



FENOC
Davis-Besse Power Station
Transmittal Report

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One White Flint North

11555 Rockville Pike

Rockville, Maryland 20852-2738

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AX45
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Davis-Besse Nuclear Power Station

PROCEDURE

RA-EP-02880

INTERNAL FLOODING

REVISION 04

Prepared by: Ron Tyrie

Procedure Owner: Superintendent - Nuclear Operations

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LEVEL OF USE:

STEP-BY-STEP

INTERNAL FLOODING

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1.0 PURPOSE

This procedure provides guidance for actions to be taken for internal flooding incidents.

2.0 REFERENCES

2.1 Developmental

- 2.1.1 Assessment of the Internal Flood Hazard for the Davis-Besse Nuclear Power Station, SAROS, September 1989.
- 2.1.2 INPO SOER 85-5, Internal Flooding of Power Plant Buildings, December 30, 1985.
- 2.1.3 ECP 13-0195, Emergency Feedwater Facility
- 2.1.4 ECP 13-0196, Emergency Feedwater System

2.2 Implementation

- 2.2.1 RA-EP-01500, Emergency Classification
- 2.2.2 RA-EP-02720, Recovery Organization
- 2.2.3 NOP-SS-3300, FirstEnergy Enterprise Records Management Program
- 2.2.4 NORM-LP-7202, Davis-Besse Specifications for FLEX Equipment Out of Service

3.0 DEFINITIONS

- 3.1 INTERNAL FLOODING - Flooding that occurs from breaches of water systems that are located inside plant buildings and are connected to large water sources such as Intake Forebay or tanks.

4.0 RESPONSIBILITIES

- 4.1 The Shift Manager shall implement this procedure in the event of internal flooding that constitutes a threat to:
 - Personnel Safety
 - Safe Shutdown capability
 - Power production capability
 - Diverse And Flexible Coping Strategies capability (FLEX / EFW)

5.0 INITIATING CONDITIONS

This procedure shall be implemented upon Control Room identification of internal flooding incidents that exceed the existing Station Drainage System's removal capability AND constitutes a threat to:
(1) Personnel Safety, or (2) Safe Shutdown capability, or (3) Power production capability, or
(4) Diverse And Flexible Coping Strategies capability (FLEX / EFW).

6.0 PROCEDURE

6.1 Flooding in Areas that Affect Safe Shutdown Systems

- 6.1.1 Service Water Pump Room and Adjacent Areas; GO TO ATTACHMENT 1, FLOODING AFFECTING THE SERVICE WATER PUMP ROOM.
- 6.1.2 Component Cooling Water Pump Room; GO TO ATTACHMENT 2, FLOODING AFFECTING THE CCW PUMP ROOM.
- 6.1.3 Emergency Core Cooling System room(s); GO TO ATTACHMENT 3, FLOODING AFFECTING THE ECCS ROOMS.

6.2 Flooding in Areas that Affect the Diverse and Flexible Coping Strategies

- 6.2.1 Emergency Feedwater Facility, GO TO ATTACHMENT 6, FLOODING AFFECTING THE EFWF.

6.3 Flooding in All Other areas

6.3.1 Symptoms

- High sump level alarms.
- High flow (low pressure) indications for affected systems.
- Automatic system response to high flow rates.
- High or low tank level indications.

NOTE 6.3.2

Attachment 4 contains the areas analyzed to be susceptible to internal flooding.

WARNING 6.3.2

Advise operators to use extreme caution when opening doors leading to rooms with potential internal flooding.

6.3.2 Determine the source of flooding, REFER TO ATTACHMENT 4, POTENTIAL SOURCES OF INTERNAL FLOODING.

- Monitor Control Room indications to assist in identifying the flooding source.
- Dispatch an operator to investigate the source of the problem.

NOTE 6.3.3

The desired method of isolation will vary with the leak location and rate of leakage. Drastic actions may be required.

6.3.3 Leak isolation may be performed by:

- Manual or remote isolation of affected piping.
- Shutdown of pumps

NOTE 6.4

Water to be removed after a flooding incident may be contaminated, contain oil, or other chemicals subject to legal release limitations.

6.4 Cleanup of the Affected Areas

6.4.1 IF the water to be removed is:

- Potentially contaminated
- Contains oil
- Contains other chemicals subject to legal discharge limits,

THEN notify Radiation Protection and/or Chemistry to obtain assistance in determining how to dispose of the water and determine if external notifications are required.

6.4.2 Notify Maintenance if additional resources are required to remove the water and/or clean the area.

6.4.3 Notify the appropriate maintenance group to inspect equipment that appears to have been submerged or sprayed during the incident.

6.5 Equipment restoration

6.5.1 WHEN potentially effected equipment has been inspected and released by the responsible organizations,
THEN return the equipment to service as necessary.

7.0 FINAL CONDITIONS

Use of this procedure shall be terminated when one of the following conditions are applicable:

- 7.1 The flooding condition has been corrected, cleanup is completed, and necessary equipment is restored or removed from service for corrective maintenance.

OR

- 7.2 Cleanup and restoration is being conducted as a part of RA-EP-02720, Recovery Organization.

8.0 RECORDS

- 8.1 The following quality assurance records are completed by this procedure and shall be listed on the Records List, captured and submitted to Records Management in accordance with NOP-SS-3300, FirstEnergy Enterprise Records Management Program:

8.1.1 None

- 8.2 The following non-quality assurance records are completed by this procedure and shall be listed on the Records List, captured and submitted to Records Management in accordance with NOP-SS-3300, FirstEnergy Enterprise Records Management Program:

8.2.1 None

ATTACHMENT 1: FLOODING AFFECTING THE SERVICE WATER PUMP ROOM

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1.0 Symptoms

- 1.1 High sump level alarm from:
 - 1.1.1 Diesel fire pump room
 - 1.1.2 Service water valve room 2
- 1.2 High flow (low pressure) indications for affected systems:
 - 1.2.1 Service water system
 - 1.2.2 Water treatment system
- 1.3 System's automatic response to high flow rates (low pressure):
 - 1.3.1 Fire suppression system Auto. pump start(s)
 - 1.3.2 Cooling tower makeup pump trip
 - 1.3.3 Service water isolation of secondary loads

2.0 Determination of the flowing source

- 2.1 Monitor Control Room indications to assist in identifying the flooding source.
- 2.2 The following areas have the potential to flood the Service Water Pump Room.
 - 2.2.1 Room 51, Diesel fire pump room flooding sources:
 - Fire suppression piping
 - Screen wash piping
 - 2.2.2 Room 52, Service water pump room flooding sources:
 - Service water piping
 - Fire suppression piping
 - Cooling tower makeup piping

ATTACHMENT 1: FLOODING AFFECTING THE SERVICE WATER PUMP ROOM (Continued)

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2.2.3 Room 53, Service water valve room flooding sources:

- Service water piping
- Fire suppression piping
- Water treatment piping
- Cooling tower makeup piping

WARNING 2.3

Advise operators to use extreme caution when opening doors leading to rooms with potential internal flooding.

2.3 Dispatch an operator to investigate the source of the problem.

3.0 Isolation of the flooding sourceNOTE 3.1

The desired method of isolation will vary with the leak location and rate of leakage. Drastic actions may be required.

3.1 Leak isolation may be performed by:

- Manual or remote isolation of affected piping
- Shutdown of pumps

3.2 Non-isolable flooding may occur in the service water valve room. A break in the service water return line piping may result in back leakage from the forebay or intake structure.

ATTACHMENT 1: FLOODING AFFECTING THE SERVICE WATER PUMP ROOM (Continued)

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NOTE 3.3

For the maximum postulated flood it will take approximately 20 minutes to reach the level at which drain plugging is not feasible.

- 3.3 WHEN the flooding is in the service water valve room,
THEN plug the floor drains in the service water pump room and the diesel fire pump room. REFER TO Attachment 5, Pipe Tunnel Drain Arrangement.
- 3.4 REFER TO RA-EP-01500, Emergency Classification, to determine any required Emergency Action Levels.
- 3.5 For plant restoration GO TO Step 6.3.

ATTACHMENT 2: FLOODING AFFECTING THE CCW PUMP ROOM

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1.0 Symptoms

- 1.1 High/low tank level alarm from:
 - 1.1.1 Miscellaneous Waste Drain Tank (high)
 - 1.1.2 CCW surge tank (low)
- 1.2 High flow (low pressure) indications for affected systems:
 - 1.2.1 Service Water system
 - 1.2.2 Component Cooling Water system
- 1.3 System's automatic response to high flow rates (low pressure):
 - 1.3.1 Fire suppression system Auto pump start(s)
 - 1.3.2 Service water isolation of secondary loads
- 1.4 Automatic header isolation due to lowering CCW surge tank level.

2.0 Determination of the flooding source

- 2.1 Monitor Control Room indications to assist in identifying the flooding source.

NOTE 2.2

The CCW System has detectable activity, RP assistance may be required.

- 2.2 The following systems have the potential to flood the CCW Pump Room:

- Component Cooling Water system
- Fire Protection system
- Service Water system

ATTACHMENT 2: FLOODING AFFECTING THE CCW PUMP ROOM (Continued)

Page 2 of 2

WARNING 2.3

Advise operators to use extreme caution when opening doors leading to rooms with potential internal flooding.

2.3 Dispatch an operator to investigate the source of the problem.

3.0 Isolation of the flooding source

NOTE 3.1

The desired method of isolation will vary with the leak location and rate of leakage. Drastic actions may be required.

3.1 Leak isolation may be performed by:

- Manual or remote isolation of affected piping
- Shutdown of pumps

3.2 REFER TO RA-EP-01500, Emergency Classification, to determine any required Emergency Action Levels.

3.3 For plant restoration GO TO Step 6.3.

ATTACHMENT 3: FLOODING AFFECTING THE ECCS ROOMS

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1.0 Symptoms

- 1.1 High sump level alarm from:
 - 1.1.1 ECCS room 1
 - 1.1.2 ECCS room 2
 - 1.1.3 Decay Heat Cooler pit.
- 1.2 High/low tank level alarm from:
 - 1.2.1 Miscellaneous Waste Drain Tank (high)
 - 1.2.2 CCW surge tank (low)
 - 1.2.3 BWST (low)
 - 1.2.4 Low makeup tank level and automatic alignment of the makeup pump suction to the BWST.
- 1.3 High flow (low pressure) indications for affected systems:
 - 1.3.1 Service water system
 - 1.3.2 Control room alarm on high makeup system pump flow depending on pipe rupture location.
- 1.4 System's automatic response to high flow rates (low pressure):
 - 1.4.1 Fire suppression system Auto pump start(s)
 - 1.4.2 Service water isolation of secondary loads.
- 1.5 Automatic non-essential header isolation due to lowering CCW surge tank level.
- 1.6 Low flow (low pressure) indications for affected systems:
 - 1.6.1 Control room alarm on low makeup system pump flow depending on pipe rupture location.
 - 1.6.2 Control room alarm on RCP low seal water flow.

ATTACHMENT 3: FLOODING AFFECTING THE ECCS ROOMS (Continued)

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2.0 Determination of the flowing source

2.1 Monitor Control Room indications to assist in identifying the flooding source.

NOTE 2.2

Contamination is likely in these rooms, RP assistance will be required.

2.2 The following systems have the potential to flood the ECCS Pump Room:

- Borated Water Storage Tank system
- Component Cooling Water system
- Fire Protection system
- Service Water system
- Makeup system
- Emergency Feedwater

WARNING 2.3

Advise operators to use extreme caution when opening doors leading to rooms with potential internal flooding.

2.3 Dispatch an operator to investigate the source of the problem.

3.0 Isolation of the flooding sourceNOTE 3.1

The desired method of isolation will vary with the leak location and rate of leakage. Drastic actions may be required.

3.1 Leak isolation may be performed by:

- Manual or remote isolation of affected piping.
- Shutdown of pumps

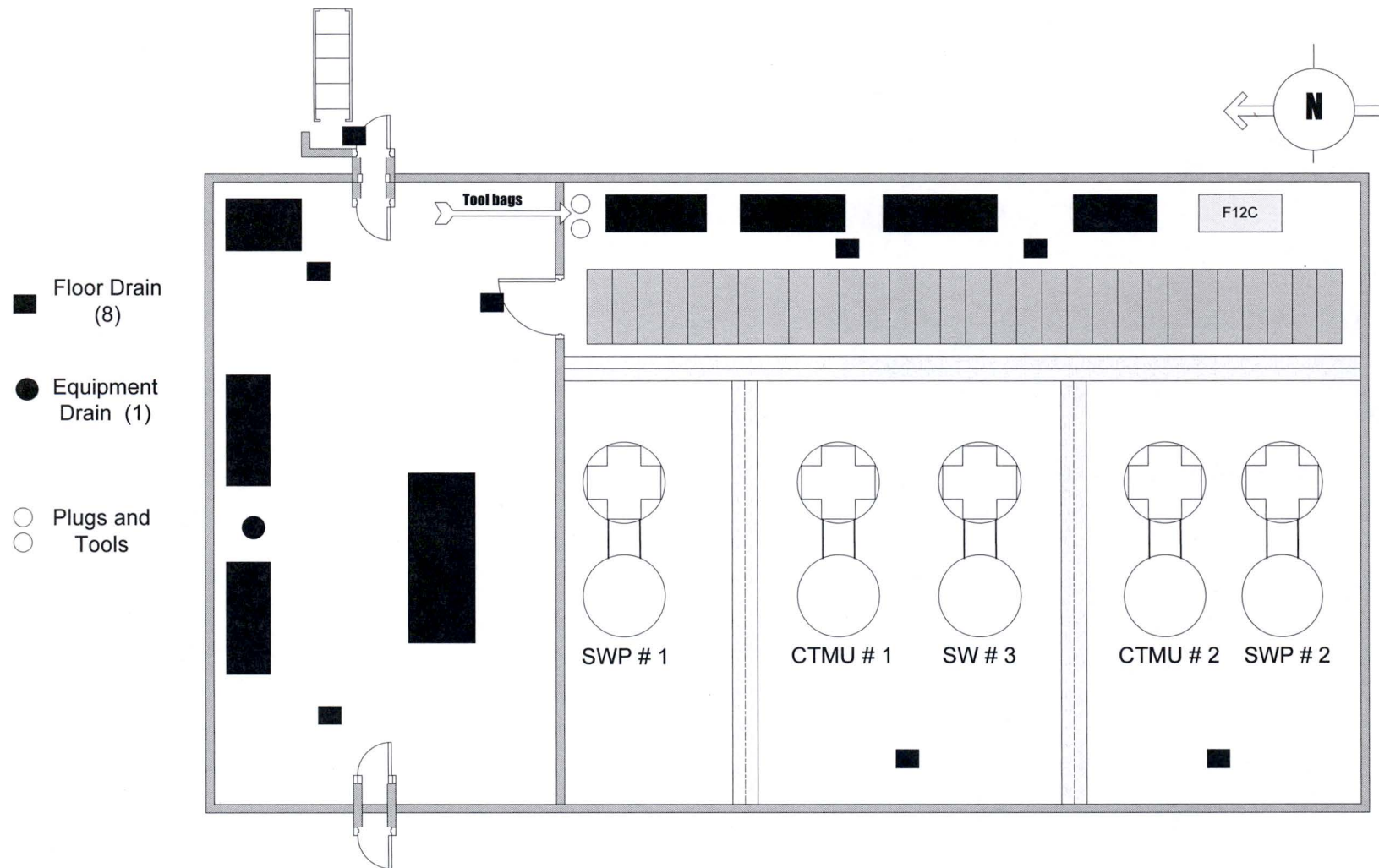
3.2 REFER TO RA-EP-01500, Emergency Classification, to determine any required Emergency Action Levels.3.3 For plant restoration GO TO Step 6.3

ATTACHMENT 4: POTENTIAL SOURCES OF INTERNAL FLOODING

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ROOM #	ROOM NAMES	SW	SCRN WASH	FP	BWST	MFW & COND	DW	MN STM	MAKEUP	CCW	DH	CW	EF
50	Screen Pump Room	X	X	X									
101	Pipe Tunnel				X								
202	Pipe Way Area												X
208	Mechanical Penetration Room No. 1			X		X							X
209	Corridor to Mechanical Penetration Room No. 1			X			X	X	X				
225	Make-up Pump Room								X	X			
227	Passage to Mechanical Penetration Room No. 2			X									
236	Mechanical Penetration Room No. 2			X							X		
237	Auxiliary Feed Pump Room No. 1					X				X			
238	Auxiliary Feed Pump Room No. 2					X				X			
240	Boric Acid Addition Tanks Room									X			
252	Main Feedwater Pumps Room (West Condenser Pit)					X							
253	Condensate Pumps Pit					X							
260	Circ Water Pump House Substructure Area											X	
EFWF	EFW Pump Room			X									X
303	Mechanical Penetration Room No. 3			X		X							X
304	Corridor to Mechanical Penetration Room No. 3			X		X				X			
312	Spent Fuel Pool Pump Room			X									
314	Mechanical Penetration Room No. 4	X		X		X				X			
318	Emergency Diesel Generator Room No. 1			X			X			X			
319	Emergency Diesel Generator Room No. 2			X			X			X			

ATTACHMENT 5: PIPE TUNNEL DRAINS ARRANGEMENT
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ATTACHMENT 6: FLOODING AFFECTING THE EFWF
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1.0 Symptoms

1.1 "EFW SYSTEM TRBL" 10-6-G

- Low EWST Level – T89
- EFWF Sump Level Alarm

1.2 High/low tank level alarm from:

1.2.1 T89 EWST ("EFW SYSTEM TRBL" 10-6-G)

1.3 System's automatic response to high flow rates (low pressure):

1.4.1 Fire suppression system Auto pump start(s)

1.4 Low flow (low pressure) indications with EFW system in operation could be indicative of a pipe break.

2.0 Determination of the flowing source

2.1 Monitor T89 EWST level indications to assist in identifying the flooding source.

NOTE 2.2

NORM-LP-7202 lists required notifications when FLEX or EFW equipment is unavailable to perform its required functions.

2.2 The following systems have the potential to flood the EFW Facility:

- Emergency Feedwater system
- Fire Protection system

ATTACHMENT 6: FLOODING AFFECTING THE EFWF
Page 2 of 2

WARNING 2.3

Advise operators to use extreme caution when opening doors leading to rooms with potential internal flooding.

2.3 Dispatch an operator to investigate the source of the problem.

3.0 Isolation of the flooding source

NOTE 3.1

The desired method of isolation will vary with the leak location and rate of leakage. Drastic actions may be required.

3.1 Leak isolation may be performed by:

- Manual or remote isolation of affected piping.
- Shutdown of pumps

3.2 REFER TO RA-EP-01500, Emergency Classification, to determine any required Emergency Action Levels.

3.3. WHEN the leak is isolated,
THEN review required specifications for any affected FLEX Program Equipment,
AND EFW System Equipment. REFER TO NORM-LP-7202, Davis-Besse Specifications for
FLEX Equipment Out of Service.

3.4 For plant restoration GO TO Step 6.3.