

# **Dynamic Relay Testing**

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# **Dynamic Relay Testing?**

**. . . testing under  
Power System  
Conditions**

## **Dynamic Testing**

### **Test Under Power System Conditions**

- **Staged Fault Testing**      **Apply Actual Faults**
- **Simulator Testing**      **Model with EMTP  
Playback “Event”**
- **Phasor Testing**      **Model with a Short  
Circuit Program**

## **Relay Performance Testing**

**Special Report  
96 TP 115-0 1996**

## **Assignment**

**Write a report on the methods for:  
Steady State  
Transient  
Dynamic  
testing of modern relays.**

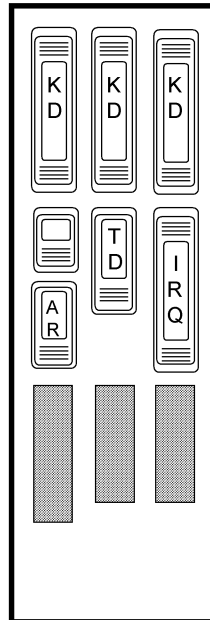
## **New Terms**

- **Steady-state Test**
- **Dynamic-state Test**
- **Transient Simulation Test**
- **Application Test**

## Steady-state Test

Apply phasors to determine relay settings by slowly varying relay input.

### Manual Tests EM Panel



Single Function Relays

## **Types of Test Equipment**

- **Passive EM Test Equipment (1950)**
  - **Load Boxes**
  - **Variacs**
  - **Phase Shifters**

### **Steady-state Test (1950) Passive EM Test Components**

**Apply phasors to determine  
relay settings by slowly varying  
relay input.**

# **Why Test Under Power System Conditions?**

## **Digital Relays are Multi-function Devices**

- **Provide complete protection.**
- **Combines a number of measuring criteria.**
- **Algorithms operate for power system conditions.**
- **Some have over 2000 setting possibilities.**
- **Require extensive configuration and setting procedures.**

## **Modern Digital Line Relays**

- **6 Zones Phase & Ground Distance**
- **Choice of Characteristics Mho/Quad**
- **Timers for Overreaching Zones**
- **Choice of Pilot Schemes & Timers**
- **Directional Ground Overcurrent**
- **Instantaneous Overcurrent**

## **Modern Digital Line Relays**

Continued

- **Switch onto Fault Detection**
- **Loss of Potential**
- **Remote-end Just Opened**
- **Breaker Failure**
- **Reclosing & Sync Check**
- **Fault Location & Records**
- **Programmable Logic**

## Types of Test Equipment

- **Passive EM Test Equipment (1950)**
  - Load Boxes
  - Variacs
  - Phase Shifters
- **Digital Test Equipment (1985)**
  - Power System Simulators

**How to test  
Multifunction  
Digital  
Relays?**

