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August 6, 1979

Mr. Thomas A. Ippolito, Chief
Operating Reactors Branch No. 3
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Re: Docket No. 50-133
License No. DPR-7

Dear Mr. Ippolito:

Enclosed is Attachment A which contains the additional information requested in your letter dated July 20, 1979, concerning IE Bulletin 79-08.

Very truly yours,

Philip A. Crane, Jr.

Attachment

CC w/attachment: Mr. R. H. Engelken, Director
Office of Inspection and Enforcement
Region V

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ATTACHMENT A

Response to Request for Additional Information Related to IE Bulletin 79-08

## Introduction

A number of items in the request for additional information concern the schedule for action. Our original response states that "Humboldt Bay Power Plant Unit No. 3 has been out of service for seismic modifications and resolution of seismic and geologic issues. The changes in design and operating procedures discussed in this response will be completed prior to the time the Unit is returned to service." This represents the most definitive schedule commitment that can be made at this time.

## Item No. 2

1. We have reviewed all applicable operating and emergency operating procedures and have confirmed that containment isolation exists via a) normally closed valves or b) is automatically initiated by engineered safeguards actuation or c) is manually initiated. This is true for all lines except those needed for safety features or cooling capability and the closed cooling water lines to the drywell air coolers which were identified as requiring manual isolation in previous submittal. (Refer to attached Table III-1, III-2 from our Technical Specifications.)

2. As discussed in the Introduction, we have not prepared nor implemented the procedure change requiring the manual isolation of the closed cooling water lines to the drywell air coolers.

3. No other items related to Item No. 2 require action.

## Item No. 4

1. The Humboldt Bay reactor has two types of level instrumentation; one system is manufactured by Yarway and the other by Bailey. The Yarway reactor water level instrumentation is utilized to initiate a reactor trip and reactor isolation upon reactor low water level signal. If reactor pressure is less than 150 psig, the reactor low water level signal also activates the core spray and low pressure core flooding systems. With coincident signals from high drywell pressure and loss of feedwater flow, low reactor water level will also initiate the reactor depressurization system (vent valves). The Bailey reactor water level instrumentation is utilized to automatically or manually control the reactor water level via feedwater regulation during power operation. The Bailey system is not utilized for automatic actuation of the engineered safety systems.

   The Yarway and Bailey level columns are attached to stilling wells which in turn are attached to the reactor vessel. The Bailey primary sensors are saturated level columns since the reference leg is maintained at saturation conditions by locating it inside the variable leg and insulating the entire column. The Yarway level sensors are designed to operate with the reference leg subcooled since the reference leg is designed to operate at drywell ambient



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conditions (approximately 175°F) plus 56% of the difference between the drywell ambient and reactor saturation (563°F) temperatures. Since the Yarway system reference leg operates below saturation, i.e., subcooled, the reactor pressure could decrease to less than 250 psig before affecting the Yarway reference leg. The output from both the Bailey and Yarway level sensors is a differential pressure which is a direct function of the difference in height of the variable (reactor water level) and reference (constant) legs. The Bailey output is electronic and is converted to a pneumatic signal for use in the feedwater controls; therefore, all of the readouts for reactor water level (two indicators and one recorder), are dependent upon an electrical as well as pneumatic supply. The Yarways, which are completely electronic, are supplied with emergency power for reliability and have two separate control room reactor water level readouts.

2. Changes in reactor coolant inventory due to leaks would be detected by various automatically actuated signals and instrumentation. There are only three places where primary system lines are routed; these are the reactor drywell, the refueling building and the pipe tunnel.

If a primary system leak occurred in the drywell, it would be detected by an increase in the containment (drywell) pressure and temperature. The change in temperature would be detected by resistance temperature detectors whose readout is recorded in the control room and by thermocouples whose readout is indicated and alarmed in the control room. The increase in pressure would be indicated and alarmed in the control room and would result in a reactor trip and isolation if it reached the 2 psig setpoint. A primary system leak would also be detected by an increase in the drywell sump level. This sump is monitored by local instrumentation that is read each shift by the operator on his round. If the level increases by 50 gallons, it initiates two independent control room level alarm annunciators and must be manually drained by the operator using a low level interlocked, "deadman" switch. The frequency of sump draining is recorded and monitored by the operators and our operating procedures require that plant management be notified a) of any change in the rate of accumulation or b) if rate of accumulation exceeds 50 gallons per month, i.e,. one draining per month.

If primary system line or valve leakage were to occur in the pipe tunnel, it would be noticed by an increase in the area radiation, as indicated and alarmed by the pipe tunnel area radiation monitor, and by an increase in the temperature as noted by the mainsteam line break sensors which would trip and isolate the reactor following an increase of 30°F above normal ambient.

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If primary system leakage were to occur in the refueling building or access shaft, the steam released would be detected by one or all of the following: 1) one of the eight radiation monitors in the refueling building and access shaft due to the radioactivity level increase, 2) by the moisture detector in the access shaft instrument vault, and/or 3) by actuation of the refueling building high differential pressure protection system which would isolate the isolation (emergency) condenser and the cleanup system.

In addition to the above described instrumentation, the reactor pressure, in conjunction with other indicators, can indicate a loss of reactor inventory. Our reactor safety valves and reactor vent valve discharge lines are monitored by temperature detectors to assist the operator in determining if leakage or actuation has occurred.

Item No. 5

1. See discussion in Introduction.

Item No. 6

1. In our present Cold Shutdown mode of operation, there are no requirements for valve alignment of engineered safety features. As discussed in the Introduction, we will conduct our Startup, Sealed Valve and Critical Sensor Check Lists prior to returning to power operation following our present outage.

2. During each refueling outage, each valve in the plant engineered safety systems is exercised to verify that it is functional and is not in need of maintenance. Additionally, systems are cleared for other testing or maintenance. As a consequence, the Sealed Valve and Critical Sensor Check Lists are utilized just prior to returning to power operation to insure proper availability and operation of an engineered safeguards feature or reactor safety system by physically verifying that all of the subject valves are in proper alignment and then sealing them in the required position.

3. See response to Item 6.1 above.

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Item No. 7

1. Refer to attached Table I.

2. Resetting of the engineered safety features instrumentation will not result in inadvertent transfer of radioactive gases and liquids outside of containment since none of the isolation or system valves, except those listed below, change position automatically upon resetting (by either manual or automatic methods).

   A. Scram Dump Tank Drain Valve - Any reactor trip will close the drain valve. This valve cannot be re-opened unless: 1) the reactor trip signal resets and 2) the control room operator manually resets the reactor safety system. The second action is prevented administratively until a complete evaluation of the cause of the trip is conducted. Once reset, the scram dump tank drains to the reactor equipment drain tank (REDT) which is located inside the refueling building (secondary containment). Once released to the REDT, the liquid could be automatically pumped to the radwaste facility which is outside secondary containment since the REDT pumps are automatically started by high REDT level. An alternate flow path, such as proposed for the emergency condenser vent in our previous submittal, is not required because: 1) manual action is required to cause the transfer, 2) if the transfer were initiated, the operator can shut down the REDT pumps from the control room if excessive radioactivity is detected from the radiation monitors near the tank or located in the radwaste facility which indicate and alarm in the control room.

   B. Suppression Pool Cooler Recirculation Valve - If operating in the recirculation mode, any automatic actuation of the core spray system would cause closure of the valve. Manual resetting of the engineered safeguards initiation controls would cause the valve to return to the recirculation mode. This action would only cause a recirculation of radioactive liquid from the suppression chamber through the cooler and then back to the chamber so long as the core spray pumps continue to run.

   C. Suppression Chamber Relief Line Isolation Valve - This valve closes when drywell pressure increases to 2 psig. Once drywell pressure decays, the valve would re-open. This would not cause a transfer of radioactive gases because the vacuum relief valves would still be closed preventing a release to the refueling building.

3. In all cases, continued operability of the features designed to prevent inadvertent transfer of radioactive liquid or gases is assured by administrative controls, visual inspection during operator rounds, surveillance tests or some combination of these methods.

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4. As discussed in the Introduction, we will install the alternate vent path for the emergency condenser prior to our return to Power Operation if the modification is determined to be desirable. During our evaluation of the alternate vent path, consideration will be given to high radiation interlocks, containment isolation signal desirability and the method for assuring continued operability.

Item No. 8

1. Operability of redundant safety-related components or systems is presently verified by surveillance testing conducted at the time of redundant system removal. If testing is not appropriate or is not deemed necessary, a visual inspection is conducted prior to clearance of the redundant component or system to assure operability of the remaining component or system. Our Technical Specifications and maintenance and operating procedures also require a demonstration of acceptable performance following any maintenance or testing activity if the function of the component or system could have been impaired.

2. Our procedures require that the shift reactor operational personnel not leave their posts until they have provided the on-coming personnel with a full report on station conditions. This includes, as appropriate: a) jobs or tests in progress, b) bypassed or jumpered features, c) cleared equipment, d) work planned for the upcoming shift, and e) any other unusual conditions. In addition, the relieving personnel are not permitted to take over their watch until they are fully aware of plant conditions. To aid the Shift Foreman during watch turnover, a "Shift Turnover Sheet" has been provided to remind the on-coming Shift Foreman of the various routine review requirements. It is also a convenient place for the off-going Shift Foreman to note the status of special operations; i.e., completed, in progress, or planned, which he feels are important enough to be reviewed by the next Shift Foreman. To assist the reactor operational personnel in determining the status of equipment, we are using an inoperable equipment log and a tagging system to insure that: 1) the OPERABILITY status of all equipment and any pending ACTION requirements are clearly understood, readily available to the shift operators and accurately transferred from shift to shift, 2) prior to a change in OPERATIONAL CONDITION, the required equipment is demonstrated to be OPERABLE by performing the surveillance requirements, and that once demonstrated OPERABLE, the equipment remains OPERABLE, and 3) equipment which becomes INOPERABLE is properly demonstrated to be OPERABLE after corrective actions are complete.

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Item No. 9

1. As described in the Introduction, our supplement to the existing reporting procedures for NRC notification will be revised prior to returning to Power Operation. The supplement will state that NRC notification is required "within one hour of the time the reactor is not in a controlled or expected condition of operation."

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TABLE I

Systems Designed To Transfer Radioactive Gases Or Liquids Outside Of Containment

| System | Isolation | Remarks |
|---|---|---|
| 1. Main Steam Line[3] | Automatic Isolation[1] | |
| 2. Emergency Condenser[3] | Automatic Isolation[2] | A closed system that returns condensed steam to the reactor following high pressure initiation. Vent used as continuous bleed to remove non-condensible gases. |
| 3. Clean Up[3] | Auto Isolation[1 2] | A closed system that returns demineralized water to the reactor vessel. Continuous sample system that bleeds to main condenser. |
| 4. Shutdown[3] | Normally Isolated | A closed low pressure system used for decay heat removal during outages. Inlet valves opened on isolation scram with reactor pressure less than 150 psig to initiate Low Pressure Core Flooding. |
| 5. Suppression Chamber Core Spray Suction | Normally Open | A closed low pressure system that takes suction on the suppression chamber and sprays water into the reactor vessel through normally closed motor operated valve. Pumps start, core spray valve opens, and recirc. valve closes on isolation scram with reactor pressure less than 150 psig. |
| 6. Control Rod Drive Scram[3] | Automatic Isolation by all trips | Refer to Item 7.2.A. |
| 7. Drywell Purge | Normally Isolated | System can be used to vent excess pressure off through normally closed remote manually operated solenoid valves to the gas treatment system. |
| 8. Suppression Chamber Gas Treatment Suction | Normally Isolated | System can be used to vent excess pressure off through normally closed remote manually operated solenoid valves to the gas treatment system. |

Table I (Cont'd)

| System | Isolation | Remarks |
| --- | --- | --- |
| 9. Drywell Lower Head Drain | Normally Isolated | Fifty gallons can be drained from 300 gallon sump to reactor equipment drain tank by opening manual valve solenoid valve operated by a local deadman pushbutton. Solenoid valve closes when released or when low level set-point is reached. |

NOTE: 1 Automatic Isolation occurs following initiation of any of the following sensors: 1) Reactor Water Low Level, 2) Drywell High Pressure, 3) Main Steam Line Break (in pipe tunnel), 4) Loss of Potential to the 115 volt A-C preferred busses, 5) Remote Manual Scram.

NOTE: 2 Automatic Isolation occurs if refueling building differential pressure increases to 3.0±3 inches of water.

NOTE: 3 These liquid systems have normally closed and sealed vents and drains that can be utilized for transfer of contaminated liquids to the radwaste facility.

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## TABLE III-1 DRYWELL PENETRATIONS

| Penetration Function | Number | Diameter | Type of Closure and Seal | Position During Power Operation (1) |
|---|---|---|---|---|
| Main steam line | 1 | 24 inch | Two 12 inch motor operated isolation valves | Open (2) |
| Emergency condenser steam supply line | 1 | 16 inch | Two 6 inch motor operated isolation valves | Open (3) |
| Emergency condenser return line | 1 | 12 inch | One 4 inch motor operated and one 4 inch check isolation valve | Closed (Opens automatically on high reactor pressure) (3)(6) |
| Liquid poison injection line | 1 | 8 inch | Two 2 inch check isolation valves | Closed (Open during poison injection |
| Hydraulic supply pump dump line | 1 | 6 inch | Two 1 inch check isolation valves | Open |
| Control rod leak-off line | 1 | 6 inch | Two 1 inch check isolation valves | Closed (Open during control rod movement) |
| Feedwater line | 1 | 20 inch | One 8 inch motor operated and one 8 inch check isolation valve | Open |
| Reactor head flange inner seal leak detection line | 1 | 6 inch | One 1 inch manual and two 1/2 inch solenoid isolation valves | Manual valve open. Solenoid valves one closed, one open (5) |
| Coolant cleanup supply line | 1 | 8 inch | Two 2 inch motor operated isolation valves | Open (2) (3) |
| Coolant cleanup return line | 1 | 10 inch | One 2 inch motor operated and one 2 inch check isolation valve | Open (2) (3) |
| Control rod hydraulic lines | 4 | 24 inch | Blind flange and gasket | Closed |
| Incore flux monitor calibration thimbles | 1 | 6 inch | Eight closed thimbles and a check valve to the dry well terminate in a flange plate at the penetration. A 4 inch manual isolation valve is mounted on flange. A 1/2 inch manual test valve connects to the body of the isolation valve between the valve gate and the flange | Closed (Open during flux wire irradiation) |
| Reactor water sample line and test connections | 4 | 6 inch | Two 1 inch manual isolation valves on each line. One line contains a 1/2 inch solenoid valve which connects to the control rod hydraulic system pressure sensing line and a 1/2 inch deadman solenoid valve which connects to a reactor water sample station or to the low pressure connection of the downcomer manometer. The second line contains a 1/2 inch deadman solenoid valve which connects to the high pressure connection of the downcomer manometer. The remaining two lines are for future use. | Manual valves in two lines connecting to other systems open. Solenoid valve on reactor pressure sensing line open (5). Deadman solenoid valves open during sampling or testing.<br><br>Manual valves in future use lines closed. |
| Access opening, top | 1 | 14 feet | Flanged and double "O" ring seal | Closed |
| Reactor vent valve control line | 1 | 4 inch | Four air supply lines, ecah with a 1/2 inch manual and a 1/2 inch 3-way solenoid operated isolation valve. A 1 1/2 inch test connection with a 1 1/2 inch manual valve and cap, and a 1/4 inch test connection with a 1/4 inch valve and cap connect into the 4 inch line | Manual valves on air supply lines open. Solenoid valves closed (5). Manual valves in test connections closed. |
| Reactor extension tank overflow | 1 | 4 inch | Blind flange | Closed |
| Peripheral control rod hydraulic lines | 1 | 14 inch | Welded into pipe cap | Closed |
| Dry well purge air supply line | 1 | 8 inch | Two 8 inch manual isolation valves | Closed (6) |
| Shutdown cooling supply line | 1 | 18 inch | Two 8 inch motor operated isolation valves | Closed (Opens automatically if low pressure core flooding is initiated when pressure is below 150 psig) (4) |
| Shutdown cooling return line | 1 | 18 inch | One 8 inch motor operated and one 8 inch check isolation valve | Closed (4) |
| Reactor pressure control line | 1 | 6 inch | One 1 inch manual and one 1/2 inch solenoid operated isolation valve | Open (5) |
| Instrument lines connecting to the reactor vessel | 8 | 6 inch | One 1 inch manual and one 1/2 inch solenoid operated isolation valve on each line | Open (5) |

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TABLE III-1 DRY WELL PENETRATIONS (Cont.)

| Penetration Function | Number | Diameter | Type of Closure and Seal | Position During Power Operation (1) |
|---|---|---|---|---|
| Dry well water level tap (vent pipe elevation) | 3 | 2 inch | Two level instruments | Closed System |
| Dry well cooling water lines | 8 | 1 1/2 inch | One 2 inch air operated isolation valve on supply and return headers. One 1 inch manual valve on each line. | Open (5) |
| Access opening, bottom | 1 | 6 feet | Flanged and double "O" ring seal | Closed |
| Continuous leak rate monitoring system penetration (Nitrogen fill line) | 1 | 3/4 inch | One 3/4 inch manual and one 3/4 inch air operated valve | Manual valve open. Air operated valve opens on dry well low pressure. |
| Continuous leak rate monitoring system pressure sensing line | 1 | 1/2 inch | One 1/2 inch manual valve. One 1/2 inch deadman solenoid plus one 1/2 inch manual valve in manometer line. Pressure transmitter on other branch is closed system. | Deadman solenoid and manual valve in manometer line closed except when taking readings |
| Reactor safety valves vent lines to suppression pool | 4 | 10 inch | Safety valves | - |
| Dry well pressure tap | 1 | 1 inch | Pressure instrument | Closed system |
| Core spray and post-incident cooling supply line | 1 | 8 inch | One 3 inch motor operated and one 3 inch check isolation valve | Closed (Opens automatically if core spray is initiated) (6) |
| Vacuum breaker line to suppression chamber | 1 | 20 inch | Two 14 inch vacuum breakers in parallel in the line | - |
| Dry well vent lines to suppression pool | 6 | 40 inch | | - |
| Dry well air space sample line | 1 | 1/2 inch | One 1/2 inch manual isolation valve and pipe cap | Closed (Open during dry well air space sampling) |
| Reactor head flange outer seal leak detector line | 1 | 1/2 inch | One 1/2 inch manual and one 1/2 inch solenoid operated isolation valve | Closed (5) |
| [illegible] well purge suction and venting lines | 1 | 8 inch | Two 8 inch manual isolation valves, and one 1 inch manual and two 2 inch solenoid operated isolation valves on bypass line | 8 inch valves: Closed (6)<br>1 inch manual valve: Open<br>2 inch solenoid valves: Closed (Open during dry well venting) |
| Dry well lower head drain line and dry well lower head water level indicators | 2 | 2 inch | Two 1 inch manual and one 1 inch solenoid operated valve on drain line. Three level instruments. | Drain line valves closed (Open during dry well draining (8)<br>Closed system |
| Electrical leads | 5 | 24 inch | Blind flange and gasket | Closed |
| Safety valve discharge line vacuum breakers | 1 | 1 inch | Three 1 inch check valves in parallel | - |

Notes: (1) Isolation valves which are listed as closed may be opened under the conditions noted. Isolation valves which are listed as open may be closed under certain conditions.

(2) Automatic closure on reactor low water level, dry well high pressure, main steam line break, or low voltage on 115 volt preferred a-c busses (safety system power supply).

(3) Automatic closure on Refueling Building high differential pressure.

(4) Can be opened manually during reactor "cool down" when pressure is below 120 psig. Automatic closure when reactor pressure reaches 135 psig.

(5) Remote manual closure.

(6) Valve opening annunciated in the control room.

(7) If sample systems are added in future, a remote manual solenoid valve will be added. Valves will then be open during sampling.

(8) Solenoid valve opened from local pushbutton station. Valve automatically closes to maintain water seal in drain line or when pushbutton is released.

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TABLE III-2 SUPPRESSION CHAMBER PENETRATIONS

| Penetration Function | Number | Diameter | Type of Closure and Seal | Position During Power Operation |
|---|---|---|---|---|
| Access openings | 2 | 30 inch | Flanged and double gasketed manholes | Closed |
| Dry well vent lines to the suppression chamber | 6 | 40 inch | - | - |
| Reactor safety valve discharge lines | 4 | 10 inch | Safety valves | - |
| Vacuum breaker line from dry well | 2 | 20 inch | Two 14 inch vacuum breakers in parallel in the line | - |
| Pool bottom core spray pump suction lines | 2* | 3 inch | One 4 inch manual valve | Open |
| Pool normal core spray pump suction line | 2 | 3 inch | One 4 inch manual valve | Open |
| Pool water level instrument lines | 2 | 2 inch | Level instruments | Closed system |
| Chamber pressure instrument line | 1 | 1 inch | Pressure instrument | Closed system |
| Chamber gas treatment suction line | 1 | 4 inch | Two 4 inch manual isolation valves, and one 1-1/2 inch manual and two 1-1/2 inch solenoid operated isolation valves on bypass line. | 4 inch valves: closed 1-1/2 inch manual valve: open 1-1/2 inch solenoid valves: closed (open during venting) |
| Chamber vacuum relief line | 1 | 6 inch | One 6 inch air operated isolation valve followed by two 6 inch vacuum relief valves | Air operated valve open (closed on high dry well pressure) |
| Shutdown system drain lines | 2 | 1 inch | Two 1 inch check isolation valves, one 1 inch manual valve | Closed (open when draining shutdown system) |
| Pool water make-up and suppression cooler return line | 1 | 3 inch | Manual isolation valve in each of the three lines which enter this line. Air operated valve in cooler return line. | Make-up lines manual valves closed (open when adding water to pool). Cooler return line air operated valve closed (open when cooling pool water) |
| Continuous leak rate monitoring system penetration (Nitrogen fill line) | 1 | 3/4 inch | One 3/4 inch manual and one 3/4 inch air operated valve. | Manual valve open, air operated valve closed (opens on low suppression chamber pressure) |
| Continuous leak rate monitoring system pressure sensing line | 1 | 1/2 inch | One 1/2 inch manual valve. One 1/2 inch deadman solenoid plus one 1/2 inch manual valve in manometer line. Pressure transmitter in other branch is closed system | Deadman solenoid and manual valve in manometer line closed except when taking readings |
| Pool temperature instrument line | 1 | 1 inch | Thermowell | Closed system |
| Spare | 1 | 6 inch | Welded cap | Closed |
| Spare | 1 | 3 inch | Welded cap | Closed |
| Spare | 1 | 2 inch | Welded cap | Closed |
| Leak rate reference chamber | 1 | 14 inch | Blind flanged | Closed |

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