United States Government **Department of Energy**

Bonneville Power Administration

memorandum

DATE: March 7, 2024

REPLY TO ATTN OF: TPP/OPP-3

SUBJECT: PDCI Probing and Chief Joseph Brake Test Plan for the 2024 Operating Season

TO:

Kyle Kohne – TPP/OPP3	Bill MacBean – TORD/DITT1
Margaret Albright – TOO/DITT2	Steve Felker – TORM/MEAD

1. Summary and Objectives

This is a continuation of system tests that were conducted annually in years 1999 – 2023. The tests include operations of the Chief Joseph braking resistor and injection of PDCI probing signals.

We will perform system tests during spring runoff with high hydro generation, and during late summer with lower hydro and predominant thermal generation

2. Test Dates

PDCI probing and Chief Joseph brake tests will be performed on

- June 20, 2024 with an alternate day of June 26, 2024
- September 11, 2024 with an alternate date of September 18, 2024

3. Operating Conditions Required For Tests

- Obtain Work Permit from BPA Dispatcher
- BPA will coordinate with RC West to confirm that it is acceptable to proceed with the testing, and that the OREX IROL (Oregon Export) is not exceeding its control margins.
- The power system operation is normal, and is within System Operating Limits. This will be confirmed with the Senior Dispatcher the day of the test.
- The BPA Oscillation Detection Application shows no oscillations--all PMUs and all boxes are “green”-lit
- If the BC-Alberta tie is in service, the North-South Mode A is above 9%
- If the BC-Alberta tie is out of service, the North-South Mode B is above 5%
- The Chief Joseph 500/230-kV Bank #3 transformer is in service
- The Keeler 230-kV Static Var Compensator is in service
- The Keeler 500/230-kV Bank #2 transformer is in service
- The Grand Coulee – Malin phasor angle is less than 55 degress
- PDCI power is above 1,000 MW

4. Test Precautions and Termination Procedure

If at any time the Test Observers, security coordinators or system operators identify conditions under which the tests should not continue, then the Test Director will suspend the test sequence until those conditions are no longer present, and the Test Coordinator will have Dispatch send out a message on the GMS (Grid Messaging System) to "All Reliability – Inform".

Reasons for suspending, modifying, or terminating the test sequence include but are not limited to:

- A system emergency within the Western Interconnection
- There are interconnections operating outside of normal limits (NWACI, PDCI or Northern Intertie)
- There are undamped or unacceptable levels of system oscillations
- The Celilo facility operator deems that the facility is unsafe for test, or that the test procedure is interfering with proper operation of that facility
- Test procedure is conflicting with a peak in operator workload
- A disturbance just occurred resulting in system frequency below 59.90 Hz

If a disturbance occurs during a probing test, the test will be terminated immediately.

Additional Notification Procedure
If any AVR/PSS/PDCI Controller problems are observed, notify the Transmission Operator immediately so that information can be communicated to the Generator Operator for their action.

5. Sequence of Test Events

Test Series A: Calibration Checks on PDCI Probing Signals

Step A0 [at time 19:10] Celilo instrumentation check using +20MW waveform (10 seconds) and -20 MW (10 seconds). Check proper function of PSG using Celilo/Sylmar DC metering.

Step A1 [19:15] Calibration check on MSF-1/5/2/100 for ±20 MW noise probing for a duration of one period (100 seconds). Adjust PSG scaling if needed.

Step A4 [19:20] Apply MSF-0.1/4x for ±20 MW single frequency sine wave for four cycles. (1 period)

Step A5 [19:25] Apply MSF-0.3/4x for ±20 MW single frequency sine wave for four cycles. (1 period)

Step A6 [19:30] Apply MSF-0.7/4x for ±20 MW single frequency sine wave for four cycles. (1 period)

Step A7 [19:35] Apply MSF-1.0/4x for ±20 MW single frequency sine wave for four cycles. (1 period)

Test Series C: Chief Joseph brake insertion (in the Afternoon and Evening)

Step C1 [20:15] Apply a ±20 MW MSF-1/5/2/100 for a duration of 12 periods (20 minutes).

Step C2 [20:40] Apply the Chief Joseph braking resistor

6. Test Director Responsibilities

1. The Test Director (from TOOC, Transmission Operations Control) will schedule the tests through the BPA Outage Dispatcher.
2. The Test Director will post the proposed test dates on the BPA external Web page at https://transmission.bpa.gov/Business/Operations/SystemNews/default.aspx
3. The day before each test, BPA will send a message on the GMS to "All Reliability – Inform" notifying RC West and the other TOP's in the Western Interconnection of the tests.
4. If there are concerns about abnormal system conditions, a BPA Dispatcher should be contacted as early as possible to cancel the test. The test will be resumed the next hour after the system returns to normal.
5. The probing signal will be injected by an Operator at Celilo converter station. The Operator will check with the BPA Dispatcher and Test Director before the signal injection.

A phone bridge will be available on the day of the test: 509-822-4485 or 503-230-4000, code 671-608-328#

TEST APPROVALS

This test plan submitted by:

Dmitry Kosterev – TPP
Andreas Schmitt – TPP
Elliott Mitchell-Colgan – TPP

Dan Goodrich – TOOC
Daniel Duran -- TOOC

Paul Cicrich – TFDI - Celilo

Approved: _____ Date:_____
Manager – Kyle Kohne, Transmission Planning, TPP

Approved: _____ Date:_____
Manager – Margaret Albright, Technical Operations, TOO

Approved: _____ Date:_____
Manager – Bill MacBean, Dittmer Dispatch, TORD

Approved: _____ Date:_____
Manager – Steve Felker, Munro Dispatch TORM