



## RECOMMENDED TESTING & CARE MULTI-TAP RENTAL DUTY TRANSFORMERS

### 1. PURPOSE

The purpose of this document is to provide suggested tests and care for Multi-Tap Substation rental units.

### 2. STANDARD TESTING FROM THE FACTORY

2.1 All VanTran transformers are tested to ANSI Standards as defined by ANSI/IEEE C57.12.90. The following tests are performed...

- 2.1.1 Turn Ratio & Phase Relation
- 2.1.2 Winding Resistance
- 2.1.3 Insulation Resistance
- 2.1.4 Impedance & Load Losses\*
- 2.1.5 No-Load Losses & Excitation Current
- 2.1.6 Dielectric Induced Voltage
- 2.1.7 Dielectric Applied Voltage
- 2.1.8 Dielectric Leak

*\*specialty transformers & high current units will be done at VanTran's discretion.*

### 3. ROUTINE TESTING & CARE

2.2 While there are no specific tests that can determine if damage has occurred to a unit, there are a few tests that can be used on a routine basis to gain insight on internal conditions.

- 2.2.1 Turn Ratio & Phase Relation Testing
  - 2.2.1.1 The most valuable test VanTran performs on older units, and one we recommend at minimum, is Turn Ratio & Phase Relation.
    - 3.1.1.1 Repeated Turn Ratio & Phase Relation testing should give testing personnel a good indication on the "health" of the unit and determine failed components or connections inside the unit.



### 3.1.2 Visual Inspection

3.1.2.1 Visual inspections should also be performed with careful attention given to the bushings. Any sign of overheating and discoloration can be an indication that the rated kVA capacity has been exceeded.

### 3.1.3 Winding/Insulation Resistance Testing

3.1.3.1 Repeated and documented resistance readings, if access to equipment is available, is recommended so that baseline measurements can be established. Fluctuations in temperature and other factors will cause variances in resistance readings, but abrupt changes from baseline measurements can indicate internal component damage or failure.

### 3.1.4 "Megger" Testing

3.1.4.1 Routine "Megger" tests are also recommended if access to equipment is available. These tests can give insight into the condition of the insulation and presence of moisture within the unit.

### 3.1.5 Dielectric Oil Testing

3.1.5.1 As with any transformer, annual or quarterly oil samples should be drawn and tested for dielectric strength and Dissolved Gas Analysis (DGA). DGA results and baseline measurements can offer long-term insight into the condition of your unit.