ComEd

Exelon

PECO
An Exelon Company

Implementation of PI Historian for Substation Equipment Assessment at PECO Energy

A encore presentation

(plus some new stuff)

John R. Baranowski, P.E.

Agenda

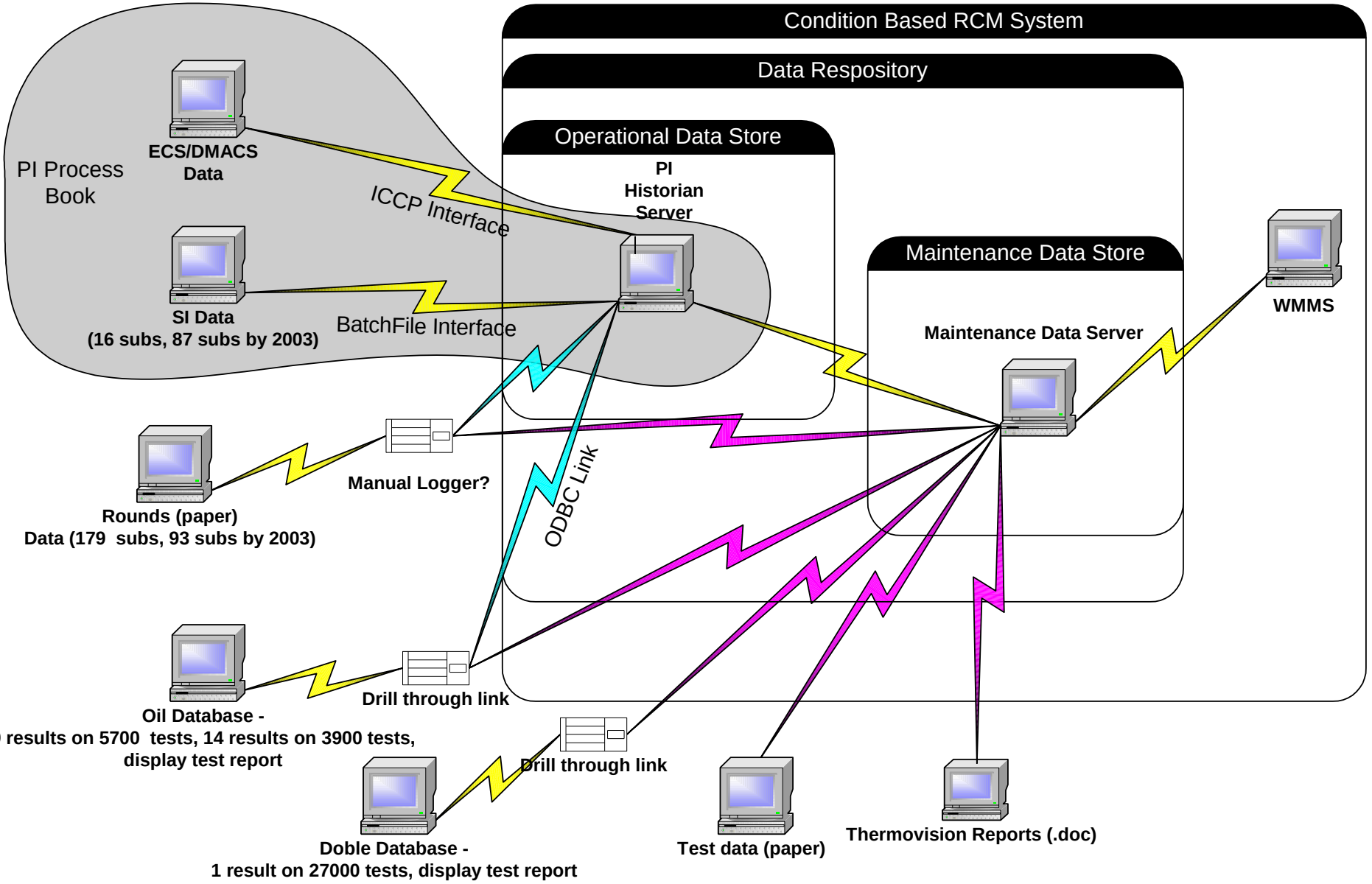
- Maintenance Data Analysis System
  - Background and Goals
  - Current System Architecture
- PI system configuration and history
- Process Book Displays
  - Equipment summary displays
  - Power System 'batches'
  - IEEE Transformer Standard in Process Book
  - PI Perfmon and PI Ping examples
  - AMR data in PI
  - PI on the intranet
- Lessons learned to date
- Next steps

Transmission & Substation Maintenance Data Analysis System (MDAS)

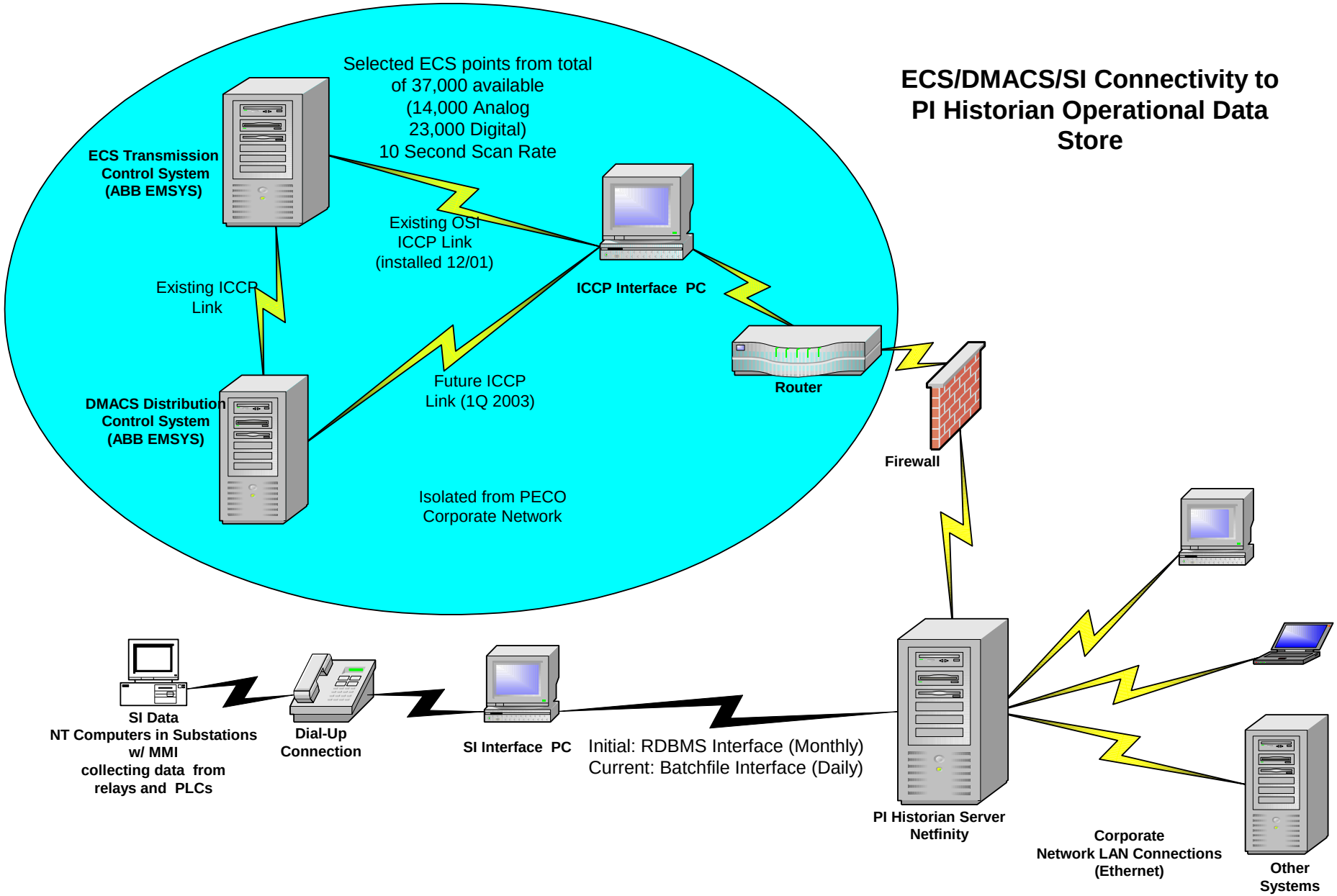
- The current maintenance methodology is one that is time based.
- The data analysis system will allow us to store pertinent information (data warehouse) used by the knowledge management system (expert rules) to determine when a piece of equipment requires maintenance.
- Moves us from time based maintenance to condition based maintenance.
- Currently collecting over 48 Million data points per year from 9 Substation Integration (SI) substations.

The Business Case

Maintenance Data Analysis System (MDAS) Overview



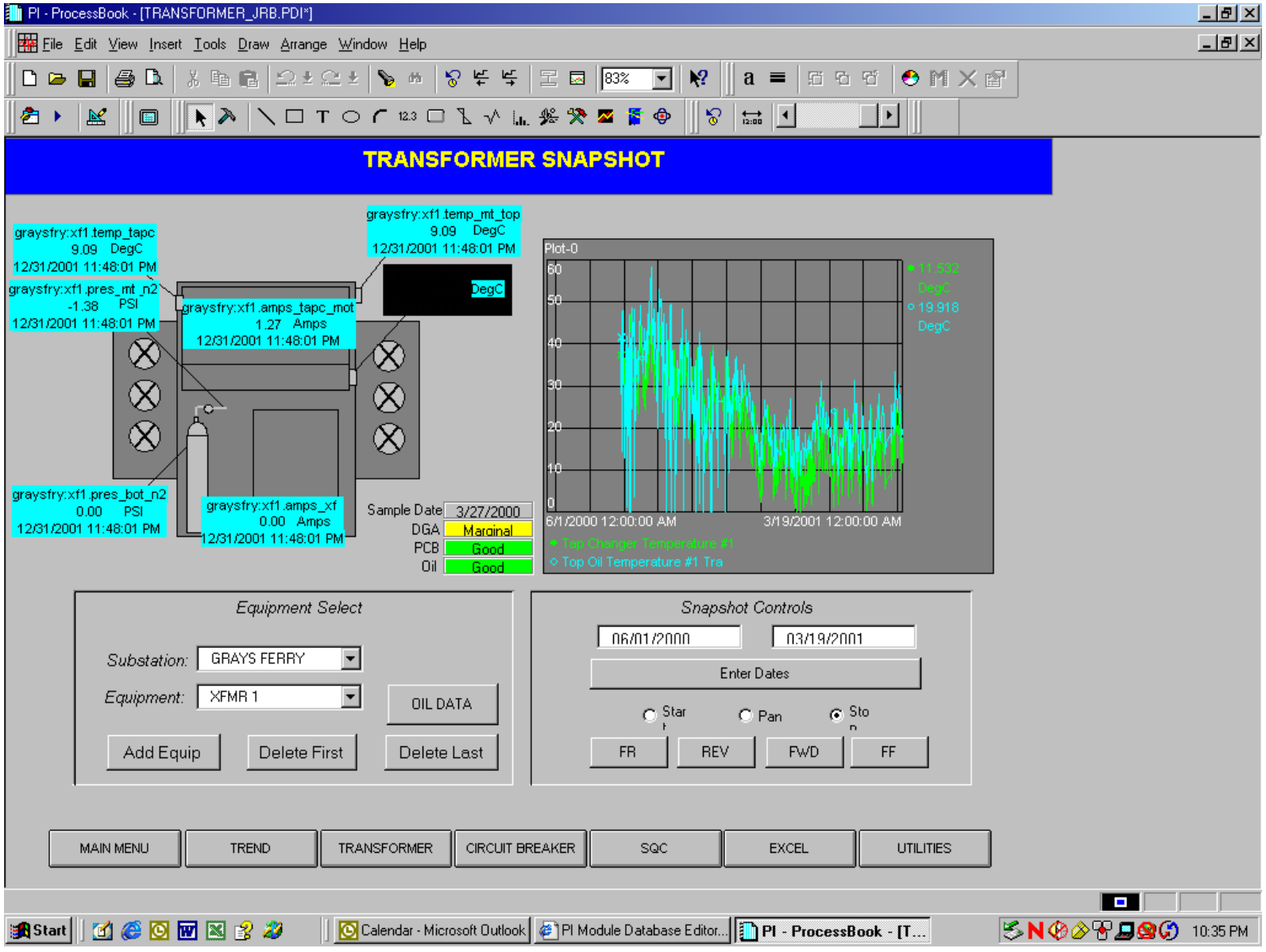
ECS/DMACS/SI Connectivity to PI Historian Operational Data Store



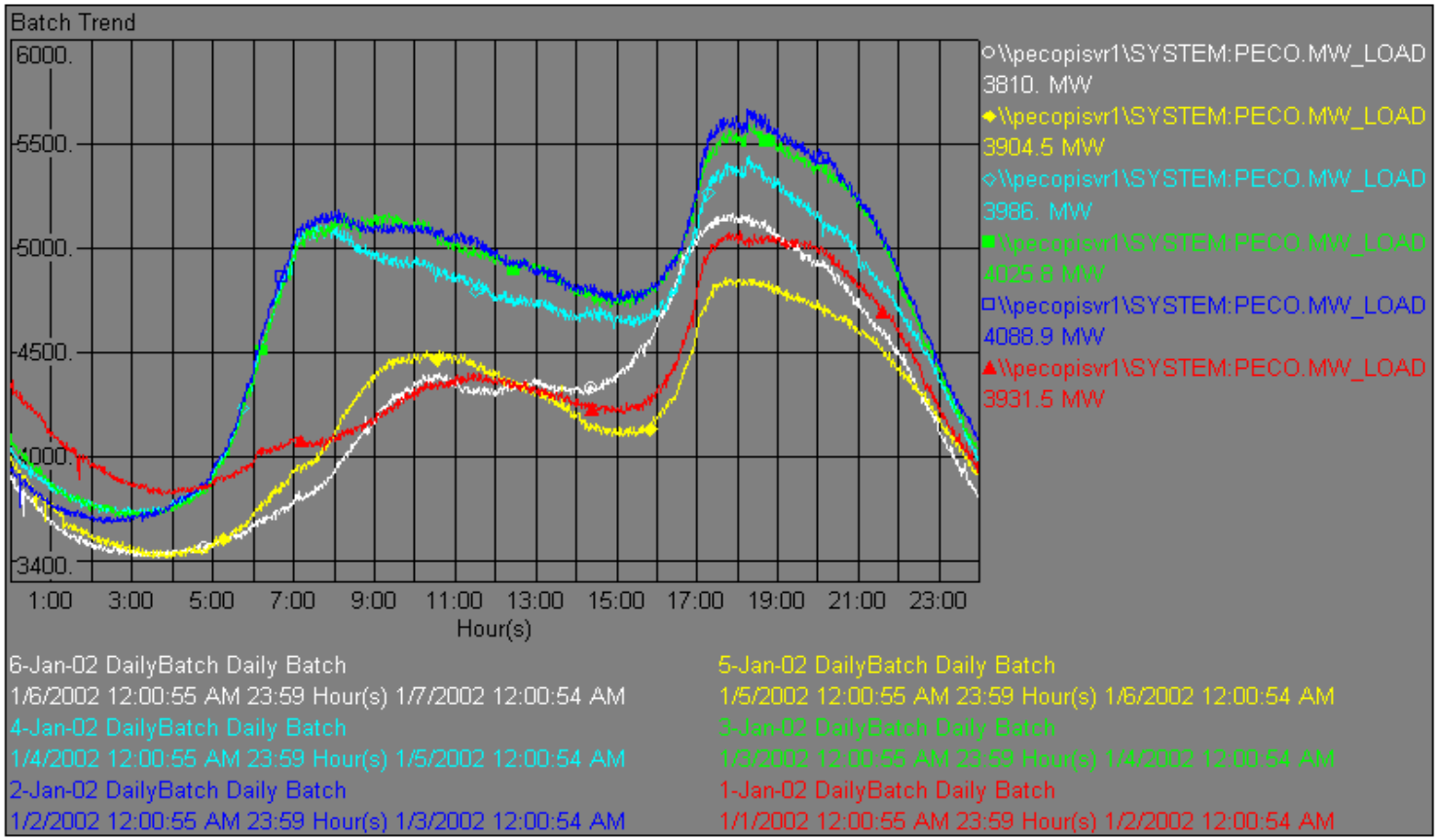
PI Historian Implementation
A short history

- Test server (v3.2) delivered from vendor in February 2001.
- Test server rebuilt (v3.3) in July 2001
- Production server configured in August 2001.
- Production server databases rebuilt in November 2001.
- ICCP interface installed in December 2001.
- PI-Ping and Perfmon purchased in December 2001.
- Batchfile interface begins use in January 2002.
- AMR data using Batchfile in July 2002.
- PI Web Page using devnet example in August 2002.
- PI Data Access Pack purchased in September 2002.

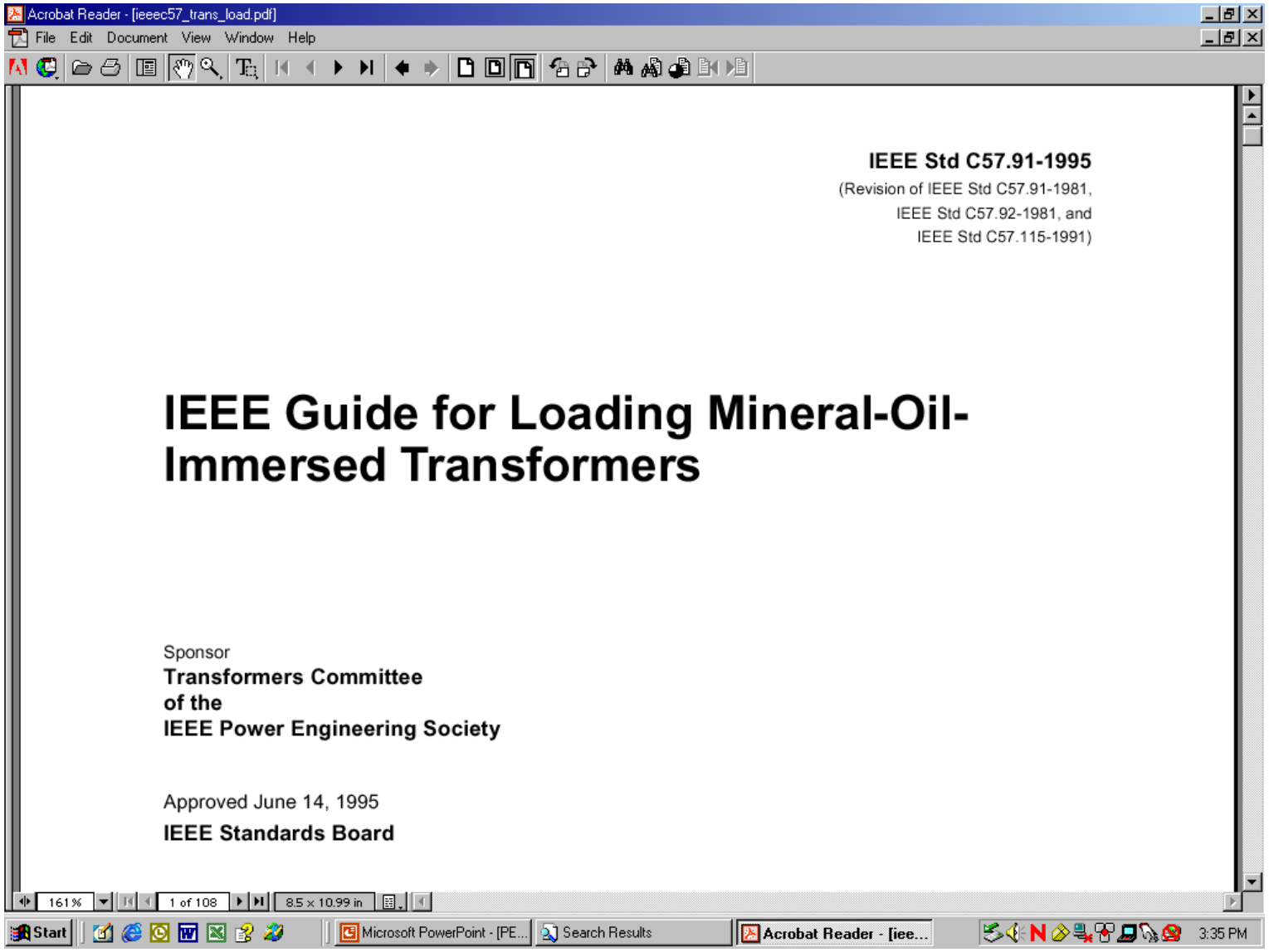
Transformer Process Book Display with ODBC links



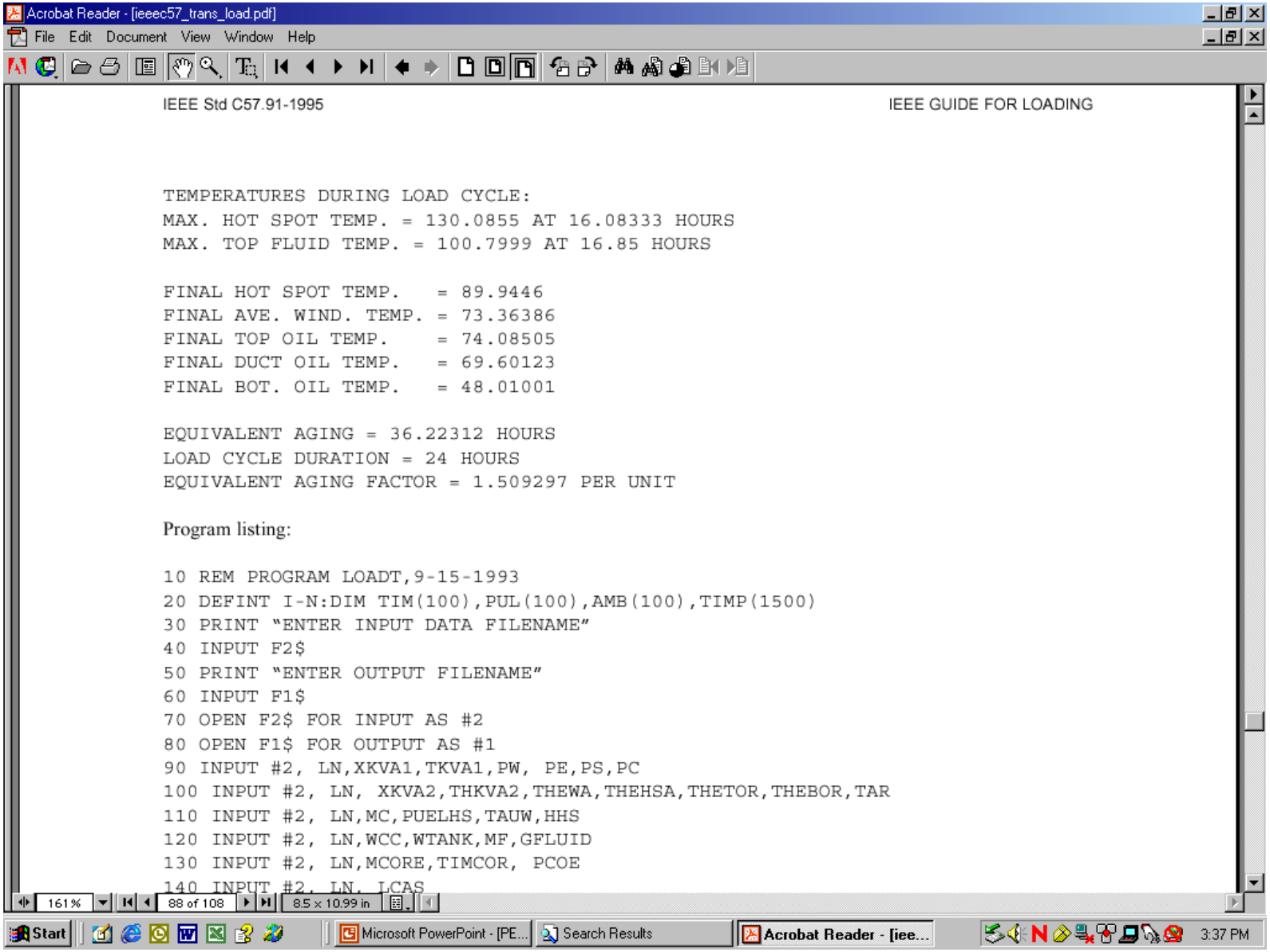
Batch Trends



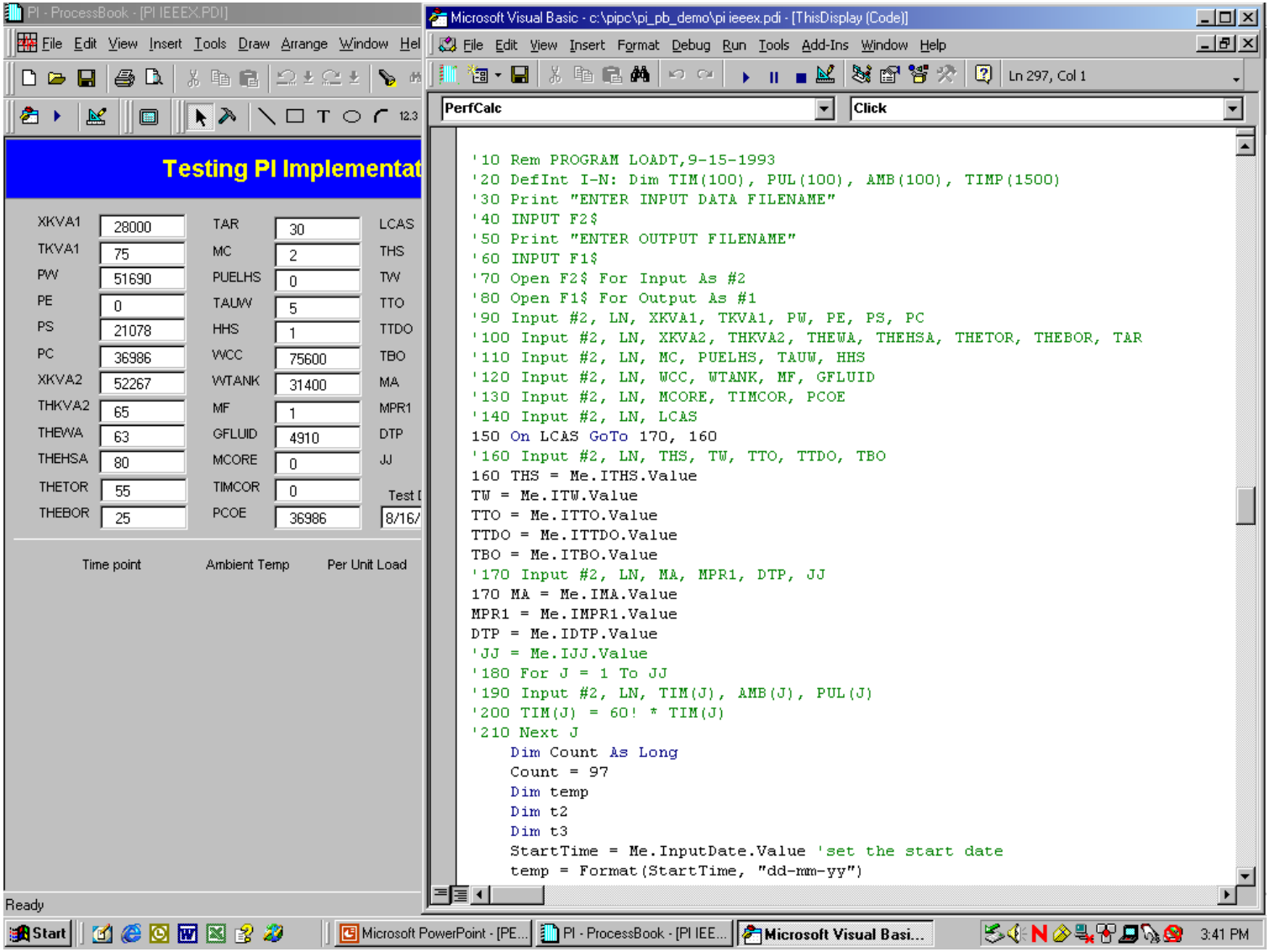
IEEE C57.91 Standard



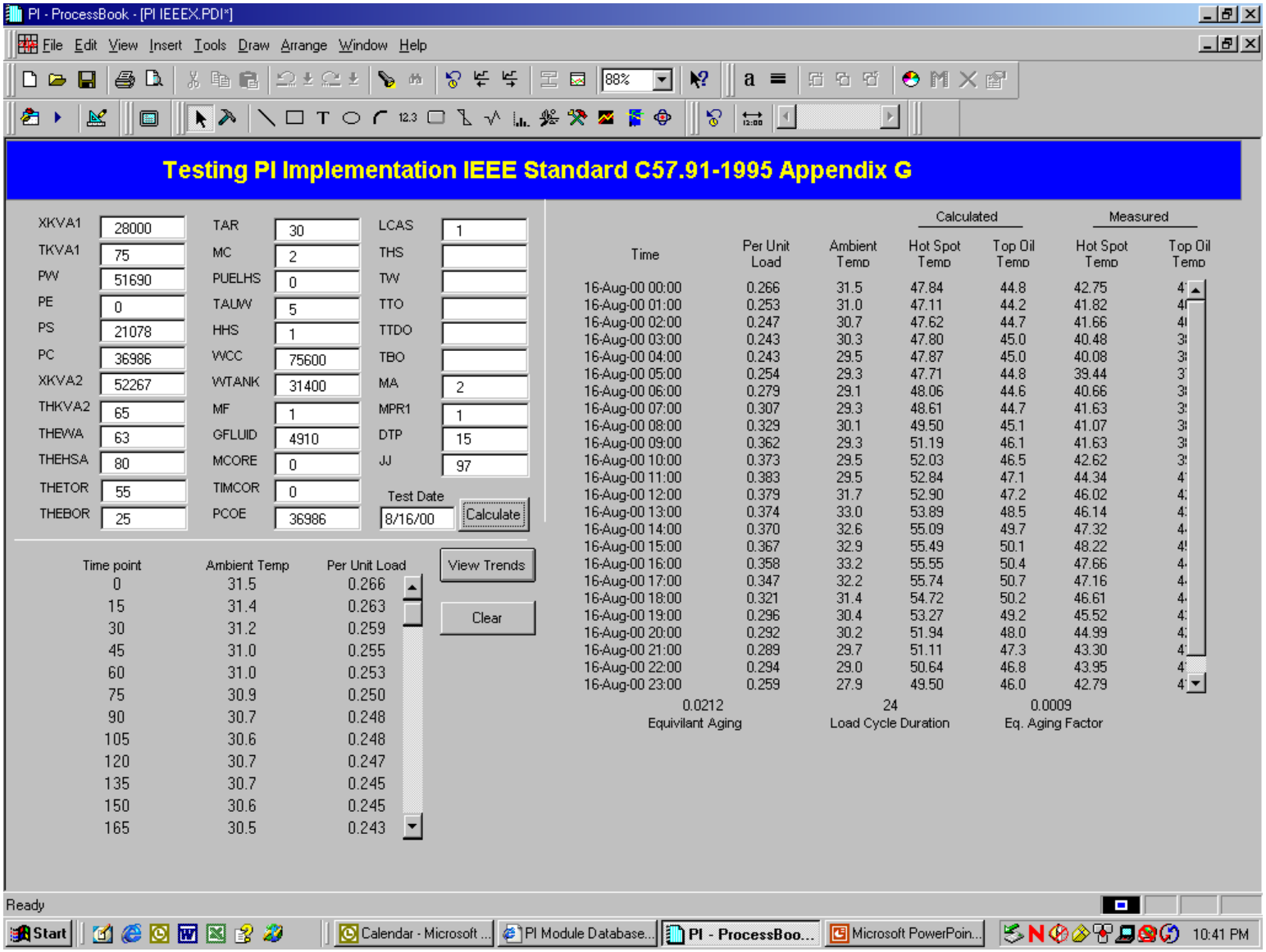
IEEE Loading Program



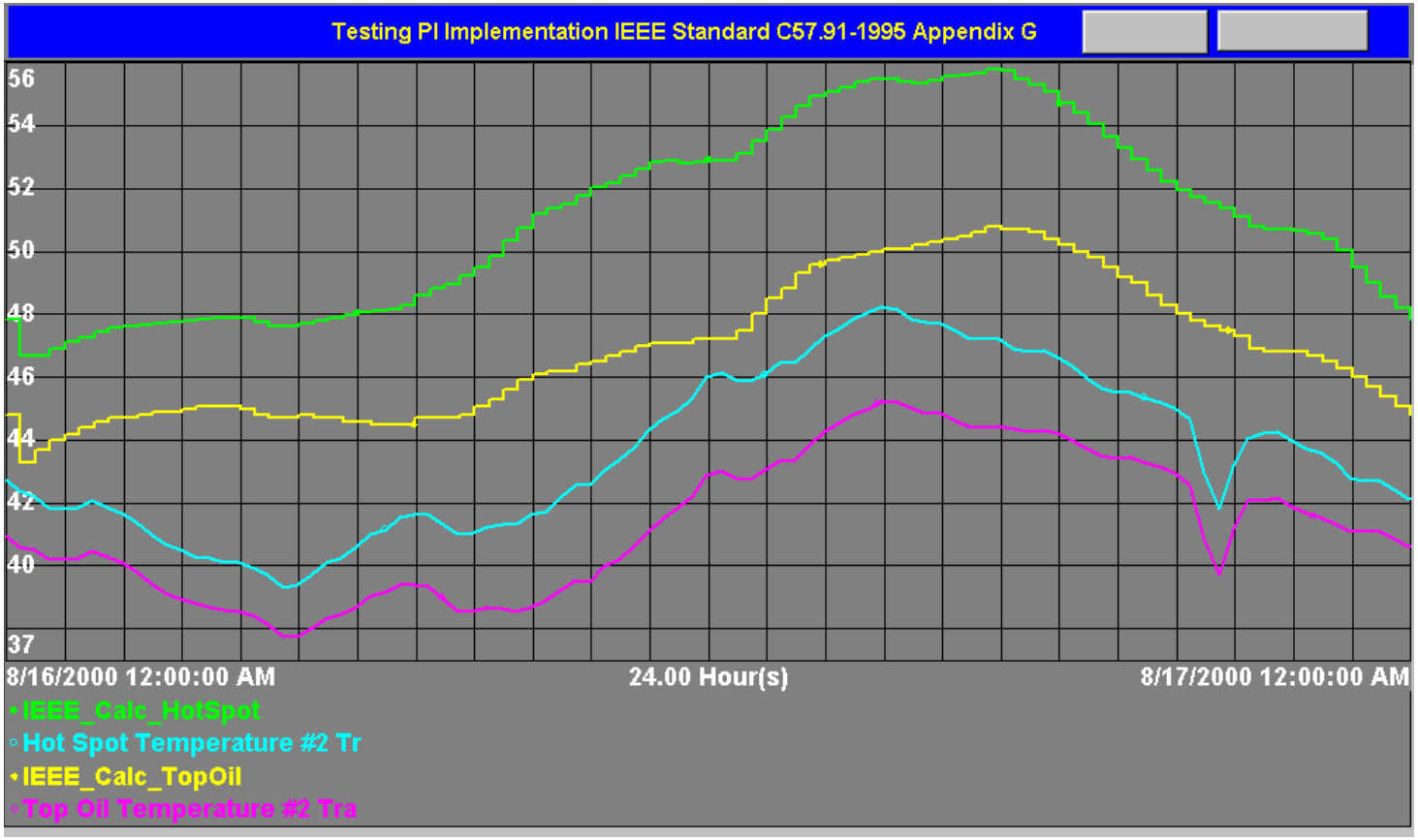
IEEE Loading Program in PB



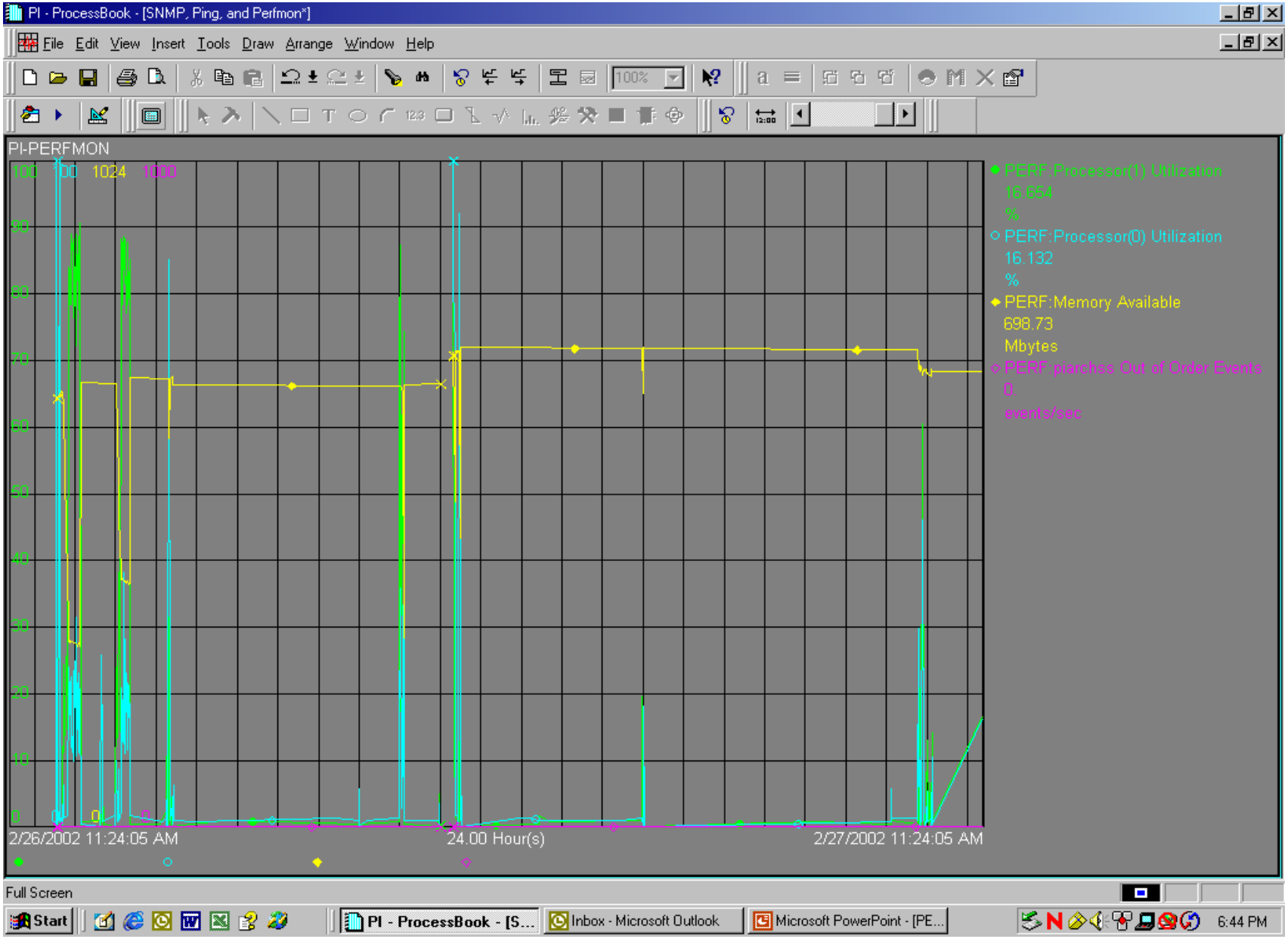
IEEE Standard in Process Book



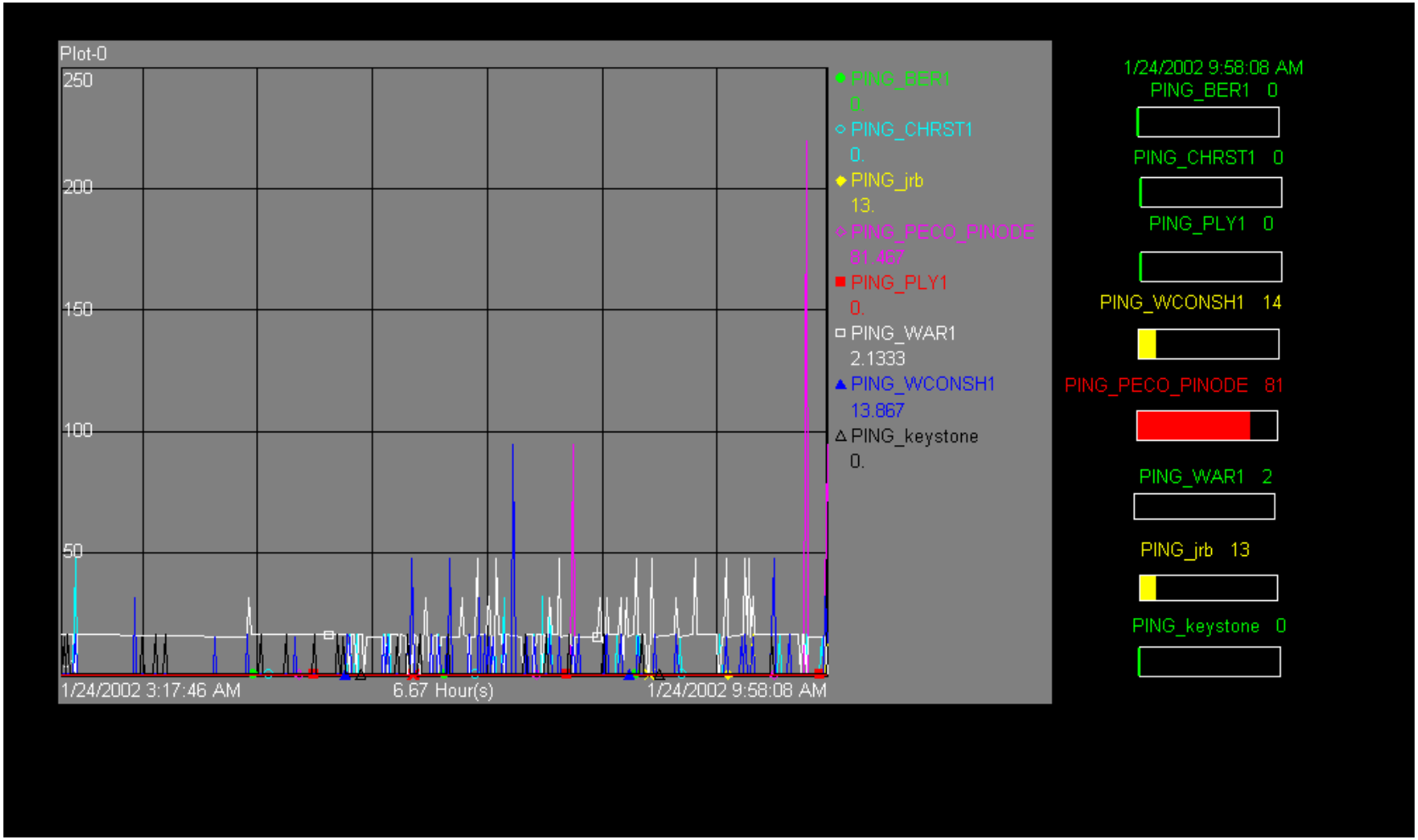
IEEE Standard Graph



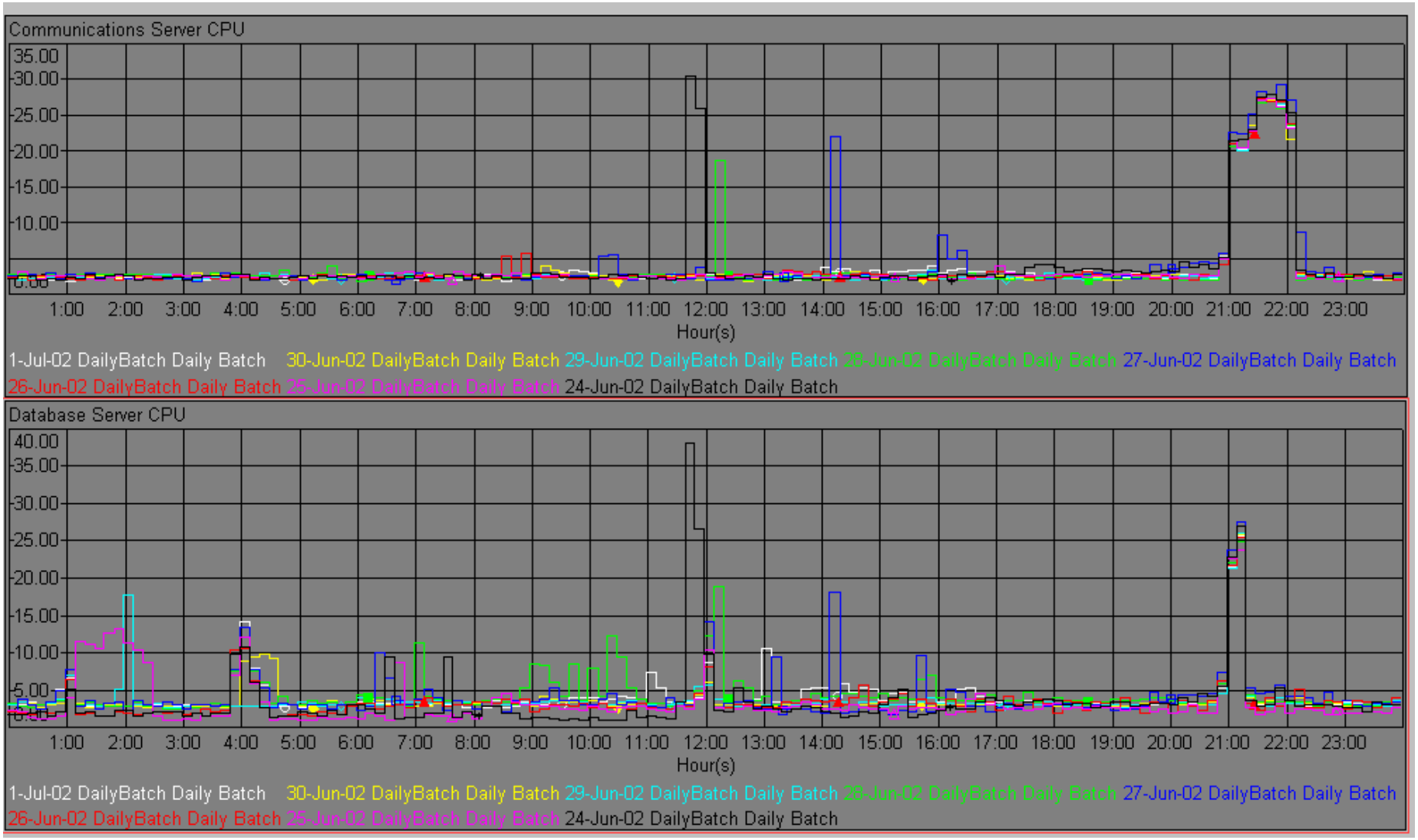
PI Perfmon for PI Server Status



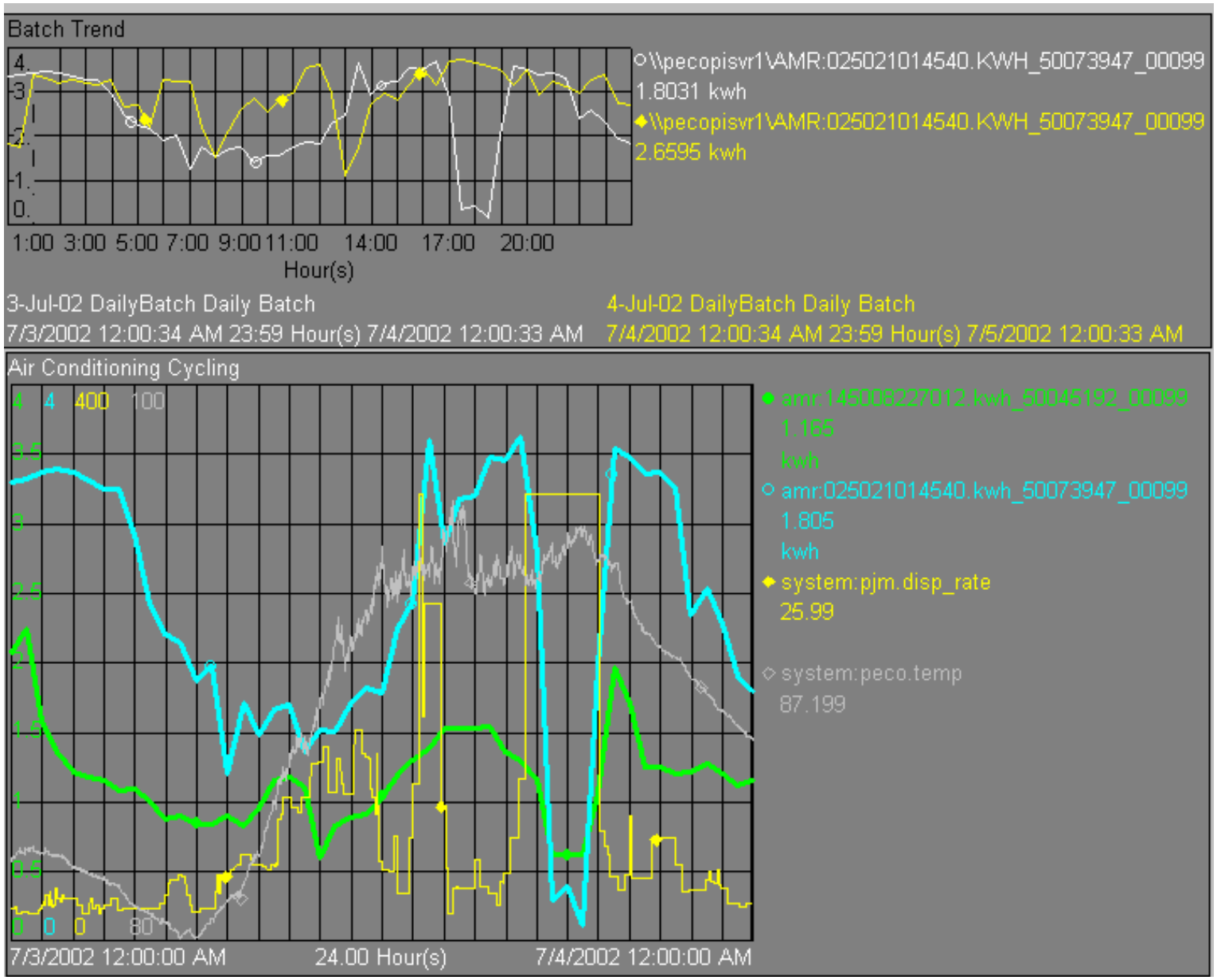
PI Ping for Server Status



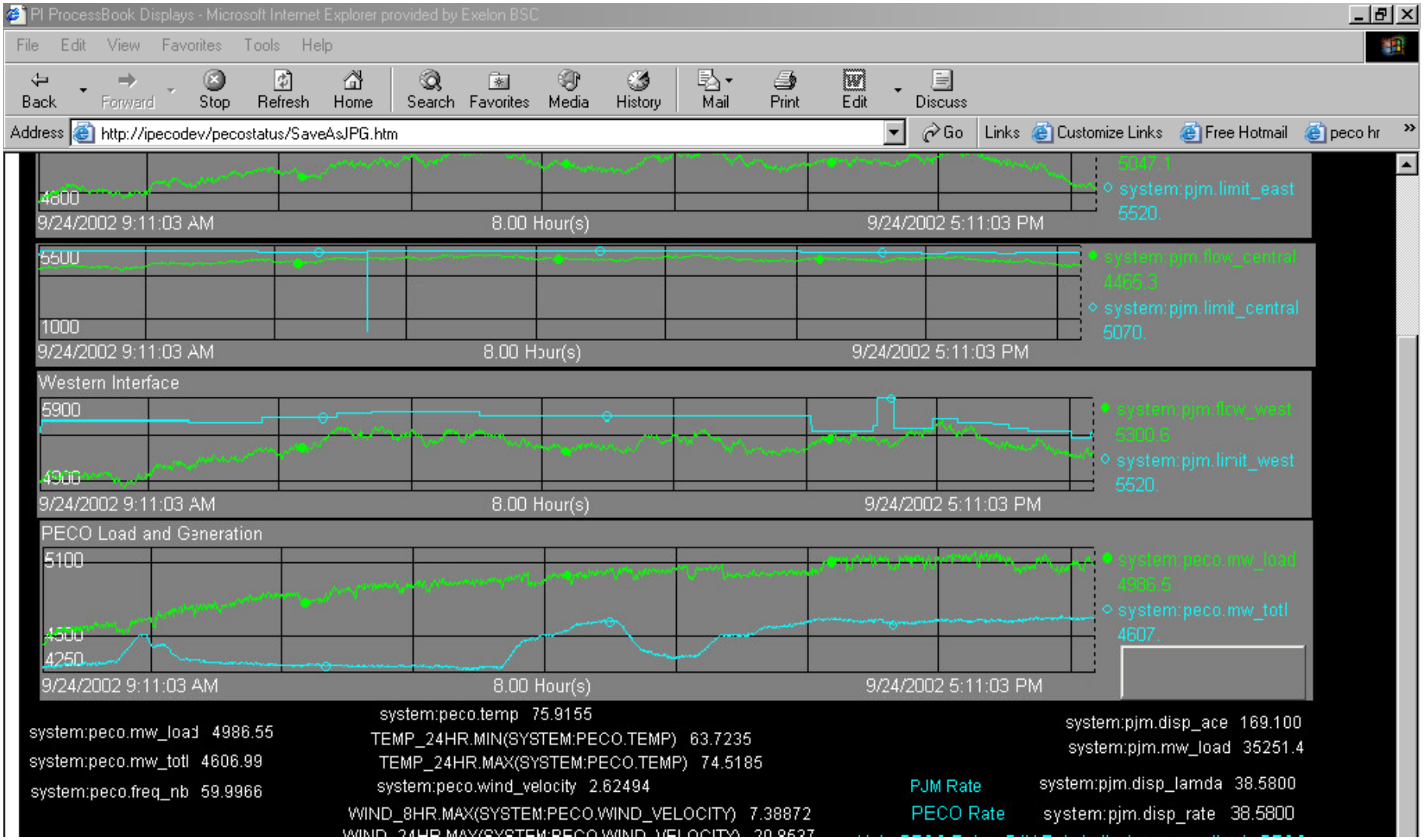
Perfmon & Batch for OMS Analysis



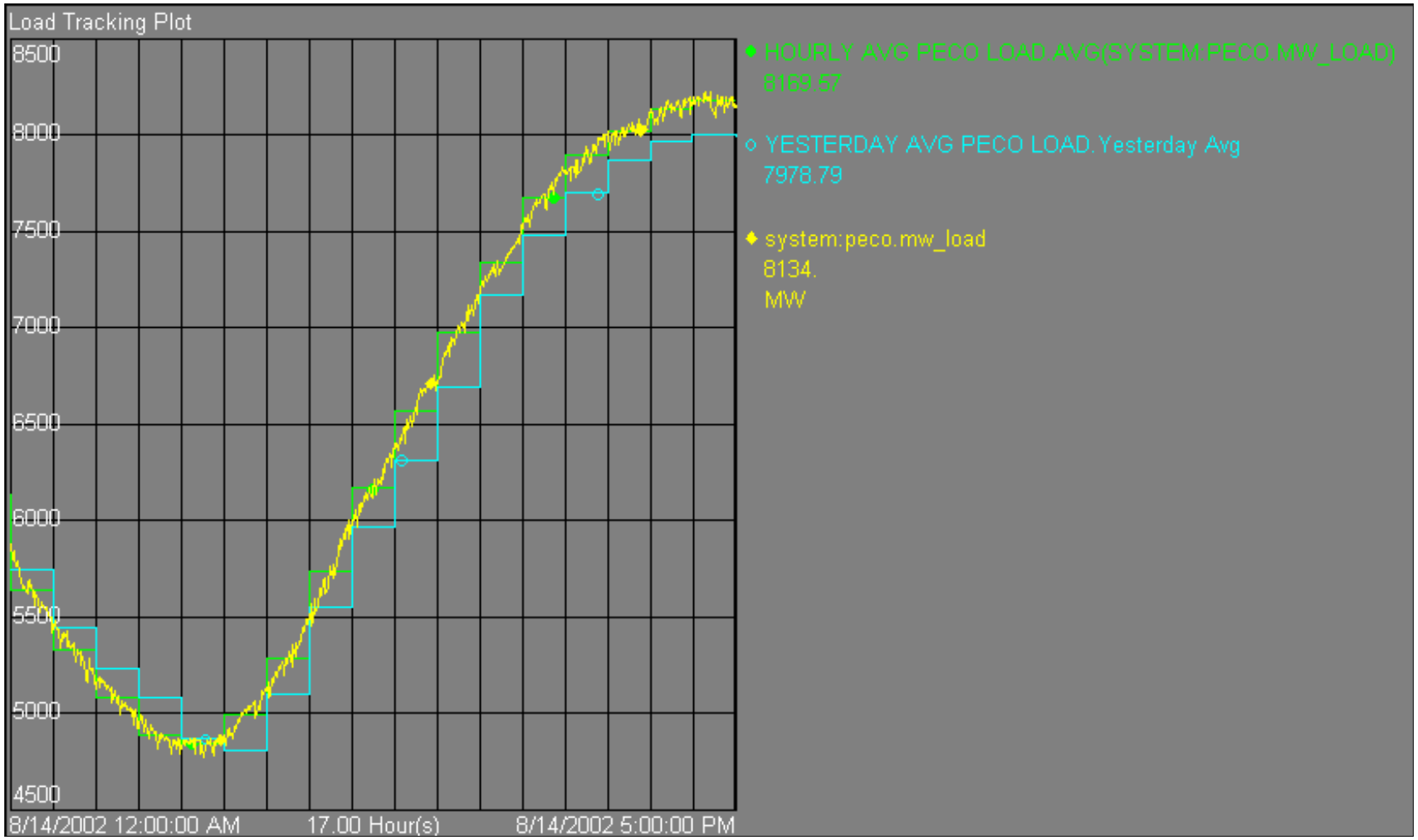
AMR Data (A/C Cycling)



System Status Web Page (Using devnet example)



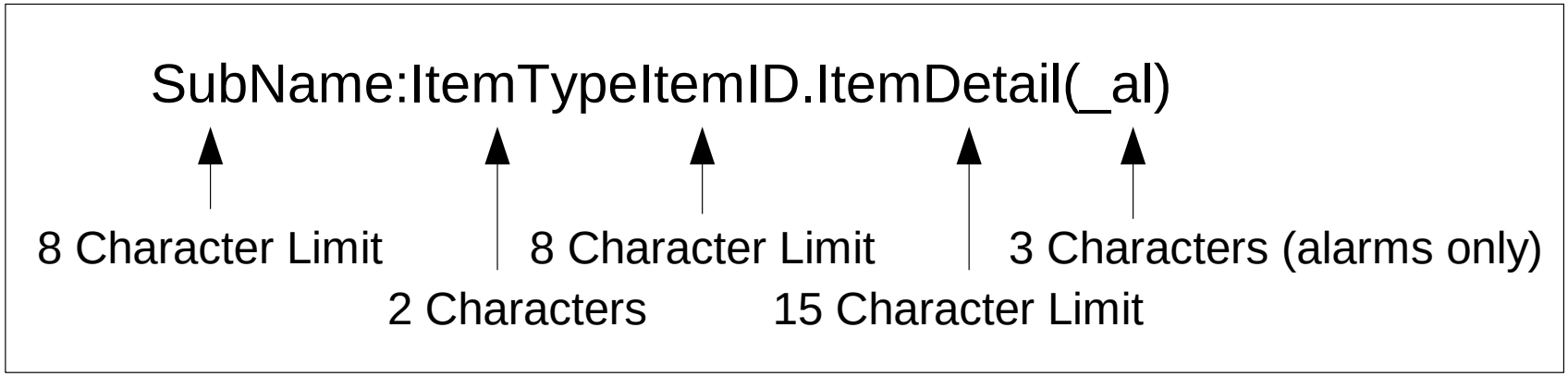
A better load display (next steps)



Lessons Learned

- Train early and often.
  - Initial training held, but ongoing training needed.
- Define PI point naming convention earlier and develop change management process.
- Spend the time up front to verify all data and compression settings.
  - OSI provides a good set of tools to modify and update archives.
  - Data Access Pack can help build auditing reports.
- Use DevNet to jumpstart development.
- Build Process Books, not individual displays.
  - Easier to maintain and distribute.
- ICCP link is difficult to set-up initially, but once configured it runs well.
  - Be sure to have access to EMS vendor during install.
- Batchfile interface is simple and reliable.

PECO's Point Naming Convention



Sample tag names (from Grays Ferry)

- -graysfry:cb025.pres_hi_sf6
- -graysfry:xf1.temp
- -graysfry:xf1.temp_al

Sample pattern tag searches:

- -*:xf*.temp*
- -*_al

Next Steps

- Use Module Database for ODBC links to other systems and aliasing for algorithms
- Use Module Database for common equipment displays
- PI ACE for algorithm development/links to other systems?
- Develop Web displays for summary data (executive information/storm response)
- Use Data Access Pack to send data to Cascade, and write audit reports
- Use AMR and PI for unit substation & network monitoring ('poor man's SCADA')

ComEd

PECO
An Exelon Company

Exelon

Questions???