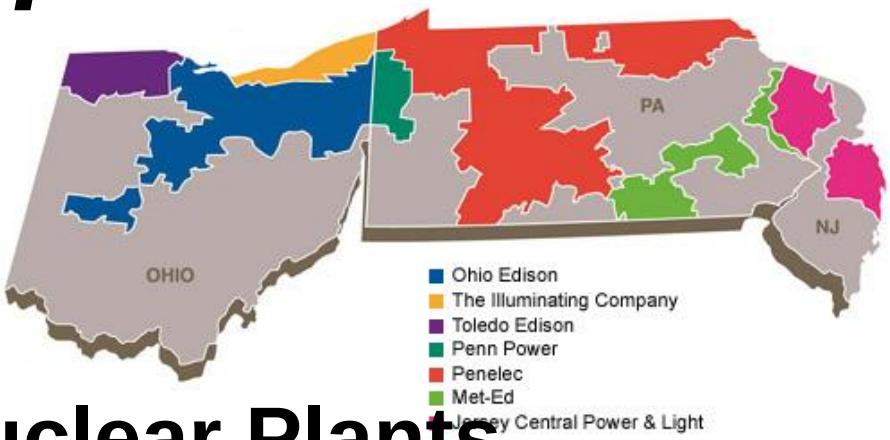
E-Notification for OSI PI®

Enterprise Alert System and Automated Reporting Applications at First Energy

Presented By: Ron Carson, FEC

Mike Santucci, ECG

First Energy Corporation



- **9 Fossil Plants, 3 Nuclear Plants**
- **4th largest investor-owned electric system in the United States**
- **4.3 million customers within 36,100 miles of Ohio, Pennsylvania and New Jersey**

First Energy PI System

- **PI3 Installed 1997**
- **9 Fossil Plants have NT PI Servers**
- **2 Corporate PI Servers**
- **100,000+ Tags in the PI system**
- **Bailey Infi90, Westinghouse, Honeywell Modicon, A/B, and PlantView Interfaces**
- **100’s of PI users.**

Automate Everything!!!

- **Overwhelming Amount of Data is Now Available**
- **Manpower-Corporate Downsizing-Less People-More Responsibility**
- **Need to Filter Useable Information**
- **Need for Event Based Monitoring**
- **Tell me when to look at the Data**
- **Automated Report Generation**
- **Personal Alarms vs DCS Alarms**

FEC Notification System

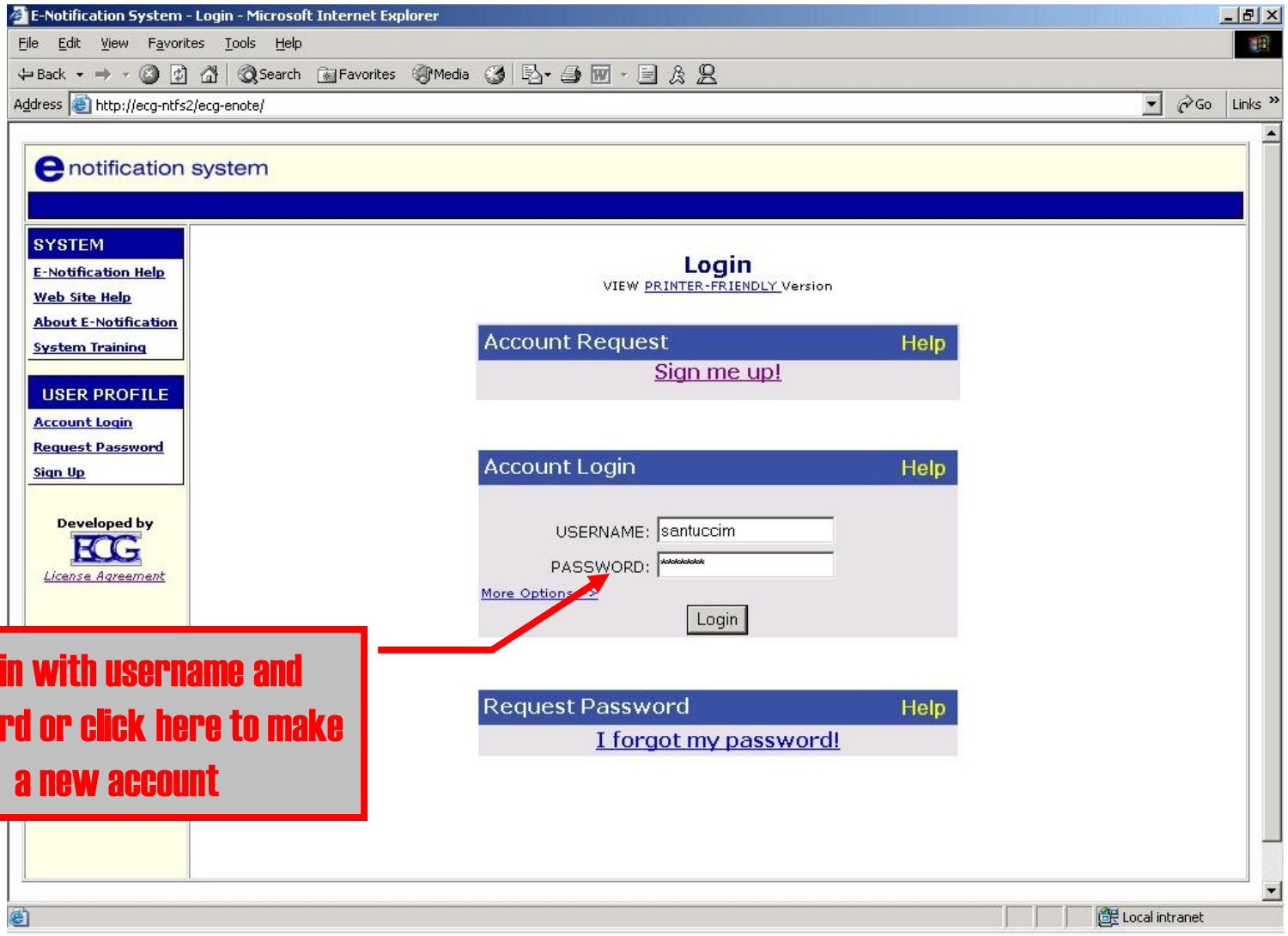
Interface available through Web Based Portal

- **Enterprise-Wide, User-Administered from any location within the Corporate WAN using only a standard browser**
- **Scalable, 1 - 1000+ Users**
- **User configured events based on any PI point**
- **Snapshot and Trend of any PI point(s)**
- **Built-in security to allow only FEC users**

Notifications and Reports (E-Mail and/or Pager)

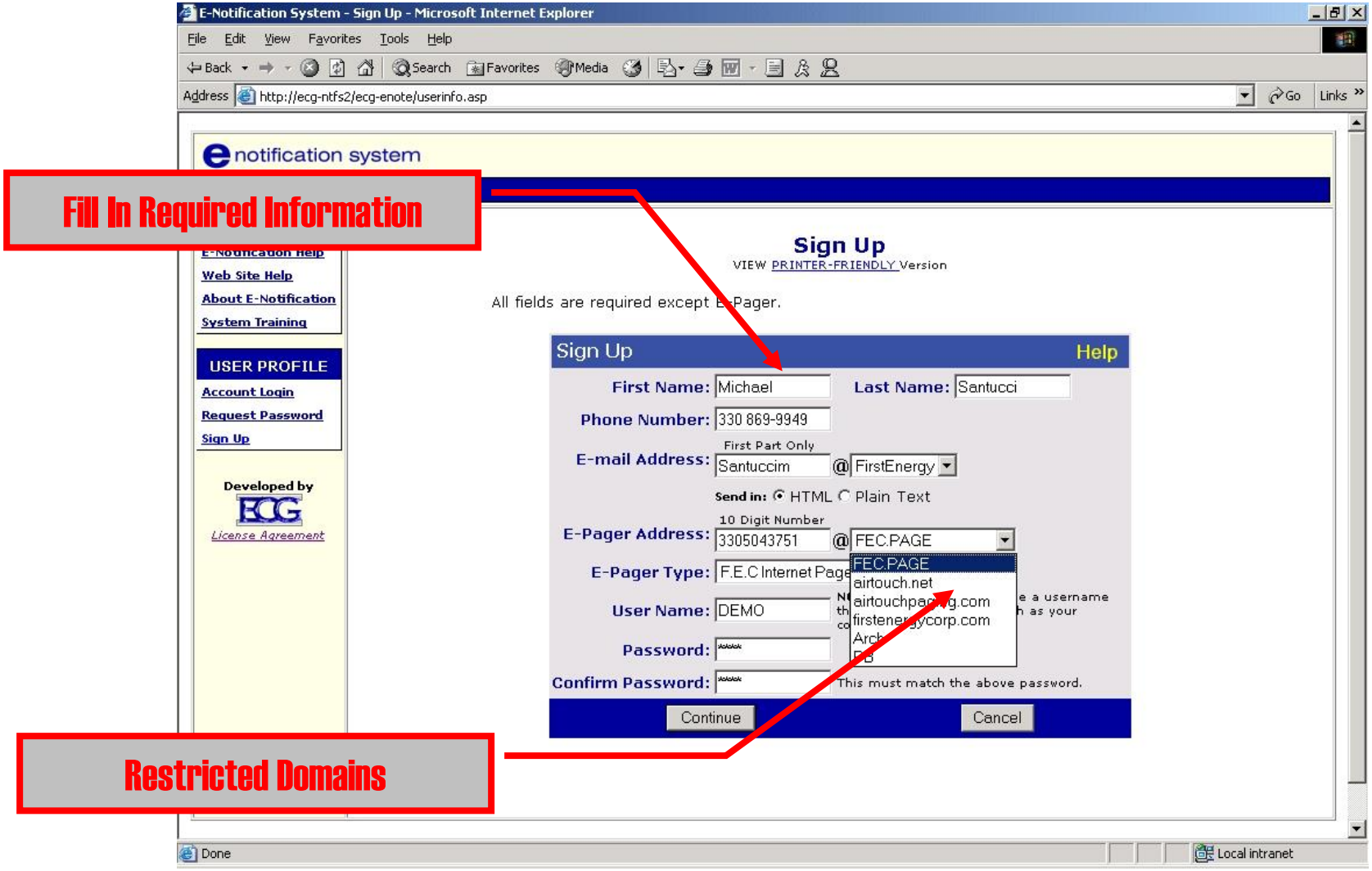
- **Events (Single point exceeds bounds)**
- **Reports (List of Descriptions and Values)**
- **Spreadsheets (DataLink populated)**

E-Note: Sign-Up

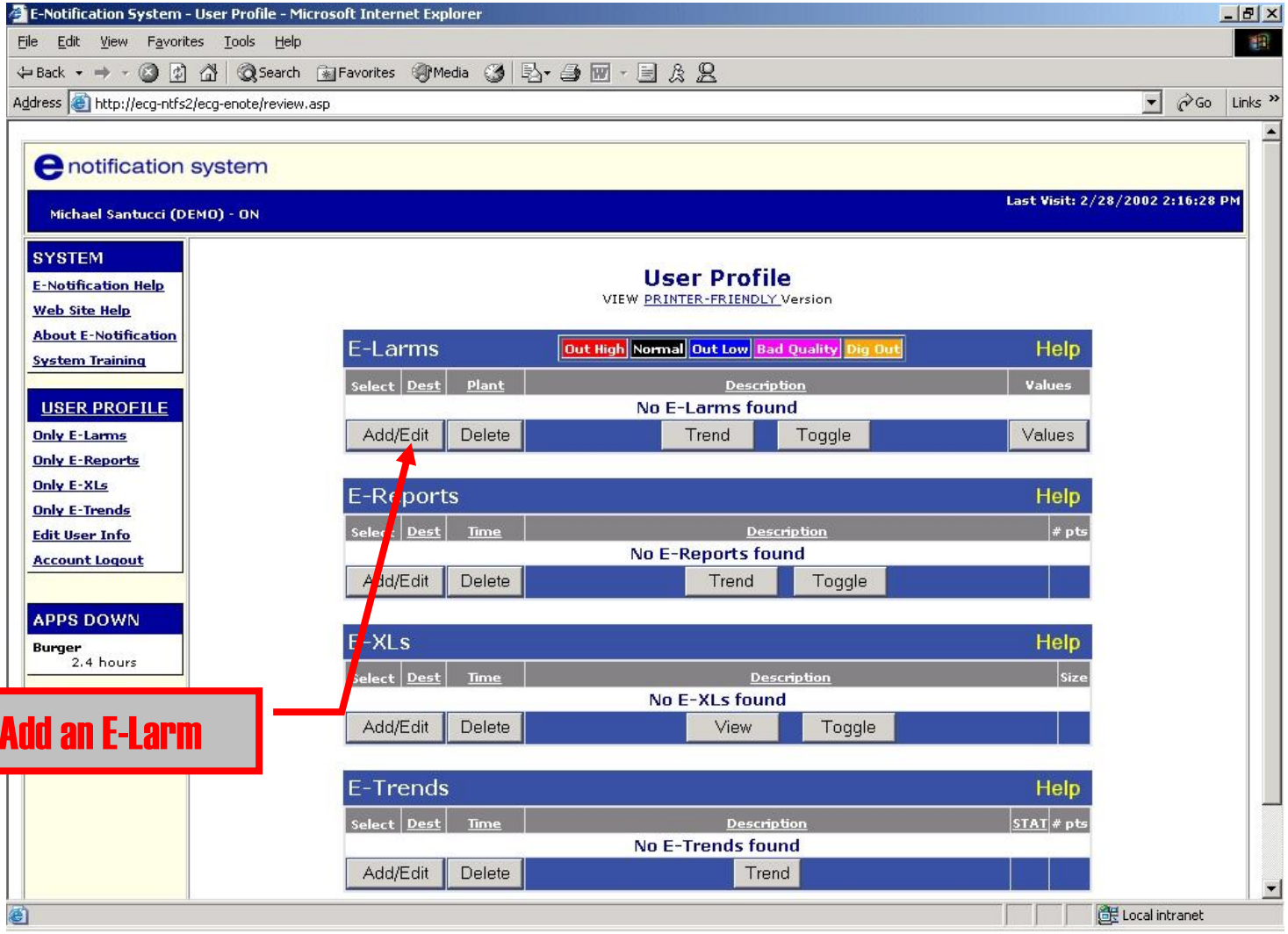


Sign-in with username and password or click here to make a new account

E-Note: Sign-Up Detail

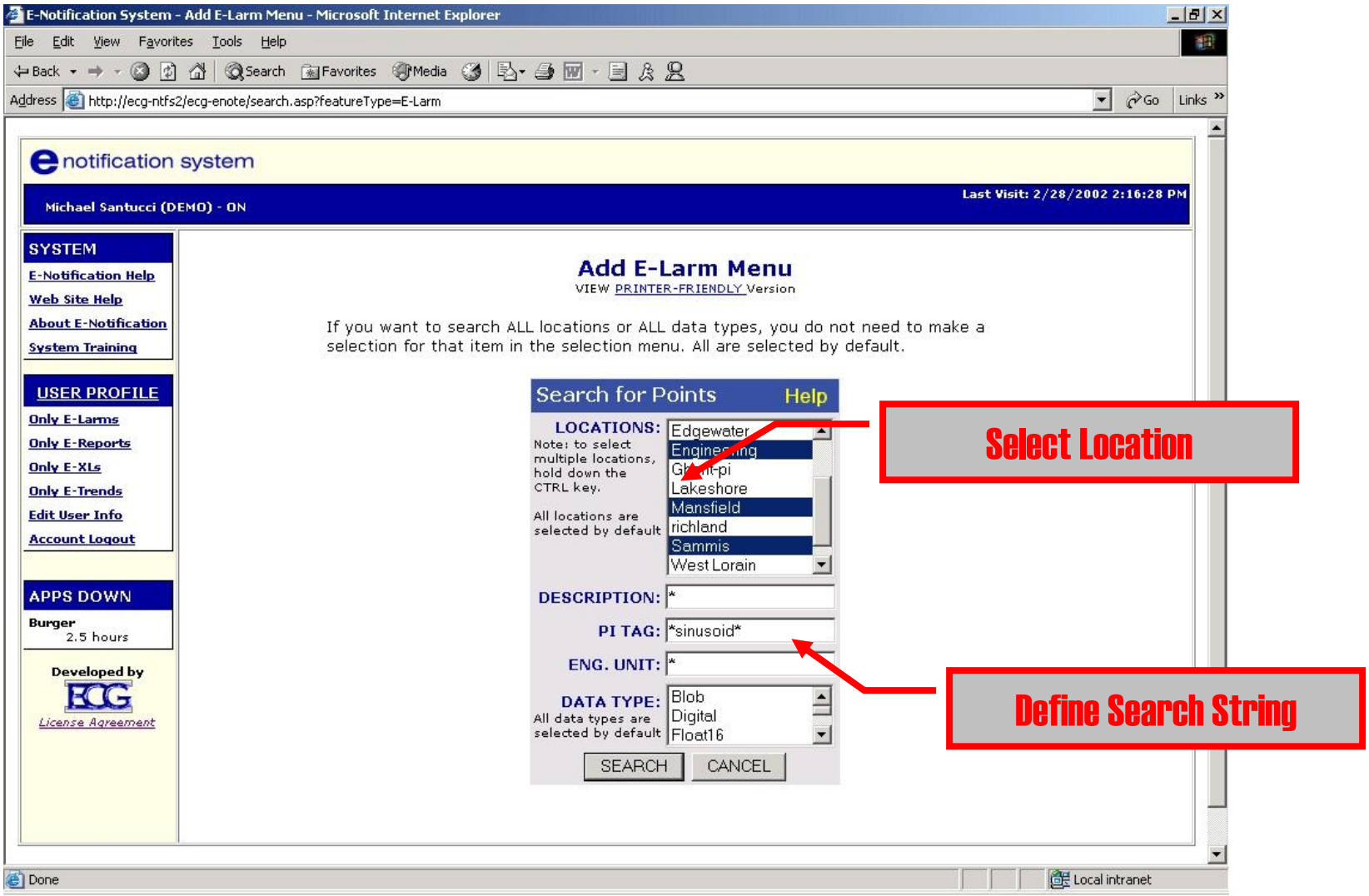


E-Note: User Profile

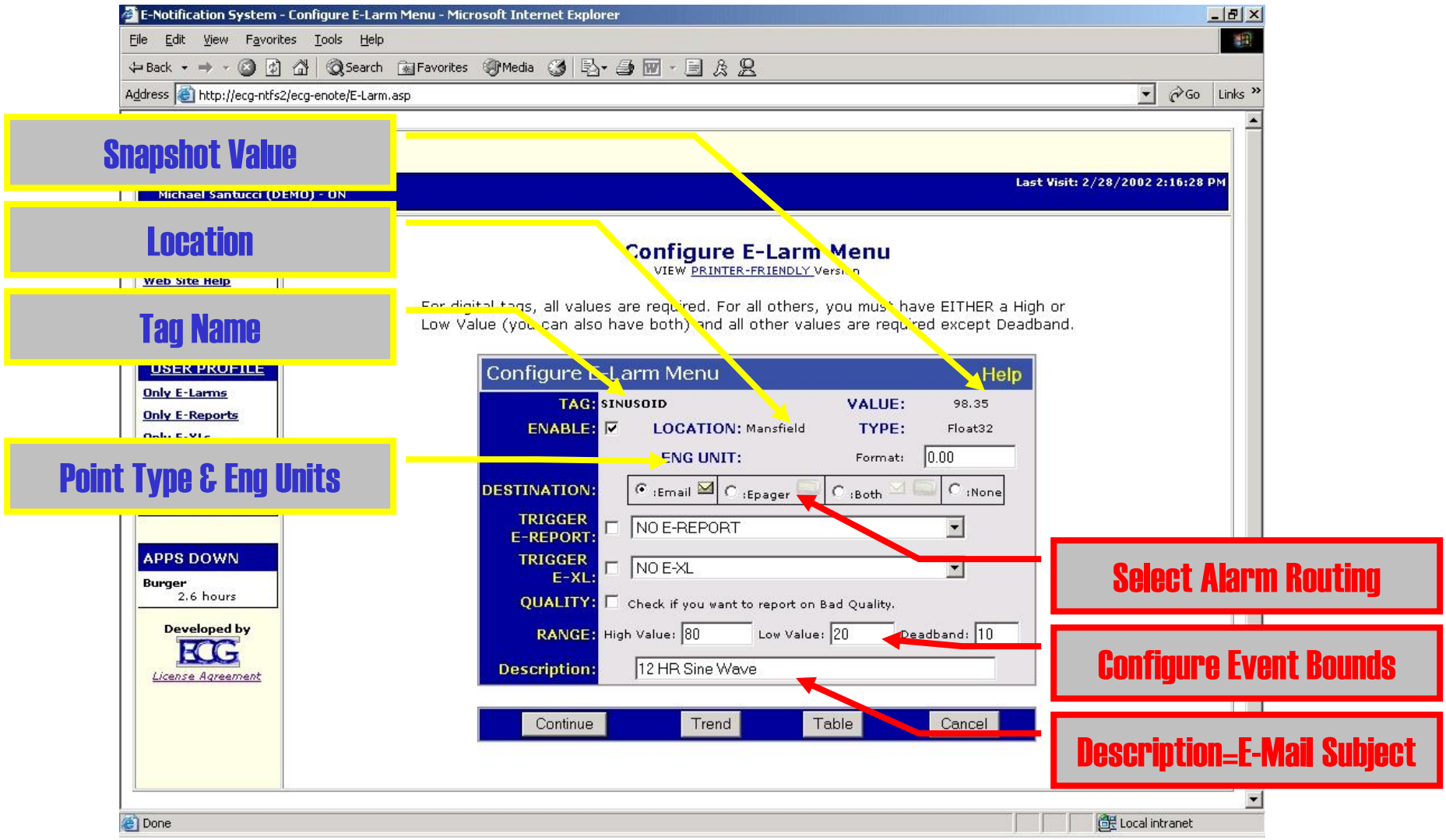


Click to Add an E-Larm

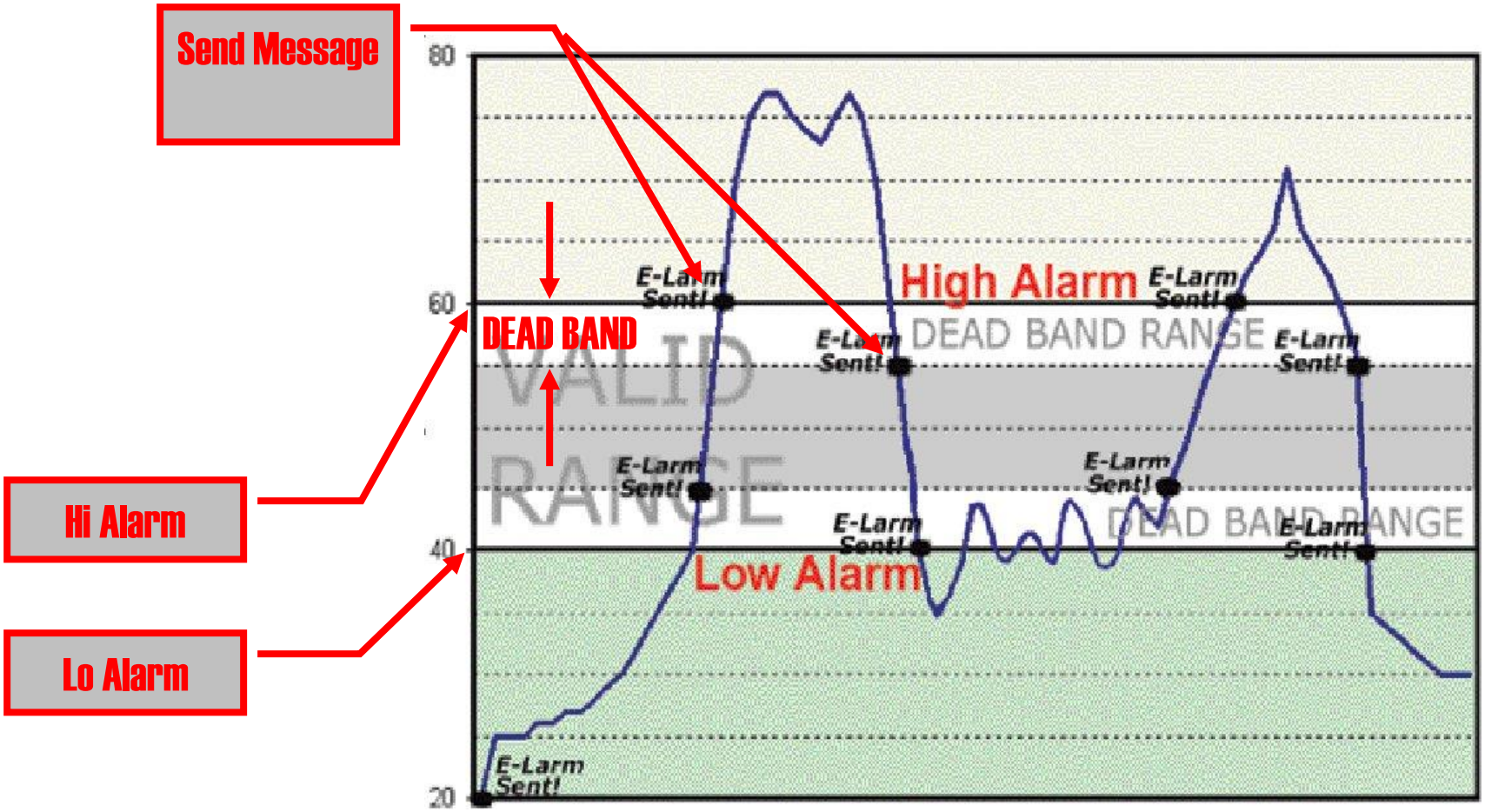
E-Note: E-Larm Search



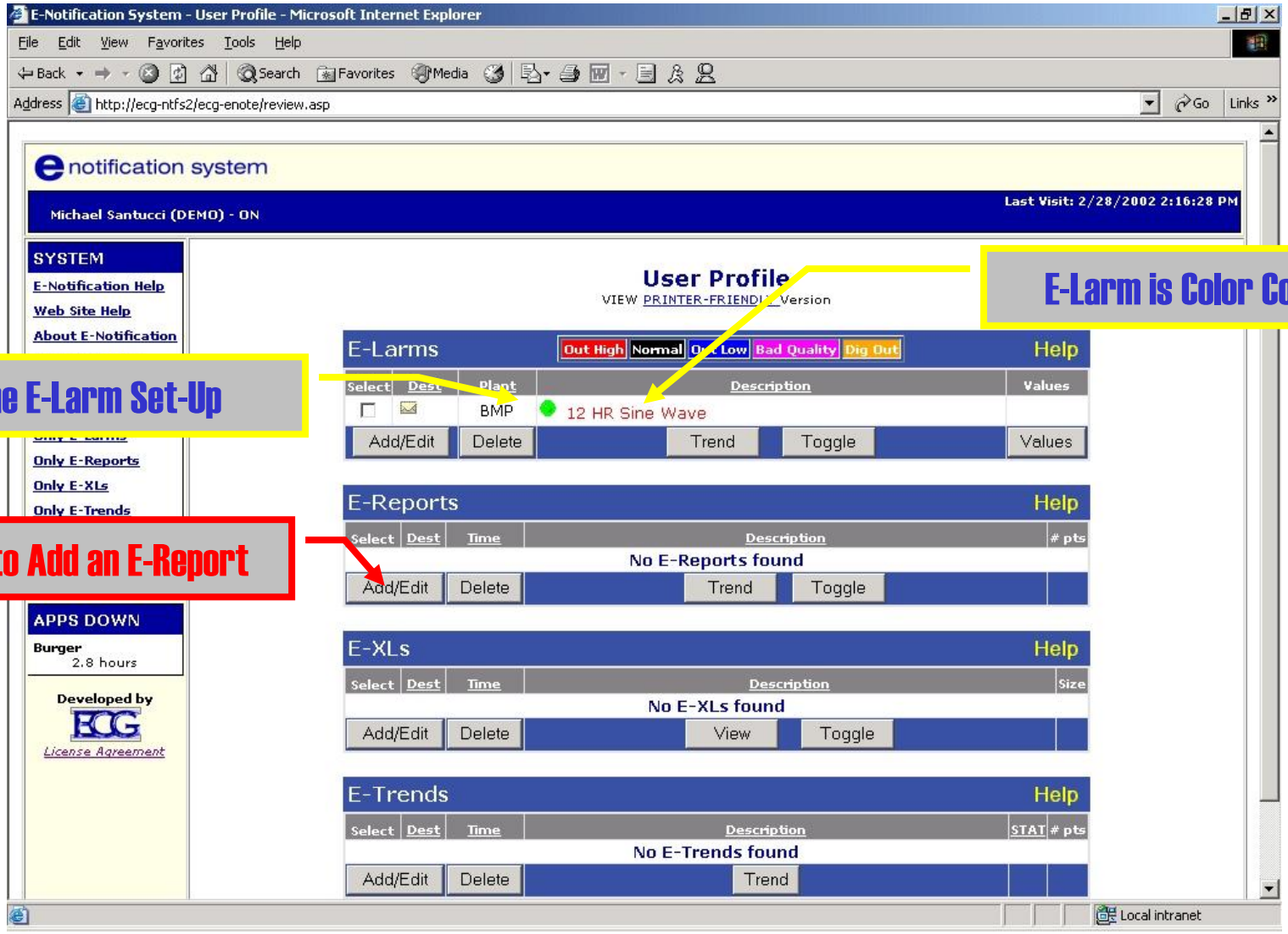
E-Note: E-Larm Configuration



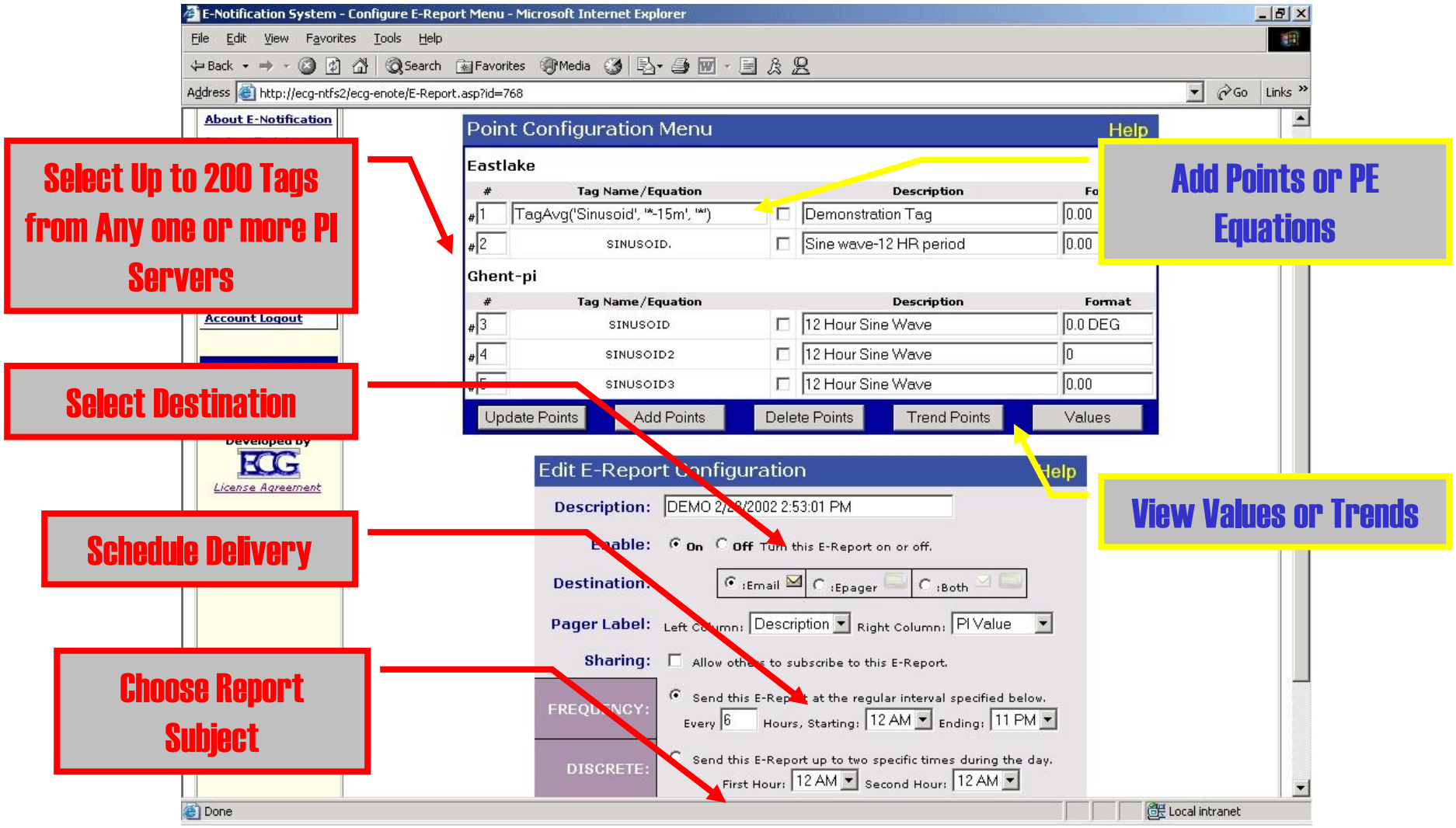
E-Larm Triggering



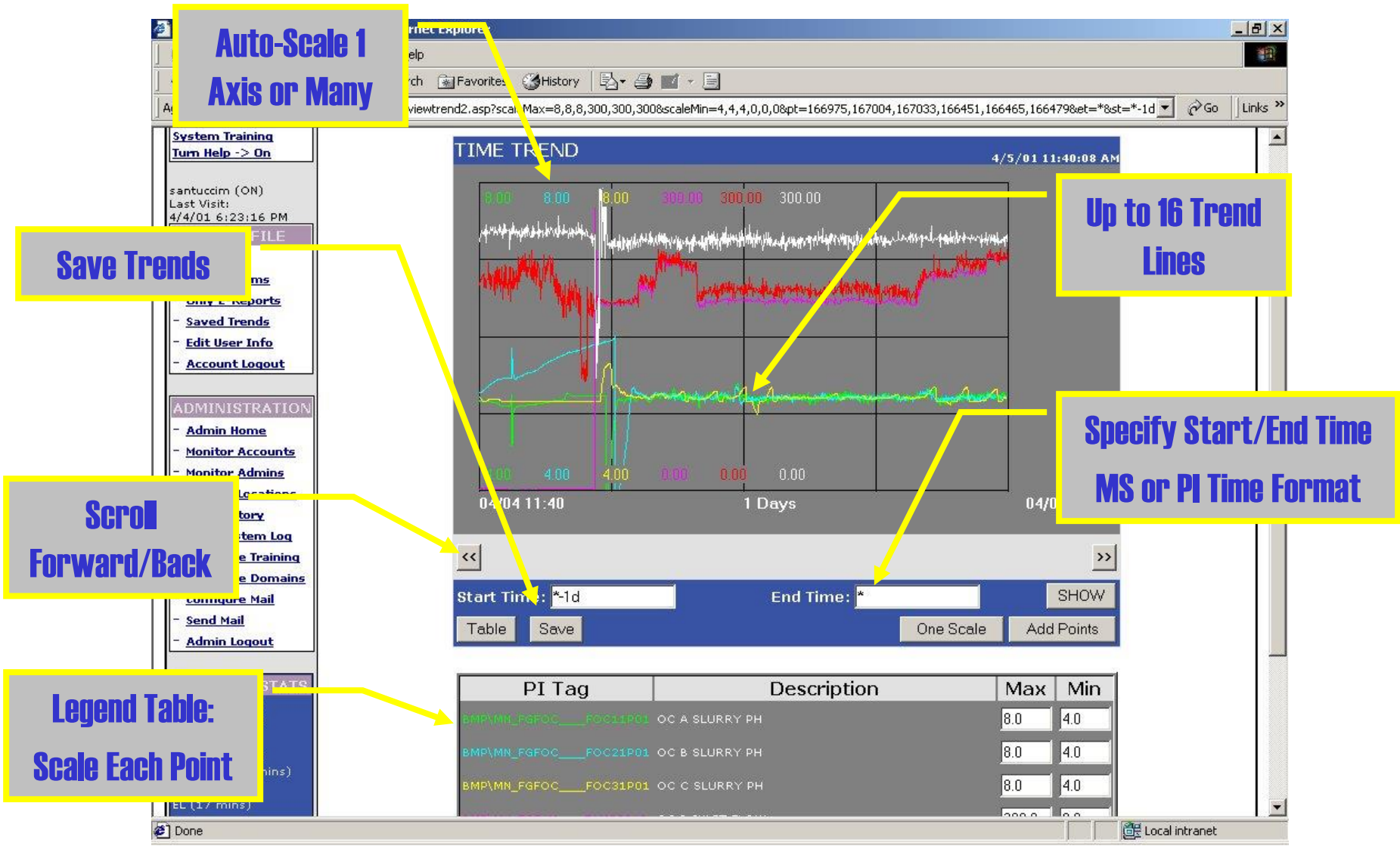
E-Note: User Profile 1 Alarm



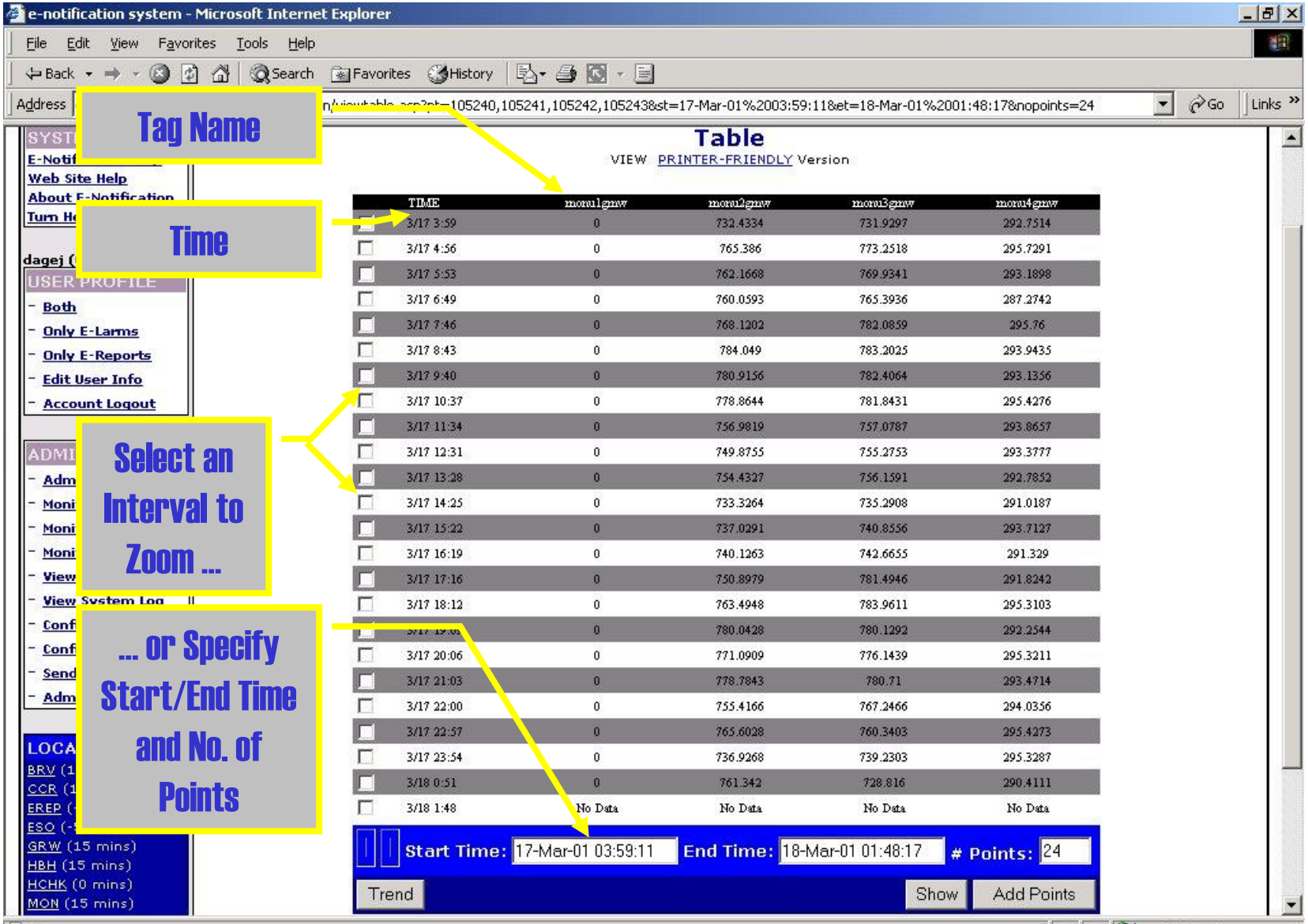
E-Note: E-Report Setup



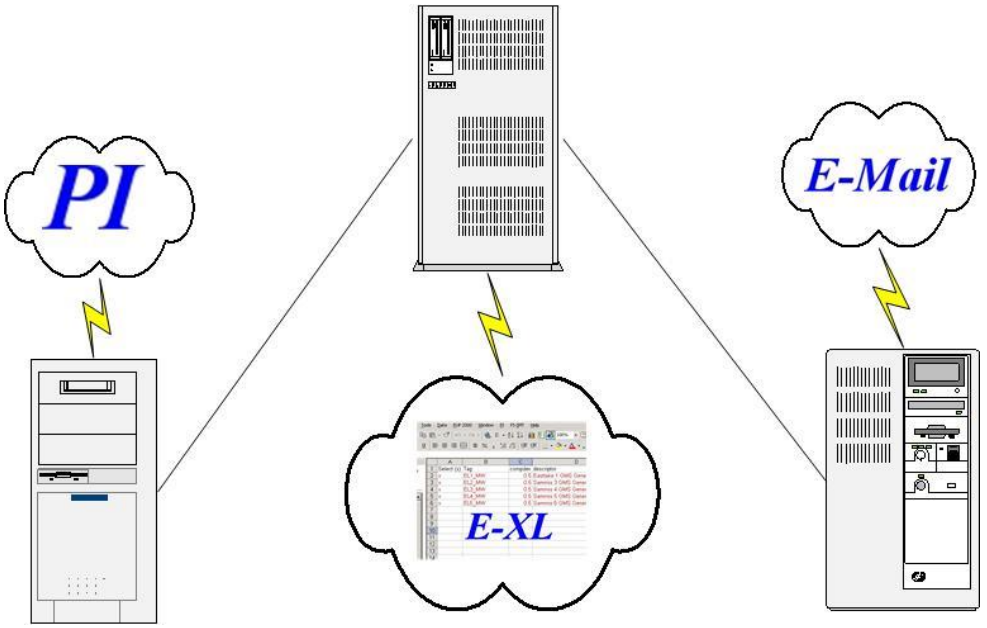
E-Note: Trend Archive Data

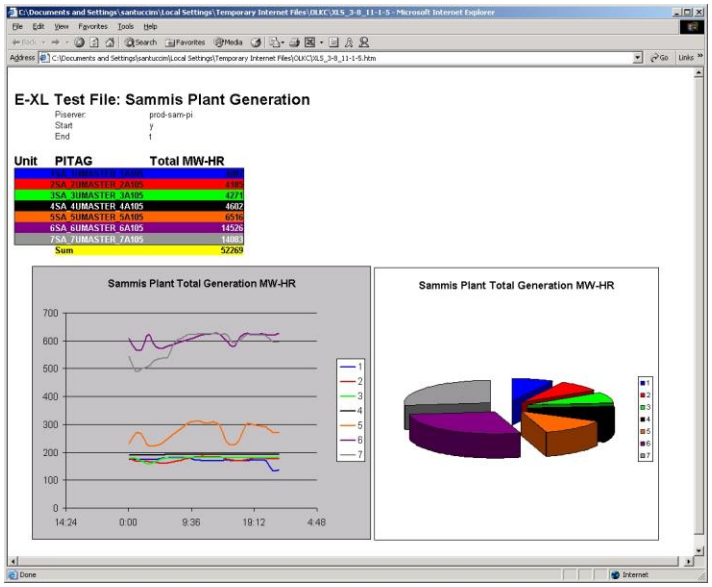


E-Note: Table Archive Data



E-Note: Spreadsheet Reports





Excel: Configure Report using Excel® with DataLink

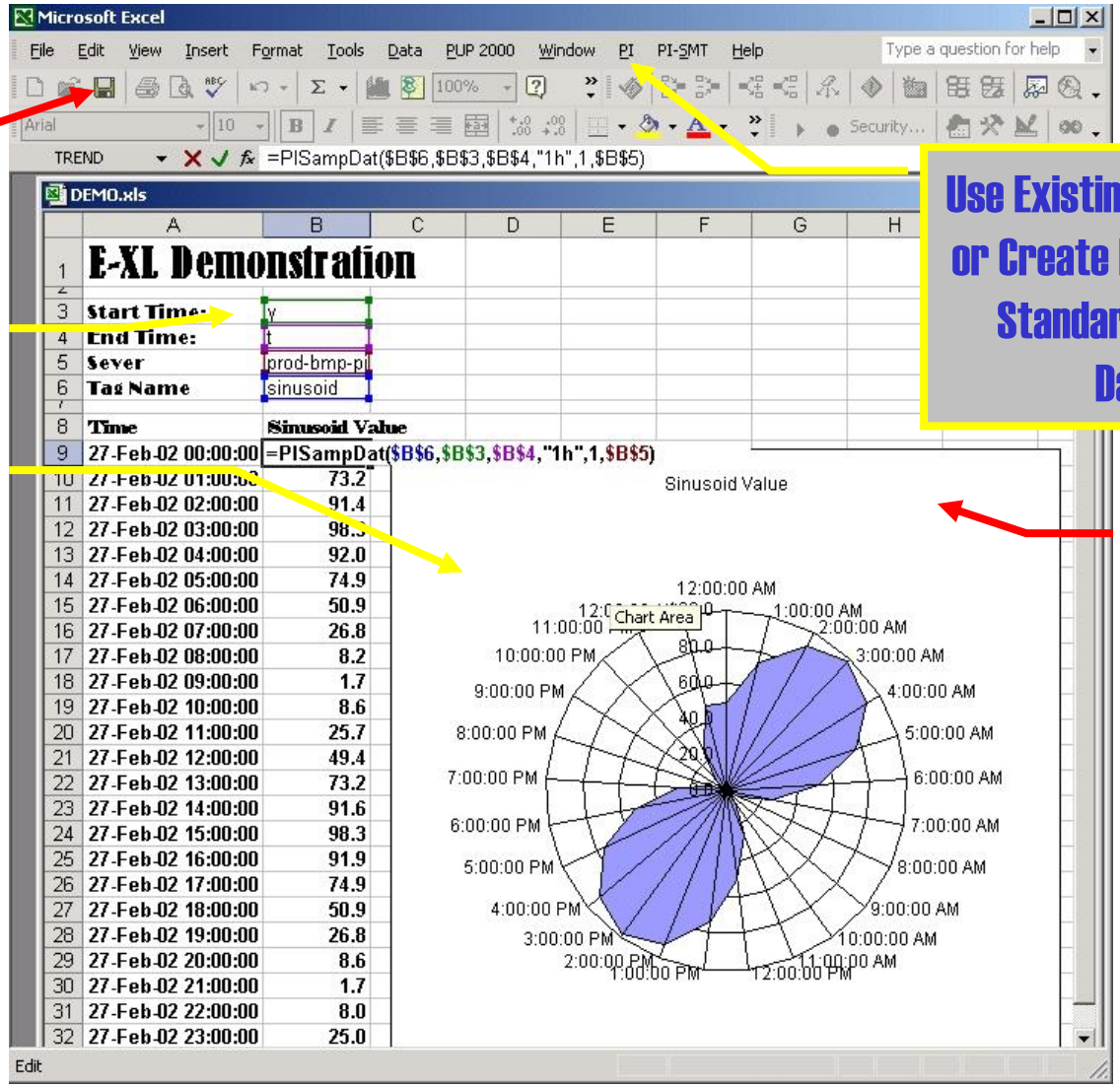
Save File

Server Location

Format Report

Use Existing Spreadsheets or Create New Ones using Standard Excel with Datalink

Set Print Area, use Print Preview



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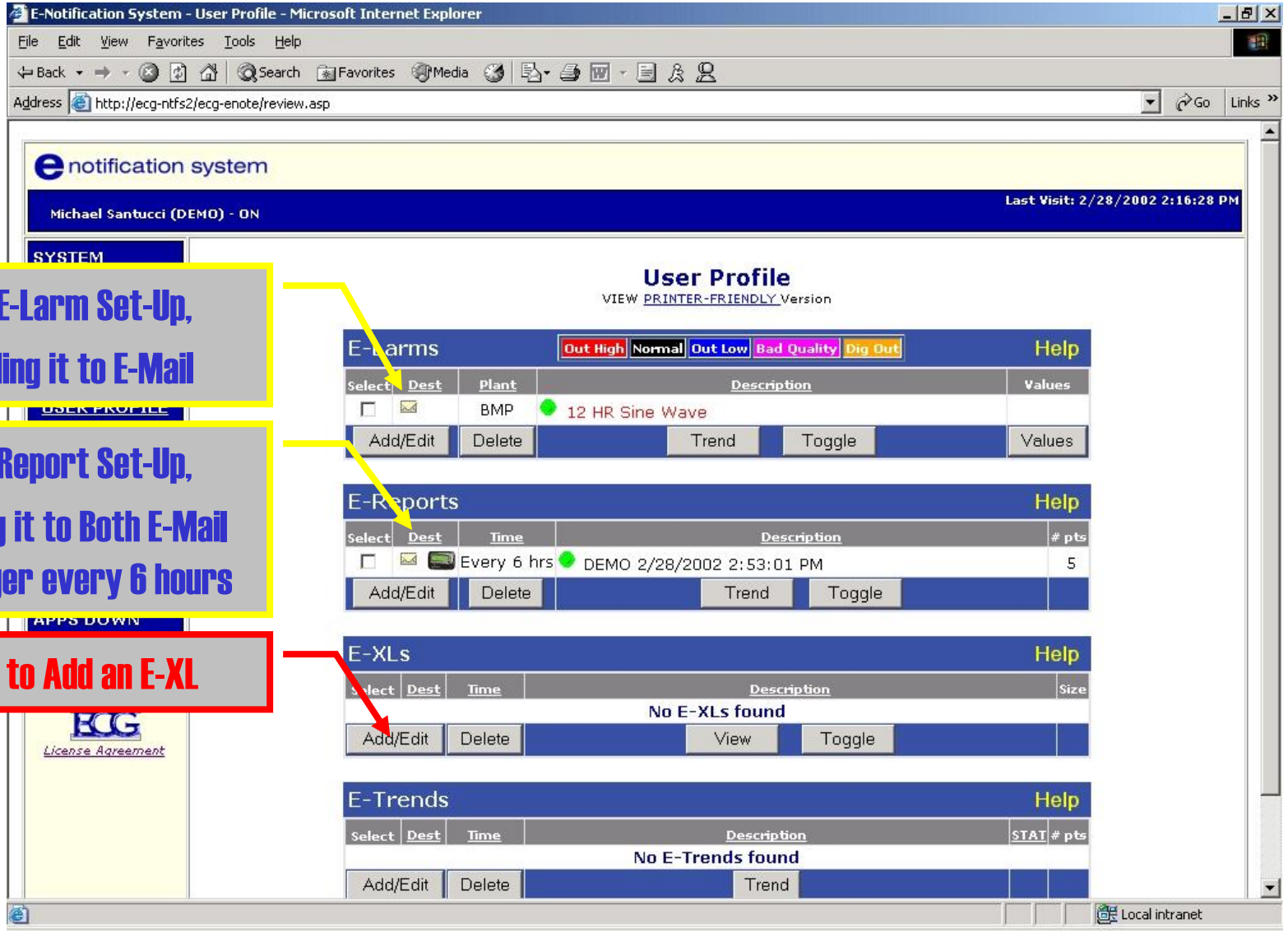
E-Note: Add New E-XL



One E-Larm Set-Up, Sending it to E-Mail

One Report Set-Up, Sending it to Both E-Mail and Pager every 6 hours

Click to Add an E-XL

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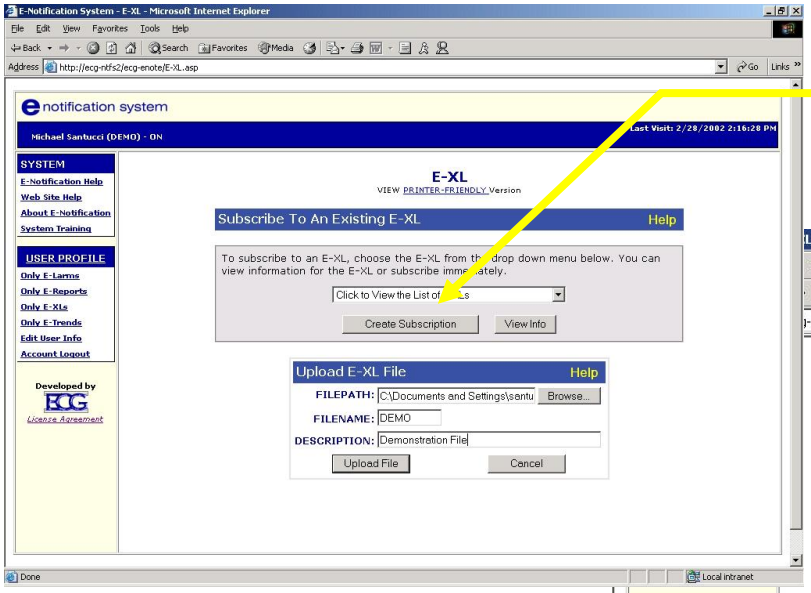
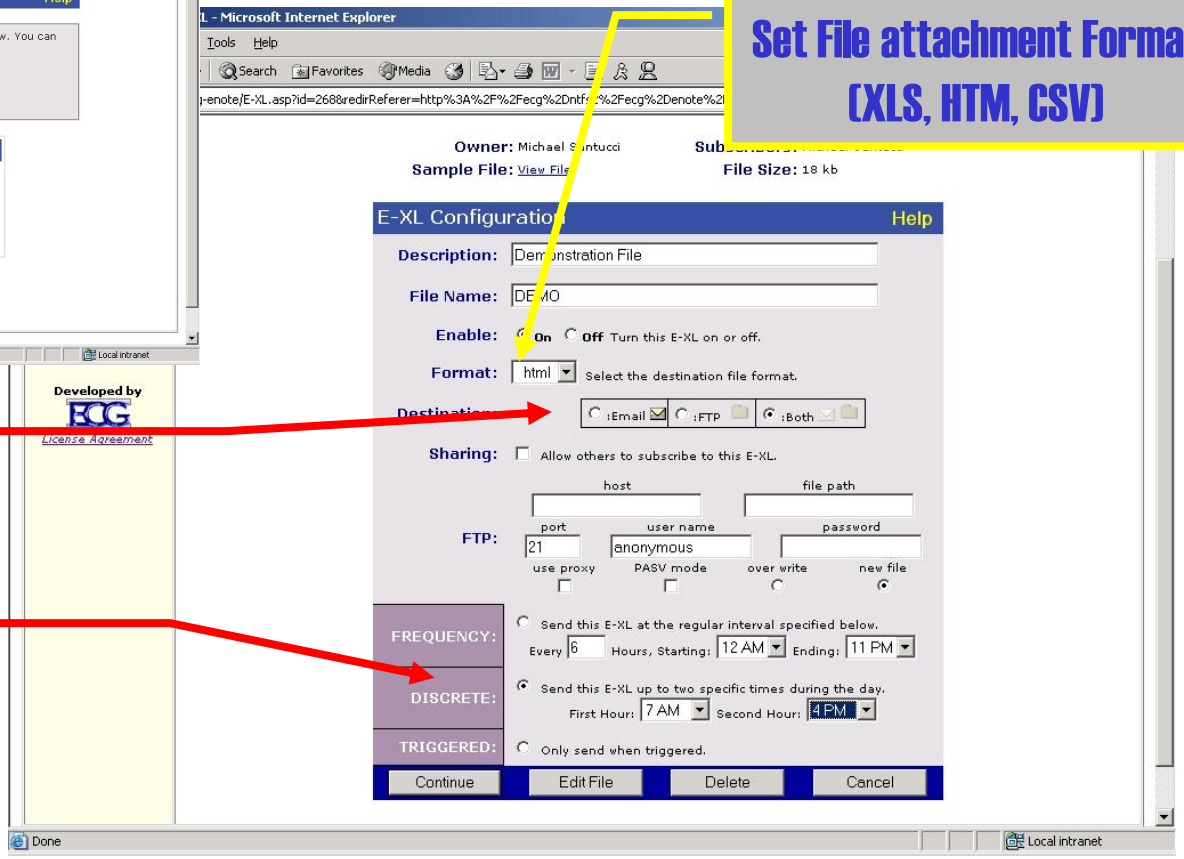
E-Note: Configure E-XL Properties



Browse to Find File

Set File attachment Format (XLS, HTM, CSV)



Configure Destination (Email or FTP)

Configure When Message will be Delivered

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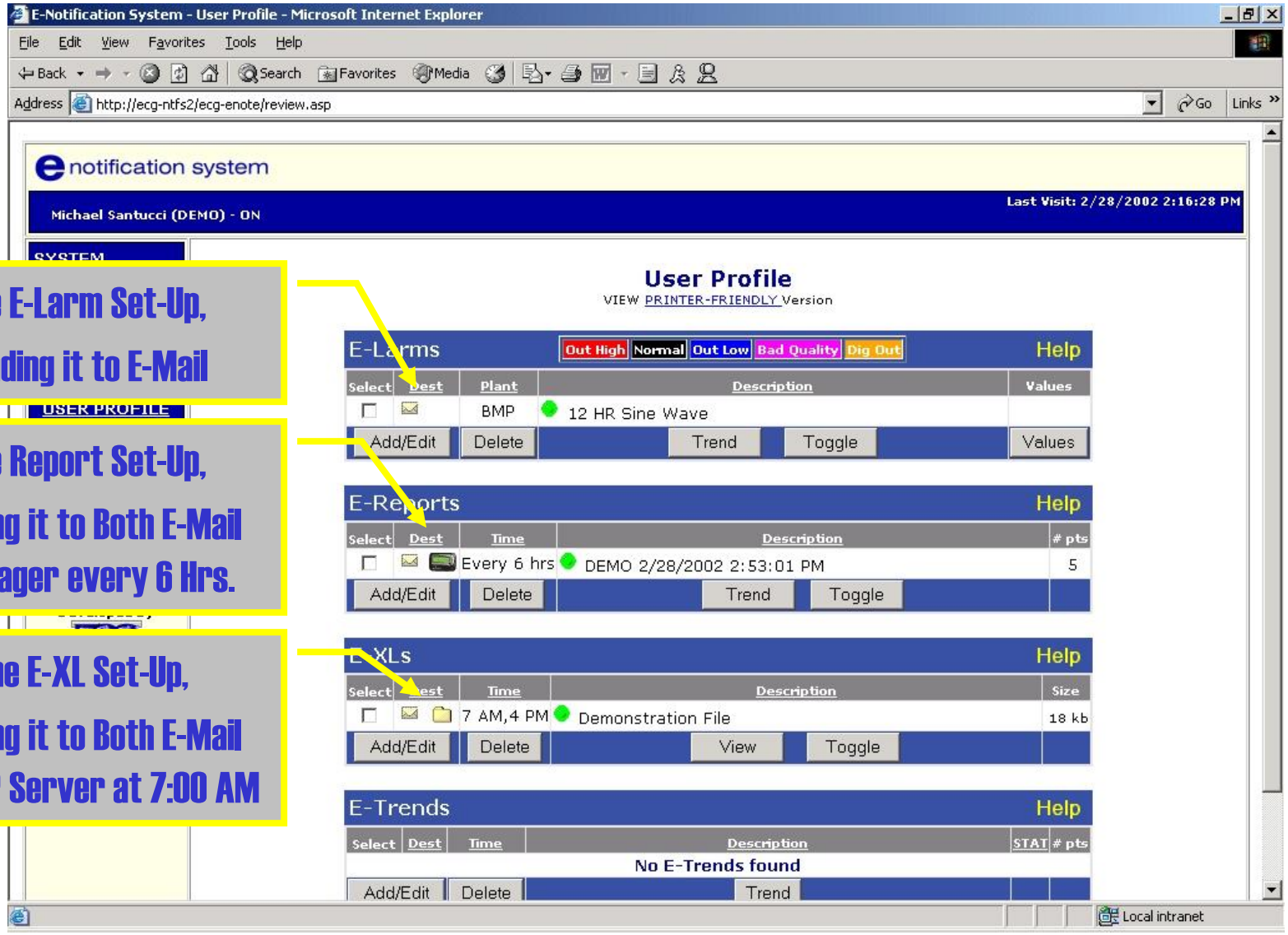
E-Note: User Profile *(One of Each)*

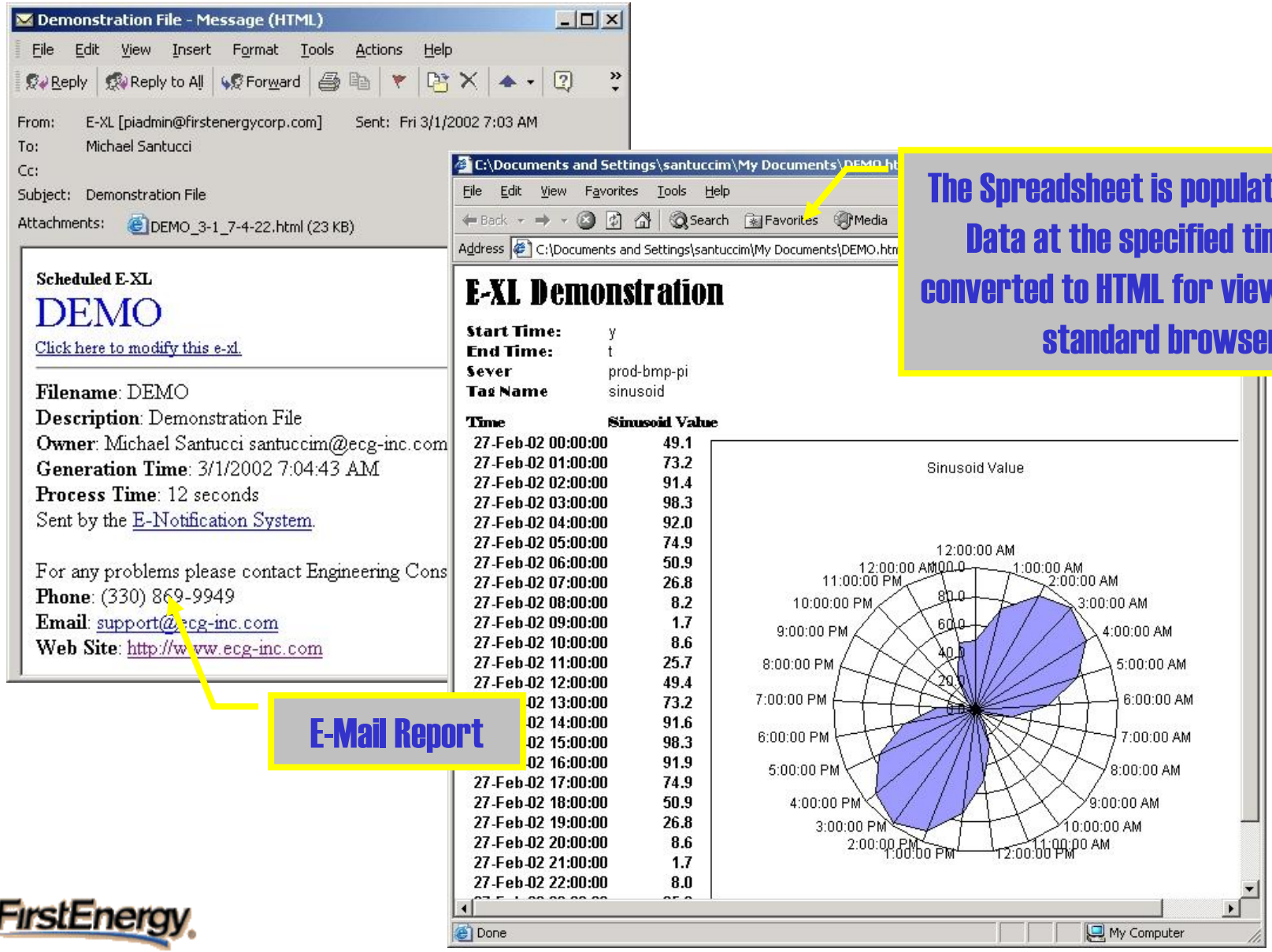
One E-Larm Set-Up,
Sending it to E-Mail

One Report Set-Up,
Sending it to Both E-Mail
and Pager every 6 Hrs.

One E-XL Set-Up,
Sending it to Both E-Mail
and FTP Server at 7:00 AM



Outlook: Message Attachment



The Spreadsheet is populated with PI Data at the specified time then converted to HTML for viewing with a standard browser.

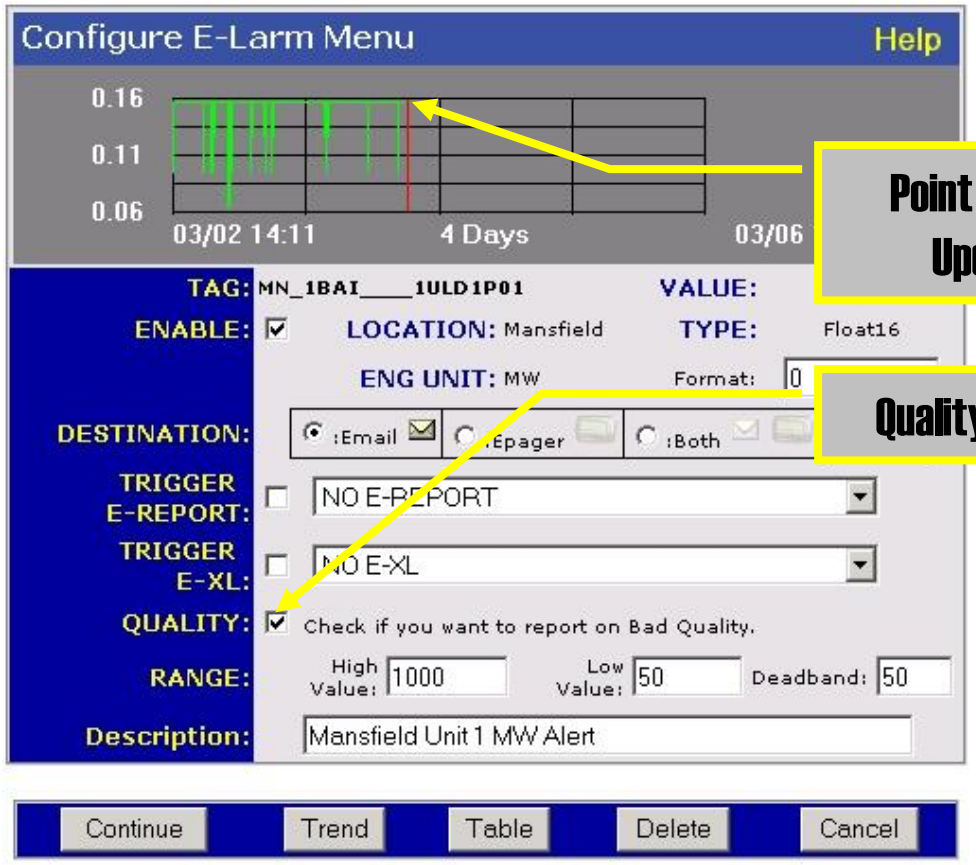
E-Mail Report

E-Note: E-XL Message

File Extension	Features	Limitation
.CSV	Data can be read in to any text editor, notepad, wordpad, etc.	No Formatting Available
.HTM	Data can be Formatted and viewed in any standard browser	Objects such as Charts Are not supported.
.XLS	Charts and most other features of Excel are supported	Must be opened in an Excel viewer.

First Energy Corporation Customized Notification Examples and Automated Excel Reports

E-Larm: Interface Trouble



Point Stopped Updating

Quality Flag Set

What:

Interface Trouble

Who:

PI Admins

Why:

Point is Bad Quality

When:

- Non-Numeric Value return from PI
- Exception Max Time exceeded without a fresh Snapshot.

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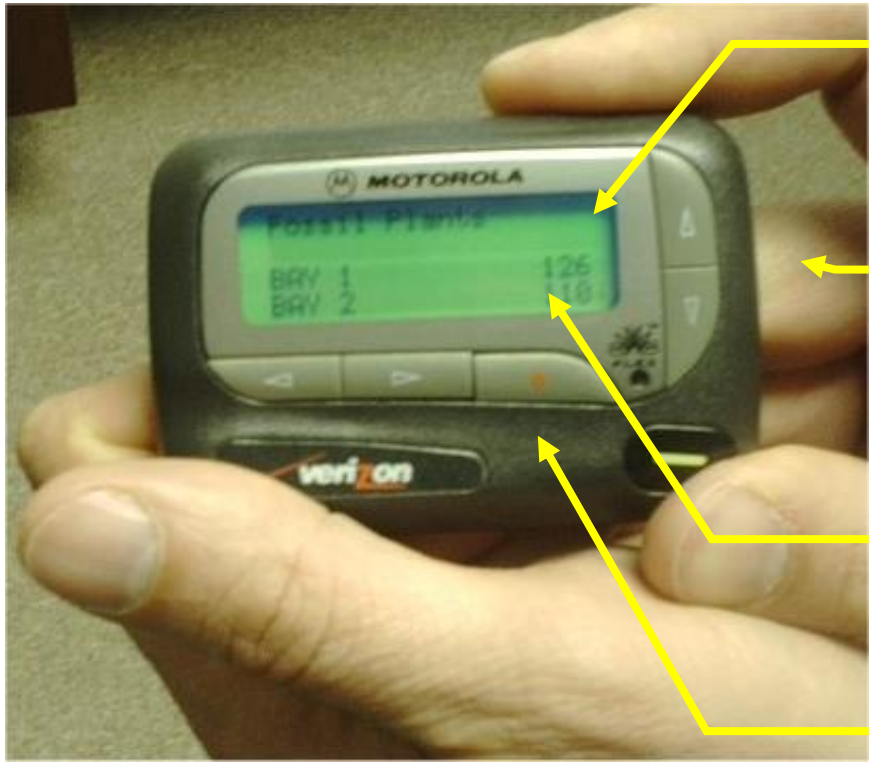
E-Report: Pager Messages



List of Unit MW Values

Silent Delivery Every Hour and After Any Unit On/Off

Snapshots and PE Equations

Up to 500 Characters

What:

Fossil Plants MW's

Who:

Vice Presidents

Plant Managers

Unit Engineers

Tech. Support Group

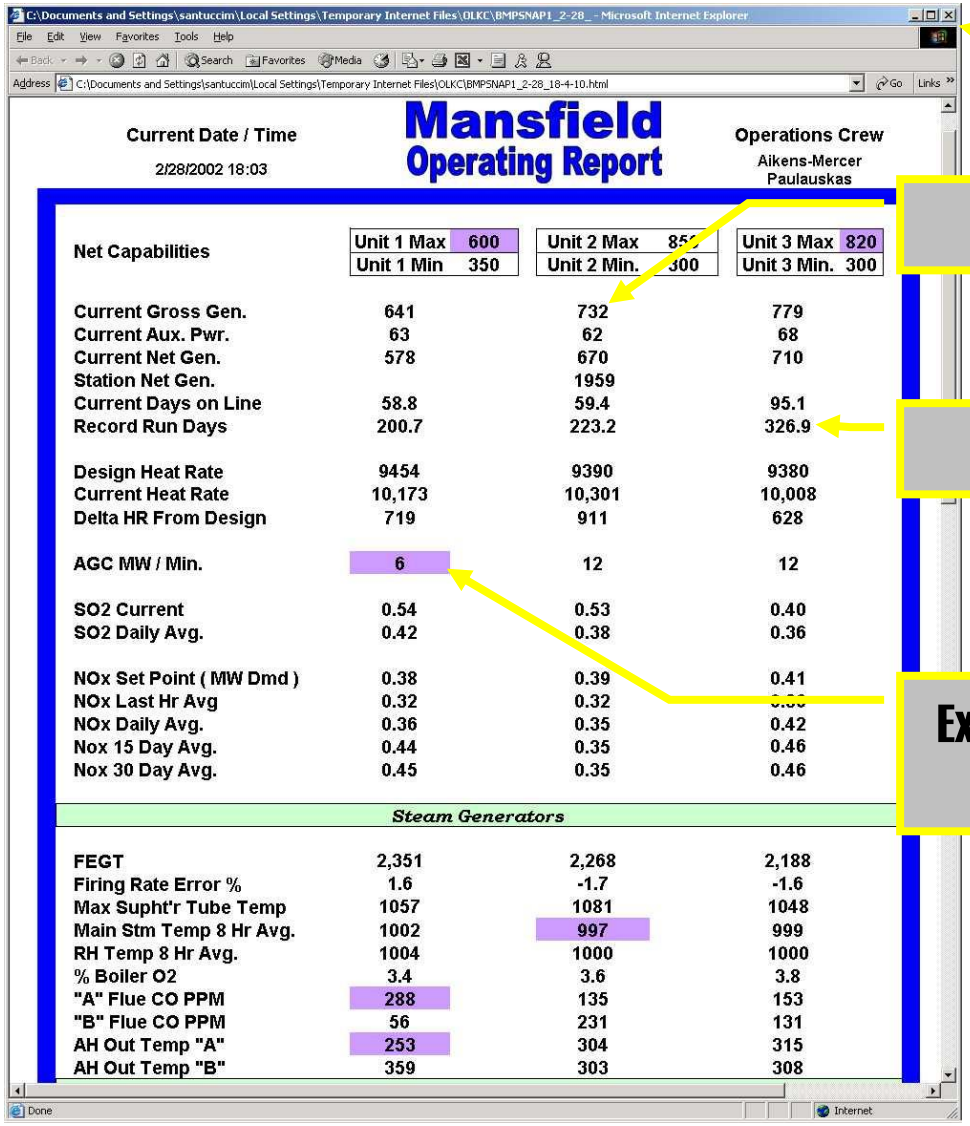
Why:

Status of Unit Loads and On/Off Notifications

When:

Hourly and by Event

E-XL: Plant Business Report



C:\Documents and Settings\santuccim\Local Settings\Temporary Internet Files\OLKC\BMPSNAP1_2-28_ - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address C:\Documents and Settings\santuccim\Local Settings\Temporary Internet Files\OLKC\BMPSNAP1_2-28_18-4-10.html

Current Date / Time
2/28/2002 18:03

Mansfield Operating Report

Operations Crew
Aikens-Mercer
Paulauskas

Net Capabilities	Unit 1 Max 600 / Unit 1 Min 350	Unit 2 Max 850 / Unit 2 Min. 300	Unit 3 Max 820 / Unit 3 Min. 300
Current Gross Gen.	641	732	779
Current Aux. Pwr.	63	62	68
Current Net Gen.	578	670	710
Station Net Gen.		1959	
Current Days on Line	58.8	59.4	95.1
Record Run Days	200.7	223.2	326.9
Design Heat Rate	9454	9390	9380
Current Heat Rate	10,173	10,301	10,008
Delta HR From Design	719	911	628
AGC MW / Min.	6	12	12
SO2 Current	0.54	0.53	0.40
SO2 Daily Avg.	0.42	0.38	0.36
NOx Set Point (MW Dmd)	0.38	0.39	0.41
NOx Last Hr Avg	0.32	0.32	
NOx Daily Avg.	0.36	0.35	0.42
Nox 15 Day Avg.	0.44	0.35	0.46
Nox 30 Day Avg.	0.45	0.35	0.46
Steam Generators			
FEGT	2,351	2,268	2,188
Firing Rate Error %	1.6	-1.7	-1.6
Max Supht'r Tube Temp	1057	1081	1048
Main Stm Temp 8 Hr Avg.	1002	997	999
RH Temp 8 Hr Avg.	1004	1000	1000
% Boiler O2	3.4	3.6	3.8
"A" Flue CO PPM	288	135	153
"B" Flue CO PPM	56	231	131
AH Out Temp "A"	253	304	315
AH Out Temp "B"	359	303	308

Done Internet

Snapshots

SQL Data

Excel Macro Flags Alarm Limits

What:

Plant Operating Data Report

Who:

Plant Manager
Operation Manager
Unit Engineers
Tech. Support Group

Why:

Daily Review of Past Days' Operating Data

When:

Mornings and Afternoons @ 6:00

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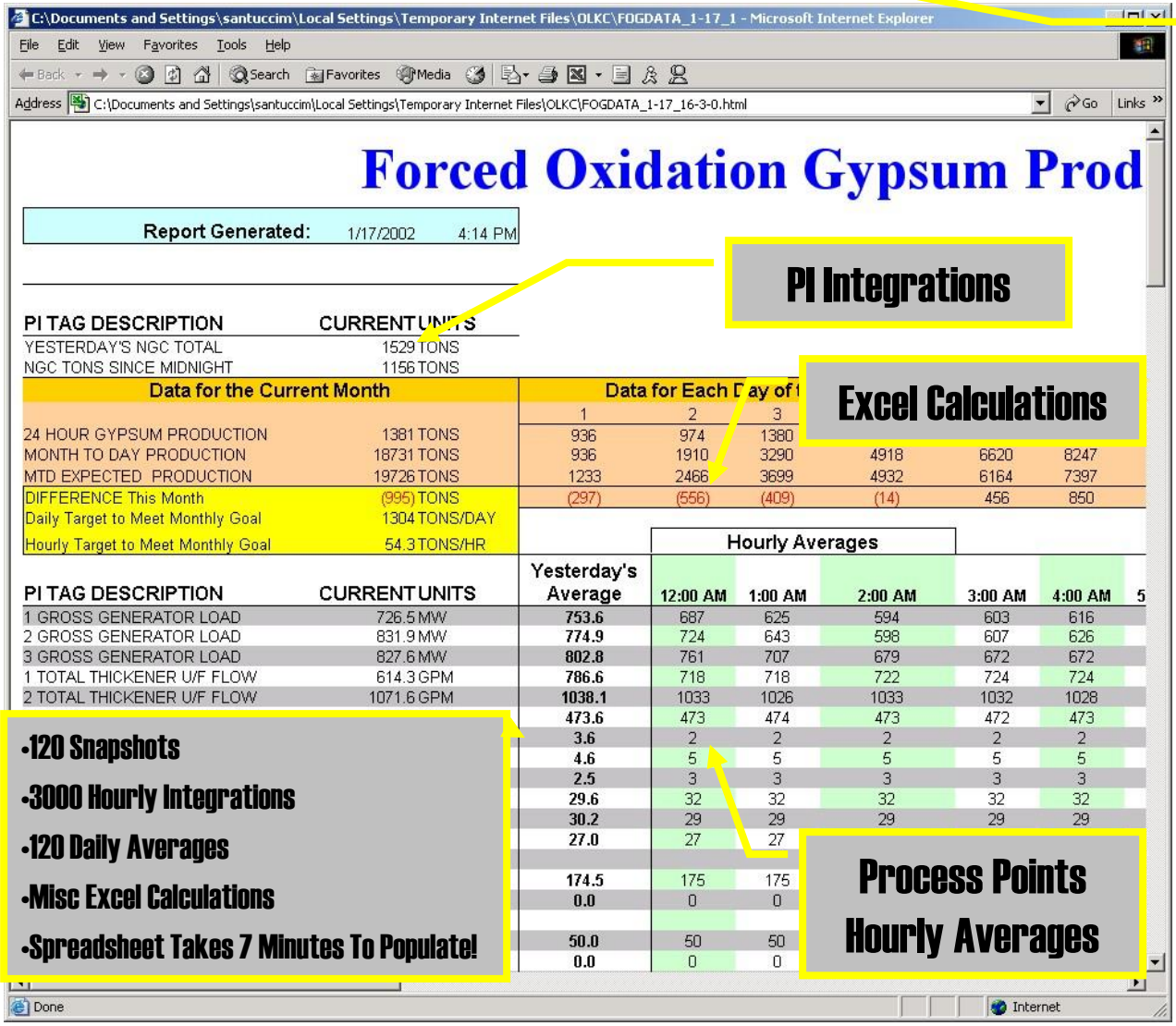
E-XL: Process Reporting



What:

FOG Plant Production

Who:

Plant Manager

FOG Manager

External Consultant

Why:

Monthly Goal

Achievement Progress

When:

Mornings and Shifts

E-XL: Emissions Tracking

First Energy Corporation Running 30 Nox Activity

#/MBTU	Burger			Mansfield			Sammis						
Date	Unit 3	Unit 4	Unit 5	Unit 1	Unit 2	Unit 3	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
02/05/02	0.18	0.55	0.69	0.52	0.38	0.52	0.51	0.41	1.07	0.42	0.51	0.42	0.37
02/06/02	0.17	0.46	0.95	0.52	0.41	0.47	0.57	0.38	1.14	0.43	0.50	0.43	0.40
02/07/02	0.17	0.41	0.87	0.55	0.38	0.48	0.51	0.41	1.11	0.42	0.53	0.45	0.40
02/08/02	0.17	0.75	0.84	0.52	0.40	0.50	0.50	0.39	1.12	0.43	0.50	0.43	0.41
02/09/02	0.17	0.63	0.76	0.48	0.34	0.52	0.48	0.32	1.06	0.40	0.39	0.32	0.37
02/10/02	0.17	0.59	0.69	0.41	0.29	0.47	0.47	0.31	1.07	0.40	0.41	0.30	0.37
02/11/02	0.17	0.76	0.83	0.53	0.34	0.51	0.51	0.39	1.20	0.51	0.46	0.47	0.39
02/12/02	0.17	0.75	0.87	0.55	0.36	0.53	0.50	0.41	1.12	0.60	0.51	0.48	0.43
02/13/02	0.18	0.81	0.91	0.45	0.34	0.49	0.46	0.53	1.13	0.55	0.46	0.46	0.41
02/14/02	0.18	0.97	0.92	0.47	0.33	0.55	0.38	0.50	1.1				3
02/15/02	0.17	0.68	0.87	0.50	0.39	0.52	0.43	0.53	1.2				0
02/16/02	0.17	0.80	0.19	0.51	0.39	0.47	0.44	0.56	1.1				2
02/17/02	0.17	0.84	0.10	0.40	0.33	0.41	0.42	0.53	1.1				2
02/18/02	0.17	0.44	0.22	0.48	0.36	0.43	0.40	0.54	1.17	0.48	0.53	0.47	0.40
02/19/02	0.17	0.68	0.15	0.51	0.35	0.51	0.38	0.57	1.16	0.52	0.50	0.48	0.39
02/20/02	0.17	0.54	0.35	0.51	0.35	0.43	0.43	0.45	1.13	0.53	0.49	0.43	0.37
02/21/02	0.17	0.50	0.27	0.49	0.37	0.46	0.42	0.47	1.17	0.51	0.49	0.41	0.45
02/22/02	0.17	0.51	0.08	0.48	0.40	0.45	0.42	0.47	1.19	0.51	0.52	0.41	0.38
02/23/02	0.17	0.50	0.10	0.33	0.33	0.47	0.42	0.44	0.87	0.49	0.51	0.42	0.37
02/24/02	0.17	0.62	0.10	0.35	0.31	0.43	0.44	0.38	0.96	0.44	0.47	0.45	0.38
02/25/02	0.17	0.79	0.10	0.37	0.33	0.44	0.48	0.48	1.09	0.48	0.49	0.41	0.40
02/26/02	0.17	0.77	0.05	0.36	0.35	0.43	0.48	0.41	1.11	0.49	0.48	0.42	0.41
02/27/02	0.17	0.82	0.03	0.31	0.34	0.43	0.51	0.46	1.12	0.50	0.50	0.40	0.44
02/28/02	0.17	0.82	0.06	0.35	0.34	0.42	0.48	0.49	1.09	0.46	0.48	0.41	0.42
03/01/02	0.17	0.81	0.12	0.24	0.33	0.42	0.43	0.41	1.08	0.50	0.47	0.35	0.38
03/02/02	0.17	0.79					0.44	0.39	1.07	0.50	0.45	0.42	0.38
03/03/02	0.17	0.66					0.44	0.40	1.07	0.51	0.46	0.40	0.36
03/04/02	0.17	0.31					0.46	0.54	1.07	0.48	0.43	0.40	0.40
03/05/02	0.17	0.29					0.48	0.51	1.06	0.49	0.44	0.39	0.41
03/06/02	0.17	0.29					0.46	0.50	1.05	0.46	0.45	0.34	0.40
03/07/02	0.17	0.28					0.49	0.46	1.01	0.47	0.47	0.35	0.41
30 Day Avg	0.17	0.63					0.46	0.45	1.10	0.49	0.49	0.42	0.40

Three PI Servers

Process Points
Hourly Averages

What:

Nox Emissions Report

Who:

Environmental

Conv Econ

Plant Staff

Why:

Monthly Target

Nox Credits

When:

Mornings

Where:

Corporate [redacted]S Server

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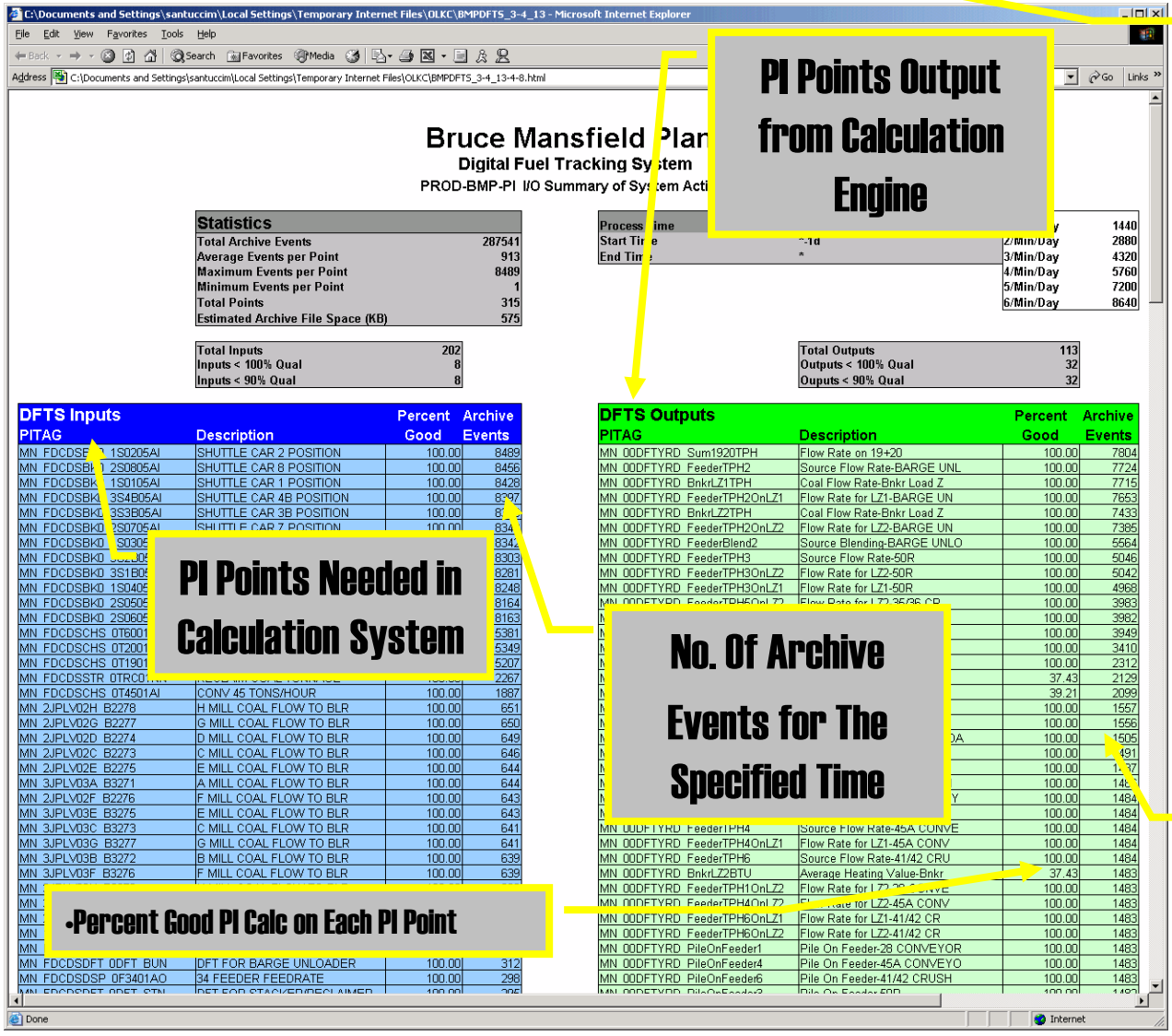
E-XL: Interface Performance



PI Points Output from Calculation Engine

PI Points Needed in Calculation System

No. Of Archive Events for The Specified Time

•Percent Good PI Calc on Each PI Point

What:

Fuel Tracking Interface

Who:

PI Administrator and Third Party Support

Why:

Bad Quality Points
Flat-Lined Points
Overactive Points

When:

Daily

Excel Macro Sorts Points and ColorCodes "over/under active points

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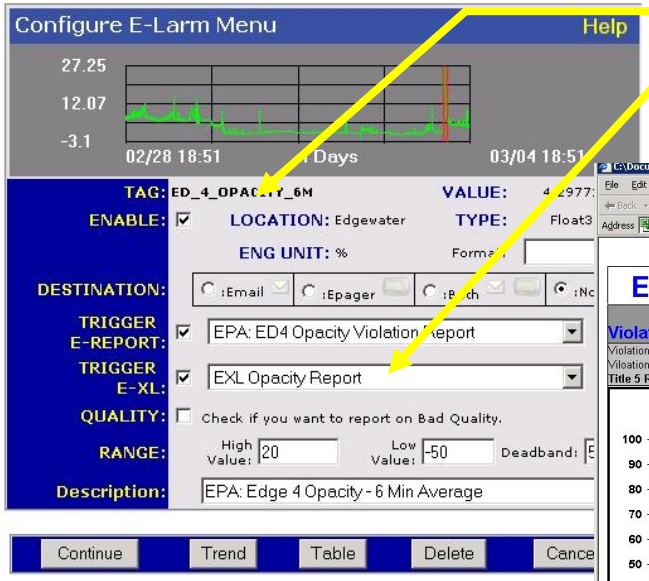
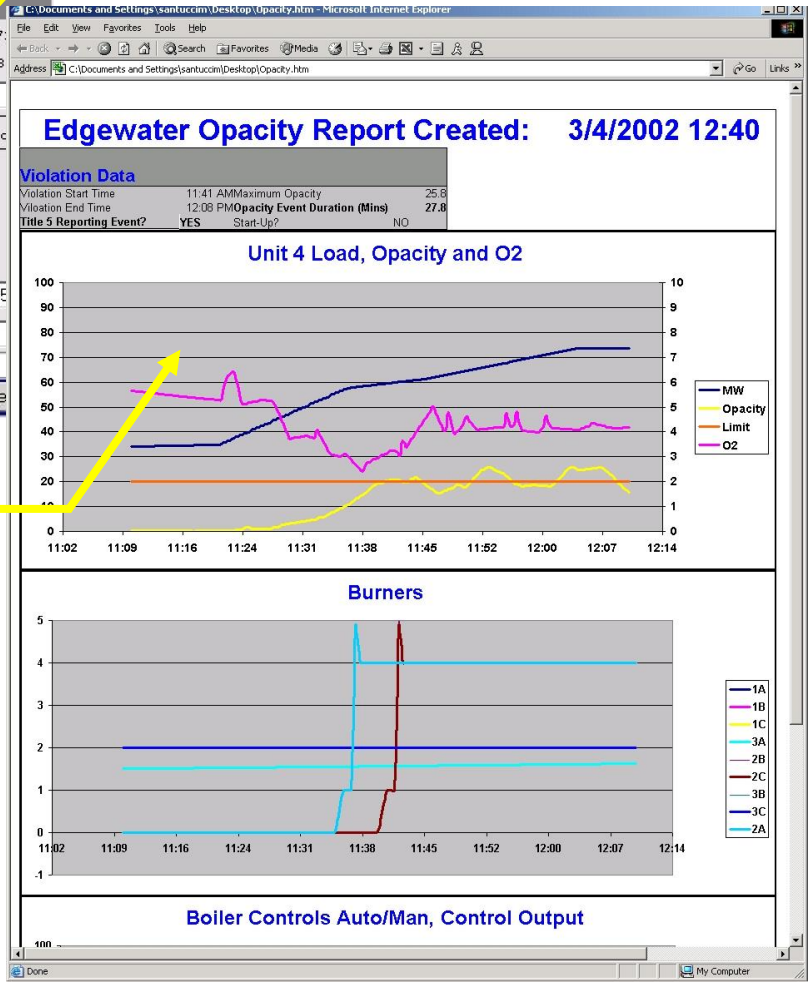
E-XL: Process Event Reporting



PI Tag That Triggers Report

Report that is Triggered



Excel Report is FTP'ed to Central Server

What:

Opacity Violation spawns a Spreadsheet Report

Who:

Plant Manager

Environmental Admin

Why:

Each Violation Must be Documented with Reason Code

When:

Anytime 6-Min Average Opacity Exceeds 20%

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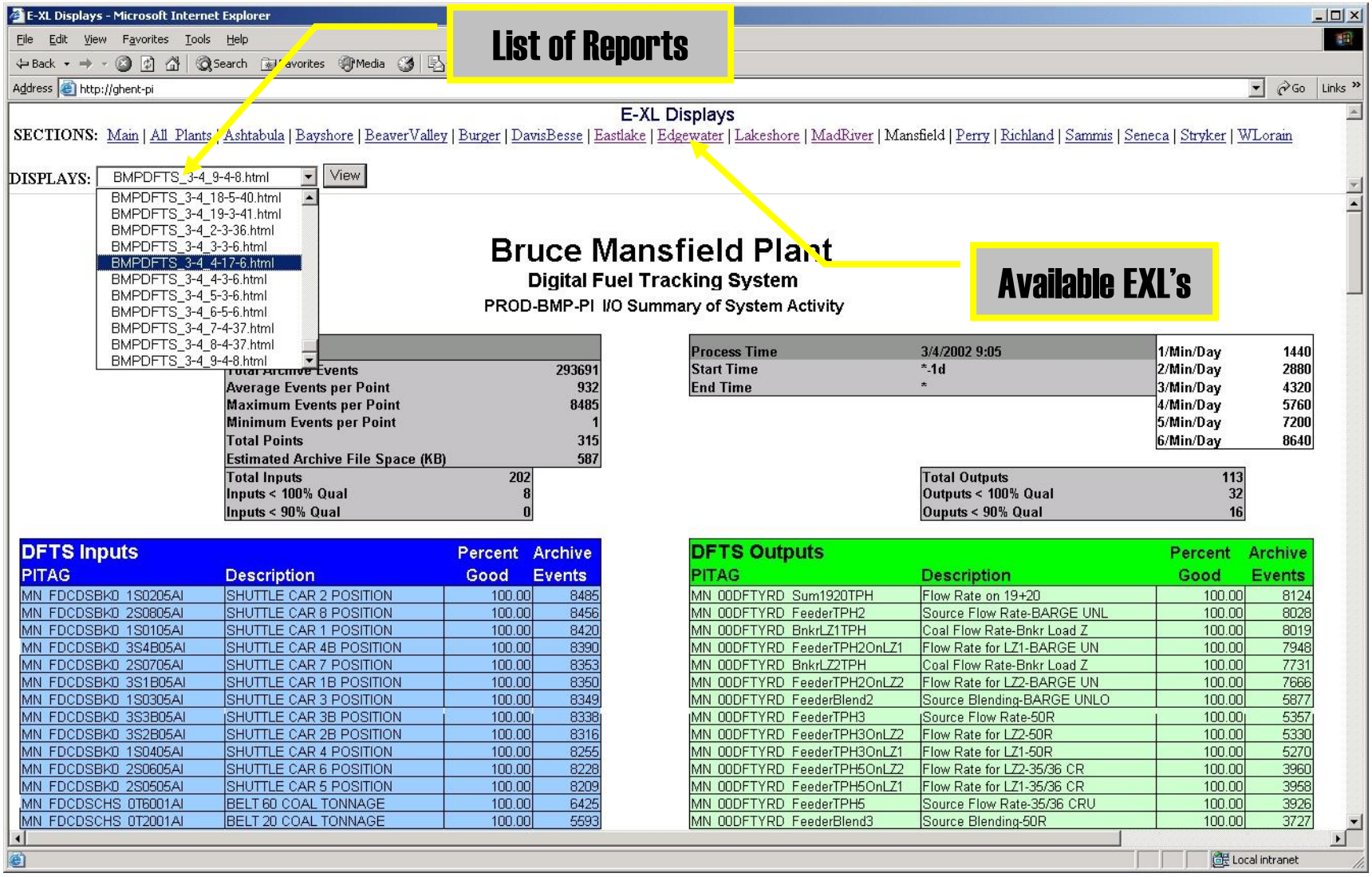
E-XL: Viewer


List of Reports
Available EXL's
E-XL Displays - Microsoft Internet Explorer
E-XL Displays
SECTIONS: Main | All_Plants | Ashtabula | Bayshore | BeaverValley | Burger | DavisBesse | Eastlake | Edgewater | Lakeshore | MadRiver | Mansfield | Perry | Richland | Sammis | Seneca | Stryker | WLorain
DISPLAYS: BMPDFTS_3-4_9-4-8.html View
BMPDFTS_3-4_18-5-40.html
BMPDFTS_3-4_19-3-41.html
BMPDFTS_3-4_2-3-36.html
BMPDFTS_3-4_3-3-6.html
BMPDFTS_3-4_4-17-6.html
BMPDFTS_3-4_4-3-6.html
BMPDFTS_3-4_5-3-6.html
BMPDFTS_3-4_6-5-6.html
BMPDFTS_3-4_7-4-37.html
BMPDFTS_3-4_8-4-37.html
BMPDFTS_3-4_9-4-8.html
Bruce Mansfield Plant
Digital Fuel Tracking System
PROD-BMP-PI I/O Summary of System Activity
Total Archive Events 293691
Average Events per Point 932
Maximum Events per Point 8485
Minimum Events per Point 1
Total Points 315
Estimated Archive File Space (KB) 587
Total Inputs 202
Inputs < 100% Qual 8
Inputs < 90% Qual 0
Process Time 3/4/2002 9:05
Start Time *-1d
End Time *
1/Min/Day 1440
2/Min/Day 2880
3/Min/Day 4320
4/Min/Day 5760
5/Min/Day 7200
6/Min/Day 8640
Total Outputs 113
Outputs < 100% Qual 32
Ouputs < 90% Qual 16
DFTS Inputs
PITAG Description Percent Good Archive Events
MN_FDCDSBK0_1S0205AI SHUTTLE CAR 2 POSITION 100.00 8485
MN_FDCDSBK0_2S0805AI SHUTTLE CAR 8 POSITION 100.00 8456
MN_FDCDSBK0_1S0105AI SHUTTLE CAR 1 POSITION 100.00 8420
MN_FDCDSBK0_3S4B05AI SHUTTLE CAR 4B POSITION 100.00 8390
MN_FDCDSBK0_2S0705AI SHUTTLE CAR 7 POSITION 100.00 8353
MN_FDCDSBK0_3S1B05AI SHUTTLE CAR 1B POSITION 100.00 8350
MN_FDCDSBK0_1S0305AI SHUTTLE CAR 3 POSITION 100.00 8349
MN_FDCDSBK0_3S3B05AI SHUTTLE CAR 3B POSITION 100.00 8338
MN_FDCDSBK0_3S2B05AI SHUTTLE CAR 2B POSITION 100.00 8316
MN_FDCDSBK0_1S0405AI SHUTTLE CAR 4 POSITION 100.00 8255
MN_FDCDSBK0_2S0605AI SHUTTLE CAR 6 POSITION 100.00 8228
MN_FDCDSBK0_2S0505AI SHUTTLE CAR 5 POSITION 100.00 8209
MN_FDCDSCHS_0T6001AI BELT 60 COAL TONNAGE 100.00 6425
MN_FDCDSCHS_0T2001AI BELT 20 COAL TONNAGE 100.00 5593
DFTS Outputs
PITAG Description Percent Good Archive Events
MN_0ODFTYRD_Sum1920TPH Flow Rate on 19+20 100.00 8124
MN_0ODFTYRD_FeederTPH2 Source Flow Rate-BARGE UNL 100.00 8028
MN_0ODFTYRD_BnkrLZ1TPH Coal Flow Rate-Bnkr Load Z 100.00 8019
MN_0ODFTYRD_FeederTPH2OnLZ1 Flow Rate for LZ1-BARGE UN 100.00 7948
MN_0ODFTYRD_BnkrLZ2TPH Coal Flow Rate-Bnkr Load Z 100.00 7731
MN_0ODFTYRD_FeederTPH2OnLZ2 Flow Rate for LZ2-BARGE UN 100.00 7666
MN_0ODFTYRD_FeederBlend2 Source Blending-BARGE UNLO 100.00 5877
MN_0ODFTYRD_FeederTPH3 Source Flow Rate-50R 100.00 5357
MN_0ODFTYRD_FeederTPH3OnLZ2 Flow Rate for LZ2-50R 100.00 5330
MN_0ODFTYRD_FeederTPH3OnLZ1 Flow Rate for LZ1-50R 100.00 5270
MN_0ODFTYRD_FeederTPH5OnLZ2 Flow Rate for LZ2-35/36 CR 100.00 3960
MN_0ODFTYRD_FeederTPH5OnLZ1 Flow Rate for LZ1-35/36 CR 100.00 3958
MN_0ODFTYRD_FeederTPH5 Source Flow Rate-35/36 CRU 100.00 3926
MN_0ODFTYRD_FeederBlend3 Source Blending-50R 100.00 3727
Local intranet

E-Note: Summary

- **Filters PI data deluge to events that need attention**
- **Simple user interface requiring minimal training (just need to know Excel)**
- **User administered**
- **Cost Reduction, Data Sharing, Decision Assistant**

E-Notification™ for OSI PI®

Enterprise Alert System and Automated Reporting Applications at First Energy

Presented By: Ron Carson, FEC

Mike Santucci, ECG