NOV 1 0 1972

50-331

Roger Boyd, Assistant Director for Boiling Water Reactors, L
THRU: Walter Butler, Chief, Boiling Water Reactors Branch #1, L

Original signed by
Walter Butler

SITE VISIT AND MEETING CONCERNING THE DUANE ARNOLD ENERGY CENTER

The Project Manager, George Lear, and a hydrologist from the Site Analysis Group, Bill Bevin, travelled to Cedar Rapids, Iowa on October 23, in order to make a site visit and participate in a meeting with the Iowa Electric Light and Power Company (IELP) on October 24 and 25. The Project Manager had established these goals for the trip: to observe construction onsite of reactor, reactor building, turbine building, pump house, intake facilities, radwaste facilities, and such other components, equipment and structures as might be under construction at that time; and to meet with the Iowa Electric Light and Power Company and its contractor representatives in order to discuss their response to various questions in Amendments 1 through 7 of the FSAR. The hydrologist was on this trip in order to inquire into matters pertaining to the hydrology of the area. In particular the latter wished to observe the construction and plans for operation of the water intake facilities, to discuss calculations of the PMF, and to obtain data concerning release rates and permeability of the soil following liquid radiological releases.

On October 24, the Project Manager and the hydrologist visited the site of the construction project. It was observed that a strike was in progress. One welder had been fired by the architect engineer (Bechtel) for use of improper welding rods while welding stainless steel piping. Since it was a wildcat strike, unauthorized by the union, that caused the slow down in work for several days, an injunction against the striker enabled the company to resume normal work on Thursday, October 26.

The Project Manager was accompanied by the Iowa Electric project personnel and a Bechtel representative in a tour of the plant. The components, equipment and structures visited are listed in Enclosure 3 with appropriate comments on the observations of these features of the plant. Mr. Bevins visited features of the plant associated with flood protection, the provision of water for cooling purposes and the provision of features to control or prevent the release of liquids from the plant into the soil or the Cedar River.

On October 25, G. Lear and B. Bevin met with the applicant's representatives including participants from Bechtel and General Electric to discuss the applicant's response to questions raised by the staff. The applicant

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had, as of October 20, submitted seven amendments to the FSAR. Response to all of the staff's questions has not been adequate. The Project Manager discussed those questions which were incompletely answered or not answered at all with the thought in mind to obtain the applicant's commitment to providing requested information prior to a stated date. In Enclosure 2, attached hereto, there is a list of these outstanding questions together with pertinent comments and the applicant's estimated date for submittal of the responses. The dates for the applicant's response to these questions will be outside the "critical path." It is hoped that the applicant's responses will contain the proper information to enable the staff to keep on schedule with the ultimate goal of writing a Safety Evaluation in January, 1973.

Other matters of significance that were discussed during this meeting with the applicant are presented in Enclosure 1.

The participants in the site visit and the meeting are listed in Enclosure 4 to this memo.

Original signed by
George E. Lear

George Lear, Project Manager
Boiling Water Reactors #1
Directorate of Licensing

Enclosures:
1. Significant Aspects of Meeting, Oct. 25
2. Questions and Target Dates
3. Observations During Site Visit, Duane Arnold Energy Center, October 24, 1972
4. List of Attendees

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See attached list

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ENCLOSURE 1

SIGNIFICANT ASPECTS OF IELP - STAFF MEETING
OCTOBER 25, 1972
CEDAR RAPIDS, IOWA

1. Technical Specifications:

   The applicant is preparing first draft of the Technical Specifications which will include changes primarily in Sections 1 and 6.

2. Testing:

   Acceptance Testing versus Preoperational Testing and the assignment of systems tests to these two categories were discussed at length. There presently is a disagreement between Regulatory Operations-Region III and the Iowa Electric Company over the assignment of systems tests to these two categories.

3. MSL IV and Seal System:

   Calculation of doses and the elimination of excessive exposures resulting from the main steam line isolation valve (MSL IV) leakage in the post LOCA condition. The applicant indicated that his response to this problem in Amendment 5 had indicated that the system presently installed is adequate. He was advised that our current calculations, based upon the use of the TID14844 radiological source terms, result in a two hour dose at the exclusion area boundary that exceeds 10 CFR Part 100 limitations. The applicant was advised that this is a serious concern that must be corrected. The MSL IV seal system is not a backfit, inasmuch as this problem had been discussed in the Safety Evaluation report and in the ACRS letter written during the CP stage of review.

4. Pipe Whip Restraint Report:

   Preparation and formal submission of the pipe whip restraint report was discussed. Although an informally submitted copy of the report is available to the staff and is being reviewed, it was pointed out to the applicant that formal submittal must be accomplished.

5. Control Rod Drop Accident:

   Preparation of the control rod drop accident analysis by other

applicants' (TVA and PECO) using General Electric topical reports and the adoption of the General Electric concept for a rod sequence control system were discussed. The Iowa Electric personnel were advised that we expect comparable or better solutions for use on the Duane Arnold facility. The IELP representatives indicated that they undoubtedly would follow the fix adopted for Browns Ferry and Peach Bottom as opposed to waiting for a subsequent and possibly better system because of the time problem associated with the latter course of action.

6. Future Submittals:

Future submittals by the applicant were discussed. These submittals will be responses to questions not previously properly answered and responses to our position statements that are presently being sent to the applicant. Amendment No. 8 is under preparation at Iowa Electric Company for submission on November 17.

7. Future Meetings:

Future meetings and site visits were discussed. A site visit by Charles Miller is planned for November 13, 14 and 15 so that he can review electrical wiring, cables, and electronic equipment in the facility. The ACRS subcommittee visit has not been scheduled as yet; however, it is anticipated that this visit will be during the latter two weeks of December. Future meetings with the applicant are anticipated for the purpose of discussing outstanding issues that result from our statement of positions. At least one more meeting on the Technical Specifications prior to January 1 will be scheduled.

8. Quarry and Airport Operation:

Quarry operation and operation of nearby airports were discussed. The applicant indicated, somewhat reluctantly, that checking of the vibration response of the soil and rock between the quarry and the plant through the use of the seismic instrumentation of the plant may be difficult in view of the problems associated with arranging shots at the quarry. However, he was advised that we would require that kind of information. With regard to the nearby small airport, the applicant indicated there was no permanent manager at this facility; hence, determining information of flight operations would be difficult. Again, we advised the applicant that this information would be needed.

9. Technical Support by IELP During Plant Tests:

Technical support at the plant site by the applicant during the preliminary testing that will occur at the facility in the next few months was discussed. Iowa Electric plans to move in December ten engineering staff personnel to the plant site to assist in the plant preoperational testing program. This is a move that is associated with the problem discussed above on acceptance testing versus preoperational testing. It is a move planned to demonstrate that Iowa Electric will be more involved in the performance of onsite tests.

10. Public Hearings:

The public hearings for which a public notice had been made on September 30 may have intervention. Two intervenors have indicated interest; however, Iowa Electric believes that one intervenor may be provided enough information before the scheduled public hearing to satisfy his concerns. The other intervenor, Iowa Electric indicated, had been a participant as a limited appearance, in the construction permit hearings and most likely would reappear during the environment hearing scheduled later in 1973.

ENCLOSURE 2

TARGET DATES FOR APPLICANT RESPONSE
TO CORRECT UNANSWERED OR INCOMPLETE ANSWERS IN
AMENDMENTS 1 THROUGH 7, DUANE ARNOLD FSAR

1. AMENDMENT NO. 1

Questions	Comments	Target Dates
Q.5.4 & C5.2	Pipe whip report. To be submitted in Amendment 8.	11/6
Q.11.2C	Radiation shielding design and turbine shine dose calculations were to be prepared to form the basis for shielding. No data to date was submitted. Iowa Electric has indicated that it will check to verify its dose calculations.	

2. AMENDMENT NO. 2

Questions	Comments	Target Dates
Q.3.2A	Information concerning the gadolinium oxide mixture core. This will be supplied in Amendment No. 9.	11/17
Q.3.2	Gadolinia fuel information concerning shutdown margins has been supplied, but is considered inadequate.	11/17
Q.23.2	Analysis for misplaced fuel bundles in the core has not been completed.	11/17
Appendix G Q.G.7.1	This is the response on the CAD system design and is not complete. Remaining to be submitted are the P&IDs. The applicant indicates the procedures for operation have been included in Amendment 7. With	11/3

Questions	Comments	Target Dates
	regard to the inerting and purging techniques that are to be developed, the applicant indicated that the P&IDs will also show this capability. The applicant indicated that testing procedures and the frequency for testing is discussed in Amendment 7. Likewise Amendment 7 reflects the 62 psig containmment pressure as the upper bound on the range of post LOCA monitoring instrumentation for pressure.	

3. AMENDMENT NO. 4

Questions	Comments	Target Dates
Q.4.9	Remote inspection equipment for the reactor vessel is stated as being under development. The applicant indicates that a contract exists for the first inservice inspection equipment with the General Electric Co. There is no immediate plan for providing this equipment since the first inservice inspection using this equipment will not be required for a period of years. The first actual inspection will be accomplished manually.	Not stated (years)
Q.M.3.2.D	The applicant indicated the pressure and temperature response in rooms such as the RCIC, HPCI, and RHR pump rooms must be calculated to determine effects following the steamline break postulated. A computer code preparation and print-out will be executed by Bechtel.	11/30

4. AMENDMENT NO. 5

Questions	Comments	Target Dates
Q.F.2.2	A change in wording is needed to show that the isolation valve failure to a safe position applies only for air instrumented or air operated valves. This change will be in Amendment No. 9.	11/17
Q.5.8	The calculation of main steam-line isolation valve post LOCA leakage exposure dose has been submitted by the applicant with a rather large number of mathamatical errors. IELP has also indicated that additional work on fission product plateout, condensation, fallout and so forth, may permit subsequent submittal of information that will reduce further the exposure doses calculated by GE. This information is still needed and the applicant indicated that it would be submitted at an unknown future date.	
Fig. 5-5.13-1	The applicant was advised that the figure was incorrect. He agreed that this figure designated as a vacuum breaker valve was indeed the fixture for the crane; IELP will correct by page changes. See Amendment 7.	11/17
Fig. 5-7.3-1	A future page change will be provided to account for this error shown on this particular page.	11/17
Page 5-G1.1-1	The responses to questions Q.G.7.3 and question 11.1 are missing. The applicant indicated both are now in Amendment No. 7.	N/A
Preparedness Plan.	Para. 2.0: The applicant indicated that additional information would be	

Questions	Comments	Target Dates
	submitted in a subsequent document to be added to the preparedness plan.	11/30

5. AMENDMENT NO. 6

Questions	Comments	Target Dates
Q.9.22	The applicant stated that para. 9.4.1 in the FSAR would be amended later as a page change.	11/30
Q.9.9	The detergent drain routing is not complete and will be completed in a subsequent amendment.	11/30

6. AMENDMENT NO. 7

Questions	Comments	Target Dates
Q.1.2	The operational test program for justifying the increase from rated power operation to design power operation is still under preparation by the GE. It will be submitted with Amendment No. 9.	11/17
Q.6.1 & Q.6.4	GE is performing an analysis to determine and submit information on the effect of the loss-of-coolant accident on the gadolinium oxide core using the interim acceptance criteria.	11/30
Q.14.9	The gadolinium oxide core reactivity coefficients are being established by GE for submittal by IELP	11/17
Q.14.10 & 14.14	The transient analysis presented in the FSAR will be upgraded and conformed with the current core design in material to be submitted in Amendment No. 9.	11/17
Q.14.15	Control drop rod accident analysis will be dependent upon the AEC	

Questions	Comments	Target Dates
	licensing review of the GE proposed control rod sequence control system. Now under review in Licensing are the Browns Ferry and Peach Bottom systems.	
G.7.3C	The CAD system P&IDs will be submitted in the near future. In fact, the applicant indicated an informal submittal will be made during the week of October 30 in order to permit the staff to begin review.	11/3
Page 7-G1.0-2	The applicant indicated that a future amendment will include page revisions in conformity with the requirements set forth in Safety Guide 25. The applicant stated that the response to AEC Safety Guide No. 29 (seismic design classification) is still in preparation and will be submitted later.	12/10 11/30

ENCLOSURE 3

OBSERVATIONS DURING SITE VISIT
DUANE ARNOLD ENERGY CENTER
OCTOBER 24, 1972

1. Turbine Building (TB):

   a. On the lowest level of the structure, the diesel oil transfer pumps (from seven days storage tanks to day tanks) were found to be sited in a corner that can be easily blocked-in to prevent flooding in event of rupture of the circulating water system in the turbine hall.

   b. Installed equipment that was observed included the steam jet air ejector, mechanical vacuum pumps (hogging pumps), TB ventilation ducts, intake fans, roof exhaust ducts (8), condenser system and circulating water lines.

   c. The turbine-generator is being assembled on the turbine floor. Walls for gamma shielding between the demoisturizers (one on each side of the low pressure turbine) and the turbine, as well as along the TB wall above the turbine floor level are planned. Shielding walls will be concrete block, filled with re-bar and concrete slurry; a double row of block will be laid along the TB exterior wall as is being done in the Reactor Bldg. (RB) on the refueling floor.

   d. Ventilation of turbine bldg. air during the summer months will be through the combined flow of roof vents (8 exhaust ducts on roof) drawing air upwards from a level about 15' above the turbine floor and the RB exhaust system which draws air downward through the turbine bldg., through its lowest level, and then into the RB exhaust duct and plenum to the two exhaust fans which direct the RB and TB air to 3 fiberglass roof vents (circular ducts) that exhaust at about RB roof level. In the winter the 8 roof vents in the TB will not be used.

   e. The diesel generator rooms were observed and found to be constructed of concrete block walls only partially. To complete the enclosures started with reinforced concrete (poured in-place) walls, the walls of concrete block were set with re-bar inserts, filled with concrete slurry, and anchored to floor and roof to provide a Class I structure. The architect-engineer had analyzed the turbine bldg. structure, including the block walls, to validate their design as a Class I seismic enclosure for the two diesel generator rooms.

2. Control Room:

The control rod selection and display panels were observed. A control rod select switch permits the position indication (display) of the rod selected and its three adjacent control rods. A Rod-In, Rod-Out, and a Drift Alarm is annunciated and lighted on the main core-control rod display located on the vertical panel before the control room operator. To obtain a display of all control room positions, the process computer may be keyed to print-out the digital positions of all rods. The computer read-out and keying panel will be located behind the operator, readily accessible to him or his assistant.

3. Radwaste System and Radwaste Building

Access to the Radwaste Building is possible from the Reactor Building. The control room for radwaste processing has a control panel that mimics the process system thus aiding the operator. Included in this system are 3-10,000 gallon tanks (2 equipment + 1 floor drain tanks), 1-40,000 gallon tank (surge tank), 2-centrifuges, 2-solid waste hoppers attached below the centrifuges, waste sludge tanks, drumming operators and racks, and 2-sumps for radwaste collection following wash-down. The radwaste system is enclosed in a Class II seismic building that from outward appearance (reinforced concrete) would withstand considerable acceleration. (The applicant representative stated that the structure was Class II mainly because the appropriate structural analysis for a Class I building was not performed)

Processing and handling solid waste was well planned in the arrangement of centrifuges, hoppers, drumming devices, conveyor belts and drum transports. An operator can perform these tasks, including the capping of 55 gallon drums, wash-down of the drum, taking sample swipes, and monitoring from shielded positions adjacent to the solid radwaste processing area. Amercoat surfacing on walls and floors of the drum storage area will permit washdown for decontamination.

To load out solid radwaste in 55 gallon drums a truck can be backed into an enclosure where remotely operated "transfer cars" move drums from the storage aisles to the truck. Vision via periscopes for the operator eliminates direct line-of-sight exposures.

4. Rooms inside the reactor building and located around the periphery of the torus include the RCIC pump room, HPCI pump room, and two rooms each containing 2-RHRS pumps, 1-core spray pump, and 1-RHRS heat exchanger. Equipment in these rooms has been installed but not as yet tested.

5. Pump House:

Near the reactor building and the two bays of forced draft cooling towers (wet) is the pump house. Two water pumps, each rated at 140,000 gal/min, circulate water in a closed system to the condenser and then to the cooling towers from which water will flow by gravity back to the pump house basins. The pump house also includes 2 flood (PMF) protected enclosures each containing 2-RHR Service Water Pumps and 1-Emergency Service Water Pump that are available for cooling purposes. Water from the river is circulated by these latter pumps through Class I (seismic) piping, basins, and related heat exchangers. The pump house and its contained equipment and components is almost completed.

6. Cooling Towers:

Almost finished are two forced-draft wet cooling towers. Circulating cooling water from a "closed" (not "once-through") system will be cooled in the towers. Blowdown is taken from the cooler basin water to reduce impact on Cedar River.

ENCLOSURE 4

PARTICIPANTS IN DAEC SITE VISIT
AND MEETINGS, OCTOBER 24 AND 25, 1972

AEC		IELP		GE	
George Lear - L	S,M	D. Arnold*		Al Smith	S,M
Bill Bevins - TR	S,M	C. Sandford*			
		L. Root	S,M		
		J. Ward	S,M		
		D. Flanaghan	M		
		K. Meyer	M		
		D. Ahrens	S		

Commonwealth Associates		Bechtel	
Bill Heilmann	M	Tom Broad	S,M
Adnon Alsofar	M	Sam Cott	S,M

Key: S = Site Visit
M = Meeting

*Brief Visit on October 25