Consumers Power Company

David P Hoffman
*Nuclear Licensing Administrator*

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-1636

September 14, 1981



Mr James G Keppler
Office of Inspection and Enforcement
Region III
US Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

DOCKET 50-255 -DPR-20 - PALISADES PLANT -
SUPPLEMENTAL INFORMATION - IE BULLETIN 80-06 -
ENGINEERED SAFETY FEATURE (ESF)RESET CONTROLS

IE Bulletin 80-06 dated March 13, 1980 requested Consumers Power Company to determine if all associated safety-related equipment remains in its safety-related mode upon the reset of the emergency safety features actuation signal (ESFAS). This list of equipment was provided as Attachment 2 of Consumers Power Company letter dated June 23, 1980 and is provided as Attachment 1 to this letter.

During a telephone conversation with the NRC July 7, 1981, Consumers Power Company was requested to provide justification as to why the emergency safety feature (ESF) equipment which does not remain in the emergency mode upon ESF reset should not be modified. As described in our letter of June 23, 1980, Palisades Plant Emergency Operating Procedure #1 "Reactor Trip" requires that a number of post-trip conditions be established prior to resetting safety injection (these post-trip conditions are listed in Attachment 2). Our June 23, 1980 letter states that since all of these conditions must be met prior to resetting safety injection, the plant would be in such a condition as to safely accommodate the return of these safety injection components to their normal mode of operation.

In response to the July 7, 1981 request, the list from our June 23, 1980 letter, Attachment 1 to this letter, was evaluated to assess the impact of each of the listed component's response to ESF reset. Contrary to the position taken in our June 23, 1980 letter which stated that the plant could safely accommodate the return of these safety injection components to a normal mode, this evaluation revealed that some of these components responded to reset in a manner which may be undesirable.

IE01
S
1/1

Attachment 3 documents the aforementioned evaluation and recommends certain procedural modifications which will be implemented to prevent certain ESF components from assuming a normal mode of operation upon ESF reset which could possibly result in equipment damage. As can be seen in Attachment 3,

oc0981-0005a142



SEP 16 1981

procedural modifications are planned for the service water valves that supply the ESF room coolers (valves SV0825 & SV0878), the component cooling water valves to shutdown heat exchangers (valves SV0937 & SV0938), the component cooling water valves to the spray pumps' and injection pumps' seal cooling (valves SV0913 & SV0950) and containment spray header isolation valves SV3001 and SV3002.

It is the opinion of the Consumers Power Company that procedural modifications, in lieu of circuit modifications, are preferred for the following reasons:

1. The existing circuit logic for these components readily lends itself to procedural supervision and restriction regarding its operational status. For example, the closure of each of the aforementioned valves can be prevented by simply placing the control room hand switches for these valves in the open position.

2. By the time that the ESF can be reset, the operators will have had sufficient time to refer to procedures and utilize them for plant recovery.

Finally, it should be noted that Fans V-36 and V-46 should be removed from the list (Attachment 1). As can be seen in the attached schematic drawings E-271 and E-222, respectively, both fans remain in their emergency mode upon ESF reset.

Brian D. Johnson

Brian D Johnson
Senior Licensing Engineer

CC Director, Office of Nuclear Reactor Regulation
Director, Office of Inspection and Enforcement
NRC Resident Inspector-Palisades

ATTACHMENT 1

SAFETY-RELATED EQUIPMENT THAT DOES
NOT REMAIN IN THE EMERGENCY MODE
UPON ESF RESET (Page 1 of 2)

| Item # | Equipment Designation | Equipment Description | Emergency Mode |
|---|---|---|---|
| (1) | SV0878 | Service Water to ESF Cooler | Open |
| (2) | SV0342 | SI Tank Relief Valve | Close |
| (3) | E/P 2130 | Boric Acid Recirc Valve | Close |
| (4) | SV0346 | SI Tank Relief Valve | Close |
| (5) | SV0911 | Component Cooling Water From Containment | Close |
| (6) | SV0910 | Component Colling Water To Containment | Close |
| (7) | SV0938 | Component Cooling Water To Shutdown Hx | Open |
| (8) | SV0825 | Service Water to ESF Cooler | Open |
| (9) | SV1359 | Service Water to Non-Critical Items | Close |
| (10) | SV3069 | SI Tank Leakage Valve | Close |
| (11) | SV0950 | Component Cooling Water From Seal Cooling | Open |
| (12) | SV0347 | SI Tank Relief Valve | Close |
| (13) | E/P 2136 | Boric Acid Recirc Valve | Close |
| (14) | SV0338 | SI Tank Relief Valve | Close |
| (15) | SV0913 | Component Cooling to Seal Cooling | Open |
| (16) | SV0944A | Component Cooling Water To Fuel Pool Hx | Close |
| (17) | SV0873 | Service Water From Containment Coolers | Open |
| (18) | SV0861 | Service Water From Containment Coolers | Open |
| (19) | SV0944 | Component Cooling Water to Rad Waste Evaps | Close |
| (20) | SV0977B | Component Cooling Water to Rad Waste Evaps | Close |
| (21) | SV0940 | Component Cooling Water From Containment | Close |
| (22) | SV0910 | Component Cooling Water To Containmer | Close |
| (23) | SV0937 | Component Cooling Water to Shutdown Hx | Open |
| (24) | SV0864 | Service Water From Containment Coolers | Open |
| (25) | SV0913 | Component Cooling Water to Seal Cooling | Open |

| Item # | Equipment Designation | Equipment Description | Emergency Mode |
|---|---|---|---|
| (26) | SV0950 | Component Cooling Water From Seal Cooling | Open |
| (27) | SV0867 | Service Water from Containment Coolers | Open |
| (28) | SV0437A | Iodine Removal Tank Discharge Valve | Open |
| (29) | SV3001 | Containment Spray Discharge Valve | Open |
| (30) | SV0437B | Iodine Removal Tank Discharge Valve | Open |
| (31) | SV3002 | Containment Spray Discharge Valve | Open |
| (32) | SV2155 | Boric Acid Blender Outlet Valve | Close |
| (33) | V-36 | Control Room Isolation Fan | Start |
| (34) | V-46 | Air Room Purge Fan | Trip |

ATTACHMENT 2

POST-REACTOR TRIP CONDITIONS WHICH MUST BE MET IN ORDER TO RESET SAFETY INJECTION PER EMERGENCY OPERATING PROCEDURE #1 "REACTOR TRIP"

(Page 1 of 1)

1. The reactor is shut down and will remain shut down.

2. The hot and cold leg temperatures are at least 50°F subcooled.

3. The cause of the low pressure condition is known and corrected.

4. Pressurizer pressure is greater than 1700 psia and is returning to normal.

5. Pressurizer level is greater than 20% and is returning to normal.

6. $T_{AVG}$ is stable or increasing and is less than 545°F.

ATTACHMENT 3

JUSTIFICATION AND/OR REQUIRED MODIFICATION FOR ESF

EQUIPMENT WHICH DOES NOT REMAIN IN

THE EMERGENCY MODE UPON ESF RESET

| Attachment 1 Item #* | Component # | Component Description | Position Upon ESF Reset | Drawing # (Drawing Location)** |
|---|---|---|---|---|
| 8 | SV0825 | Service Water to ESF Room Coolers | Closed | M-208 (C/3) |
| 1 | SV0878 | Service Water to ESF Room Coolers | Closed | M-208 (C/3) |

Required Modification:

Although the containment spray (CS) pumps and the low pressure safety injection (LPSI) pumps may be shut down by the time the ESF signal can be reset, the high pressure safety injection (HPSI) pumps will most likely be in operation providing long-term core cooling. The operation of these pumps will significantly contribute to the heat input to the ESF room. Other heat additions to the room will occur from motor copper losses and safety injection piping carrying hot containment sump water during the recirculation phase.

According to the Consumers Power Company's October 1980 Environmental Qualification of Safety-Related Electrical Equipment report, the expected temperature for the ESF room during shutdown in 90°F. It should be noted that the basis for this temperature is the set point of the room thermostats. These thermostats are presently set to automatically start the ESF room cooler fans at a temperature between 85°F and 88°F.

Accordingly, the Consumers Power Company will modify existing operating procedures to prevent the subject valves, if required, from closing upon ESF reset. As can be seen in Drawings E-219-1 & 3, the existing circuit logic will allow procedural modification to prevent valve closure. As can be seen, resetting safety injection will not close the valves if either or both of the hand switches (eg, HS0878 A & B) are in the open position. Therefore, a procedural requirement can be added to place these hand switches (located in the control room) in the open position, if required, prior to ESF reset.

| Attachment 1 Item #* | Component # | Component Description | Position Upon ESF Reset | Drawing # (Drawing Location)** |
|---|---|---|---|---|
| 18 | SV0861 | Service Water From Containment Coolers | Closed | M-208 (C/6) |
| 24 | SV0864 | Service Water From Containment Coolers | Closed | M-208 (A/6) |
| 27 | SV0867 | Service Water From Containment Coolers | Closed | M-208 (C/8) |
| 17 | SV0873 | Service Water From Containment Coolers | Closed | M-208 (A/7) |

Justification

Requiring that Attachment 2 post-trip conditions #2, 4 and 5 are met prior to ESF reset provides reasonable assurance that no significant primary coolant system energy release to the reactor building is occuring. Therefore, when the post-trip conditions are met, it will not be necessary for the coolers to be in service to provide reactor building pressure reduction and subsequent reduction in leakage of airborne radioactivity. It is, therefore, allowable that these valves close upon ESF reset.

It should be noted that safety injection reset cannot be accomplished with a standing containment high pressure (CHP) condition in the first place. This fact alone ensures that service water to the containment coolers will not be disrupted during a condition requiring these coolers to perform their safety-related function.

| Attachment 1 Item #* | Component # | Component Description | Position Upon ESF Reset | Drawing # (Drawing Location)** |
|---|---|---|---|---|
| 9 | SV1359 | Service Water To Non-Critical Items | Open | M-213 (E/7) |

Justification:

Whenever post-trip conditions are such that the ESF signal can be reset (see Attachment 2), this valve is opened to provide service water for cooling non-critical items such as the turbine lube oil coolers, the turbine EH oil coolers and the condensate pumps cooling, among others. Table 9-1 of the FSAR shows that the capacity of the service water system (SWS) would not be exceeded in the event that the non-critical items were valved into the SWS while all of the critical items were still operating. As can be seen in the table, a total shutdown cooling flow of 15,565 gpm (critical items) and a total non-critical items flow of 6110 gpm would result in a total SWS flow of 21,675 gpm. Under these worst-case conditions, the SWS would not be overdutied since it is rated at 24,000 gpm (8000 gpm/pump).

In addition, there may be a need to establish the availability of the SWS to the non-critical items in a timely manner. An example would be the necessity of providing cooling water to the condensate pump in the event that this pump is needed as an alternate feed to the steam generators. Therefore, it is desirable that this valve open upon ESF reset.

| Attachment 1 Item #* | Component # | Component Description | Position Upon ESF Reset | Drawing # (Drawing Location)** |
|---|---|---|---|---|
| 6 (22) | SV0910 | Component Cooling Water To Containment | Open | M-209 (E/5) |
| 5 | SV0911 | Component Cooling Water From Containment | Open | M-209 (A/6) |
| 21 | SV0940 | Component Cooling Water From Containment | Open | M-209 (A/5) |

Justification:

Upon satisfying the required post-trip conditions (see Attachment 2) and resetting the ESF signal, it is preferred that the subject valves assume an open position. The reason for this preference is the need to establish cooling flow to the primary coolant pumps and to the control rod drive mechanisms to protect the seals.

As can be seen in FSAR Table 9-6, reopening the component cooling water (CCW) valves to and from the containment upon ESF reset will not overduty the CCW system nor starve the loads already in service. As an example of a worst-case condition, the total CCW system flow rate of 10,139 gpm for the condition of "24 hours after initiation of shutdown" can be added to the in-containment CCW loads of 534 gpm to yield a total CCW load of 10,673 gpm. The addition of the in-containment CCW loads will not overduty the CCW system since it is rated at 18,000 gpm (6,000 gpm/pump).

It should be noted that Item 22 is a duplication of Item 6 in Attachment 1.

| Attachment 1 Item #* | Component # | Component Description | Position Upon ESF Reset | Drawing # (Drawing Location)** |
|---|---|---|---|---|
| 23 | SV0937 | Component Cooling Water to Shutdown Hx | Closed | M-209 (H/3) |
| 7 | SV0938 | Component Cooling Water to Shutdown Hx | Closed | M-209 (F/3) |

Required Modification:

As described in the "Justification and Required Modifications" discussion for the CCW valves that provide seal cooling (Valves SV0913 and SV0950), the containment spray pumps may be in operation at the time of ESF reset. These pumps may be providing containment cooling by circulating containment sump water through the shutdown heat exchangers. Therefore, the CCW valves to these heat exchangers may have to remain open upon ESF reset.

Since the valves' control logic is similar to that for Valves SV0825 and SV0878, modifications to existing operating procedures will be made to ensure that, if required, these valves do not close upon ESF reset (refer to Drawings E-239-1 & 2 for Valves SV0937 and SV9038 control logic). As in the case of Valves SV0825 & SV0878, operating procedures will be modified to place the valve hand switches (located in the control room) in the open position, if required, prior to ESF reset.

| Attachment 1 Item #* | Component # | Component Description | Position Upon ESF Reset | Drawing # (Drawing Location)** |
|---|---|---|---|---|
| 15 (25) | SV0913 | Component Cooling Water To Seal Cooling | Closed | M-209 (D/3) |
| 11 (26) | SV0950 | Component Cooling Water To Seal Cooling | Closed | M-209 (C/5) |

Required Modification:

Drawing M-209 shows that the above valves, when closed, serve to isolate seal cooling flow to the LPSI, HPSI and CS pumps. Closing these valves upon meeting the post-trip conditions in Attachment 2 and resetting the ESF signal is acceptable since the CS pumps will most likely be shut down (a standing CHP condition will not allow the ESF signal to be reset in the first place) as will the LPSI pumps which receive an auto trip upon switchover from injection to recirculation. Although the HPSI pumps may still be running, FSAR, Paragraph 6.1.2.2(c) states that HPSI pumps "are designed for the thermal transient conditions of 40°F to 300°F in five seconds". FSAR figure 14.18-9 shows that the peak temperature of the liquid inside containment only reaches approximately 268°F in approximately 5 seconds and the containment sump is at least 30°F subcooled at that time. The FSAR futher states that the HPSI pump seals "are designed for operation at 300°F, but are provided with cooling to extend seal life in a similar manner to the low pressure pumps".

Since the CS pumps do not feature an auto trip signal, procedural modifications are necessary to ensure that either of the following is verified prior to ESF reset: 1) the CS pumps are shut down or 2) provisions have been made to prevent the seal cooling valves and the containment spray header isolation valves from closing upon ESF reset (refer to the "Justification and Required Modifications" discussion for Valves SV3001 and SV3002). It should be noted that for each of these valves (SV0913, SV0950, SV3001 and SV3002) procedural modifications would be implemented to prevent closure upon reset by stating that, if required, the hand switches for these valves should be placed in the open position. Schematic Drawings E-237 and E-239-2 reveal the circuit logics.

It should be noted that Items 25 and 26 are duplicates of Items 15 and 11, respectively (see Attachment 1).

| Attachment 1 Item #* | Component # | Component Description | Position Upon ESF Reset | Drawing # (Drawing Location)** |
|---|---|---|---|---|
| 14 | SV0338 | Safety Injection Tank Relief Valve | Open | M-203 (D/4) |
| 2 | SV0342 | Safety Injection Tank Relief Valve | Open | M-203 (D/7) |
| 4 | SV0346 | Safety Injection Tank Relief Valve | Open | M-203 (D/6) |

| | | | | |
|---|---|---|---|---|
| 12 | SV0347 | Safety Injection Tank Relief Valve | Open | M-203 (D/5) |
| 10 | SV3069 | Safety Injection Tank Leakage Valve | Open | M-203 (D/8) |

Justification:

Upon meeting the post-trip conditions as itemized in Attachment 2 and resetting the ESF signal, the desired action of these valves is to travel open. Opening Valves SV0338, 0342, 0346 and 0347 will provide instrument air to control Valves CV3038, 3042, 3046 and 3047, respectively. This air enables the control valves to regulate the pressure between the check valves at the outlet of the SI tanks to prevent these check valves from leaking and allowing primary coolant system pressure from reaching the tanks. Proper regulation ensures that the tanks, designed for pressures less than the primary coolant system pressure, are not over-pressurized. Proper regulation also ensures that the SI tank contents (if still available) are not diluted with primary coolant water.

It is also desired that Valve SV3069 open upon ESF reset since it serves as the common SI tank leakage path to the primary system drain tank. The proper operation of Valves CV3038, 3042, 3046 and 3047 is dependent on SV3069 opening.

| Attachment 1 Item #* | Component # | Component Description | Position Upon ESF Reset | Drawing # (Drawing Location)** |
|---|---|---|---|---|
| 3 | E/P2130 | Boric Acid Pump Recirc Valve | Open | M-202 (E/2) |
| 12 | E/P2136 | Boric Acid Pump Recirc Valve | Open | M-202 (E/3) |

Justification:

Allowing these valves to automatically open upon ESF reset is acceptable since the boric acid pumps will provide adequate flow for shutdown conditions which would prevail after the post-trip conditions (as listed in Attachment 2) are met even with the recirculation valves open. It should be noted that Drawing M-202 shows that these valves are normally open and close only upon SIS actuation.

| Attachment 1 Item #* | Component # | Component Description | Position Upon ESF Reset | Drawing # (Drawing Location)** |
|---|---|---|---|---|
| 28 | SV0437A | Iodine Removal Tank Dch Valve | Closed | M-204 (F/2) |
| 30 | SV0437B | Iodine Removal Tank Dch Valve | Closed | M-204 (F/2) |

Justification:

According to FSAR, Paragraph 6.4.2.1, the iodine removal tank is used to provide an initial pH of approximately 7 in the combined quantities of SIRW tank water, primary system water and safety injection tank water. A second tank, the iodine removal make-up tank, is available for continued pH control during the recirculation phase of the DBA. Therefore, allowing the above iodine removal tank valves to close upon ESF reset is appropriate since the iodine removal tank will have already performed its function.

| Attachment 1 Item #* | Component # | Component Description | Position Upon ESF Reset | Drawing # (Drawing Location)** |
|---|---|---|---|---|
| 29 | SV3001 | Containment Spray System Discharge Valve | Closed | M-203 (H/3) |
| 31 | SV3002 | Containment Spray System Discharge Valve | Closed | M-203 (G/3) |

Required Modification:

Allowing these valves to close upon resetting the ESF signal is acceptable since the need for containment spray at this time will most likely not be present. In fact, a standing CHP condition will not allow the ESF signal to be reset in the first place. However, to ensure that the discharge path will not be removed from the pumps for any appreciable amount of time should the pumps be running after the CHP has cleared (it should be noted that the pumps do not auto trip upon removal of the CHP signal), operating procedures will be modified as described in the "Justification and Required Modifications" discussion for Valves SV0913 and SV0950.

| Attachment 1 Item #* | Component # | Component Description | Position Upon ESF Reset | Drawing # (Drawing Location)** |
|---|---|---|---|---|
| 32 | SV2155 | CVCS Make-up Valve | Open | M-202 (D/6) |

Justification:

Since adjustments in boron concentration may be necessary during long-term shutdown, allowing this valve to open upon meeting the post-trip conditions of Attachment 2 and resetting the ESF signal is acceptable.

*Items are grouped according to similarity.
**Referenced drawings are attached.

# DOCUMENT/ PAGE PULLED

# ANO. 8109220561

NO. OF PAGES 13 pp.

REASON

☐ PAGE ILLEGIBLE

☐ HARD COPY FILED AT: PDR CF

OTHER _____

☐ BETTER COPY REQUESTED ON ____/____/____

☒ PAGE TOO LARGE TO FILM

☒ HARD COPY FILED AT: PDR (CF)

OTHER _____

☒ FILMED ON APERTURE CARD NO 8109220561 - 12