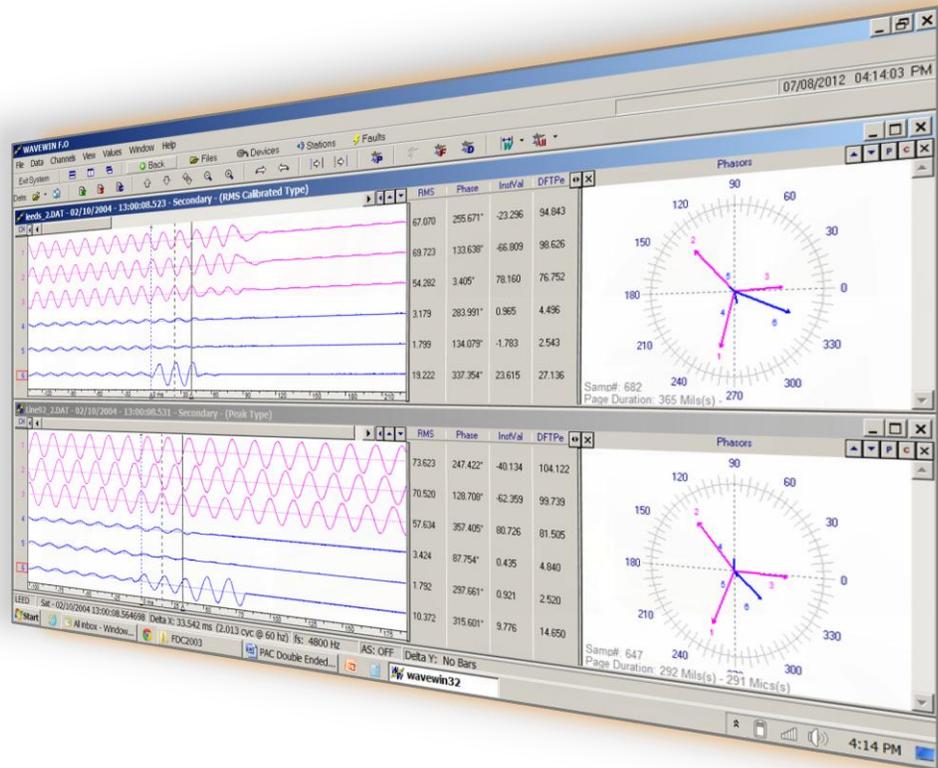


# Wavewin Training Course (Outline & Agenda)

Fault and Disturbance Data Fundamentals and Advanced Analysis

Wavewin 101

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# Training on Transient Data Management and Analysis with Wavewin

(One Day Course)

The objective of the training class is to explain fault and disturbance data and how to use Wavewin for their management and analysis. The course is worth 8 professional development hours. Certificates will be provided to interested students upon request.

## **Summary:**

Students will learn how to evaluate real events from collected data. They will learn how to prepare the data for compliance with NERC PRC-002 and 005 reporting requirements (including how to correct problems with the data and avoid traps in analysis). Techniques for converting the data to phasor quantities and RMS measurements will also be covered.

The analysis training will focus on recognition and classification of fault types including measuring fault attributes such as fault location, type, magnitude, duration, frequency, power, DC components, harmonics, and so forth. Special emphasis will be placed on recognition of fault signatures such as saturation and inrush.

The highlighted tools and features will include scaling and shifting data, synchronizing multiple data records, appending and merging channels, calculating missing phases, envelopes, sequence components, generating sequence of event summaries, and converting raw data formats to the COMTRADE format. The class is composed of 5 sessions:

Session-1: Fault and disturbance data fundamentals (sources, formats, types)

Session-2: Data standards (NERC PRC-002, IEEE COMTRADE, IEEE COMNAME, ASCII CSV)

Session-3: Data displays and analysis tools (analog, digital, virtual, harmonic, calculators, views)

Session-4: Advanced analysis (classification, single and double ended fault location calculations)

Session-5: Signatures (CT saturation, cap bank ringing, arcing, transformer inrush)

## **Class Agenda:**

08:00 - 08:30 Setup

08:30 - 09:30 Session-1 (sources and formats)

09:30 - 10:30 Session-2 (relevant standards and requirements)

10:30 - 10:45 Break

10:45 - 12:00 Session-3 (displays and tools)

12:00 - 01:00 Lunch

01:00 - 02:30 Session-4 (classification and fault location)

02:30 - 02:45 Break

02:45 - 04:00 Session-5 (signature recognition)

04:00 - 04:30 Summary and Adjourn