

TECHNICAL BULLETIN

TB-0173

Safety chains and mounting bolts on pole transformers

Background

Hazard alert 22-10 - Stainless steel transformer mounting bolt failure and TB-0085 - Safety chains on pole transformers were issued back in Oct 2010 to highlight and address a problem with a specific brand of faulty transformer mounting bolt (HXH). At that time the quality of the mounting bolts were not to specification and subsequently broke allowing two (2) transformers in two (2) separate incidents to come off the pole and in one (1) of the instances the transformer fell to the ground.

To address this issue a safety chain was fitted to all transformers that were assessed as being at risk of failure due to this particular make of bolt being used for mounting. 1,372 pole mounted transformers were identified and assessed and where it was found to be necessary they were fitted with safety chains.

As an additional safety measure it was stated that OLI/GLI inspectors, district operators or any other field staff must not work under transformers unless a safety chain was fitted, transformers with 'U'-bolts were not part of the hazard alert.

The safety chains were also added to the standard construction as an additional interim safety measure while the incident was being investigated, and decisions were being made on mandatory quality control checks of bolt supplies.

Actions

After metallurgical analysis of the failed bolts it was deemed necessary to improve the quality of the bolt from the current grade of stainless steel 304 to 316 to prevent the same type of structural failure reoccurring. Note the HXH 304 grade stainless was found to not achieve the minimum requirements including corrosion protection and forging process to be considered 304 grade.

The new 316 grade stainless bolts were introduced in 2012 and a rigorous batch testing regime has been introduced on each batch ordered, including tensile strength, ultrasound and chemical analysis. Product approval for the 316 grade stainless remains limited to one supplier only.

Changes

Now that all the safety chains have been fitted to the at risk transformers, the new mounting bolts have been installed since 2012 and a testing procedure for the bolts is in place, it has been agreed in consultation that the identified risk has been adequately addressed and that effective immediately the restriction to OLI/GLI inspectors, district operator and field staff working below pole mounted transformers without safety chains shall be removed (HA 22-10). Further, the safety chains identified with cracks as detailed in Hazard alert 40-14 were limited to a batch provided in early 2014 and therefore does not require an extraordinary inspection, as these transformers with the identified safety chains were installed using the stainless steel grade 316 bolts.

Installation of safety chains on all new and existing pole transformers is no longer required and changes to the standard drawings will take place.

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