

THE VIBRO-ACOUSTIC METHOD AS FAST DIAGNOSTIC TOOL ON LOAD TAP CHANGERS THROUGH THE SIMULTANEOUS ANALYSIS OF VIBRATION, DYNAMIC RESISTANCE AND HIGH SPEED CAMERA RECORDINGS.

Fouad Brikci, Pier-Antoine Giguère, Daniela Petrucci,
Mathieu Soares, Carl Tardif

ABSTRACT

Classic testing techniques give very little information on mechanical problems occurring inside an on load tap changer (OLTC) while in service. The vibro-acoustic method is based on the principle that all mechanical operations produce a vibro-acoustic pattern while operating. This pattern is recorded by an accelerometer and converted into a vibro-acoustic signature that is unique for each tap changer, and stable in time in the case of a healthy mechanism.

The functioning of an OLTC is complex since a lot of mechanisms are operating at the same time. To facilitate the comprehension of the vibro-acoustic signature, the following instruments have been used at the same time during the execution of a test:

- A high speed camera (to see)
- A vibration transducer (to listen)
- A dynamic resistance accessory (to capture the electrical currents)
- A current clamp (to record the motor current, determine the operation synching, and identify the operating range of the taps)

Each of these tests provides a piece of information that, coupled with the other tests, creates a complete picture of the condition of the OLTC. Therefore, the final target of all the tests is to be able to easily detect vibration problems in the future. In fact, the simultaneous correlation of all the signals, images and videos allows a fast understanding of the internal movements of an OLTC. It also improves the knowledge about the vibration for the operator as a reliable interpretation tool to find problems on OLTCs while in service, and before they create an outage.