Company Brief

Georgia System Operations Corporation

Oglethorpe Family of Companies

1974 – Oglethorpe Power Corporation started.

1997 – Oglethorpe Power Corporation split into 3 corporations.

- Oglethorpe Power Corp.(OPC) – Generation Resources
- Georgia Transmission Corp.(GTC) – Transmission Resources
- Georgia System Operations Corp.(GSOC) – System Operator

ELECTRIC MEMBERSHIP CORPORATIONS (EMC)

OPC, GTC, & GSOC are owned by 39 EMC's in Georgia

EMC's provide electric service:

- To approximately 50% of households in Georgia
- Covers 75% of the state's land area
- Serves more than 3 million customers
- 3 EMC's in North Georgia are affiliated with TVA

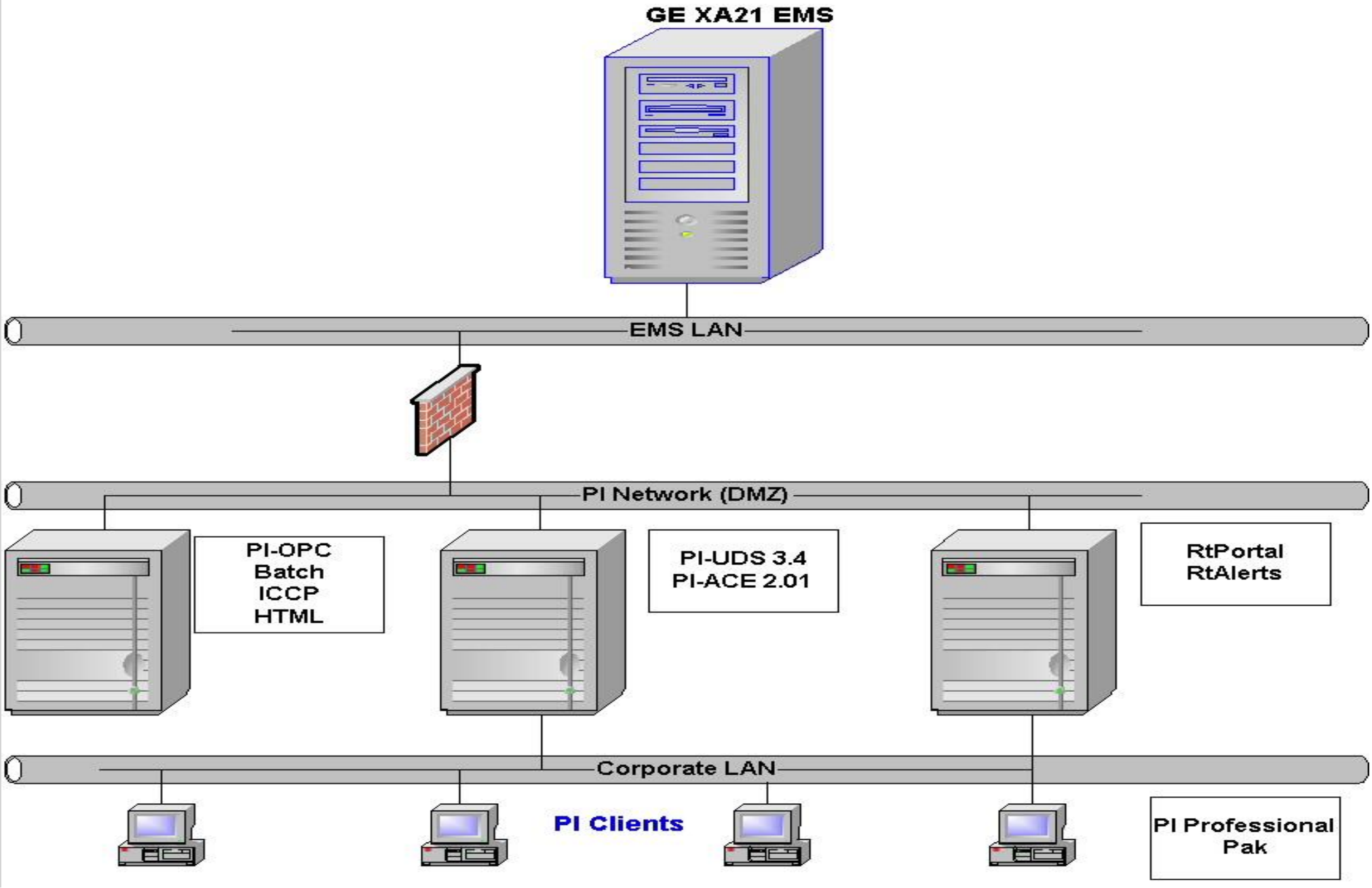
PI System Overview (GSOC)

- PI historian is the primary source of historical data collected via the energy management system(EMS).
- PI first installed in 2000 with just a few hundred points.
- The PI system consists of the following components:
  - PI Database server – central component of PI system.
  - PI API – responsible for the PI interfaces that connect to the various data sources within the ECS network.
  - PI ACE – performs various calculations on PI data.
  - RtPortal – web portal that displays PI data in real-time using a web browser interface.

Overview(cont'd)

- Current PI system consist of more than 54,000 tags(points).
- Online storage capacity of 526GB
- PI-ICCP Interface is currently the primary interface used to connect to GE-XA21 Energy Management System. Other interfaces include PI-OPC, PI-Batchfl, and PI-HTML.
- ICCP Interface scans EMS data at scan rates as fast as 2 seconds on status scans.

PI System Configuration - Current



PI System Access Tools

- PI-ProcessBook – graphical interface to PI data.

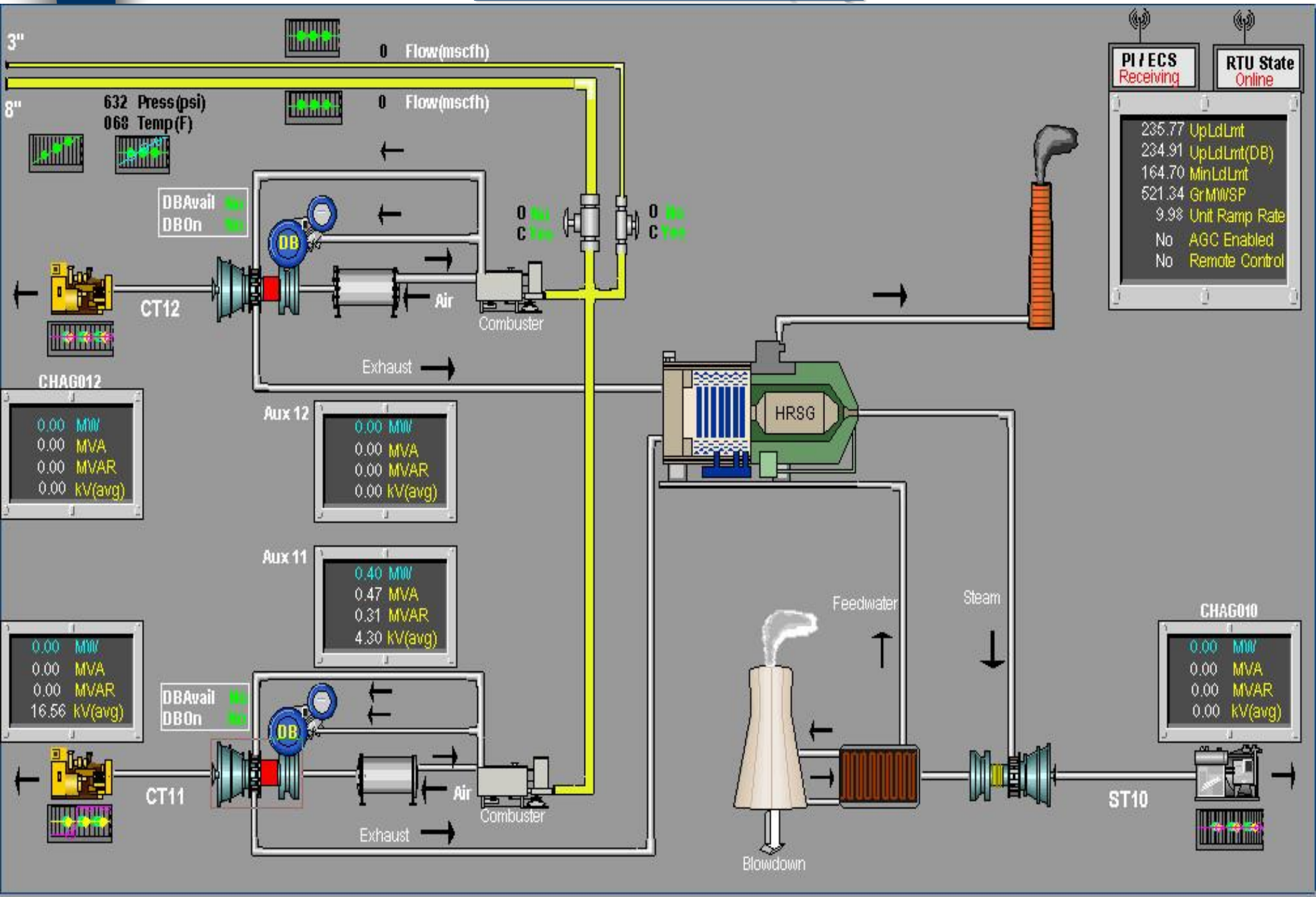
- PI-Datalink – Microsoft Excel Add-In. Uses many of the Excel functions and tools.

- RtPortal – Web Portal

- PI-ODBC – Allow the collection of PI data using relational database access tools such as Microsoft Access, SQL Server, Sybase, etc.

Examples

ProcessBook Display



PI DataLink Daily Report

Microsoft Excel - EMC_Load_Summary

File Edit View Insert Format Tools Data Window PI PI-SMT Help

Arial Narrow 10

Security...

E18 = {=PISampDat("A30007:Carroll Tot Ld",B3,B4,B5,0,B2)}

EMC TOTAL LOAD

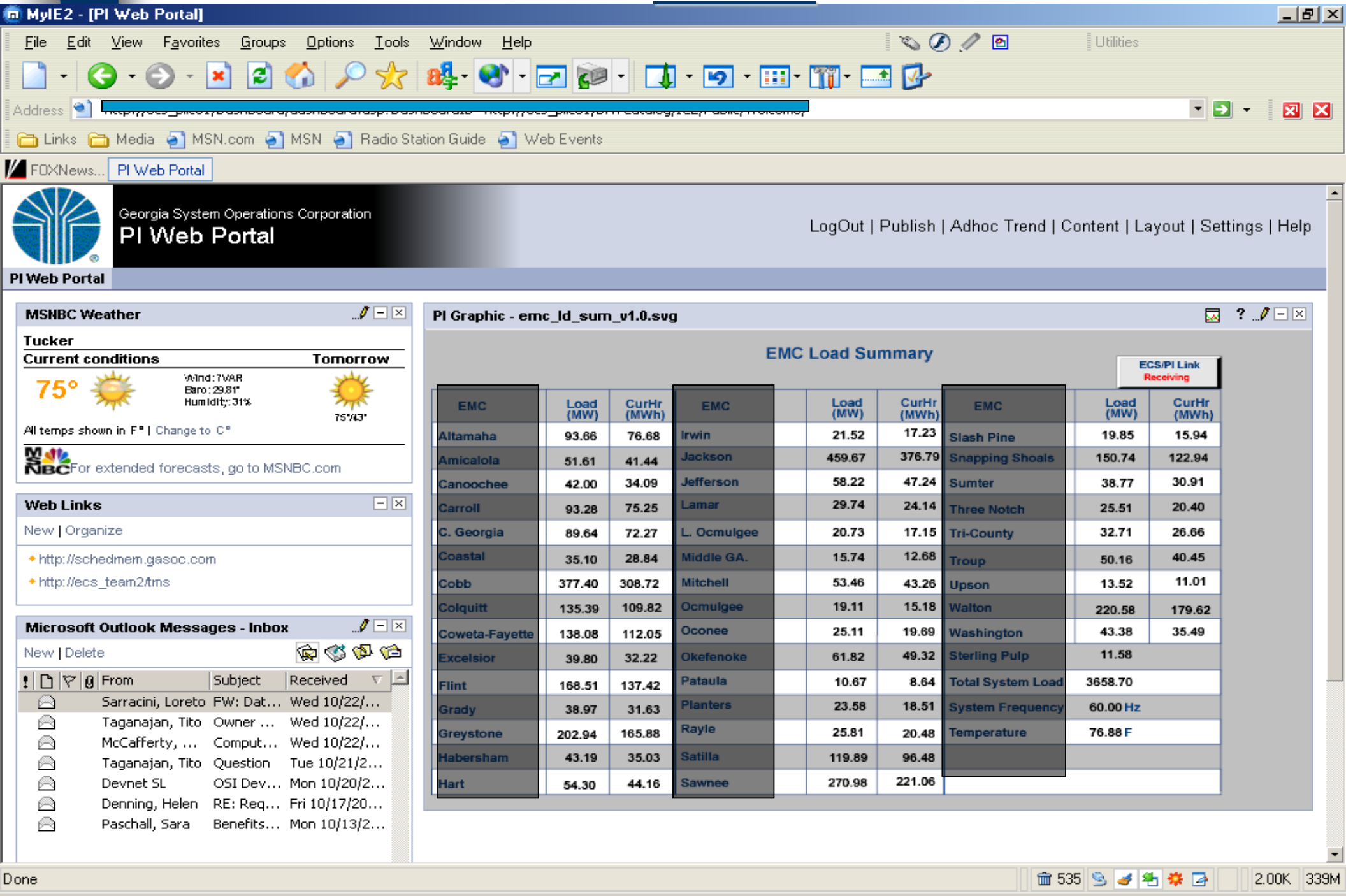
PI Server	
Start Date/Time	10/23/2003
End Date/Time	10/24/2003
Interval	1H

Date/Time	Altamaha Load (MW)	Amicalola Load (MW)	Canoochee Load (MW)	Carroll Load (MW)	Central GA Load (MW)	Coastal Load (MW)	Cobb Load (MW)	Colquitt Load (MW)	Coweta Load (MW)	Exelsior Load (MW)	Flint (MW)
23-Oct-03 00:00:00	78.9289	33.8942	24.8144	69.0449	59.1948	23.2684	225.5070	70.4899	82.56087494	24.8144	24.81
23-Oct-03 01:00:00	74.9061	32.5580	24.0385	64.1269	56.1022	22.4633	210.4416	65.3799	77.44821167		
23-Oct-03 02:00:00	75.0519	32.1430	23.9822	64.8181	55.3678	21.9996	204.3036	62.4305	76.63989258		
23-Oct-03 03:00:00	75.2319	33.8272	24.2406	65.9142	56.4928	22.1609	201.9688	61.6236	76.45717621		
23-Oct-03 04:00:00	78.5727	38.6711	26.0424	71.8634	61.6210	23.3550	211.4373	64.0593	81.44104004		
23-Oct-03 05:00:00	86.5674	51.0464	31.7556	85.4177	75.2750	28.5869	250.7364	78.4890	98.71509552		
23-Oct-03 06:00:00	96.1470	65.0198	39.1676	99.7416	93.3865	34.4643	318.9546	105.6672	127.0714264		
23-Oct-03 07:00:00	92.3224	60.6692	33.8807	92.2262	83.6233	29.6073	321.6312	94.4622	118.0117188		
23-Oct-03 08:00:00	88.9516	58.8613	32.0836	89.7318	79.3697	28.9011	313.8410	93.1619	116.3382492		
23-Oct-03 09:00:00	89.3263	55.4283	30.9377	87.3879	79.4847	28.1662	318.2496	91.8175	115.8252716		
23-Oct-03 10:00:00	86.9678	53.6516	31.2690	87.4354	77.2214	27.2551	319.2579	94.4114	115.1363144		
23-Oct-03 11:00:00	88.8925	50.7020	30.8896	84.4987	76.2237	27.1170	318.5420	96.6046	115.6305313		
23-Oct-03 12:00:00	84.3913	49.6136	31.1256	87.0431	76.9249	27.2199	326.1340	99.4916	118.45883394		
23-Oct-03 13:00:00	87.1586	47.8143	32.5608	87.8813	77.9533	27.4509	331.6226	104.0269	121.5050201		
23-Oct-03 14:00:00	87.2811	47.0501	34.6909	88.1261	80.1809	28.9381	343.2745	111.4211	124.214653		
23-Oct-03 15:00:00	87.5509	49.2383	37.6314	92.4911	82.2207	30.3435	350.7939	118.2480	129.0757294		

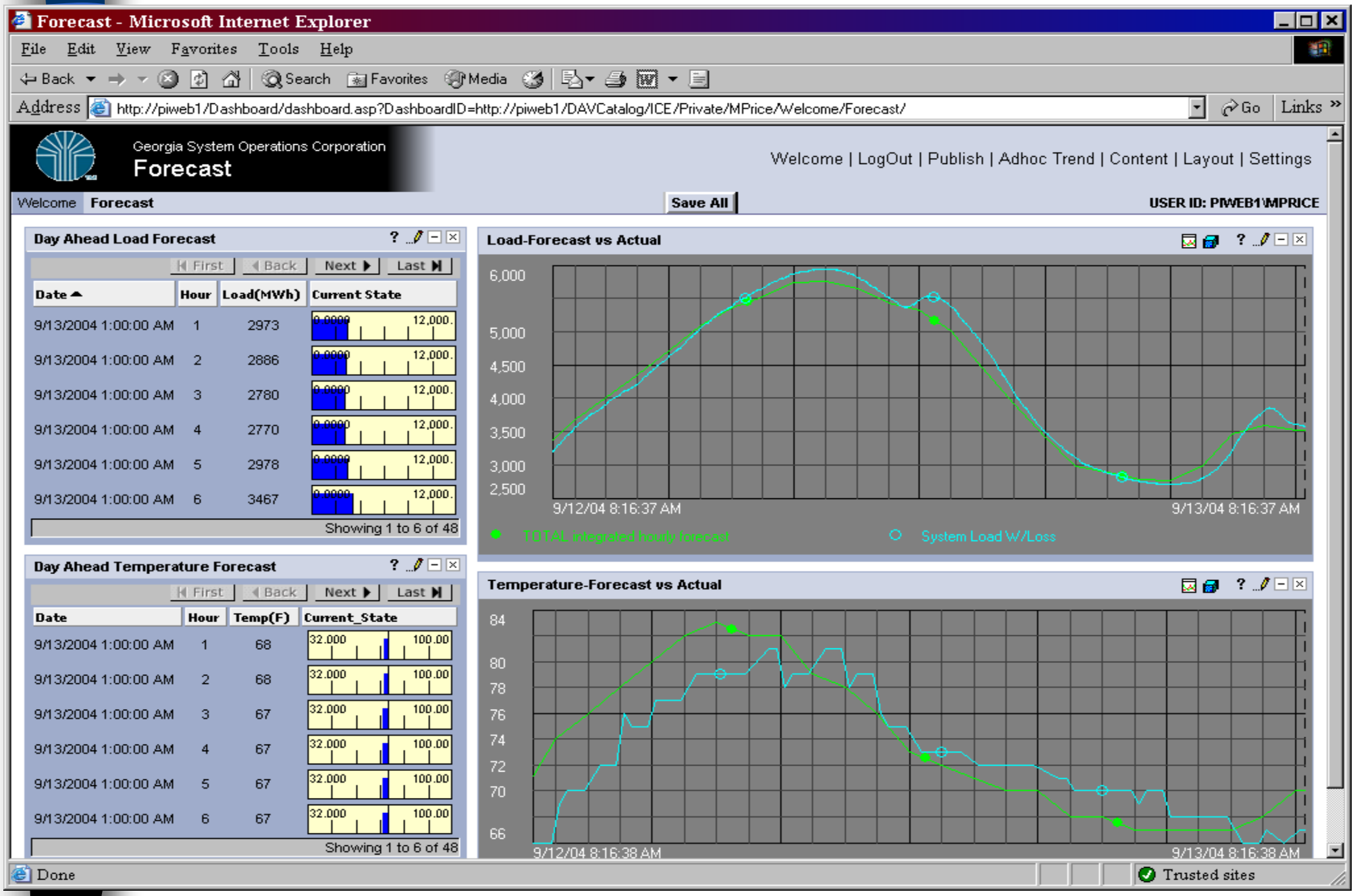
080602 Sheet3

Ready NUM

RtPortal


MyIE2 - [PI Web Portal]
File Edit View Favorites Groups Options Tools Window Help
Utilities
Address
Links Media MSN.com MSN Radio Station Guide Web Events
FOXNews... PI Web Portal
Georgia System Operations Corporation
PI Web Portal
LogOut | Publish | Adhoc Trend | Content | Layout | Settings | Help
PI Web Portal
MSNBC Weather
Tucker
Current conditions
Tomorrow
75°
Wind: 7VAR
Baro: 29.81"
Humidity: 31%
75°/43°
All temps shown in F° | Change to C°
For extended forecasts, go to MSNBC.com
Web Links
New | Organize
http://schedmem.gasoc.com
http://ecs_team2/tms
Microsoft Outlook Messages - Inbox
New | Delete
From Subject Received
Sarracini, Loreto FW: Dat... Wed 10/22/...
Taganajan, Tito Owner ... Wed 10/22/...
McCafferty, ... Comput... Wed 10/22/...
Taganajan, Tito Question Tue 10/21/2...
Devnet SL OSI Dev... Mon 10/20/2...
Denning, Helen RE: Req... Fri 10/17/20...
Paschall, Sara Benefits... Mon 10/13/2...
PI Graphic - emc_ld_sum_v1.0.svg
EMC Load Summary
ECS/PI Link Receiving
EMC Load (MW) CurHr (MWh) EMC Load (MW) CurHr (MWh) EMC Load (MW) CurHr (MWh)
Altamaha 93.66 76.68 Irwin 21.52 17.23 Slash Pine 19.85 15.94
Amicalola 51.61 41.44 Jackson 459.67 376.79 Snapping Shoals 150.74 122.94
Canoochee 42.00 34.09 Jefferson 58.22 47.24 Sumter 38.77 30.91
Carroll 93.28 75.25 Lamar 29.74 24.14 Three Notch 25.51 20.40
C. Georgia 89.64 72.27 L. Ocmulgee 20.73 17.15 Tri-County 32.71 26.66
Coastal 35.10 28.84 Middle GA. 15.74 12.68 Troup 50.16 40.45
Cobb 377.40 308.72 Mitchell 53.46 43.26 Upson 13.52 11.01
Colquitt 135.39 109.82 Ocmulgee 19.11 15.18 Walton 220.58 179.62
Coweta-Fayette 138.08 112.05 Oconee 25.11 19.69 Washington 43.38 35.49
Excelsior 39.80 32.22 Okefenoke 61.82 49.32 Sterling Pulp 11.58
Flint 168.51 137.42 Pataula 10.67 8.64 Total System Load 3658.70
Grady 38.97 31.63 Planters 23.58 18.51 System Frequency 60.00 Hz
Greystone 202.94 165.88 Rayle 25.81 20.48 Temperature 76.88 F
Habersham 43.19 35.03 Satilla 119.89 96.48
Hart 54.30 44.16 Sawnee 270.98 221.06
Done
535
2.00K
339M

RtPortal


Forecast - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://piweb1/Dashboard/dashboard.asp?DashboardID=http://piweb1/DAVCatalog/ICE/Private/MPrice/Welcome/Forecast/
Go Links
Georgia System Operations Corporation
Forecast
Welcome | LogOut | Publish | Adhoc Trend | Content | Layout | Settings
Welcome Forecast
Save All
USER ID: PIWEB1\MPRICE
Day Ahead Load Forecast
First Back Next Last
Date Hour Load(MWh) Current State
9/13/2004 1:00:00 AM 1 2973
9/13/2004 1:00:00 AM 2 2886
9/13/2004 1:00:00 AM 3 2780
9/13/2004 1:00:00 AM 4 2770
9/13/2004 1:00:00 AM 5 2978
9/13/2004 1:00:00 AM 6 3467
0.0000 12,000.
Showing 1 to 6 of 48
Load-Forecast vs Actual
6,000
5,000
4,500
4,000
3,500
3,000
2,500
9/12/04 8:16:37 AM
9/13/04 8:16:37 AM
TOTAL integrated hourly forecast
System Load W/Loss
Day Ahead Temperature Forecast
First Back Next Last
Date Hour Temp(F) Current_State
9/13/2004 1:00:00 AM 1 68
9/13/2004 1:00:00 AM 2 68
9/13/2004 1:00:00 AM 3 67
9/13/2004 1:00:00 AM 4 67
9/13/2004 1:00:00 AM 5 67
9/13/2004 1:00:00 AM 6 67
32.000 100.00
Showing 1 to 6 of 48
Temperature-Forecast vs Actual
84
80
78
76
74
72
70
66
9/12/04 8:16:38 AM
9/13/04 8:16:38 AM
Done
Trusted sites

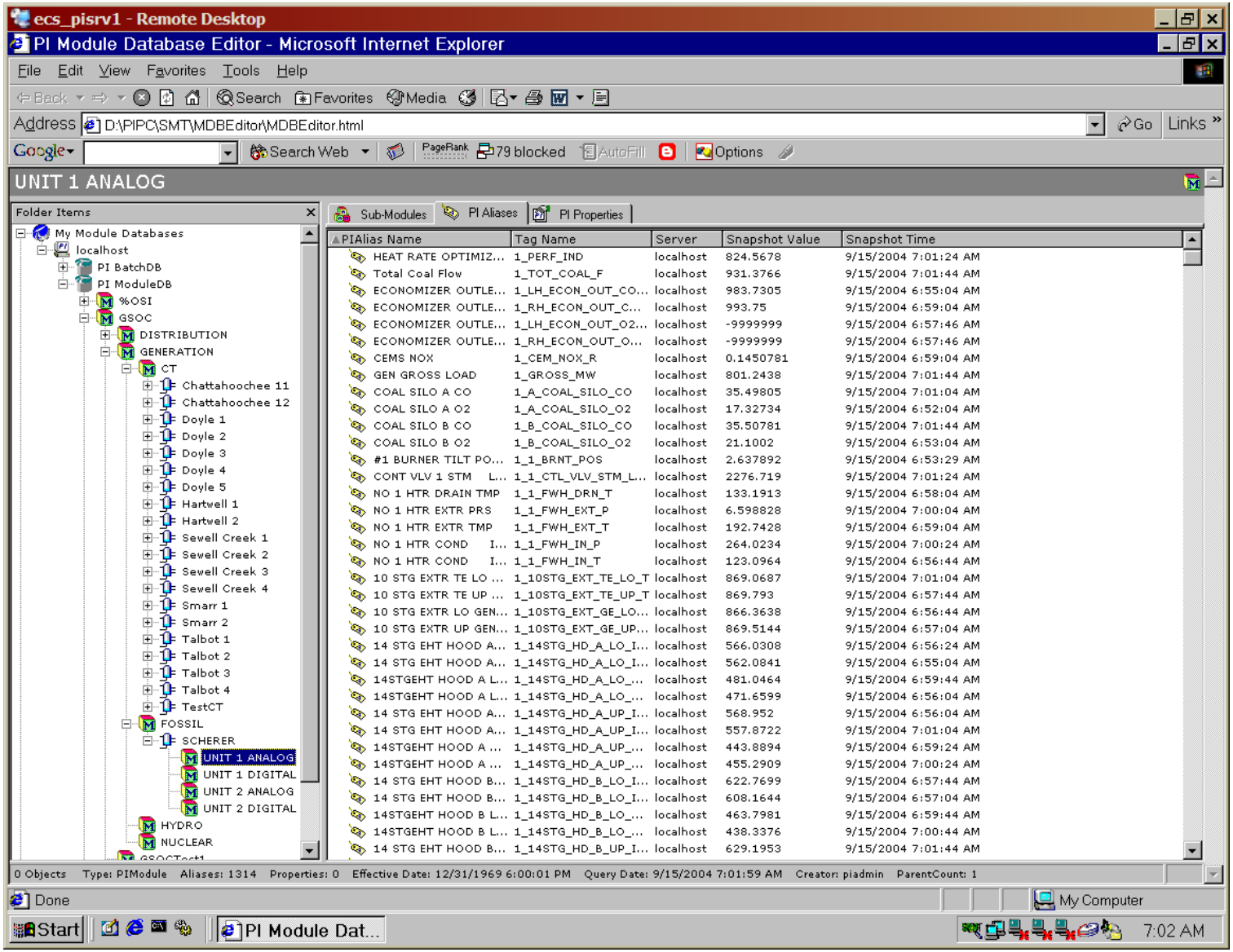
Using the Batch System in Power

- Batch System = “Event Tracking”
- Batches should be used whenever you need to know “when something occurred.”
  - Unit dispatching
  - Voltage Excursions
  - RTU Communication interruptions
  - Meter imbalances
  - Breaker Trips

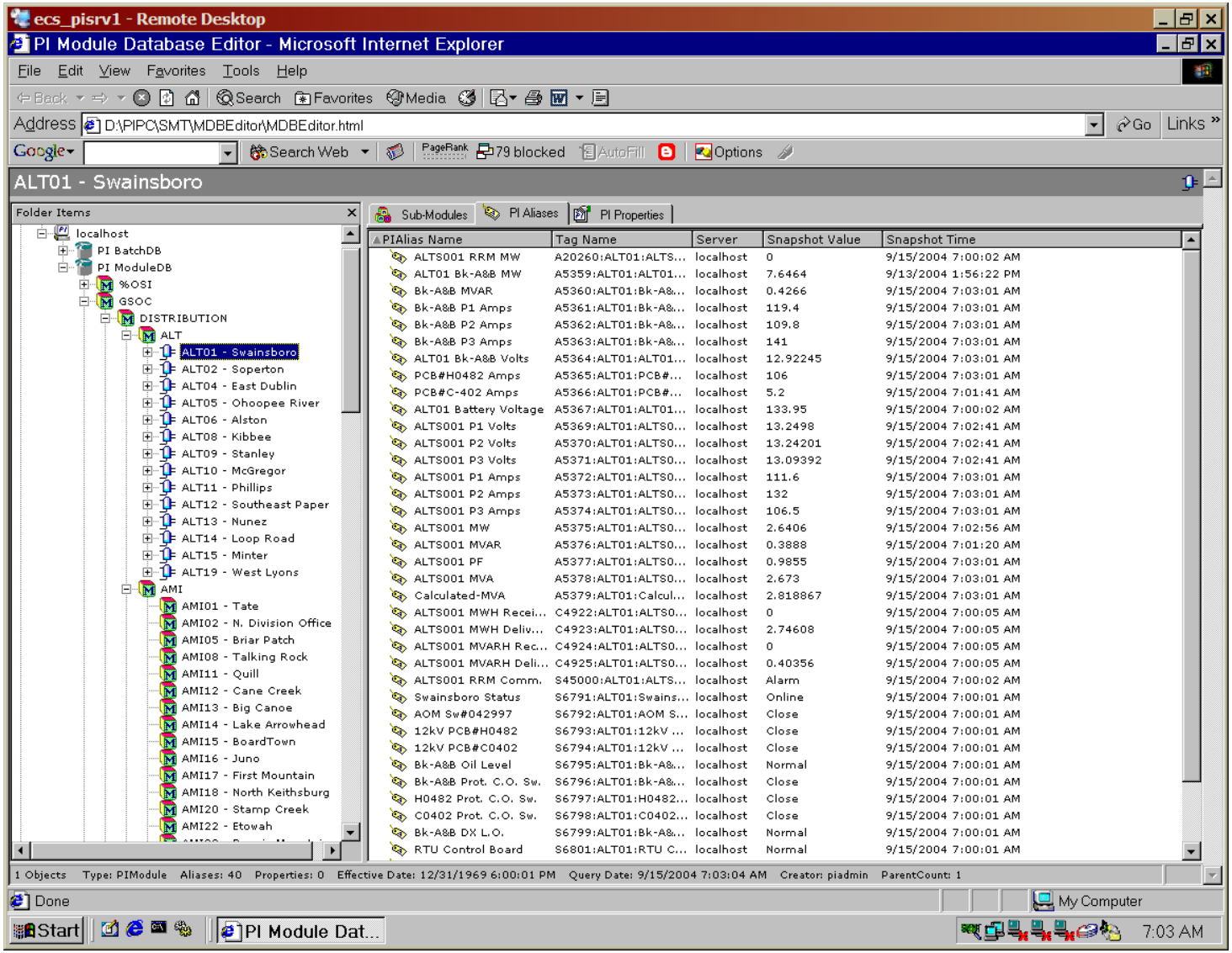
Using Batches for T&D

- Examples
  - Unit Dispatch list
  - RTU Communication Interruptions
  - Meter Imbalances
  - Breaker Trips

PI Module Structure for Generation



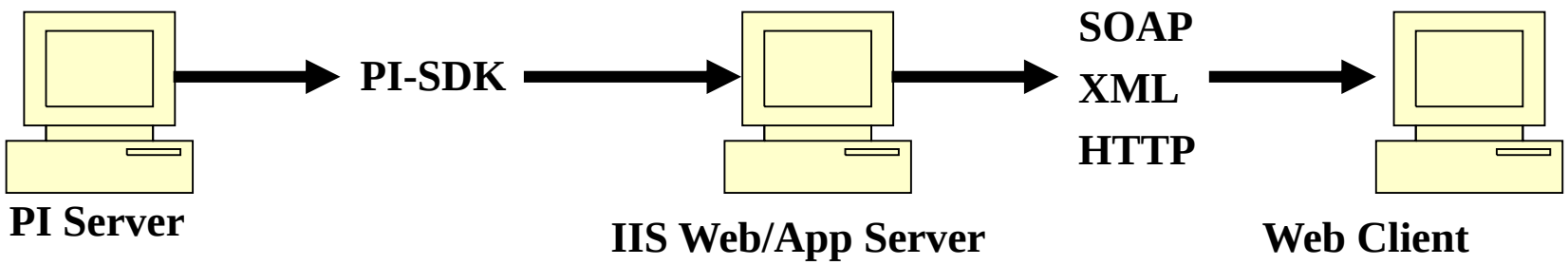
PI Module Structure for Distribution



ACE Applications

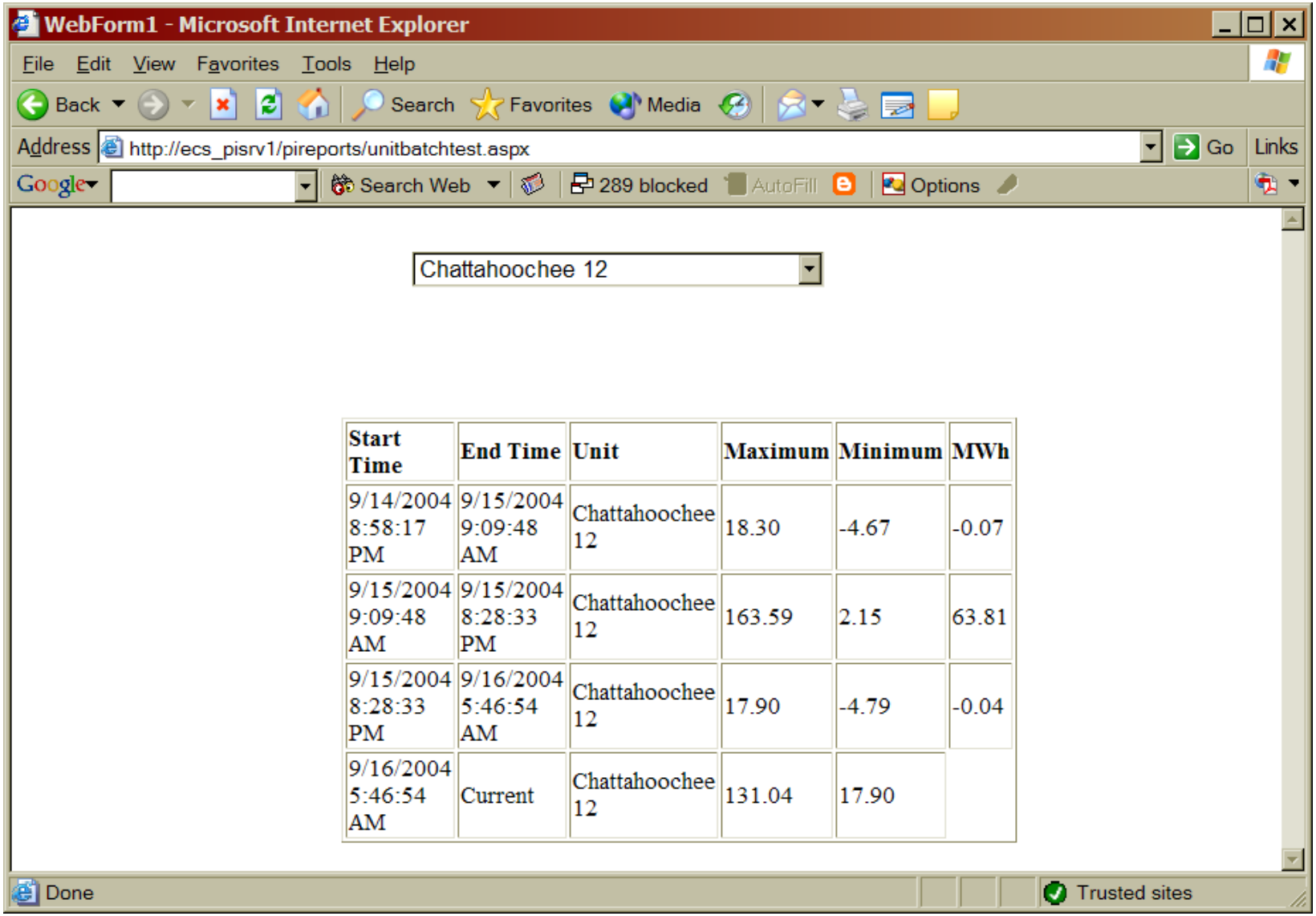
- Using the Module Database speeds up deploying ACE applications (contexts) substantially
- Sample Applications
  - “Homegrown” batch generation application
  - Meter imbalance applications
  - Three-phase current imbalance
  - ACE Applications are exposed as SOAP XML Web Services

Data flow for Web Services



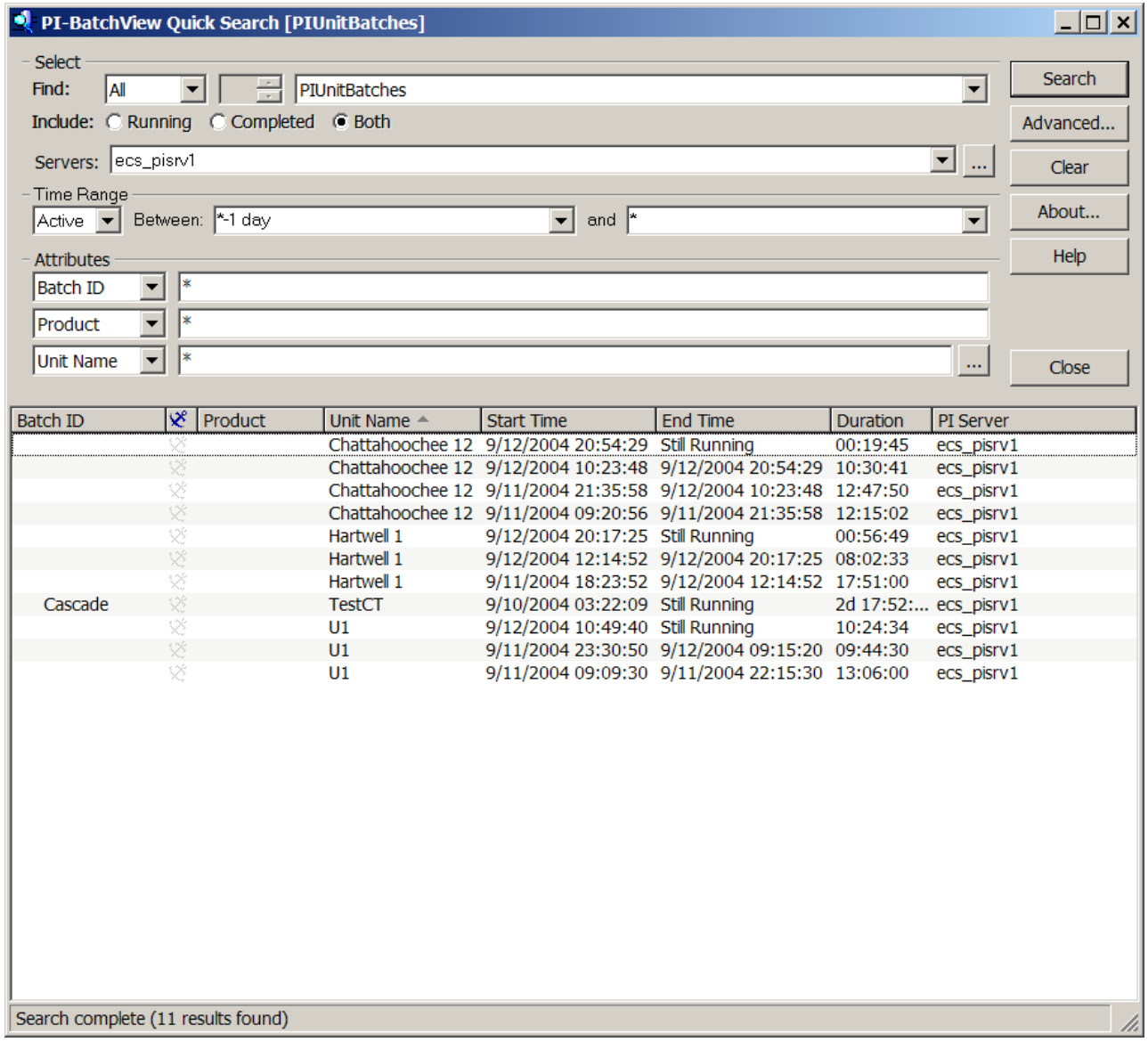
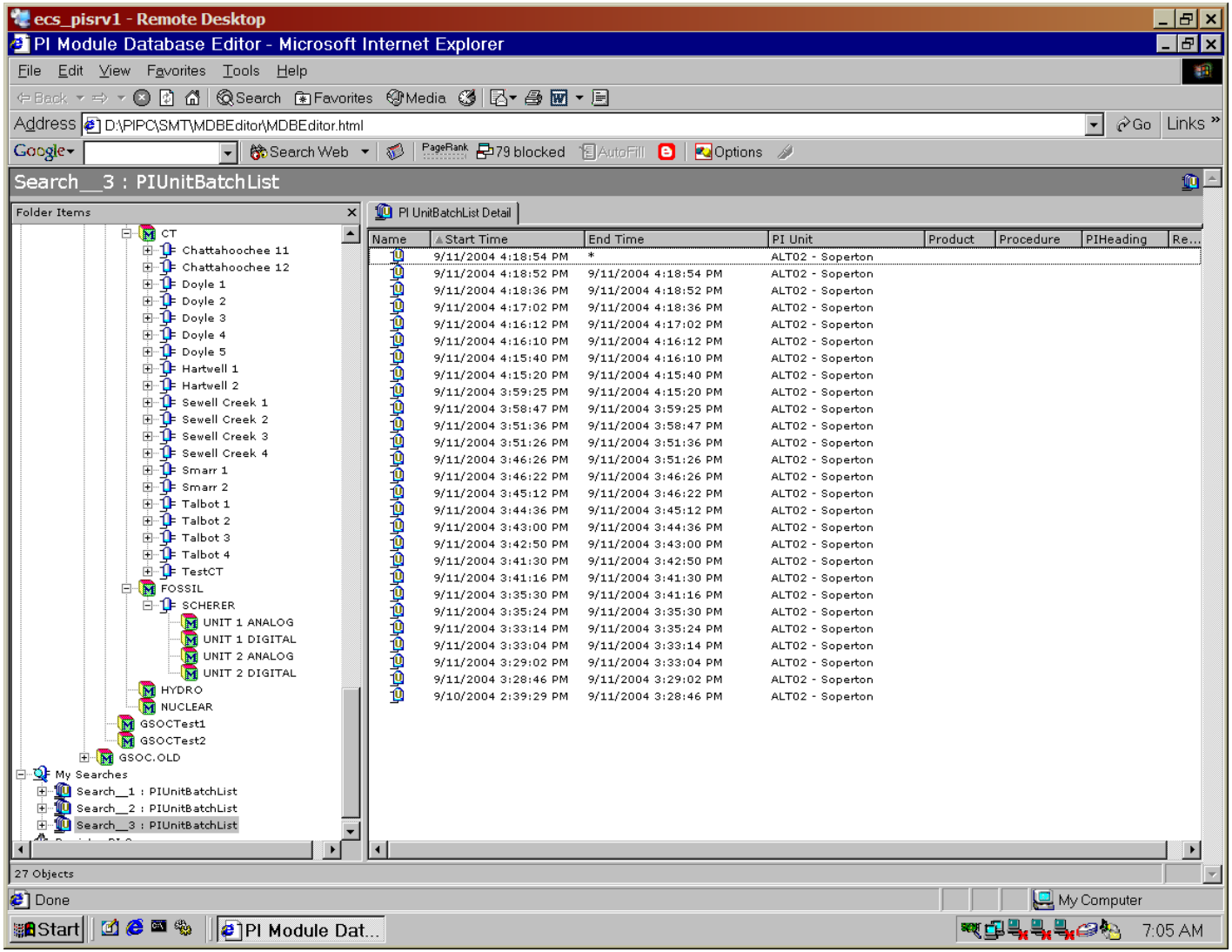

```
POST /pisoap/pi.asmx
HTTP/1.1 Host: localhost
Content-Type: text/xml; charset=utf-8
Content-Length: length
SOAPAction: "http://localhost/Sinusoid"
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
<soap:Body>
<Sinusoid xmlns="http://localhost" />
</soap:Body>
</soap:Envelope>
```

ASP.NET Unit Dispatch Report



Start Time	End Time	Unit	Maximum	Minimum	MWh
9/14/2004 8:58:17 PM	9/15/2004 9:09:48 AM	Chattahoochee 12	18.30	-4.67	-0.07
9/15/2004 9:09:48 AM	9/15/2004 8:28:33 PM	Chattahoochee 12	163.59	2.15	63.81
9/15/2004 8:28:33 PM	9/16/2004 5:46:54 AM	Chattahoochee 12	17.90	-4.79	-0.04
9/16/2004 5:46:54 AM	Current	Chattahoochee 12	131.04	17.90	

PI Batches For Unit Dispatch



PI Batches for Comm. Problems