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Davis-Besse Nuclear Power Station

EMERGENCY PLAN OFF NORMAL OCCURRENCE PROCEDURE

RA-EP-02820

EARTHQUAKE

REVISION 05

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Procedure Owner: Manager – Regulatory Affairs

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X Safety Related

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TABLE OF CONTENTS

Page

1.0 PURPOSE 3

2.0 REFERENCES 3

3.0 DEFINITIONS 4

4.0 RESPONSIBILITIES 4

5.0 INITIATING CONDITIONS 4

6.0 PROCEDURE 5

6.1 Immediate Operator Actions 5

6.2 Supplementary Actions 5

7.0 FINAL CONDITIONS 9

8.0 RECORDS 10

COMMITMENTS 11

1.0 PURPOSE

This procedure describes the actions to be taken in the event of a seismic event.

2.0 REFERENCES

2.1 Developmental

2.1.1 10 CFR 100, Appendix A, Seismic and Geologic Siting Criteria for Nuclear Power Plants

2.1.2 Davis-Besse Nuclear Power Station Emergency Plan

2.1.3 USAR 2.5, Geology and Seismology

2.1.4 USAR 3.7.4.3, Accelerograph Readout Procedure

2.1.5 USAR 9.2.1.2 and 9.2.5.1, Loss of Ultimate Heat Sink

2.1.6 Technical Specifications

2.2 Implementation

2.2.1 DB-OP-00002, Operations Section Event/Incident Notifications and Actions

2.2.2 DB-OP-02504, Rapid Shutdown

2.2.3 DB-OP-02511, Loss of Service Water Pumps/System

2.2.4 DB-OP-02550, Dry Fuel Storage Abnormal Event

2.2.5 DB-OP-06012, Decay Heat & Low Pressure Injection System Operating Procedure

2.2.6 DB-OP-06233, Auxiliary Feedwater System

2.2.7 DB-OP-06414, Seismic Monitoring System

2.2.8 DB-SC-03070, Emergency Diesel Generator 1 Monthly Test

2.2.9 DB-SC-03071, Emergency Diesel Generator 2 Monthly Test

2.2.10 DB-SC-03272, Control Rod Exercising Test

2.2.11 DB-SP-03356, RCP Seal Leakage (Monthly)

2.2.12 RA-EP-01500, Emergency Classification

3.0 DEFINITIONS

3.1 SAFE SHUTDOWN EARTHQUAKE (SSE) - The SSE as defined in 10 CFR 100, Appendix A, is that earthquake which is based upon an evaluation of the maximum earthquake potential considering the regional and local geology and seismology and specific characteristics of local subsurface material. It is that earthquake which produces the maximum vibratory ground motion for which certain structures, systems, and components are designed to remain functional. These structures, systems, and components are those necessary to assure:

3.1.1 The integrity of the reactor coolant pressure boundary

3.1.2 The capability to shut down the reactor and maintain it in safe shutdown condition, OR

3.1.3 The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures.

3.2 OPERATING BASIS EARTHQUAKE (OBE) - The OBE as defined in 10 CFR 100, Appendix A, is that earthquake which, considering the regional and local geology and seismology and specific characteristics of local subsurface material, could reasonably be expected to affect the plant site during the operating life of the plant; it is that earthquake which produces the vibratory ground motion for which those features of the nuclear power plant necessary for continued operation without undue risk to the health and safety of the public are designed to remain functional.

4.0 RESPONSIBILITIES

The Shift Manager shall be responsible for directing the operating shift in the utilization of this procedure.

5.0 INITIATING CONDITIONS

The following conditions shall initiate the use of this procedure:

5.1 The Strong Motion Recording System and Seismic Monitoring Equipment are actuated and record a seismic disturbance.

5.2 As directed by Station management.

6.0 PROCEDURE

6.1 Immediate Operator Actions

6.1.1 The Shift Manager shall:

a. Order all fuel handling operations suspended.

b. IF fuel is being supported from a crane or a bridge,
THEN order that it be lowered into a safe storage location.

c. IF the Spent Fuel Pool Demineralizer and/or filters are in service for the Decay Heat System (DH) or the recirculation of the Borated Water Storage Tank (BWST),
THEN verify the following valves are closed:

BWST	DH
BW 16	DH 28
SF 98	DH 29
	DH 70

d. Evaluate control position, reactor power, and other pertinent variables to verify that no change has occurred in core reactivity.

6.2 Supplementary Actions

6.2.1 The Control Room Operators shall:

a. Monitor the control panels to determine the effect of the earthquake, if any, on instrumentation, controls or station operations.

b. Notify the Shift Manager of any abnormal indications.

c. Verify that there is no abnormal sump pump operation and that tank levels are stable.

d. Verify the operability of systems or components not running at the time of the earthquake before relying upon them.

e. IF the unit has been shutdown by automatic protection systems,
THEN place the unit in a safe shutdown condition.

6.2.2 The Shift Manager shall:

NOTE 6.2.2.a

A plant shutdown following an earthquake shall proceed slowly enough to allow evaluation of the operation of systems used to support the plant shutdown.

a. IF a valid OBE or SSE Alarm is received, AND ground motion is felt THEN, conduct a carefully controlled shutdown of the unit.

b. Utilize RA-EP-01500, Emergency Classification, to determine the proper emergency classification and take actions accordingly.

c. Analyze the magnitude of the earthquake utilizing DB-OP-06414, Seismic Monitoring System. Assistance in analyzing the graphic record of the event may be required from the Engineering Department, or from other knowledgeable personnel responding to the Emergency Plan activation.

d. Order an inspection of the station looking for:

- leaking fluids
- deformed structures, particularly those spanning seismic joints
- broken gauge glasses
- any physical damage.

Particular attention shall be directed to the following systems:

1. Emergency Core Cooling Systems, including the Borated Water Storage Tank

2. Nuclear Steam Supply System

3. Auxiliary Feedwater

4. Component Cooling Water

5. Service Water

   REFER TO DB-OP-02511, Loss of Service Water Pumps/ System; Service Water Non-Seismic Line Rupture section

6. Makeup and Purification Systems

7. Boric Acid Storage Tanks and associated piping

8. Radwaste Systems

9. Spent Fuel Pool and Spent Fuel Pool Cooling System

10. New Fuel Storage

11. Containment Integrity

12. Intake Canal and Intake Forebay

13. Dry Fuel Storage

REFER TO DB-OP-02550, Dry Fuel Storage Abnormal Events

e. Verify the Aux Feed Pump turbines casing drains and drip leg drains have not been blocked by the Seismic Event.
IF the Aux Feed Pump turbines casing drains and drip leg drains can not be verified clear,
THEN perform either of the following two steps within two hours after receiving the seismic alarm:

1. Start the Aux Feed Pump Turbines in accordance with DB-OP-06233, Aux Feedwater System.

2. Drain the Aux Feed Pump turbine case drains and drip legs every two hours.

f. IF the seismic event results in loss of the supply pipe from Lake Erie to the intake canal (collapse of the dike)
THEN perform the following:

1. Perform a rapid shutdown of the reactor,
REFER TO DB-OP-02504, Rapid Shutdown.

2. Close CT 840, Cooling Tower Blowdown Valve.

3. Verify service water returns are aligned to the intake forebay or the intake structure.

4. IF the dilution pump is running in the dilution mode,
THEN shutdown the dilution pump.

5. IF forebay water level decreases to 564' IGLD
THEN:

a. Trip the reactor.

b. Initiate AFW flow and isolation using HIS 6403 (AFW1 TO SG1 & ISO SG1) and HIS 6404 (AFW2 TO SG2 & ISO SG2).

c. Reduce SW loads as directed by the Shift Manager.

d. Begin a cooldown to Hot Shutdown using the Auxiliary Feedwater pumps using CST's if available.

e. Maintain cooling from AFW until directed by the Shift Manager to transfer to the Decay Heat Removal System. This decision will be based on available forebay cooling.

g. IF the seismic event results in a loss of the Spent Fuel Pool Cooling System,
THEN notify the Operations Superintendent and perform an evaluation to consider aligning a Decay Heat Removal train to provide Spent Fuel Pool Cooling.
REFER TO DB-OP-06012, Decay Heat and Low Pressure Injection System Operating Procedure.

h. Notify the Plant Manager and/or the Operations Superintendent of the results of the physical inspection of the Station.

6.2.3 Operating personnel shall perform the following tests as deemed necessary by the Shift Manager.

a. DB-SP-03356, RCP Seal Leakage (Monthly).

b. DB-SC-03272, Control Rod Exercising Test.

c. DB-SC-03070, Emergency Diesel Generator 1, Monthly Test.

d. DB-SC-03071, Emergency Diesel Generator 2, Monthly Test.

6.2.4 The Plant Manager shall:

a. Notify the on-call Vice President Nuclear of the earthquake.

b. Notify the NRC in accordance with DB-OP-00002, Operations Section Event/Incident Notifications and Actions.

c. With the assistance of the plant operating shift and staff personnel, convene the onsite review board to evaluate the reports, records, and recordings for any possible earthquake damage to equipment and structures. Determine if any of the engineered safety features have been damaged.

d. IF a seismic event inhibits the use of Lake Erie as a water source, THEN the Engineering Department shall be notified so that temporary pumping to the intake forebay can be established before the end of the 30-day stored water cooling period.

The following are potential sources of temporary pumps:

- Davis-Besse Maintenance
- Davis-Besse Fire Protection
- FirstEnergy
- Carroll Township
- Ottawa County
- Ohio National Guard

e. IF a seismic event greater than OBE has occurred, THEN conduct an unscheduled inservice inspection of the steam generators during the subsequent shutdown in accordance with Technical Specification 4.4.5.3.c.2.

f. Order an inspection of hydraulic and mechanical snubbers in accordance with Technical Specification 4.7.7.1.e.

g. Order restoration of the seismic monitoring instrumentation in accordance with the Technical Requirements Manual.

7.0 FINAL CONDITIONS

The plant is in a stable condition and it has been determined that no classifiable emergency has occurred.

8.0 RECORDS

8.1 The following quality assurance records are completed by this procedure and shall be listed on the Nuclear Records List, captured, and submitted to Nuclear Records Management in accordance with NG-NA-00106:

8.1.1 None

8.2 The following non-quality assurance records are completed by this procedure and may be captured and submitted to Nuclear Records Management, in accordance with NG-NA-00106:

8.1.2 None

COMMITMENTS

Section	Reference	Comments
6.1.1.c	Generic Letter 87-02	Insure the non-seismic SFP demineralizer system is not in use on the BWST or DH systems.
6.2.2.a	USAR Section 3.7.4.3	Station shutdown if acceleration exceeds safe shutdown limit
6.2.2.d.5	RCTS O 20570	Service water concerns in the event of an earthquake. Safety Evaluation 88-0189
6.2.2.f	USAR Section 9.2.5.1	Loss of Intake Canal
6.2.2.g	RCTS O 18969	Loss of Spent Fuel Cooling
6.2.4.d	CA 02-06087-1	Potential sources of temporary pumps.
6.2.4.e.	PCAQR 86-0519	OTSG inspection
6.2.4.g.	Tech. Spec. Verification Program	Seismic monitoring instruction