

**RSO : RECURRENT SURGE OSCILLOGRAPH TEST (RSO) ON ROTOR FIELD WINDING TESTING FOR DETECTING INTERTURN OR EARTH FAULTS.**

---

### **Faults in Generator Rotor**

Faults in generator rotor (main field winding) are classified in two categories,

- Winding to rotor body (Earth Faults)
- Winding to winding (Interturn Faults)

Earth fault can be detected with the help of an insulation tester. However, interturn faults are not easily detected. A Rotor with single earth fault can run without any operational problem whereas, rotor with interturn fault will have an excessive vibrations.

## **WHAT IS RSO**

The rotor reflectometer uses technique of time domain reflectometer.

Application of testing rotors by time domain reflectometer method is known as RSO (Recurrent Surge Oscillograph test).

## **HOW THIS TECHNIQUE WORKS**

In this method, DC pulse of 12V DC is applied between one end of rotor and the body through a pulse generator. The traces at the end of the winding and the reflected waveform at input end of winding are captured using two channel digital storage oscilloscope.

If the voltage step is applied from each end of the rotor winding then two oscilloscope traces will be obtained which will be superimposed. A healthy rotor without any earth fault or interturn fault will have identical traces from both ends. For faulty rotor these traces will be asymmetrical forming a loop as indicated below in Fig 1.

A typical interturn fault in rotor winding is given below.

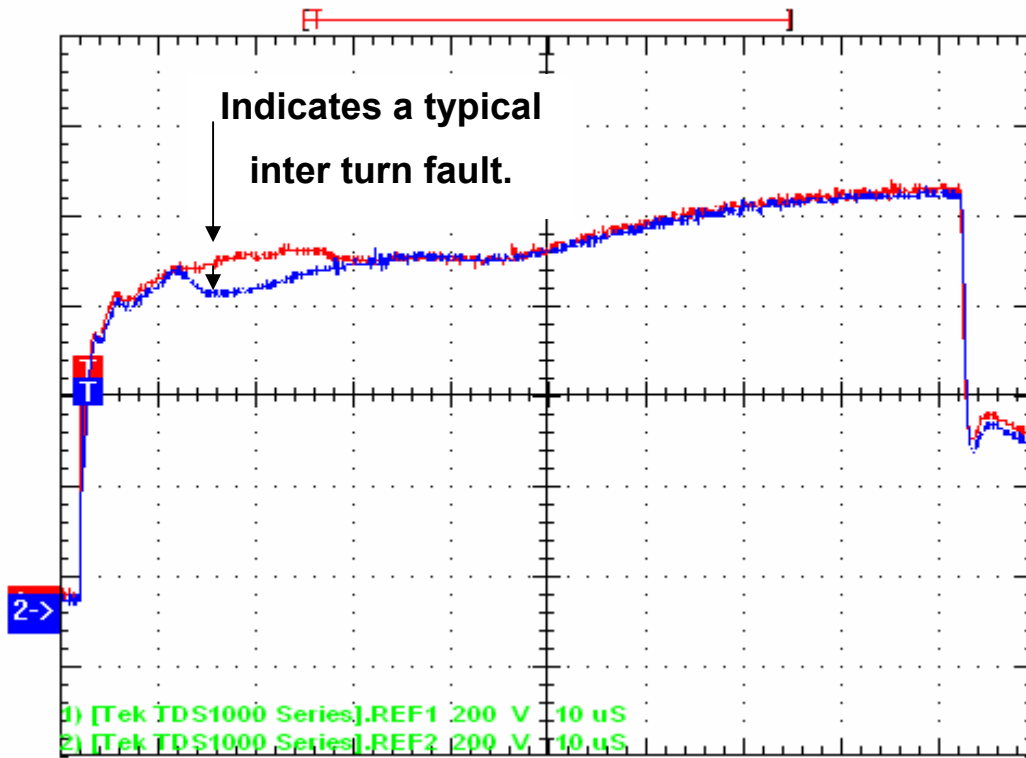


FIG 1: RSO traces

## FAULT DETECTION

Detection of faults can be done by

- Testing of stationary rotor within generator (unexcited).
- Testing of rotor when removed from generator.
- Testing of rotor in running condition (unexcited).

## **TEST EQUIPMENT**

Recurrent Surge Oscillograph test is carried out with,

Rotor Reflectometer, Type: TDR

Make: Convex Design Ltd. Bristol, England.

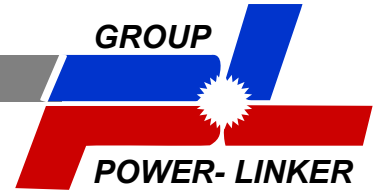
This instrument is a world renowned, highly accurate Rotor Reflectometer for Recurrent Surge Oscillograph test on rotor field winding.

## **EXPERIENCE**

**Power-Linker group is already working for condition monitoring and diagnostic analysis of Transformers, Generators, Motors etc. for past few years. The features of RSO test equipments used by Power-Linker can be viewed at : <http://www.convexdesign.co.uk / tdr100.htm>**

You may write to us for RSO test on main rotor field winding or any other condition monitoring and diagnostic test, which are being carried out by POWER-LINKER.

**POWER-LINKER**



**CONTACT US**

**Power- Linker**

122, Nahar & Seth Estate,  
Chakala, Andheri (E),  
Mumbai 400 099, India.

Tel : + 91-22-2823 4892  
Fax: + 91-22-2838 6205

Email:  
[powersys@vsnl.com](mailto:powersys@vsnl.com)

Website:  
<http://www.powersystemconsultant.com>  
<http://www.powerlinker.org>