an inductive coil as determined by a change in current when metal is present.

QUESTION 321.92

"What type of instrumentation is contained on the trash shredder filter to indicate that it is plugged?"

RESPONSE

No instrumentation is provided since this filter can be visually inspected at the inlet shredder hood and readily replaced if required.

QUESTION 321.93

"What variable is AERSAL 75C monitoring in the vessel head of the dry waste processor? Is it density?"

RESPONSE

Instrument AERSAL 75C monitors oxygen.

QUESTION 321.94

"Does an alarm occur on a high or low ΔP across the scrubber preconcentrator?"

RESPONSE

Alarms for both high and low ΔP across the scrubber preconcentrator occur.

QUESTION 321.95

"Why are there two different density (?) monitoring elements with alarms on the recirculation line from the scrubber/pre-concentrator recirculating pipe?"

RESPONSE

Instrument AERAHL 66c monitors density and pH. See Topical Report No. AECC-2-NP, Amendment 2, Volume Reduction System P&ID.

QUESTION 321.96

"Why would the material from the bed storage and transfer hopper of the dry waste processor have the contents of its bed transferred to the hopper associated with the fluid bed dryer when these two vessels utilize entirely different bed material for the two processes?"

RESPONSE

The material from bed storage and transfer hopper (OVR06T) is transferred to the fluidized bed dryer (OVR01D) for disposal.

QUESTION 321.97

"What parameters are monitored in order to ensure that the gas/solid separator is working correctly?"

RESPONSE

Pressure drop, flow rate, and gas temperature are monitored to ensure proper operation as follows:

Pressure Drop - The ΔP transmitter (PDTSAH 71C) located across the gas/solids separator is connected to a high alarm in the control room. The high alarm indicates plugging of the unit.

Flow Rate - The inlet flow rate to the gas/solids separator is indirectly controlled by controlling the inlet flow rates to the fluid bed dryer vessel (OVR01D) and the dry waste processor vessel (OVR035). The fluidizing air flow rate to the fluidized bed dryer is controlled via PTRSAHL 72A, the elbow air flow rate to the fluidized bed dryer is controlled via FITSAL 72E, and the fluidizing air flow rate to the dry waste processor is controlled via FIRSALH 73D. These flow rates are alarmed in the control room.

Temperature - The dryer outlet gas temperature is controlled via TWERAHL 71C and the dry waste processor outlet gas temperature is controlled via TEWRCSAHL 74. Both temperatures are alarmed in the control room.

QUESTION 321.98

"It appears that, in portions of the VR system, there is insufficient instrumentation on various components of the system to provide the operator of the VR system adequate details on the status of these components. Some of this is because the instrumentation is monitored locally with no input to the VR system control room. In other cases there is no monitoring at all. Examples where flow indication in the control room would provide useful information include:

(a) waste recirculation pump;

(b) contaminated oil pump;

(c) service air to fluid bed dryer;

(d) flush water recovery tank pump (no indication of flow at all);

(e) booster blower (no indication of flow at all).

"The filter, OVR0 8F, sheet 34, should contain P alarms, high and low. The bed storage and transfer hoppers should contain level indicators, for there is no way to tell the storage capacity of the hopper without looking through the fill port.

"Justify this lack of instrumentation in the control room and explain why such instrumentation has been excluded from the VR system control room."

RESPONSE

a. Waste Recirculation Pump - These two pumps, OVR01PA and OVR01PB, are designed for full-flow operation. There is no requirement for monitoring the flow rate. However, pump discharge pressure is indicated.

b. Contaminated Oil Pump - Measurement of flow rate is not required for system operation. However, the pump speed can be adjusted via a manual speed controller to maintain the dry waste processor heat release rate a design value.

c. Service Air to Fluid Bed Dryer - The service air consisting of atomizing air and purge air to the dryer nozzle is measured and indicated locally via OFIVR 126 and OFIVR 131. The operating personnel will monitor these flow indicators.

d. Flush Water Recovery Tank Pump - This pump is designed for full flow operation. There is no requirement for monitoring the flow rate. However, the discharge pressure of the pump is indicated.

e. Booster Blower - This blower is run at a constant speed. The quantity of air discharged by the blower is controlled by the system logic via valve OVR 255. This valve cannot be fully closed due to a mechanical stop on the operator; therefore, the blower cannot be deadheaded unintentionally. As the air entering the VR system is measured, a flow indicator on the exhaust is not required.

f. Filter OVRO 8F - This F-4 filter is equipped with a ΔP indicator. The operating personnel will monitor the ΔP to ensure the filter has not plugged.

g. Bed Storage and Transfer Hoppers (OVR06T and OVR07T) - These hoppers do not contain level indicators. However, the fluid bed dryer vessel OVR01D and the dry waste processor vessel OVR03S are equipped with level indicators. This provides an indication of the volume of bed material that is to be transferred from OVR01D to OVR07T or from OVR03S to OVR06T. Furthermore, hoppers have a capacity 50% greater than the OVR01D and OVR03S operating bed volume. This precludes overfilling hoppers when transferring bed material.

Also, the bed material is weighed prior to initial loading into the OVR06T hopper to preclude overfilling. There is no need for level indication on the hoppers.

QUESTION 321.99

"There appears to be a significant difference in the instrumentation on the VR system described in AECC-2-P(NP) and the system installed at Byron/Braidwood. It appears that a substantial amount of instrumentation has been deleted at Byron/Braidwood. Please provide a justification for each of these omissions."

RESPONSE

The instrumentation on the VR system installed at Byron is essentially identical to that described in Topical Report No. AECC-2-P(NP). The apparent differences are due to the manner used to show it on the P&ID's. There are separate instrumentation diagrams for the Byron project that show the instrumentation in the same detail as the Topical Report.