

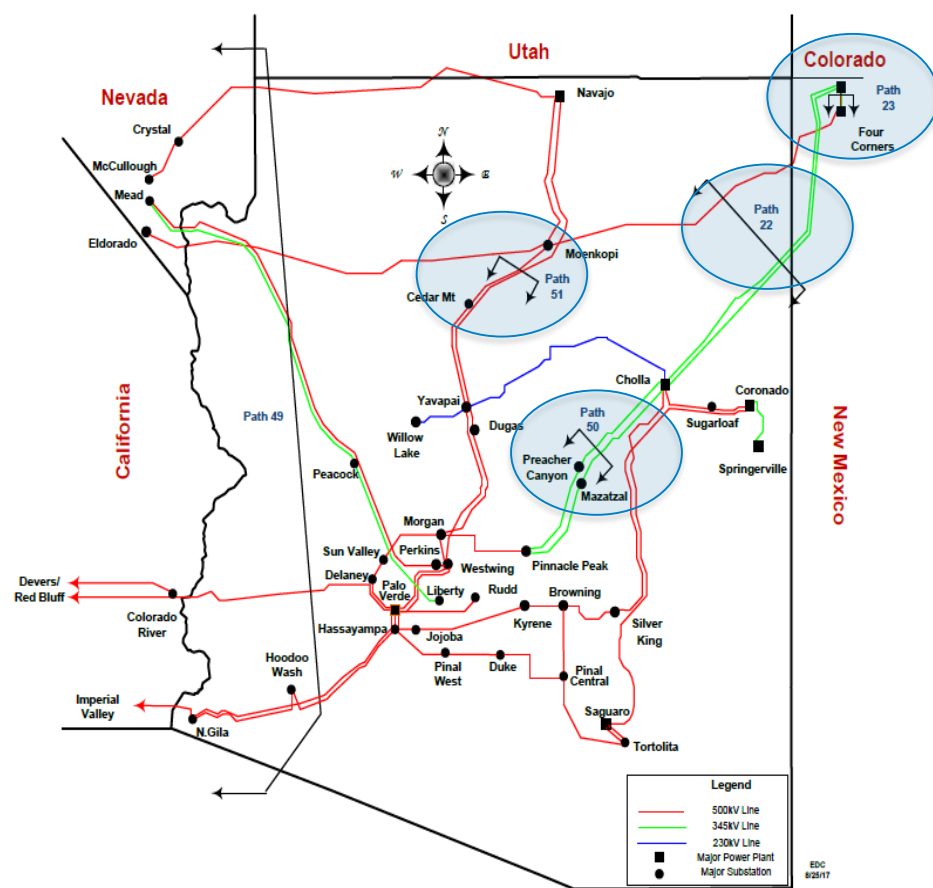
Delisting of WECC Paths

Southwest Four Corners (Path 22), Four Corners 345/500 (Path 23), Cholla – Pinnacle Peak (Path 50), and Southern Navajo Transmission System (Path 51)

Arizona Public Service
Reliability Assessment Committee (RAC) Meeting
October 18, 2019



Illustrations of WECC Paths for Delisting



Primary Drivers for Delisting

- Coal retirements resulting in reduced WECC Path ratings
- Challenges with timely WECC Path rating changes
- Real-Time Contingency Analysis (RTCA) use in Operations
- APS: Publicly announced transition to MOD-030 within 2 years

Current Planning and Operational Practices Ensure Grid Reliability and Provide Open Access



- Transmission Planning: APS coordinates with its neighbors for base case development and various studies including:
 - Identify any reliability standard violations, including the possibility of load shedding
 - Identify mitigation for any violations
 - FAC-013 studies
 - TPL-001-4 studies
- System Operations: APS operates system in accordance with applicable reliability standards
 - Schedules generation output and transmission outages to ensure acceptable pre- and post-contingency system performance, including the avoidance of load shedding
 - MOD-029 studies

Current Planning and Operational Practices Ensure Grid Reliability and Provide Open Access - Continued



- As a result of the retirement of TOP-007-WECC-1 in 2017, operation of a WECC path within the path rating or Total Transfer Capability (TTC) is no longer required with the exception of paths that are stability limited.
 - Studies have shown that for APS paths 22, 23, 50 and 51 thermal and voltage violations would occur well before any stability concerns, and thus the path flow would be maintained below any stability limit.
 - Enforcement of path limits is not useful for reducing the possibility of load shedding
 - WECC Path TTC studies are performed using offline tools with optimized generation patterns to maximize TTC. Real time generation patterns can lead to reliability concerns below the rated TTC
- Operating with advanced online network analysis tools such as RTCA is a more conservative method of ensuring system reliability is maintained.
 - The thermal and voltage operational concerns of the facilities making up WECC paths are more accurately identified with Real Time Contingency Analysis (RTCA) tools.

Communication and Coordination in WECC Path Delisting Process

- Process Understanding
 - Two separate meetings with WECC in 2018 to determine process/procedure to delist
- Internal
 - Examination of risks and opportunities 2017-2019
- E&O Coordination/Communication
 - Numerous meetings; Navajo E&O approved delisting of WECC Path 51 on April 22, 2019
 - Couple of meetings; Four Corners E&O approved delisting for Path 23 on June 14, 2019
 - No concerns raised with Path 22
 - Mead-Phoenix Project (MPP) E&O was notified of WECC Path 51 on May 1, 2019 with no comments or concerns
- Industry/Utility/Stakeholder Coordination/Communication
 - SRP one-on-one on Path 50 on August 9, 2019
 - Adjacent utility notification letter sent out on August 15, 2019
 - OASIS posting on August 15, 2019
 - SWAT Oversight/SWAT-AZ presentation on August 21, 2019
 - StS/OC/RAC notification and StS presentation on September 3rd and September 17th respectively
 - WebEx Presentation and Q&A at StS meeting
 - 30 day comment/question/concern period ending COB October 17th
 - This RAC meeting presentation

Summary of Written Comments Received and APS Responses

- Joint owners – capacity after delisting
 - Communicated values privately
- SRP – Process for rating
 - APS will follow FAC-013/MOD-029 until APS moves to MOD-030
- WECC - SAR for FAC-501-WECC-2
 - APS will follow standard until delisted paths are removed

Future Activities to Finalize Delisting

- Final RAC Notification Letter
- Final OASIS Notification
- FAC-013 results to adjacent transmission owners
- Work with WECC on SAR for FAC-501-WECC-2
- Retirement of Arizona Security Monitoring Manual

Effective Delisting Date

- Southwest Four Corners (Path 22), Four Corners 345/500 (Path 23), Cholla – Pinnacle Peak (Path 50), and Southern Navajo Transmission System (Path 51)
 - Effective delisting date January 1, 2020

Questions/Comments/APS Contact?

- For general questions about the delisting, please contact David Wiley
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- For questions about the technical study effort please contact Chris Fecke-Stoudt
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- For OASIS transmission related questions, please send an email to
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