TRANSPOWER

QUALITY ALERT!

23 April 2021
Maximo REF No. N/A

Insulator fitting bolt Nyloc nut looseness

ISSUE IDENTIFIED:

Urgent helicopter inspections were required over the BPE-WIL-A 220 kV line after routine condition assessment (CA) in February this year identified shackle nuts/bolts had worked loose on the 'cold end' of insulator assembly fittings on several towers. An extreme example was later found on tower 70 (see Figure 1), where a shackle bolt had no nut and was hanging by a thread.

CA is done 4 yearly (rather than standard 8 yearly) on this line due to coastal location, high winds and salt. The previous CA identified a number of flush Nyloc nuts on some towers on this line, but no loose nut issues. The recent CA has identified that Nyloc nuts have worked loose in between CA inspections.

Figure 1 - WIL-BPE-A Tower 70

CONTRIBUTING FACTORS:

This line was commissioned in 1983 and progressively re-insulated over subsequent years, with Nyloc nuts used as security fasteners on most hot and cold end fittings. Over the last 10 years there has been a history of issues nationally on manufacturer supplied fittings on lines assets, with bolts not fully engaging the Nyloc nut, caused by:

- Flush Nuts, which had bottomed out on shank before a min 1 - 1.5 threads protruded through the Nyloc.
- Workmanship, where Nyloc nuts were not fully tightened during installation of assemblies.

ACTIONS TAKEN TO PREVENT REOCCURENCE:

- Security of supply, safety risks and the best course of action were discussed, landowners and wider community notified about the urgent inspections required.
- A close aerial helicopter inspection of both BPE WIL A circuit towers was conducted, and affected Shackle nuts/bolts were repaired under outage.
- The repairs involved fitting a new shackle bolt/nut/split pin or correctly tightening any Nyloc nuts that had enough thread to do so. Where the minimum thread protrusion could not be achieved, the nut will be replaced with a “half” Nyloc nut at the next available opportunity.

LEARNINGS FROM THIS

- **Transpower now uses stainless steel split pin (also known as humpback split pins), through a hole in the bolt shank to secure insulator fittings following the above Nyloc nut issue.**
- **All insulator fittings with Nyloc nuts must be checked during CA to ensure the nut has been correctly installed. Replace any incorrectly installed nuts with new “half” Nyloc nuts.**

Quality Assurance

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