Symposium 2010: The 25th Meeting

- PEPSE User Group Meeting
- Performance Software User Group Meeting
- Symposium

August 18, 2010
What keeps you up at night?

- Outage headaches?
- Lost megawatts?
- Plant trips?
- Cyber security issues?
- Equipment degradation/prediction?
- A stubborn network issue?
- Inadequate time; decreasing manpower?
What keeps Scientech up at night?

The never ending need to innovate.
Scientech Innovations

• PEPSE
  ✓ Created in 1977 - mainframes
  ✓ Minicomputers in the early ‘80s
  ✓ Design mode components
  ✓ PCs in the ‘90s
  ✓ Special Option 6
  ✓ PEPSE-PMAX link in the ‘00s
Scientech Innovations

- R*TIME
  - Evolved from early post-TMI SPDS/ERFDADS projects
  - Original Modcomp and DEC computing platforms; Aydin, Tesselator monitors; Flick database; all software was custom
  - Unix servers; X-Windows HMI at PVNGS, NMP in early ‘90s
  - Port to Windows 3.1 in early ‘90s – productize – R*TIME is born
  - First to deliver on Windows platform – TMI PPC
  - Presently Windows Server ’08 or Solaris 9 and Windows XP/7
Scientech Innovations

• PMAX
  ✓ ‘First in class’ for real-time plant thermal performance in 1984
  ✓ MicroVax computer platform; Intecolor monitors
  ✓ Windows PCs in the 90s
  ✓ Sootblower advisor
  ✓ Input Validation using Advanced Pattern Recognition in the ‘00s
  ✓ WebView – real-time thermal performance through an internet browser
Scientech Innovations

- PdP Monitoring

**PdP**

Specific Component

*REAL-TIME DATA*

Pressures
Temperatures
Flows
Vibrations
Positions
Speed
Load
Performance results
Efficiency
Calculated values

**Prediction Algorithm** (SSA)

Actual Sensor Values

Expected Value for Each Sensor

Actual vs. Expected

Early Warning

Bearing Problem
Scientech Innovations

• Rules Engine - Automated Assessments

✓ Application is dynamic, real-time assessment process; not static look-up lists
✓ Rules incorporate all specific integrated information & results - real-time, periodic, off-line
✓ Utilizes decision tree analysis processing
✓ Rules configurable to any modeled component
✓ All rules and calculations are user configurable
✓ Integrates with all FAMOS monitoring products – PMAX, PdP
Fleet Asset Management and Optimization Solution

Debuted in 2008. What is it?

- integrated solution set of applications for analyzing and optimizing plant performance, monitoring and detecting problems, and providing insight and visualization to various plant data & information sources.
Scientech’s FAMOS Product Platform

✓ **R*TIME** - platform for high speed data acquisition, display and historian/archival

✓ **PEPSE** - off-line, first-principle modeling tool to establish best achievable KPIs

✓ **PMAX** - thermal performance monitoring and process optimization

✓ **PdP** - advanced pattern recognition for anomaly detection and prediction

✓ **Rules Engine** - diagnostic and decision support tool, coupled with rules assessment library

✓ **FAMOS Suite** - integrated performance and equipment condition monitoring for asset management
FAMOS System – Integrated Condition Monitoring

- Real-time monitoring, alarming, and information integration; composite model approach – plant health visualization
- Pattern prediction (PdP) and thermal performance (PMAX & PEPSE) monitoring results as well as other condition monitoring information
- Component Assessment Library for automated condition assessment
- Advanced alarm processing and management
- Detail diagnostics and drill-down
- Asset management resource
Complexity to Manageability

- Higher expectations on everyone
- No time to waste
- Less or decreasing manpower
- Intolerance for unanticipated equipment failures
- Need for immediate data acquisition
- Need to predict degradation as early as possible
- Many sources of component & system information
- Many databases to access
- Need for real-time performance indicators

✓ Optimized Processes
✓ Application Integration
✓ Automation
✓ Trusted/Capable Supplier

more sleep?
FAMOS Installations

- PMAX adopted world-wide by >250 thermal power plants (nuclear, fossil, combined cycle)
- PMAX is the On-line thermal performance tool of choice at 59 of USA’s 104 nuclear generating units
- Utilized by seven (7) major nuclear fleets in the USA – Constellation – Duke – Exelon – First Energy – PSEG – TVA – FPL (Turkey Point & ST. Lucie)
- PEPSE is in all the USA nuclear power plants
- PdP is used at fossil, wind, and T&D situations; some fleet, others site specific
- FAMOS implementation at fossil fleet
What’s next?

(Project Facelift)
What is ‘Project Facelift’?

✓ Commenced in April 2010

✓ Plan and develop the business case for the next several years of integration and innovation in the FAMOS product line

✓ To the extent possible evaluate the technical and implementation underpinnings for:

• Decisions related to “make vs. buy”: acquisition of technology, teaming partnerships, internal development, open source tools, etc.
  o Platform decisions
  o Common ‘look and feel’
  o Enhancements

• Phasing the development to integrate with Scientech and CWFC business goals
Who is ‘Project Facelift’?

- Brent Young, Chairman
- Jim Herzau, ER/Utility Applications Expert
- Dan Popovich, Software Engineer
Project Facelift - Scope

- Become familiar with the various FAMOS products.
- Reach out to key stakeholders, both internal and external, and identify their needs.
- Collect information on the business process for the FAMOS line of products.
- Identify, evaluate, and recommend technologies/modifications to enhance the FAMOS user experience, marketability, development, and support.
- Deliver presentation of Project Facelift results to Scientech management during the 2011 business planning cycle.
- Brent/Jim/Dan: do all of this in your spare time.
Prepare a business case for Project Facelift

✓ What direct “fixes” and “updates” need to be made to the products?
✓ What technologies would be most appropriate such as compilers, operating systems, databases, languages, platforms, networks…?
✓ What is the market for these products?
✓ Who competes with us; what are they doing?
✓ What would the project cost in time, resources and money?
✓ What are the benefits of modernizing the FAMOS products?
✓ What are the most requested and desirable improvements?
✓ What would be “nice to have”?
✓ What are the costs and benefits of these upgrades?
✓ How difficult will it be to implement specific updates?
✓ What are our conclusions and recommendations?
What is your (the customer) role in Facelift?

✓ What direction do you see FAMOS going?
✓ Looking down the road and around the corner, what is the next big problem you face for which you have inadequate tools to solve?
✓ In what areas does the current FAMOS implementation fall short of your expectations?
✓ If you could have one new super-whammy-dyne enhancement to FAMOS that solves your most gnarly, most stressful problem what would it be?
✓ All week, and especially on Friday, passionately communicate your needs for the FAMOS suite.
Why FAMOS?

✓ Integrated solutions focusing on major plant cost drivers: thermal performance and equipment reliability

✓ Converts mountains of data into reliable information allowing efficient and productive action

✓ Asset management resource for operators, engineers and management

✓ Solutions supporting nuclear, fossil and renewable plants

✓ Flexible maintenance subscription terms; not dependent on third party software

✓ Dedicated power plant specialists as a life-line and M&D Center

✓ Technology with a business case ($$$) and documented payback < one year
Why select Scientech as technology partner?

- Demonstrated commitment to plant performance improvement through advanced monitoring tools for over 30 years
  - Dedicated business unit: Plant Performance Group
  - FAMOS: a suite of optimization tools
  - Experienced, dedicated staff for day-to-day support and consultation

- Competitive technology to improve performance and equipment reliability; focused at reducing O&M costs

- Proven implementation focuses on engineering expertise in CM practices for improved model building to assure actionable information with minimum nuisance alarms

- Scientech has a competitive pricing structure and flexible investment terms.
We think we can improve your sleep.