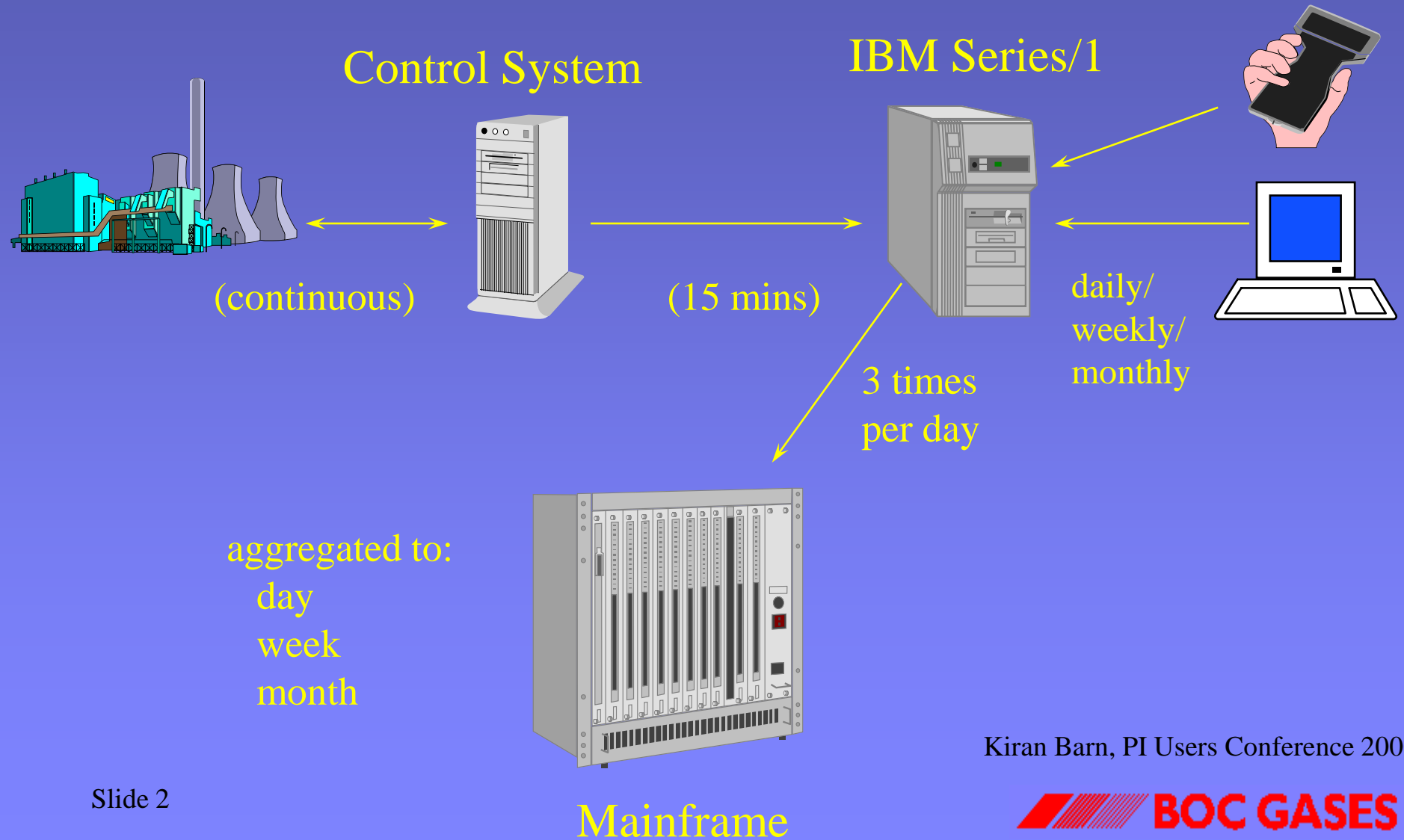




# Plant Information Just One Click Away

Kiran Barn, Principal Engineer.

# WE HAD PRODUCER



# SHORTCOMINGS OF PRODUCER

- Series/1 are 10 years old and difficult to support
- Software & hardware expertise severely limited
- Available history too short
- Data presentation poor and could not be exported
- Prone to errors in data
- Editing calculations and reports was time consuming

# DATABASES

- Large volumes of data to be handled
- Averaging results in most of cause-and-effect information being missed or dramatically altered.
- Data compression techniques required which are proprietary databases e.g. PI archive.

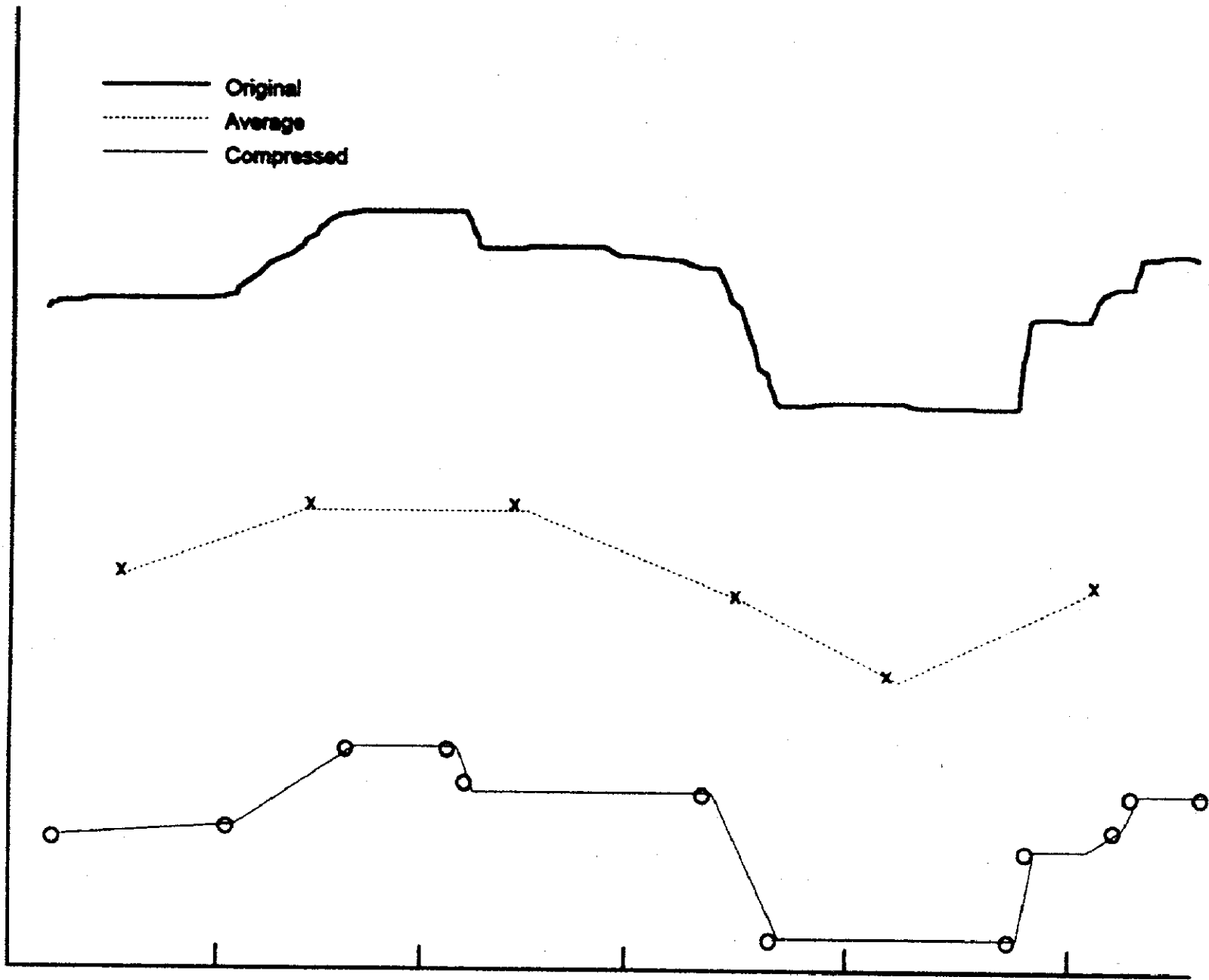


Figure 2.10 Comparison of averaging versus compression.

# OSI SOFTWARE / PI

- Leading global Process Historian software
- Marketed in the UK by Beaver Valley Systems
- Interfaces to Maxivis and In-Touch
- Many reference sites in UK and USA
- Comprises Process Book & excel add-in
- Modular system - pay only for what you need

# OPPORTUNITIES WITH PIM

- Graphical data presentation
- Compare different time periods / plants
- History kept for plant lifetime
- Minimise errors in raw and derived data
- Real-time plant performance feedback
- Spot problems quicker
- Models for Product Supply optimisation

# PIM Architecture Overview

S  
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A  
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A

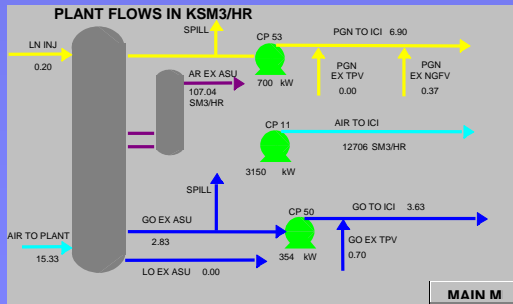
A  
  
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INTERFACES



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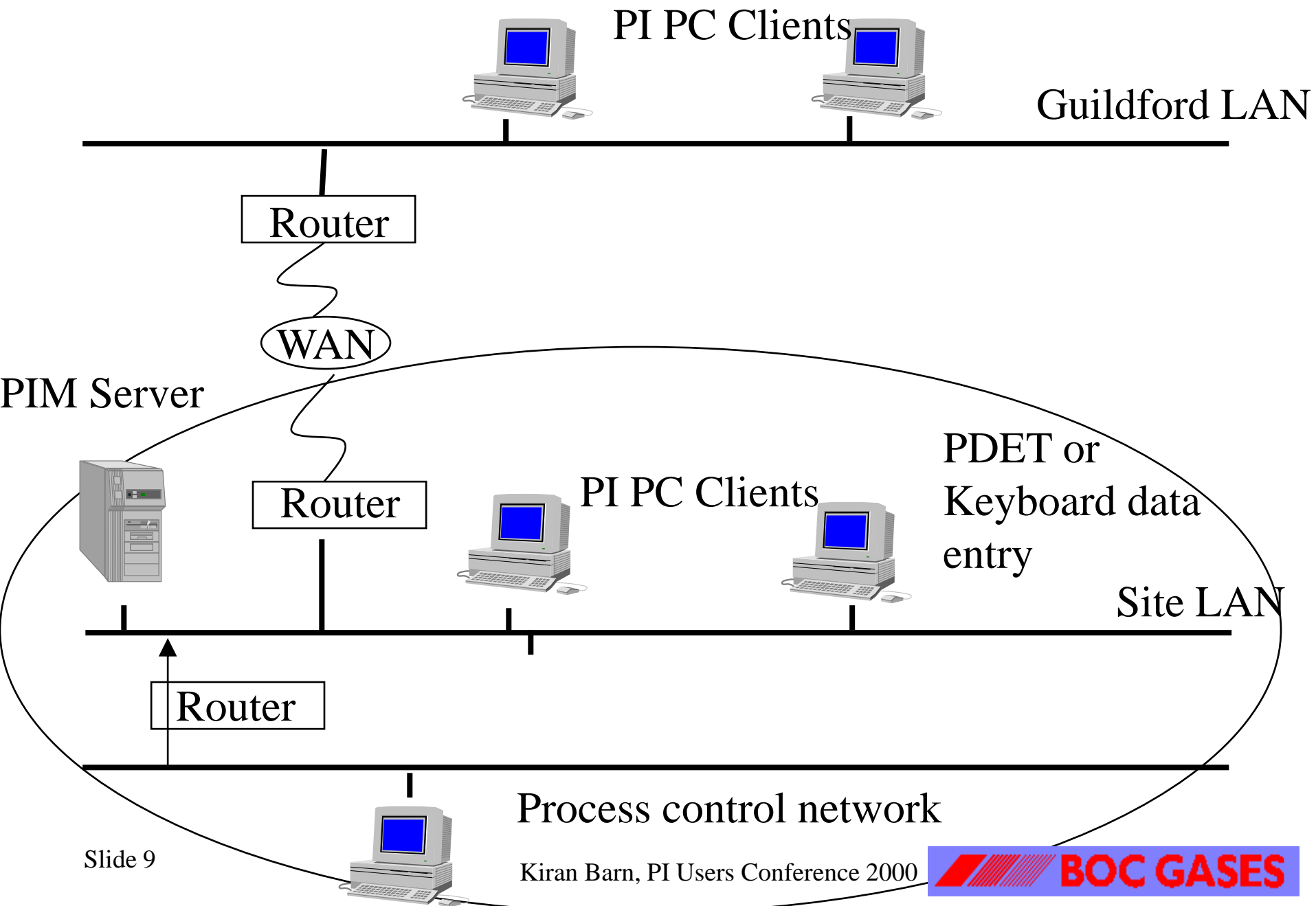


1 2 3 BOC GASES RUN CORN						
Daily Production Report for: 16-JUL-07						
Description	Tag Name	Start of Day	End of Day	Total For Day	Average	Units
<b>TOTALS</b>						
PN TO PIPELINE	CPHSTOTAL	3871	4073	332.39	8.43	kSm3/hr
PN EX TPV	FBI4-10TOTAL	13037	13037	0.00	0.00	kSm3/hr
PN EX INGV	FBI4-10	87103	87108	124.69	1.42	kSm3/hr
GO TO PIPELINE	FBI4-4	N/A	N/A	N/A	N/A	kSm3/hr
GO TO PIPELINE	CPHSTOTAL	34496	34519	22.93	0.54	kSm3/hr
GO EX TPV	FBI4-10TOTAL	5223	5226	3.26	0.14	kSm3/hr
LIQD OXYGEN	LIQDTOTAL	2454	2454	0.00	0.00	kSm3/hr
LN INJECTION	FBI4-3	890	896	6.21	0.22	kSm3/hr
AIR TO PIPELINE	AIRTOTAL	79164	79436	272.02	11.33	kSm3/hr
CRUDE ARGON	CLARTOTAL	1321	1524	2.11	0.09	kSm3/hr
CP11 POWER	CP11POWER	28412	28480	67.46	2.81	MW
CRP2 POWER	CRP2POWER	4391	4391	2.46	0.10	MW
CRP3 POWER	CRP3POWER	11970	11987	16.87	0.70	MW
<b>KEY PARAMETERS</b>						
PN TO PIPELINE	FBI4-10	7.46	8.45	7.88	kSm3/hr	
PN EX TPV	FBI4-10	0.00	0.00	0.00	kSm3/hr	
PN EX INGV	FBI4-10	0.17	0.27	0.24	kSm3/hr	
GO EX ASU	FBI4-4	2.78	2.89	2.82	kSm3/hr	
GO TO PIPELINE	FBI4-70	2.09	4.26	2.62	kSm3/hr	
GO EX TPV	FBI4-10	0.09	1.31	0.28	kSm3/hr	
LIQD OXYGEN	FBI4-1	0.00	0.02	0.01	kSm3/hr	
LN INJECTION	FBI4-3	0.19	0.22	0.21	kSm3/hr	
AIR TO PIPELINE	FBI4-2	3648	14418	12061	Sm3/hr	
CRUDE ARGON	FBI4-24	93.89	108.69	105.34	Sm3/hr	
CP11 POWER	A1142	2057	3169	3141	MW	
CRP2 POWER	J90-42	322	305	336	MW	
CRP3 POWER	J90-42	733	821	775	MW	
WASTE NO FLOW	FBI4-18	3.07	3.13	3.10	kSm3/hr	
ARGON COLUMN FEED	FBI4-1	2.92	3.38	3.15	kSm3/hr	
TEMPERATURE EX CP50	T50-06	21.31	24.00	22.94	°C	
TEMPERATURE EX CP53	T50-27	20.16	22.97	21.53	°C	
TEMPERATURE EX CP11	T11-54	20.04	22.86	21.38	°C	
CO PURITY	T50-02	17.87	20.89	19.38	% CO	
GO PURITY	A00-10	39.75	39.82	39.79	% CO	
PN PURITY	A00-30	0.81	4.24	2.31	ppm O2	
PN AND PURITY	A00-30	40.00	40.00	40.00	% Argon	
CRUDE ARGON PURITY	A20-4	1.82	2.01	1.89	% O2	
TRAY 40 PURITY	A20-40	6.00	6.00	6.76	ppm O2	
WIN PURITY	A00-18	400	1388	803	ppm O2	
<b>KEY PERFORMANCE INDICATORS</b>						
ARGON SPECIFIC POWER	CALCSP	Min:	Max:	Average:	W/KWH	
ARGON OXYGEN RATIO	CALCAR	3.09	3.86	3.69	%	
ARGON RECOVERY	CALCAR	86.34	89.64	87.43	%	
CRP2 EFFICIENCY	CALCPOE	30.76	44.02	36.80	%	
CRP3 EFFICIENCY	CALCPOE	35.39	60.03	56.37	%	
<b>STORAGE TANKS</b>						
LN STORAGE T61A	LBI4-02	Start of Day:	End of Day:	Change:	%	
LN STORAGE T61B	LBI4-02	77.2	73.9	-3.4	%	
		86.0	88.1	2.1	%	





# BOC Europe: PI System Architecture



# IMPLEMENTATION HISTORY

- JUN 1998 PI SOFTWARE ARRIVES
- JUL 1998 1ST PIM SERVER TO MIDDLESBROUGH SITE
- AUG 1998 MIDDLESBROUGH PIM LIVE, PRODUCER OFF
- SEP 1998 THAME PIM LIVE, PRODUCER OFF
- OCT 1998 SCUNTHORPE PIM LIVE, PRODUCER OFF
- NOV 1998 PIM SERVER INSTALLED AT ST HELENS FOR DATA COLLECTION FROM REMOTE SITE AT RUNCORN

# IMPLEMENTATION HISTORY

- DEC 1998 PIM SERVER INSTALLED AT FAWLEY
- JAN 1999 FAWLEY PIM LIVE, PRODUCER OFF
- FEB 1999 MOTHERWELL PIM LIVE, PRODUCER OFF
- MAR 1999 PI USERS CONFERENCE MONTEREY .  
PIM SERVER INSTALLED AT MARGAM FOR 1130  
TPD PLANT.
- APR 1999 MY HOLIDAY TO LANZOROTE,  
PIM TAG CONFIGURATION TRAINING TO  
NOMINATED EXPERTS FROM EACH SITE.
- MAY 1999 DAILY REPORT SCHEDULING SET UP ON  
PROPANE.

# IMPLEMENTATION HISTORY

- JUN 1999 MARGAM PIM LIVE, PRODUCER OFF
- JUL 1999 PIM SERVER INSTALLED IN DUBLIN
- AUG 1999 SATELLITE PLANTS SETUP ON MARGAM PIM
- SEP 1999 SYMBOL 3805 LASER DATA TERMINALS DEPLOYED FOR MANUAL LOGGING.
- OCT 1999 LEGACY DATA BACK FED TO PIM SERVERS.
- NOV 1999 ACTIVE X AND PI-API TRAINING CLASSES ATTENDED IN SAN LEANDRO.

# DIMENSIONS

- 9 PI Servers Set Up and Installed at Sites.
- 29 Individual Interfaces
- 20,000 Tags created
- 120 Technicians trained in Manual logger data input and made PIM Aware.
- Client Training for 40 engineers.
- Training in Pi Database, Tag Configuration and Manual log setup for 14 Expert Users.
- 2897 manhours, Kiran Barn.
- 2267 manhours, Other Team members.

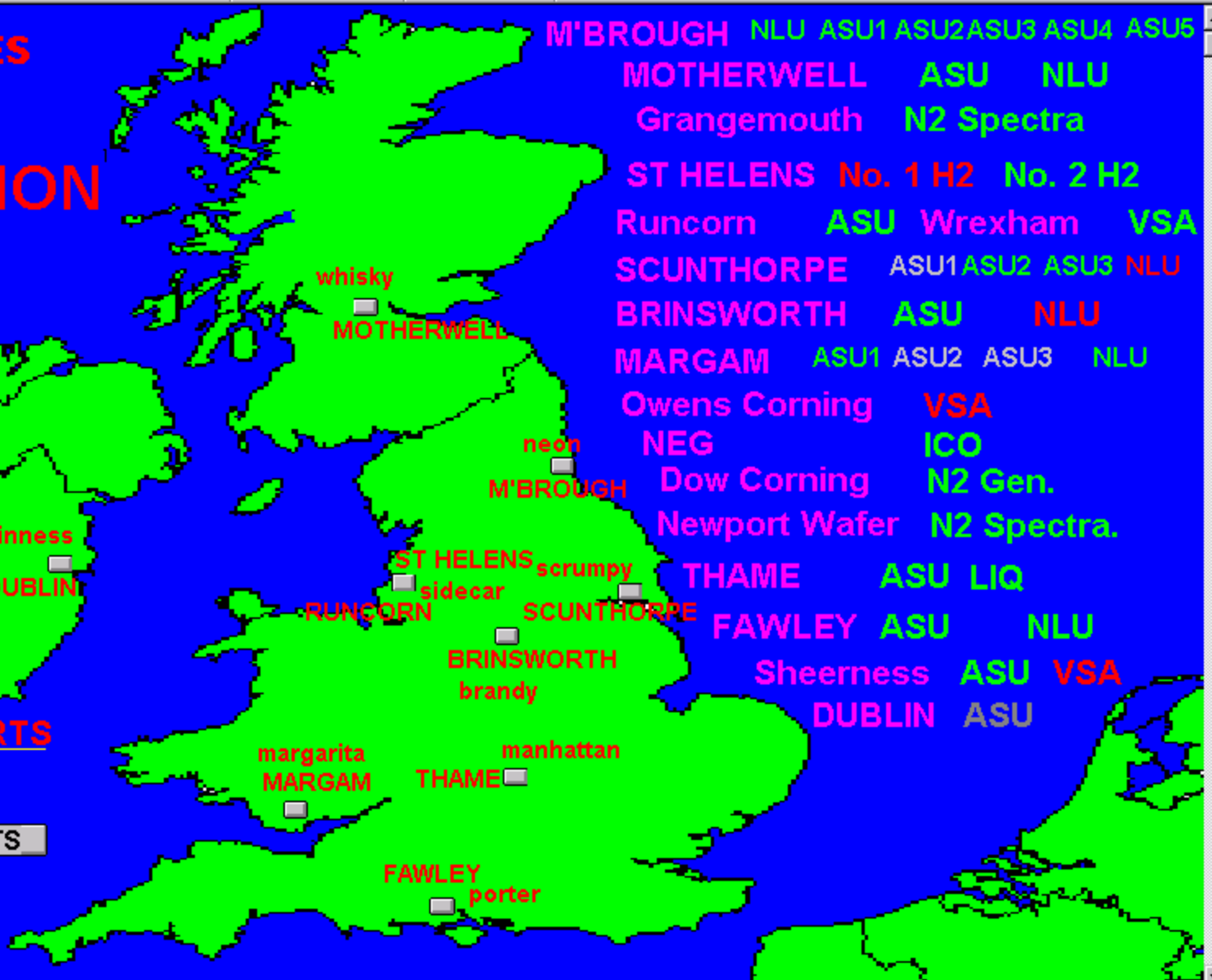
FOR THE FIRST TIME,  
SHARING  
~~BORROWING~~  
~~STEALING~~ A SLOGAN FROM BILL GATES  
I COULD SAY TO PEOPLE IN BOC,  
“WHERE DO YOU WANT TO GO TODAY”

# BOC GASES

## PLANT INFORMATION MANAGER

PSM ELECTRONIC LOG

Read Write



### NATIONAL REPORTS

STOCKS & HRS RUN

SITE DAILY REPORTS

margam.piw

**1130**

- 1130 Plant Overview
- 1130 Warm End
- 1130 Trends
- MP/HP GO Spill % Opening
- 1130 MSA Bed
- CP11/12 Cooling Water Temps
- 1130 Analysis Trend Display

Off Sites

Margam Overvi

720

1050

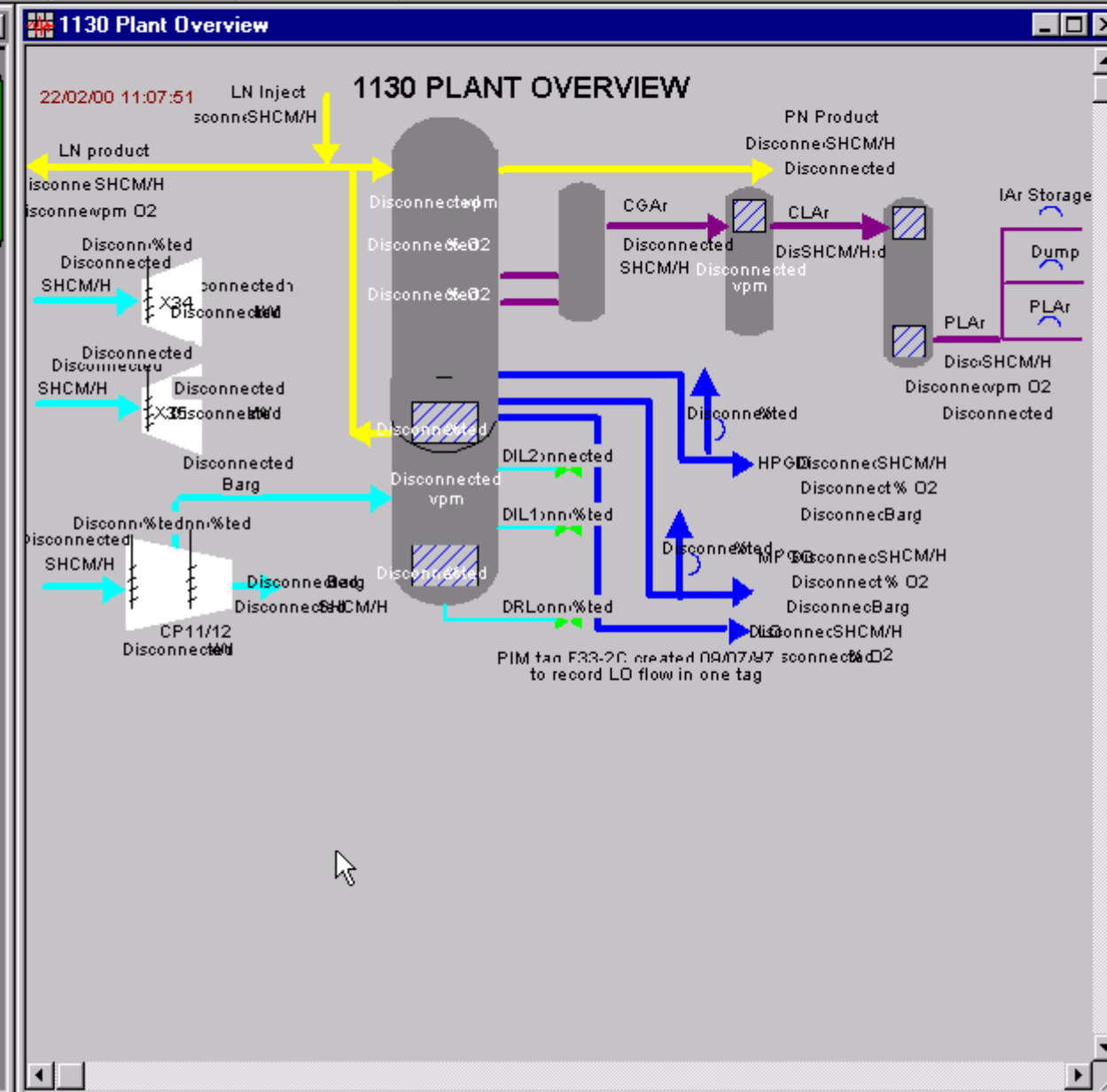
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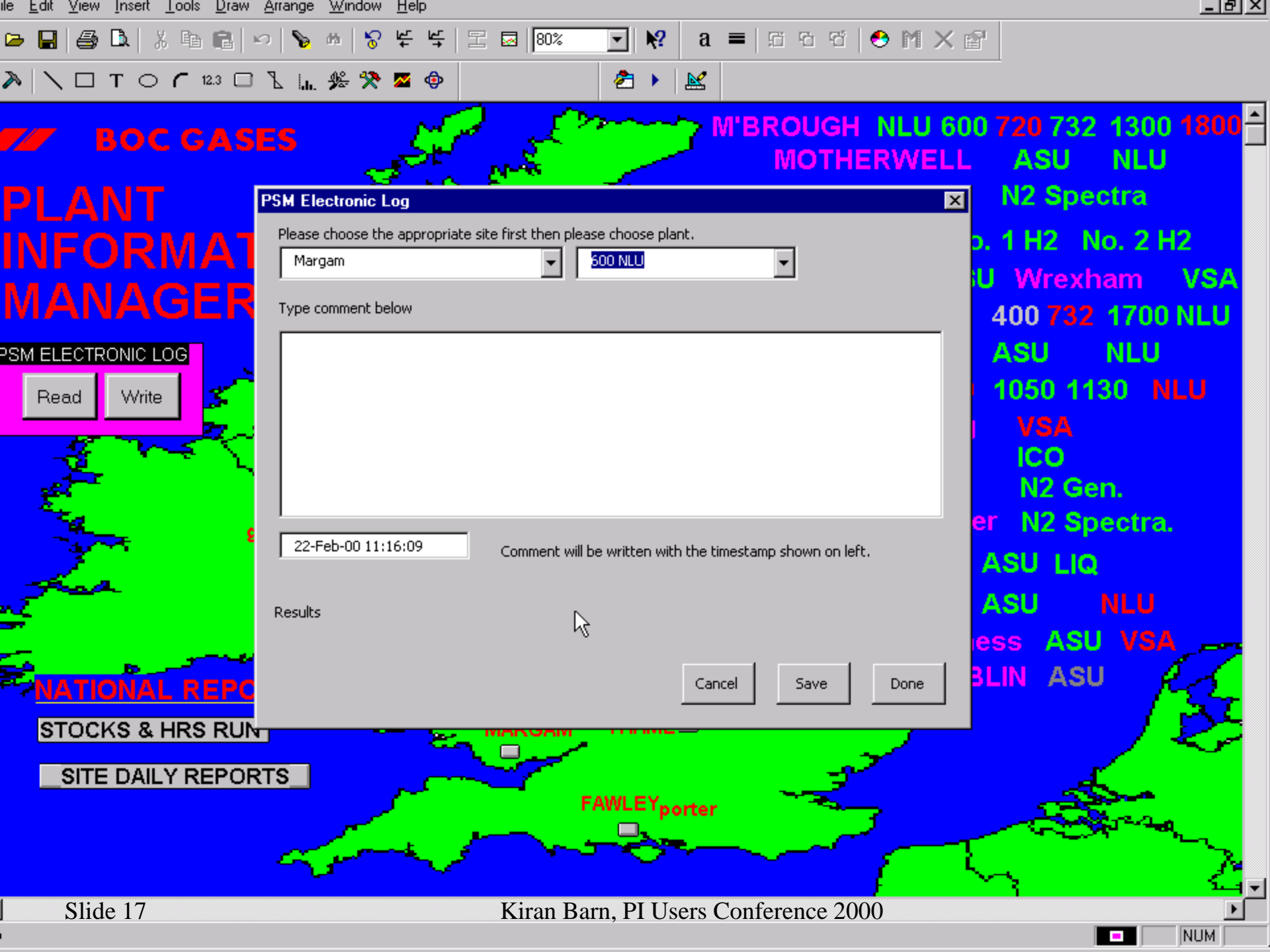
duct Compr

72 KPI's

New Open







BOC GASES

PLANT  
INFORMATION  
MANAGER

M'BROUGH NLU 600 720 732 1300 1800  
MOTHERWELL ASU NLU

N2 Spectra

No. 1 H2 No. 2 H2

Wrexham VSA

400 732 1700 NLU

ASU NLU

1050 1130 NLU

VSA

ICO

N2 Gen.

N2 Spectra.

ASU LIQ

ASU NLU

ess ASU VSA

BLIN ASU

FAWLEYporter

**PSM Electronic Log**

Please choose the appropriate site first then please choose plant.

Margam 500 NLU

Type comment below

22-Feb-00 11:16:09 Comment will be written with the timestamp shown on left.

Results

Cancel Save Done

PSM ELECTRONIC LOG

Read Write

NATIONAL REPORT

STOCKS & HRS RUN

SITE DAILY REPORTS

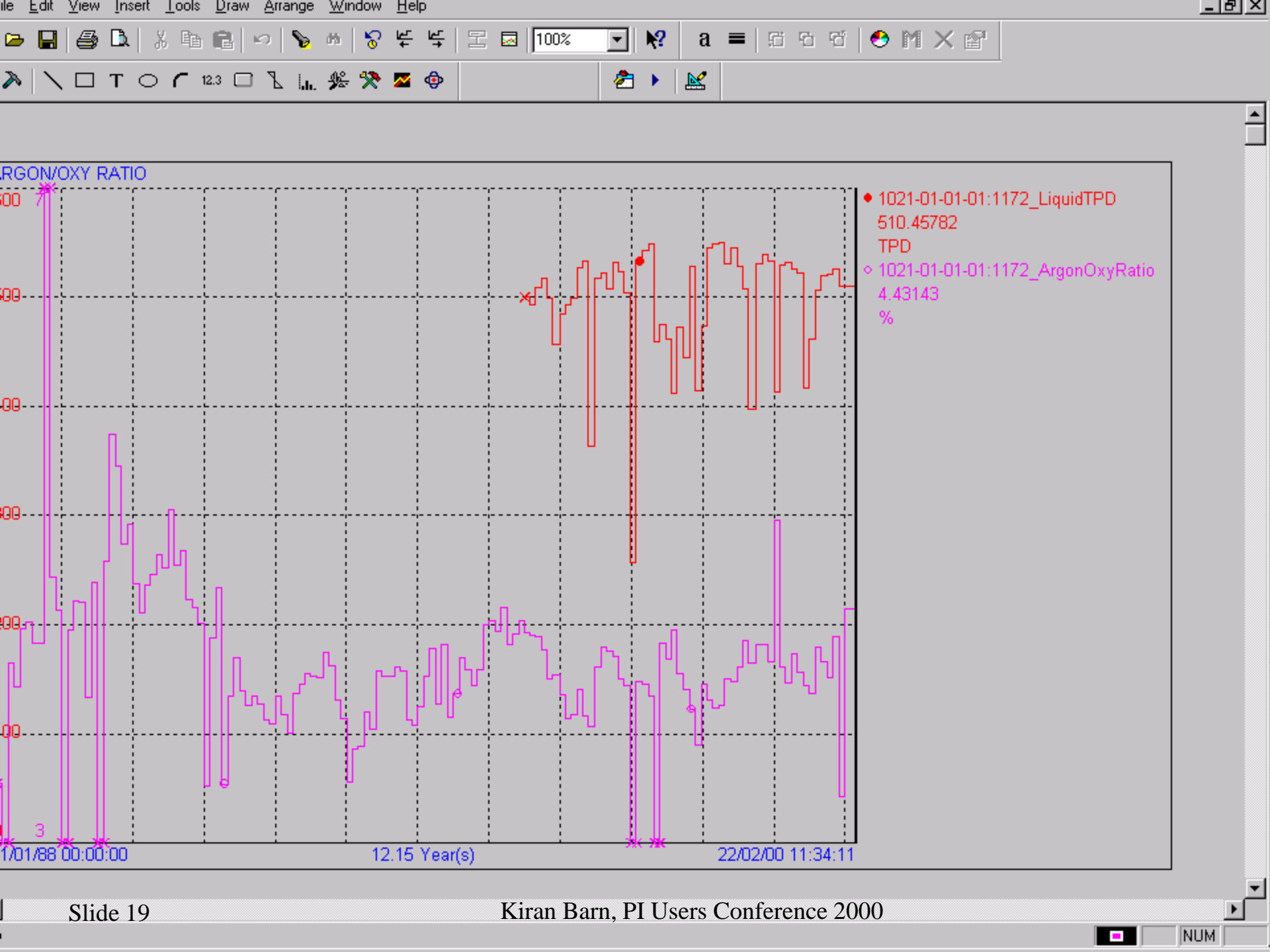
File Edit View Insert Format Tools Data Window PI PI-SMT Help

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10 B I U

A	B	C	D	E	F	G	H	I	J	K	L	M
To: 22/02/00 11:23	From: 12/02/00 11:23	No of days data required 10			Filter By:	<ul style="list-style-type: none"> <li>Show All</li> <li>Brinsworth</li> <li>Cork</li> <li>Dow Corning</li> <li>Dublin</li> <li>Fawley</li> <li>Grangemouth</li> <li>Margam</li> <li>Middlesbrough</li> <li>Motherwell</li> </ul>						
data points:												
14-Feb-00 14:10:40	Middlesbrough; 1800 ASU; ASU failure reported at midday. PA loss expected to be 24 hours.											
14-Feb-00 14:13:23	Middlesbrough; NO 3 APU; Restart problems - planned to restart PM Weds 9th February for both PA and UHP PA. Still no prodn to storage by											
16-Feb-00 14:48:44	Middlesbrough; 600 ASU; GO and PN purity are expected this afternoon / evening.											
17-Feb-00 11:01:24	Middlesbrough; NO 3 APU; No Prodn (continued to trip out overnight)											
17-Feb-00 14:07:28	Middlesbrough; 600 ASU; Came on line 6pm last night.											
17-Feb-00 14:08:09	Middlesbrough; 1800 ASU; Attempting to sacrifice GO purity in order to increase PN purity to allow external NLU to run for LN.											
21-Feb-00 17:00:09	Middlesbrough; 1800 ASU; CP12 will not now be restarted until Wednesday 23rd February 2000.											
21-Feb-00 17:00:09	Middlesbrough; 1800 ASU; CP11 is expected to become available for service again on Thursday 24th February 2000.											



# Summary of PIM Benefits

- Increased Capacity
- Easier Navigation
- Visual Analysis
- Easier Charting
- Multiple Connections
- Effortless Analysis
- Ability To Build Solutions

# Major PIM Enabled Initiatives During Year 2000

## PLANT RELIABILITY

- IT IS ESTIMATED THAT SOME £2-4 MILLION/ANNUM OF COSTS ARE ATTRIBUTABLE TO UNPLANNED PLANT OUTAGES.
- ACTIONS:
- Set Up Daily/Weekly/Monthly Hours Run in PIM.
- Used in Combination with Weekly Plans an Accurate View of Plant Unavailability Can be Obtained and Numerate Key Performance Indicators Reported.
- % Unavailability (Scheduled and Unscheduled ) to be reported.
- Classification as to Root and Basic Causes.
- £ Cost of Plant Unavailability to be reported.

# Major PIM Enabled Initiatives During Year 2000

## POWER EFFICIENCY

- POWER BILL IS £60 MILLION/ANNUM. 1% IMPROVEMENT IN EFFICIENCY IS TARGET.
- ACTIONS:
- New Power Loggers being installed on all Sites.
- Implement Modbus interface being developed by Beaver Valley Systems from PIM to Power Loggers.
- Report Performance on a Real Time/Shift/Day/Week/Month Basis which is Accurate Reliable and Automatically Captured.
- Use as basis for Shift Supervisor Accountability for Plant Performance.

# Major PIM Enabled Initiatives During Year 2000

## PRODUCT LOSSES

- PRODUCT LOSSES ON SITE ARE ESTIMATED TO HAVE A COST OF £2 MILLION/ANNUM. BEST INDUSTRY PRACTICE SUGGESTS THESE CAN BE REDUCED BY A THIRD.
- ACTIONS:
  - Ensure that all data required to monitor losses is captured in PIM.
  - Create Reports to help identify source of losses.

## Major PIM Enabled Initiatives During Year 2000

# ME AND MY PI CONTEST

£ SAVINGS RESULTING FROM PREVIOUS  
3 INITIATIVES WILL BE USED AS BASIS OF  
ENTRY TO ME AND MY PI CONTEST.





# Plant Information Just One Click Away

**ANY QUESTIONS?**