Discussion of WECC Paths
Southern New Mexico (NM1) Path 47

This brief provides observations regarding the Southern New Mexico (NM1) WECC path. These observations draw from current project development information, historical data, and forward looking congestion analysis. Readers should review the "Discussion of WECC Paths – Introduction" with this document.

Observations

Transmission project development, historical congestion analysis, and forward looking congestion analysis were used to form the following observations concerning Path 47.

- Path 47 is historically congested based on actual flow metrics from the 2007 Path Utilization Study, and maximum schedule metrics from the 2008 Study. The path should continue to be evaluated by the TEPPC Historical Analysis Work Group (HAWG) in their biannual path utilization report. It is likely that Path 47 will have reduced flow in future historical analysis because of new generation located in southern New Mexico.
- There are a number of projects in development that could directly impact Southern New Mexico (NM1) path flows. Further development in the region will require more research as to future expectations on path flow.
- Path 47 was not congested in the 2020 expected future study case, or any other cases in the 2010 Study Program.

Description

Path 47 is defined as the sum of flows on four lines in southern New Mexico. The lines range in size from 115 kV to 345 kV. Key path characteristics defined by the 2011 WECC Path Rating Catalog can be found in

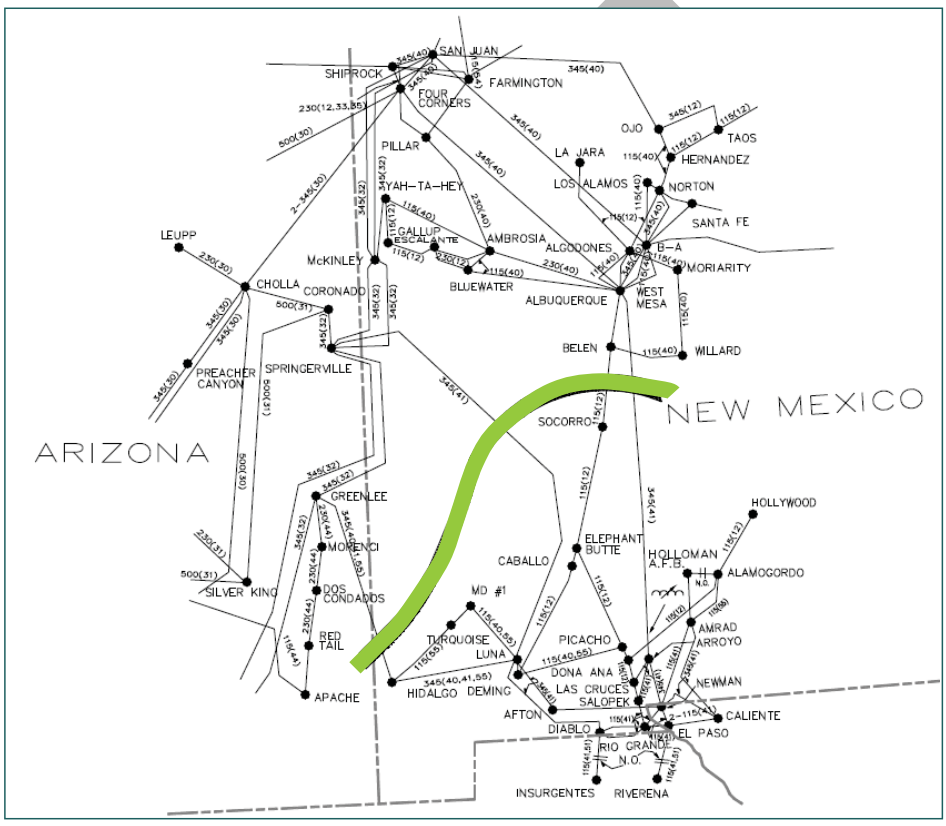
Table 1. Figure 1, on the next page, shows the physical cut plane that forms the Southern New Mexico path.[1]

[1] WECC 2011 Path Rating Catalog: Link

Table 1: Path 47 Characteristics

Path Characteristics	
Rating W to E	940 MW (simultaneous firm) 1048 MW (non-simultaneous)
Max Voltage	345 kV

Figure 1: Path 47 Definition

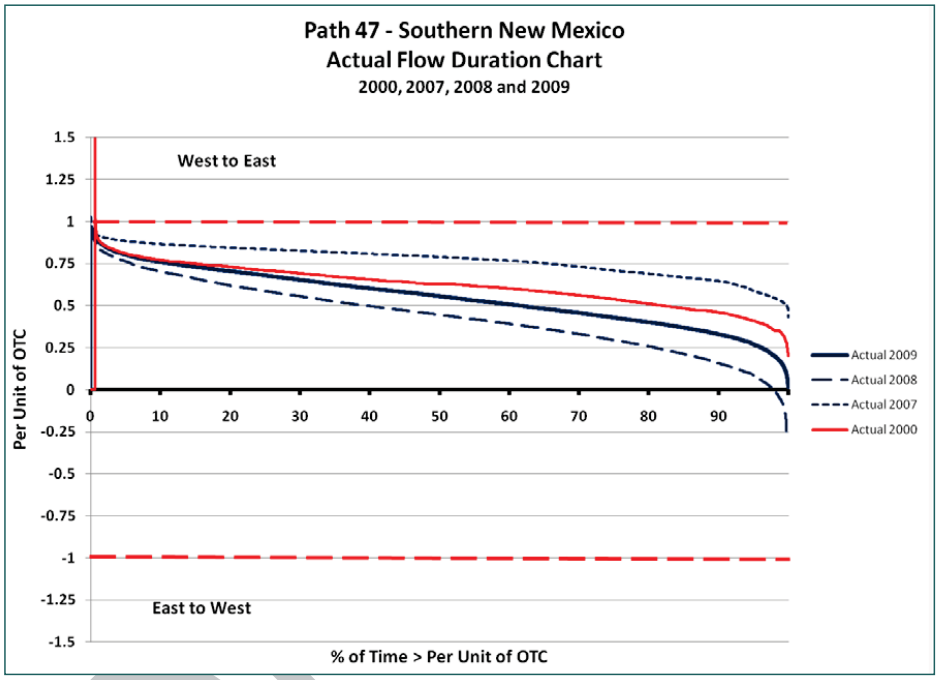


Historical Congestion

Path 47 was analyzed in the 2009, 2008, and 2007 Transmission Path Utilization Studies, and was historically congested based on actual flow metrics from the 2007 Study, as well as maximum schedule metrics from the 2008 Study. The 2009 Study did not identify Path 47 as

one of the most congested paths. Actual flow data for historic years can be found in the duration plot in Figure 2. Although informative, the plot does not necessarily reflect the metrics that support the path as historically congested.

Figure 2: Path 47 Actual Flow Duration Plot



Project Development

The following projects were determined by stakeholders to be the most likely to have an impact on Path 47.

- Centennial West Clean Line (Studied in 2010 Study Program)
- High Plains Express (Studied in 2010 Study Program)
- SunZia (Studied in 2010 Study Program)

None of these projects was included in the 2019 or 2020 datasets.

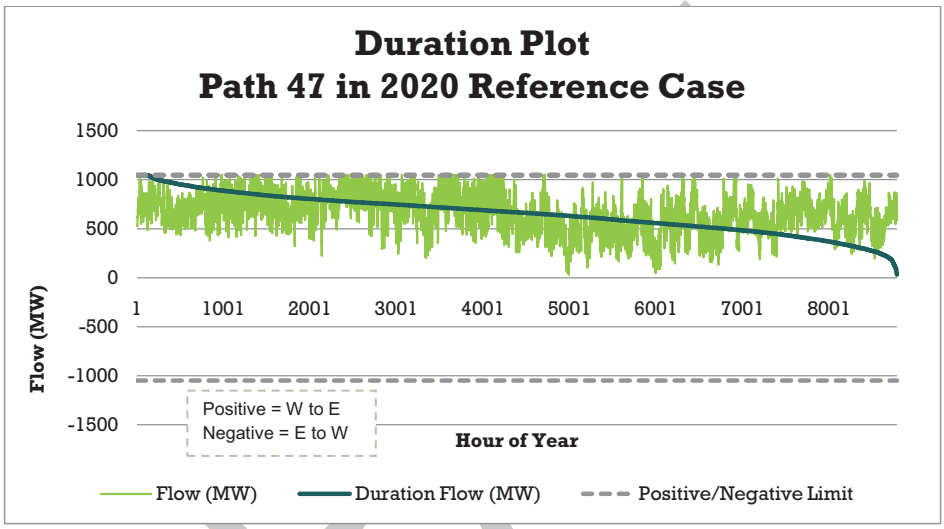
Future Congestion Analysis

The forward looking congestion analysis draws upon study case results from production cost model runs based on 2019 and 2020 datasets. This work was done as a part of the 2010 Study Program.

Expected Future

Path 47 was not heavily utilized or congested in the expected future case. The path exceeded U90 and U75 for 6.44 percent and 25.85 percent of the year, respectively. Neither of these values surpasses the utilization screening requirement. The duration plot in Figure 3 shows this light utilization. The chronological plot in the same figure shows the seasonality of the flows. Note the higher flows in spring and early summer.

Figure 3: Path 47 2020 Duration Plot



Alternative Futures

Path 47 did not pass the utilization screening in any of the 15 cases used to inform the 10-Year Plan. There was no combination of assumptions that caused the path to be highly utilized.

Conditional Congestion

Congestion on Path 47 is not contingent on any future evaluated in the 2010 Study Program.

Project Development Impact

By comparing congestion results from the expansion studies with that of the base case, and the resource relocation (without incremental transmission) we can better understand how Path 47 behaves under varying assumptions. Path 47 U75 values are presented in Table 2.

Table 2: Project Development Impact on Path 47

Study Cases	Path 47 U75 (% of year)
2019 Base Case	2.43%
2019 New Mexico Resource Relocation	6.19%
2019 New Mexico + Centennial West Clean Line Project	2.88%
2019 New Mexico + High Plains Express/Sun Zia	0.00%

Path 47 is not heavily utilized in the base case or the resource relocation case. Change in flows caused by the implementation of the incremental transmission was not significant. Both projects were effective at transporting resources out of New Mexico, thereby leaving fewer resources to flow on Path 47, which decreased its utilization as an effect. It is worth noting that the Centennial West Clean Line Project is a DC line that if contracted to specific generation would have little to no effect on Path 47 in terms of its actual loading.

Other Observations

The path operator provided the following comments on Path 47 in response to this write-up:

> "Congestion on Path 47 has been reduced due to the addition of the Luna Energy Facility (LEF) generating station owned by Phelps Dodge Energy, PNM, and TEP. The LEF generation output flows in an east to west direction which counter flows the natural flow of Path 47."

PNM provided the following recommendation for Path 47 regarding future TEPPC studies:

> "Path 47 is only rated West to East and does not have an accepted East to West rating. As such Public Service Company of New Mexico (PNM) recommends for the purpose of TEPPC studies use the West to East simultaneous firm limit of 940 MW as a proxy. Allowing the limit to be undefined in TEPPC studies allows conclusions to be made that might not otherwise be drawn if there was an East to West simultaneous firm limit established."