SMURFIT-STONE
solving it from all sides

2009 OSI Regional Seminar Series Presents:

Environmental Reporting Solution (ERS and PI)

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SSCC:

- Smurfit-Stone Container Corporation is one of the industry's leading integrated containerboard and corrugated packaging producers, and one of the world's largest paper recyclers.
- Smurfit-Stone serves its customers through an extensive, integrated network of 14 mills, 100+ container operations, 29 recycling facilities as well as sales offices, design centers and other facilities.

Locations:

- The ContainerBoard Mill Division consists of 14 Mills in:
  - Fernandina Beach, FL
  - Jacksonville, FL
  - Panama City, FL
  - Florence, SC
  - Missoula, MT
  - West Point, VA
  - Hopewell, VA
  - Stevenson, AL
  - Uncasville, CT
  - Coshocton, OH
  - Ontonagon, MI
  - Hodge, LA
  - La Tuque, QC
  - Matane, QC

The game changed:

- Over the past several years, U.S. EPA has promulgated a number of Clean Air Acts and other rules that impose extensive, environmental data collection and recordkeeping requirements on Smurfit-Stone's pulp and paperboard mills.
- Examples of the types of environmental information our mills are currently tracking and reporting using PI include:
  - Operating parameters for pollution control devices and other process equipment that is subject to environmental regulation
  - Air emissions information, including data from Continuous Emissions Monitors (CEMS)
  - Startup, Shutdown and Malfunctions
  - Some mills are using PI to collect data used to manage the mill's raw water supply wells and to comply with its groundwater withdrawal permits.

Options\Advantages:

- What we needed was:
  - A reliable collection system for real time data.
  - A system that easily interfaced to disparate data sources.
  - A central system that allowed data to be stored and retrieved easily. It had to meet the new requirements for record keeping and reporting.
- When looking at different options that would meet our needs, several solutions were considered. A solution based on PI was chosen.

The Install:

- May 2000 SSCC acquired three mills that were using PI:
  - La Tuque, Matane and West Point
  - More importantly we gained PI knowledge from these three mills.
- November, 2000: The PI server was installed at the first Environmental Reporting Solution (ERS) location
- March, 2001: Prism Systems, was chosen as the consultant based on their expertise, began installing the Environmental Reporting Solution (ERS).
- In 2002 we acquired the Stevenson Mill:
  - They were currently using PI and we gained additional PI knowledge.

Software and Servers:

- 1 Enterprise PI server
  - Over 90% of the interfaces in the mills are OPC.
  - A Mill can have anywhere from 3 – 12 interfaces.
  - Current sizing roughly about 10,000 tag server per Paper Machine
- 1 PC in each control room: runs process book that monitors the operational area and alerts the operator of an issue.
- All other reports, documentation, and event entry are done via the secure website.
- SQL 2005 Standard running on a server with IIS
  - PI OLEDB data provider, Part of the Data Access (DA) package.

Data Access Pack (DAP):

- Data Access Pack
  - PI OLEDB data provider, is part of the Data Access (DA) package.
- The OLEDB Provider gives you the ability to view PI as a Linked Server in Microsoft SQL Server
- This allows you to:
  - Query the PI server using SQL statements
  - Read and write to and from the PI server using stored procedures.
  - Returns data in SQL Record Sets

ERS - Now that we have the data in PI:

- Identify the process values that are needed for each area: Lime Kiln, Bleach\Wash, Power Boiler, Recovery.
- Validation is done. We need to know programmatically if the process is running as part of SSM. This is done using a performance equation.
- Simple Example: IF (('06_CWSHR_2ndStgFiltratePump_MOTOR' <> "STOP") AND ('06_CWSHR_WasherDecker_MOTOR' <> "STOP")) THEN "RUN" ELSE IF (('06_CWSHR_2ndStgFiltratePump_MOTOR' = "STOP") AND ('06_CWSHR_WasherDecker_MOTOR' = "STOP")) THEN "DOWN" ELSE '06_CLINE_TitleV_OPER_ST'

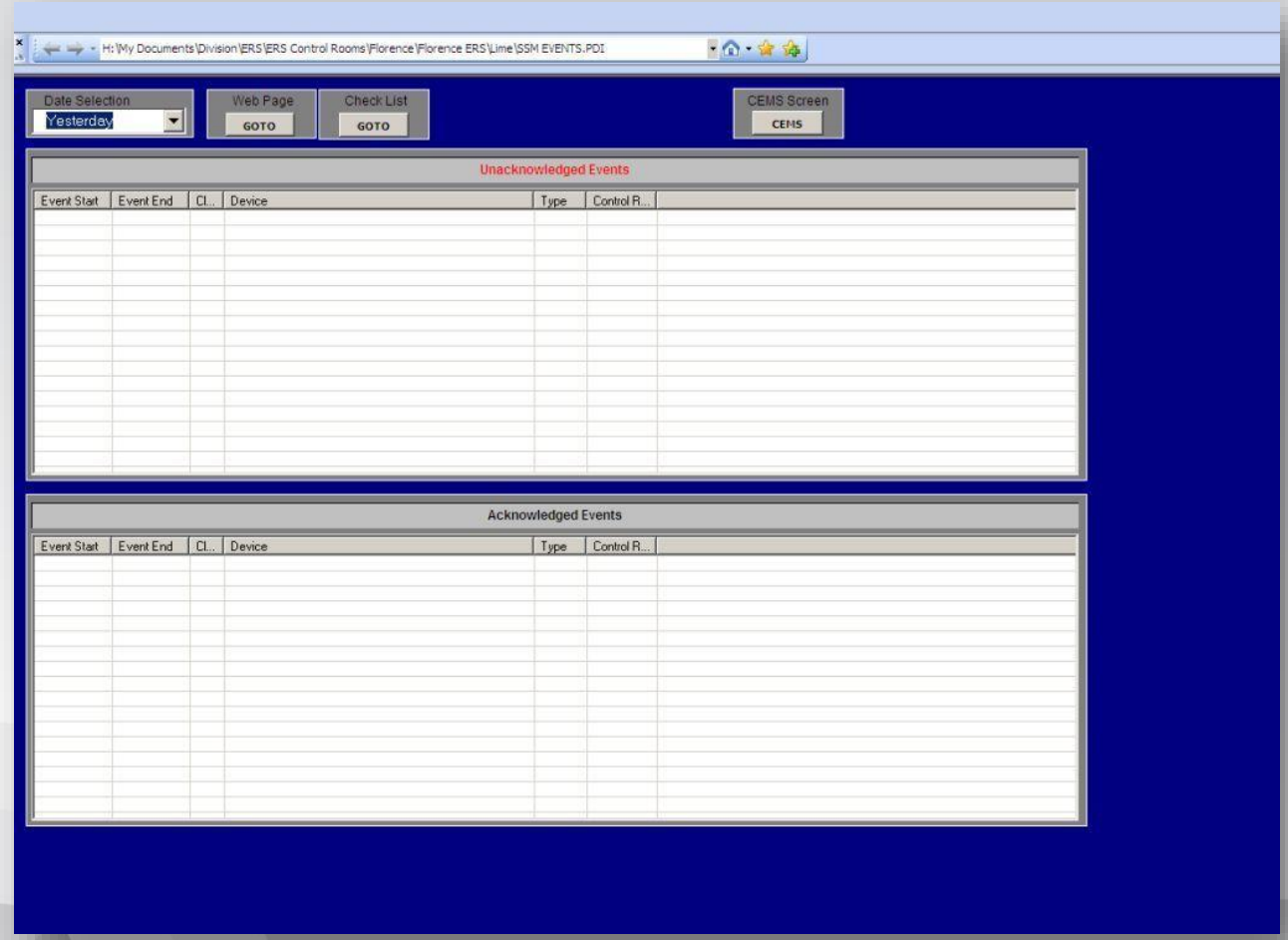
ERS - Now that we have the data in PI:

- Not so simple example: IF '74_LK_MACT2SSM_OPER_ST' = "ST" THEN IF (('74_LK_BrnrOilFlow_PV' >= '74_LK_BrnrOilFlow_HiLim_MAN') AND ('74_LK_TotalMudFltrFlow_CALC' >= '74_LK_TotalMudFltrFlow_HiLim_MAN') AND ('27_LK_KilnFeedBelt_PV' = "FWD") AND ('74_LK_DivertGate_COMMAND' = "CRUSH")) THEN "RUN" ELSE IF ('74_LK_BrnrOilFlow_PVLT_ROLL5m_TIME' >= '5Minutes_CONST') THEN "SD" ELSE "ST" ELSE IF ('74_LK_MACT2SSM_OPER_ST' = "RUN") THEN IF ('74_LK_BrnrOilFlow_PVLT_ROLL5m_TIME' >= '5Minutes_CONST') THEN "SD" ELSE "RUN" ELSE IF ('74_LK_MACT2SSM_OPER_ST' = "SD") THEN IF(('74_LK_DivertGate_COMMAND' = "DUMP") OR (('74_LK_BrnrOilFlowOff_ROLL210m_TIME' >= '3.5Hours_CONST'))) THEN "DOWN" ELSE IF (('74_LK_BrnrOilFlow_PV' > '74_LK_BrnrOilFlow_HiLim_MAN') AND ('74_LK_TotalMudFltrFlow_CALC' >= '74_LK_TotalMudFltrFlow_HiLim_MAN') AND ('27_LK_KilnFeedBelt_PV' = "FWD")) THEN "ST" ELSE "SD" ELSE IF(('74_LK_BrnrOilFlow_PV' > '74_LK_BrnrOilFlow_HiLim_MAN') AND ('74_LK_TotalMudFltrFlow_CALC' >= '74_LK_TotalMudFltrFlow_HiLim_MAN') AND ('27_LK_KilnFeedBelt_PV' = "FWD")) THEN "ST" ELSE '74_LK_MACT2SSM_OPER_ST'

ERS - Now that we have the data in PI:

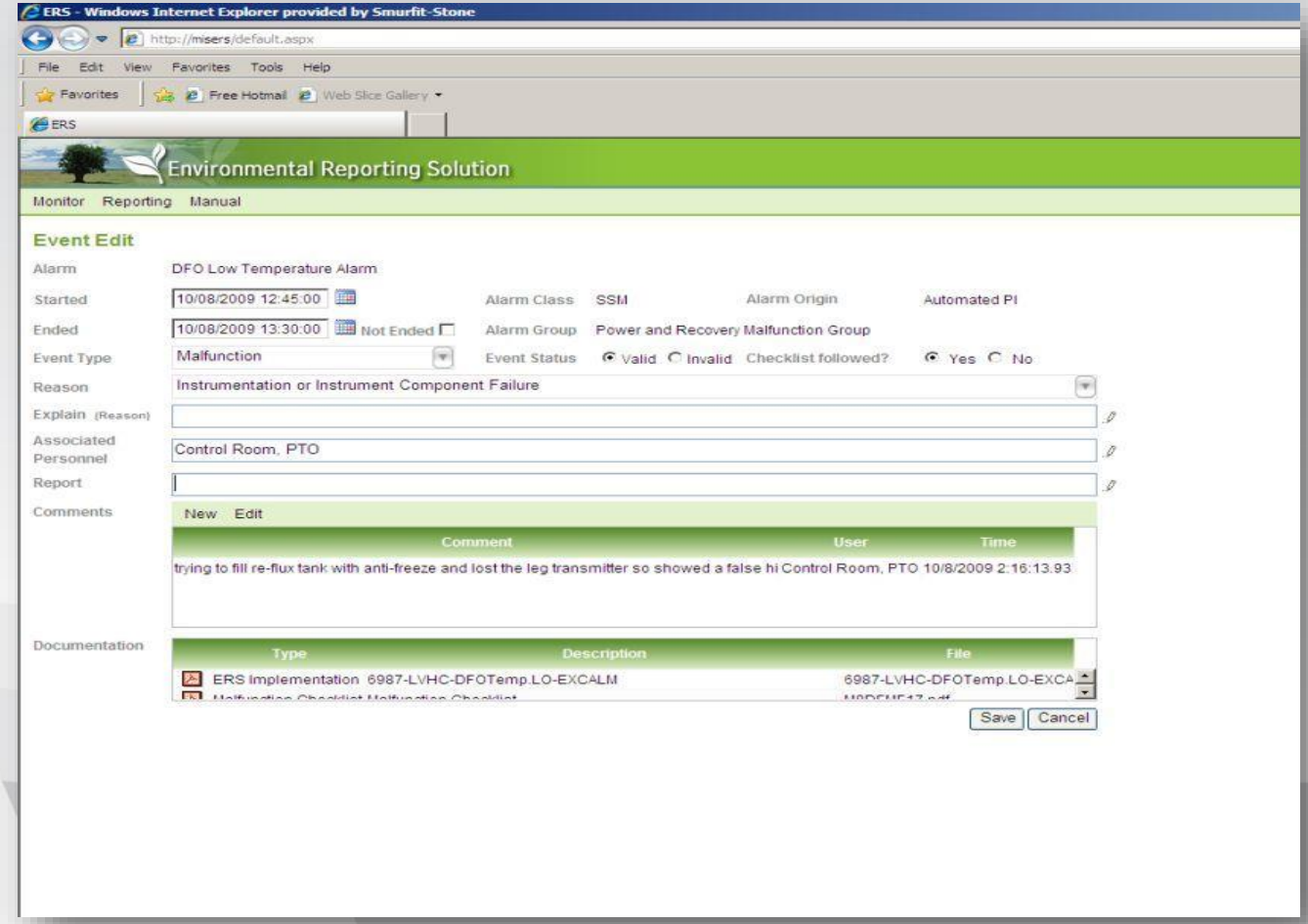
- We perform calculations against the identified process data to give us the required limits and averages.
- We use Performance Equations, Totalizer Tags and Alarm Tags.
- SQL stored procedures query PI using the OLEDB Provider looking for “events”.
- As events are stored in a SQL database, users are notified via email and ProcessBook.
- Once an event is acknowledged, it is written back into PI using the OLEDB Provider.

Process book Displays Events:



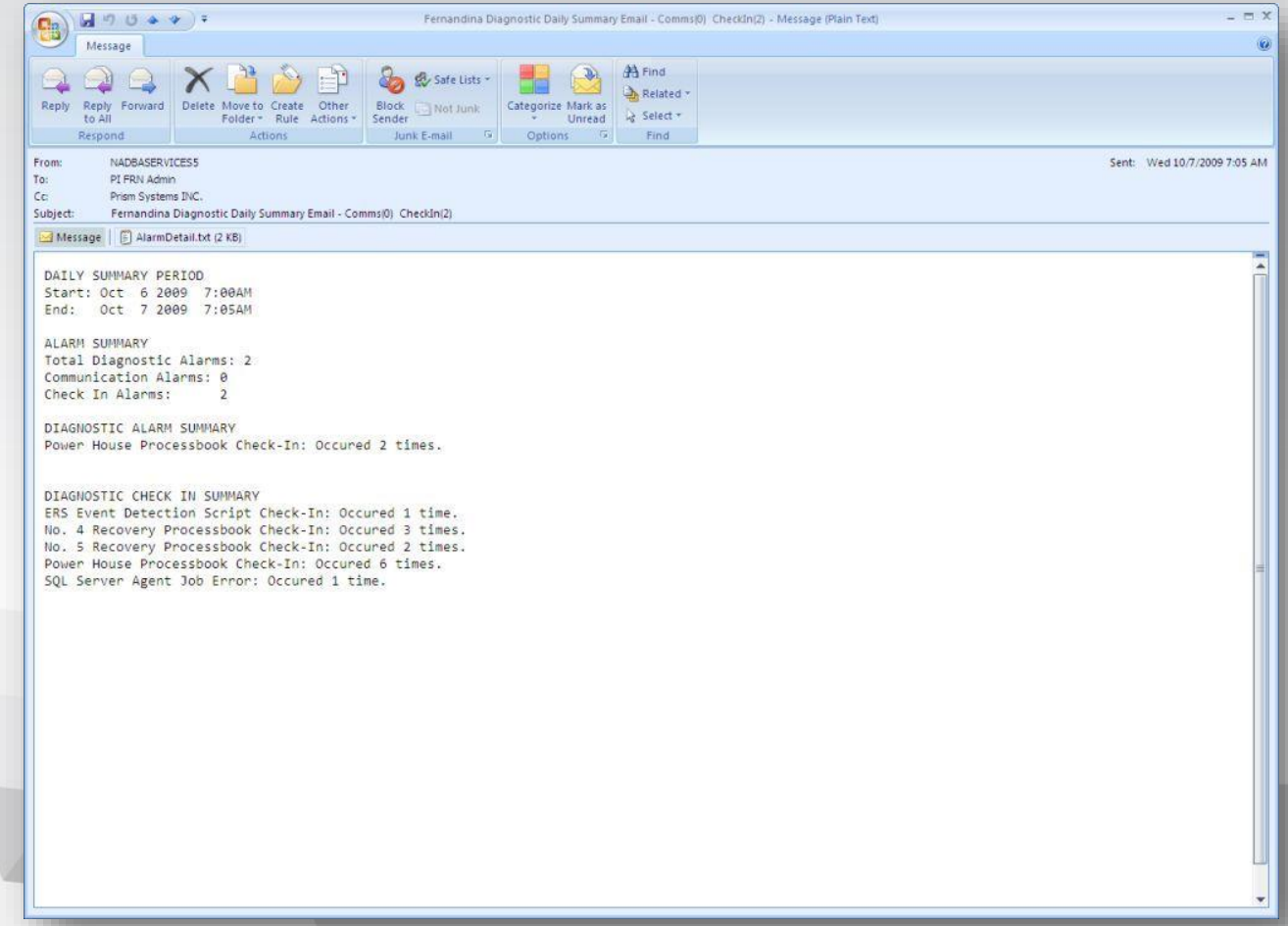
Both unacknowledged and acknowledged events are available in the display. Contains links to: CEMS displays, ERS webpage and operational checklists.

How it works:



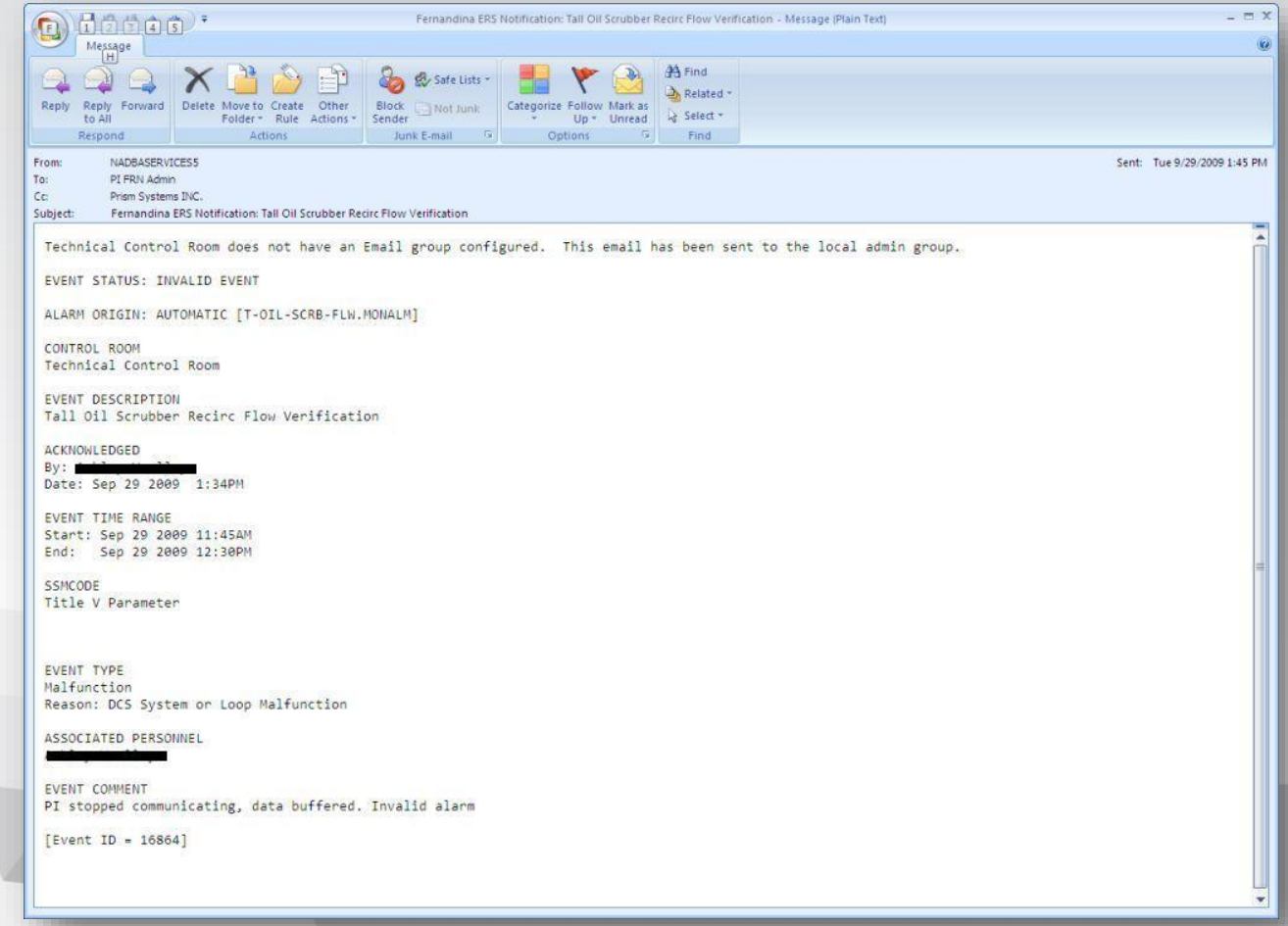
Operator links out to the ERS website to enter required information.

Email Alerts: Emails notifications are sent



Daily Summary Emails are sent each morning as a review of the past days activities.

Email Alerts: Emails notifications are sent



Fernandina ERS Notification: Tall Oil Scrubber Recirc Flow Verification - Message (Plain Text)

Message

Reply | Reply to All | Forward | Delete | Move to Folder | Create Rule | Other Actions | Block Sender | Safe Lists | Not Junk | Categorize | Follow Up | Mark as Unread | Find | Related | Select

Respond | Actions | Junk E-mail | Options | Find

From: NADBASERVICES5
To: PI FRN Admin
Cc: Prism Systems INC.
Subject: Fernandina ERS Notification: Tall Oil Scrubber Recirc Flow Verification
Sent: Tue 9/29/2009 1:45 PM

Technical Control Room does not have an Email group configured. This email has been sent to the local admin group.

EVENT STATUS: INVALID EVENT

ALARM ORIGIN: AUTOMATIC [T-OIL-SCRB-FLW.MONALM]

CONTROL ROOM
Technical Control Room

EVENT DESCRIPTION
Tall Oil Scrubber Recirc Flow Verification

ACKNOWLEDGED
By: [redacted]
Date: Sep 29 2009 1:34PM

EVENT TIME RANGE
Start: Sep 29 2009 11:45AM
End: Sep 29 2009 12:30PM

SSMCODE
Title V Parameter

EVENT TYPE
Malfunction
Reason: DCS System or Loop Malfunction

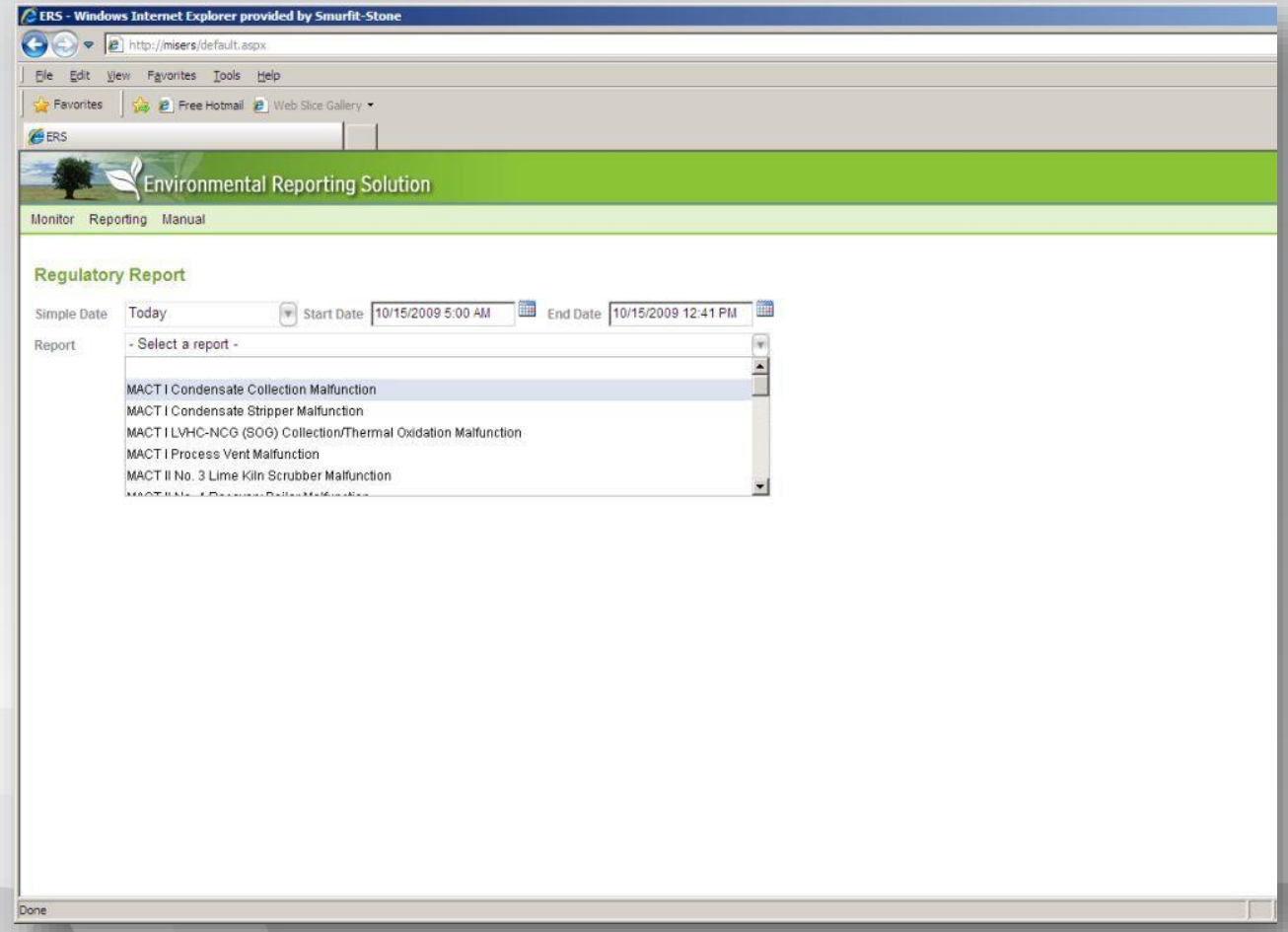
ASSOCIATED PERSONNEL
[redacted]

EVENT COMMENT
PI stopped communicating, data buffered. Invalid alarm

[Event ID = 16864]

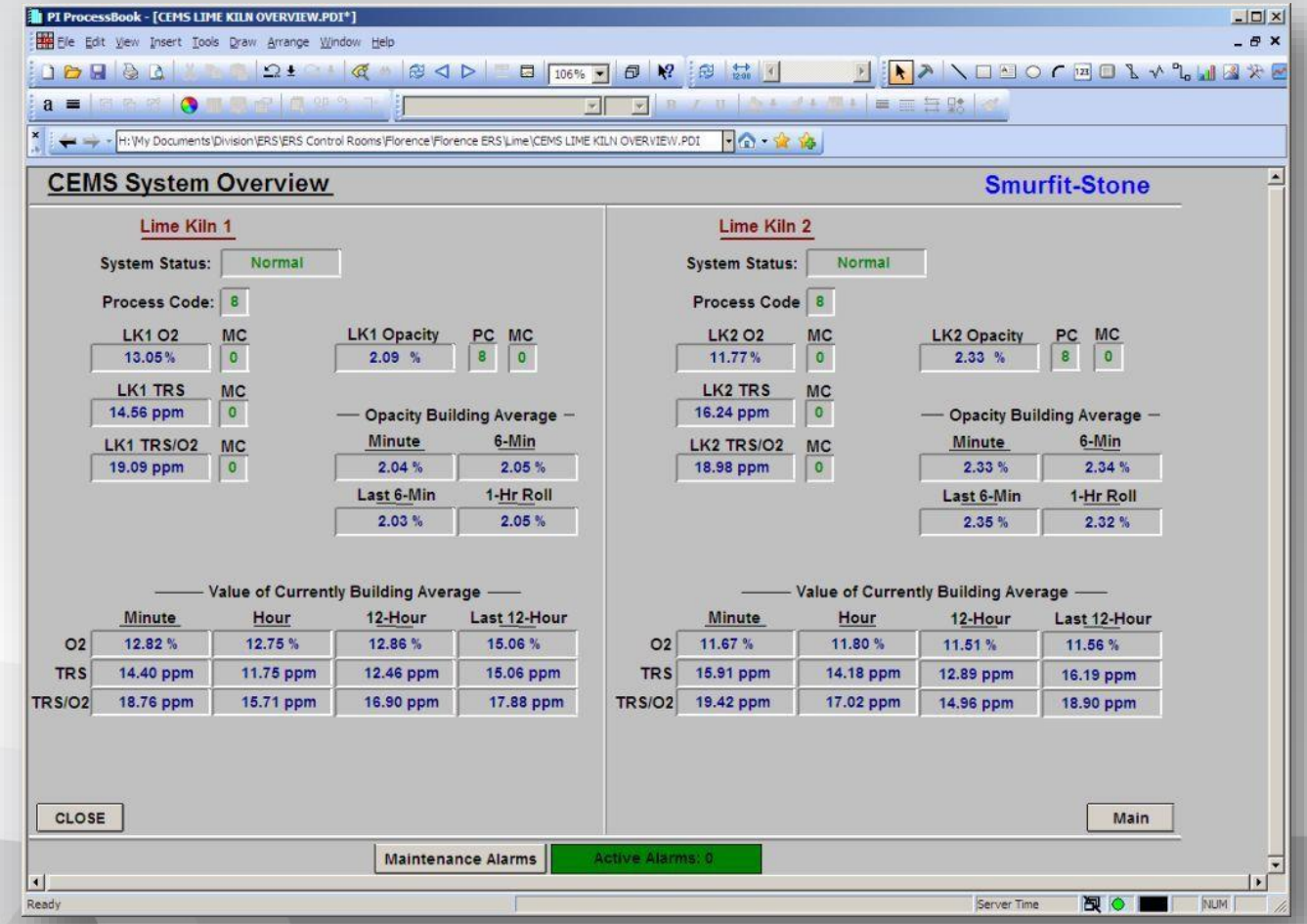
Emails are also sent when we have an interface issue or an SSM Event.

Reports are run from the ERS website



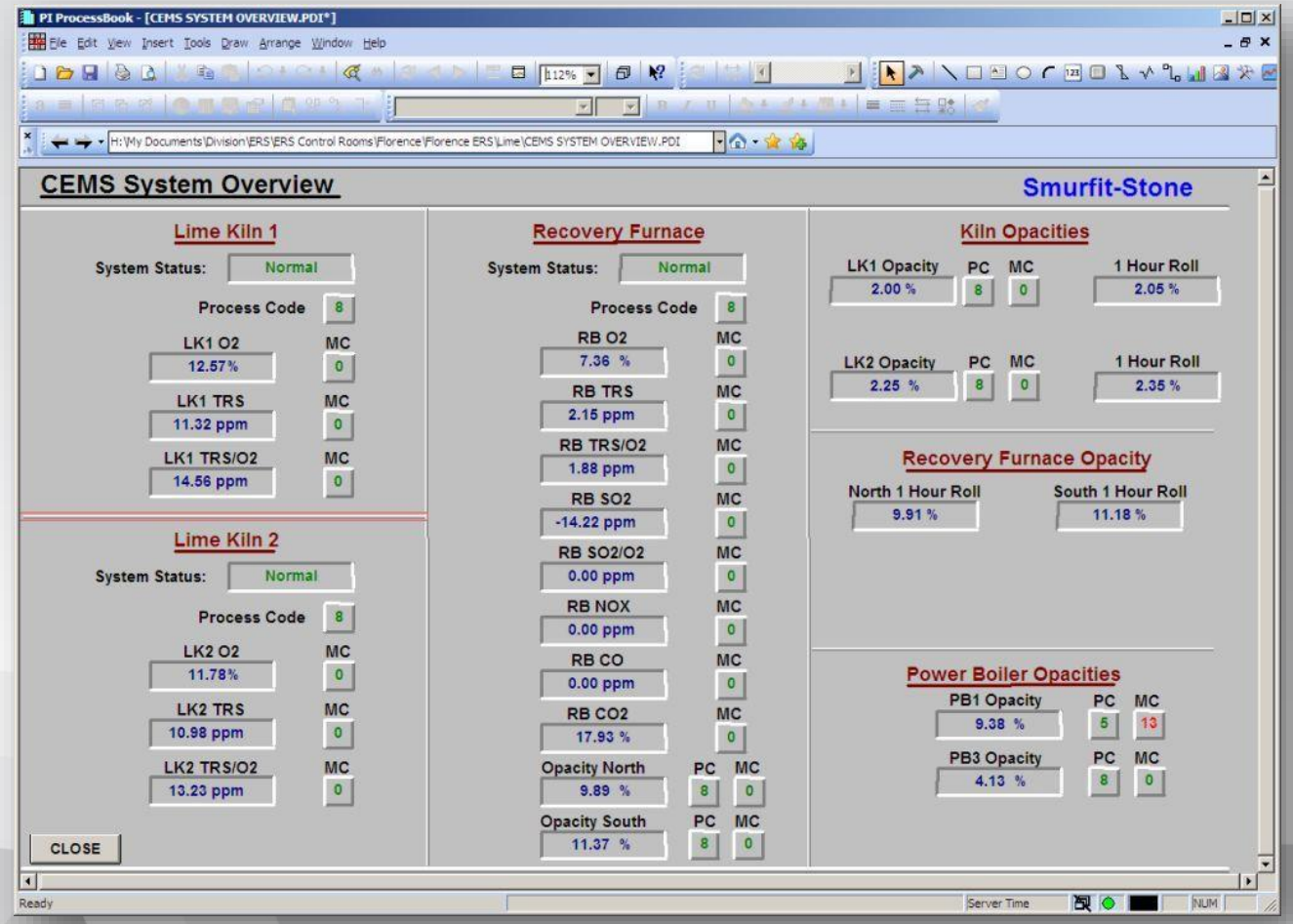
Events can be monitored using the Mills ERS Website
Reports generation is done via the website and can be exported to Excel for further analysis.

CEMS



Part of the ERS System is the Continuous Emissions Monitor (CEM) data collection

CEMS



Engineers in control rooms are constantly paying attention to their emissions, making sure they're within legal limits.

Benefits of the ERS System and PI:

- We have a standard Environmental System creating opportunities for standard reports and easy integration into Corporate Dashboards.
- Because the system is based on PI:
  - The same skills that are used to maintain the PI systems are used for the ERS system.
  - Internally two IT resources and one Engineering resource support the systems.
  - Process, Production and Environmental data are brought together. Making PI a key part of our plant infrastructure.
  - Area where there is no DCS, PI serves as the collection and viewing point for the data we do collect.

Questions ?