

# Davis-Besse Restart Test Plan



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# Davis-Besse Restart Test Plan

Revision 1  
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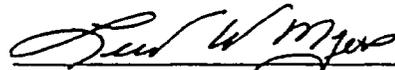
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Recommended for Approval  
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**This revision is a total rewrite therefore revision bars are not included.**

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# Summary of Revision Changes

## Revision 1

This is a total rewrite to increase the scope of this plan. The following activities have been added to the plan:

- Integrated leakage rate testing of containment
- An evaluation of testing on systems and components that may have been affected by RCS leakage and boric acid deposits
- Development of an integrated restart procedure to provide a mechanism to control restart of the plant by ensuring all applicable restart actions have been completed prior to mode ascension.

This revision also eliminates the evaluation of the RCS Leakage Management Program. This evaluation is now included in the Program Compliance Plan, therefore, the title of this plan has been changed to eliminate post restart activities.

## Executive Summary

This plan has four key elements to ensure that comprehensive testing is performed prior to and during restart, and that restart activities have been completed to ensure Davis-Besse Nuclear Power Station is in a condition to support sustained safe and reliable operation. These elements include:

- Testing the Reactor Coolant System (RCS), including components and associated piping exposed to full RCS pressure, to ensure integrity following replacement of the Reactor Vessel Head and maintenance of RCS piping and components.
- Testing the Containment by performing an Integrated Leakage Rate Test in accordance with 10CFR50, Appendix J (Type A test) to ensure the integrity of containment following restoration of the containment pressure vessel.
- Evaluating the adequacy of proposed post-maintenance and post-modification testing on systems and components affected by RCS leakage and boric acid deposits and to determine if additional testing is required.
- Develop an Integrated Restart Procedure to ensure required restart activities, tests and inspections have been performed prior to mode ascension.

The Integrated Restart Procedure shall identify the sequence of critical steps, procedures, and tests that must be performed to safely restart Davis-Besse Nuclear Power Station. This procedure shall also include the necessary administrative controls required to authorize mode changes during plant restart. In addition to the normal procedure approvals, the Integrated Restart Procedure shall be reviewed by the Engineering Assessment Board and receive concurrence from the Restart Senior Management Team. Final authority to restart the plant resides with the FENOC Chief Operating Officer.

# Charter

Perform Restart Testing necessary to ensure the integrity of the Reactor Coolant System and the Containment Pressure Vessel, and to evaluate proposed testing of systems and components affected by RCS leakage and boric acid deposits.

In addition, develop an Integrated Restart Procedure to ensure that proper sequencing of required restart activities are accomplished prior to mode ascension.

## Plan Description

### Reactor Coolant System Leakage Testing

Two separate RCS leakage tests are included in the scope of this plan. The first test will occur after initial filling and venting and the system will be pressurized. RCS temperature will remain less than 200°F during the first test. The second test will occur at the normal operating pressure of approximately 2155 psig (Mode 3). For both tests, RCS Temperature will be maintained as required by the pressure-temperature curve limits and other equipment restrictions.

Inspections will be performed on the following with the systems in their normal lineup:

- Reactor Coolant pressure boundary Class 1 piping and components.
- RCS piping and components that are subjected to RCS pressure during normal operation.
- Portions of the makeup and letdown system, instrumentation and sampling piping and components connected to the RCS that are subjected to RCS pressure during normal operation.
- Piping systems outside containment, such as normal makeup and letdown that are pressurized to RCS pressure during normal operation.

The inspections of the RCS and associated piping will be performed by VT-2 qualified personnel using approved procedures and/or inspection plans. Inspections will be performed on the external surfaces and low points of installed insulation, and un-insulated piping and components for evidence of active RCS leakage. Insulation was removed from mechanical joints and alloy 600 welds to perform containment health inspections of boric acid containing systems. This insulation will remain off of these source locations during these pressure tests.

Areas within the scope of these inspections include, but are not limited to:

- Reactor Vessel flange
- Reactor Head CRDM nozzles penetrations
- Reactor Head CRDM flanges

- Reactor Vessel Incore Detector penetrations
- Steam Generator and Pressurizer manways and hand-holes
- Reactor Coolant Pump covers
- Reactor Coolant Pump seal area
- Pressurizer Heaters
- Pressurizer Safety and Relief Valves
- Body to bonnets on RCS Valves and packing glands
- Bolted connections and flanges

The first inspection will be performed following initial RCS filling and venting. System temperature will be maintained less than 200 °F for this first inspection. Any identified leakage shall be documented on Condition Reports designated as Mode 4 restraints requiring resolution prior to performing RCS heatup to normal operating temperature and pressure.

After an evaluation of the Condition Reports and completion of required corrective actions, the RCS shall be heated as required by the pressure-temperature curve limits and pressurized to approximately 2,155 psig (Mode 3). A system leakage test will be performed per DB-PF-03010, RCS Leakage Test in accordance with ASME Section XI, Code, IWA-5000, Pressure Testing. This leakage test will be performed with the insulation installed as allowed by the code. Any identified leakage shall be documented on a Condition Report and shall require resolution prior to ascending to Mode 2. The Engineering Assessment Board and the Restart Senior Management Team shall review and concur with the evaluation and corrective actions associated with these Condition Reports prior to ascending to Mode 2. A plant cooldown and depressurization may then be performed to resolve identified deficiencies and to allow insulation to be reinstalled.

The goal is to have no observed RCS leakage. Any identified leakage shall be corrected or evaluated for impact on surrounding systems and components.

Where possible, photographs will be taken to document the "as-found" condition of any observed leakage identified, including boric acid deposits on surrounding equipment. Where evidence of active RCS leakage exists, the source of the leak and the leak path must be traced to ensure that there is no wastage of the RCS pressure boundary.

Where possible, as-left photographs will be made to document each acceptable re-inspection area identified by condition reports generated during the Containment Health Plan walkdowns.

Observed leakage that is not corrected shall be, documented and justified in a report that is presented to the Engineering Assessment Board. After review and concurrence by the Engineering Assessment Board, the Restart Senior Management Team will provide final concurrence, or may require additional repairs and leakage tests to be performed. This report will be sent to the Restart Overview Panel.

Depending on the extent and type of repairs required, additional leakage testing may be required. Following satisfactory completion of these leakage tests, insulation will be reinstalled.

### **Containment Leakage Rate Testing**

Following restoration of the temporary opening to permit movement of the replacement Reactor Pressure Vessel Head into containment, the Containment Pressure Vessel will be subjected to an integrated leakage rate test in accordance with 10CFR50, Appendix J (Type A test). (Ref. DB-PF-10310)

During this integrated leakage test, while the containment pressure vessel is pressurized, the weld associated with the closure of the temporary opening in the pressure vessel will be visually inspected in accordance with ASME Section XI, IWA-5240. A VT-2 qualified inspector will perform this inspection. (Ref. DB-PF-00204 and DB-PF-03065)

### **Evaluation of Post Maintenance and Post Modification Testing**

Propose post-maintenance and post-modification testing shall be evaluated for selected systems by identifying systems and components affected by RCS leakage and boric acid deposits. A report will be generated that assesses the overall adequacy of planned test activities on the affected systems and components. The assessment report shall be reviewed by the Engineering Assessment Board. Additional testing may be scheduled if necessary to demonstrate that systems and components are capable of performing their intended functions. Any additional required testing will be added to the integrated schedule include the required mode constraints and other system test considerations.

### **Integrated Restart Procedure**

An Integrated Restart Procedure shall be developed to control restart of the plant. This procedure shall include the identification of required tests and inspection activities necessary to ensure a safe and reliable return to service. This procedure is not intended to include routine surveillance testing.

This procedure shall include the sequencing and identification of restart activities that must be performed prior to ascension to the applicable mode. This will include restart items in the Davis-Besse Restart Database. The Integrated Restart Procedure shall include the necessary administrative hold points and management approvals required to be satisfied during plant heat-up through power operation.

In addition to the normal procedure approvals, the Integrated Restart Procedure shall be reviewed by the Engineering Assessment Board and receive concurrence from the Restart Senior Management Team.