

Braidwood Station Unit 1 Post Accident Monitoring Report

This report is being submitted for Braidwood Station Unit 1 in accordance with Technical Specifications (TS) 5.6.7, Post Accident Monitoring Report. IR 4907736 documents failure and subsequent declaration of inoperability of 1B Reactor Vessel Level Indication System (RVLIS) Sensors 6B and 7B during plant heat-up at the end of Braidwood's recently completed refueling outage (10/21/2025).

'B' Train of RVLIS was declared inoperable and TS 3.3.3 Condition B was entered at 1655 on October 21, 2025. Condition B requires the inoperable channel to be restored to operable within 30 days. Constellation Energy Generation, LLC (CEG) has determined that this channel could not be restored within 30 days, therefore TS 3.3.3 Condition B requires initiation of action in accordance with TS 5.6.7 to submit a written report within 14 days outlining the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channel to operable status.

Description of Issue:

On October 21, 2025, Braidwood Unit 1 Main Control Room received an alarm indicating an issue with the RVLIS. RVLIS Plenum indication was notably swinging. RVLIS Head Indication was at 100% and pressurizer level was indicating as expected.

Per TS Bases 3.3.3, Reactor Vessel Water Level is provided for verification and long-term surveillance of core cooling. It is also used for accident diagnosis and to determine reactor coolant inventory adequacy.

Each unit's RVLIS is made up of two channels (Train A & Train B) which contain 8 sensors each, 2 head and 6 plenum. Each sensor contains one heated and one un-heated Chromel-Alumel thermocouple. When the sensor is submerged in a fluid of good heat transfer (covered), the temperature difference (ΔT) between the two thermocouples is small. The ΔT will increase when the sensor becomes uncovered.

Preplanned Alternate Method of Monitoring

The alternative method of monitoring is utilizing the 1A RVLIS probe which offers redundant monitoring capability.

Cause of inoperability

Per TS Bases 3.3.3, a RVLIS probe is considered operable with 1 of 2 sensors active in the 'head' region and 3 of 6 sensors active in the 'plenum' region.

1B RVLIS channel was declared inoperable due to alarms and erratic indications. Sensors 6B and 7B in the plenum indicated 'NO COOL' during Mode 3 heat up at the end of the refueling outage. RVLIS plenum indication was observed to swing between 78% and 10%.

Plans for Restoration

A Work Order has been prepared for maintenance to cross-tie Sensor 6B and 7B indications to those from known-good sensors from the 1B RVLIS channel. This has previously been successfully completed for other sensors on the 1A and 2B RVLIS trains.

The station will perform a surveillance to determine operability of Reactor Vessel Water Level Instrument channels. A channel may be considered operable if one of the two sensors in the head region and three of the six sensors in the plenum region are operable. Operability of a sensor is determined by reviewing error messages in accordance with plant procedures.

Long-term plans for restoration include work to investigate and repair connectors inside the Unit 1 Containment during the next Unit 1 refueling outage.