

Questions from Wind Coalition on ETT West Texas Arms Project

The purpose of these questions and answers is to provide additional insight to the currently posted outage schedule for the ETT CREZ area outages. These outages are in ERCOT's Outage Scheduler software and have not deviated from the previously submitted outages discussed in 2017 through the ERCOT stakeholder process. Due to contract and confidentiality agreements, no commercial terms and confidential information will be answered by ETT.

1. Progress to date on warranty repair work? Failure rate remained consistent? Have any efficiencies been realized?

Answer: The current project is approximately 33% complete through the first inspection cycle. We are not encouraged by the failure rates which are above our anticipated rates discussed at the beginning of this project. Several efficiencies have been realized:

- We are in process of implementing a drone inspection program for the tangent towers on ETT's CREZ lines. This will allow for inspection of lines while they are energized. As defective arms are identified shorter outages for arm change outs will be required.
- Scaffolding is being deployed for weld repairs on towers that will improve weld quality, safety and hopefully improve productivity levels. This program starts in August once contracts are in place.
- Several process improvements have been accomplished by our contract crews so that our productivity numbers have improved from the upper 30% range to the mid 40% range. Wind outs continue to be the biggest problem.

2. Have Drones reduced labor efforts or are they not useful in this circumstance?

Answer: Drones have reduced labor efforts for our tangent tower work. However for all other towers, a physical inspection is still required due to the fact a drone cannot photograph or get in a position to view the critical areas that need to be inspected.

3. Has ETT continued to evaluate doing inspection and/or repair work with the opposite side of the tower hot?

Answer: Yes, but due to safety issues, extended outage requirements and impact on land owners we have decided not to pursue this option at this time.

4. In consideration of the single day outages ETT submitted, have any wind events resulted in ETT returning the line to service? How has forecast accuracy been compared to actual times where workers were winded out?

Answer: Yes, in the event of bad weather or projected wind out days we have returned lines to service on the following dates:

- 11/21/2017 - Riley (R)-Edith Clarke (EC) – Thanksgiving and forecast wind out (Return to service for 6 days).
- 12/1/2017 – 11 A.M.: Handed back R-EC for mobilization to EC-Cottonwood (CW) (energized 3 days early).
- 12/21/2017: Placed EC-CW line in service for Christmas and bad weather forecast.
- 1/4/2018 – 1 P.M.: Took R-EC line out of service (delayed one day). We were originally scheduled to receive the outage on 1/3/2018 but weather projections delayed taking the outage on time.
- 3/21/2018 – 11 A.M.: Returned R-EC to service upon request from ETT. Another line had an emergency outage so ETT requested return to service for R-EC for 6 days.
- 3/27/2018: R-EC out of service (return to outage scheduler plan).
- 4/19/2018: Returned R-EC back into service 1 day early.
- 4/24/2018 – 1:45 P.M. Took Clear Crossing (CC) -Dermott (D) line out of service. Originally scheduled to begin the outage on 4/23/2018; delay based on wind out projection.
- 7/3/2018: Returned to service CC-D for the 4th of July (one day early due to wind out projection).
- 7/6/2018: Began CC-D outage.

Our forecast accuracy is in the lower 90% range for predicting “wind out days.”

5. What are the issues with base flange defects and cross arm defects i.e. prevalence, severity, ability to schedule for the future, need for immediate attention?

Answer: Every tower is rated from Category 5 (immediate and emergency work) to Category 1 (get to it at the best opportunity). As of July 30, 2018, we have replaced one tower (Category 5 defect on the flange), completed 228 of 986 flange inspections needed. For arms, approximately 4,688 tangent arms and 1,289 angle structure arms have been inspected. Seven (7) Category 5 (immediately replace) arms have been replaced. A total of

968 arms have been, or are in the process of being, replaced as of July 30, 2018. These arms range in severity from Category 1-4.

6. What is the standard for considering a repair to be needed and then the repair being acceptable?

Answer: The weld must be in compliance with AWS D1.1 specifications. This is determined by a combination of magnetic particle testing, ultra-sound testing, and visual inspection. Meeting AWS D1.1 insures the structural integrity of the weld. Any weld not in compliance is then repaired using a qualified weld procedure according to AWS D1.1 specifications. The repaired weld is then subjected to the same requirements as in the original inspection. In layman's terms all cracks and any imperfection internal to the weld must be cut out and re-welded to AWS standards.

7. Are there "jigs", "tower crawlers", crane to tower stabilizers, or platforms that are being considered or experimented with to expedite the inspections and the repair?

Answer: Scaffolding will be used and is effective up to 35 mph winds. The effort is in the contracting phase and we hope to use scaffolding beginning in late August 2018.