

System Reconfiguration to Support Barber Lake Switching Station

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WE DELIVER.



Outline

Study Considerations

China Grove SPS #28

Impact of Barber Lake Switching Station

System Reconfiguration

Study Considerations

SSWG 2014 Summer Base Case (Created 6/19/2013)

N-1, ERCOT-1 and G-1 + N-1 Loadings

No West Texas Wind Generation

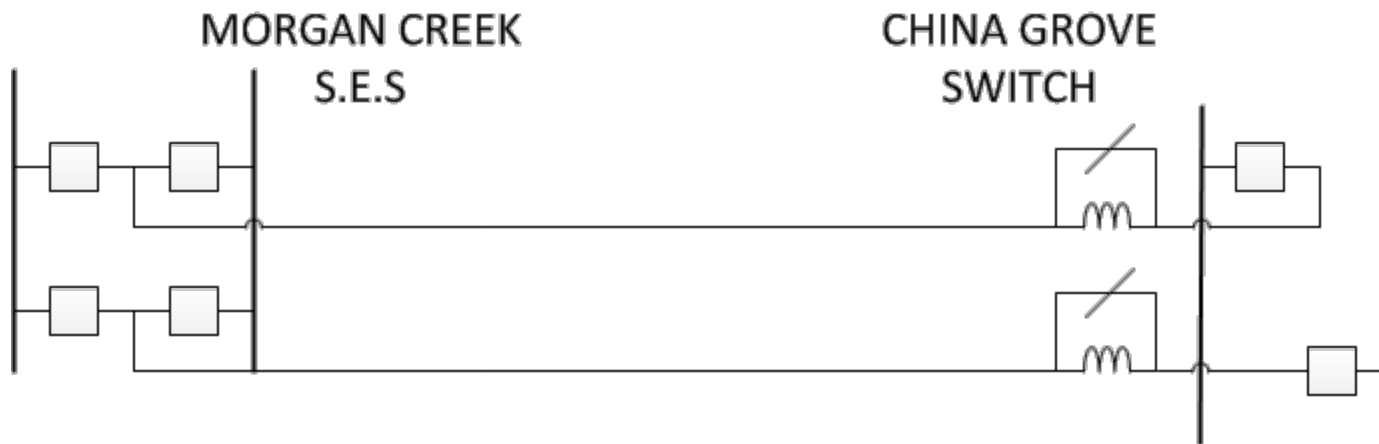
Loss of Permian Basin Plant

Effect of A-1 + N-1 Loadings

China Grove SPS #28

No West Texas Wind Generation and prior to Willow Valley 345/138 kV Autotransformer:

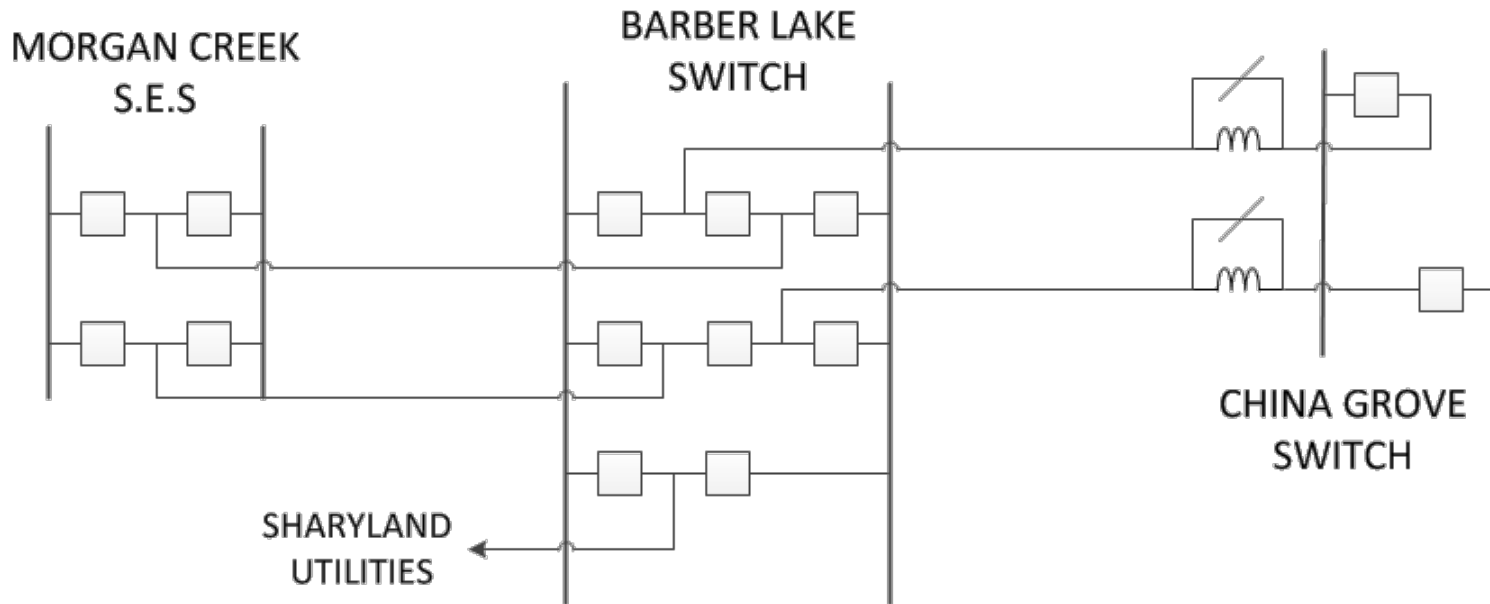
- Loss of one Morgan Creek – China Grove line results in the other line loading to 100% of rating
- Loss of Kinder Morgan generation unit and one Morgan Creek – China Grove line results in the other line loading to 107% of rating



Activating the China Grove SPS #28 relieves loadings to 70% and 75%, respectively

Impact of Barber Lake Switching Station

Barber Lake Switching Station will be a point of interconnection with Sharyland Utilities (Sharyland) resulting in significant changes in load flows



The Morgan Creek – Barber Lake 138 kV lines will have post-contingency loading issues due to the increased power flow caused by transfer of Sharyland load

Impact of Barber Lake Switching Station

Loss of one Morgan Creek – Barber Lake line:

- Post-contingency loading on other Morgan Creek – Barber Lake line is 109% of rating
- With the China Grove Series Reactors (Series Reactors) normally in-service, the post-contingency loading is 97%
- With no West Texas wind generation and the Series Reactors normally in-service, the post-contingency loading is 107%

Impact of Barber Lake Switching Station

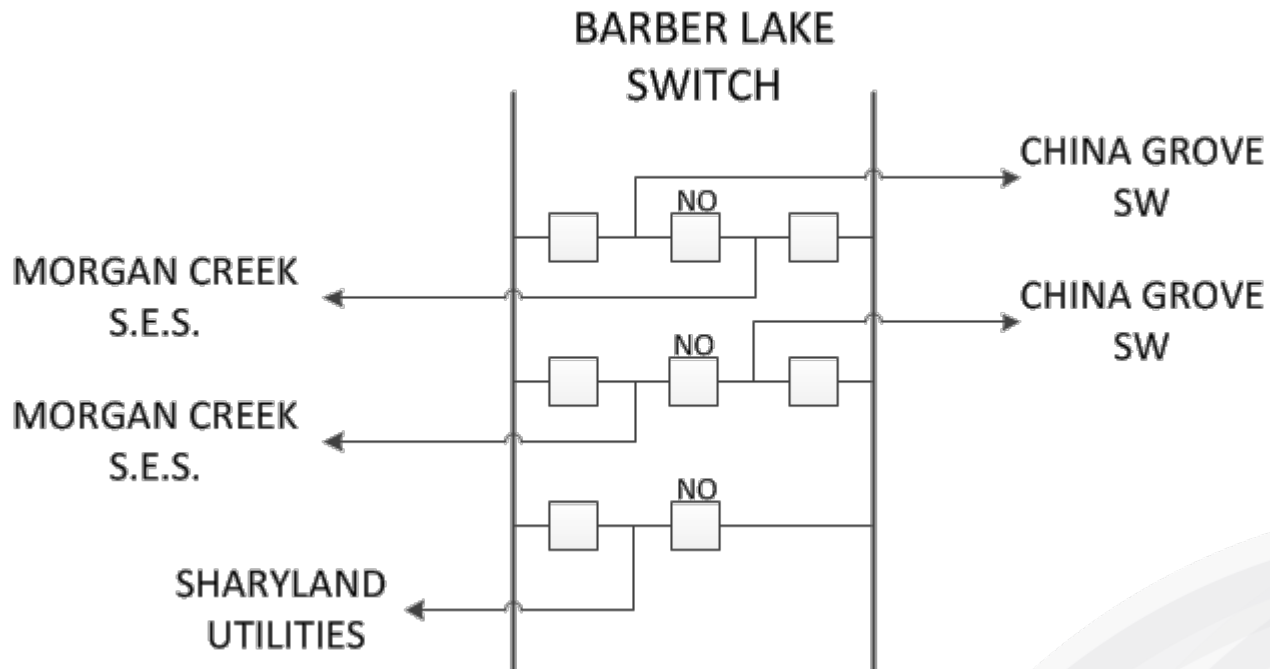
Loss of one Kinder Morgan generation unit and one Morgan Creek – Barber Lake line:

- Post-contingency loading on other Morgan Creek – Barber Lake line is 114% of rating
- With the Series Reactors normally in-service, the post-contingency loading is 101%
- With no West Texas wind generation and the Series Reactors normally in-service, the post-contingency loading is 111%

System Reconfiguration

Proposed to open bus tie breakers keeping Morgan Creek – Barber Lake – China Grove lines separate

This addresses loading concerns prior to upgrade of Morgan Creek – Barber Lake 138 kV lines



System Reconfiguration

With the reconfiguration and the Series Reactors normally in-service, the prior N-1, ERCOT-1 or G-1 + N-1 loading issues are relieved and there are no additional loading concerns

With the loss of Sharyland Midkiff – Driver 138 kV Line or the loss of the Willow Valley 345/138 kV Autotransformer, both Series Reactors normally in-service result in loading issues on the Morgan Creek – Barber Lake line serving the Sharyland load

These loading issues are relieved when the Series Reactor on the line bypassing the Sharyland load is switched off

Other Notes

The loss of the Permian Basin Generating Plant did not significantly affect the flows on the Morgan Creek – China Grove lines under any of the studied configurations

Loss of a 345/138 kV autotransformer followed by the loss of another element was also studied and the results will be incorporated into the proposal of future projects

Questions