

Docket No. 50-346  
License No. NPF-3  
Serial No. 625  
January 5, 1981

Attachment A

I. Changes to Davis-Besse Nuclear Power Station Unit No. 1 Technical Specifications Appendix A, changes pages:

3/4	1-17	3/4	3-21	3/4	5-7
3/4	3-10	3/4	3-48	3/4	6-11
3/4	3-11	3/4	3-50	B 3/4	1-2
3/4	3-13	3/4	5-3		
3/4	3-20	3/4	5-6		

See proposed changes attached

A. Time Required to Implement

It's expected that this could be implemented within 90 days of NRC issuance.

B. Reason for Change (Facility Change Request 80-278) these changes have been proposed during discussion with NRC to address potential problems resulting from inadvertant or premature actuation of SFAS Level 5.

C. Safety Evaluation - attached.

Safety Evaluation for FCR 80-278

At present, the suction to the Emergency Core Cooling System (ECCS) pumps is automatically transferred from the Borated Water Storage Tank (BWST) to the Containment Emergency Sump on a Safety Features Actuation System (SFAS) trip of incident level 5. This occurs at a BWST level between 49.5 and 55 inches. This FCR proposes the above described automatic transfer of ECCS pumps be changed to manual.

The safety function of this transfer is to protect the ECCS pumps from cavitation for lack of proper net positive suction heads and to transfer these pump suction to the containment emergency sump during the recirculation mode of operation. The following table shows the BWST levels required by this analysis for the ECCS suction transfer to be successfully performed by a manual transfer.

Table 1

<u>Description</u>	<u>BWST Level (Inches)</u>	<u>BWST Volume (Gallons)</u>
<u>Develop Minimum Level to Transfer Suction to Containment Emergency Sump</u>		
1) Accident Analysis minimum level to start the transfer per the original analysis	36	
2) Instrument String Inaccuracy for Indication	<u>13.5</u>	
3) Lowest Indicated Level to Start Transfer	49.5	
4) Drawdown in one minute for operator action	<u>11.3</u>	
5) Lowest safe indicated reading to start operator action to transfer	60.8	
6) Set Annunciator alarm at	72	
<u>Develop Minimum Contained Volume</u>		
1) Annunciator alarm	72	
2) Alarm Dead band	<u>3</u>	
3) Highest indicated level that alarm can occur	75	
4) Instrument string inaccuracy	<u>13.5</u>	
5) Highest actual level that alarm can occur (this volume may not be available for the decay heat or containment spray pump)	88.5	95,314

6)	360,000 gallons required to be added for ECCS analysis	<u>334.3</u>	360,000
7)	Lowest indicated level for ECCS Analysis in Modes 1, 2, 3 & 4	422.8	455,314

As shown in the above table, the operator will manually transfer the ECCS suction when the safety grade level indicator in the control room indicates 72 inches of BWST level. Since the plant under the conditions existing at this point will be in an emergency situation for a minimum of 23 minutes, the station procedures will instruct the operator to be looking at the BWST level indicator and it will take him not more than one minute to initiate the manual transfer. As observed from the above calculation table, the minimum level requirements of BWST will be met even with this one minute manual action.

The operator will manually perform this transfer about 23 minutes after the initial SFAS trip that started all high pressure injection, low pressure injection and containment spray pumps at their maximum flow. The accident analysis requires 360,000 gallons to be added for ECCS analysis when in modes 1, 2, 3 & 4. As shown in the above table this condition will still be met and the attached Technical Specifications are changed accordingly.

This change to manual transfer will provide the same safety function as is performed by the present automatic transfer as discussed above. Hence, no adverse environment will be created by the change and the safety function of the ECCS will not be affected.

pp b/1-2

Tribhawan Wam  
1/2/81  
CR Domech / JMC 1/2/81

REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

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3.1.2.9 Each of the following borated water sources shall be OPERABLE:

- a. The boric acid addition system and associated heat tracing with:
  - 1. A minimum contained borated water volume in accordance with Figure 3.1-1,
  - 2. Between 7875 and 13,125 ppm of boron, and
  - 3. A minimum solution temperature of 105°F.
- b. The borated water storage tank (BWST) with:
  - 1. A contained borated water volume of between ~~334,650~~<sup>455,314</sup> and 550,000 gallons,
  - 2. Between 1800 and 2200 ppm of boron, and
  - 3. A minimum solution temperature of 35°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

- a. With the boric acid addition system inoperable, restore the storage system to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to 1%  $\Delta k/k$  at 200°F within the next 6 hours; restore the boric acid addition system to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.
- b. With the borated water storage tank inoperable, restore the tank to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

TABLE 3.3-3

## SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF UNITS	UNITS TO TRIP	MINIMUM UNITS OPERABLE	APPLICABLE MODES	ACTION
1. INSTRUMENT STRINGS					
a. Containment Radiation - High	4	2	3	All MODES	9#
b. Containment Pressure - High	4	2	3	1, 2, 3	9#
c. Containment Pressure - High-High	4	2	3	1, 2, 3	9#
d. RCS Pressure - Low	4	2	3	1, 2, 3*	9#
e. RCS Pressure - Low-Low	4	2	3	1, 2, 3**	9#
f. BWST Level - Low	4	2	3	1, 2, 3	9#
2. OUTPUT LOGIC					
a. Incident Level #1: Containment Isolation	2	1	2	All MODES	10
b. Incident Level #2: High Pressure Injection and Starting Diesel Generators	2	1	2	1, 2, 3, 4	10
c. Incident Level #3: Low Pressure Injection	2	1	2	1, 2, 3, 4	10
d. Incident Level #4: Containment Spray	2	1	2	1, 2, 3, 4	10
e. Incident Level #5: Containment Sump Recirculation	2	1	2	1, 2, 3, 4	10

DELETE

DELETE

TABLE 3.3-3

SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF UNITS</u>	<u>UNITS TO TRIP</u>	<u>MINIMUM UNITS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
3. MANUAL ACTUATION					
a. SFAS (except Containment Spray) and Emergency Sump Recirculation) <b>DELETE</b>	2	2	2	ALL MODES	11
b. Containment Spray	2	2	2	1, 2, 3, 4	11
4. SEQUENCE LOGIC CHANNELS	4	2***	4	1, 2, 3, 4	9#
5. INTERLOCK CHANNELS					
a. Decay Heat Isolation Valve	1	1	1	1, 2, 3, 4, 5	12#
b. Pressurizer Heaters	2	2	2	3,4,5	13#

DAVIS-BESSE, UNIT 1

3/4 3-11

Amendment No. 28

DAVIS-BESSE, UNIT 1

3/4 3-13

Amendment No. 7, 28

TABLE 3.3-4

SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
<b>INSTRUMENT STRINGS</b>		
a. Containment Radiation	< 2 x Background at RATED THERMAL POWER	< 2 x Background at RATED THERMAL POWER
b. Containment Pressure - High	≤ 18.4 psia	≤ 18.52 psia <sup>#</sup>
c. Containment Pressure - High-High	≤ 38.4 psia	≤ 38.52 psia <sup>#</sup>
d. RCS Pressure - Low	≥ 1620.75 psig	≥ 1615.75 psig <sup>#</sup>
e. RCS Pressure - Low-Low	≥ 420.75 psig	≥ 415.75 psig <sup>#</sup>
f. BWST Level	≥ 49.5 and ≤ 55.0 in. H <sub>2</sub> O	≥ 48.3 and ≤ 56.7 in. H <sub>2</sub> O <sup>#</sup>
<b>SEQUENCE LOGIC CHANNELS</b>		
a. Essential Bus Feeder Breaker Trip (90%)	≥ 3744 volts for 7 ± 1.5 sec	≥ 3558 volts for 7 ± 1.5 sec <sup>#</sup>
b. Diesel Generator Start, Load Shed on Essential Bus (59%)	≥ 2071 and ≤ 2450 volts for 0.5 ± 0.1 sec	≥ 2071 and ≤ 2450 volts for 0.5 ± 0.1 sec <sup>#</sup>
<b>INTERLOCK CHANNELS</b>		
a. Decay Heat Isolation Valve and Pressurizer Heater	< 438 psig	< 443 psig <sup>#*</sup>

DELETE

<sup>#</sup> Allowable Value for CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION.  
<sup>\*</sup> Referenced to the centerline of DU11 and DU12

TABLE 3.3-5 (Continued)

SAFETY FEATURES SYSTEM RESPONSE TIMES

<u>INITIATING SIGNAL AND FUNCTION</u>	<u>RESPONSE TIME IN SECONDS</u>
6. Containment Radiation - High	
a. Emergency Vent Fans	≤ 25*
b. HV & AC Isolation Valves	
1. ECCS Room	< 75*
2. Emergency Ventilation	< 75*
3. Containment Air Sample	< 30*
4. Containment Purge	< 15*
5. Penetration Room Purge	< 75*
c. Control Room HV & AC Units	≤ 10*
7. Borated Water Storage Tank-Low	
a. Containment Sump Suction Valves	≤ 90*
b. BWST Outlet Valves	≤ 90*

TABLE NOTATION

- \* Diesel generator starting and sequence loading delays included when applicable. Response time limit includes movement of valves and attainment of pump or blower discharge pressure.

DELETE



TABLE 4.3-2

SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
<b>1. INSTRUMENT STRINGS</b>				
a. Containment Radiation - High	S	R	M	ALL MODES
b. Containment Pressure - High	S	R	M(2)	1, 2, 3
c. Containment Pressure - High-High	S	R	M(2)	1, 2, 3
d. RCS Pressure - Low	S	R	M	1, 2, 3
e. RCS Pressure - Low-Low	S	R	M	1, 2, 3
f. BWST Level - Low	S	R	M	1, 2, 3
<b>2. LOGIC</b>				
a. Incident Level #1: Containment Isolation	S	R	M	ALL MODES
b. Incident Level #2: High Pressure Injection and Starting Diesel Generators	S	R	M	1, 2, 3, 4
c. Incident Level #3: Low Pressure Injection	S	R	M	1, 2, 3, 4
d. Incident Level #4: Containment Spray	S	R	M	1, 2, 3, 4
e. Incident Level #5: Containment Sump Recirculation	S	R	M	1, 2, 3, 4
<b>3. MANUAL ACTUATION</b>				
a. SFAS (Except Containment Spray) and Emergency Sump Recirculation	NA	NA	M(1)	ALL MODES
b. Containment Spray	NA	NA	M(1)	1, 2, 3
<b>4. SEQUENCE LOGIC CHANNELS</b>				
	S	NA	M	1, 2, 3, 4

DELETE

DELETE

DELETE

DAVIS-BESSE, UNIT 1

3/4 3-48

TABLE 3.3-10 (Continued)

POST-ACCIDENT MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>
15. Low Pressure Injection (DHR) Flow	1/Channel
16. HPI System Pump and Valve Status	1/System
17. LPI System Pump and Valve Status	1/System
18. Containment Spray Pump and Valve Status	1/System
19. Core Flood Valve Status	1/System
20. BWST Valve Status	1/System
21. Containment Emergency Sump Valve Status	1/Valve
22. Containment Air Recirculation Fan Status	1/Fan
23. Containment Air Cooling Fan Status	1/Fan
24. EVS Fan and Damper Status	1/System
25. BWST Level	2

Note: This page is also affected  
 by Toledo Edison Co.  
 Submittal to the NRC,  
 sl. No. 650, dated 9/16/80.  
 Refer to the submittal

TABLE 4.3-10 (Continued)

POST-ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

DAVIS BESSE, UNIT 1

3/4 3-50

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>
15. Low Pressure Injection (DHR) Flow	M	R
16. HPI System Pump and Valve Status	M	NA
17. LPI System Pump and Valve Status	M	NA
18. Containment Spray Pump and Valve Status	M	NA
19. Core Flood Valve Status	M	NA
20. BWST Valve Status	M	NA
21. Containment Emergency Sump Valve Status	M	NA
22. Containment Air Recirculation Fan Status	M	NA
23. Containment Air Cooling Fan Status	M	NA
24. EVS Fan and Damper Status	M	NA
<b>25. BWST LEVEL</b>	<b>S</b>	<b>R</b>

1

EMERGENCY CORE COOLING SYSTEMS

ECCS SUBSYSTEMS -  $T_{avg} > 280^{\circ}\text{F}$

LIMITING CONDITION FOR OPERATION

3.5.2 Two independent ECCS subsystems shall be OPERABLE with each subsystem comprised of:

- a. One OPERABLE high pressure injection (HPI) pump,
- b. One OPERABLE low pressure injection (LPI) pump,
- c. One OPERABLE decay heat cooler, and
- d. An OPERABLE flow path capable of taking suction from the borated water storage tank (BWST) on a safety injection signal and ~~automatically~~ manually transferring suction to the containment sump ~~and a borated water storage tank low level signal during the recirculation phase of operation.~~

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

- a. With one ECCS subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours or be in HOT SHUTDOWN within the next 12 hours.
- b. In the event the ECCS is actuated and injects water into the Reactor Coolant System, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days describing the circumstances of the actuation and the total accumulated actuation cycles to date.

SURVEILLANCE REQUIREMENTS

4.5.2 Each ECCS subsystem shall be demonstrated OPERABLE:

- a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position.

Note: This page is also affected by  
Toledo Edison Co Submittal to the  
NRC, sl. NR 669, dated 12/26/80.  
Refer to The submittal. (TECO Ref.  
FCR 77-391 Rev. A)

## EMERGENCY CORE COOLING SYSTEMS

ECCS SUBSYSTEMS -  $T_{avg} < 280^{\circ}\text{F}$

### LIMITING CONDITION FOR OPERATION

3.5.3 As a minimum, one ECCS subsystem comprised of the following shall be OPERABLE:

- a. One OPERABLE high pressure injection (HPI) pump,
- b. One OPERABLE low pressure injection (LPI) pump,
- c. One OPERABLE decay heat cooler, and
- d. An OPERABLE flow path capable of taking suction from the borated water storage tank (BWST) and <sup>manually</sup> transferring suction to the containment emergency sump during the recirculation phase of operation.

APPLICABILITY: MODE 4.

### ACTION:

- a. With no ECCS subsystem OPERABLE because of the inoperability of either the HPI pump or the flow path from the borated water storage tank, restore at least one ECCS subsystem to OPERABLE status within one hour or be in COLD SHUTDOWN within the next 20 hours.
- b. With no ECCS subsystem OPERABLE because of the inoperability of either the decay heat cooler or LPI pump, restore at least one ECCS subsystem to OPERABLE status or maintain the Reactor Coolant System  $T_{avg}$  less than  $280^{\circ}\text{F}$  by use of alternate heat removal methods.
- c. In the event the ECCS is actuated and injects water into the reactor coolant system, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days describing the circumstances of the actuation and the total accumulated actuation cycles to date.

### SURVEILLANCE REQUIREMENTS

4.5.3 The ECCS subsystems shall be demonstrated OPERABLE per the applicable Surveillance Requirements of 4.5.2.

EMERGENCY CORE COOLING SYSTEMS

BORATED WATER STORAGE TANK

LIMITING CONDITION FOR OPERATION

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3.5.4 The borated water storage tank (BWST) shall be OPERABLE with:

- a. A contained borated water volume of between ~~434,650~~<sup>455,314</sup> and 550,000 gallons,
- b. Between 1800 and 2200 ppm of boron, and
- c. A minimum water temperature of 35°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the borated water storage tank inoperable, restore the tank to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

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4.5.4 The BWST shall be demonstrated OPERABLE:

- a. At least once per 7 days by:
  - 1. Verifying the contained borated water volume in the tank,
  - 2. Verifying the boron concentration of the water.
- b. At least once per 24 hours by verifying the water temperature when outside air temperature <35°F.

CONTAINMENT SYSTEMS

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

CONTAINMENT SPRAY SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.1 Two independent containment spray systems shall be OPERABLE with each spray system capable of taking suction from the CWST on a containment spray actuation signal and ~~automatically~~ *manually* transferring suction to the containment emergency sump ~~on a berated water storage tank low level signal~~ *during the recirculation phase of operation.*

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one containment spray system inoperable, restore the inoperable spray system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours; restore the inoperable spray system to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the next 30 hours.

SURVEILLANCE REQUIREMENTS

- 4.6.2.1 Each containment spray system shall be demonstrated OPERABLE:
- a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position.
  - b. At least once per 18 months, during shutdown, by:
    1. Verifying that each automatic valve in the flow path actuates to its correct position on a containment spray test signal.
    2. Verifying that each spray pump starts automatically on a SFAS test signal.

## REACTIVITY CONTROL SYSTEMS

### BASES

#### 3/4.1.4 MINIMUM TEMPERATURE FOR CRITICALITY

This specification ensures that the reactor will not be made critical with the Reactor Coolant System average temperature less than 525°F. This limitation is required to ensure 1) the moderator temperature coefficient is within its analyzed temperature range, 2) the protective instrumentation is within its normal operating range, 3) the pressurizer is capable of being in an OPERABLE status with a steam bubble, and 4) the reactor pressure vessel is above its minimum RT<sub>NDT</sub> temperature.

#### 2/4.1.2 BORATION SYSTEMS

The boron injection system ensures that negative reactivity control is available during each mode of facility operation. The components required to perform this function include 1) borated water sources, 2) makeup or DHR pumps, 3) separate flow paths, 4) boric acid pumps, 5) associated heat tracing systems, and 6) an emergency power supply from OPERABLE emergency busses.

With the RCS average temperature above 200°F, a minimum of two separate and redundant boron injection systems are provided to ensure single functional capability in the event an assumed failure renders one of the systems inoperable. Allowable out-of-service periods ensure that minor component repair or corrective action may be completed without undue risk to overall facility safety from injection system failures during the repair period.

The boration capability of either system is sufficient to provide a SHUTDOWN MARGIN from all operating conditions of 1.0%  $\Delta k/k$  after xenon decay and cooldown to 200°F. The maximum boration capability requirement occurs from full power equilibrium xenon conditions and requires the equivalent of either 7373 gallons of 8742 ppm borated water from the boric acid storage tanks or 52,726 gallons of 1800 ppm borated water from the borated water storage tank.

The requirements for a minimum contained volume of ~~434,650~~<sup>455,314</sup> gallons of borated water in the borated water storage tank ensures the capability for borating the RCS to the desired level. The specified quantity of borated water is consistent with the ECCS requirements of Specification 3.5.4. Therefore, the larger volume of borated water is specified.

With the RCS temperature below 200°F, one injection system is acceptable without single failure consideration on the basis of the



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Attachment B

Proposed Procedure  
Modification

AP 3005.56  
EP 1202.06  
SP 1104.04