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The Value of the PI System

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Empowering Business in Real Time.

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- PI Server Version 3.4
- PI ProcessBook 3.2
- PI DataLink
- PI Module Database
- PI SMT
- PI Tag Configurator
- PI SDK Client
- PI OPC Interface

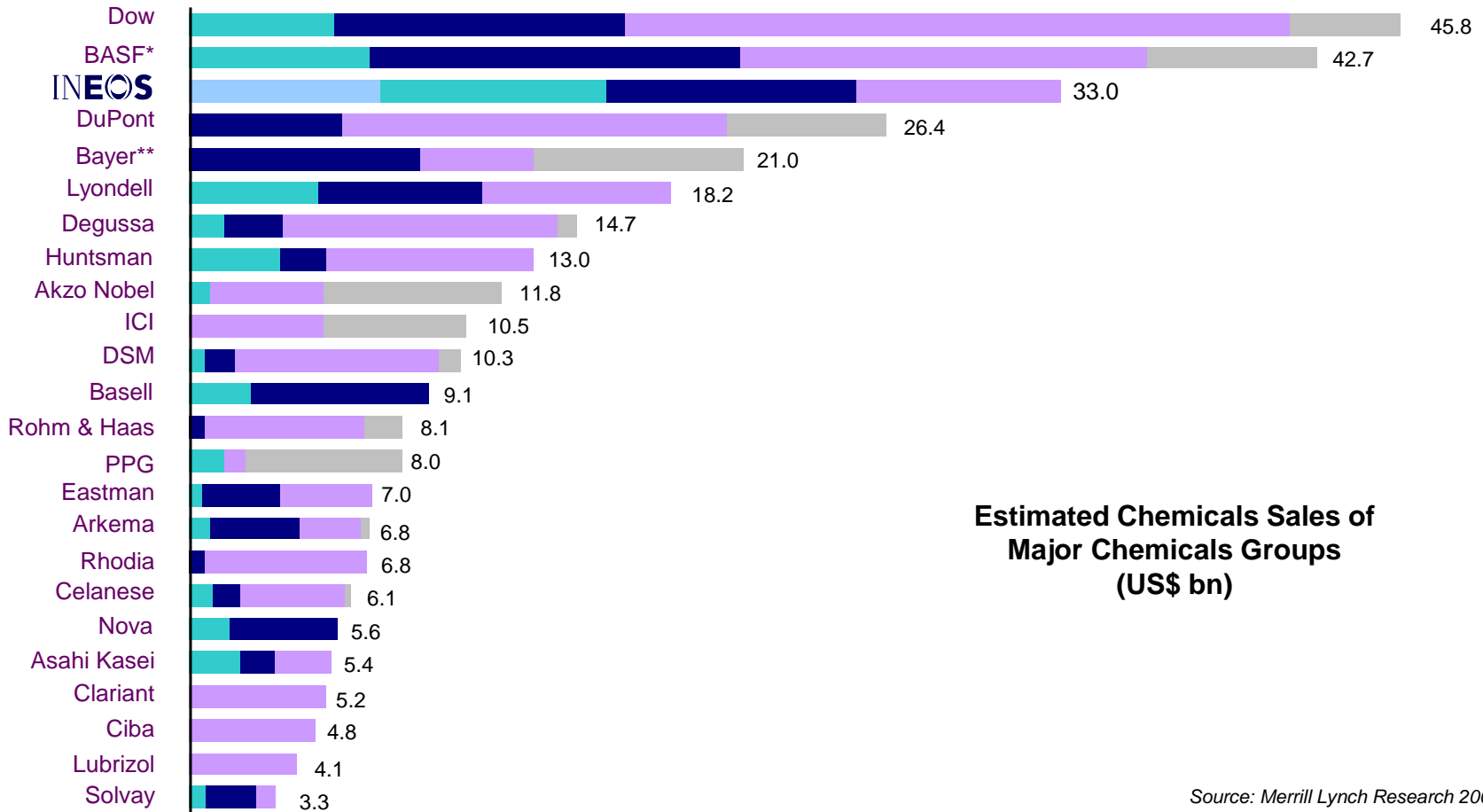
INEOS Phenol

The Leading Global Player
in the
Phenol/Acetone Industry

- About INEOS
 - Global Chemical Company
- About INEOS Phenol
- How the PI System is used in Mobile
- Groups

- Established:
 - May 1998
 - Purchased BP chemicals site in Antwerp, Belgium
 - Turnover \$200 million per year
 - 400 employees
- Now:
 - 3rd largest chemical company globally
 - 68 manufacturing sites worldwide
 - Europe 39
 - North America 20
 - South America 2
 - Asia + India 5
 - Africa 2
 - Turnover \$33 billion per year
 - 15,600 employees
 - 12,200 Europe
 - 2,630 Americas
 - 700 Asia & India
 - 70 Africa

INEOS - A global force in chemicals



Estimated Chemicals Sales of Major Chemicals Groups (US\$ bn)

Source: Merrill Lynch Research 2005

NOTES

Numbers include agrochemicals, paints, rubber, food ingredients, salt
 *Excludes BASF's oil and gas business
 **Excludes Bayer's pharmaceuticals business and Lanxess spin-off

Refining Base Chemicals Polymers Intermediates & Specialities Others

- About INEOS
- About INEOS Phenol
 - World Leader in Phenol production
- How the PI System is used in Mobile
- Groups

The worlds leading producer of Phenol and Acetone



**Gladbec
k**

**Antwer
p**

Mobile

Marl

Pt. Arthur

Capacities (kt/year)

Phenol	650	680	540	—	—
Aceton	405	310	335	—	—
€umene	—	—	—	250	500
Start up	1954	1993/97	2000		

Gladbeck



Antwerp



Mobile



Turnover:	€ 2.6 billion (2005)
Sites and Infrastructure:	3 phenol plants, global logistics network 2 cumene plants (from 2006)
Production Capacity:	Phenol: 1.6 million mt/yr Acetone: 1.0 million mt/yr Cumene: 0.75 million mt/yr
Personnel:	600



**Phenol
Aceton**

Polycarbonate

Nylon

Phenolic Resins

PMMA

Epoxy Resins

Acrylics

Antioxidants

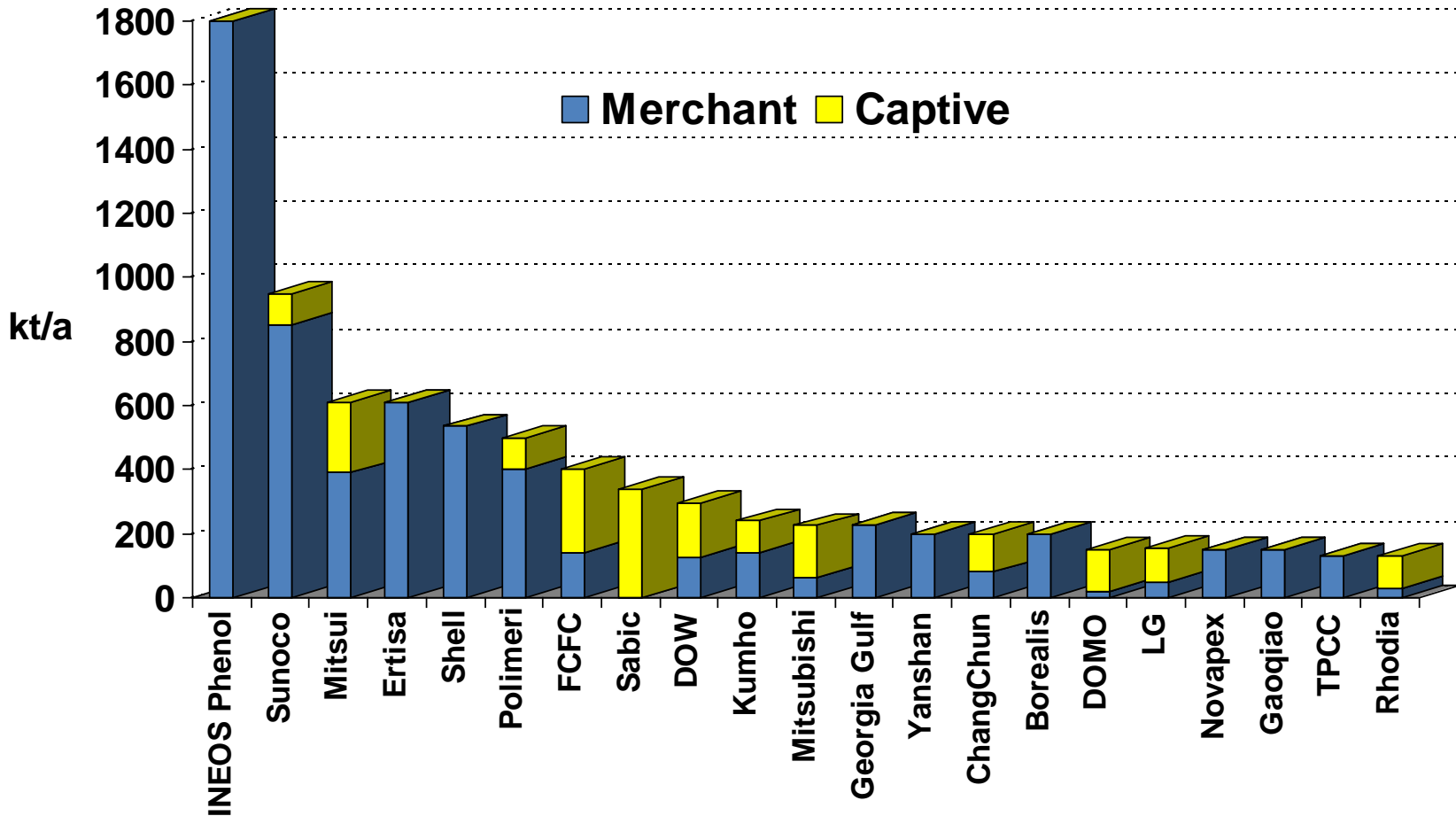
Solvents

ABS

Phenol Capacity of Major Producers

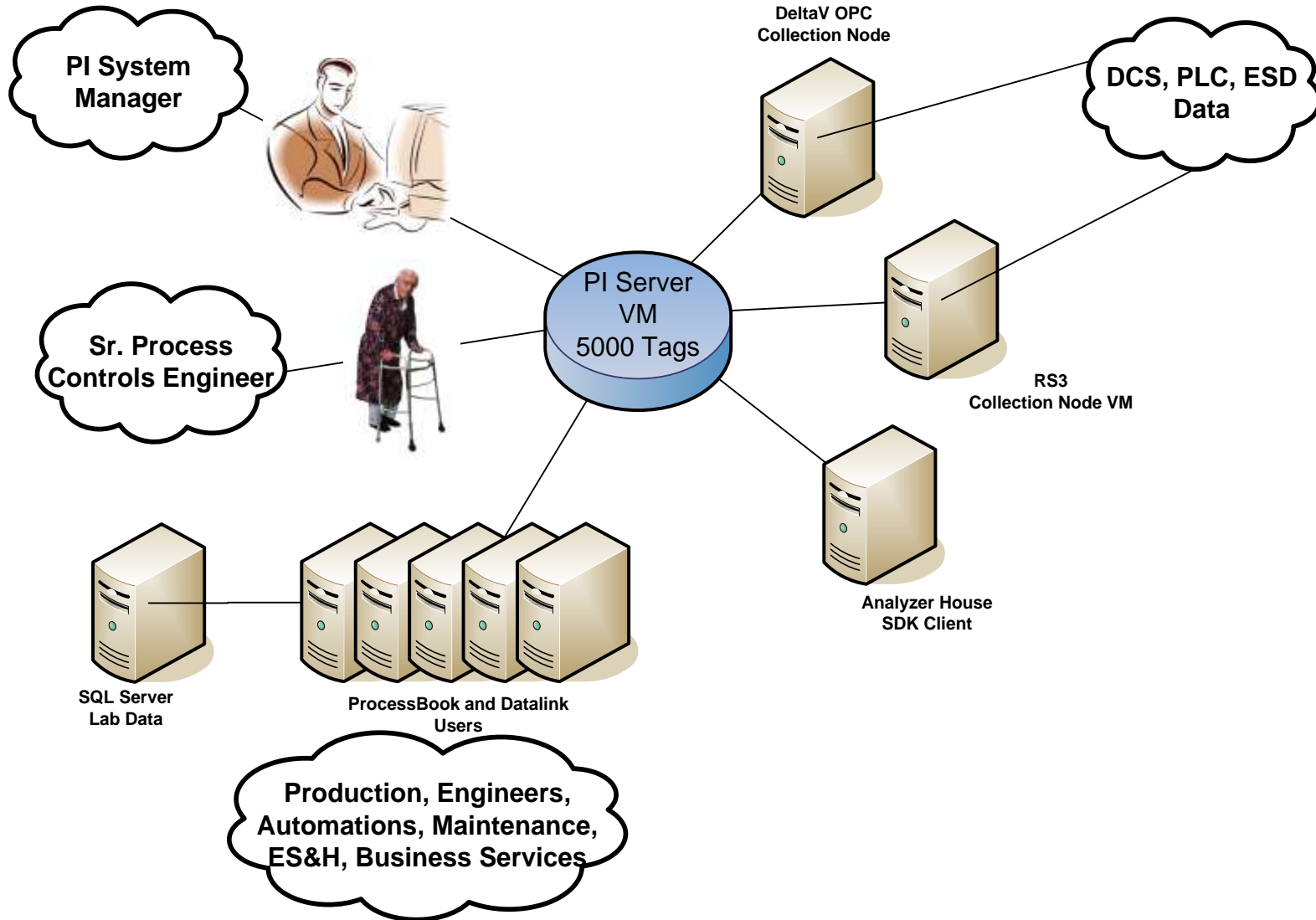


INEOS Phenol outranks the capacity of its closest competitor by a factor of two.



- About INEOS
- About INEOS Phenol
- How the PI System is used in Mobile
 - Architecture
 - Historical Trending
 - Real-time Trending
 - Graphical Displays
- Groups

- PI Server version 3.4
- Data Acquisition from Emerson RS3 via RNI API
- Data Acquisition from Emerson DeltaV via OPC
- 30 ProcessBook Clients
- PI Datalink as needed
- SDK Client for Gas Chromatographs
- PI ProcessBook ODBC Connection to SQL Server



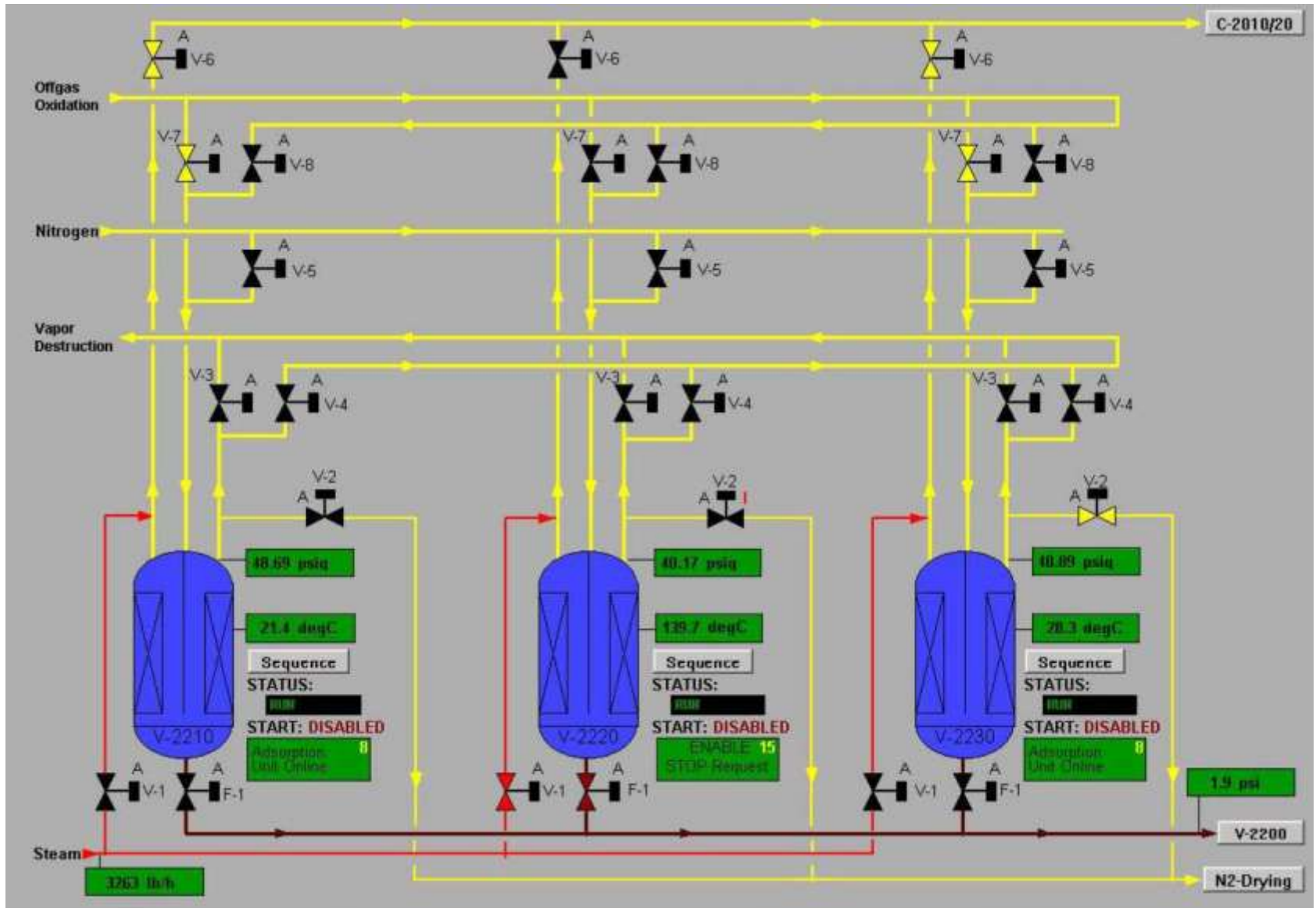
- Data accessible from April 2000 Start-up
- Asset benchmarks from initial installation
- Environmental Points Archived
- What History? Depends on who you ask.
 - Minutes
 - Hours
 - One Shift
 - Daily Reports
 - Monthly Reports
 - Last Run at 75% Rates
 - Last Fall
 - Event Based

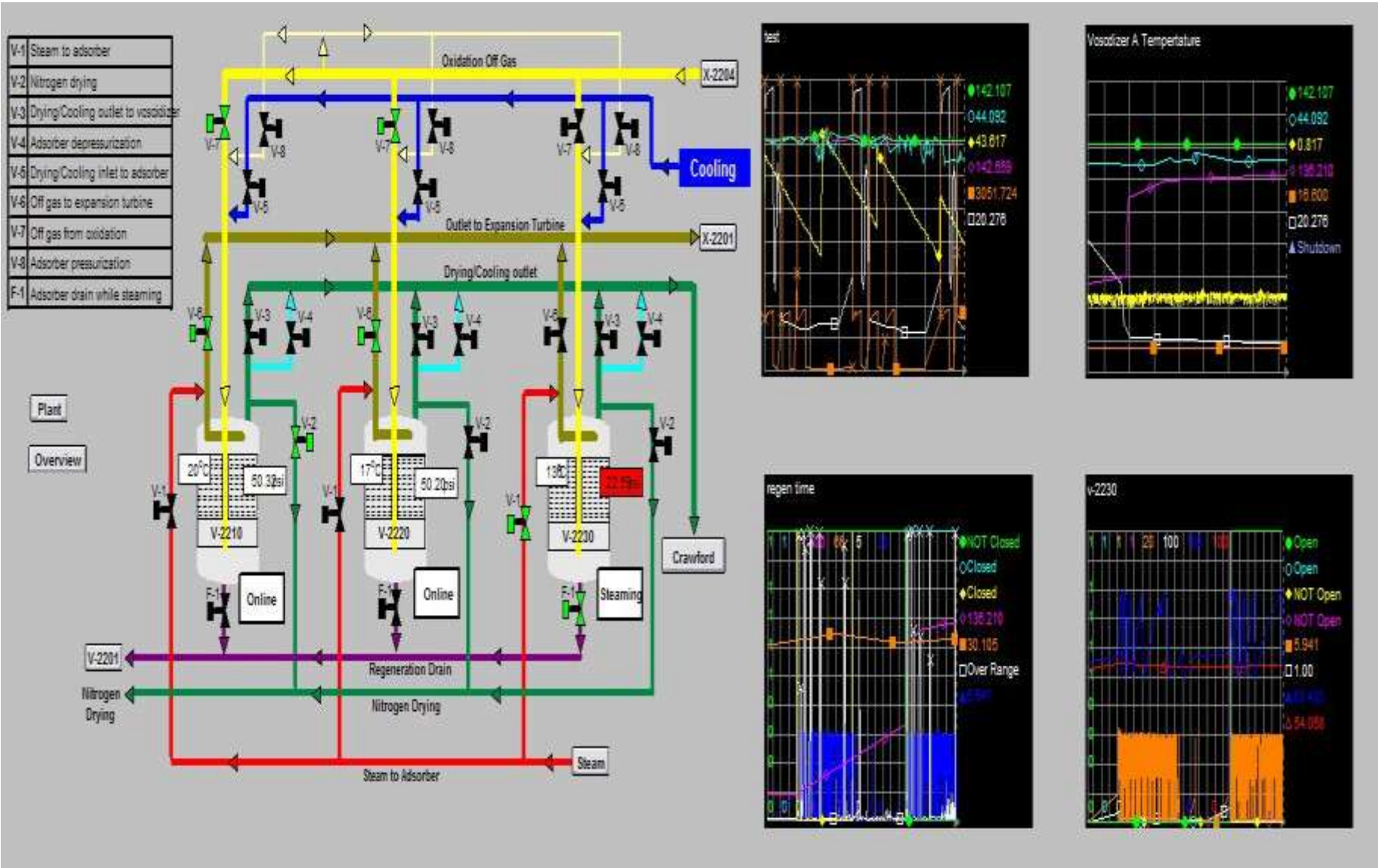
- We lack a Real Time Trend Package for the DCS.
- Operators go through fewer screens where information exists as a number inside of a box.
- Supervisors and Leads access from anywhere in the plant.
- Production engineering watches start-up without crowding the control room.
- Many users have discovered PI Calculations.

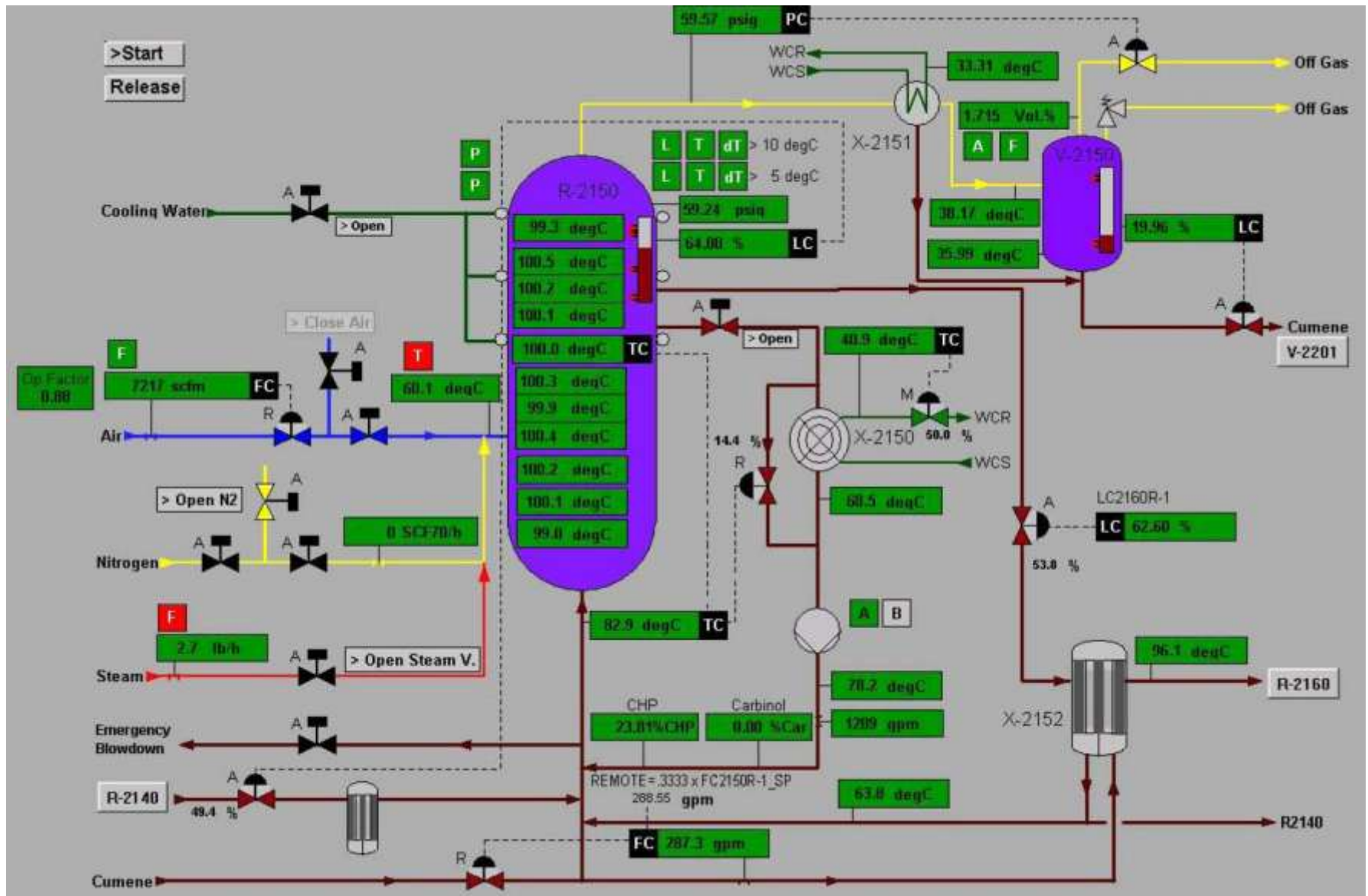
Control Room Layout

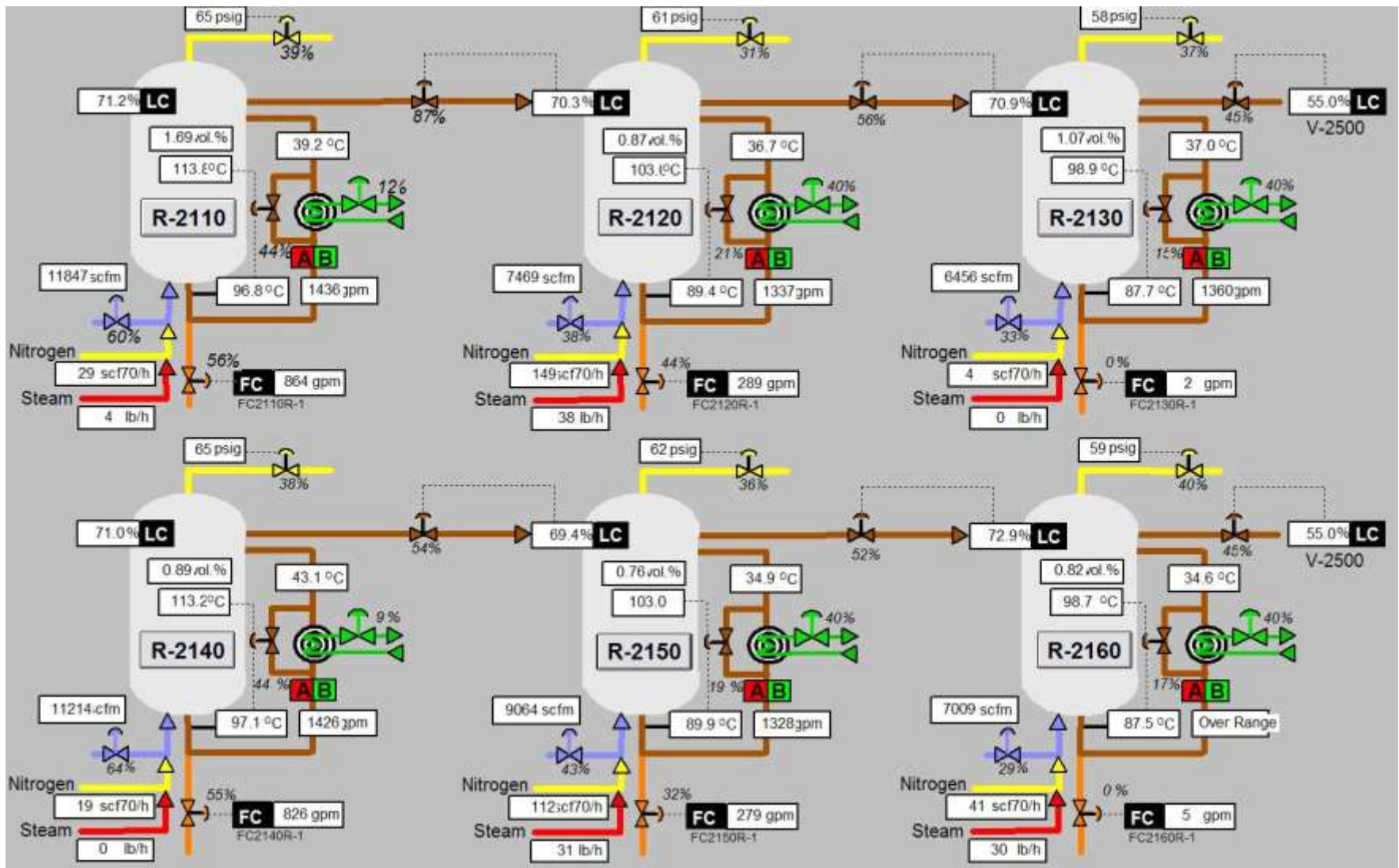


- Supervisors and Leads access from anywhere in the plant.
- Leads configure Multi-State Symbols.
 - Many based on PI Calculations.
- What do the Board Operators see?
- Production engineering, Leads, and Supervisors watch start-up without crowding the control room.
- Operations mixes Graphics with Trends. It is a powerful, quick tool for them.
 - We easily fit multiple DCS graphics on one ProcessBook Display.









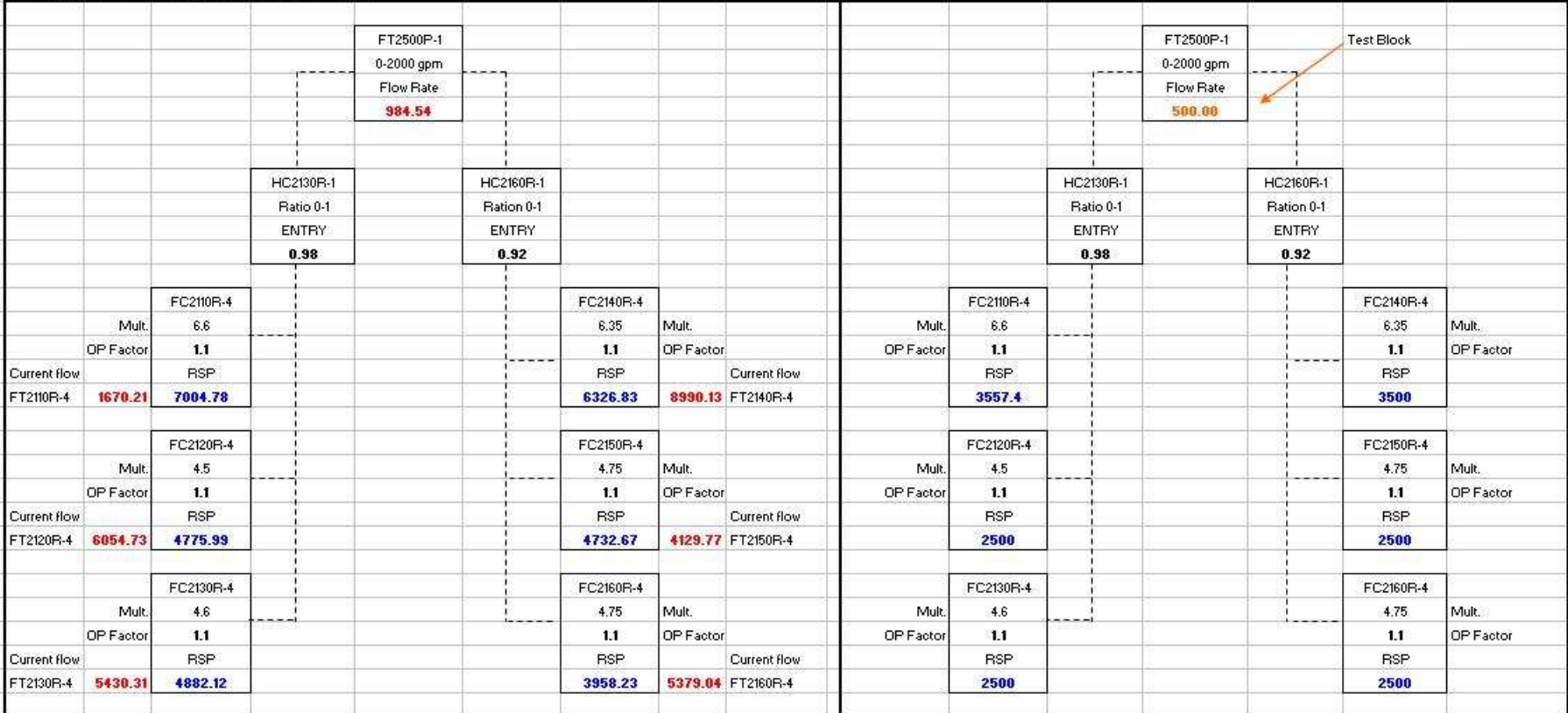
- About INEOS
- About INEOS Phenol
- How the PI System is used in Mobile
- Groups
 - Production
 - Maintenance
 - Engineering
 - Environmental & Business Services

- **PI ProcessBook**
 - Assess the plant Historically and in Real-time via trends and graphical displays.
 - Preventative action can be taken based on the correct information being displayed correctly.
 - Optimization only helps everyone.
- **PI Datalink**
 - Reporting is made easy.
 - Calculations drive decisions.
- **Sharing of Information**
 - PI ProcessBook displays and PI Datalink workbooks are shared.
- **Reliability and Up-Time is a must!**
 - We don't perform work on the PI System if we plan to change rates.

DataLink Calculations



Changing bold numbers will affect the RSP at the final control element. Calculated RSP is in BLUE. Actual flow rate from Meters are in RED. Enter a flow in the Test Block (ORANGE) to check min. flow.
 Press F9 to refresh all flow rates including the Test Block entry.



The remote Setpoint equals the flow from FT2500P-1 Multiplied by the ratio of HC210R-1, Multiplied by the Multiple (set by Carl) and then multiplied by the OP Factor.

$$RSP = ((FT2500P-1 \times Ratio) \times Multiple) \times OP\ Factor$$

FC2110R-4 and FC2140R-4 cannot have an RSP below 3500scfm

The remaining reactor controllers cannot have an RSP below 2500scfm

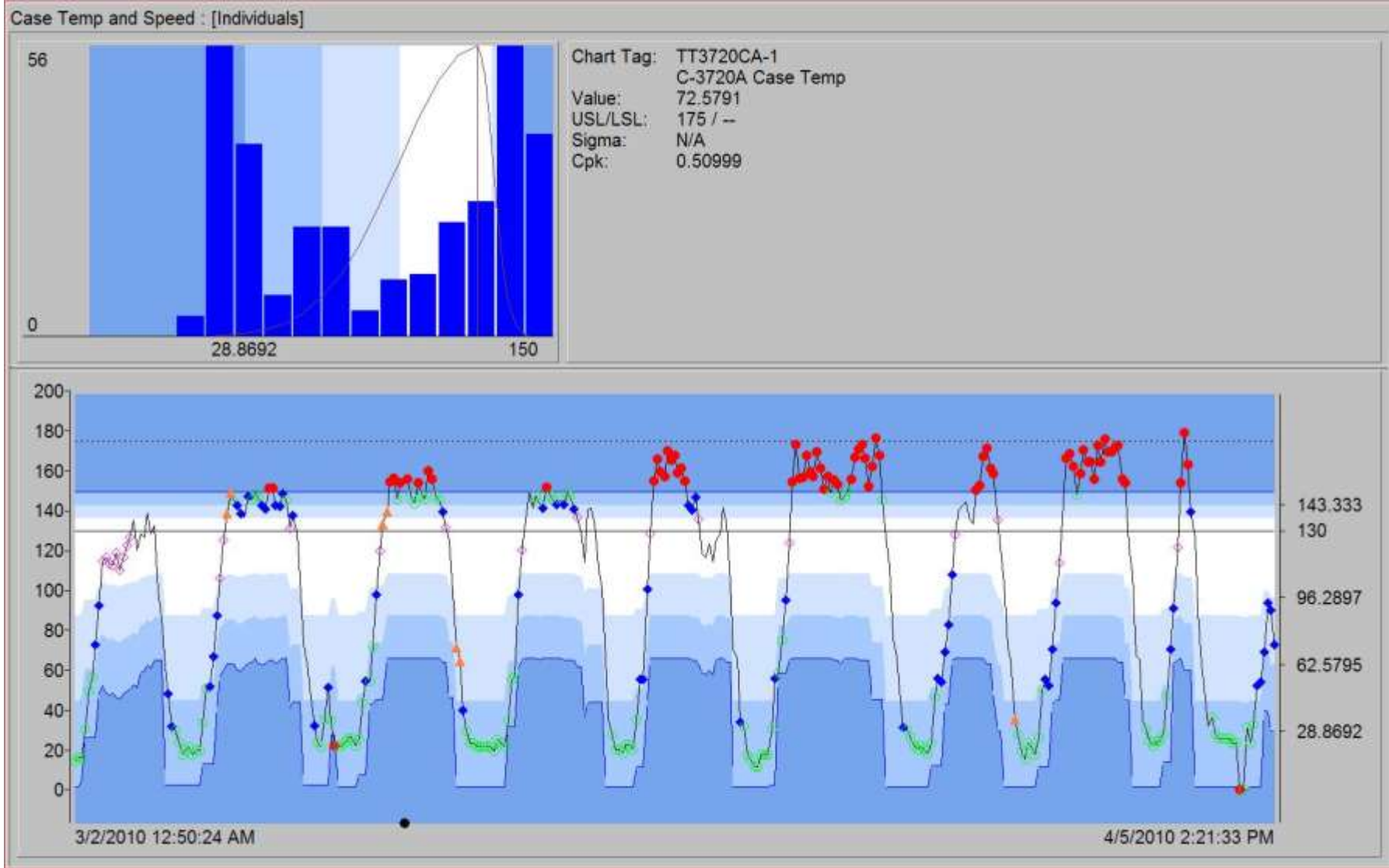
- Predictive Maintenance first and foremost!
 - Some PMs start with the PI System.
 - Daily check-ups are easily made.
 - Check PI against the work order schedule.
- Troubleshooting stand alone equipment, complex machines, or process problems.
 - Who's problem is it?
 - Sometimes knowing what the problem isn't, is the only way to find out what the problem is.
- Asset Performance.
 - Compared to what?
 - PI ProcessBook help files:
 - Find the sweet spot and mark it for later.
 - Find the upset and mark it for later.

DataLink Calculations

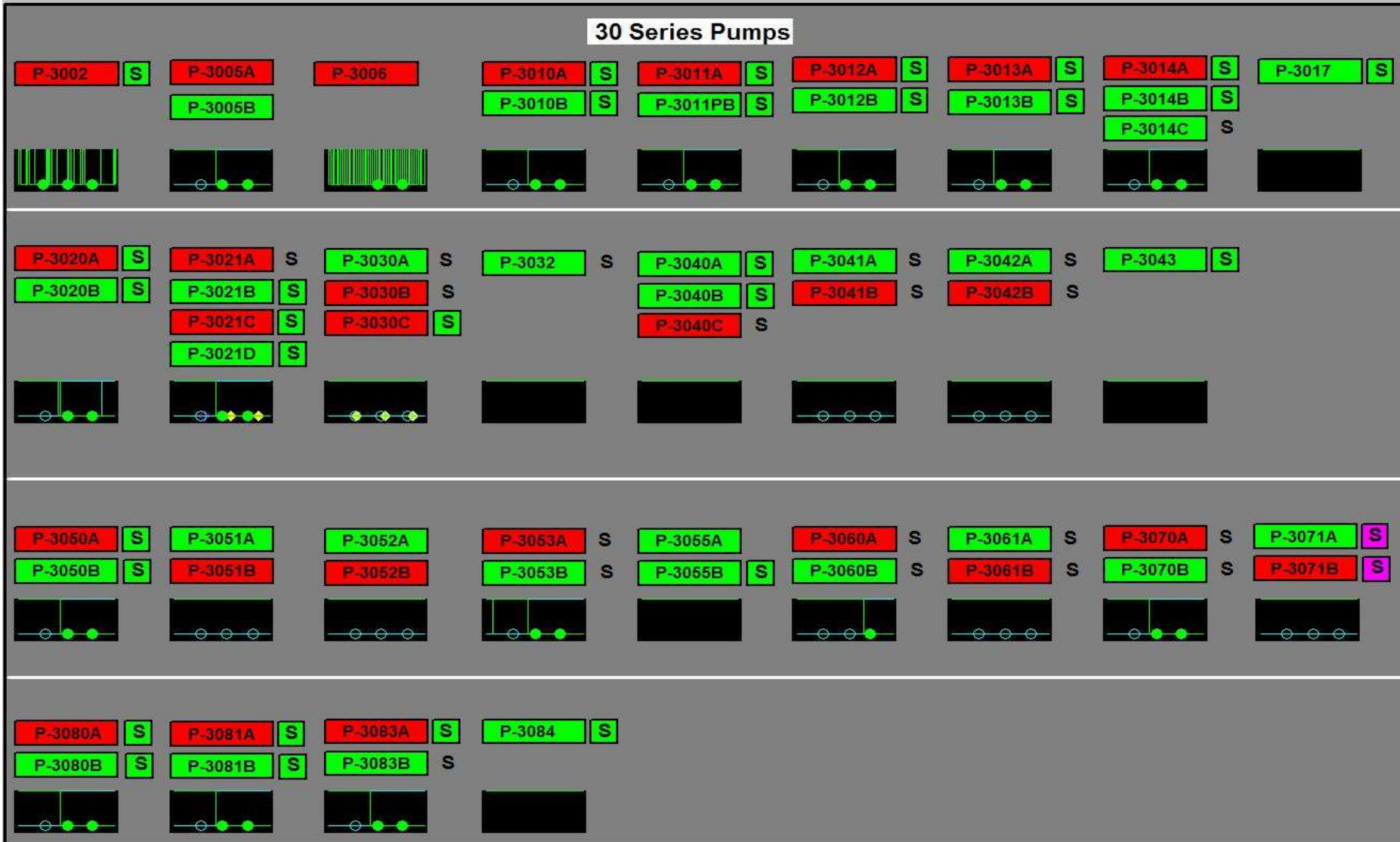


Pump operating time (Time Filtered)						
Days Ago to Start From	0					
Duration of Report in Days	30					
Tag Name	SBAH7210P-1					
Start time	18/Oct/10 00:00:00					
End time	01/Sep/10 00:00:00					
Time interval	1d					
Operation Expression	'SBAH7210P-1'="RUNNING"					
Date	Operating Time per Day	RUN TIME PER INSATNCE				
			Compressed		Archived	Time Filtered
17-Oct-10 00:00:00	0					
16-Oct-10 00:00:00	4.5	Number of Values:	44			
15-Oct-10 00:00:00	4.5	16-Oct-10 16:47:23	Running	16-Oct-10 16:51:53	stopped	4.5
14-Oct-10 00:00:00	3.983333333	15-Oct-10 01:57:04	Running	15-Oct-10 02:01:34	stopped	4.5
13-Oct-10 00:00:00	0	14-Oct-10 06:06:40	Running	14-Oct-10 06:10:39	stopped	3.983333333
12-Oct-10 00:00:00	0	11-Oct-10 14:32:35	Running	11-Oct-10 14:36:33	stopped	3.966666667
11-Oct-10 00:00:00	3.966666667	10-Oct-10 08:24:32	Running	10-Oct-10 08:29:02	stopped	4.5
10-Oct-10 00:00:00	4.5	09-Oct-10 16:50:01	Running	09-Oct-10 16:54:00	stopped	3.983333333
09-Oct-10 00:00:00	3.983333333	08-Oct-10 22:46:04	Running	08-Oct-10 22:50:03	stopped	3.983333333
08-Oct-10 00:00:00	12	08-Oct-10 14:17:18	Running	08-Oct-10 14:21:19	stopped	4.016666667
07-Oct-10 00:00:00	4.016666667	08-Oct-10 12:45:50	Running	08-Oct-10 12:49:50	stopped	3.999999746
06-Oct-10 00:00:00	0	07-Oct-10 09:47:37	Running	07-Oct-10 09:51:38	stopped	4.016666667
05-Oct-10 00:00:00	3.983333333	05-Oct-10 22:31:38	Running	05-Oct-10 22:35:37	stopped	3.983333333
04-Oct-10 00:00:00	4	04-Oct-10 11:19:10	Running	04-Oct-10 11:23:10	stopped	4
03-Oct-10 00:00:00	0	02-Oct-10 17:42:53	Running	02-Oct-10 17:46:52	stopped	3.983333333
02-Oct-10 00:00:00	3.983333333	01-Oct-10 07:05:52	Running	01-Oct-10 07:09:22	stopped	3.5
01-Oct-10 00:00:00	3.5	30-Sep-10 08:12:31	Running	30-Sep-10 08:16:32	stopped	4.016666667
30-Sep-10 00:00:00	4.016666667	29-Sep-10 02:44:00	Running	29-Sep-10 02:47:59	stopped	3.983333333
29-Sep-10 00:00:00	3.983333333	27-Sep-10 12:10:08	Running	27-Sep-10 12:14:06	stopped	3.966666667
28-Sep-10 00:00:00	0	26-Sep-10 17:51:37	Running	26-Sep-10 17:55:38	stopped	4.016666667
27-Sep-10 00:00:00	3.966666667	26-Sep-10 01:38:09	Running	26-Sep-10 01:42:09	stopped	4
26-Sep-10 00:00:00	8.016666667	25-Sep-10 02:36:46	Running	25-Sep-10 02:40:17	stopped	3.516666667
25-Sep-10 00:00:00	3.516666667	24-Sep-10 03:55:57	Running	24-Sep-10 03:59:28	stopped	3.516666667
24-Sep-10 00:00:00	3.516666667	23-Sep-10 05:34:07	Running	23-Sep-10 05:38:06	stopped	3.983333333
23-Sep-10 00:00:00	3.983333333	22-Sep-10 06:21:20	Running	22-Sep-10 06:24:50	stopped	3.5
22-Sep-10 00:00:00	3.5	21-Sep-10 13:11:47	Running	21-Sep-10 13:15:47	stopped	4
21-Sep-10 00:00:00	4	20-Sep-10 15:17:54	Running	20-Sep-10 15:21:54	stopped	4
20-Sep-10 00:00:00	4	19-Sep-10 17:55:31	Running	19-Sep-10 17:59:31	stopped	4

SQC Chart Used for PM



Mix of Multi-State and Trends



- Process Engineering
 - ROI for projects
 - R&D for proposals
 - Analyze safety related data
 - Process Optimization
 - Process Modeling
 - Check utility billing
 - Troubleshooting

- ES&H
 - Environmental reporting for the State
- Business Services
 - Inventory updates
 - Billing information

- OSIsoft® says, “get the right information to the right people, at the right time”.
 - Identify who the “right people” are.
 - Identify the right information for “*them*”.
- OSIsoft® offers collaborative tools that make mission-critical information visible across the enterprise / value chain, now, and over time.
 - Who knows what the system will do?
 - How does one or two guys with no budget train and educate everyone?
 - Train people or do it for them! He who knows it all must do it all.

- Train yourself
 - Download materials from OSI Tech Support
- Hold training classes and demos
 - Works pretty good for even the seasoned user.
- Create PI Datalink workbooks
 - No matter how I try, not everyone will understand excel.
- Create PI ProcessBook displays
 - Have a repository for graphics and trends to share
- Use screen capture software
 - We use [Camtasia Studio](#)

- What do we need the PI System to do for us?
 - ☑– Readily accessible
 - ☑– User friendly
 - ☑– Reliable
 - ☑– Available
 - ☑– Robust
- The PI System is a foundational necessity of our daily work. The system is in use 24/7.



Thank you

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777 Davis St., Suite 250 San Leandro, CA 94577

- INEOS Phenol is the world's largest producer of Phenol and Acetone. INEOS Phenol's manufacturing capacity worldwide is two times that of its closest competitor and three times that of the next largest European producer.
- INEOS Phenol is the only Phenol and Acetone manufacturer with production facilities both in Europe and America . These production facilities are supported by a global sales and distribution network. This network of facilities enables INEOS Phenol to provide its customers with a secure and competitively priced supply of Phenol and Acetone on a worldwide basis, leveraging the economics of scale of our world-scale plants.
- The key applications for Phenol and Acetone are in the production of polycarbonate, plastics, phenolic resins, synthetic fibres (such as nylon) and solvents. These products are used in a diverse range of endmarkets, including the automotive, construction, electronics and fibre industries.