

The background of the slide is a collage of four images: a dense green forest on the left, an offshore oil platform in the ocean in the top center, a large oil tanker ship in a harbor in the bottom center, and a modern multi-story office building on the right.

On-Line Control of Oil Derivates Production in a Refinery

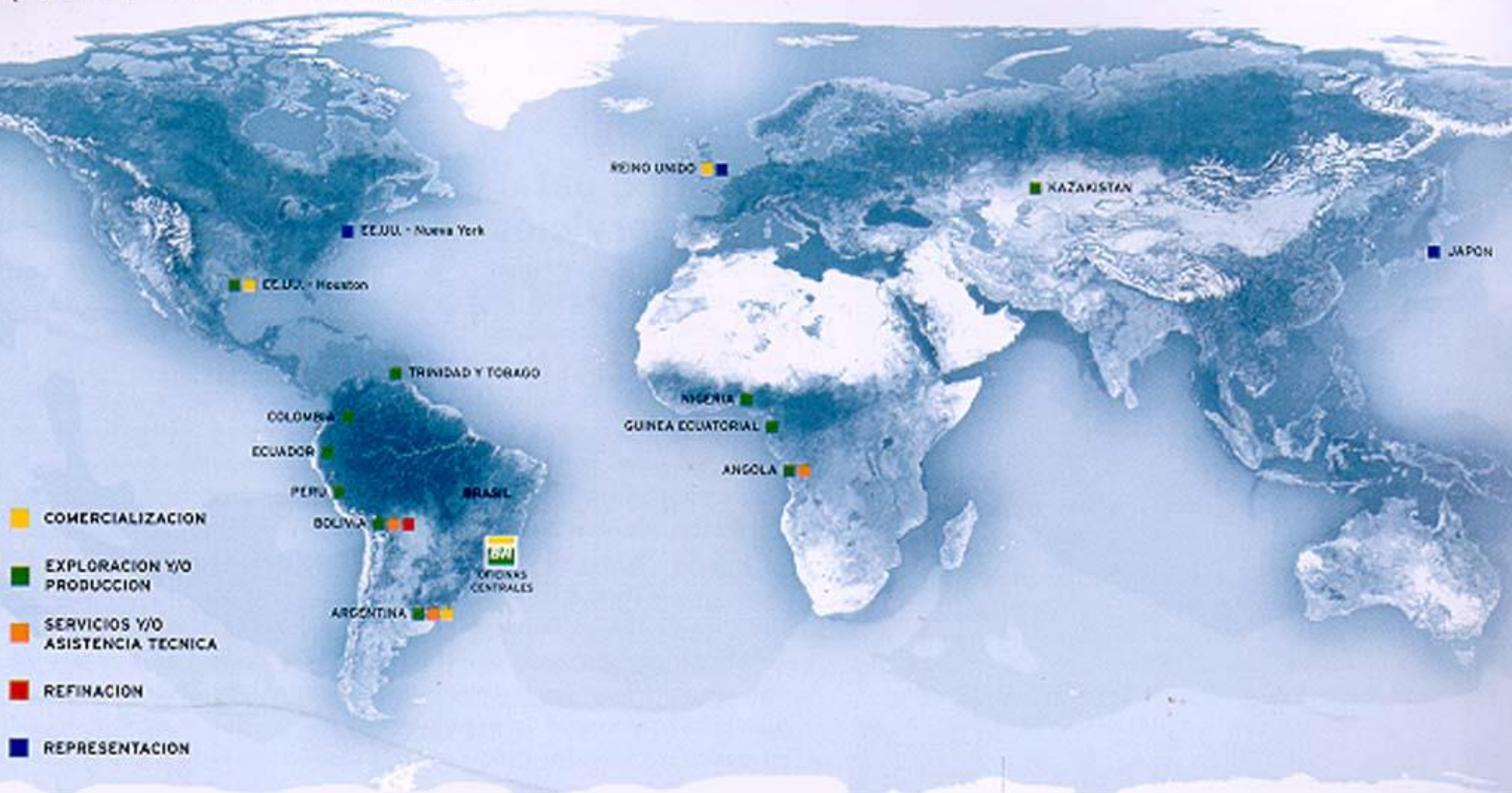
2002 Osisoft Users Conference Monterey - CA
Antonio Carlos Gomes de Souza

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- A faint world map is visible in the background of the slide, showing the continents in green and oceans in blue. Three white rectangular boxes are overlaid on the map: one over North America, one over South America, and one over Africa.
- The Company
 - The Refinery
 - On Line Control of Oil Derivates in a Refinery
 - Benefits

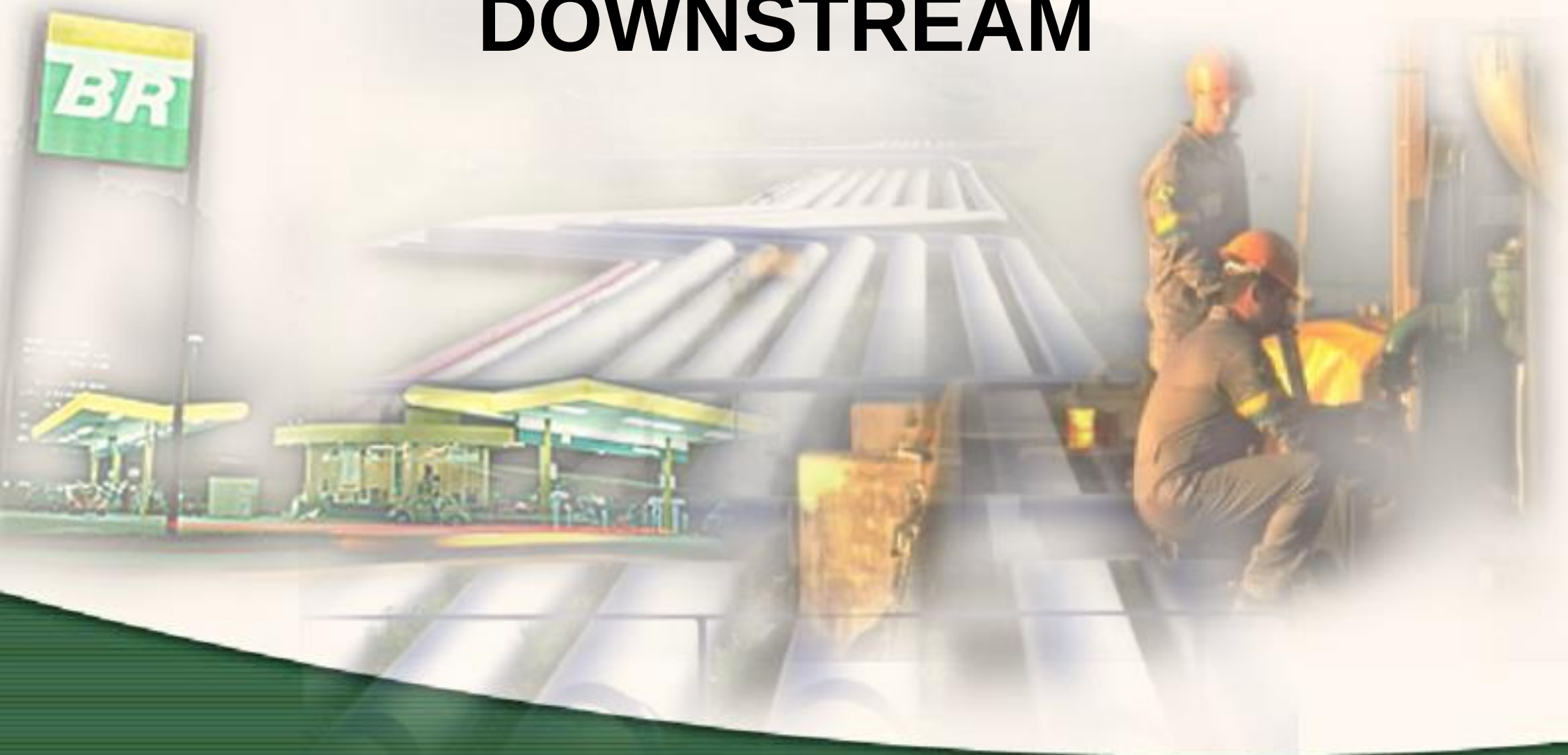
PETROBRAS in the World

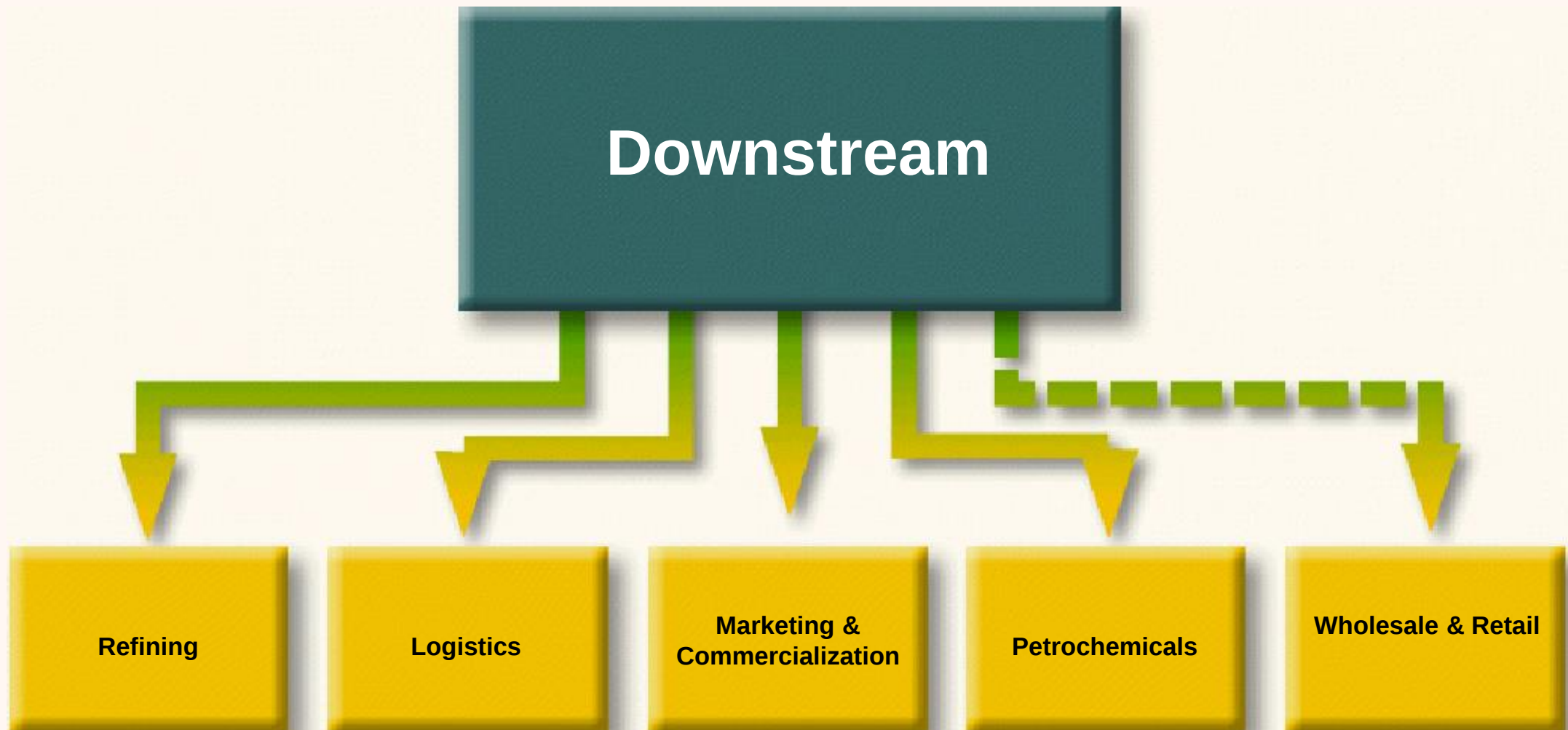


petrobras en el mundo



DOWNSTREAM

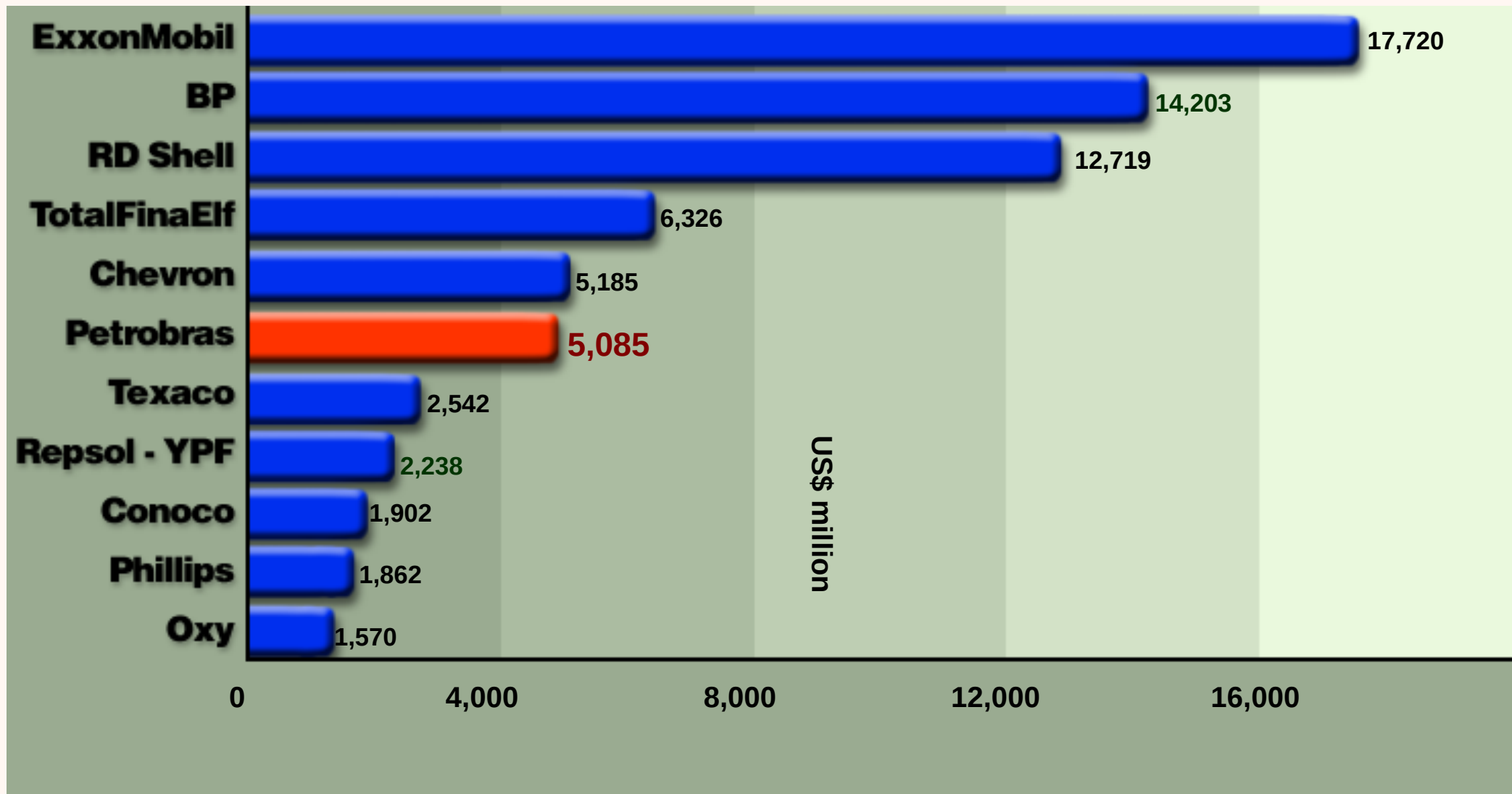




Earnings 2000 - An Outstanding Year



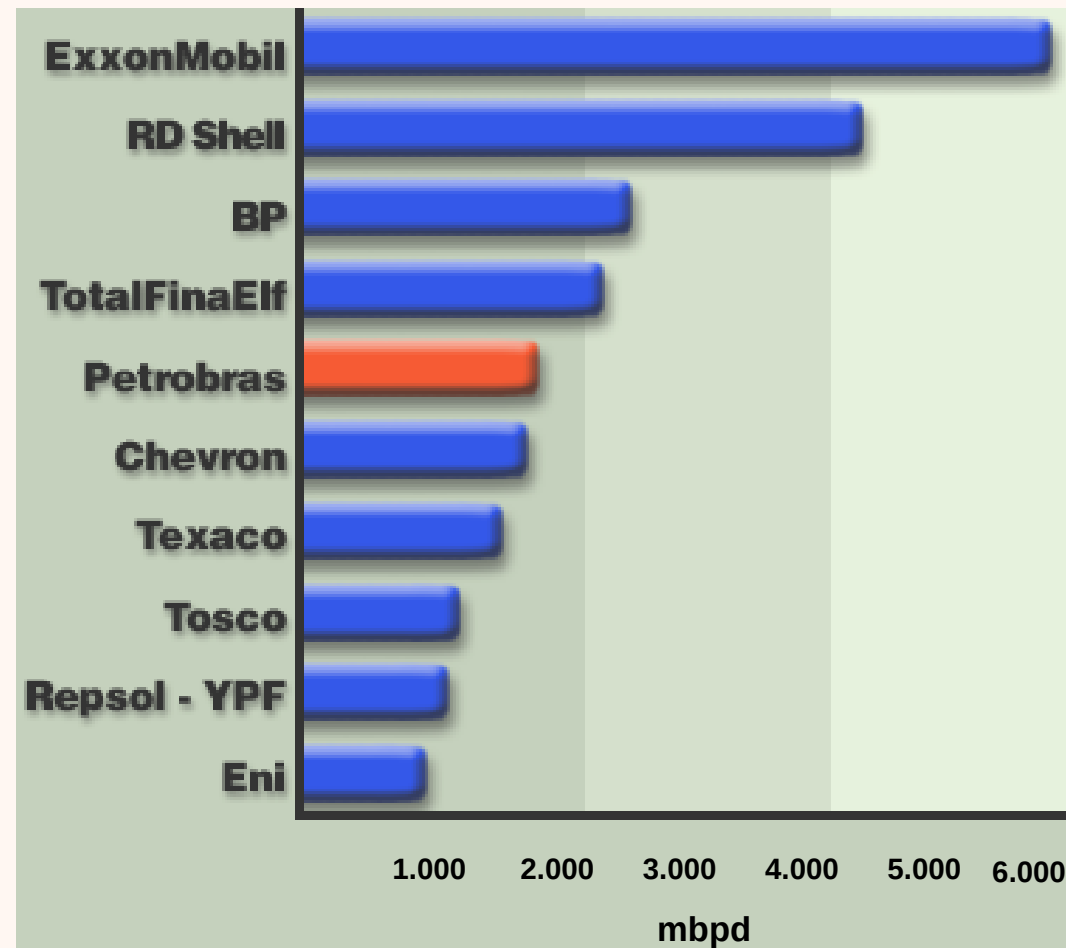
Net Income



Source: PFC, Companies Report

Leadership in Refining

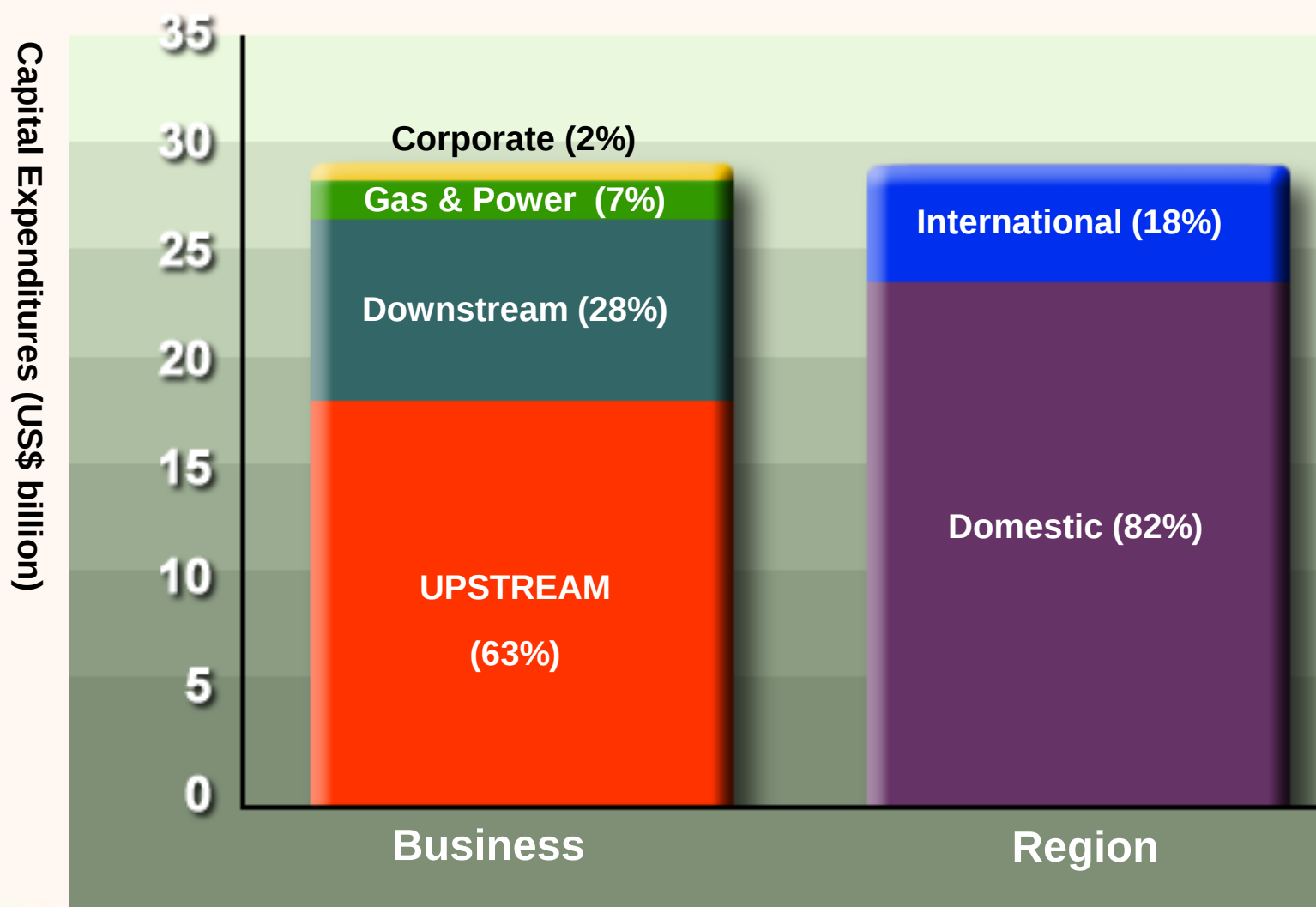
Worldwide Refining Capacities



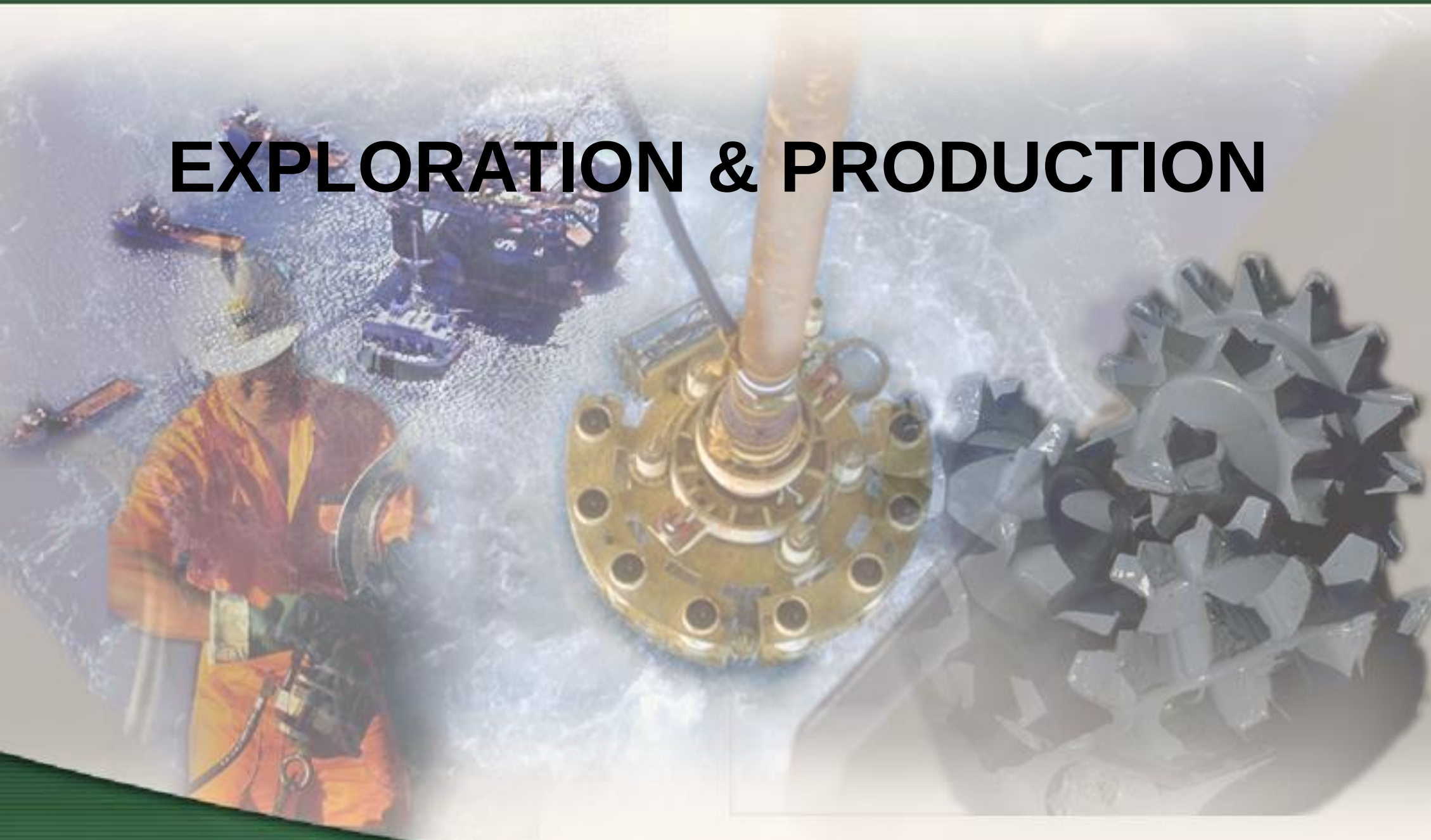
Source: PFC

- Petrobras controls 11 refineries in Brazil with a capacity about 2 million barrels per day
- Petrobras controls 2 refineries in Bolivia and 1 Argentina.
- Petrobras is the 5th biggest refiner among international companies
- Petrobras refined 92% of the company's sales in 2000

Petrobras will invest US\$ 29.4 billion (2001-2005)

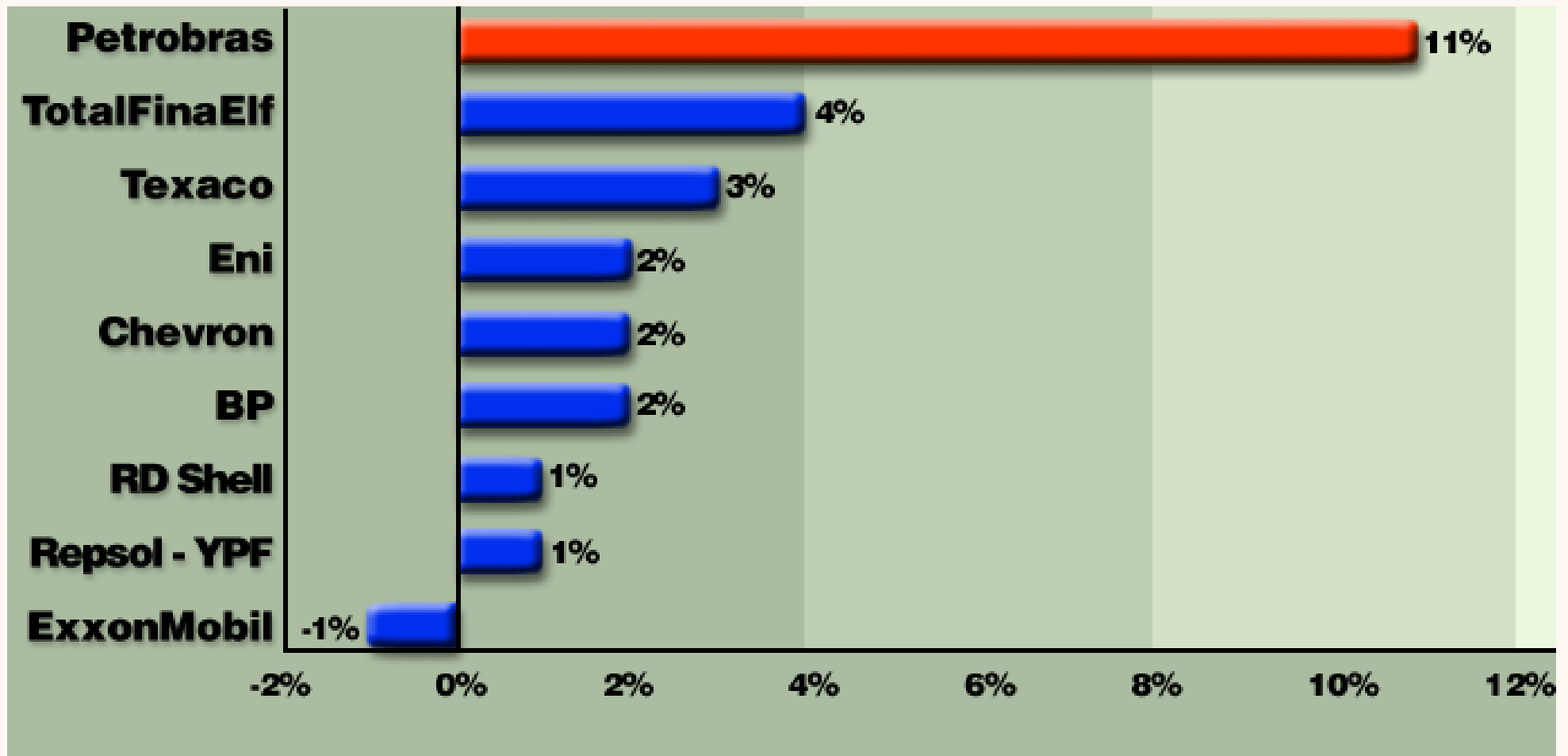


EXPLORATION & PRODUCTION



Number 1 in Production Growth

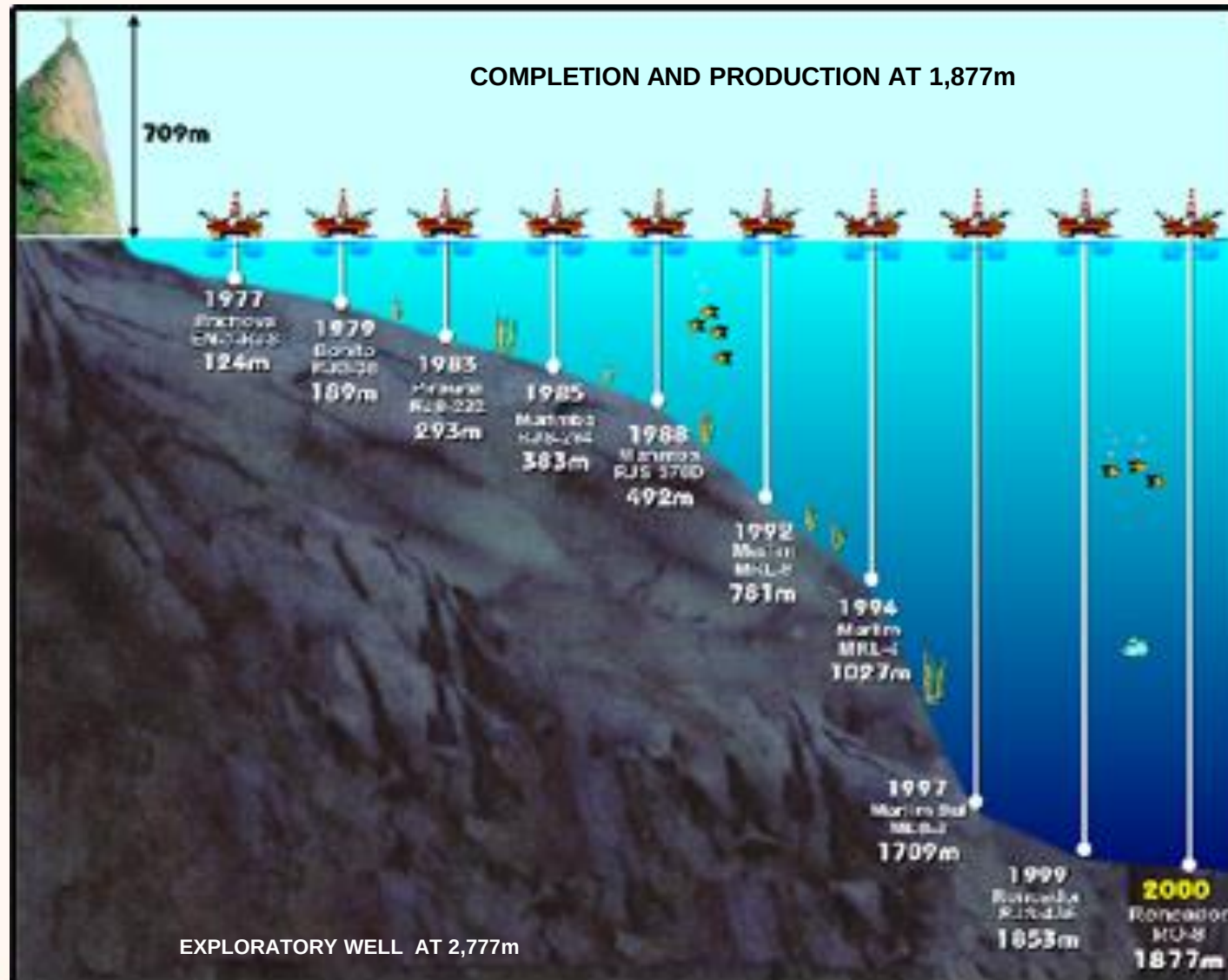
1994 vs. 1999, CAGR (oil and gas)



Source: Merrill Lynch (company reports and estimates)

Deep Waters – 1.877m Roncador Field in Basin Campos

Petrobras' World Records



PETROBRAS in Brazil



Location

Capacity

Paulinia	→	352.000
Mataripe	→	306.000
Duque de Caxias	→	242.000
São José dos Campos	→	226.000
Araucária	→	189.000
Canoas	→	189.000
Cubatão	→	170.000
Belo Horizonte	→	151.000
Capuava	→	53.000
Manaus	→	46.000
Fortaleza	→	6.000
Cochabamba	→	3.000
Santa Cruz de La Sierra	→	6.000
Baia Blanca	→	5.000

bpd

PETROBRAS



LANDULPHO ALVES

REFINERY

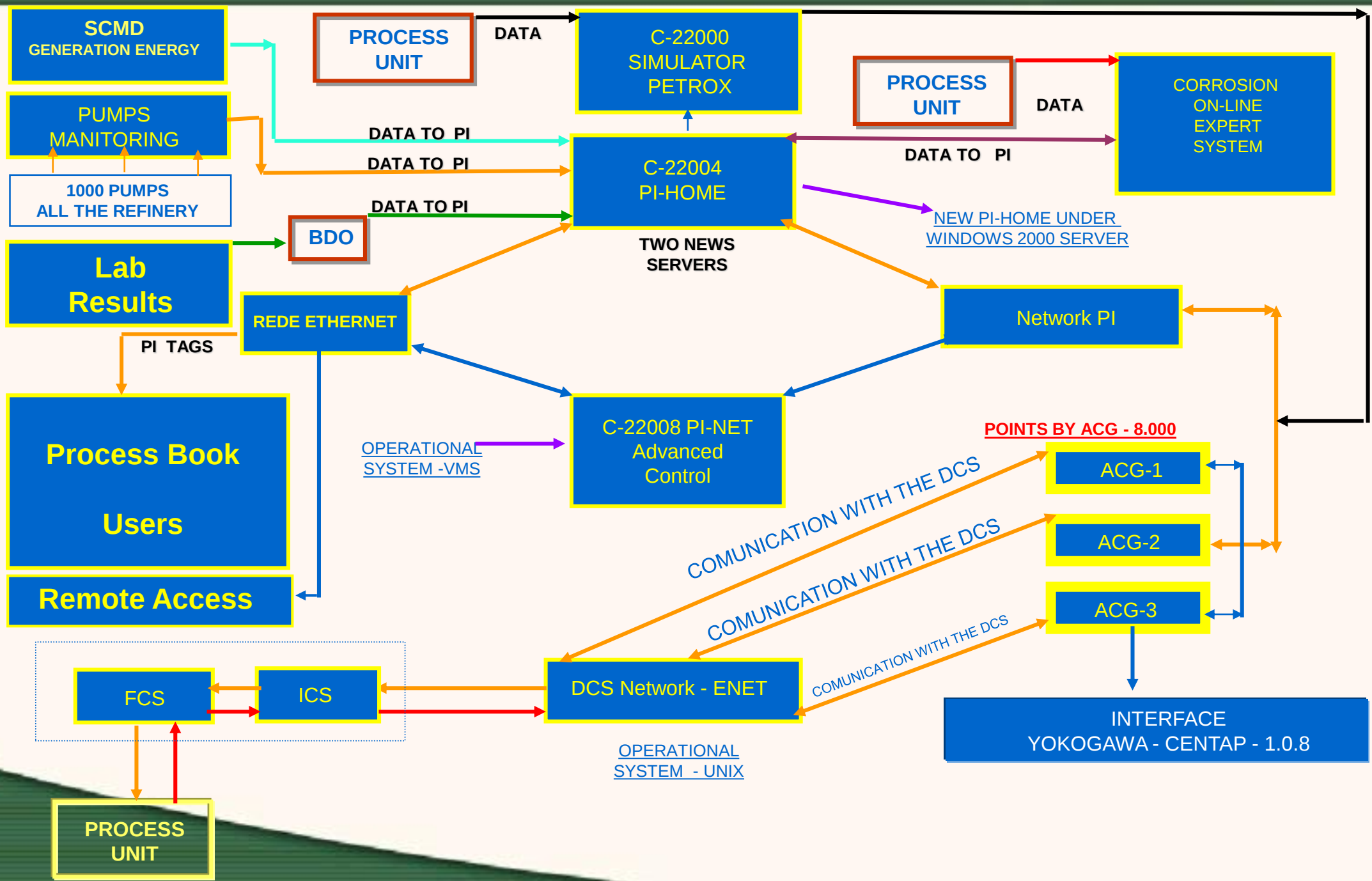
RLA M-MATARIPE

Aerial View

“36 FINISHED PRODUCTS”



Basic Diagram of Plant Information



Plant Information Monitoring



Pump Monitoring

Process Optimization

On-line Corrosion

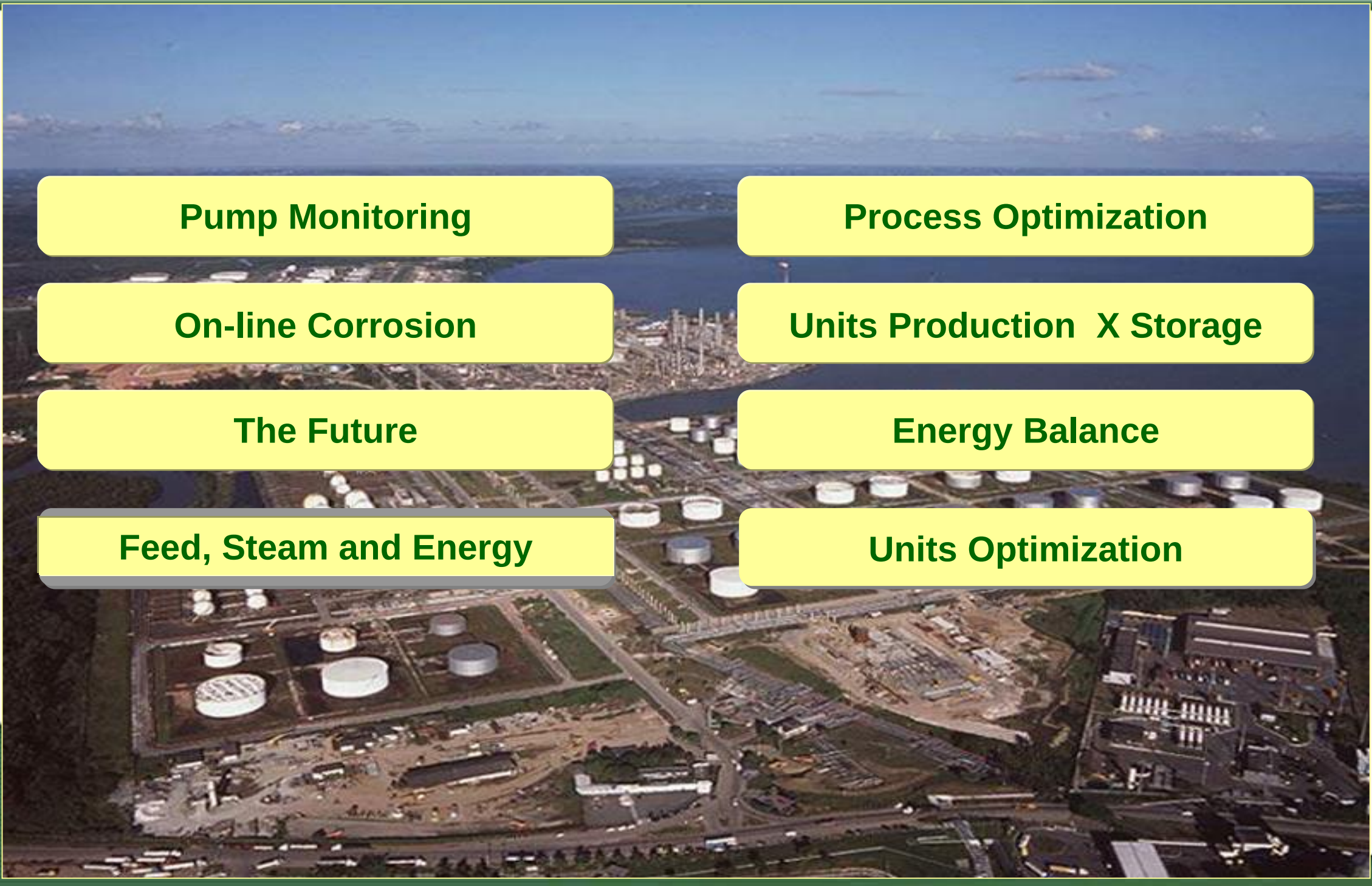
Units Production X Storage

The Future

Energy Balance

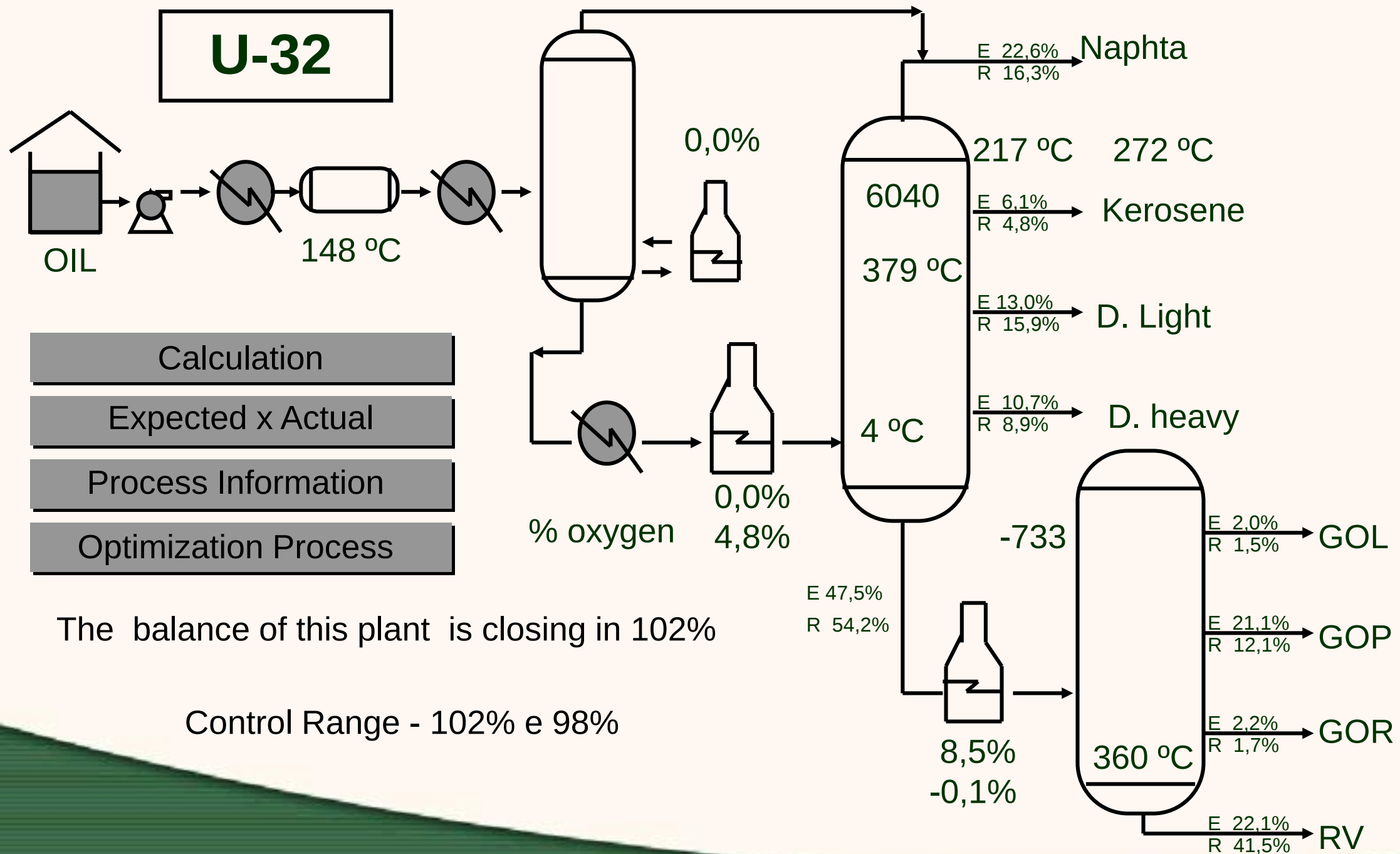
Feed, Steam and Energy

Units Optimization



Optimization Process

U-32



Feed - Steam - Energy



UNITS

Plants	Situation	Feed current / schedule	Trends
U-32	●	8/2/2002 14:04:45 21534 / 27000	
U-9	●	8/2/2002 14:05:15 9173 / 9000	
U-7	●	8/2/2002 14:04:02 1 / 0	
U-7A	●	8/2/2002 14:01:32 222 / 350	
U-8	●	8/2/2002 14:07:32 1100 / 500	
U-6	●	8/2/2002 14:07:10 3998 / 5000	
U-30	●	8/2/2002 14:05:38 799 / 1300	
U-11	●	8/2/2002 14:00:02 4 / 600	
U-12	●	8/2/2002 14:06:15 549 / 650	
U-13	●	8/2/2002 14: 07:32 199 / 570	
U-18	●	8/2/2002 14:04:15 1404 / 1550	
U-23	●	8/2/2002 14:04:02 63 / 500	
U-24	●	8/2/2002 14:03:02 260 / 300	
U-25	●	8/2/2002 14:04:32 160 / 200	
U-39	●	8/2/2002 14:07:08 11032 / 10000	

● 0-60%

● 90-100%

● 60-90%

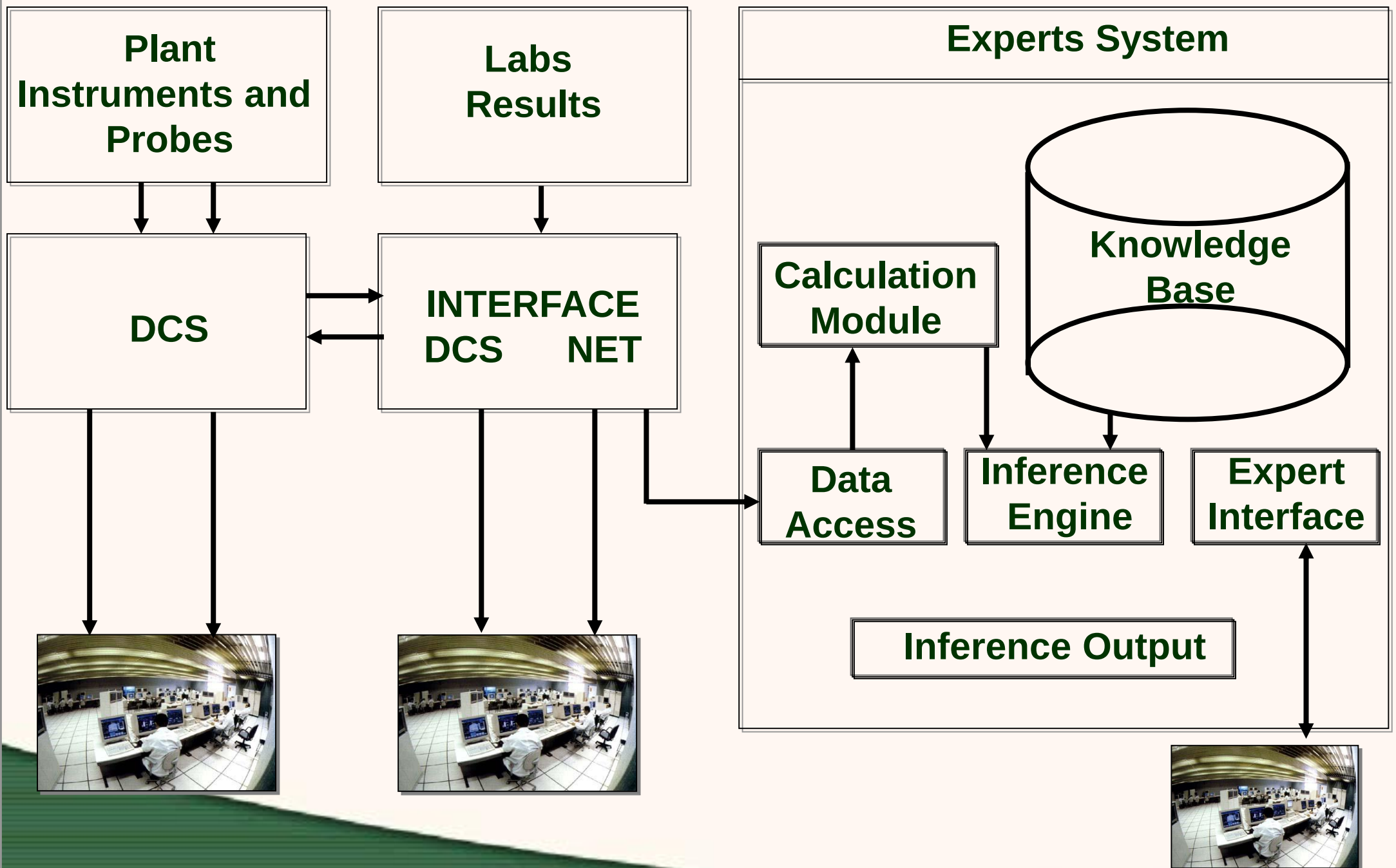
STEAM

Boiler	Situation	Feed	Trend
GV-5101	●	8/2/2002 13:59:00 74	
GV-5102	●	8/2/2002 14:05:30 85	
GV-5103	●	8/2/2002 14:03:00 72	
GV-5104	●	8/2/2002 14:01:00 0	
GV-5105	●	8/2/2002 14:07:30 87	
GV-8301	●	8/2/2002 14:06:30 87	
B-631	●	8/2/2002 14:04:40 81	
GV-3901	●	8/2/2002 14:07:38 304	
TOTALIZE		8/2/2002 14:07:38	

ENERGY

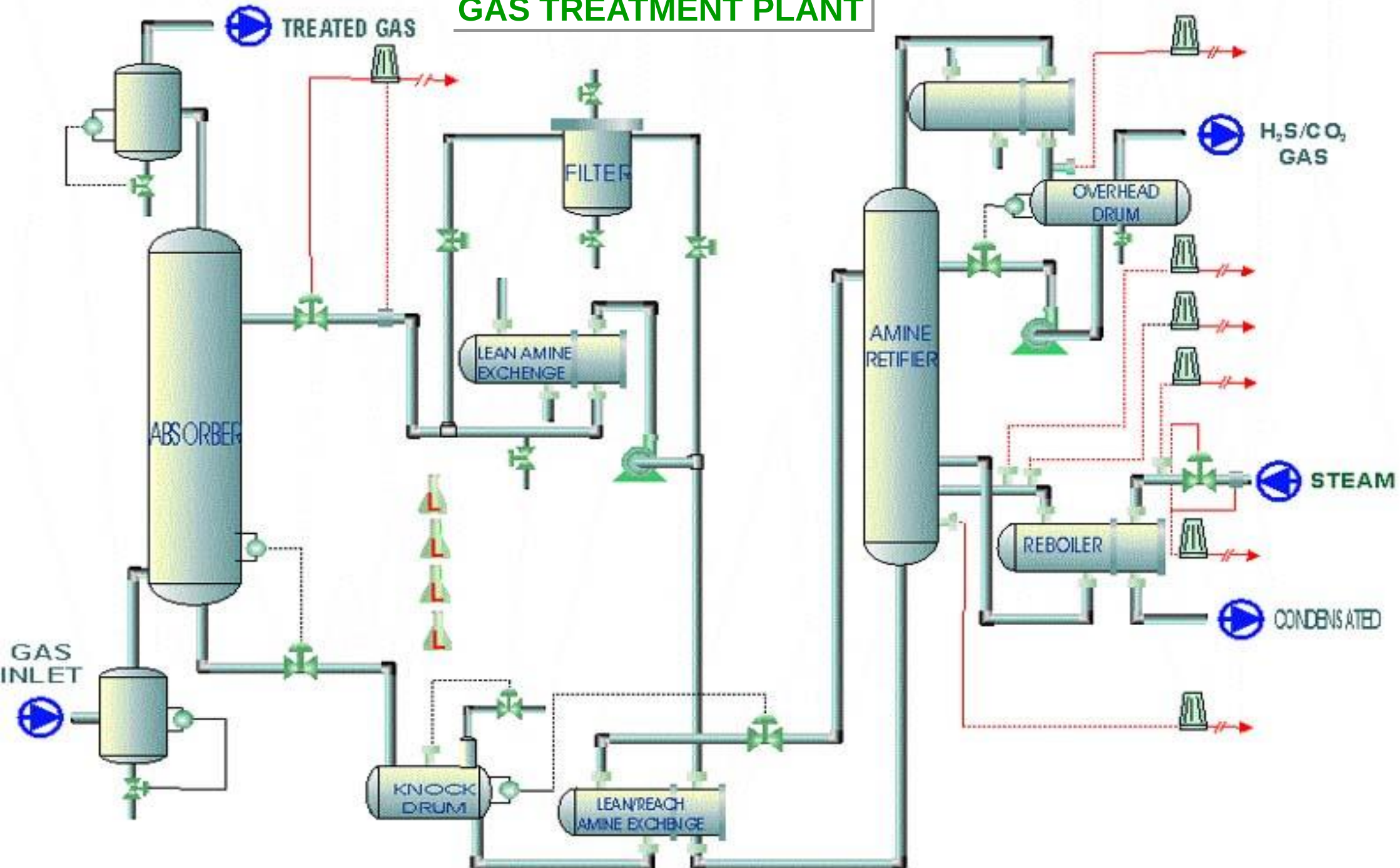
Boiler	Situation	MW
S-65	●	8/2/2002 14:06:00 18
L-17D93A	●	8/2/2002 13:59:40 0
L-17D93C	●	8/2/2002 13:59:40 0
TG-5101	●	8/2/2002 14:05:30 6
TG-8301	●	8/2/2002 14:03:00 17
TG-3901	●	8/2/2002 14:05:22 0
TOTALIZE MW		8/2/2002 14:04:00 23

Expert System Diagram in the Process Plant



Expert System Application to Gas Treatment Corrosion Control

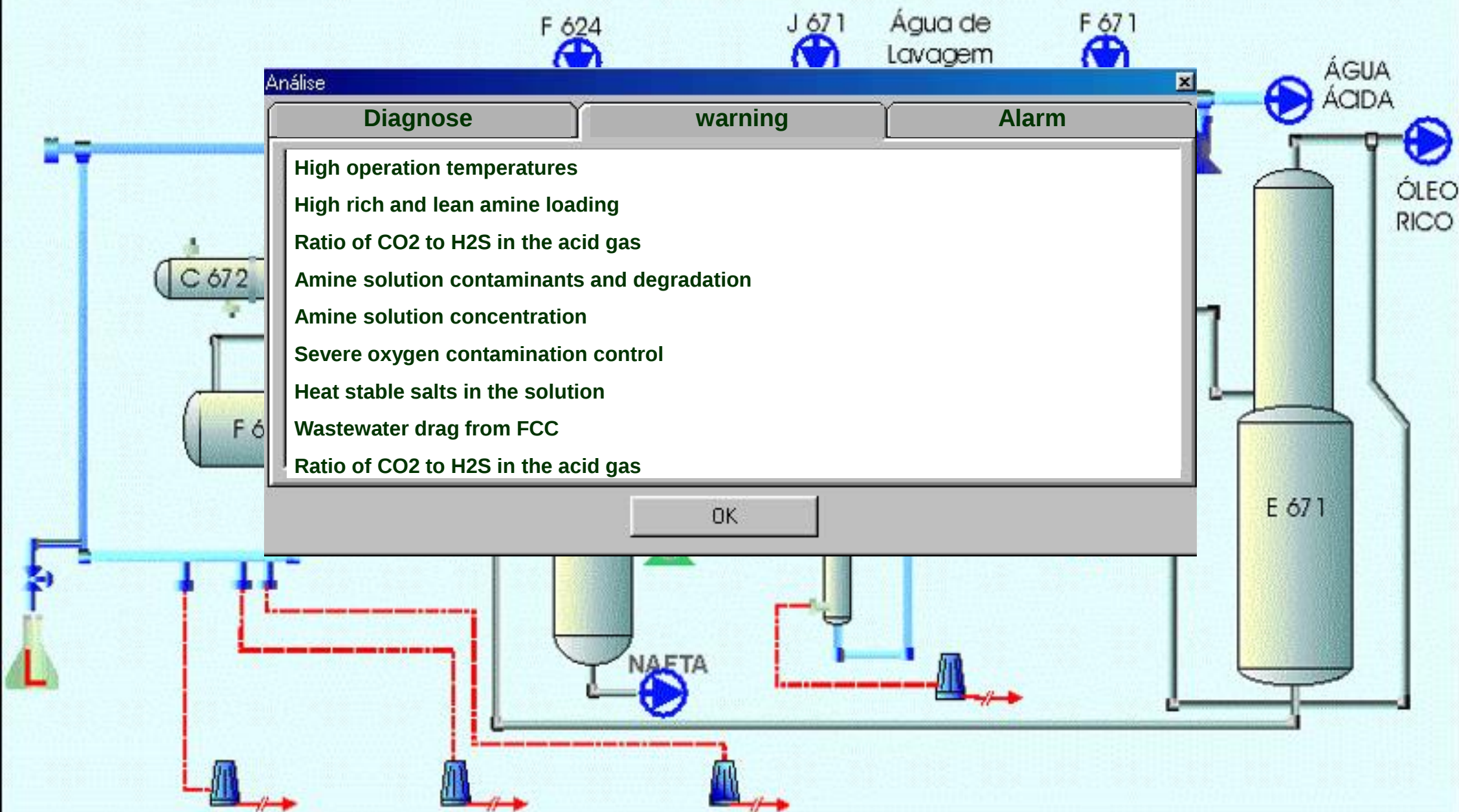
GAS TREATMENT PLANT



Expert System Application to Gas Treatment Corrosion Control



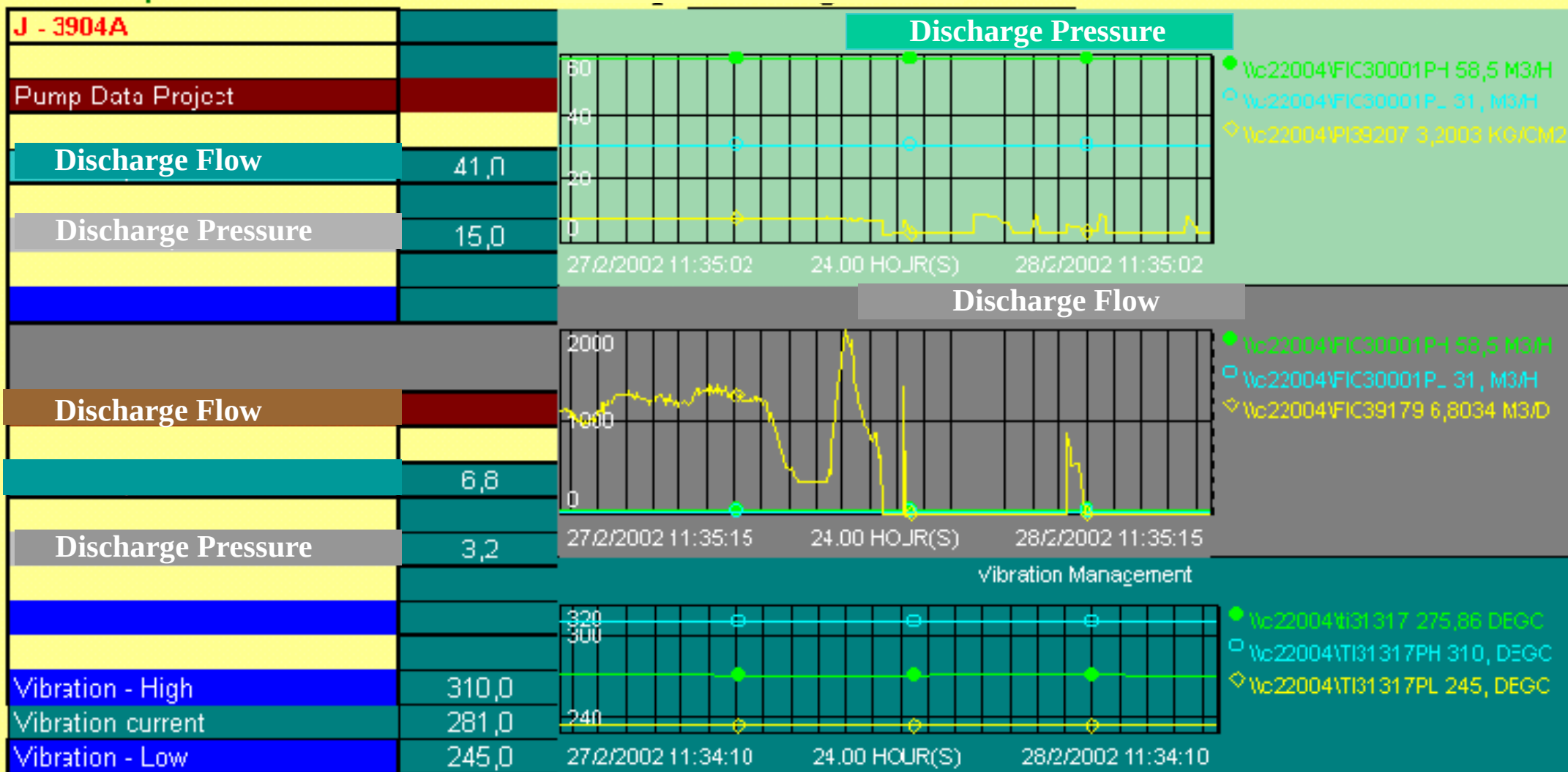
HIGH PRESSURE



Pump Monitoring



Feed Pump



Production x Storage



6/3/2002 14:54

PRODUCTION X STORAGE - MONITORING

Product

Gas

Process Unit

ECC UNIT

Customers

BR, SHELL, TEXACO, ESSO, IPIRANGA

Logistics System



Unit- 6

Pipeline



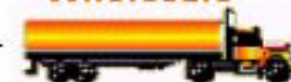
Storage

Pipeline



EMED

Wholesale



Update

Period	Unit	Production		Difference		Trend
		Instrument	Tank	ABS	%	
Hour: 12:00 às 14:00	M³	198,3	199,0	-0,7	0,3	Hour Trend
Shift: 23:00 as 7:00	M³	714,9	716,0	-1,1	-0,1	Shift trend
Day 5/3/2002	M³	2199,8	2201,0	-1,2	0,1	Day Trend
Month March	M³	13.438,6	13.444,0	5,1	0,1	

Benefits



- **Improve Profitability**
- **Plant Stabilization**
- **Increase Quality Products**
- **Reduce Energy Cost**
- **Increase Utilization Factor**

The Future

