

Pacific DC Intertie Upgrade Project Status Update

Customer Conference Call

August 19, 2015



Celilo Converter Station



PDCI Upgrade Project

- Replace aging Celilo 4 converter terminal with a new 2 converter terminal rated $\pm 560\text{kV}$ and 3410A and upgrade Celilo-NOB transmission line insulators.
- Reliability driven project
 - Must replace older unsupported technologies to maintain reliability.
- Initial upgrade to 3,220 MW with future opportunity to increase PDCI to 3,800 MW N-S.

Upgrade Benefits

- Less frequent forced and maintenance outages.
- One manufacturer technology and less equipment improves reliability, availability and maintainability.
- Simpler configuration could facilitate remote operation and potential dynamic scheduling.
- Substantial reduction in spare parts inventory.
- Improved access roads provide faster, less disruptive routes for line maintenance crews.
- Lower transmission losses / Increase capacity N-to-S.
- Reduce future O&M costs.

CELILO TERMINAL UPGRADE – New Features

- Back to Back Operation Capability
 - Allows testing of new converters without line in circuit
- Round Power Capability
 - Allows for “Test Power” without negatively affecting Western Interconnect

CELILO TERMINAL UPGRADE

Celilo Upgrade Project is on schedule

- HVDC Supplier Contract
 - Civil work complete
 - Yard equipment is on site and being erected / wired
 - 6 of 7 converter transformers have been delivered to The Dalles
 - Thyristor Valve assembly is complete
 - HVDC controls have been successfully tested in factory and shipped to site
 - All project milestones have been met

CELILO TERMINAL UPGRADE

- BPA responsibility:
 - Site Development is complete
 - Celilo successfully in Converter 3/4 Stand-alone mode
 - Building remodel and seismic upgrade completed
 - Work on schedule for Big Eddy / Celilo Relay replacement
 - Work on schedule for SCADA/SER replacement
 - Preparing for testing and commissioning

Oct. 13, 2014



Nov. 26, 2014



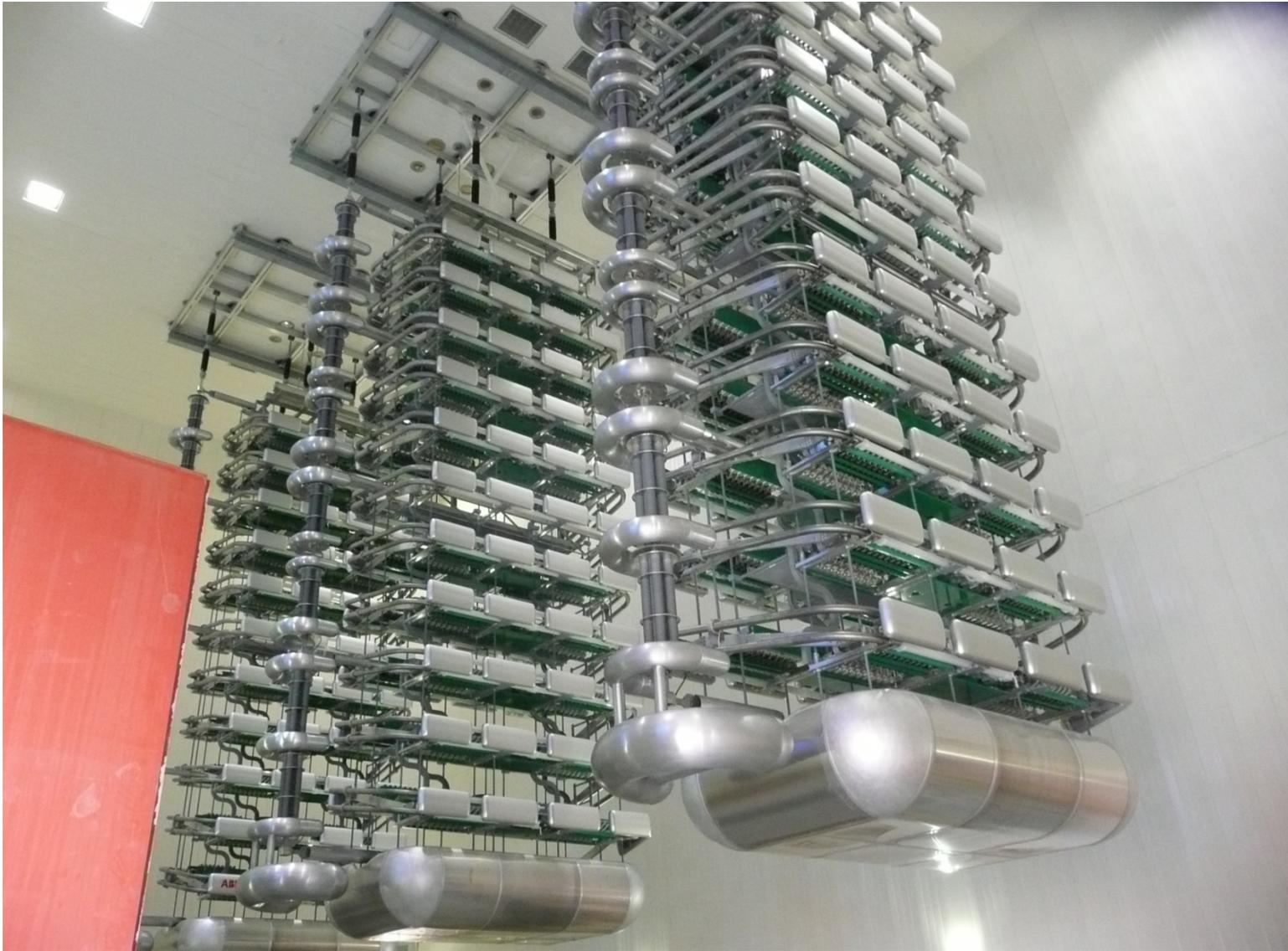
Converter Transformer Demolition

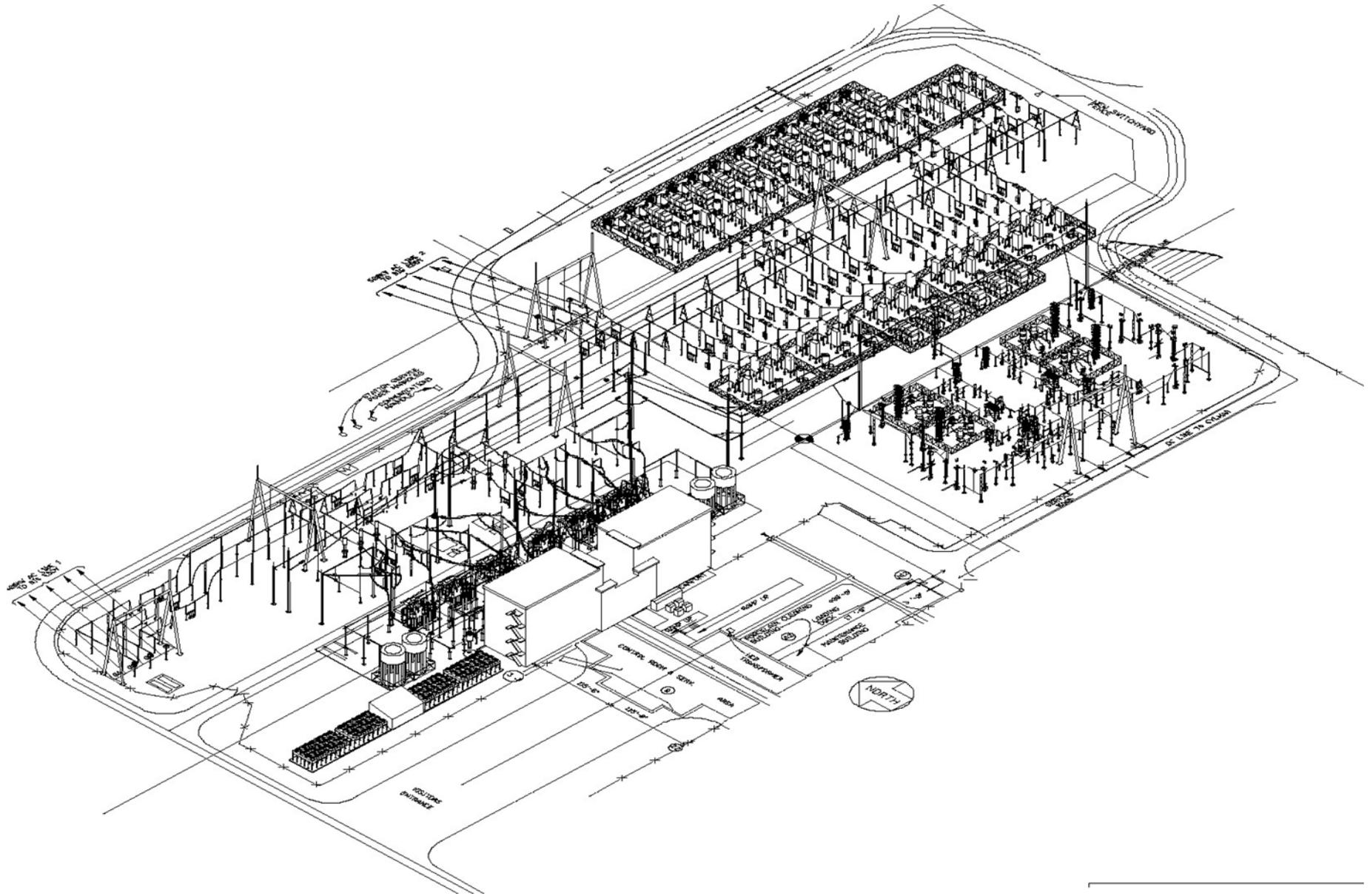




Valve Hall Demolition







Celilo: NOB DC Transmission Line Upgrade

- BPA Bare Hand Crew is currently working on 10% of the line when a hold order is available.
- Contractors plan to complete another 40% of the line during the October SIR.
- Final 10% of the line upgrade is planned to be completed in the summer/fall of 2016.

Celilo: NOB DC Transmission Line Upgrade

- 2015 SIR has been scheduled to start on October 3rd and run through November 3rd.
- BPA will coordinate additional 2015 outages with adjacent balancing authorities - LADWP and CAISO.
- PDCI outages for Celilo Terminal work has been posted on BPA OASIS.

Studied Outage Information On BPA OASIS

- Separate work listed as different outages.
 - Could see different TTC values, for the same period on different outages.
- When outages overlap, lowest TTC governs.
- Dates and TTCs may be modified several times during the project construction period.
- [BPAT Outage Summary](#)

Studied Outage Information on BPA Oasis

■ DC N>S

- 2014-12-04 05:00 to 2015-11-03 08:00 (started in September)
 - 1956MW Limit
 - BPA-Celilo: Converters 1 & 2 (Converters upgrade)
- 2015-10-03 04:00 to 2015-11-04 06:00
 - -0- MW Limit
 - BPA-Celilo-Sylmar Pole 3 and 4 1000kV Line
- 2015-11-04 06:00 to 2015-12-21 16:00
 - -0- MW Limit
 - BPA-Celilo-Sylmar Poles 3 & 4 1000kV DC Line (Celilo DC testing to complete Converters upgrade)(PDCI not available for commercial use)

Studied Outage Information on BPA Oasis

■ DC S>N

- 2014-12-04 05:00 to 2015-11-03 08:00
 - 1269MW Limit (LADWP 975 MW S>N limitation in place since December 2008 thus the lower value, 975 MW will be the TTC limit)
 - BPA-Celilo: Converters 1 & 2 (Converters upgrade)
- 2015-10-03 04:00 to 2015-11-04 06:00
 - -0- MW Limit
 - BPA-Celilo-Sylmar Poles 3 & 4 1000kV DC Line
- 2015-11-04 06:00 to 2015-12-21 16:00
 - -0- MW Limit
 - BPA-Celilo-Sylmar Poles 3 & 4 1000kV DC Line (Celilo DC testing to complete Converters upgrade)(PDCI not available for commercial use)

Managing Schedules and Flow on the DC During Upgrade

- BPA works closely with LADWP in managing schedules and flow on the DC. BPA is not expecting any changes to their process or procedures due to this upgrade.
- Next Hour Congestion Management
 - If net schedules exceeds the SOL for next hour BPA or LADWP will curtail schedules to the SOL
 - TOP 007-WECC R2
- In Hour Reliability
 - Flow can not exceed the SOL, LADWP or BPA will curtail schedules to get the flow with in the SOL
 - TOP 007-WECC R1

Questions?

- Send questions to techforum@bpa.gov
 - Use “PDCI Upgrade” in the subject heading.