Late Breaking News from TLI

IEEE PES GM

M. Kezunovic, President & CEO
Calgary, Canada, July 2009

Outline

- ***Introduction***
- Data Integration Solution (FE)
- CBR Deployment (FE)
- Network based Fault Data Analyzer (NYPA)
- Low-Voltage Simulator (CCET)

Introduction

- TLI focus:
  - How to deal with “explosion” of IED data
  - How to assure the Smart Grid investments in IEDs (PMUs) is “safeguarded”
  - How to help utilities with tools for managing data reporting for NERC and other interested parties
- Late breaking news:
  - Substation IED data integration and analysis deployment at several utilities (FE, NYPA, CNP)
  - New tools for application and performance testing of PMUs, relays and other IEDs (CCET, BPA)

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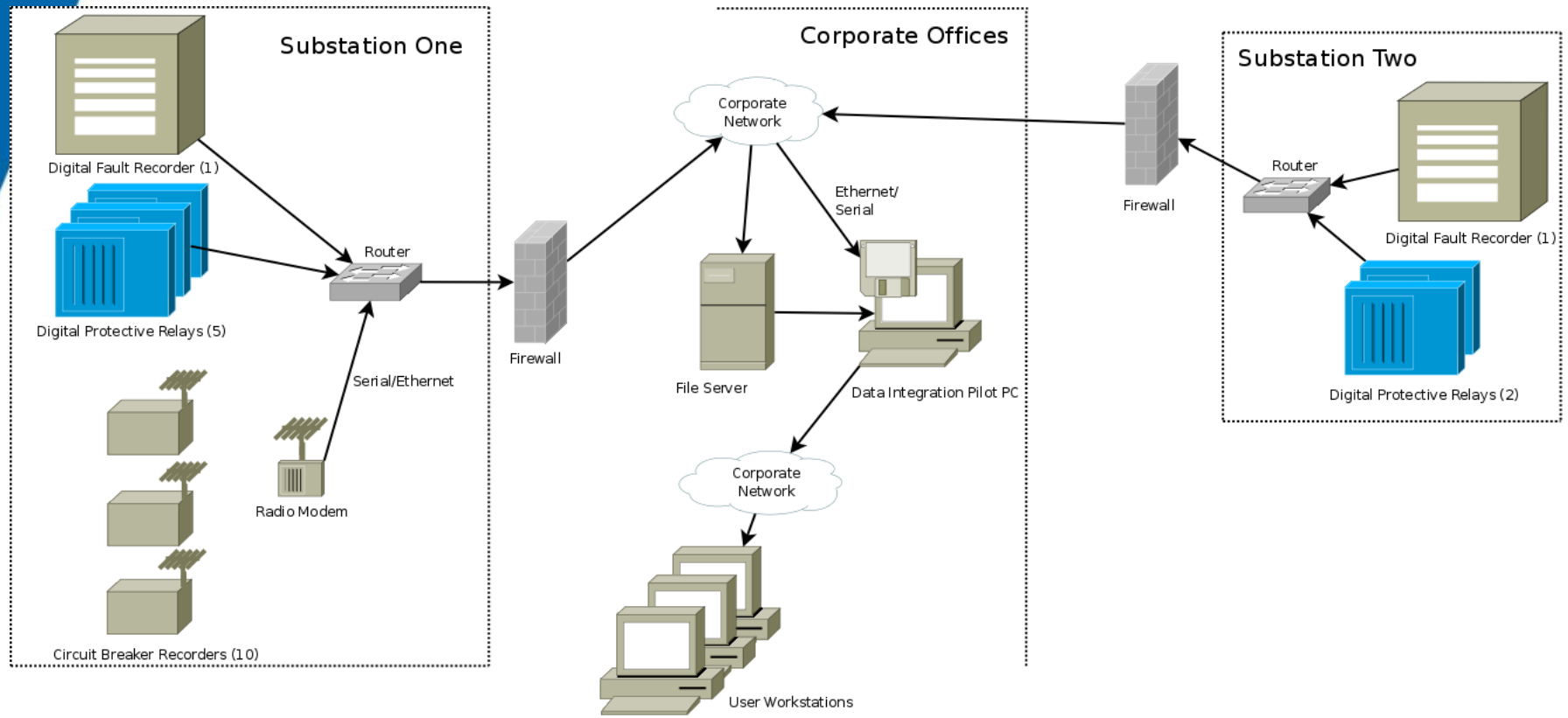
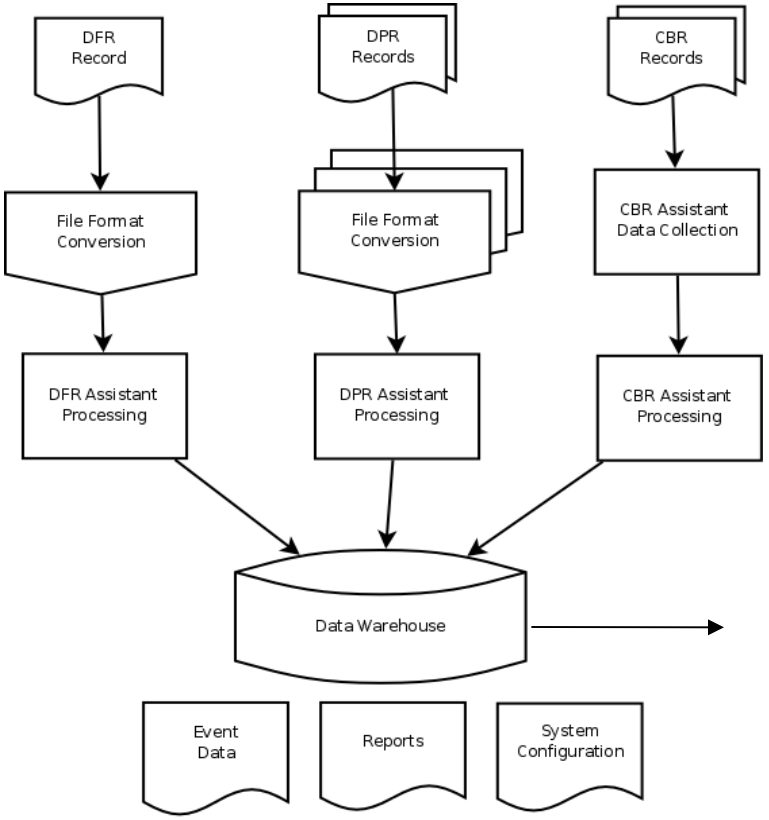
Solution Overview and Data Flow

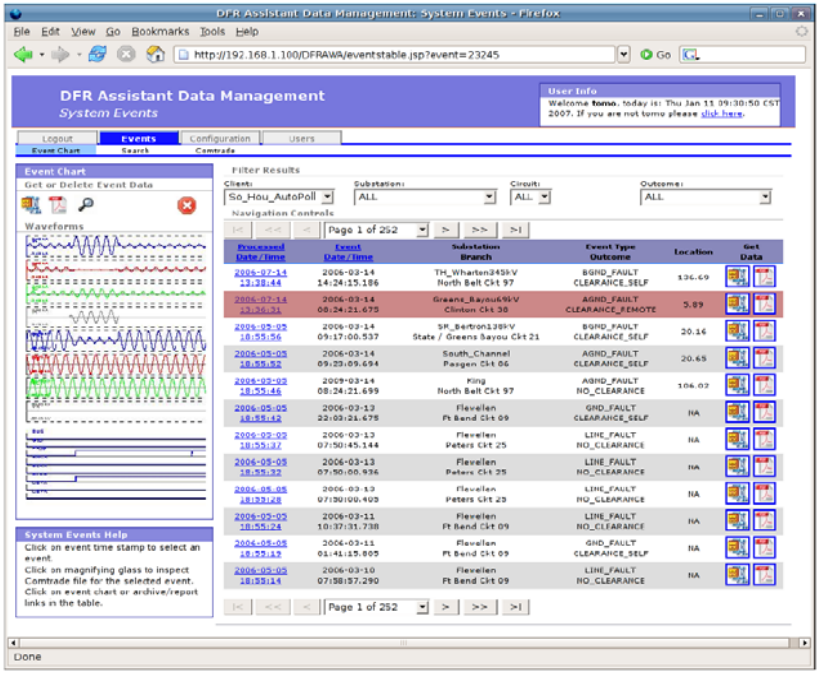


Data Integration Goals

- Data integration from variety of substation IEDs (DFR, DPR, CBR)
- Automated data processing functions
- Centralized data warehouse
- Universal user interface

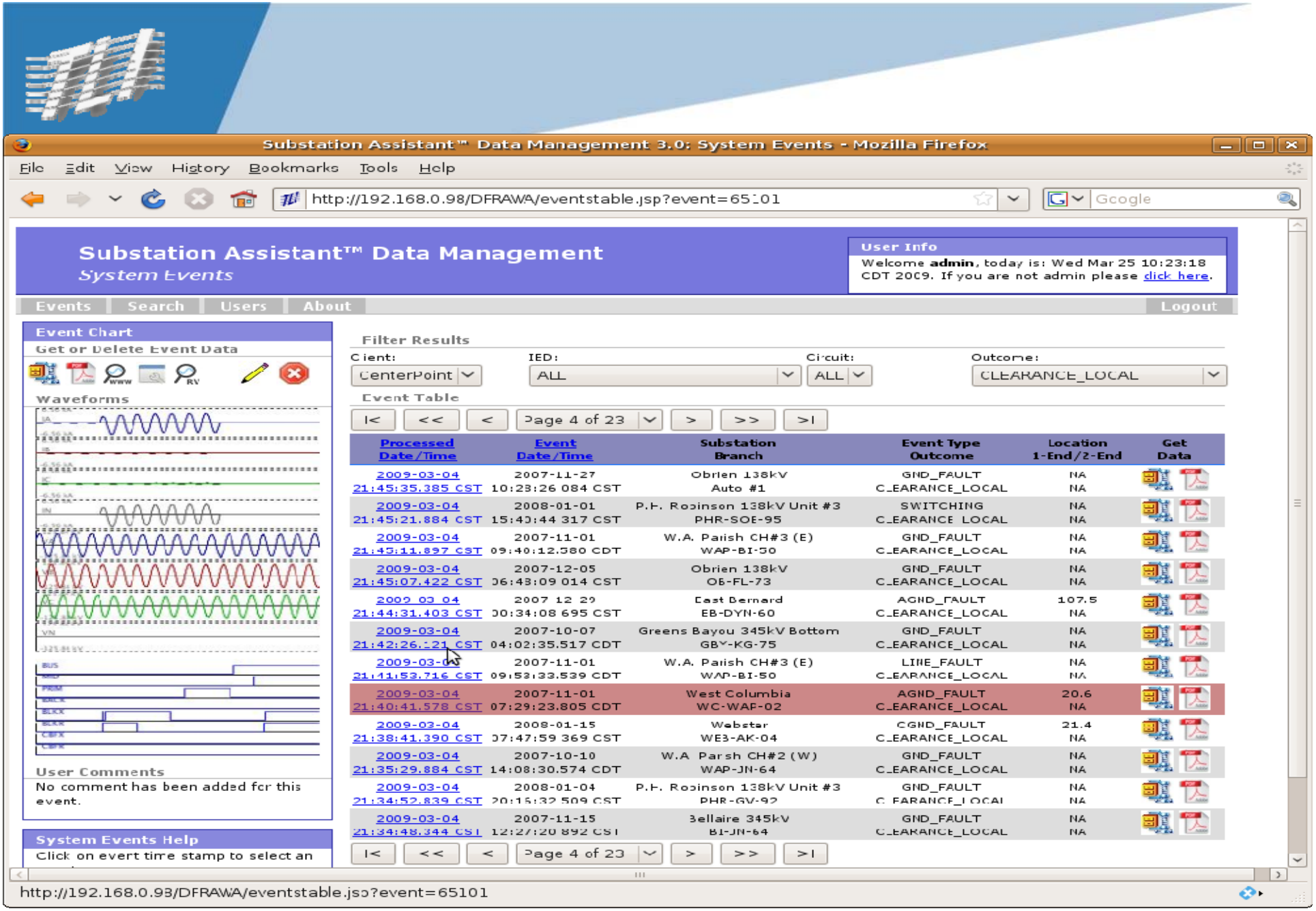
Substation Assistant™ Solution





Substation Assistant™ Features

- Universal solution for substation IED event data integration and processing
- Supports variety of DFRs and other substation IEDs
- Main features:
  - Data Integration (Data Warehouse)
  - Automated Processing (IED data)
  - Data Presentation (User Interface)



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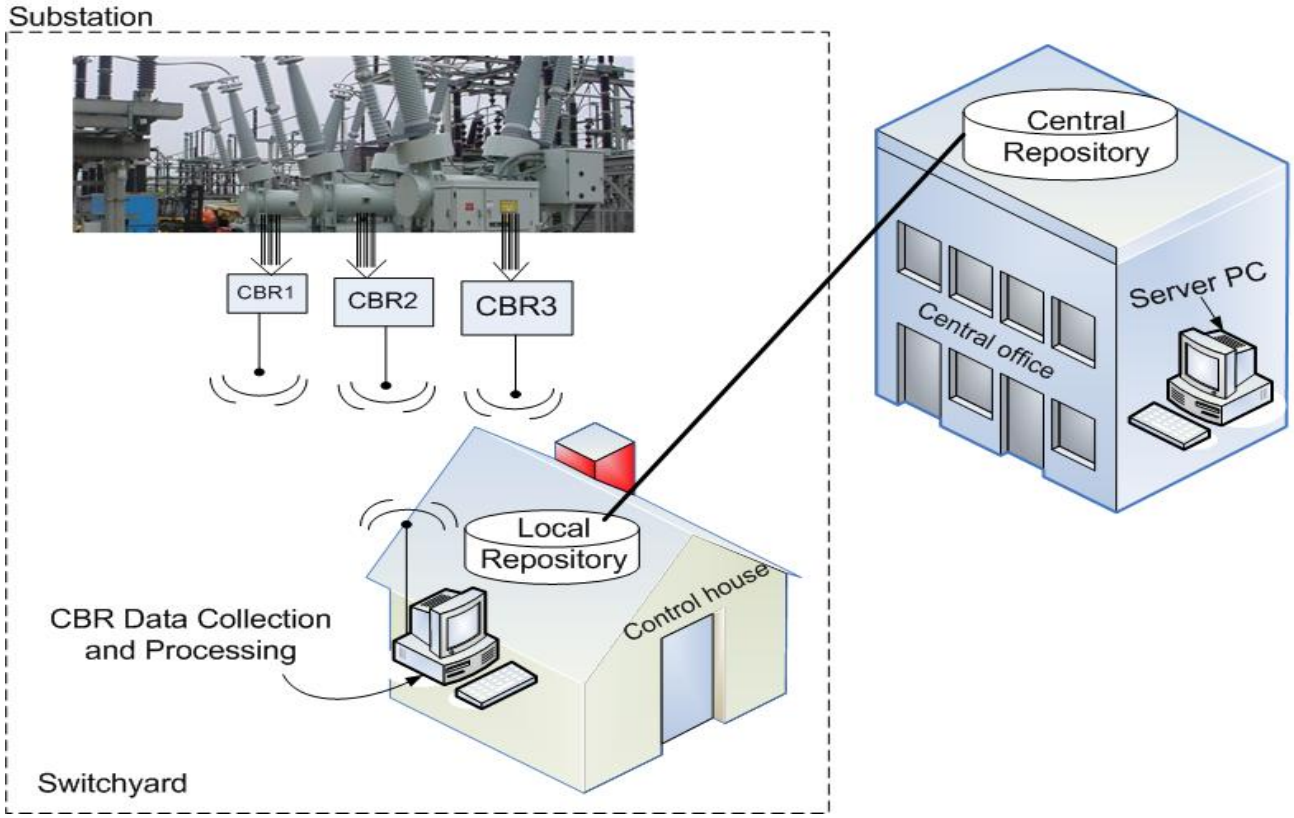
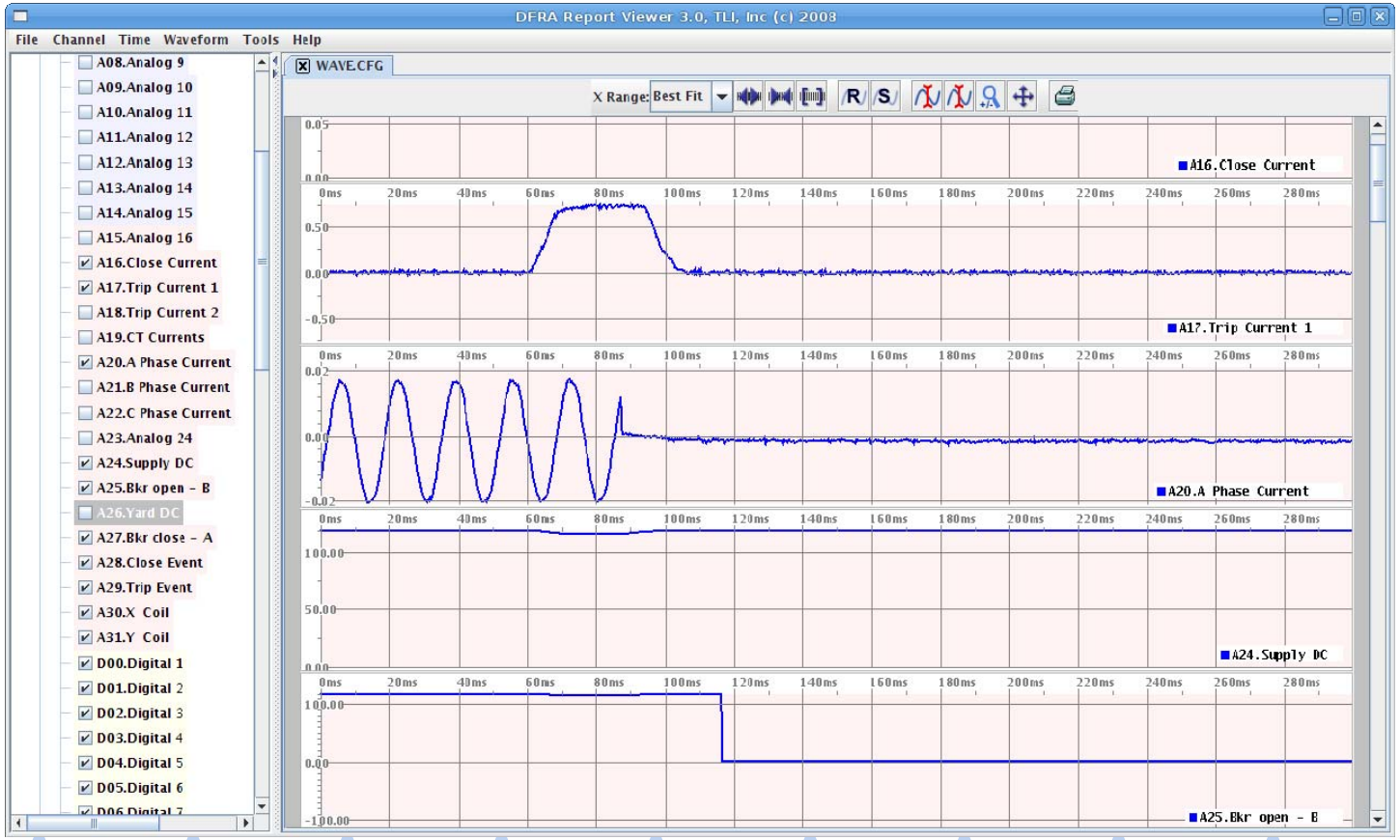
CBR Assistant™ Concept



Example: Reference Trip



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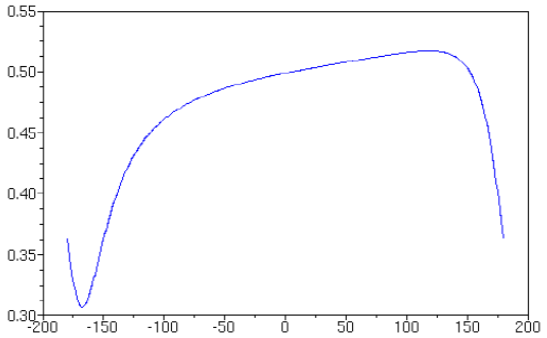
Fault Locator Evaluation

- ATP simulated fault data
- Artificially time stamped
- Single- and Two-End

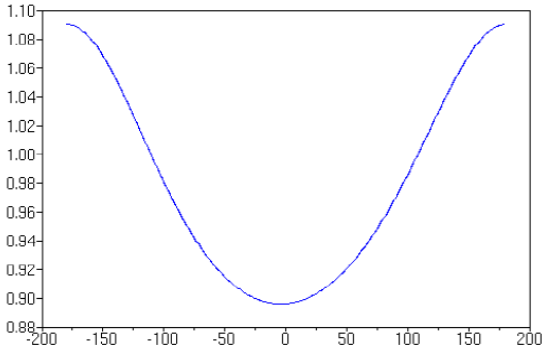
TABLE I
IN-HOUSE EVALUATION RESULTS

#	Fault Type	Number of cases	Single-end Error [%]	Two-End Error [%]
1	A-G	10	0.61 - 3.75	0.05 - 0.27
2	AB	10	0.59 - 2.57	0.01 – 0.48
3	AB-G	10	0.61 -2.57	0.05 – 0.21
4	ABC	10	0.42 – 2.57	0.05 - 0.44

Note: error % relative to line length



a) A-G fault at 0.50 (50%)



b) A-G fault at 0.90 (90%)

Fig. 6. Two-end fault location vs. angle difference

Fault Location Calculation

- Single-end algorithm
  - Expected accuracy 1-5%
  - Data from one end of the line
- Two-end algorithm
  - GPS synchronized data required
  - Data from both ends of the faulted line required
  - Targeted accuracy 0.5%
- Reference
  - IEEE Guide for Determining Fault Location

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Relay Assistant™ Software

- Use of simulated and field data
- Automated testing and reporting
- Advanced editing features
- Testing aimed at application

Relay Assistant™ New Hardware

- Based on Relay Assistant™ simulator components
- 16-bit D/A synchronized outputs
- USB 2.0 communication to host PC
- External replay start (i.e. for use with GPS)
- Small factor

Relay Assistant™ LV-Simulator

Contact

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