REAL-TIME PERFORMANCE MANAGEMENT FOR THE ENTERPRISE

RtPM

SAN FRANCISCO · PHILADELPHIA · HOUSTON · FRANKFURT

OSISOFT USER CONFERENCES 2005

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Entergy's Transition Monitor
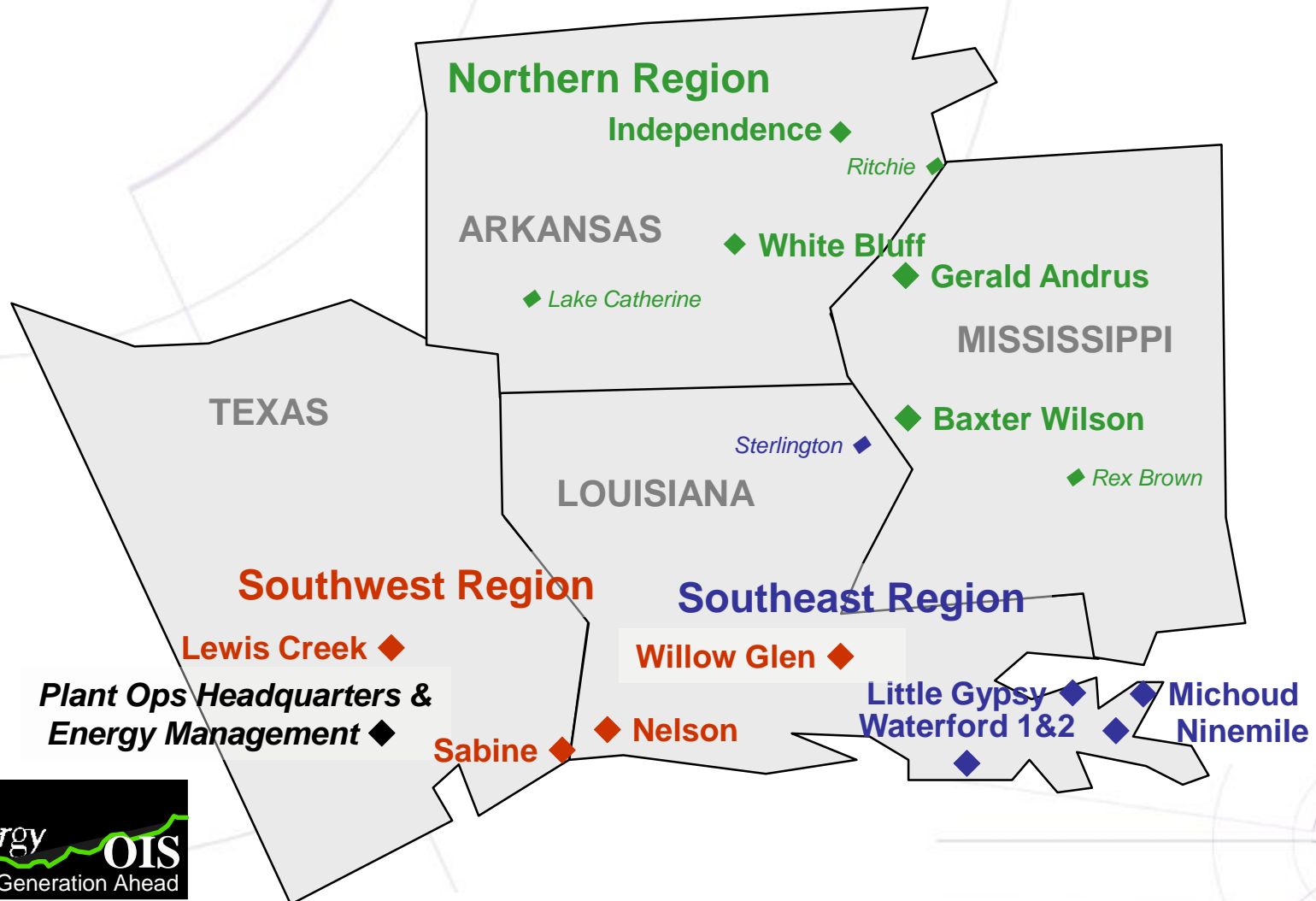## Improving Fleet Performance
April 28, 2005

Agenda

- **Entergy's PI Solutions**
- **Challenges with Unit Start-ups**
- **New PI Solution: Transition Monitor**
- **Tracking Start-ups Using PI Batch**
- **Next Steps**
- **Questions**

Entergy's PI Solutions

• • • • • • • • The Entergy Fossil System • • • • • • • •

Northern Region

Independence ◆

Ritchie ◆

ARKANSAS

◆ **White Bluff**

◆ **Gerald Andrus**

◆ *Lake Catherine*

MISSISSIPPI

TEXAS

◆ **Baxter Wilson**

Sterlington ◆

LOUISIANA

◆ *Rex Brown*

Southwest Region

Southeast Region

Lewis Creek ◆

Willow Glen ◆

Plant Ops Headquarters & Energy Management ◆

Little Gypsy ◆   ◆ **Michoud**
Waterford 1&2   **Ninemile**

Sabine ◆   ◆ **Nelson**

Entergy OIS
A Generation Ahead

Entergy's PI Solutions

Strategy:

Maximizing value from generating assets in a competitive generation market

• • • • • • • • • •

Vision:

Consolidate plant information, operating processes, and business functions in a common framework to support operations and decisions in a competitive generation market
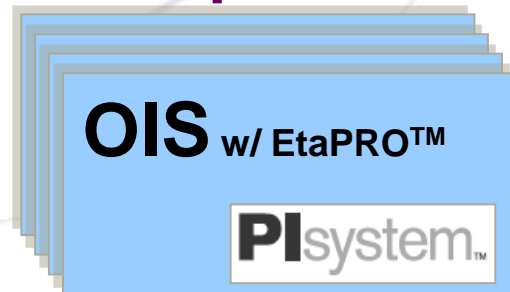
Entergy's PI Solutions
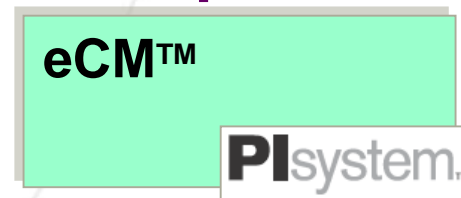
• • • • • • • • Plant Real-time Monitoring & Diagnostics • • • • • • •

Unit Optimization & Equipment Monitors

• **12 plants** •

OIS w/ EtaPRO™

PIsystem™

Event Detection & Alerting

• **15 plants** •

eCM™

PIsystem™

Fleet Optimization

• **18 plants** •

Fleet Processes & Metrics

PIsystem™

Dispatch Support, Fuel Telemetry

PIsystem™

Mobile Performance Testing

• **5 support offices** •

Incremental Heat Rate / Equipment Tests

PIsystem™

Entergy **OIS**
A Generation Ahead
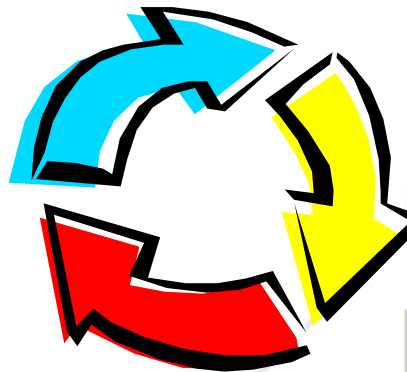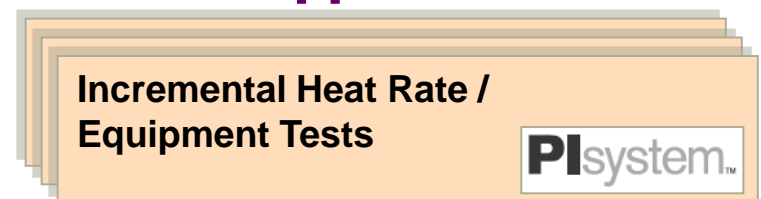
Entergy's PI Solutions

Unit & Fleet Optimization

- Real time operation adjustment
- Real time unit cost
- Real time equipment condition assessment & intervention
- Fleet analysis & decision support
- Start-up monitoring

Entergy
OIS
A Generation Ahead

Start-up Job Aid
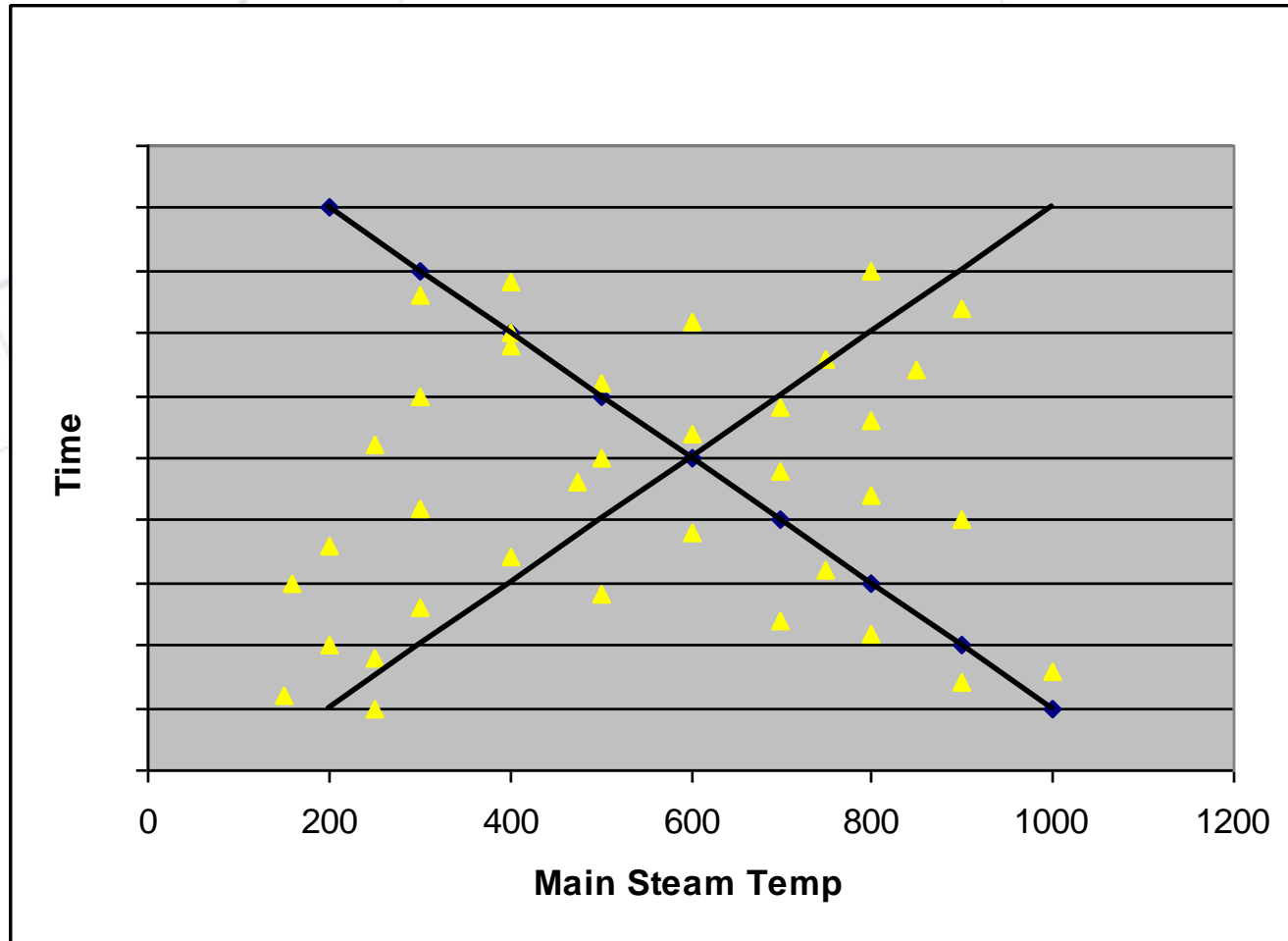
Challenges w/ Unit Start-ups

- Market requires a focus on the **time element**:
  - Duration must be **predictable & repeatable**
  - Must be **"on-line, on time"**

- Changes in **operating roles** for gas / oil units

- **Protect** personnel & equipment

- **Adhere** to environmental requirements

- Need post start-up **analysis**

Challenges w/ Unit Start-ups

- Startups are occasional, not frequent

- Practices may differ shift-to-shift

- Personnel can be shared plant-to-plant

- Aging workforce

- New employees

New PI Solution: Transition Monitor

- Graphically illustrate the start-up process
- Track progress
  - Durations, milestones, "time remaining"

- Link to operating procedures
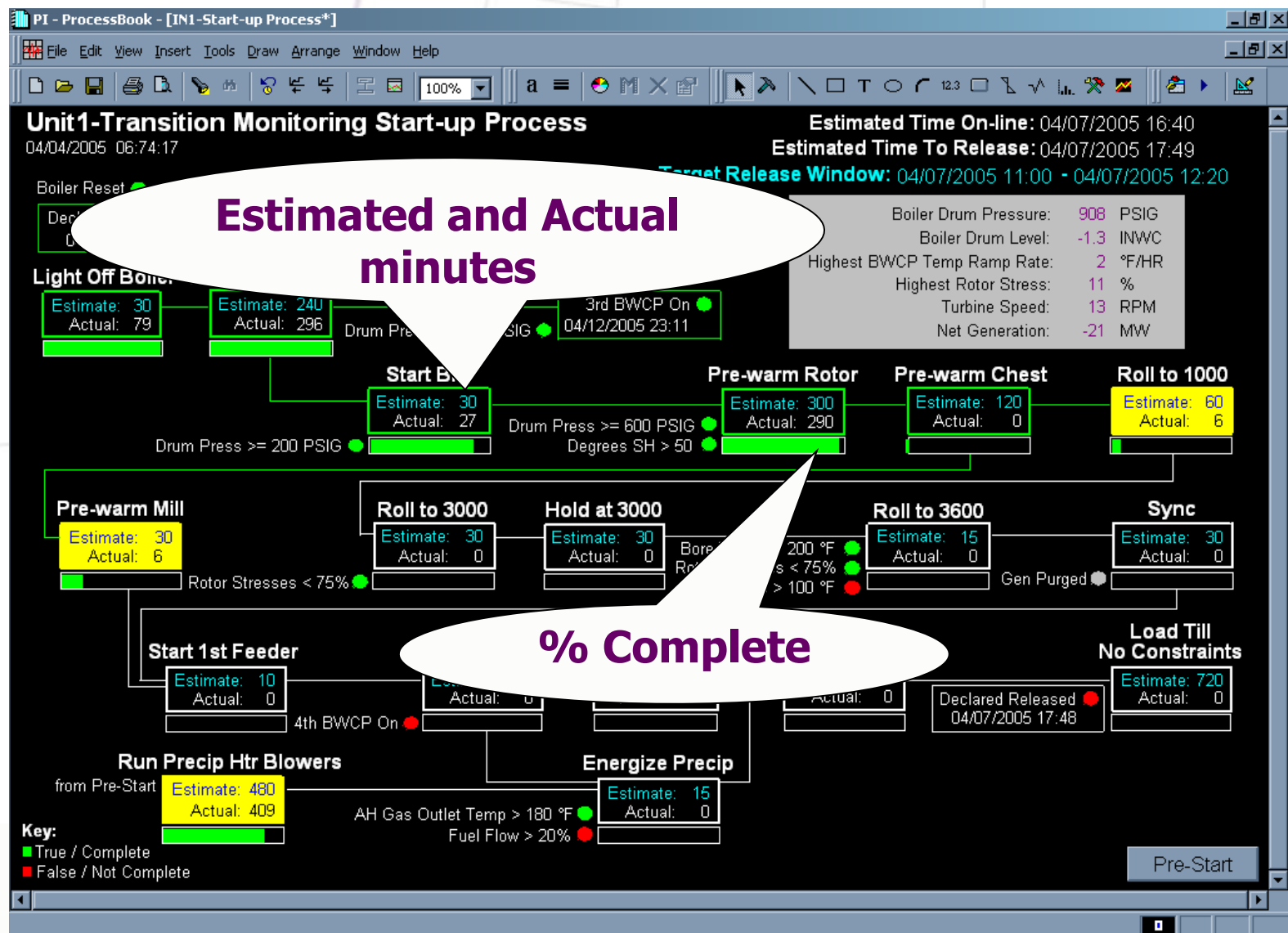- Display key process data
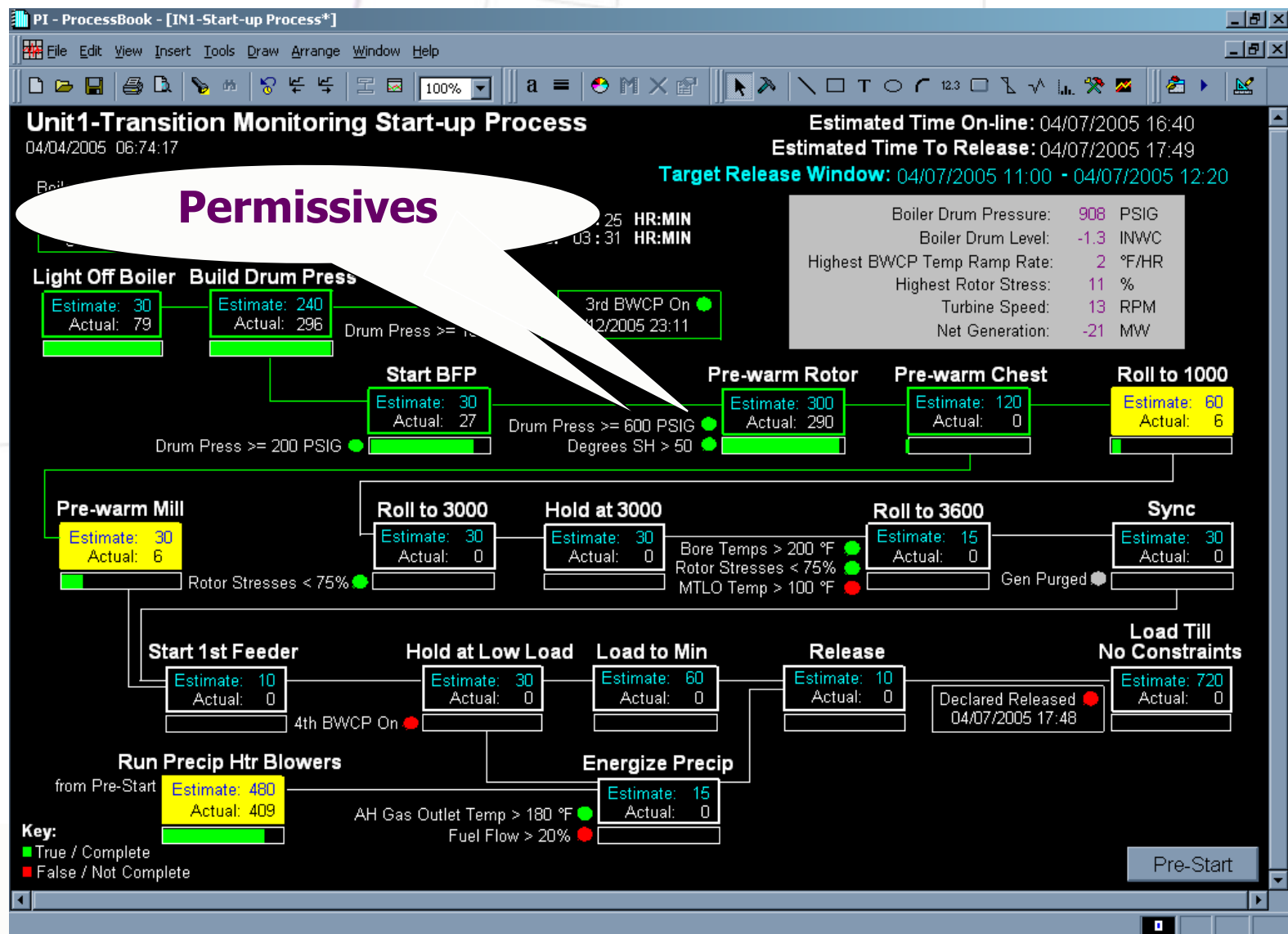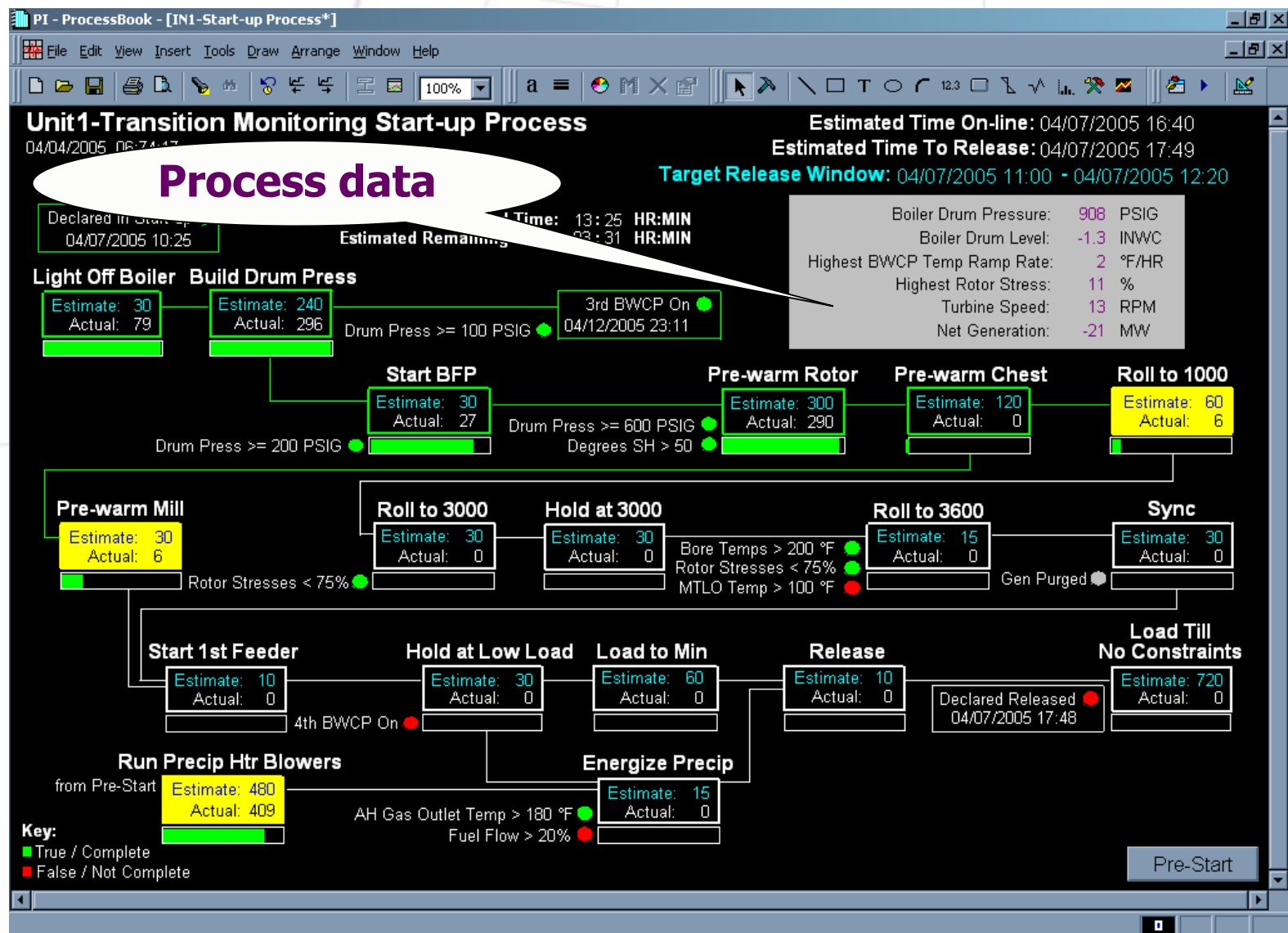- "Replay" startups for process improvement

New PI Solution: Transition Monitor
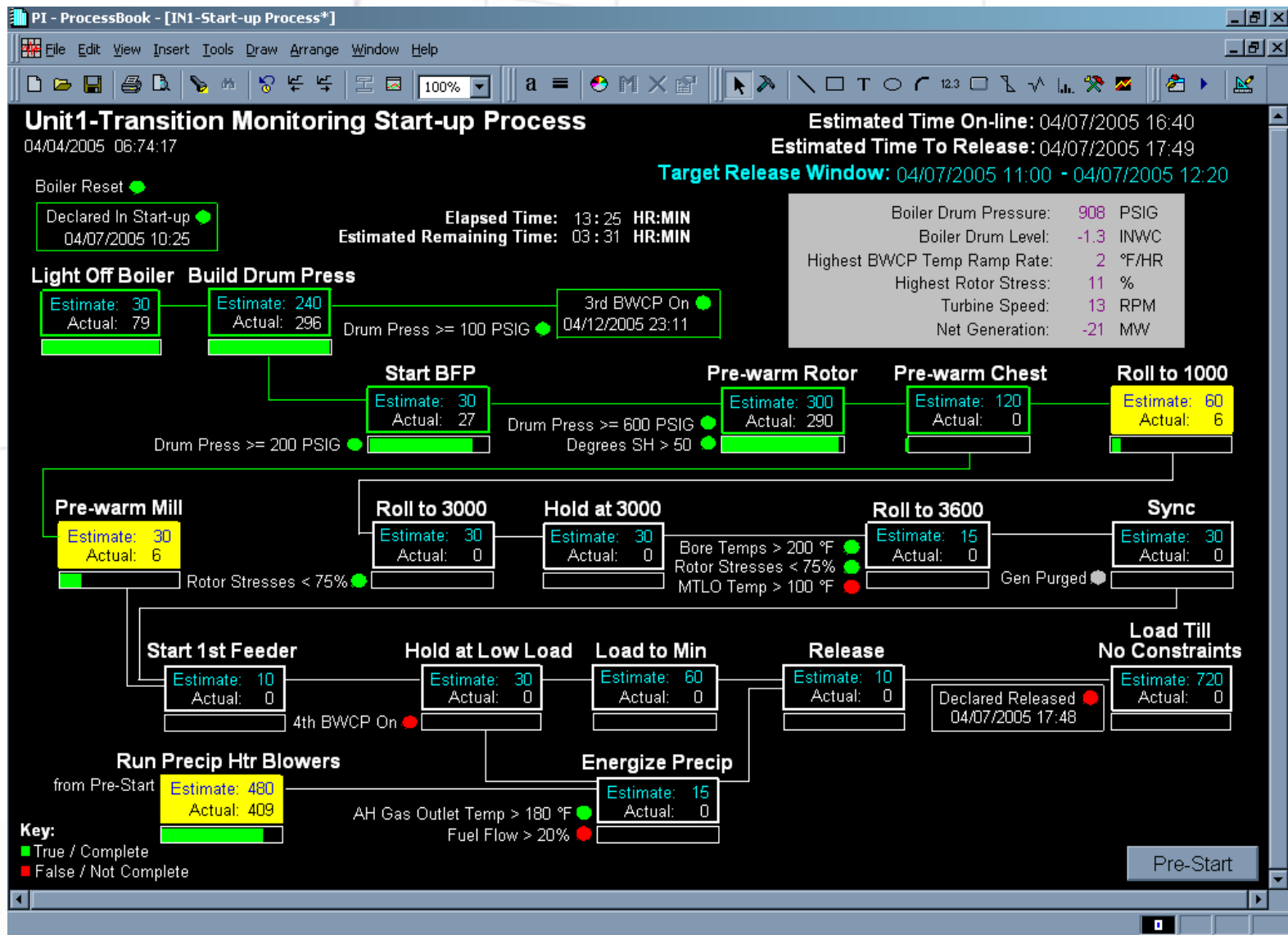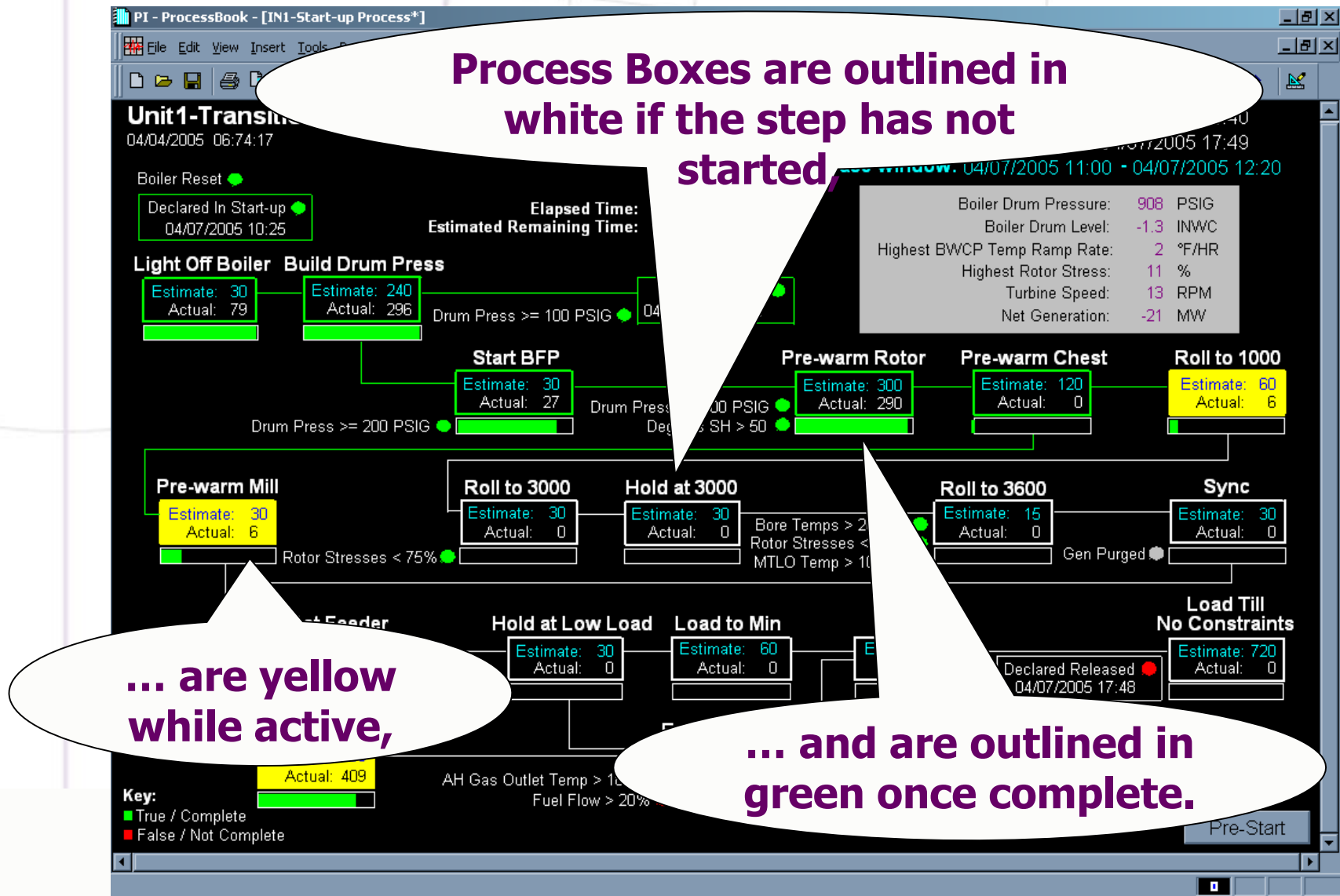
New PI Solution: Transition Monitor

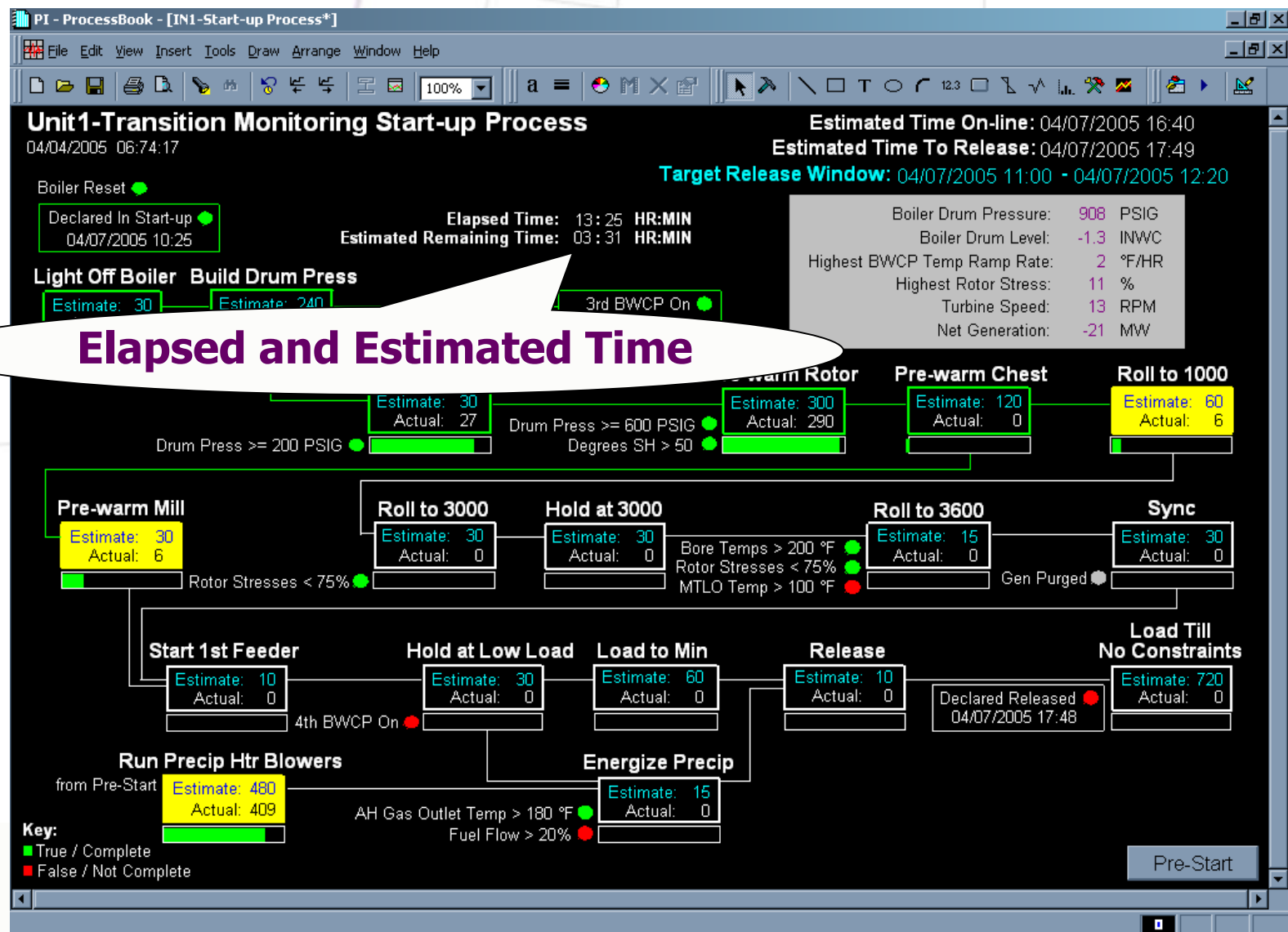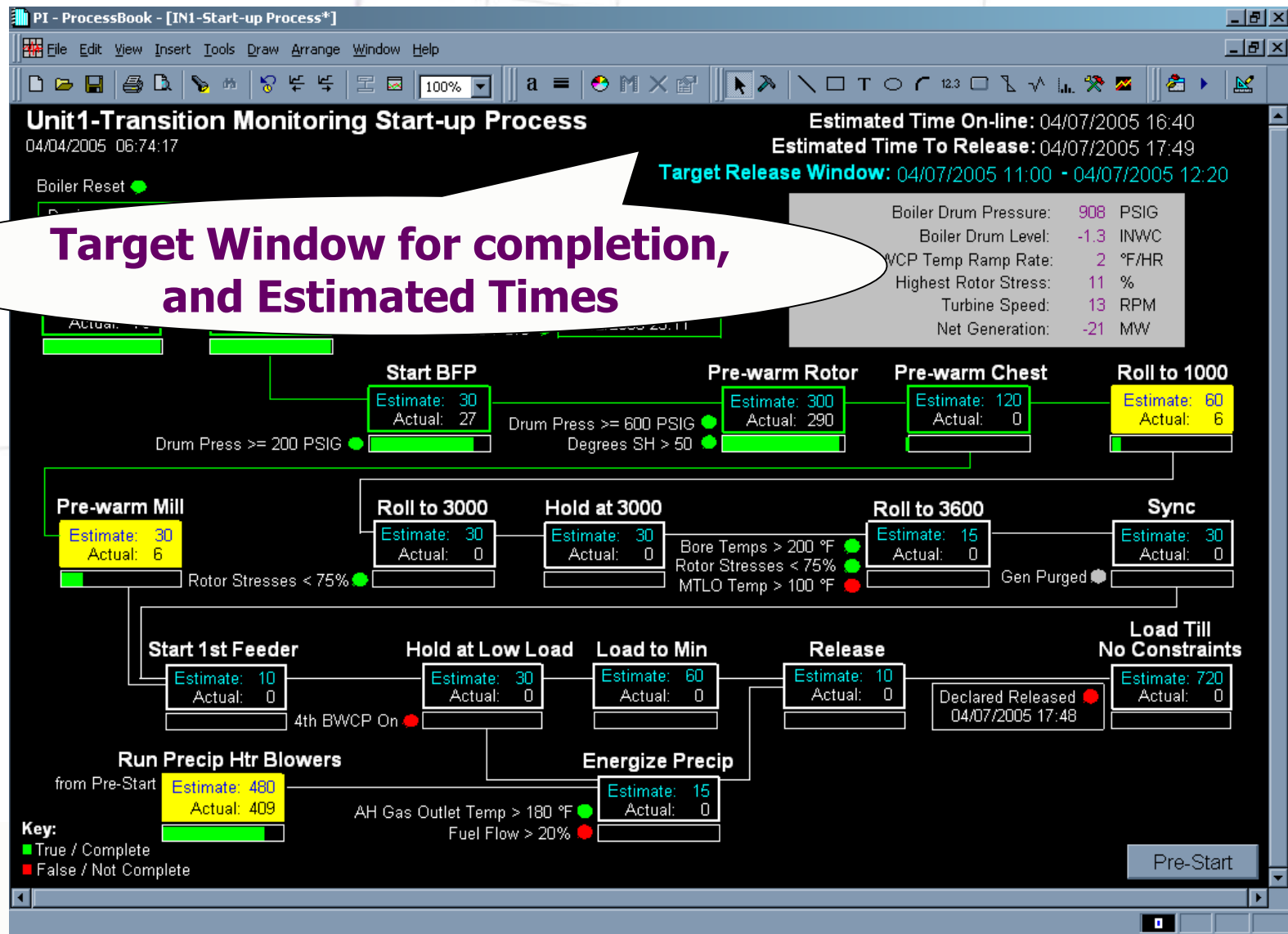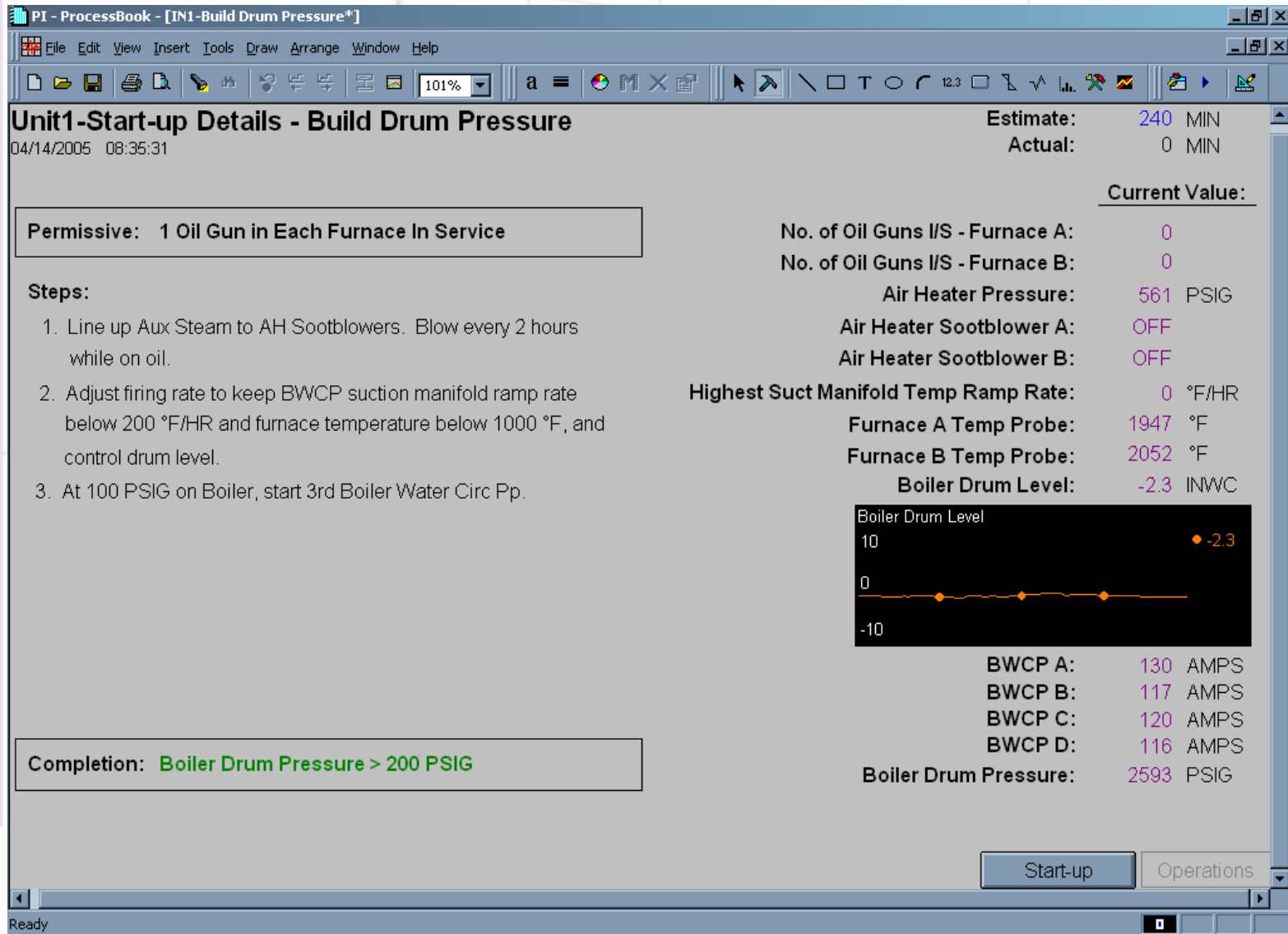# New PI Solution: Transition Monitor

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New PI Solution: Transition Monitor

Steps completed by operations

Permissive and Completion events

Selected plant process data
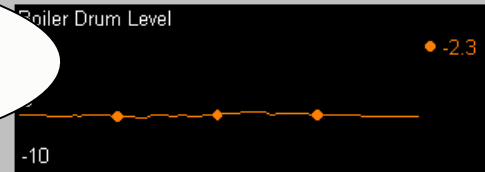
New PI Solution: Transition Monitor

PI ProcessBook & Performance Equations:

- Determine/ display start-up progress

- Accumulate actual elapsed time

- Calculate "% complete"

- Track status of plant equipment & conditions

PI Batch:

- "Back-bone" of the start-up monitor

- Facilitates reporting

PI Manual Logger (Future):

- To capture water analysis from grab samples during start-up

PI-DataLink:
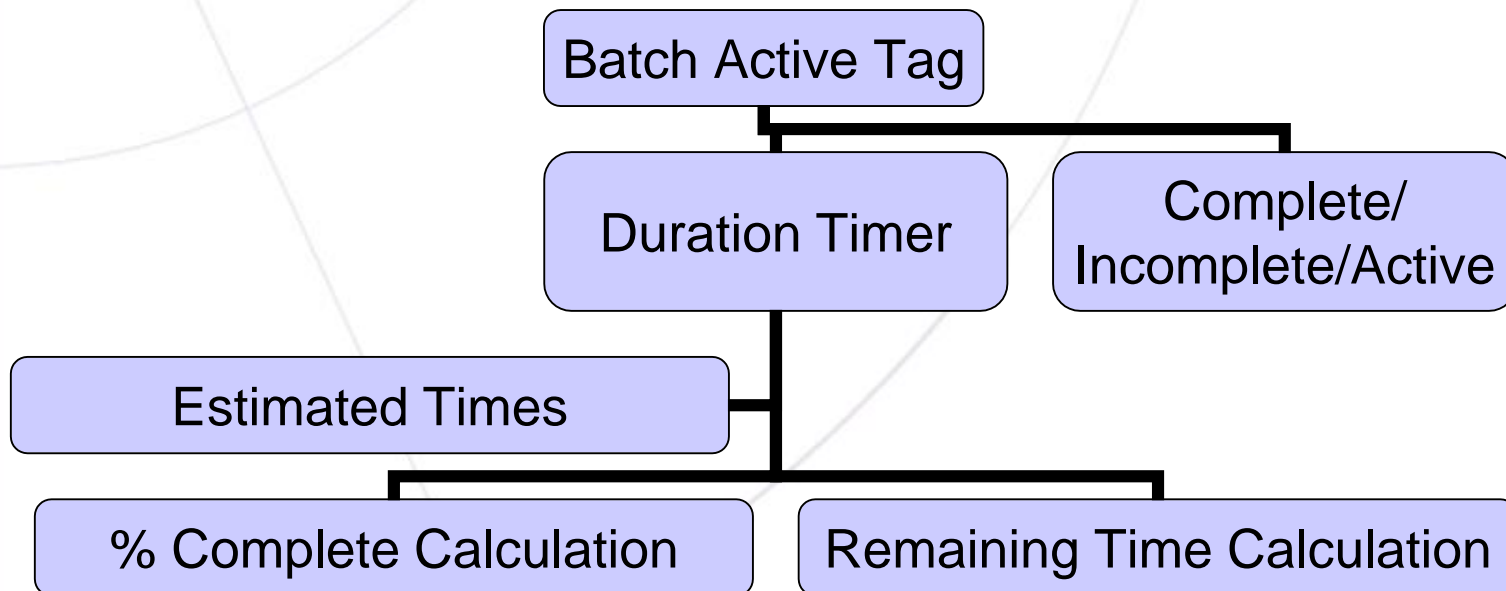
- Start-up Reports

Tracking Start-ups using PI Batch

Design Requirements:

- Well-defined start and end points

  – Valve open/closed

  – Flow > set limit

  – Pump on/off

- Consistently-followed procedures

Tracking Startups using PI Batch

- PE tags capture progress of steps
- Steps are activated by Batch Active tags

Batch Active Tag

Duration Timer

Complete/
Incomplete/Active

Estimated Times

% Complete Calculation

Remaining Time Calculation
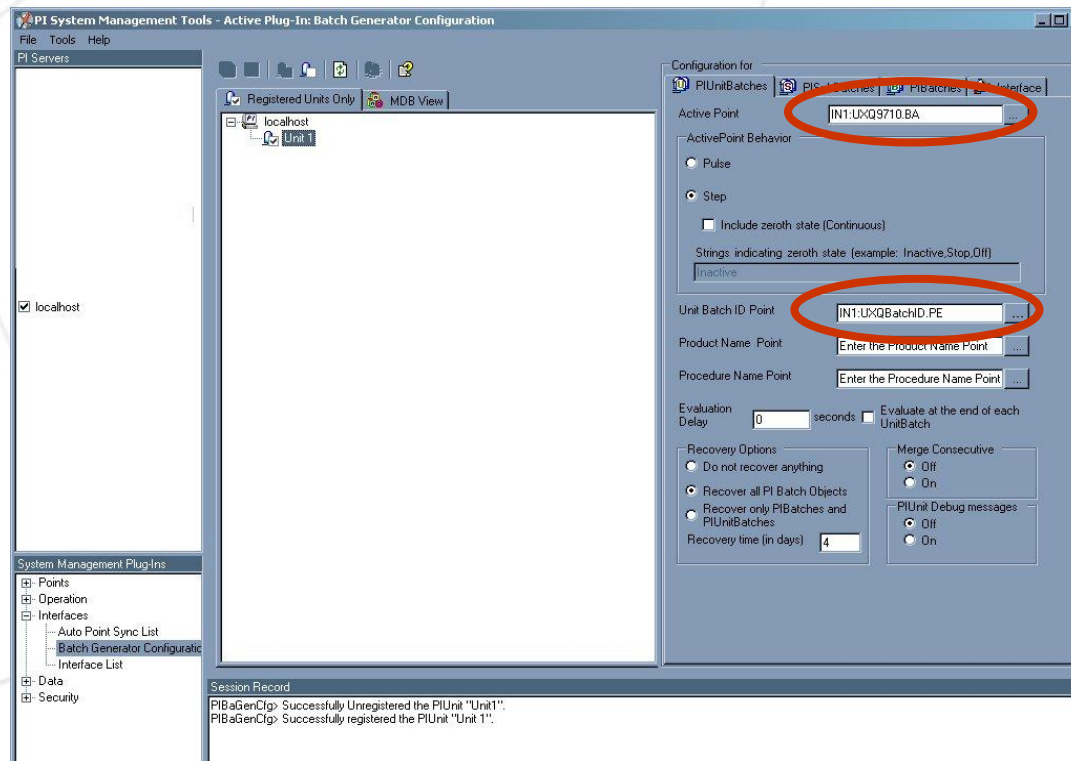
Tracking Start-ups using PI Batch

Setting up PI Batch:

- Create the Batch "Active" tags

- Create the Batch ID tag

  – Create the unit batch using PI Batch Generator (PI-BaGen)

  – Note: to use the SMT version of PI-BaGen, PI-Batch Generator 2.x **must** be installed on the PI server

- Create the sub-batches

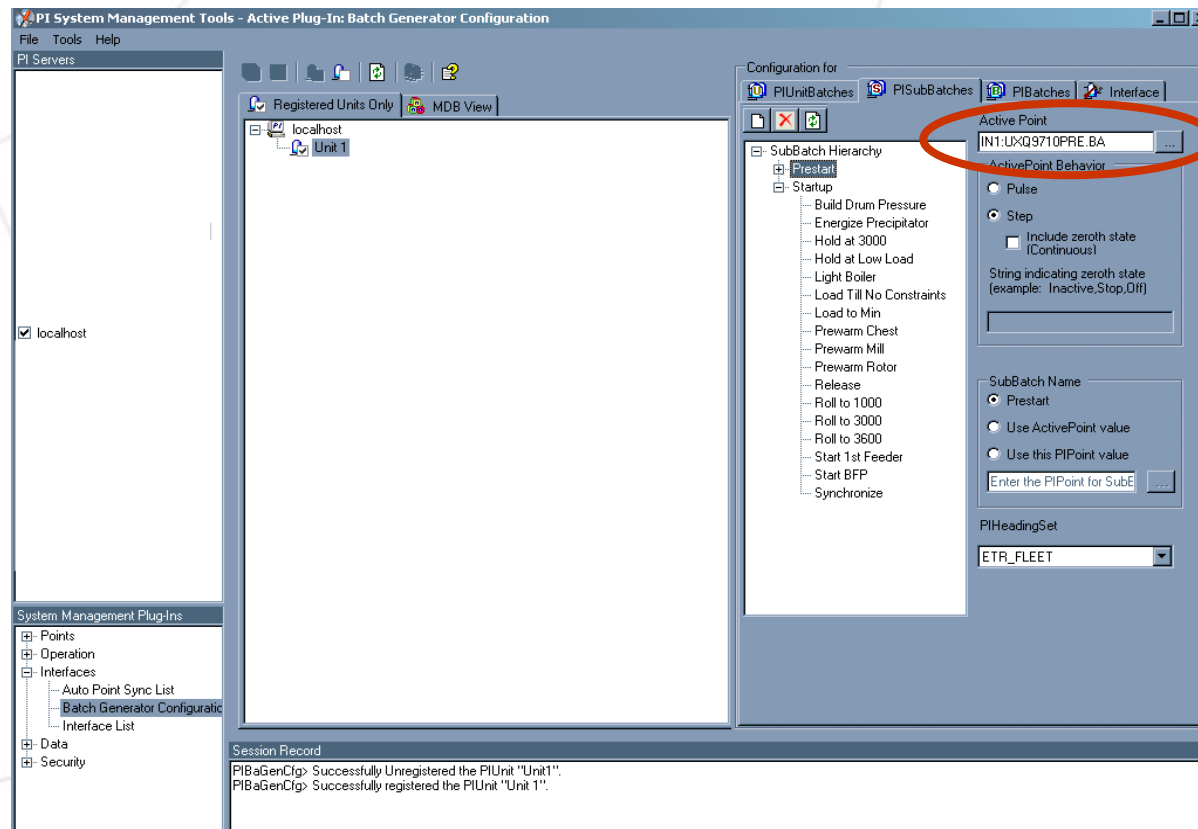# Tracking Start-ups using PI Batch

Setting up PI Batch (continued):

The required tags for setting up a unit batch are the active point and the unit batch ID point.

Tracking Start-ups using PI Batch

Setting up PI Batch (continued):

The required point for sub-batches is the active point.

Tracking Start-ups using PI Batch

Batch for Reporting

May employ the following for reporting start-up results:

- BatchView

- Batch Unit Report Spreadsheet

- Homegrown report using the best of both!

Next Steps

- Reporting Using PI-DataLink

- Incorporate Module Database

- PI Manual Logger

- Expanding to Additional Plants

Questions?