SmartProcess®

电厂运行性能优化软件

EMERSON™
Process Management

SmartProcess®

环境管理

- 符合NOx / SO2 排放标准
- 减少NOx / CO / CO_2
- 降低浊度

机组性能

- 改善热耗率
- 燃烧效率提高
- 减少未燃烬碳损失

发电管理

- 机组群/经济负荷优化
- 机组总体性能计算

运行的灵活性

- 负荷调度响应
- 改进变负荷性能

改善机组性能的综合智能软件包

SmartProcess®

经济负荷优化
机组群优化
燃烧优化
旋转炉优化
蒸汽温度优化
吹灰优化
流化床优化
SCR 和 **FGD** 优化
电除尘优化
机组负荷响应优化
总体性能建议
企业数据服务

收益

SmartProcess®

- 热耗率改善 1/2% 到 1 1/2%
- NOx 减少 15% 到 35%
- 浊度减少 15% 到 30%
- 增加机组负荷容量 1% 到 2%
- 变负荷速率改进1% of MCR per minute
- 减少炉管泄漏及相关的损耗
- 改善机组群管理能力
- 优化机组的环保设备性能，如SCRs、除灰器等

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Process Management

多年的控制系统设计、实施、现场安装经验

AES Alliant Energy Ameren Energy Generating American Electric Power Constellation Power Source Generation Dairyland Po egy Power Generat Edison Mission m. T. Kosciusz ntergy Louisian thority Keyspan oration (KEPCO evada Power Public Service of New Hampshire Saudi Electric Company Seminole Electric Cooperative Sempra Energy Resources Southern California Edison University of Michigan We Energies Xcel Energy Zespol Elektrownia Ostroleka, S.A.

已有超过 200 套SmartProcess 运行在很多不同的控制系统上, Emerson 是先进控制领域的市场引领者.

与众不同的SmartProcess

TECHNOLOGY

集成模糊逻辑、神经网络、模型预测控制和优化引擎的先进控制与优化方案，专为电力行业设计

浏览器、图形化人机界面

闭环集成 – 直接集成于任何支持OPC协议的DCS

自动化测试工具，便于快速高效实施

与众不同的 SmartProcess

FLEXIBILITY

DCS 平台独立

支持变工况下的多目标优化

动态优化，而非稳态优化 – 优化器每 10 到 20 秒执行一次性能超过所有其它类似产品

对工况变化的自适应与自学习

与众不同的 SmartProcess

ADAPTABILITY

无需日常维护 – SmartProcess 能够自适应机组动态特性的变化

数据校验 工具和 综合支持工具

易于升级改造

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部署

- 平台独立性，SmartProcess能够运行于 Ovation, WDPF 和任何其它的分散控制系统
- 由艾默生公司的技术专家实现集成
  - 每组工程队伍包括一名锅炉/燃烧专家、一名DCS现场工程师和一名神经网络/优化专家
- 实施周期(含初期调研)少于3个月
- 无扰实施 (即 不需要机组停机，优化系统本身非常容易起动/停止)
- 低维护成本 - 1 年 100% 支持
  - 无运行费用
  - 无维护费用

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RESULTS!

SmartProcess
Combustion Optimizer
- Improves heat rate
- Reduces emissions
- Controls opacity levels

SmartProcess
Cyclone Boiler Optimizer
- Improves NOx levels
- Optimizes boiler combustion processes
- Improves steam temperature

SmartProcess
Fluidized Bed Optimizer
- Achieves stable boiler operation
- Reduces emissions
- Tracks performance variances
- Achieves ideal SO_2 absorption rate

SmartProcess
FGD Optimizer
- Prevents limestone binding
- Achieves better SO_2 removal

SmartProcess
Precipitator Optimizer
- Optimizes cleaning sequences
- Minimizes particle emissions

SmartProcess
SCR Optimizer
- Lowers operating costs
- Maintains optimum temperature and pressure

SmartProcess
Unit Response Optimizer
- Improves unit stability
- Increases ramp rates
- Increases startup efficiency

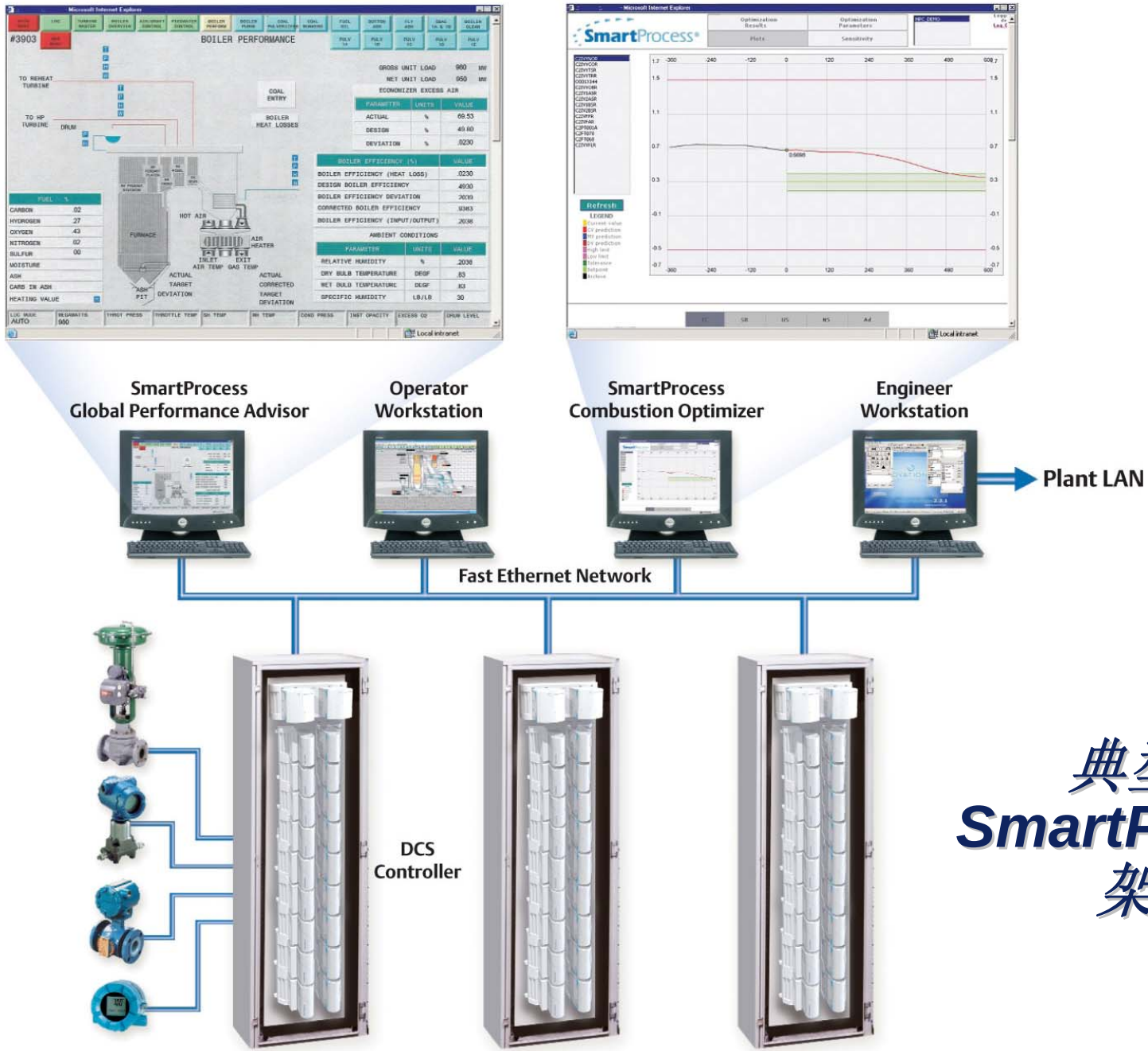
SmartProcess
Economic Optimizer
- Optimizes heat rate across multiple units
- Optimizes varying cogeneration electricity and steam demands
- Reduces maintenance costs

SmartProcess
Steam Temperature Optimizer
- Improves ramp rates
- Minimizes temperature variations

SmartProcess
Sootblower Optimizer
- Delivers optimal cleanliness
- Balances blowing sequences

SmartProcess
Global Performance Advisor
- Tracks heat rate deviations and cost of deviations
- Reduces operating costs

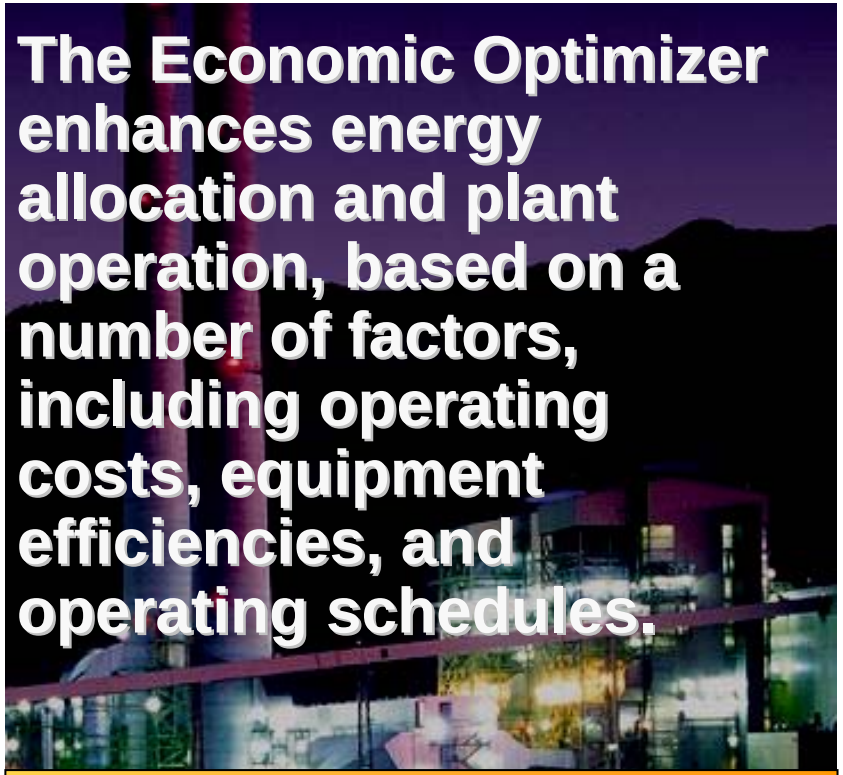
SmartProcess
Fleet Optimizer
- Provides regional optimization of multiple units for emissions, heat rate, and revenue
- Provides browser-based visualization of fleet performance



Typical SmartProcess Integration

典型的 SmartProcess 架构

经济负荷优化器



全厂级整体优化统筹

- 应用范围
  - 机组群级经济性分析
  - 降低运行成本
  - 适应燃煤电站、联合循环电站、热电联产等电站
  - 泵网
  - 燃料混配策略
  - 冷却塔优化

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机组群优化

*满足 **SO2** 和 **NOx** 指标情况下达到运行最优.*

- 优化效果
  - 为运营决策提供必要的数据
  - 提供运行/维护成本和实时热耗率报告
  - 基于未来负荷变化对机组排放达标率进行预测
  - 主动优化设备定值，以达到理想的利润指标
  - 提供关键参数的数据备份

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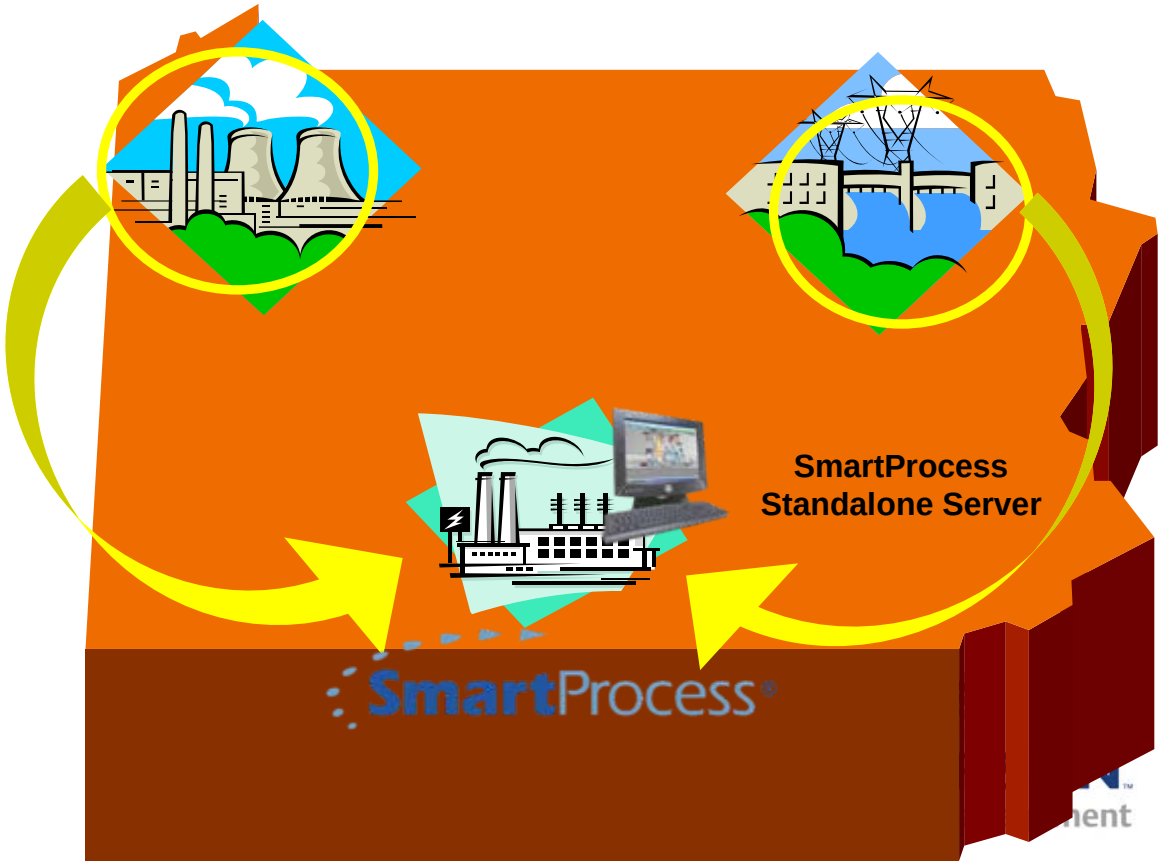
机组群级优化控制

机组群级优化器 采集来自不同地域的机组群数据以获得工业优化目标.

- 符合环境标准
- 降低运行成本
- 增加利润



机组群级排放优化器采集机组群各段流程数据

- 运行人力成本
- 热耗率惩罚因子
- 维护成本
- 当前排放指标
- 排放标准
- 机组变工况

追踪机组群的性能指标，创建用于调整日常运行操作的效率曲线和操作计划.

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机组群排放优化目标

- 为FGD确定 SO_2 最优值，以保证 SO_2 年度排放不超标
- 控制脱硫效率 >70%
- 对烟气除尘的最佳性价比优化

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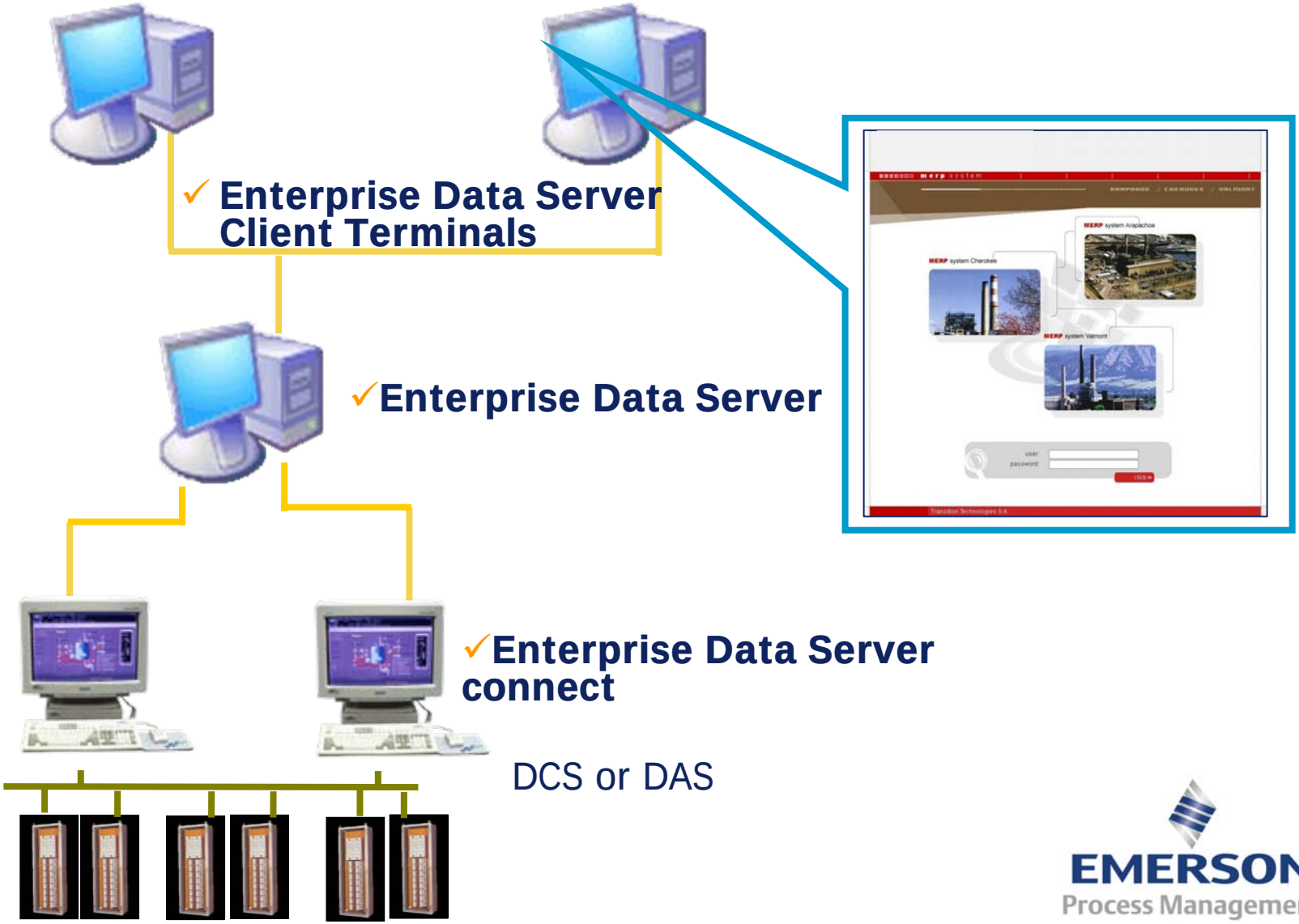
机组群级优化器架构



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MERP-system - Microsoft Internet Explorer

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Address http://170.152.23.230/charts.php Go

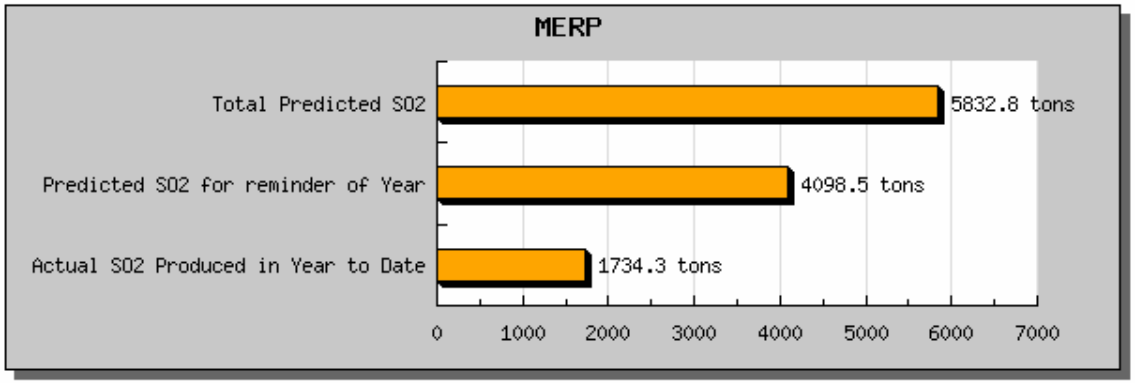
* deadband values for each quarter of year			
I	II	III	IV
30%	20%	15%	5%

MERP Reports & Analysis

Unit	Cherokee1	Cherokee2	Cherokee3	Cherokee4	Arapahoe3	Arapahoe4	Valmont
Actual SO2 Emission Rate	0.365154	0.000000	0.073745	0.090919	-0.000122	0.328857	0.079600
Optimal SO2 Emission Rate	0.424319	0.000000	0.042432	0.042432	0.000000	0.320070	0.034865

Actual MERP system removal: 76.40

Daily MERP system removal: 88.37



You are logged as:

ess2

logout

Emerson Process '2003

Done Internet

MERP-system - Microsoft Internet Explorer

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Address http://170.152.23.230/common.php# Go

main menu

Reports

- Daily SO2 Prediction data
- Daily Load Forecast
- Month - SO2 emission
- Month - SO2 removal
- Year

Applications

- Optimization package
- What-If
- Auto/Manual status

CEMS

- MERP system
- Emission limits

Analysis

- 150Z report
- Fuel Analysis
- Operation&Maintenance costs
  - Variable costs
  - Fixed costs
  - Total costs
  - Detail costs

COST

- Generation costs
- SO2 costs

You are logged as:

ess2

logout

Emerson Process '2003

http://170.152.23.230/common.php# Internet

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ess http://170.152.23.230/total_costs.php

merp system

ARAPAHOE CHEROKEE VALMONT

main menu

MERP Costs Estimates for Emission Control			
Total Variable Costs [USD]	**Arapahoe**	**Cherokee**	**Valmont**
Year 2003	830 855.26	3 282 952.39	808 734.47
Year 2004	0.00	0.00	0.00
Total Fixed Costs [USD]	**Arapahoe**	**Cherokee**	**Valmont**
Year 2003	183 532.00	1 069 243.52	582 432.00
Year 2004	0.00	0.00	0.00
Total Costs [USD]	**Arapahoe**	**Cherokee**	**Valmont**
Year 2003	1 014 387.26	4 352 195.91	1 391 166.47
Year 2004	0.00	0.00	0.00

机组群级排放优化器总结

- 运行于中央服务器
  - 支持群集
- 从多个电厂或者机组群采集数据
- 分析数据以确定机组最佳运行范围，达到经济性和环保要求的平衡
- 在机组群级的角度，管理气体排放和环保成本

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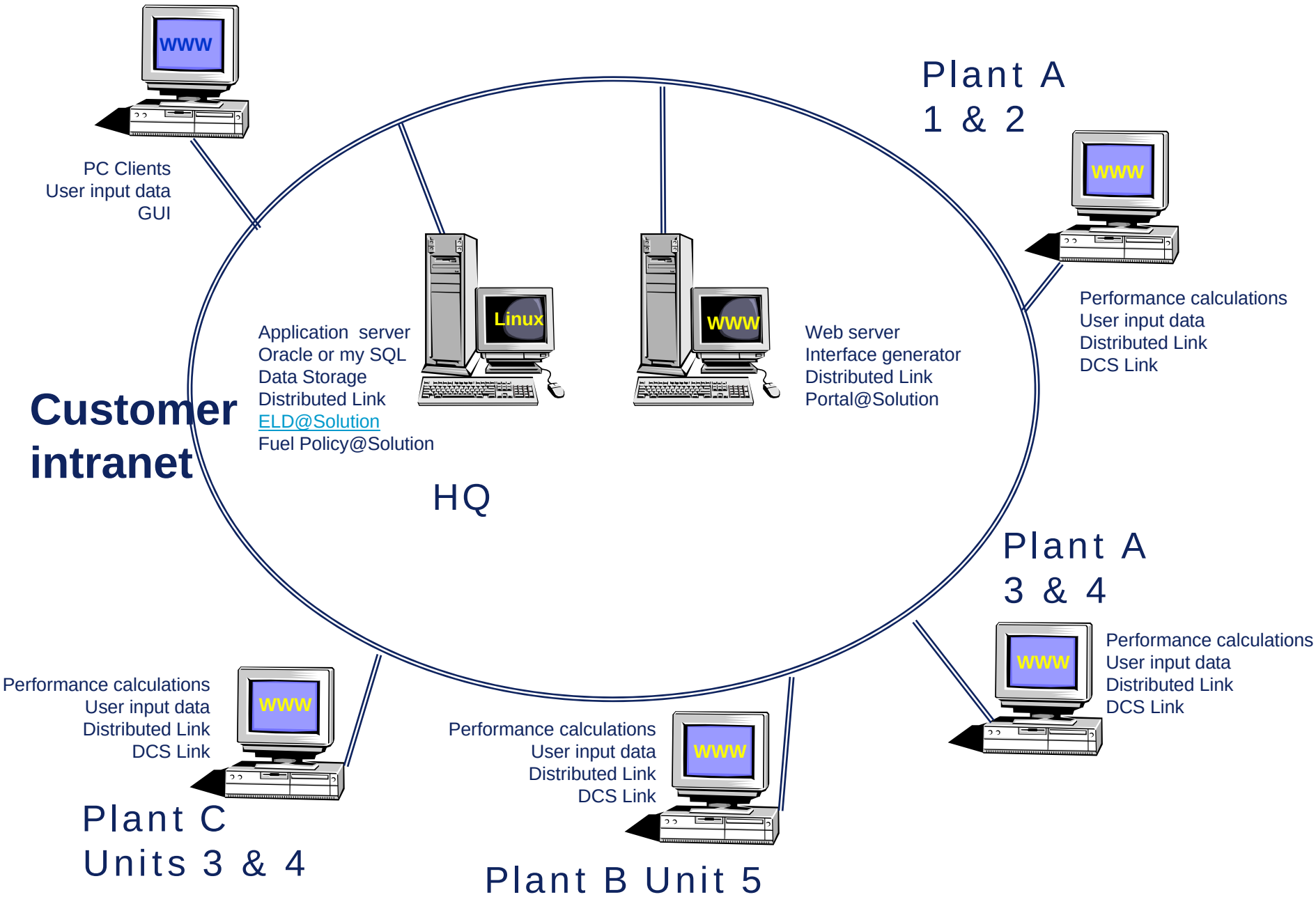
www
PC Clients
User input data
GUI
Plant A
1 & 2
www
Performance calculations
User input data
Distributed Link
DCS Link
Linux
Application server
Oracle or my SQL
Data Storage
Distributed Link
ELD@Solution
Fuel Policy@Solution
www
Web server
Interface generator
Distributed Link
Portal@Solution
Customer
intranet
HQ
Plant A
3 & 4
www
Performance calculations
User input data
Distributed Link
DCS Link
Performance calculations
User input data
Distributed Link
DCS Link
www
Plant C
Units 3 & 4
Performance calculations
User input data
Distributed Link
DCS Link
www
Plant B Unit 5

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ess http://170.152.23.230/index.php

Xcel Energy™

merp system

ARAPAHOE :: CHEROKEE :: VALMONT

Arapahoe power plant

Cherokee power plant

MERP system

Valmont power plant

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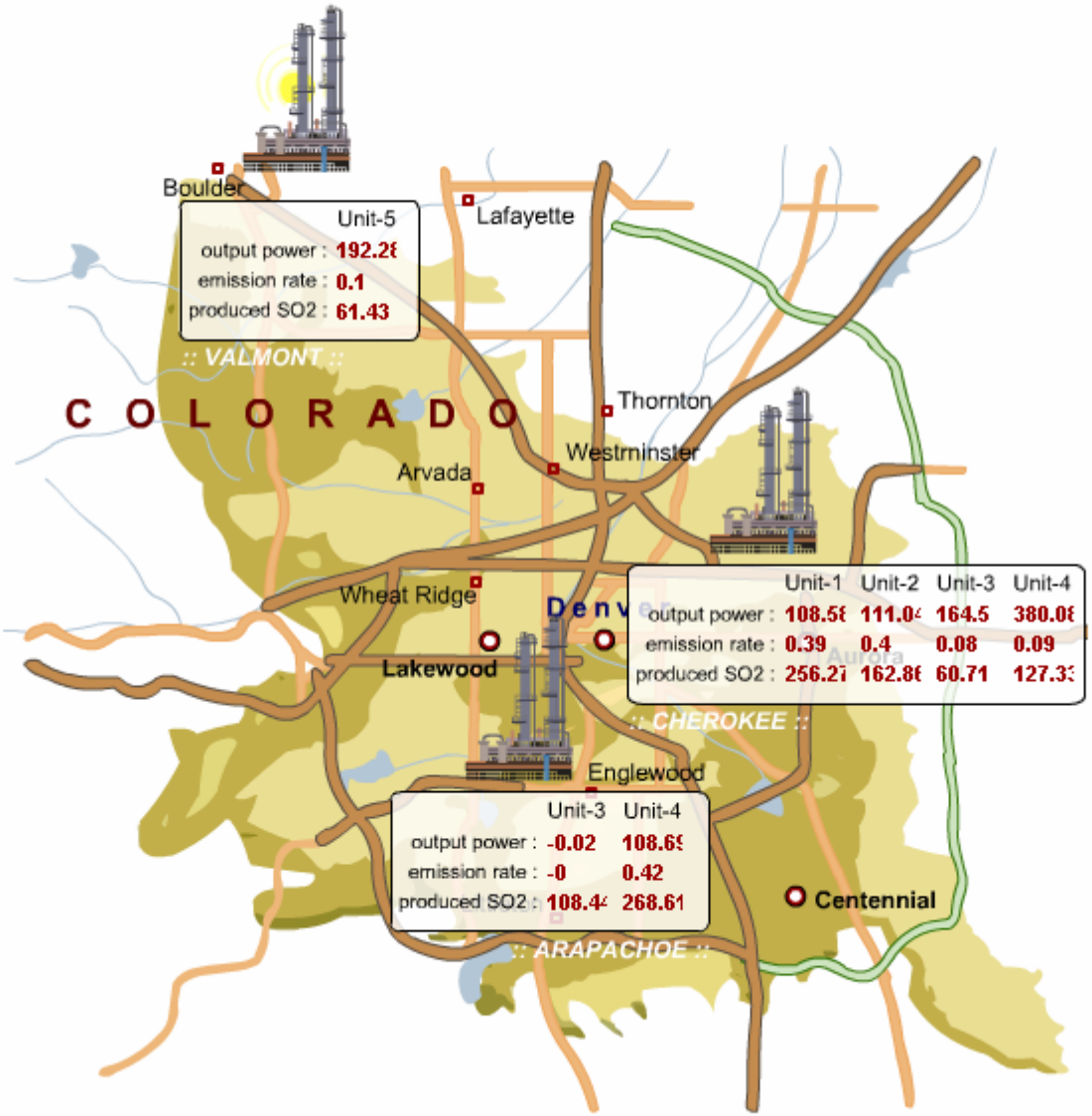
ess http://170.152.23.230/index_mapa.php

main menu



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ess http://170.152.23.230/common.php Go

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merp system

ARAPAHOE :: CHEROKEE :: VALMONT

main menu

Reports

- Daily SO2 Prediction data
- Month - SO2 emission
- Month - SO2 removal
- Year

Applications

- Optimization package
- What-If

CEMS

- MERP system
- Emission limits

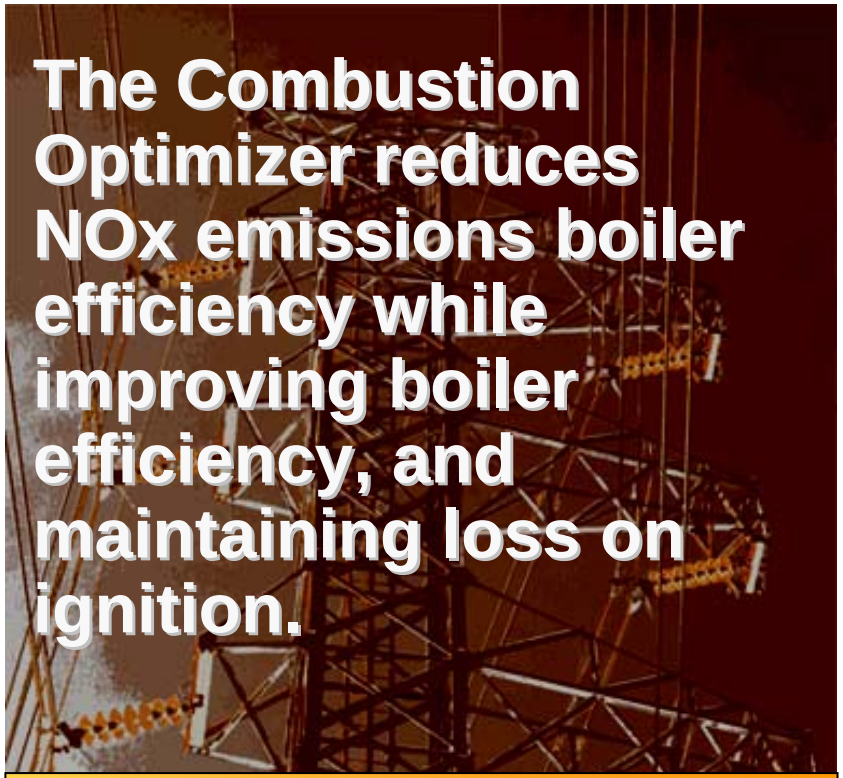
Analysis

- 150Z report
- Fuel Analysis
- Operation&Maintenance costs

COST

- Generation costs
- SO2 costs

燃烧优化器



提升锅炉燃烧过程效率.

- 效果
  - 降低 NOx 和 CO 排放
  - 改善热耗率，最高达1.5%
  - 降低机组维护成本
  - 最大化分级燃烧效率
  - 控制和降低排烟浊度

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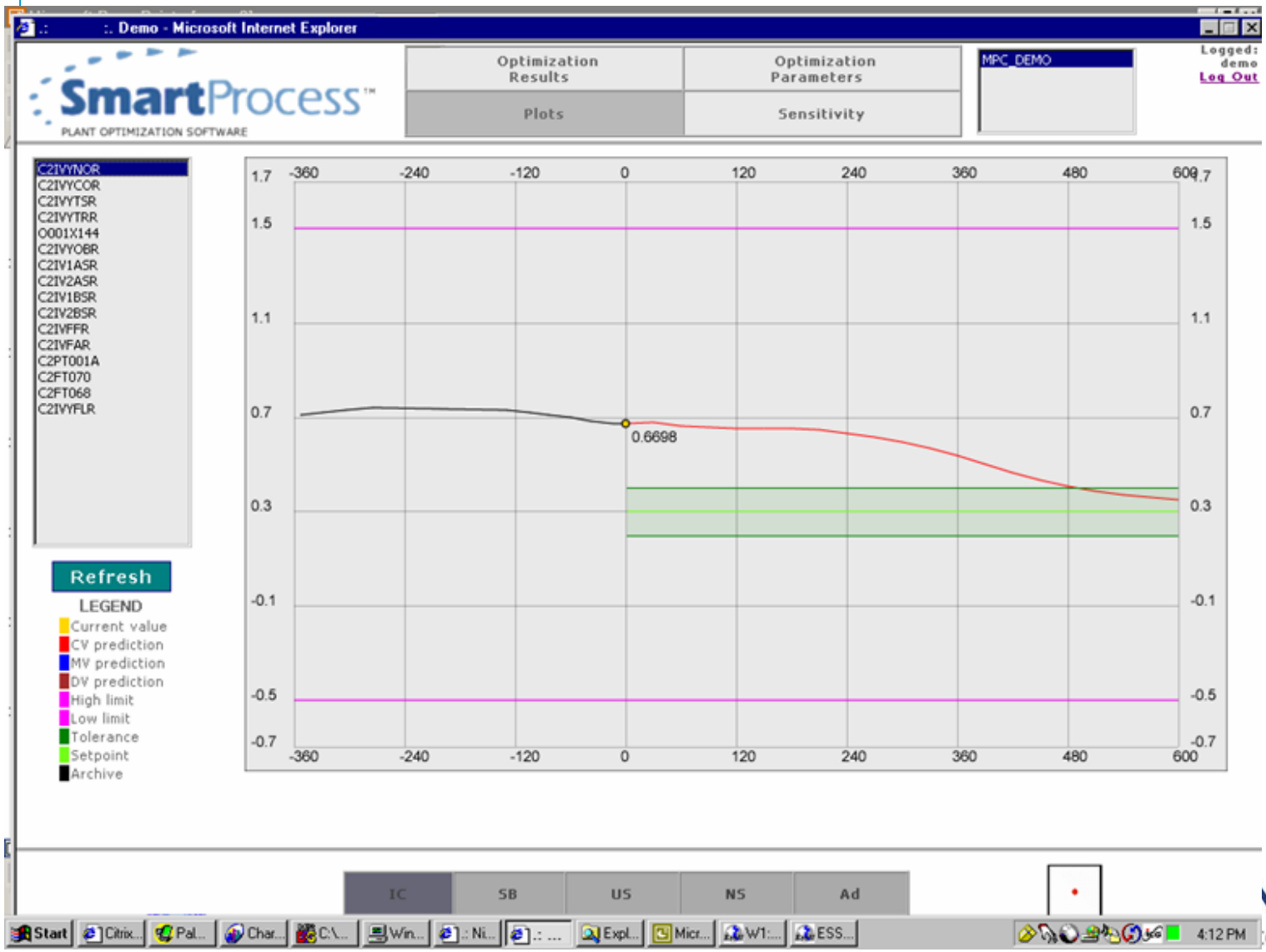
燃烧优化工具:SmartEngine



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Web 界面

.: Nikitta : Sherco :. - Microsoft Internet Explorer

SmartProcess™
PLANT OPTIMIZATION SOFTWARE

Optimization Results | Optimization Parameters | Learning | Custom Data
Plots | Sensitivity | Setpoints

BOPT

Logged: Michał Izydorski
LOGOUT

Setpoints (optimization goals and constraints)

TYPE	NAME	VALUE	SETPOINT	WEIGHT	ZONE	MIN_VALUE	MAX_VALUE	MIN_STEP	MAX_STEP	QUALITY	EDIT
CV	WW1759	84.8	86	100	0.1					0	
CV	D1NOEAST	141.1	80	10	20					0	
CV	D1NOWEST	225.2	150	10	20					2.1495	
CV	D1O2AVG_EAST	3.13	3	400000	0.05					0	
CV	D1O2AVG_WEST	3.14	3	400000	0.05					0	
CV	D11APHGO	296.6	300	1	5					0	
CV	D12APHGO	316.9	300	1	5					0	
CV	D1COEAST	149.2	100	10	100					0	
CV	D1COWEST	178.5	100	10	100					0	
MV	D11AA_DMD	50	0	0	5	0	100	-0.35	0.35	0	
MV	D12AA_DMD	34.9	0	0	5	0	100	-0.35	0.35	0	
MV	D13AA_DMD	34.9	0	0	5	0	100	-0.35	0.35	2.1495	
MV	D14AA_DMD	34.9	0	0	5	0	100	-0.35	0.35	0	
MV	D15AA_DMD	34.9	0	0	5	0	100	-0.35	0.35	2.1495	
MV	D16AA_DMD	34.9	0	0	5	0	100	-0.35	0.35	0	
MV	D17AA_DMD	34.9	0	0	5	0	100	-0.35	0.35	0	
MV	D18AA_DMD	34.9	0	0	5	0	100	-0.35	0.35	0	
MV	D11FDRSC	126.8	0	0	2	0	160	-0.2	0.2	0	
MV	D12FDRSC	126.7	0	0	2	0	160	-0.2	0.2	0	
MV	D13FDRSC	125.5	0	0	2	0	160	-0.2	0.2	0	
MV	D14FDRSC	125.8	0	0	2	0	160	-0.2	0.2	0	
MV	D15FDRSC	125.6	0	0	2	0	160	-0.2	0.2	0	
MV	D16FDRSC	125.3	0	0	2	0	160	-0.2	0.2	0	
MV	D17FDRSC	90.5	0	0	2	0	160	-0.2	0.2	0	
MV	D11OA_DMD	31.9	0	0	5	0	100	-0.35	0.35	0	
MV	D12OA_DMD	49.5	0	0	5	0	100	-0.35	0.35	0	
MV	D1O2_SP	5	3.3	10000	0.15	0	10	-0.015	0.015	0	

IC | SS | NS | US | OR

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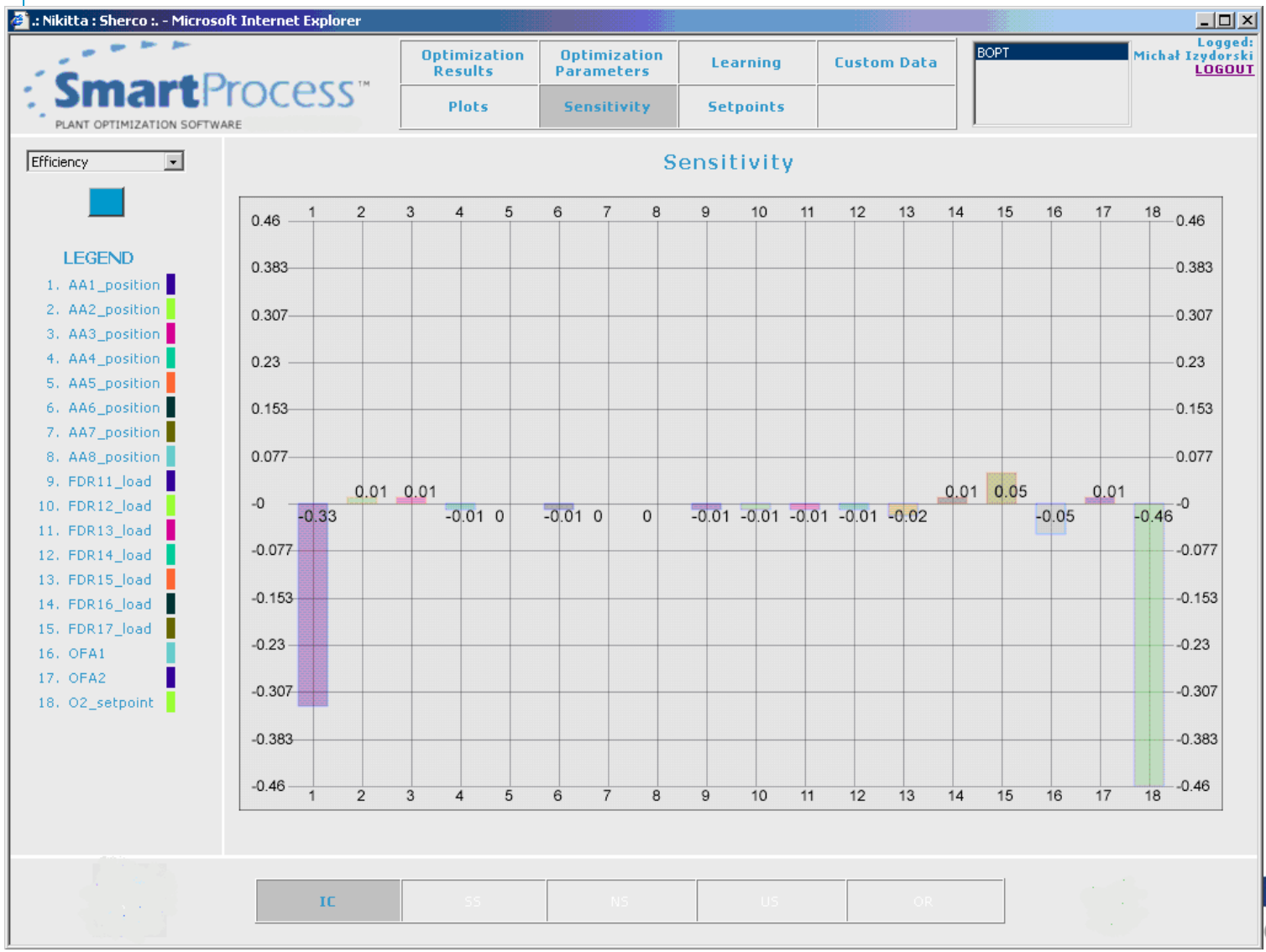
敏感度分析



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案例研究
电厂优化 – Midwest Utility Unit #2

Company:	AEG
Site:	Newton Station

Unit:	Unit #2
Location:	Newton, IL, USA
MW:	615
Boiler:	Alstom (CE)
Turbine:	GE
Primary Fuel:	Coal
Application:	NOx Optimization Steam Temp Optimization

- NOx 平均改善20.1%
- 高负荷下热耗率改善 1%
- 收益
  - 2003 年NOx 排放低于 **0.13** #/mmBTU
  - 免除安装 SCR
  - 交易 NOx 指标
- 工程周期 4 个月
- 不需要停机
- 因NOx排放的降低，9个月收回投资

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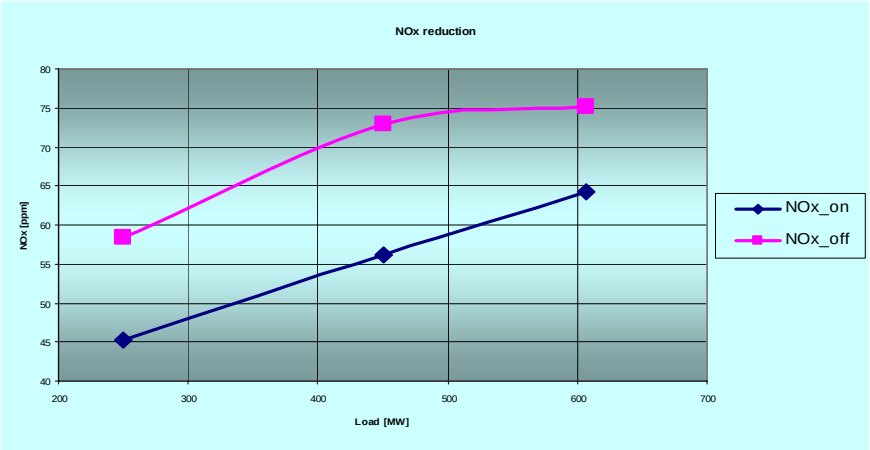
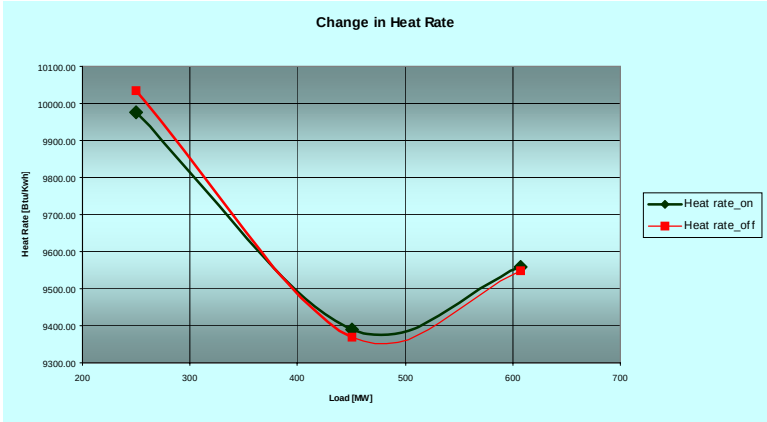
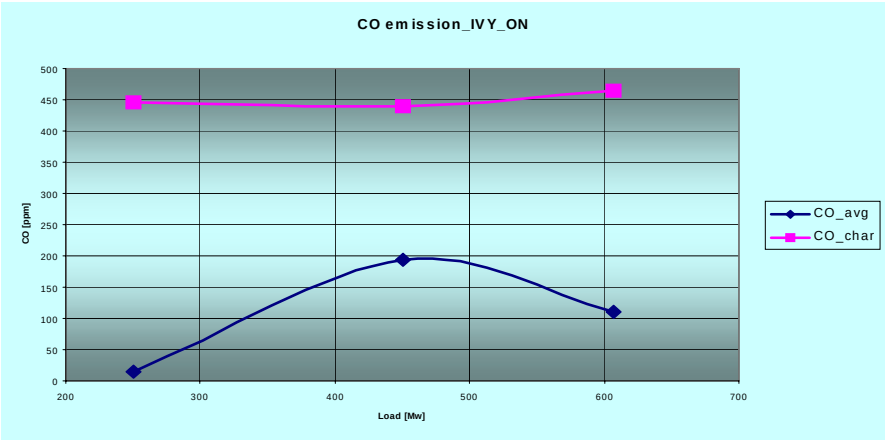
Midwest Utility Unit #2 NOx 优化效果
NOx 优化模式 (100%)



NOx 降低



保持热耗率



CO 降低

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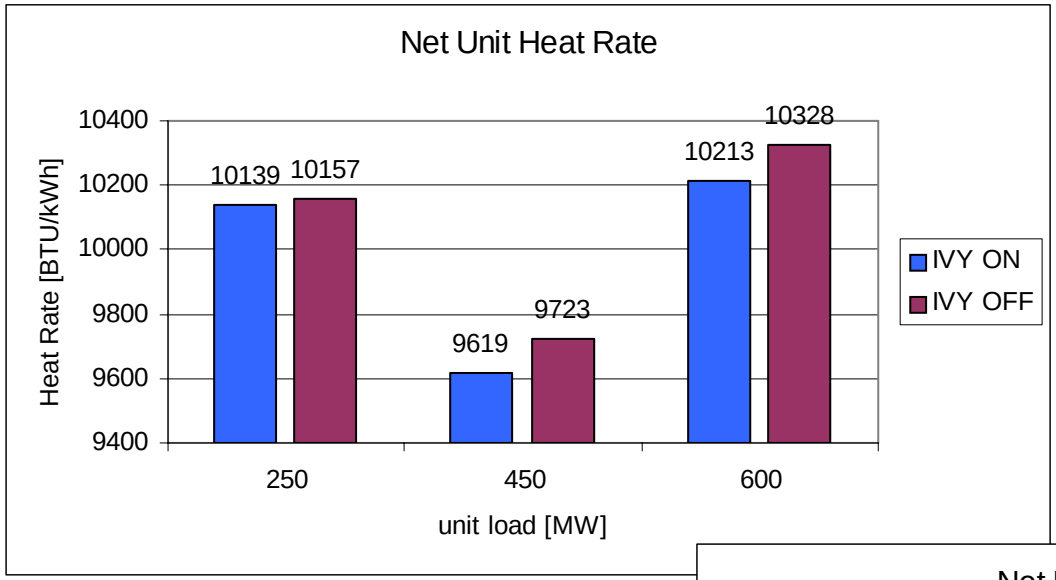
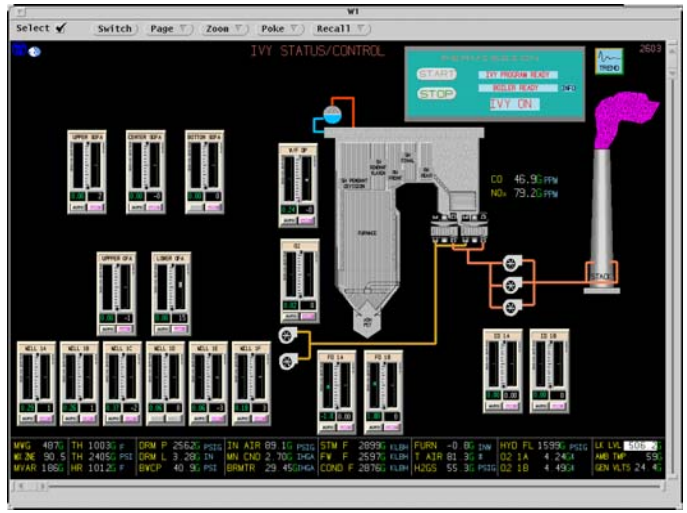
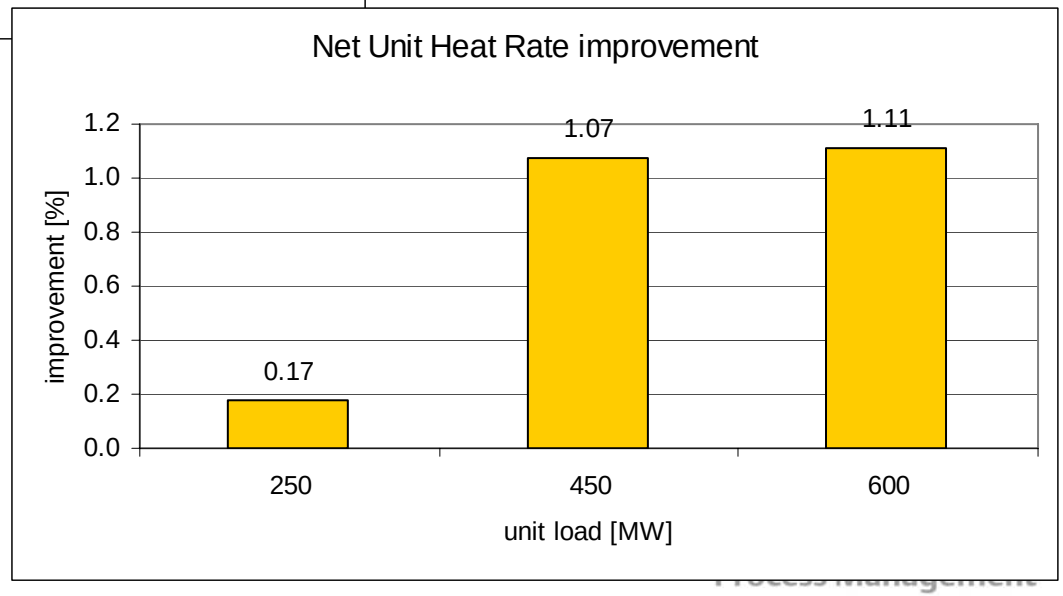
Midwest Utility Unit #2 NOx 优化效果
热耗率优化模式 (100%)







450到600 MW范围内，热耗率平均改善 1%，

相当于

$407,000

SmartProcess™

案例研究
机组优化 – Dynegy Hennepin #2

Company: Dynegy

Site: Hennepin

Unit: Unit #2
Location: Hennepin, IL
MW: 250
Boiler: Alstom (CE)
Turbine: GE
Primary Fuel: Coal

Application: NOx Optimization

- NOx排放平均改善13%
- 需求因素
  - 机组排放必须低于 .13 #/mmBTU
  - 以往的方案没有效果
- NOx 排放和热耗率的实时优化
- 工程实施周期4个月
- 无需停机
- 最有竞争力的方案

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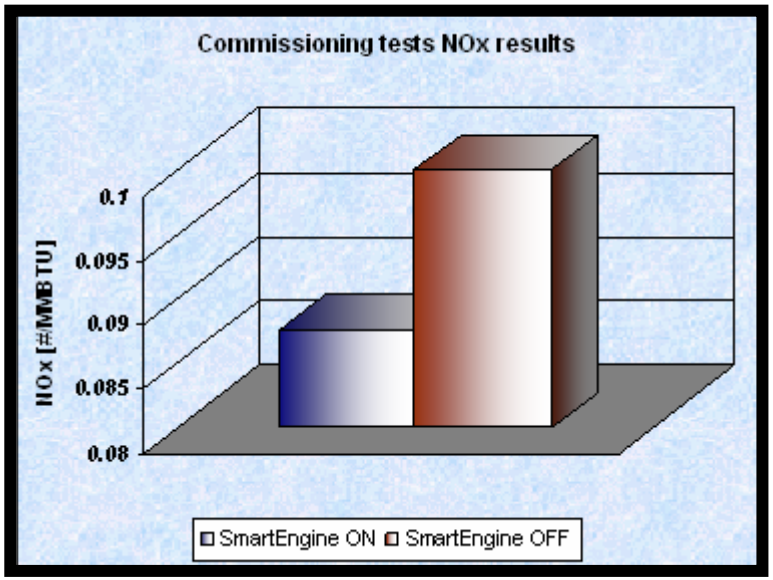
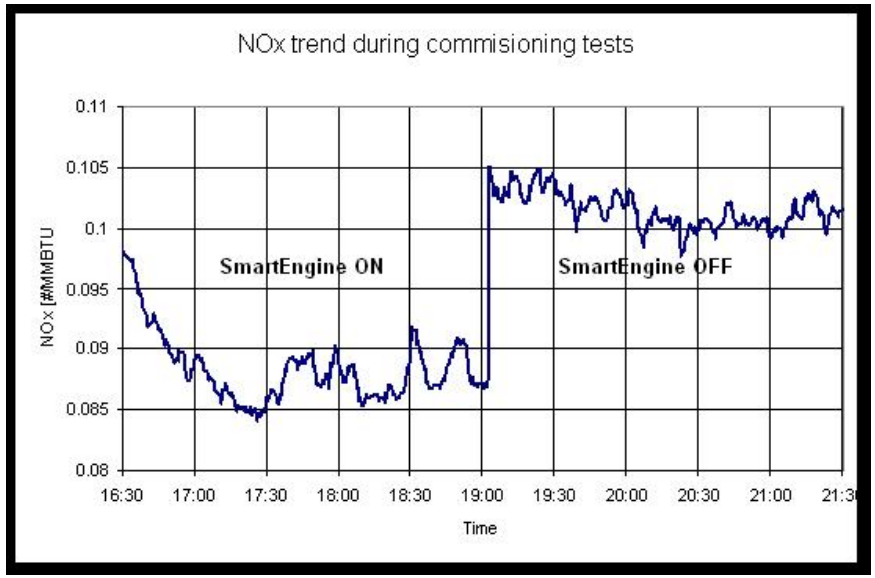
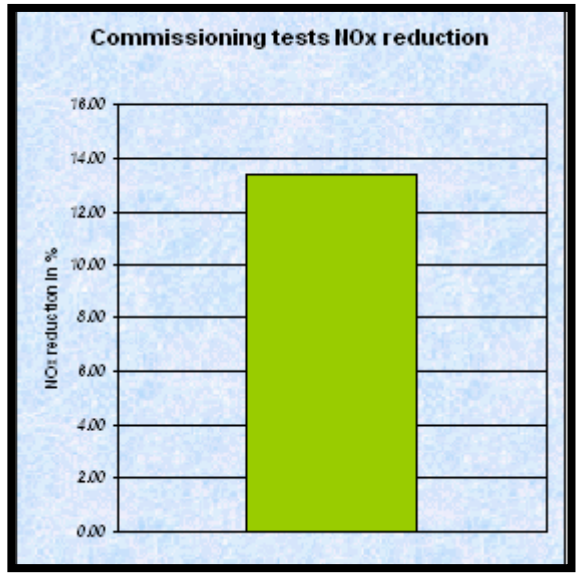
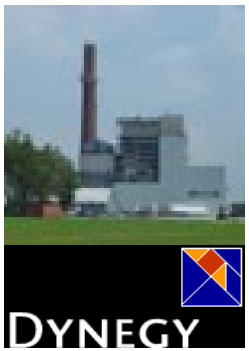
燃烧优化器的NOX改善效果



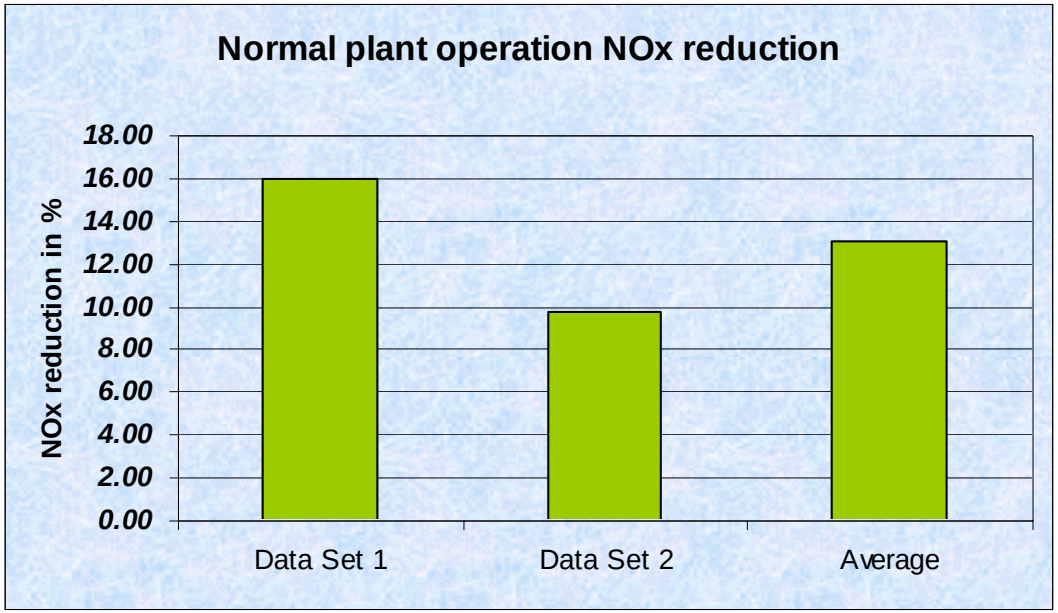






EMERSON
Process Management

案例小结



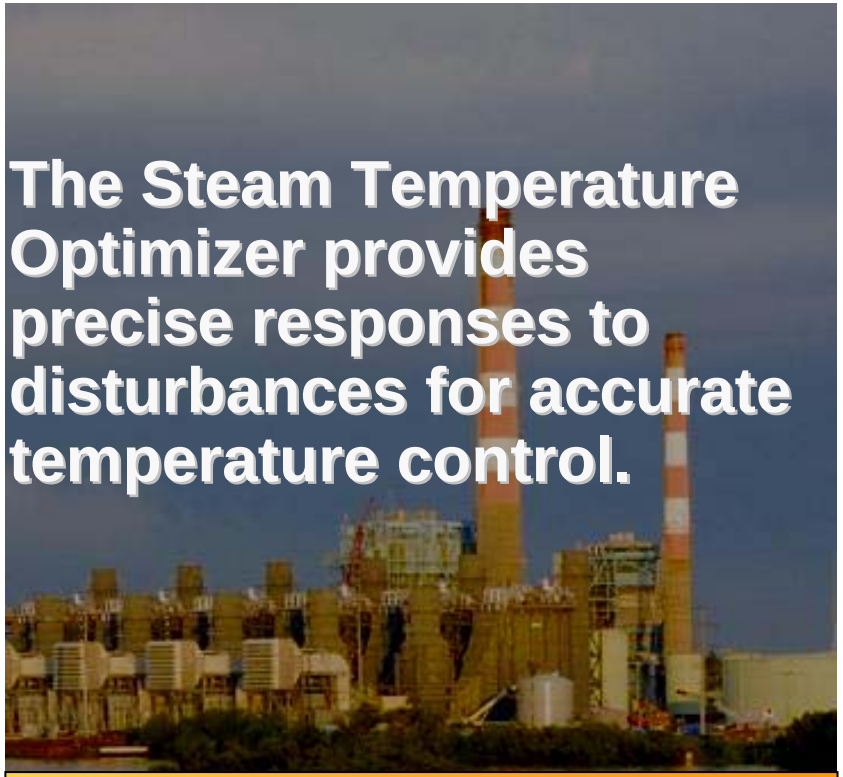
SmartEngine ON Load > 190MW January 25th, 2004 to March 3rd, 2004	Baseline - SmartEngine OFF Load > 190MW June 1st, 2003 to August 16th, 2003
NOX	**NOX**
0.112	0.141

Change in %

NOX
-21.17%

EMERSON
Process Management

蒸汽温度优化器

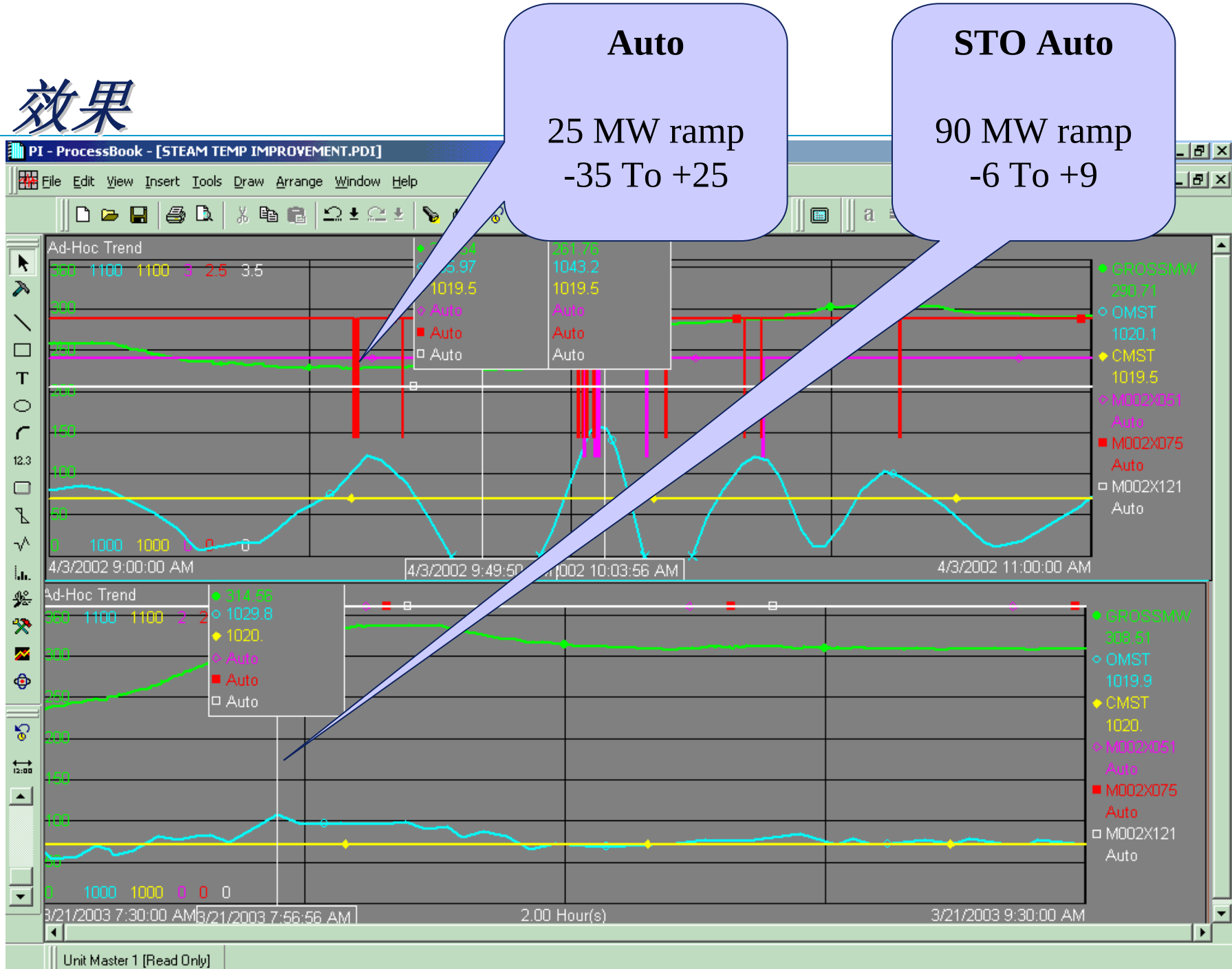


改善蒸汽温度控制，提高负荷响应能力

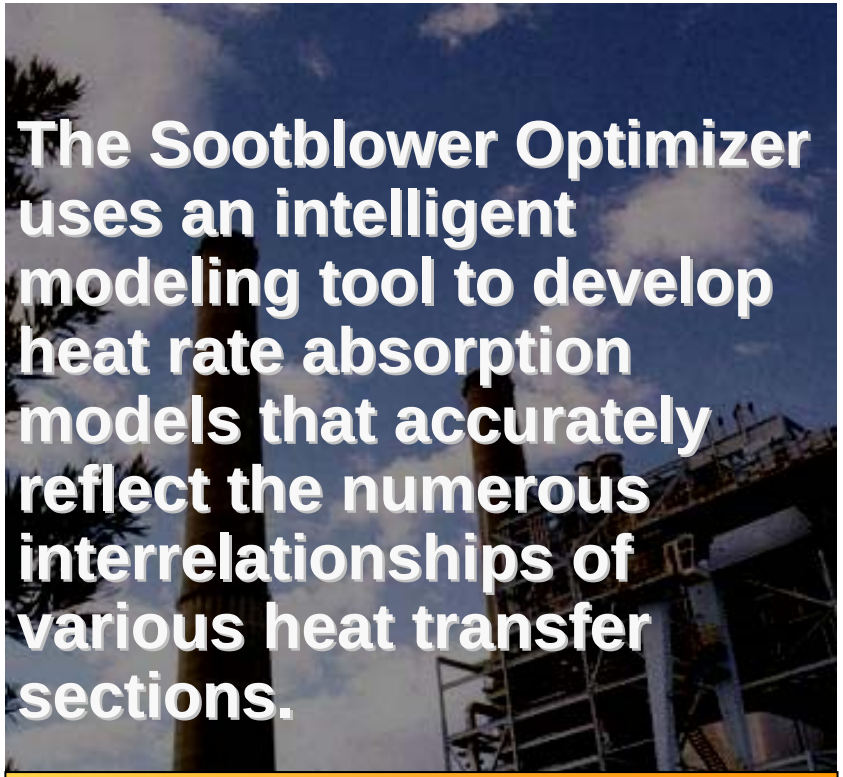
- 效果
  - 改进变负荷速率，可达 1% MCR per minute
  - 减少温度振荡，可达 75%
  - 控制喷水阀门、燃烧器摆角、烟气档板，实现精确的温度控制
  - 保持最优化蒸汽温度的多变量控制策略

EMERSON
Process Management

效果


Auto
25 MW ramp
-35 To +25
STO Auto
90 MW ramp
-6 To +9
PI - ProcessBook - [STEAM TEMP IMPROVEMENT.PDI]
File Edit View Insert Tools Draw Arrange Window Help
Ad-Hoc Trend
GROSSMW
OMST
CMST
M002X051
M002X075
M002X121
4/3/2002 9:00:00 AM
4/3/2002 11:00:00 AM
Ad-Hoc Trend
3/21/2003 7:30:00 AM
2.00 Hour(s)
3/21/2003 9:30:00 AM
Unit Master 1 [Read Only]

吹灰优化器

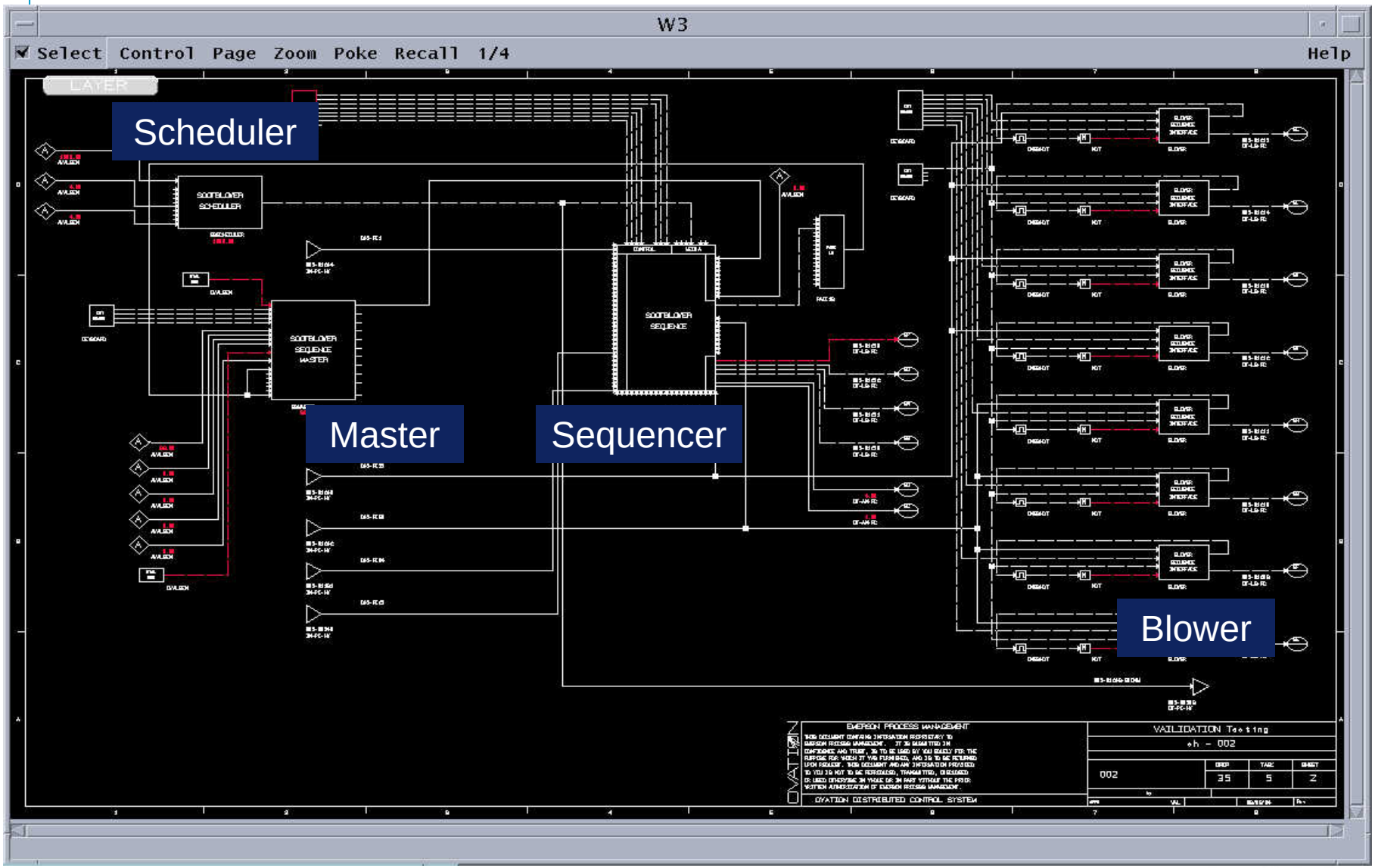


确保高效吹灰.

- 效果
  - 保持最优的锅炉清洁系数，改进热耗率0.5%
  - 减少积灰
  - 改进锅炉整体效率
  - 平衡吹灰顺序
  - 最小化不必要的蒸汽使用
  - 减少浊度峰值
  - 降低 NOx 的形成
  - 改善蒸汽温度波动

EMERSON
Process Management

吹灰器控制示意图


W3
Select Control Page Zoom Poke Recall 1/4
Help
LAYER
Scheduler
Master
Sequencer
Blower
SOOTBLOWER SCHEDULER
SOOTBLOWER SEQUENCE MASTER
SOOTBLOWER SEQUENCE
EMERSON PROCESS MANAGEMENT
OVATION DISTRIBUTED CONTROL SYSTEM
VALIDATION Testing
002

吹灰优化引擎 SmartEngine

:. Demo - Microsoft Internet Explorer

SmartProcess™
PLANT OPTIMIZATION SOFTWARE

Key Process Parameters	Sequence Off-time	Input Data Conditioning	Model Adaptation
Sootblower Operation Advisor	Section Cleanliness Model Selection	Configuration	Plots

Logged: demo
Log Out

BOILER SECTION	DESIRED CLEANLINESS	ACTUAL CLEANLINESS	DIFFERENCE	PRIORITIES	EDIT
Water Wall	0.97	1.008	0.038		
Secondary Superheater	0.99	-0	-0.99		
Intermediate Superheater	1.02	1.08	0.06		
Finished Superheater	1	0.872	-0.128		
Reheater	1.02	0.875	-0.145		
Primary Superheater	1	1.113	0.113		
Economizer	0.95	0.81	-0.14		
Air Heater	0.95	0.964	0.014		

Treshold	0.1	
Selection	manual	

RECOMMENDED SEQUENCES:

ACTUAL SEQUENCES:

Archive

Jul 9 2003 04:11:47 PM : Cleanliness Algorithm: Secondary Superheater is fouled. However no appropriate sequence can be choosen. Reheater is fouled. However no appropriate sequence can be choosen. Economizer is fouled. However no appropriate sequence can be choosen. Finished Superheater is fouled. However no appropriate sequence can be choosen.
Jul 9 2003 04:11:47 PM : Steam Temp. Algorithm: Load is high, reheater steam temp. is high. No action is recommended.
Jul 9 2003 04:11:47 PM : Time Algorithm: No sequence has exceeded its maximum off-time. No action is recommended.
Jul 9 2003 04:11:47 PM : Running sequences: Seq01, Seq02, Seq03, Seq04, Seq06, Seq08, Seq10, Seq11, Seq12, Seq14, Seq16, Seq17, Seq18.
Jul 9 2003 04:11:47 PM : Recommended sequences: no sequence is recommended.
Jul 9 2003 04:11:24 PM : Cleanliness Algorithm: Secondary Superheater is fouled. However no appropriate sequence can be choosen. Reheater is fouled. However no appropriate sequence can be choosen. Economizer is fouled. However no appropriate sequence can be choosen. Finished Superheater is fouled. However no appropriate sequence can be choosen.
Jul 9 2003 04:11:24 PM : Steam Temp. Algorithm: Load is high, reheater steam temp. is high. No action is recommended.
Jul 9 2003 04:11:24 PM : Time Algorithm: No sequence has exceeded its maximum off-time. No action is recommended.
Jul 9 2003 04:11:24 PM : Running sequences: Seq01, Seq02, Seq03, Seq04, Seq06, Seq08, Seq10, Seq11, Seq12, Seq14, Seq16, Seq18.
Jul 9 2003 04:11:24 PM : Recommended sequences: no sequence is recommended.
Jul 9 2003 04:10:49 PM : Cleanliness Algorithm: Secondary Superheater is fouled. However no appropriate sequence can be choosen. Reheater is

IC	SB	US	NS	Ad

吹灰器效果分析

Baseline Window

Information

SootBlower ID: IK01

Cycle ID:

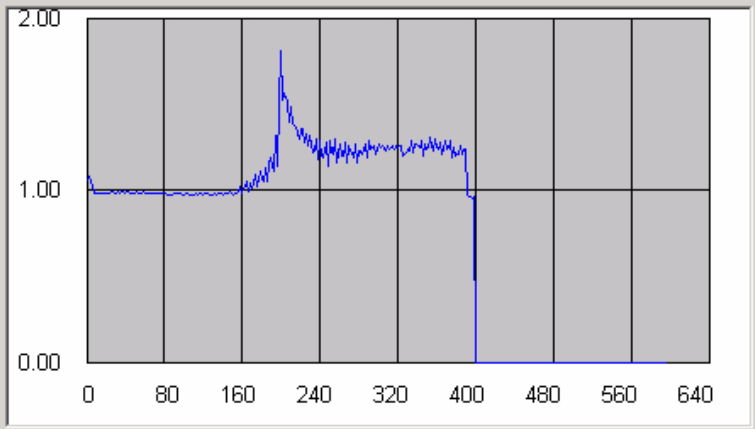
Cycle	Date/Time (seconds)
Baseline	03/02/2004 06:30:21 (400)
Recent1	03/30/2004 10:14:59 (400)
Recent2	03/30/2004 08:18:22 (402)
Recent3	03/30/2004 07:13:26 (402)
Recent4	03/30/2004 04:50:46 (400)

Metrics

Metric	Baseline	High Limit	Low Limit
Current_Average_BlowIn	0.990	1.050	0.950
Current_DEV_BlowIn	0.000	0.100	-0.100
Current_STD_BlowIn	0.030	0.020	0.000
Current_COR_BlowIn	0.695	0.100	-0.100
Current_Trend_BlowIn	0.000	0.001	-0.001
Current_Average_BlowOut	1.252	1.350	1.250
Current_DEV_BlowOut	0.000	0.100	-0.100
Current_STD_BlowOut	0.056	0.050	0.000
Current_COR_BlowOut	0.314	0.100	-0.100
Current_Trend_BlowOut	0.000	0.001	-0.001
Current_Peak	1.803	3.000	0.000
Current_Duration	200.000	410.000	300.000

Raw Data for the Baseline Cycle

CURRENT (AMPS) | PRESSURE (PSIG) | FLOWRATE (KPPH)



Color:

Chart Color

Line Color

Fill Color

Calculate

Read-Only

Save

Print Graphics

Cancel

baseline

EMERSON Process Management

状态分析工具和报表

Recent Monitoring

Configuration Information

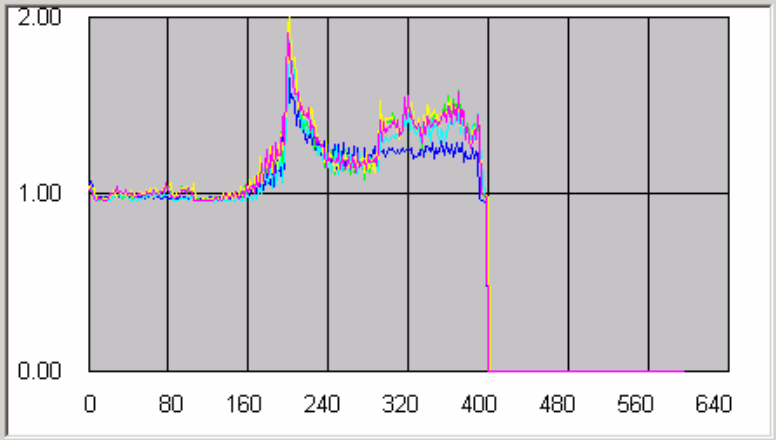
SootBlower ID: IK01 Description: Soot Blower IK01

Metrics Comparison

Metric	Baseline	Last Cycle	2nd Last Cycle	3rd Last Cycle	4th Last Cycle
Current_Average_BlowIn	0.99018 (1.05/0.95)	1.0114	0.98661	1.01968	1.01127
Current_DEV_BlowIn	0 (0.1/-0.1)	0.02122	0.00357	0.0295	0.02109
Current_STD_BlowIn	0.02969 (0.02/0)	0.05076	0.04098	0.05778	0.05592
Current_COR_BlowIn	0.69457 (0.1/-0.1)	0.6487	0.52391	0.60943	0.68757
Current_Trend_BlowIn	0 (0.001/-0.001)	0.00106	0.00057	0.00107	0.00097
Current_Average_BlowOut	1.25177 (1.35/1.25)	1.33811	1.30845	1.35416	1.34034
Current_DEV_BlowOut	0 (0.1/-0.1)	0.08634	0.05668	0.10239	0.08857
Current_STD_BlowOut	0.05551 (0.05/0)	0.13056	0.10553	0.13029	0.12084
Current_COR_BlowOut	0.31389 (0.1/-0.1)	0.78147	0.70803	0.7761	0.79699
Current_Trend_BlowOut	0 (0.001/-0.001)	0.00221	0.00138	0.00157	0.00157
Current_Peak	1.80328 (3/0)	1.98486	1.91925	2.00775	1.9162
Current_Duration	200 (410/300)	398	401	401	399

Raw Data for the all the Cycles

CURRENT (AMPS) | PRESSURE (PSIG) | FLOWRATE (KPPH)



Cycle Display Info:

Show Data

Baseline: 03/02/2004 06:30:21

Last Cycle: 03/30/2004 10:14:59 (400 sec)

2nd Last Cycle: 03/30/2004 08:18:22 (402 sec)

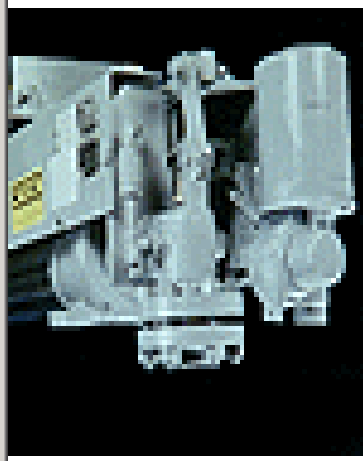
3rd Last Cycle: 03/30/2004 07:13:26 (402 sec)

4th Last Cycle: 03/30/2004 04:50:46 (400 sec)

Chart Color | Line Color | Fill Color

Print Graphics

Done



EMERSON
Process Management

案例研究: 吹灰优化
Southern California Edison - Mohave Unit #1

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL® Company

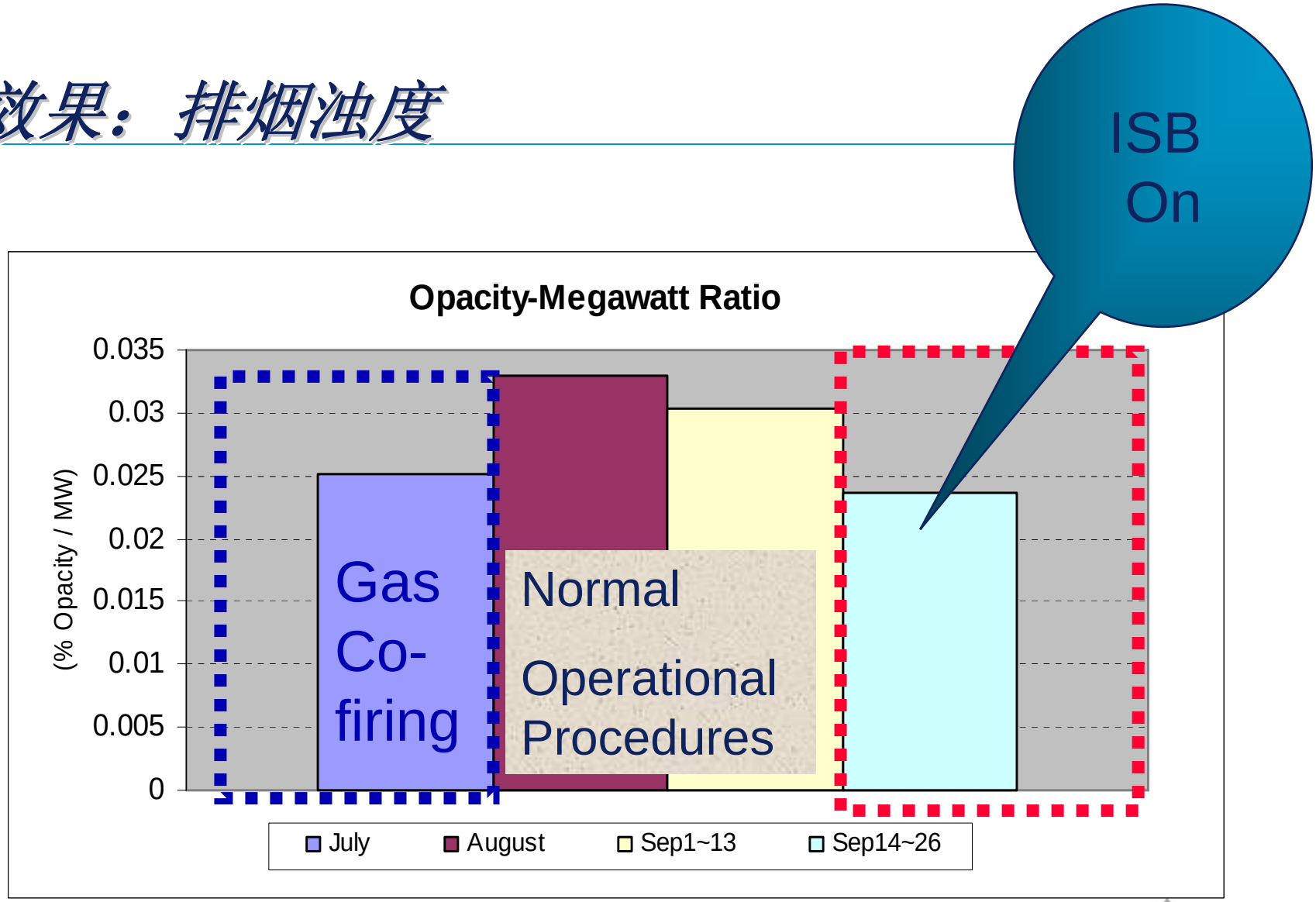
Company:	Southern California Edison
Site:	Mohave Station

Unit:	Unit #1
Location:	Laughlin, NV
MW:	800
Boiler:	Alstom (CE)
Turbine:	GE
Primary Fuel:	Coal
Application:	Steam Temperature Optimization

- 增加热传导率
  - 水冷壁和屏式过热器 8-10 %
  - 高温过热器和高温再热器 6-7%
  - 低温再热器和省煤器 2-4%
- 降低浊度
- 需求因素
  - 减少吹灰阶段和变负荷时的浊度峰值
- 实时吹灰优化
- 工程实施周期5个月
- 无需停机
- 大约8个月收回投资

EMERSON
Process Management

效果：排烟浊度



EMERSON
Process Management

总体性能建议器

监视和评估机组性能

- 效果
  - 通过跟踪机组热耗率变化和设备性能偏差，降低运行成本
  - 计算机组净热效率并追踪其偏差
  - 显示性能参数偏差和成本偏差，帮助运行人员决定正确的操作、标记需要检修的设备或者提出检修需求

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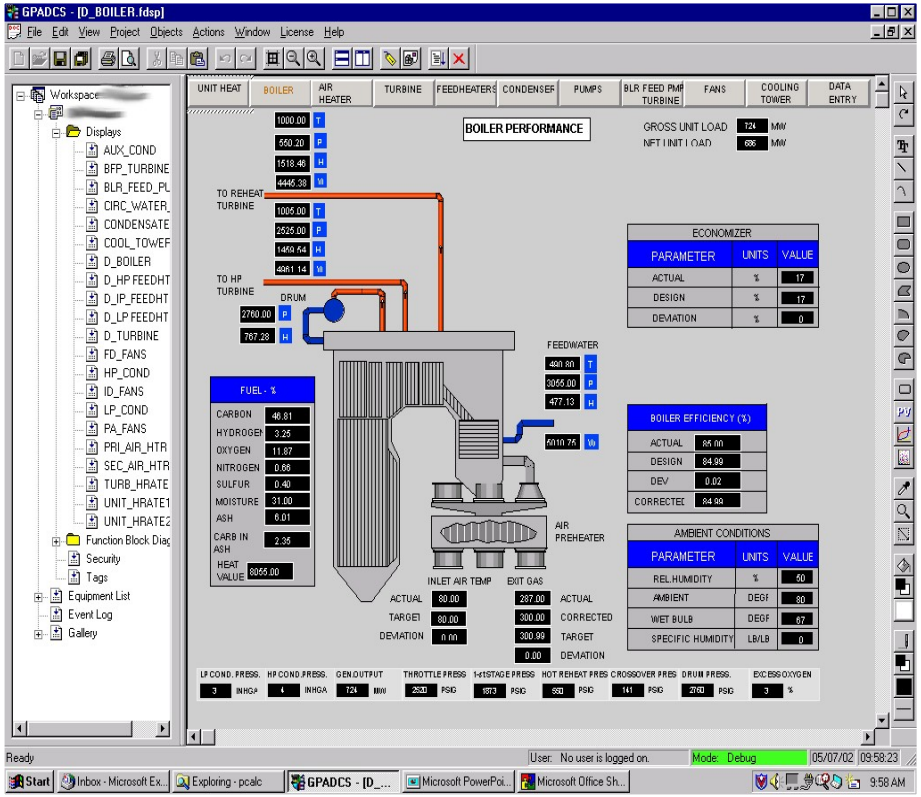
SmartProcess™

总体性能建议器

- 机组热耗率模块
- 汽机热好率模块
- 汽轮机组热平衡模块
- 凝汽器性能模块
- 锅炉性能模块
- 省煤器性能模块
- 给水加热器模块
- 给水泵小汽机模块
- 风机效率模块
- 大型泵效率模块
- 冷却塔模块

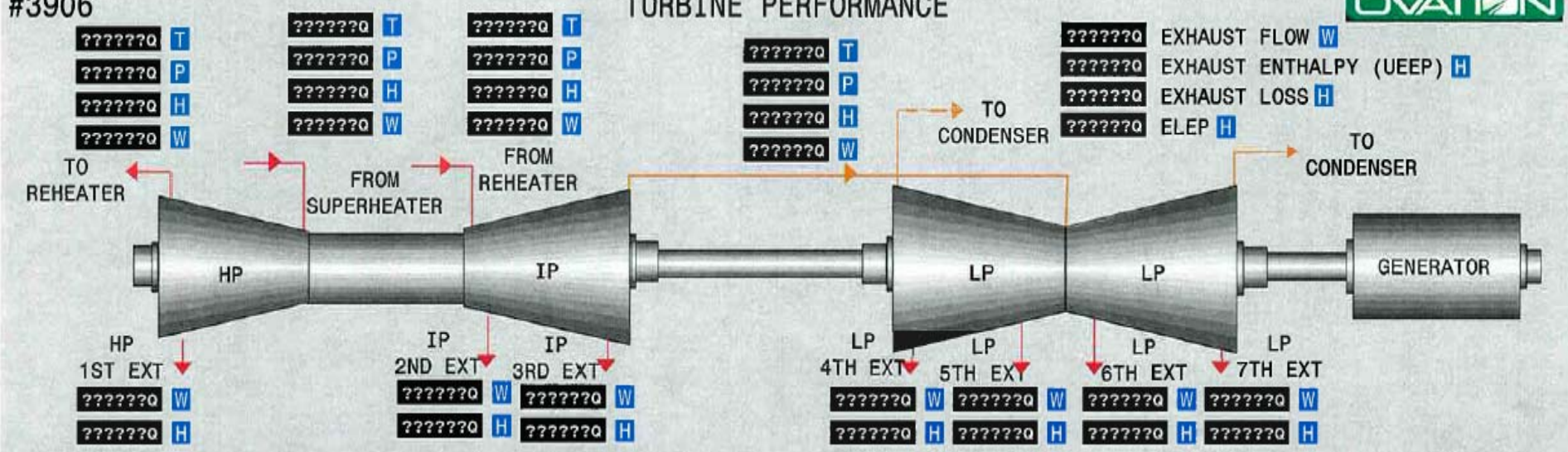


EMERSON™
Process Management

#3906

TURBINE PERFORMANCE

OVATION



TURBINE SECTION PERFORMANCE

PARAMETER	ENG UNIT	HP	IP	LP	REHEAT
ACTUAL EFFICIENCY	%	??????Q	??????Q	??????Q	??????Q
DESIGN EFFICIENCY	%	??????Q	??????Q	??????Q	??????Q
DEVIATION	%	??????Q	??????Q	??????Q	??????Q
PCT LOAD GENERATION	%	??????Q	??????Q	??????Q	??????Q
EXHAUST MOISTURE	%			??????Q	

KEY PRESSURES

PARAMETER	ENG UNIT	ACTUAL	CORRECTED
FIRST STAGE	PSIG	??????Q	??????Q
REHEAT	PSIG	??????Q	??????Q
CROSSOVER	PSIG	??????Q	??????Q

PARAMETER ENTRY

GENERATOR PERFORMANCE

PARAMETER	UNITS	VALUE
GROSS OUTPUT	MW	??????Q
NET OUTPUT	MW	??????Q
AUXILIARY POWER	MW	??????Q
TOTAL GENERATOR LOSSES	MW	??????Q
GENERATOR EFFICIENCY	%	??????Q
APPARENT POWER	MVA	??????Q
POWER FACTOR	REAL	??????Q

#3905

TURBINE HEAT RATE/GENERATOR OUTPUT

OVATION

GROSS TURBINE CYCLE HEAT RATE

PARAMETERS	ENG UNIT	VALUE
ACTUAL	BTU/KWH	??????Q
DESIGN	BTU/KWH	??????Q
DEVIATION	BTU/KWH	??????Q
CORRECTED	BTU/KWH	??????Q

GENERATOR OUTPUT

PARAMETERS	ENG UNIT	VALUE
GROSS OUTPUT	MW	??????Q
TOTAL CORRECTION	MW	??????Q
CORRECTED OUTPUT	MW	??????Q

DETAILED HEAT RATE / OUTPUT CORRECTION DATA

PARAMETERS	ENG UNIT	DESIGN VALUE	ACTUAL VALUE	OUTPUT DEVIATION (MW) -2 -1 0 1 2		HEAT RATE DEV (BTU/KWH) 50 25 0 -25 -50	
THROTTLE STEAM TEMP	DEGF	??????Q	??????Q	??????Q		??????Q	
REHEAT STEAM TEMP	DEGF	??????Q	??????Q	??????Q		??????Q	
THROTTLE STEAM PRESS	PSIG	??????Q	??????Q	??????Q		??????Q	
REHEAT PRESS DROP	%	??????Q	??????Q	??????Q		??????Q	
EXHAUST PRESS	IN HGA	??????Q	??????Q	??????Q		??????Q	
REHEAT SPRAY FLOW	KLB/HR	??????Q	??????Q	??????Q		??????Q	
SUPERHEAT SPRAY FLOW	KLB/HR	??????Q	??????Q	??????Q		??????Q	
BFP TURB EXT STEAM	KLB/HR	??????Q	??????Q	??????Q		??????Q	
MAKE UP WATER	KLB/HR	??????Q	??????Q	??????Q		??????Q	
CONDSR SUBCOOL	DEGF	??????Q	??????Q	??????Q		??????Q	
TOP HEATER TTD	DEGF	??????Q	??????Q	??????Q		??????Q	
OTHER HTRS COMBINED TTD	DEGF					??????Q	
TOTALS				??????Q		??????Q	

LDC MODE	MEGAWATTS	THROT PRESS	THROTTLE TEMP	SH TEMP	RH TEMP	COND PRESS	INST OPACITY	EXCESS O2	DRUM LEVEL
	?????Q?????	?????Q?????	?????Q?????	?????Q?????	?????Q?????	?????Q?????	?????Q?????	?????Q?????	?????Q?????

凝汽器设计数据输入界面

Algorithm Properties - Cnddesign

Configuration | Inputs | Outputs | Constants | Tags | Design Info | Source | Destination | Connect Map | Shape

Of Compartments: 2

Of passes through Condenser: 2

Design Cleanliness Factor: 90 %

Makeup Water Units: KLB/HR

Condenser Duty

Is Circulating Water Flow: No

If It is NOT measured, check all that are used in calculating the condenser duty:

- [x] LP Exhaust
- [ ] Makeup Water
- [ ] LP Heater(s) Drain
- [ ] Steam Jet Air Ejector
- [ ] Gland Steam Condenser Drain
- [ ] Steam Seal Regulator Spillover
- [ ] Boiler Feedpump Turbine Exhaust
- [ ] Out-of-Service Low Pressure Heater
- [ ] Miscellaneous 1
- [ ] Miscellaneous 2

Compartment In-Service Status

- ( ) Digital Flag
- (•) Compartment Temperature Rise Threshold: 10 DEG. F

Condenser Tubes

Compartment #: 1

Material: Stainless Steel 304/316

Number of Tubes: 5514

Tube Wall Gage: 22 BWG

Outside Tube Diameter: 0.8725 IN.

Tube Length: 43.25 FEET

Material	C...	#...	Wall ...	Outsi...	Ler
Stainless Steel 30...	1	5...	22	0.8725	43.
Stainless Steel 30...	2	5...	22	0.8725	43.

<- Add

-> Delete

Modify

Total Tubes Compartment 1: 5514

Compartment 2: 5514

OK | Cancel | Apply | Help

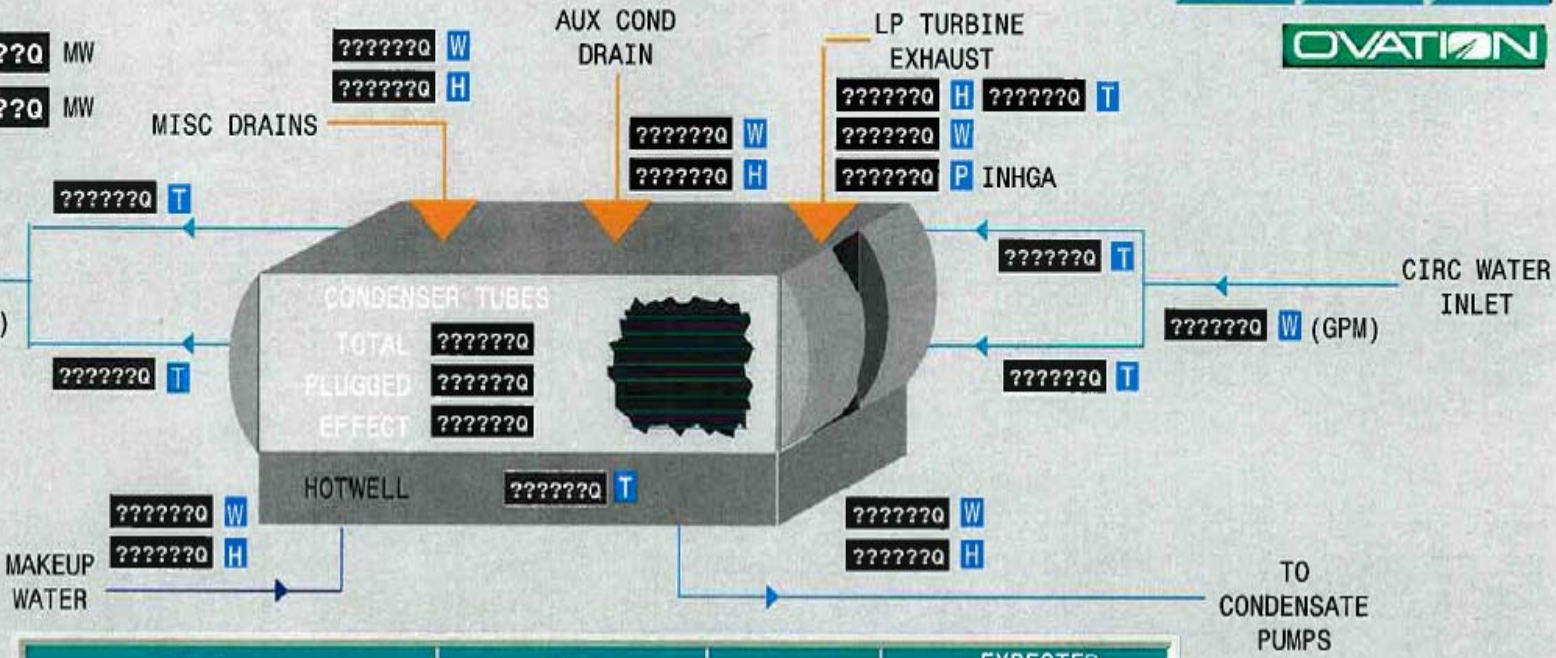
#3907

CONDENSER PERFORMANCE

OVATION

GROSS UNIT LOAD ??????Q MW

NET UNIT LOAD ??????Q MW

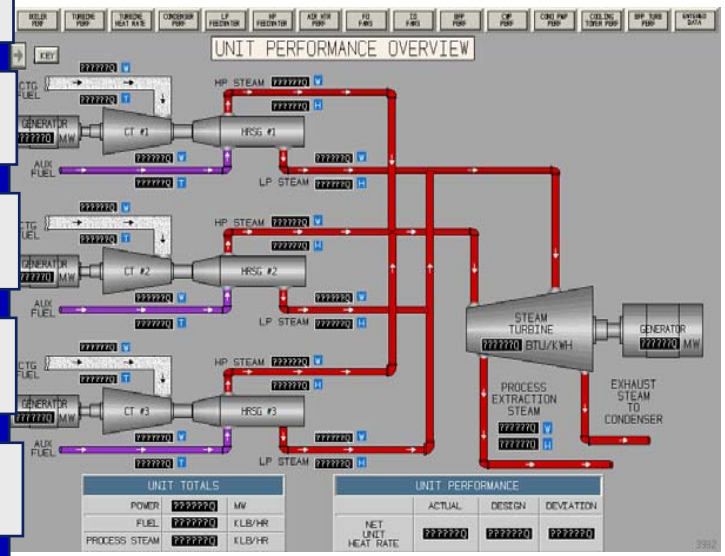


PARAMETER	UNITS	ACTUAL	EXPECTED (CLEAN CONDITION)
BACK PRESSURE	INHGA	??????Q	??????Q
HEAT TRANSFER COEFFICIENT	BTU/(HR*FT^2*^{o}F)	??????Q	??????Q
CLEANLINESS	%	??????Q	??????Q
TERMINAL TEMP DIFFERENCE	DEGF	??????Q	
INITIAL TEMP DIFFERENCE	DEGF	??????Q	
SUBCOOLING	DEGF	??????Q	
LOG MEAN TEMP DIFFERENCE	DEGF	??????Q	
CIRC WATER VELOCITY	FT/SEC	??????Q	
CONDENSER DUTY	MBTU/HR	??????Q	

PARAMETER ENTRY

完整的、可组态式动态链接库，专为机组性能计算而设计

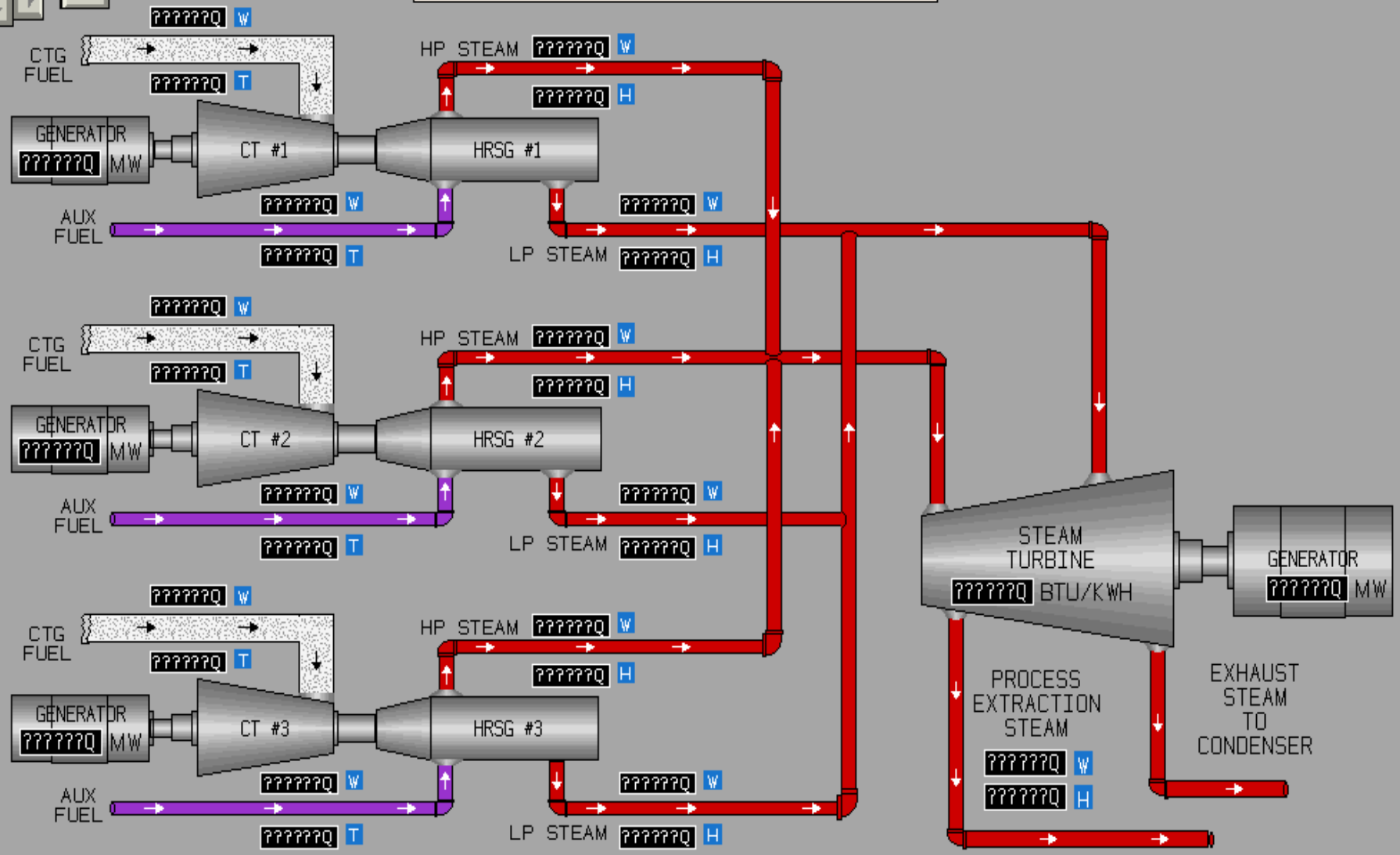
- 机组热耗率模块
- 汽轮机热耗率模块
- 汽轮发电机组效率模块
- 余热锅炉性能模块
- 燃气轮机性能模块
- 凝汽器性能模块
- 冷却塔性能模块
- 大型泵性能模块



EMERSON
Process Management

KEY

UNIT PERFORMANCE OVERVIEW



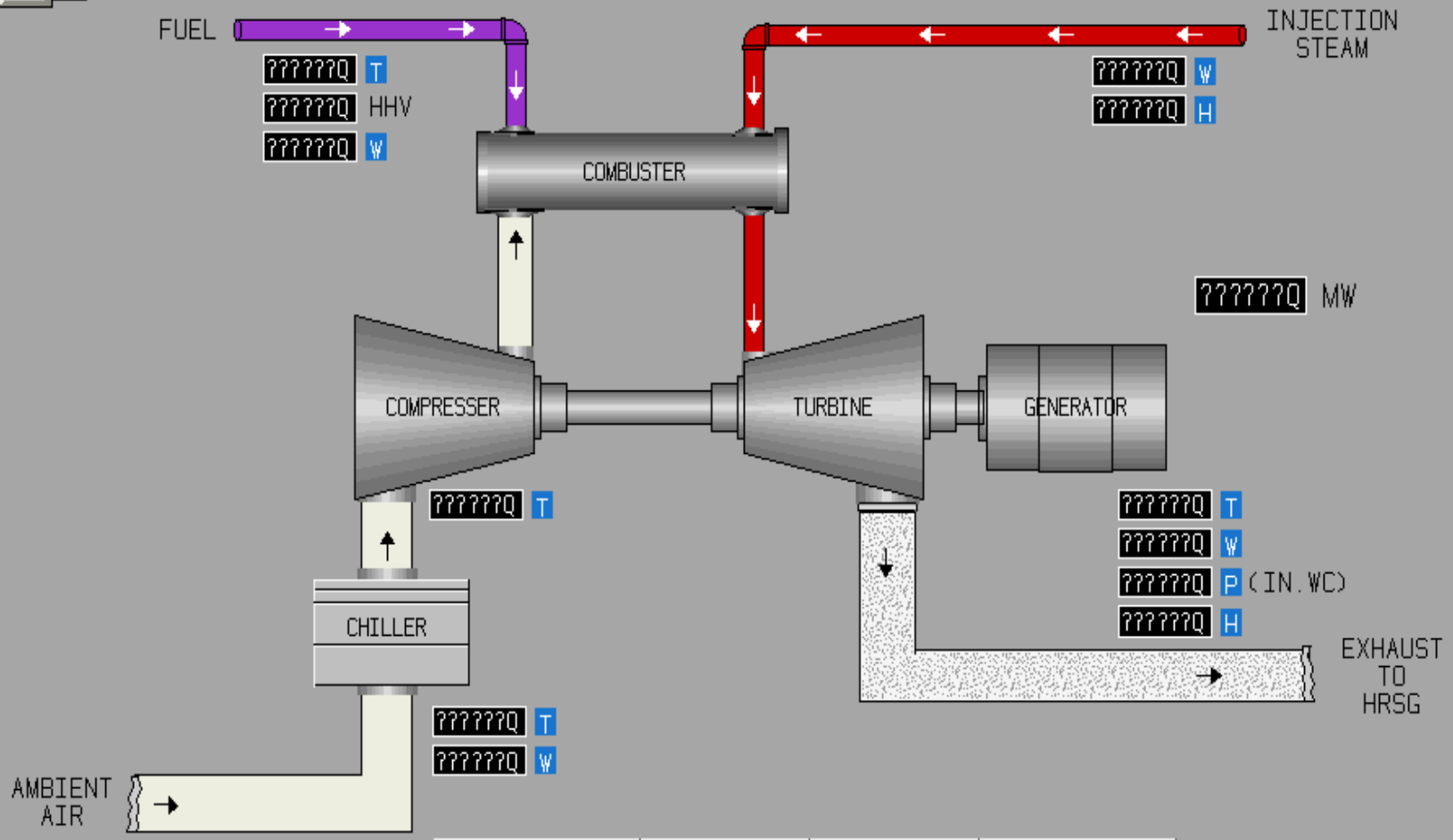
UNIT TOTALS		
POWER	??????Q	MW
FUEL	??????Q	KLB/HR
PROCESS STEAM	??????Q	KLB/HR

UNIT PERFORMANCE	ACTUAL	DESIGN	DEVIATION
NET UNIT HEAT RATE	??????Q	??????Q	??????Q

3932

KEY

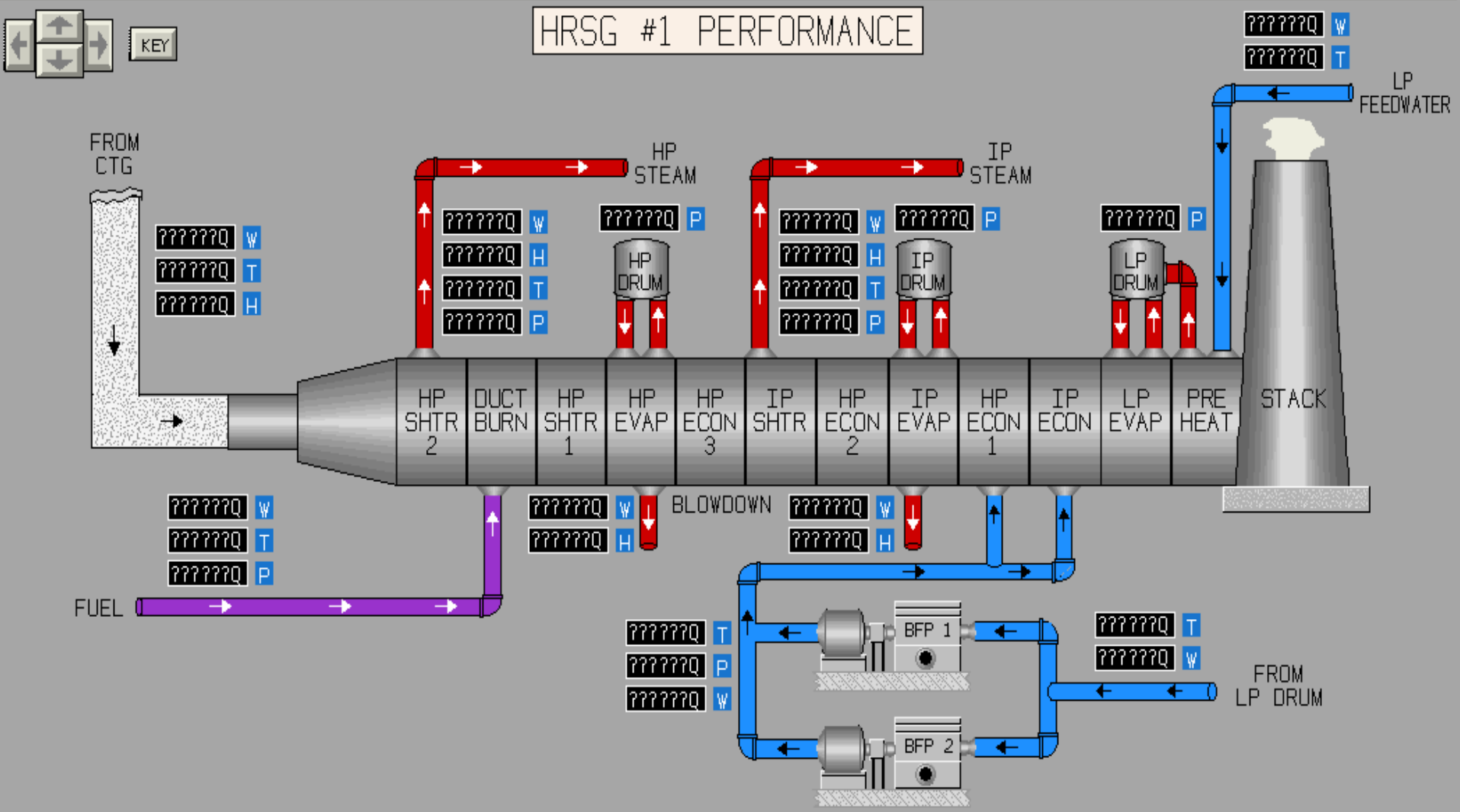
COMBUSTION TURBINE #1 PERFORMANCE



	HEAT RATE (BTU/KWH)	EFFICIENCY (%)	POWER OUTPUT (MW)
ACTUAL	??????Q	??????Q	??????Q
CORRECTED	??????Q	??????Q	??????Q
DESIGN	??????Q	??????Q	
DEVIATION	??????Q	??????Q	

KEY

HRSG #1 PERFORMANCE



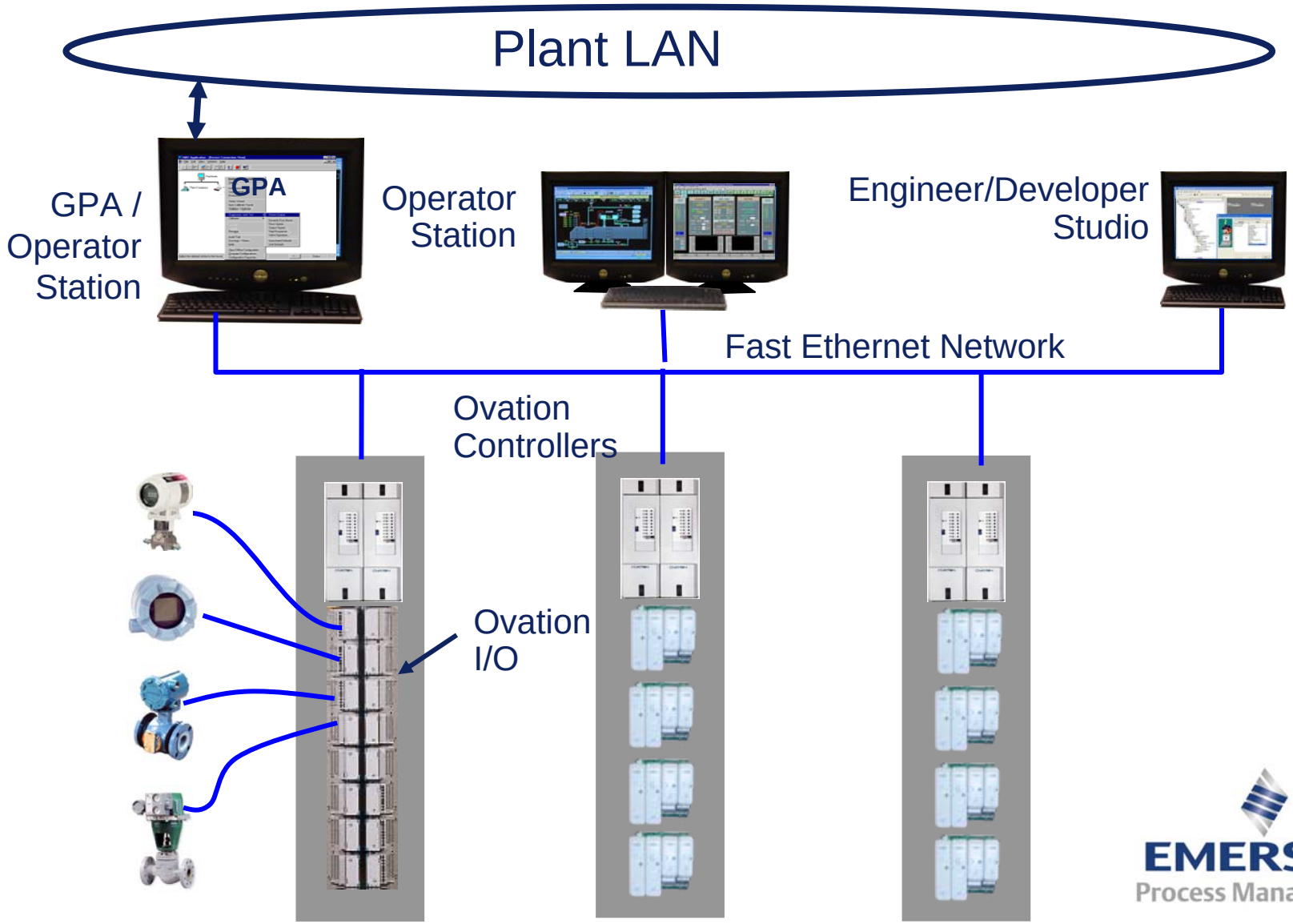
STEAM PRODUCTION PERFORMANCE

	HP STEAM	IP STEAM
ACTUAL	??????Q	??????Q
DESIGN	??????Q	??????Q
DEVIATION	??????Q	??????Q

HRSG EFFICIENCY

	INPUT/OUTPUT	HEAT LOSS
ACTUAL	??????Q	??????Q
DESIGN	??????Q	??????Q
DEVIATION	??????Q	??????Q

典型的 Ovation GPA 架构



EMERSON
Process Management

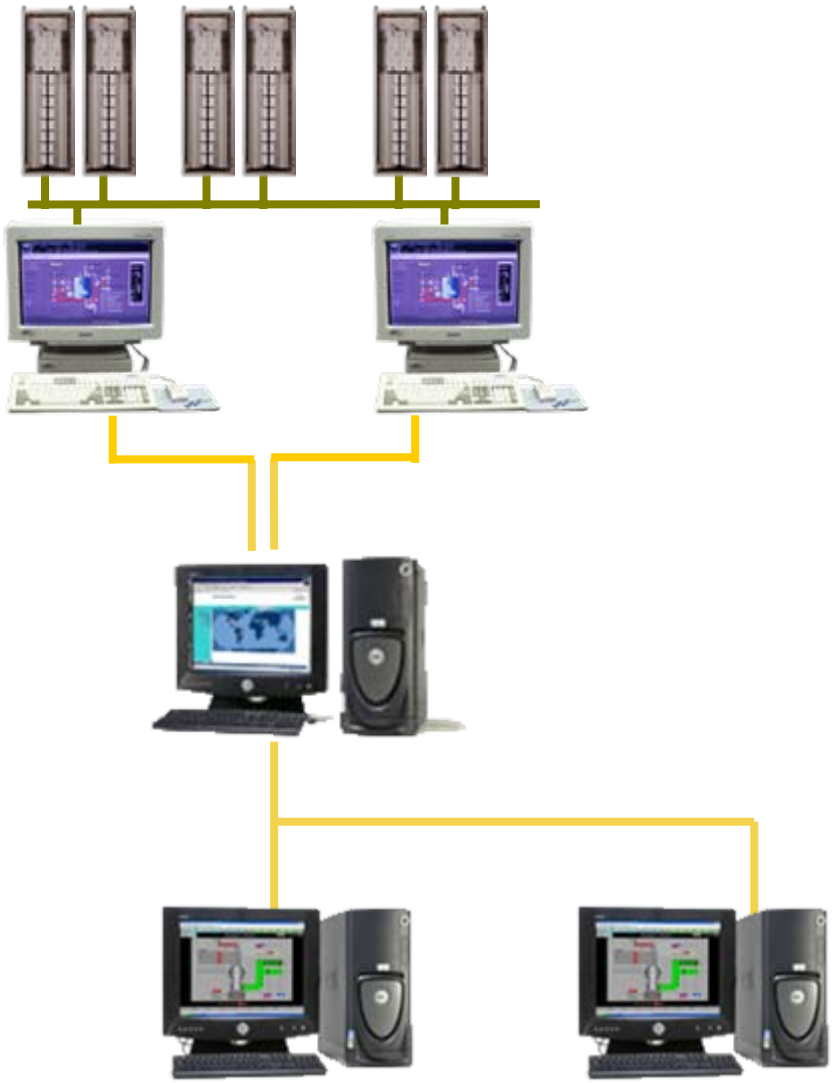
企业数据服务器 (EDS) 集成化软件

企业数据服务器 (EDS) 采集和处理机组数据，支持用户访问采集自控制系统或者其它数据源的实时数据和历史数据。

- 最高 100,000 数据点的处理能力
- 运行于各种不同的系统平台，包括 Linux, Windows NT, Windows 2000, Windows 95, 和 Sun Solaris
- 一体化结构: 报警、可视化界面、报表、计算、归档数据存储、优化和高级数据分析
- 采集全厂数据或者多数据源数据至统一的存储区域
- 分析、计算、过程优化均采用统一的数据源
- 可视化界面和报表支持多种数据源

EMERSON
Process Management

EDS 结构



DCS or DAS

(EDS connect)

EDS Server

EDS Terminals

EMERSON
Process Management

性能监视系统
数据校验 和 数据替代

- 独立算法模块，具备OPC接口
- 载入数据时，进行数据分析，包括坏数据、未知错误标志、数据重复和数据缺失等
- 为关键传感器变量建立神经网络模型，如：燃料量、给水量等
- 为二次量提供传统的处理方法，如替代数据、曲线等
- 通过ULS模块实现全工况的数据替代模型

EMERSON
Process Management

W1: (WDPF 1000.edf)

File Help

ESS II LOG

Mark

LOAD DEMAND COMPUTER | UNIT OVERVIEW | FW / AIR / FUEL | HEAT RATE BARS | FW FUEL/AIR 1 HR TREND

DAIRYLAND POWER COOPERATIVE
GENOA STATION 3

1000

SERV/FILT WATER TANKS | CEM BARS | COLOR KEY CHART | SYSTEM STATUS | CONTROL LOGS

AIR OVERVIEW
ID FANS
ID FAN 1-1 OIL PUMPS
ID FAN 1-2 OIL PUMPS
FD FANS
FD/ID FAN CONTROLS
AIR CONTROL
WINDBOX/FURNACE CONTROL
WINDBOX / FURNACE DAMPER POS
SOFA/CCOFA CONTROL
SOFA/CCOFA DAMPER POS
SOFA / BURNER TILTS
FAN ROOM / COLD END CONTROL

CIRCULATING WATER OVERVIEW
CIRC WATER PUMPS AND VALVES
MAIN MECHANICAL EXHAUSTERS
PRECIPITATOR OVERVIEW
SOOTBLOWING OVERVIEW

CONDENSATE SYSTEM OVERVIEW
PRIMARY CONDENSATE PUMPS
CONDENSATE BOOSTER PUMPS
DEAERATOR
AP WATER HEATER
AIR PREHEATER COILS
LOW PRESSURE HEATERS
CONDENSATE CONTROL

FEEDWATER OVERVIEW
BFP 1-1
BFP 1-2
BFP 1-1 OIL PUMPS
BFP 1-2 OIL PUMPS
BFP 1-1 CONTROLS
BFP 1-2 CONTROLS
BFPT SPEED RAMP
AUX MECHANICAL EXHAUSTERS
BFP AUX CONDENSATE PUMPS
HIGH PRESSURE HEATERS
FEEDWATER CONTROL

BOILER CIRC PUMP OVERVIEW
BOILER CIRC PUMP 1-1
BOILER CIRC PUMP 1-2
BOILER CIRC PUMP 1-3

START-UP OVERVIEW
STARTUP VLV CONTROL (1)
STARTUP VLV CONTROL (2)
TRANSMITTER SELECT SUMMARY
2 TRANSMITTER SELECT (1)
2 TRANSMITTER SELECT (2)
3 TRANSMITTER SELECT (1)
3 TRANSMITTER SELECT (2)
TRANSMITTER SELECT

BOILER STEAM AIR OVERVIEW
FW/FUEL RATIO CONTROL
SUPERHEAT / REHEAT CONTROL
BLEED STEAM AIR OPERATED CHECK VALVES
SEALING STEAM SYSTEM
TURBINE STEAM CONTROL
CONTROL STATIONS

TCS UNIT OVERVIEW
TCS MANUAL PANEL
TURBINE OIL PUMPS
TURBINE VALVE POSITION
TURBINE DRAINS
TURBINE STEAM FLOW
TURBINE METAL TEMPERATURES
TURBINE VIBRATION/ TEMPERATURES
TURBINE POSITION
TURBINE STRESS MONITOR
WATER WALL TEMPERATURES
START-UP STATEMENTS

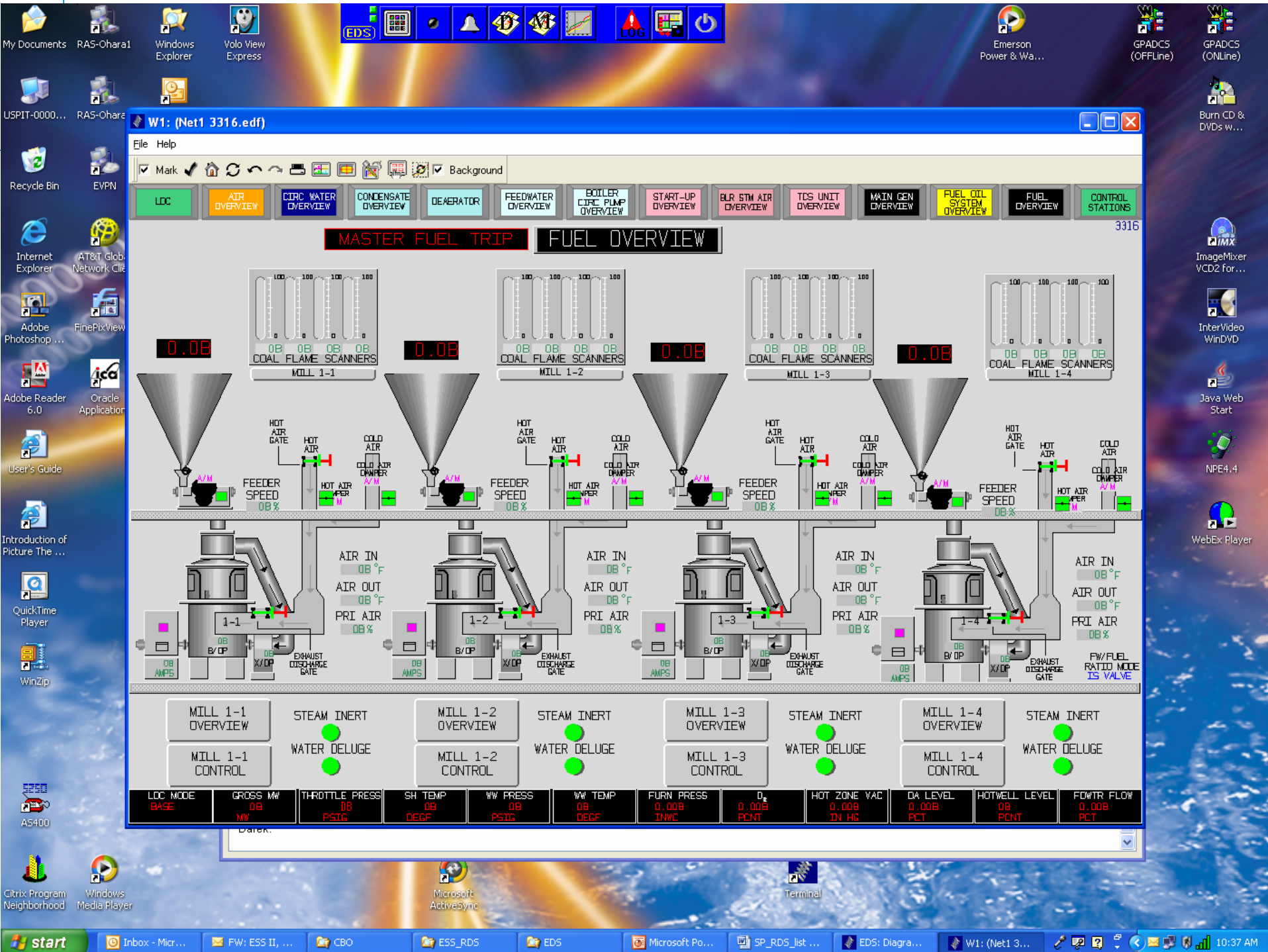
FUEL OIL SYSTEM OVERVIEW
BOILER PURGE AND PRELIGHT
WARMUP ELEVATION AB
WARMUP ELEVATION C
WARMUP ELEVATION D
FUEL OIL CONTROLS
FIRST-OUTS
SHUT-DOWN STATEMENTS

FUEL OVERVIEW
MILL 1-1 AND FEEDER
MILL 1-2 AND FEEDER
MILL 1-3 AND FEEDER
MILL 1-4 AND FEEDER
FUEL AIR DAMPERS
SCANNER OVERVIEW
MILL/FOR 1-1 CONTROLS
MILL/FOR 1-2 CONTROLS
MILL/FOR 1-3 CONTROLS
MILL/FOR 1-4 CONTROLS
MILL 1-1/1-2 CONTROL
MILL 1-3/1-4 CONTROL

MAIN GENERATOR OVERVIEW
ESTABLISH VACUUM
FLOW THRU PART 1
FLOW THRU PART 2
ESTABLISH PURGE
ESTABLISH FIRE PART 1
ESTABLISH FIRE PART 2
ROLL MAIN PART 1
ROLL MAIN PART 2
BRING ONLINE PART 1
BRING ONLINE PART 2

STATION ELECTRICAL
SHUT-DOWN PART 1
SHUT-DOWN PART 2
SHUT-DOWN PART 3
SHUT-DOWN LOG FORM

LDC MODE	GROSS MW	THROTTLE PRESS	SH TEMP	WW PRESS	WW TEMP	FURN PRESS	O_2	HOT ZONE VAC	DA LEVEL	HOTWELL LEVEL	COND FLOW
REMOTE	341 MW	3498 PSIG	988 DEGF	3800 PSIG	770 DEGF	-0.40 INWC	2.65 PCNT	2.54 IN HG	49.95 PCT	59 PCNT	89.07 PCNT


W1: (Net1 3316.edf)
File Help
Mark
Background
LOC
AIR OVERVIEW
CIRC WATER OVERVIEW
CONDENSATE OVERVIEW
DEAERATOR
FEEDWATER OVERVIEW
BOILER CIRC PUMP OVERVIEW
START-UP OVERVIEW
BLR STM AIR OVERVIEW
TCS UNIT OVERVIEW
MAIN GEN OVERVIEW
FUEL OIL SYSTEM OVERVIEW
FUEL OVERVIEW
CONTROL STATIONS
3316
MASTER FUEL TRIP
FUEL OVERVIEW
COAL FLAME SCANNERS
MILL 1-1
MILL 1-2
MILL 1-3
MILL 1-4
FEEDER SPEED
HOT AIR GATE
HOT AIR
COLD AIR
COLD AIR DAMPER
AIR IN
AIR OUT
PRI AIR
EXHAUST DISCHARGE GATE
FW/FUEL RATIO MODE
IS VALVE
MILL 1-1 OVERVIEW
MILL 1-1 CONTROL
MILL 1-2 OVERVIEW
MILL 1-2 CONTROL
MILL 1-3 OVERVIEW
MILL 1-3 CONTROL
MILL 1-4 OVERVIEW
MILL 1-4 CONTROL
STEAM INERT
WATER DELUGE
LOC MODE
GROSS MW
THROTTLE PRESS
SH TEMP
WW PRESS
WW TEMP
FURN PRESS
HOT ZONE VAC
DA LEVEL
HOTWELL LEVEL
FDWTR FLOW

ESS II: T1

236.81G

438.24
876.48
1195.60
1086.04

236.81

-22.00
-44.01
44.99
50.49

01:26:07 07/0

17:00 19:00 21:00 23:00 01:00
07/08/2009

Name	Source	Description	IESS
AGENMW	WOPF	SELECTED GENERATOR MW	AGEI
AGSTSP	WOPF	AUX STM TO GS TEMP SETPOINT	AGS
A262	WOPF	VHPT LMSV STM T TT002	A26
A478	WOPF	HIPT LEFT EXHAUST STM T TT007	A47

Mark

LOC | AIR OVERVIEW | CIRC WATER OVERVIEW | CONDENSATE OVERVIEW | DEAERATOR

SUPERHEAT / REHEAT CONTROL | TURBINE STEAM CONTROL

BOILER STEAM

RVV-41 RVV-42

997 °F 1000 °F 996 °F 998 °F 1000 °F 999 °F 1000 °F 998 °F 876 °F 867 °F

VHP TURBINE

IP TURBINE

HP TURBINE

ESS II

LOG

SS II: Management of point groups

ction

Source | Local groups | TG

WDPF | 0

ESS II: A543

10.86G

11.34
11.34

10.86

-1.06
-1.06

07:05:49 07/09/2009

4:00 05:00 06:00 07:00 08:00 09:00 10:00
07/09/2009

Server Label

Name	Source	Description	IESS	Unit	Value	Max	Min	Hair
A543	WOPF	N SEC SH EXCESS O2	A543	PRCNT	X	5.5	2.0	3.7
A544	WOPF	S SEC SH EXCESS O2	A544	PRCNT	X	10.	0.9	10.

My Computer Palm Desktop

ESS II LOG

ESS II: Events - List

Timestamp	Type	Kind	Priority	Name	Description	Value	Level
15:13:01 07/09/2003	ALRM	IMPORTED LOW	4	D3BOSHOUTABS	Superheater outlet heat abs.	***	0.000
15:12:13 07/09/2003	ALRM	IMPORTED LOW	2	D3MWCNT	Megawatt	***	0.000
15:09:43 07/09/2003	ALRM	IMPORTED LOW	6	D3BOPSHTABS	Primary superheater heat abs.	***	0.000
15:09:40 07/09/2003	ALRM	IMPORTED LOW	8	D3BOPLTNABS	Superheater platen heat abs.	***	0.000
15:07:16 07/09/2003	ALRM	IMPORTED HIGH	5	D3RHSWFLOW	Rhtr spray water flow	***	0.000
15:03:31 07/09/2003	ALRM	IMPORTED LOW	7	D3BOREHTABS	Reheater heat abs.	***	0.000
15:01:10 07/09/2003	ALRM	IMPORTED LOW	4	D3WIPST	steam temp.	***	0.000
15:00:40 07/09/2003	ALRM	IMPORTED LOW	7	D3W2STGSWFLO	2nd stage spray water flow	***	0.000
14:51:16 07/09/2003	ALRM	IMPORTED HIGH	2	ULS_O2_C1	Component 1	***	4.400
14:51:03 07/09/2003	ALRM	IMPORTED HIGH	7	D3BOOPACITY	Opacity	***	0.000
14:51:03 07/09/2003	ALRM	IMPORTED LOW	2	D3SAW24	time signal	***	0.000
14:21:21 07/09/2003	ALRM	IMPORTED LOW	2	D3AIRHTRABS	Airheater heat abs.	***	0.000
13:20:18 07/09/2003	ALRM	IMPORTED HIGH	1	A591	MAIN TURB OIL TNK REL HUMIDITY	***	90.0
11:05:11 07/09/2003	ALRM	IMPORTED HIGH	1	AIP219	SEALING STEAM HEADER PRESSURE	***	6.0
10:15:19 07/09/2003	ALRM	IMPORTED HIGH	1	AIP066	TURB GLAND SEAL STM PRESS	***	14.0
07:02:19 07/09/2003	ALRM	IMPORTED	4	DIEC05	BFP 1-1 GLAND SEAL TROUBLE	***	
20:14:35 07/08/2003	ALRM	IMPORTED	2	MBP0023D	BUNKER #1 CARBON MONOXIDE	***	
20:14:35 07/08/2003	ALRM	IMPORTED HIGH	1	AITREPP	MAIN TURB. ROTOR ECC. PK-PK	***	0.0
20:14:35 07/08/2003	ALRM	IMPORTED	4	DGTH11AU	EH SKID#1 MOTOR#1 AUTO PB TEXT	***	
20:14:35 07/08/2003	ALRM	IMPORTED	4	DGTH12AU	EH SKID#1 MOTOR#2 AUTO PB TEXT	***	
20:14:35 07/08/2003	ALRM	IMPORTED	4	DGTH21AU	EH SKID#2 MOTOR#1 AUTO PB TEXT	***	
20:14:35 07/08/2003	ALRM	IMPORTED	4	DGTH22AU	EH SKID#2 MOTOR#2 AUTO PB TEXT	***	
20:14:35 07/08/2003	ALRM	IMPORTED	4	XARBV8OP	RBV-8 FAIL TO OPEN	***	
20:14:34 07/08/2003	ALRM	IMPORTED	4	DICD06	HOT WTR EXP TANK HI-LO LEVEL	***	
20:14:34 07/08/2003	ALRM	IMPORTED	4	DIEC06	BFPT 1-1 OIL CLR OUTLET TEMP	***	

Mode
- List
- History
- Unackno

Groups
- 0
- 1

Sources
- CALC
- GPA
- SERVER
- Simulate
- SmartEng
- WDPF

Point types
- Analog
- Binary
- Packed
- Time
- Other

Priorities
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8

Shown: 25/25

Start

报表功能

ESS II: Report definer

File Edit Format Help

AGENMW

	A-1	B-2	C-3
1	POWER PLANT REPORT		
2	*Average production*		
3		*Done*	15:23:13 07/09/2003
4		*Period*	00:00:00 07/09/2003
5		*Interwal [s]*	3600
6		*Points*	AGENMW
7		*Unit*	MW
8		*Operator's name*	
9			*SELECTED GENERATOR MW*
10	*Start time*	*End time*	*Result*
11	00:00:00 07/09/2003	01:00:00 07/09/2003	240
12	01:00:00 07/09/2003	02:00:00 07/09/2003	237
13	02:00:00 07/09/2003	03:00:00 07/09/2003	237
14	03:00:00 07/09/2003	04:00:00 07/09/2003	238
15	04:00:00 07/09/2003	05:00:00 07/09/2003	237
16	05:00:00 07/09/2003	06:00:00 07/09/2003	237
17	06:00:00 07/09/2003	07:00:00 07/09/2003	246
18	07:00:00 07/09/2003	08:00:00 07/09/2003	313
19	08:00:00 07/09/2003	09:00:00 07/09/2003	335
20	09:00:00 07/09/2003	10:00:00 07/09/2003	327
21	10:00:00 07/09/2003	11:00:00 07/09/2003	337
22	11:00:00 07/09/2003	12:00:00 07/09/2003	341
23	12:00:00 07/09/2003	13:00:00 07/09/2003	336
24	13:00:00 07/09/2003	14:00:00 07/09/2003	339
25	14:00:00 07/09/2003	15:00:00 07/09/2003	340
26	15:00:00 07/09/2003	16:00:00 07/09/2003	340
27	16:00:00 07/09/2003	17:00:00 07/09/2003	#NODATA
28	17:00:00 07/09/2003	18:00:00 07/09/2003	#NODATA

r4.rdf

Start 3:25 PM

测点列表和帮助

ESS II: Points selection

Name	Source	Identifier	Description	Type	Archivization
T4IAB1	WDPF	T4IAB1	IGN AB1 IGN VALVE SUPERV TIMER	ANALOG	L
T4IAB2	WDPF	T4IAB2	IGN AB2 IGN VALVE SUPERV TIMER	ANALOG	L
T4IAB3	WDPF	T4IAB3	IGN AB3 IGN VALVE SUPERV TIMER	ANALOG	L
T4IAB4	WDPF	T4IAB4	IGN AB4 IGN VALVE SUPERV TIMER	ANALOG	L
T5BAB1	WDPF	T5BAB1	BNR AB1 BNR IN SERVICE TIMER	ANALOG	L
T5BAB2	WDPF	T5BAB2	BNR AB2 BNR IN SERVICE TIMER	ANALOG	L
T5BAB3	WDPF	T5BAB3	BNR AB3 BNR IN SERVICE TIMER	ANALOG	L
T5BAB4	WDPF	T5BAB4	BNR AB4 BNR IN SERVICE TIMER	ANALOG	L
T5IAB1	WDPF	T5IAB1	IGN AB1 IGN IN SERVICE TIMER	ANALOG	L
T5IAB2	WDPF	T5IAB2			
T5IAB3	WDPF	T5IAB3			
T5IAB4	WDPF	T5IAB4			
T6BAB1	WDPF	T6BAB1			
T6BAB2	WDPF	T6BAB2			
T6BAB3	WDPF	T6BAB3			
T6BAB4	WDPF	T6BAB4			
T6IAB1	WDPF	T6IAB1			
T6IAB2	WDPF	T6IAB2			
T6IAB3	WDPF	T6IAB3			
T6IAB4	WDPF	T6IAB4			
T7BAB1	WDPF	T7BAB1			
T7BAB2	WDPF	T7BAB2			
T7BAB3	WDPF	T7BAB3			
T7BAB4	WDPF	T7BAB4			
T8BAB1	WDPF	T8BAB1			
T8BAB2	WDPF	T8BAB2			
T8BAB3	WDPF	T8BAB3			

IESS

Groups

0

1

Help (Release: rel_2_5_3_2, qt 2.3.1)

Display of point list

Button |Point List| on the ESS II Control Panel allows displaying a window with a list of all process points defined in the system together with their parameters. The figure below shows such a window. To view full settings of a point, the user has to select it on the list.

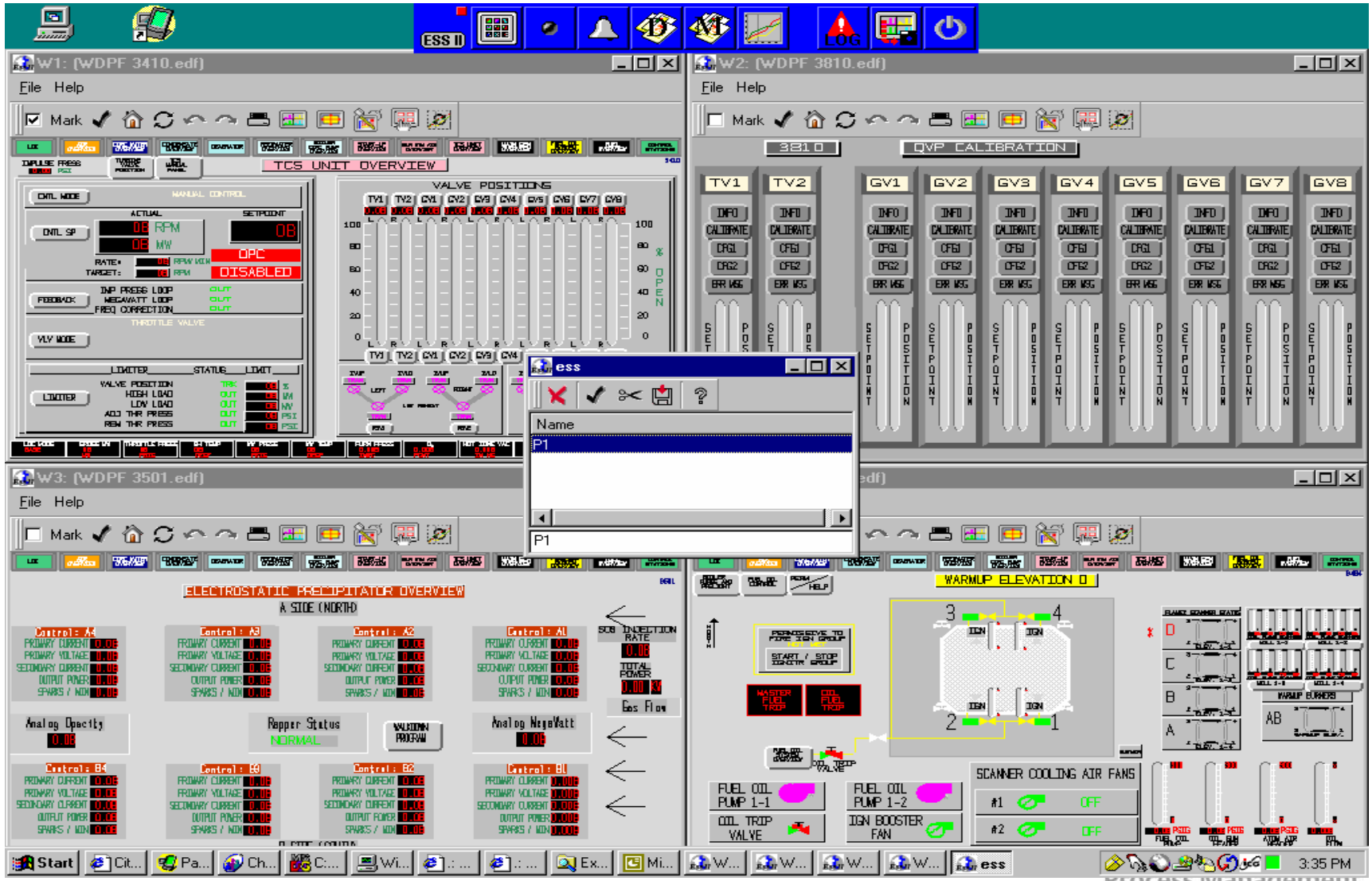
Area marked |Groups| in the upper right part of the above window allows to filter the displayed list of points with regard to security groups | each check-box allows to include points belonging to this group. Area |Sources| allows doing the same, but with regard to sources of data (field |ZD|).

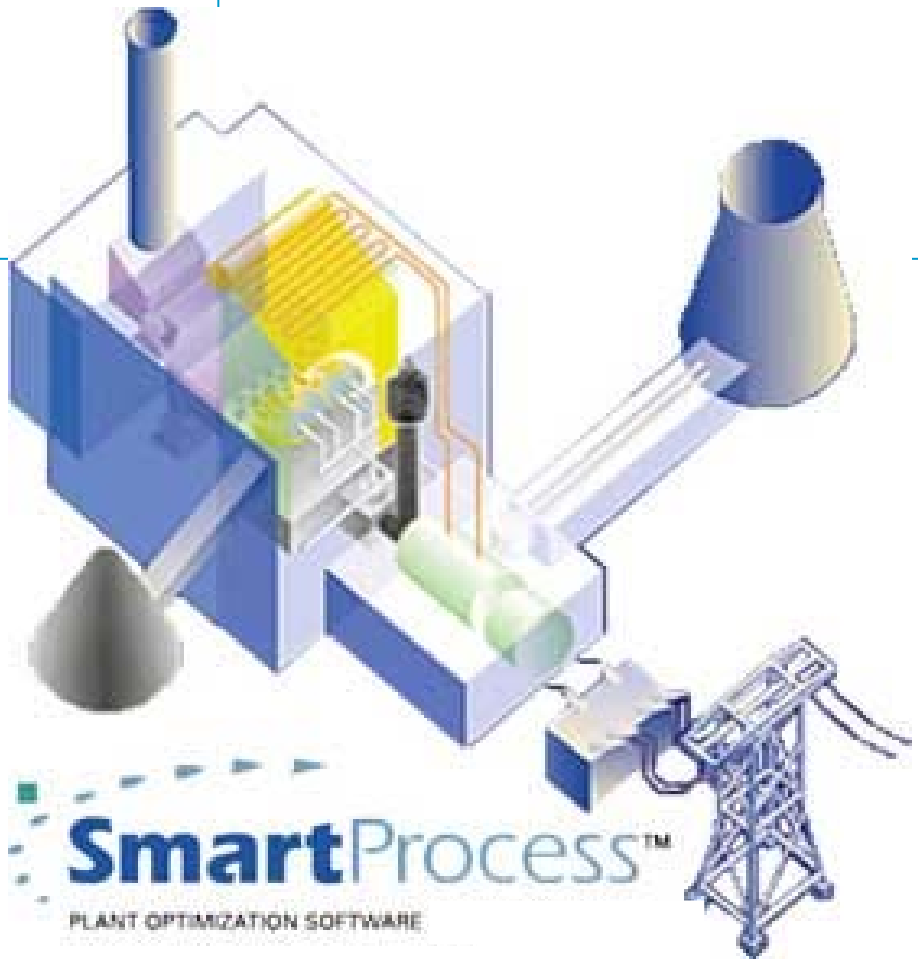
Trend Window can be opened by selecting the requested point and clicking trend button on the top.

The |drag&drop| feature allows to add a new point to an already opened Trend Window just by selecting a point on a point list and dragging it on to the Trend Window.

RSON
nagement

配置文件定义


W1: (WDPF 3410.edf)
File Help
Mark
TCS UNIT OVERVIEW
VALVE POSITIONS
W2: (WDPF 3810.edf)
File Help
Mark
3810
QVP CALIBRATION
TV1
TV2
GV1
GV2
GV3
GV4
GV5
GV6
GV7
GV8
ess
Name
P1
P1
W3: (WDPF 3501.edf)
File Help
Mark
ELECTROSTATIC PRECIPITATOR OVERVIEW
A SIDE (NORTH)
Analog Opacity
Rapper Status
NORMAL
Analog MegaWatt
WARMUP ELEVATION 0
FUEL OIL PUMP 1-1
FUEL OIL PUMP 1-2
COIL TRIP VALVE
IGN BOOSTER FAN
SCANNER COOLING AIR FANS
Start
3:35 PM



提问与回答

EMERSON™
Process Management