

# HORSE CREEK WIND PROJECT

## Project Description:

Located in Haskell County the Horse Creek wind project consists of one hundred (100) EPE wind turbines each rated at 1.5 MW for a total wind project size of 150 MW. The project point of interconnection (POI) is the 138 kV Smoky Hill substation

## Need:

Electric Power Engineers Inc. (EPE) performed a Synchronous Oscillations (SSO) study to evaluate the performance of the Horse Creek wind project and determine its vulnerability to SSO within the Electric Reliability Council of Texas (ERCOT) utility grid. The Horse Creek wind project becomes radially connected to series capacitor banks under N contingency conditions

In accordance with the needs of this project EPE performed a frequency scan screening study and a detailed EMT study in PSC D E TDCT to identify any risk for SSO. The frequency scan screening study shortlisted the cases that become radially or near radially connected to the series compensated transmission lines. Based on the results of the screening study select cases were subject for further investigations via the detailed EMT study. This contingency conditions were considered under various switched shunts sensitivities and several series capacitor banks sensitivities

## Results:

The results of EPE's analysis revealed that the series capacitor banks located nearby will ride through the fault on the adjacent transmission line and are never bypassed causing a high energy discharge to be released from the said series capacitor banks to the Horse Creek wind project after clearing that fault leading. This ultimately leads to tripping the project off-line due to over-current not due to SSO. EPE provided suggested protection settings changes to the series capacitor to the Transmission Service Provider (TSP) in order to eliminate these high energy discharges. It was concluded that the Horse Creek wind project is not susceptible to SSO for the contingencies studied. The study was approved by ERCOT and TSP



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