

Honeywell Romania

HPS Bucharest

GES & AS overview

April 2015

Honeywell

A bit of History....

- **1885** - an inventor named **Albert Butz** patented the **furnace regulator and alarm**.
- **1904**, a young engineer named **Mark Honeywell** was perfecting the **heat generator** as part of his plumbing and heating business. Two years later, he formed the **Honeywell Heating Specialty Co. Incorporated**, specializing in hot water heat generators.
- **1942**, the company invented the **electronic autopilot**, which proved to be critically important to the U.S. war effort.
- **1953**, the company introduced the T-86 "Round" **thermostat** one of the world's most recognizable designs, it remains in production today and adorns the walls of more households around the world than any other thermostat.
- **1955** - a JV called Datamatic Corporation = Raytheon Corp. + Honeywell's built the **computer business D-1000**, weighed 25 tons, took up 5,574 sqm, and cost \$1.5 million.
- **1963** was registered **Honeywell Inc.**, even though it had been casually referred to as such for nearly 40 years.
- **1969** Honeywell instruments helped U.S. astronauts Neil Armstrong and Edwin "Buzz" Aldrin land on the moon.





\$39.1B

in sales for 2013

55%

sales outside U.S.

- 1,300 sites, 68 countries
- 131,000 employees
- Morristown, NJ headquarters
- Fortune 100



Aerospace



**Performance Materials
and Technologies**



**Automation and
Control Solutions**

Who Is Honeywell?

Business Overview

Aerospace



\$15.7 Billion

(2013 Sales, \$B)

Automation and Control Solutions



\$13.5 Billion

Performance Materials and Technologies



\$9.9 Billion

Great Positions In Good Industries



Honeywell developed the first autopilot flight controller (1914), first commercial weather radar system (1954), first business jet turbofan engine (1975), and is still the leader in developing revolutionary technology for aerospace today.



Honeywell pioneered automotive turbocharging 60 years ago and remains the industry leader launching, on average, 100 new turbo applications globally each year.



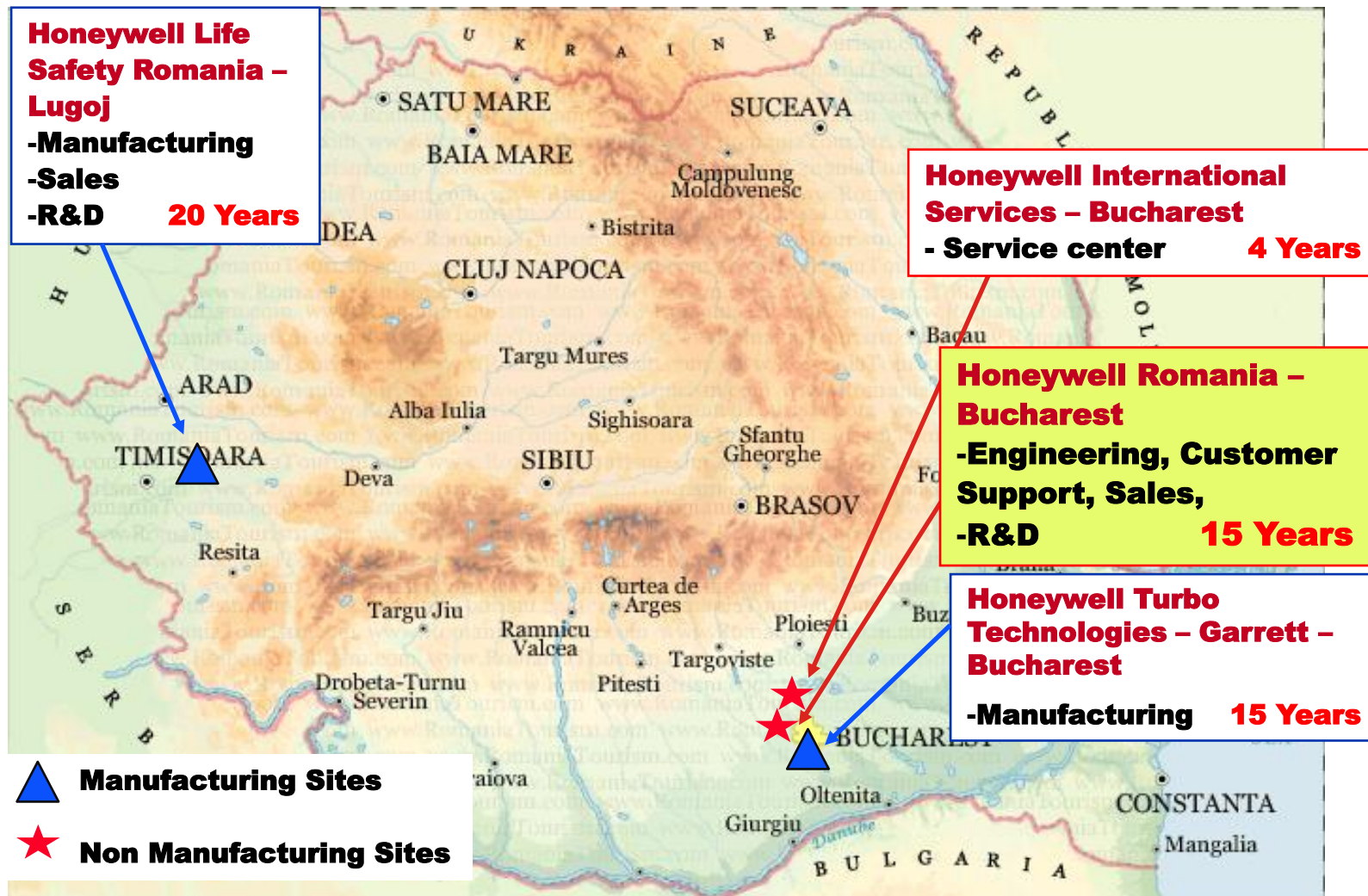
Honeywell is the leader in gas detection, fire systems, personal protective equipment, building controls, home comfort and security, and scanning and mobility.



Honeywell's technology is used to produce more than 60% of the world's gasoline, 67% of the world's paraxylene (a precursor for polyester), and 85% of the world's biodegradable detergents.

Highly Diversified, Technology Driven Industrial Company

Honeywell Presence in Romania



Honeywell is very present in Romanian economy, being one of the big Romanian exporters

Bucharest site Overview

Business presence since 1992

HPS / ECC / HLS / HBS / HSM / ACS

Registered as Honeywell Romania S.R.L.
in 1998



Process Controls



Distributed Control



Sales

Research & Development

Engineering

Project Management

Customer services:

- *Technical*
- *Administrative*
- *Finance*
- *Marketing*
- *Logistic*
- *Sales support*

Scanning and Mobility

Buildings



Instant Alert



Honeywell Bucharest site Overview

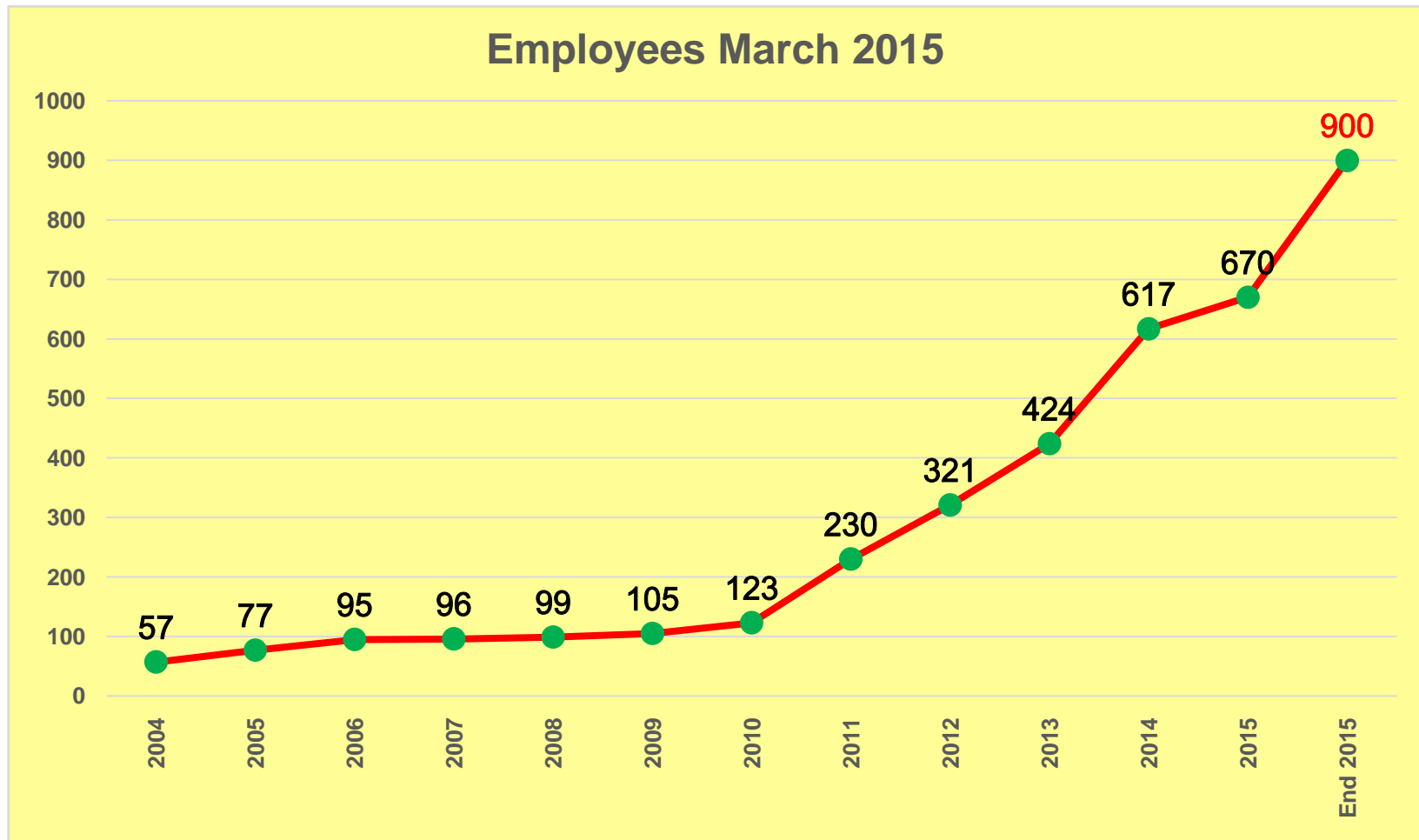
Honeywell



Honeywell Romania



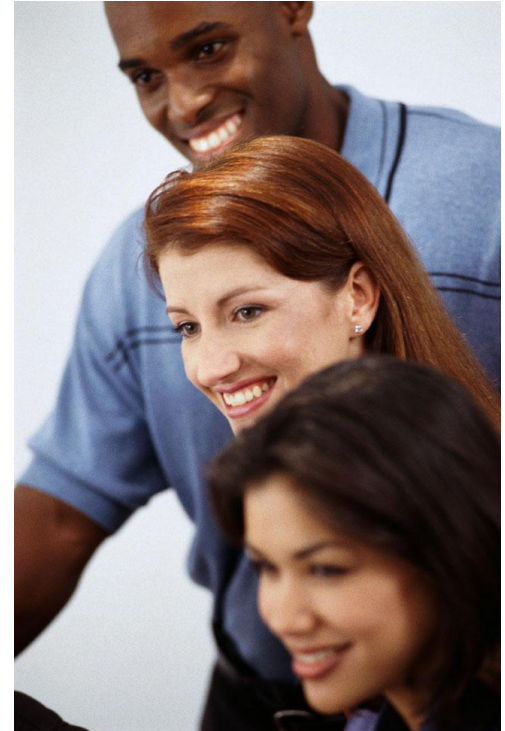
Honeywell Romania HC Growth



Average age 32 years !

Quality and performances of the local specialists attract more and more Honeywell to Romania

- **Honeywell is an exceptional place to start your career**
 - **Challenging Work**
 - **Competitive Rewards**
 - **Great People**
 - **Career Development**
 - **Continuous Learning**



People is one of the five Honeywell initiatives, continuously in the attention of the company

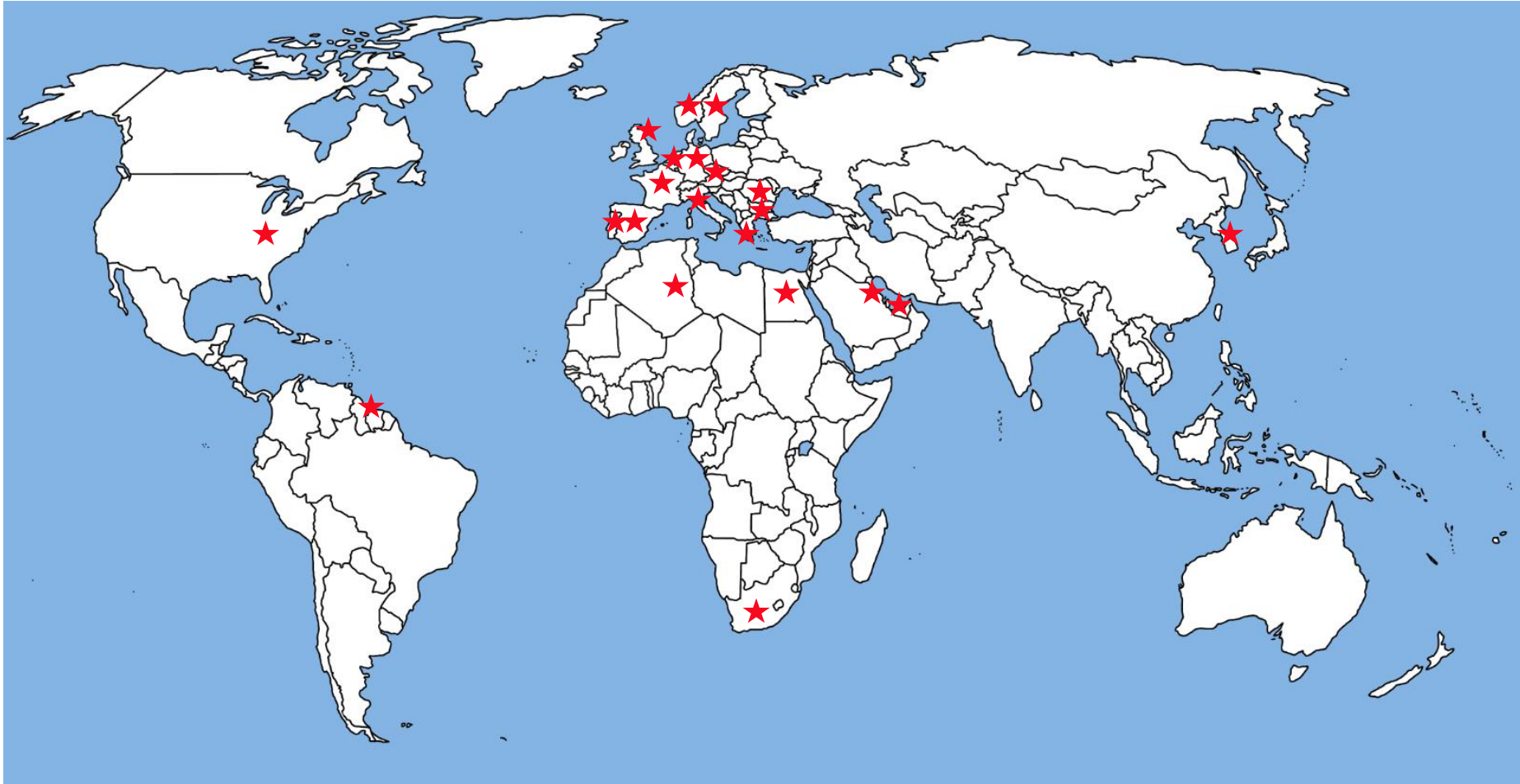
Global Engineering Services GES overview

April 2015

Honeywell

GES Romania presence in the World

Honeywell



Everywhere in the world the activity of our engineers was highly appreciated by the clients



Refineries



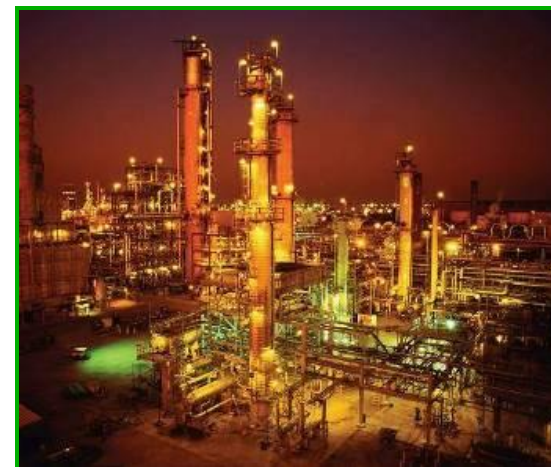
Chemicals

- Experion core functionality
- Experion Applications
- Interfaces
- Batch Solutions
- Hybrid Controller
- C300 Controller
- Icon Consoles
- TDC 3000
- TDC 2000
- TPS
- Plantscape
- QCS/CWS
- Turbine Control Solution
- Digital Video Manager
- Uniformance PHD
- OMPPro
- Cyber security
- HMI
- Handhelds
- Metersuite
- Fail Safe Controller
- Safety Manager
- Field Device Manager
- Procedural

DCS



Power Plants



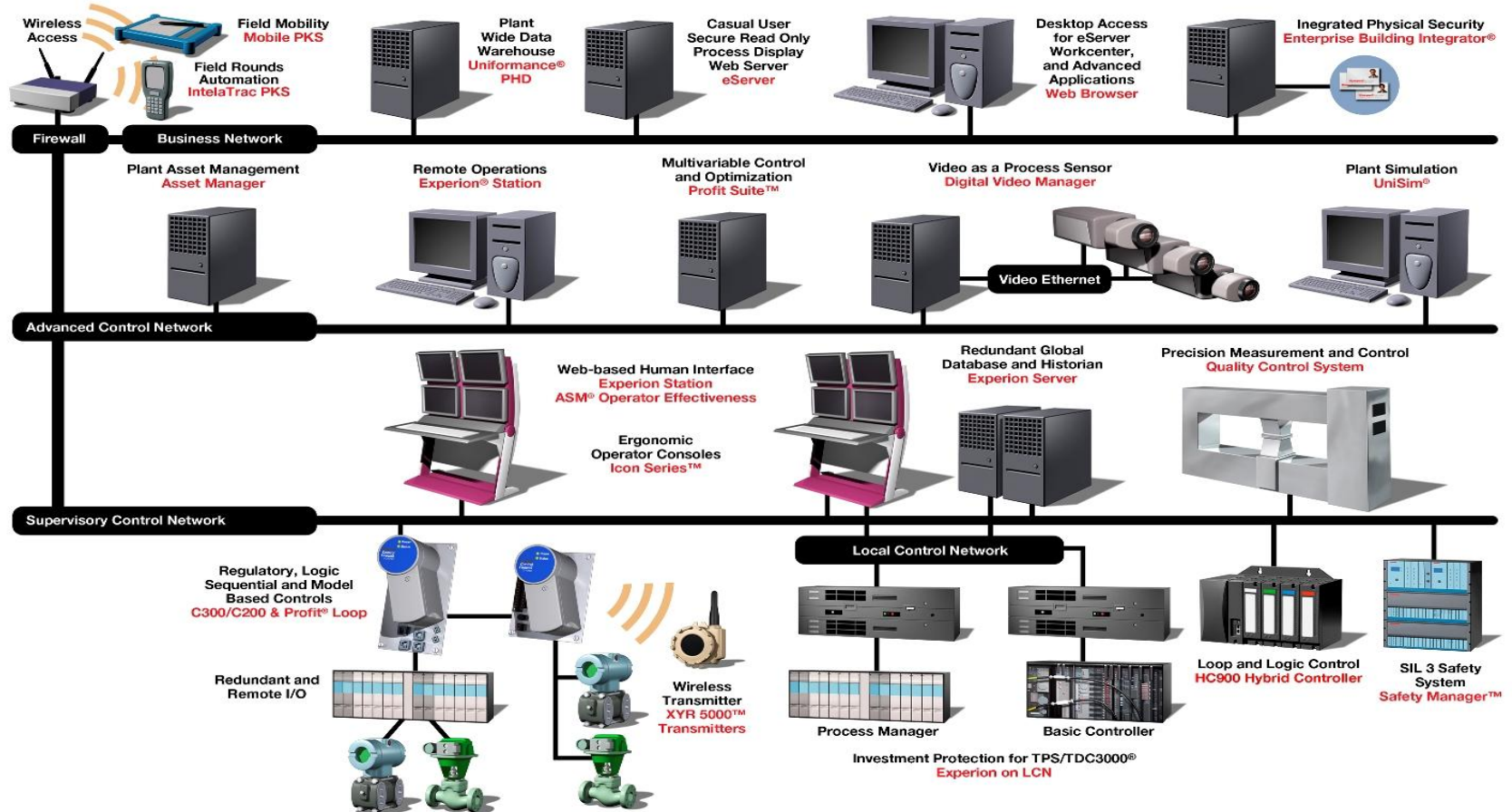
Petro-Chemistry

Being the core of all processes control we are approaching all industries

Experion Process Knowledge System

Advanced Solutions activity

GES activity



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Asset Management

DCS & Historian



Honeywell Sentinel

Asset Manager

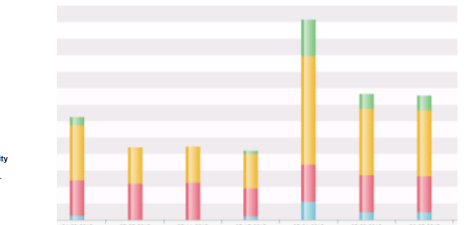
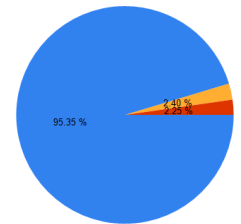
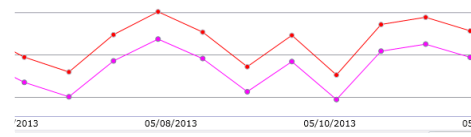
Asset Configuration | Analyze | Maintain | Configuration | Help

Analyze

Health Overview - 19-K-001

AssetName	EventType	FaultName	FaultStatus	StartDate
19-K-001	Symptom	Stage1_Efficiency_L	Active	1/31/2012 2:49:00 P
19-K-001	Fault	Bearing1_Fault	Active	1/31/2012 2:41:38 P
19-K-001	Fault	Stage1_Perf_Warning	Active	1/31/2012 2:41:38 P
19-K-001	Fault	Bearing1_Fault	Active	1/31/2012 2:41:38 P
19-K-001	Symptom	B2_Temp_H	Active	1/31/2012 2:41:38 P
19-K-001	Symptom	B7_VibX_H	Active	1/31/2012 2:41:38 P
19-K-001	Symptom	B3_VibX_H	Active	1/31/2012 2:41:38 P
19-K-001	Symptom	B5_Temp_H	Active	1/31/2012 2:41:38 P

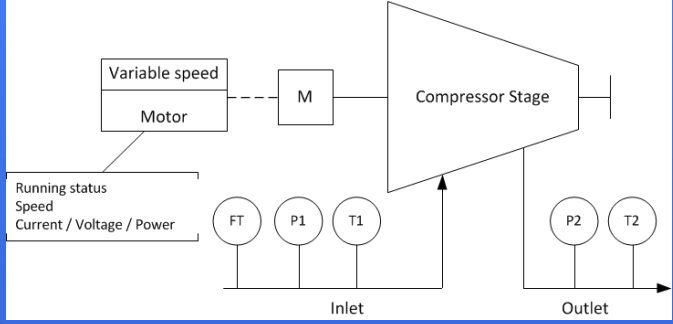
Management Reporting & KPI's



Performance Calculations & Assessment

$$OUT_H = \frac{h2 - h1}{CT_g} = \frac{T2 * CT_CP2 - T1 * CT_CP2}{CT_g}$$

$$OUT_Vol_Eff = 100 - CT_Clear * \left(\left(\frac{P2}{P1} \right)^{\frac{1}{CT_K}} * \left(\frac{CT_Z1}{CT_Z2} \right) - 1 \right)$$



Maintenance & Reliability Users



Asset Overview - 23KA001

Overview	Properties	Attributes
Name	Value	Units
OperatingOutletFluidDensity	23.2384856708626	kg/m ³
OperatingOutletFluidSpHeat	2.49418188697777	kJ/kg·C
OperatingPolyEff	25.0969648260196	%
OperatingPolyExponent	27.4447804495115	
OperatingPolyHead	2922.57676764423	m
OperatingShaftPower	3818.82655941264	kW

EventType	FaultName
Fault	Overall_alarm_690V_MNSIS_MCC
Fault	OPC_Communication_Failure
Symptom	DeviationNPSH_HIGH
Fault	Alert_Pump_Suction_Cavitation
Symptom	Alert_Pump_Head_Deviation_from_Expected
Symptom	Alert_Pump_Efficiency_Deviation_from_Expected

Process values:
Pressure
Temperature
Flow

K1_carcass	Discharge_Press_H		
K1_AH_2	Discharge_Press_L		
B1_Auxiliary	Pump_Load_H		
B1_Exhauster	Pump_Load_L	2/6/2013 8:57:45 PM	
K1_OS	Performance_Warning	2/7/2013 3:14:24 PM	Pump_Efficiency_L Pump_Efficiency_Dev_H
DS_1_MH_1	Performance_Critical	2/7/2013 3:14:24 PM	Pump_Efficiency_LL Pump_Efficiency_Dev_HH
DS_1_F1			

Asset Management

Asset Classes and Types

- Corrosion Erosion Sensor
- Data Source
- Drive
- Electrical Equipment
- FF_DEVICES
- Filter
- Filter
- Fire and Gas Detector
- HART_DEVICES
- Heat Exchanger
- Heater
- Interface Module
- IO Module
- Link
- Logical
- Maintenance Group

Model Configuration - Filter

Associated Models

- Filter_Filter_Perform_calcs
- Filter_Filter_RunningStatus
 - IN_RunStat
 - IN_Q_Calc
 - IN_Q_select
- Filter_Filter_Internal_calcs
 - Filt_K
 - HdP
- Filter_Filter_Fault_models
 - F Filter_Diff_Press_Warning
 - S Filter_DP_H
 - S Filter_DP_HH
 - F Filter>Loading_Warning

Asset Hierarchy

- 27 Score Valves
 - 27HA001
 - 27HA002
 - 27KA101
 - 27DB101
 - 27ER101
 - 27KA101-M01
 - 27KA102
 - 27KA201
 - 27KA202
 - 28 Gas sweetening
 - 29 Water Injection

Attribute Datasource Mapping - 27KA101

Inlet1_Sulfur	Inlet1_Sulfur	0	
Inlet1_SulfurDioxide	Inlet1_SulfurDioxide	0	
Inlet1_Temperature	Inlet1_Temperature		EG-PHE
Inlet1_VolumeFlowRate	Inlet1_VolumeFlowRate		
Inlet1_Water	Inlet1_Water	0	
LastMonthAvgOperatingShaftPower	Siste månedes gjennomsnittlige driftsakseffekt		EG-PHE

Attribute Configuration Limits Configuration

Real Time

Use Direct Mapping

Manual Value:

Read DataSource: EG-PHDC-01-DA-R Tag Name: 27TT1052.Y

Expression

```

pvLow = (PV<PVLo)
pvHigh = (PV>PVHi)
if !IsNan(prevLow) && !IsNan(prevHigh)
then
OscillationFlag = (pvHigh AND prevLow)
OR (pvLow && prevHigh)
Oscillation = H_Count(OscillationFlag,
Now-5M,Now)>3
else
Oscillation=0
endif
prevHigh = pvHigh
prevLow = pvLow
            
```

Filters

- 77 Environment Protection
- 79 Emergency Shutdown
- 80 Main Power U>6_6 kV
 - 80 ABB 800xA
 - 80 Electric Heaters
 - 80 Instruments
 - 80 Motors
 - 80DT001A
 - 80EG001A-COMP
 - 80EG001A-GEN
 - 80EG001A-TURB
 - 80DT001B

Real Time Monitoring Dashboard

Capacity Loss: 14.94 %

Des.IsenEff: 65.9336 %	Opr.IsenEff: 77.50 %
Des.ShaftPower: 6110.56 kW	Opr.ShaftPower: 5198.51 kW
Des.Head: 11976.30 m	Opr.Head: 10188.73 m

Asset Schematic: K-101

- Suction Flow: 10015.00 m³/h
- Disch. Flow: 6800.83 m³/h
- Suction Press.: 23.40 barg
- Suction Temp.: 33.00 deg C
- Disch. Press.: 40.70 barg
- Disch. Temp.: 81.00 deg C

Equipments GES is working with



Ergonomic Operator Console

These process controllers (C200 and C300) are based on Honeywell's proven CEE – Control Execution Environment.



Safety Manager plus RUSIO



The Master Logic is a world class modern day PLC, fully conforming to the IEC 61131-3 standard for PLC programming.

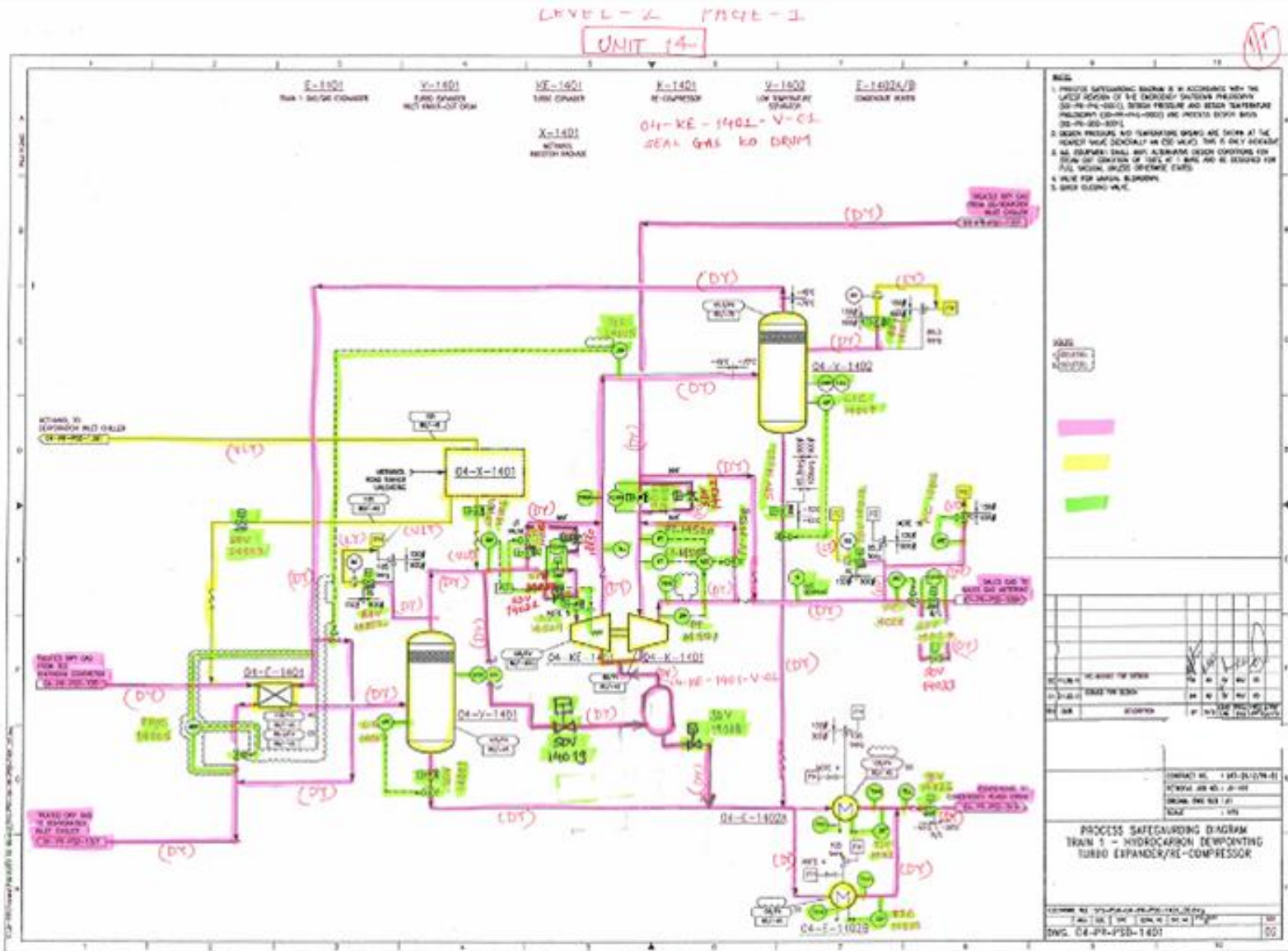
Experion Orion Console - Advanced Operator Touchpanel /Mobile Operator Tablet

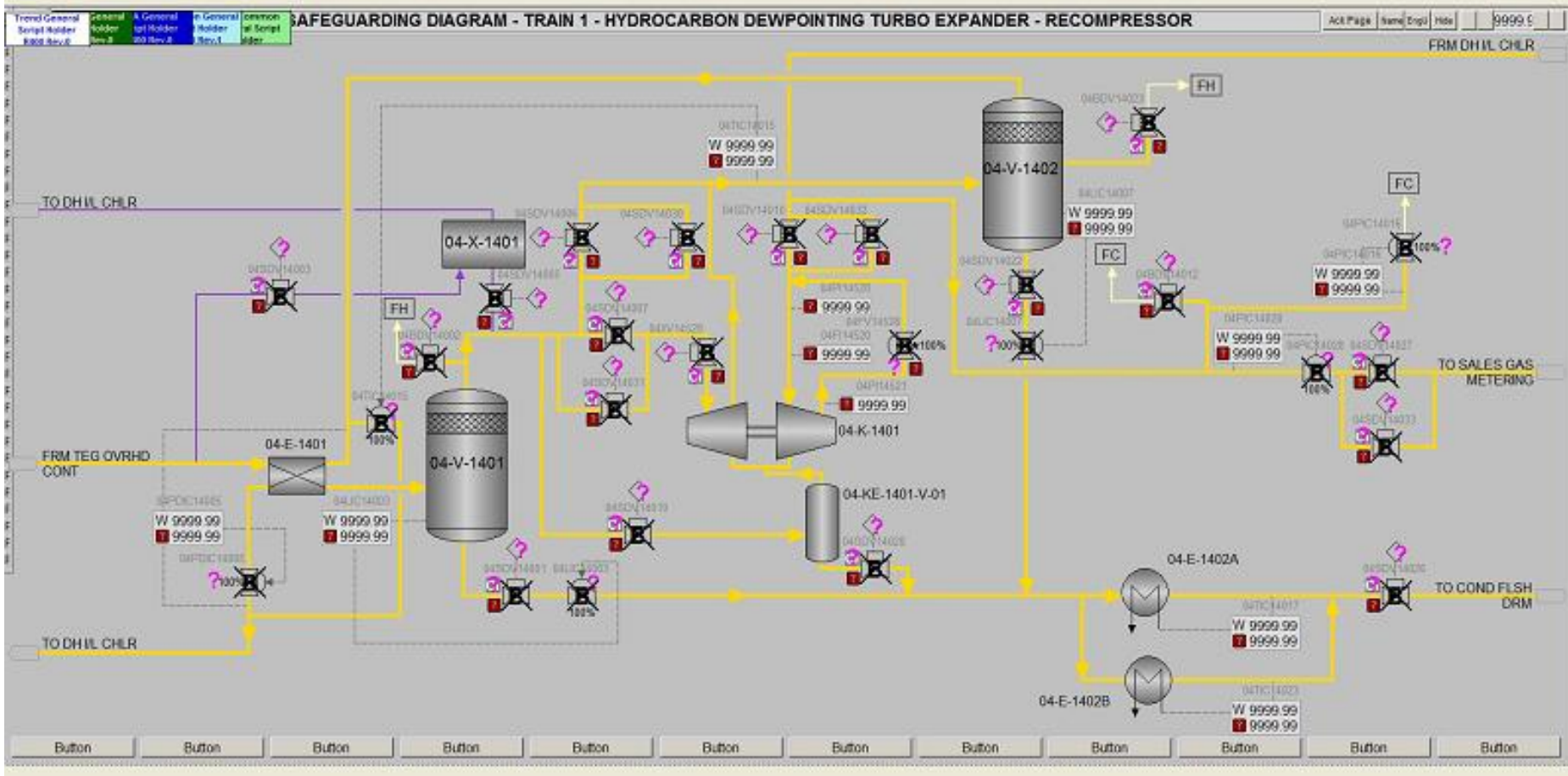
Honeywell

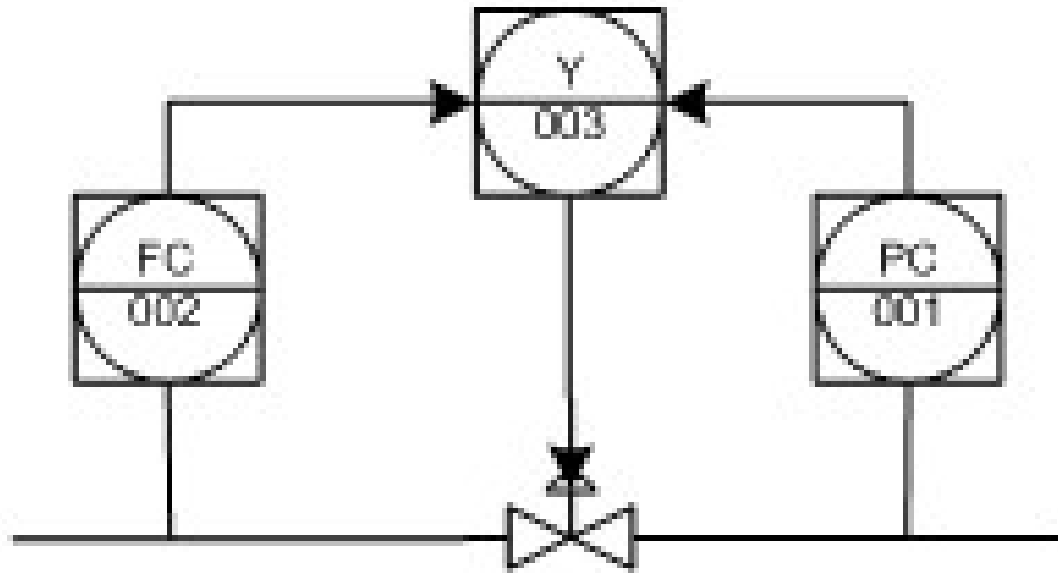
- Large 4K ultra-high def monitors provide contiguous screens supporting flexible display layouts
- Advanced Visualization Elements – Advanced Solution Pack
- Pan and Zoom Displays



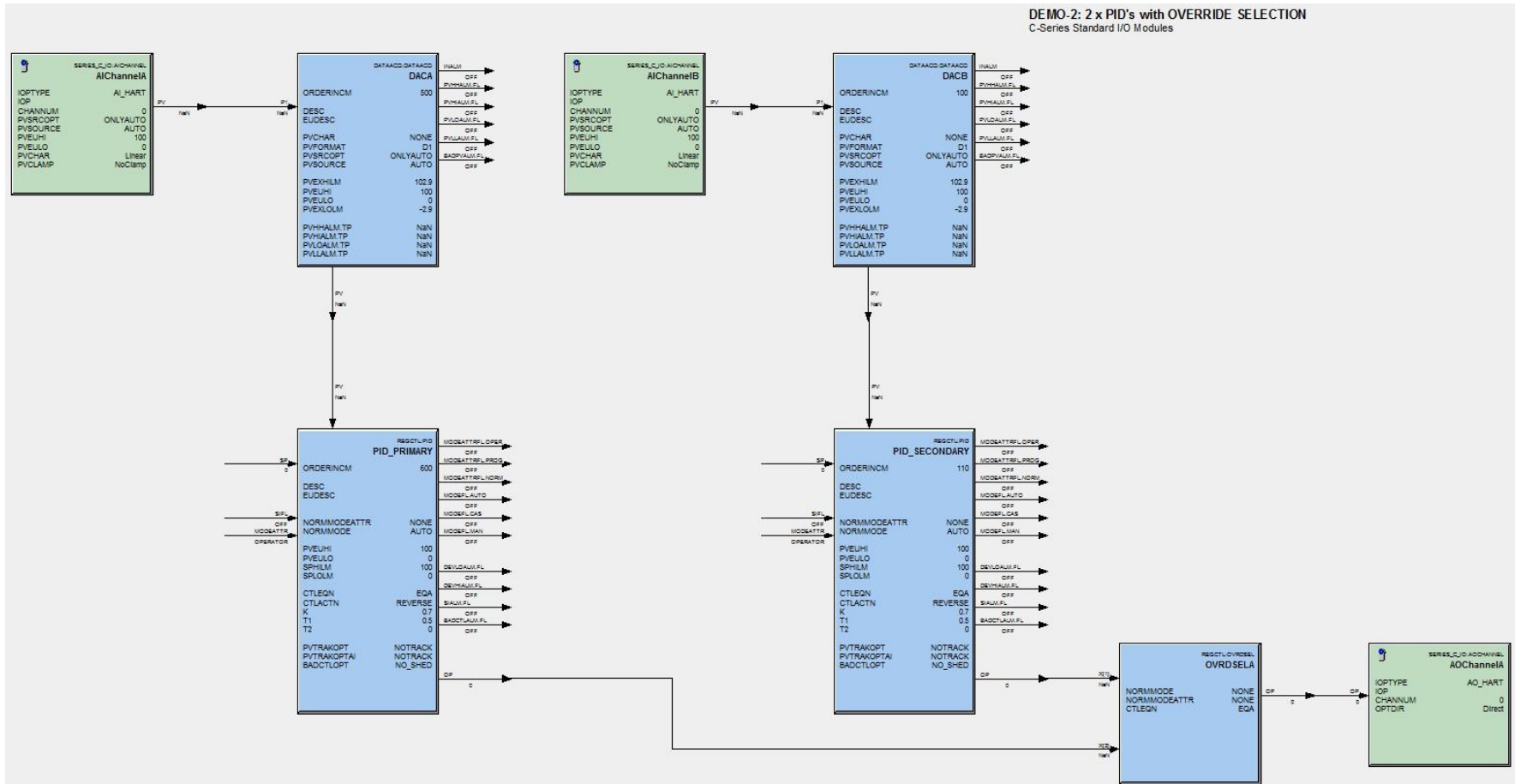
Marked up P&ID (Piping & Instrumentation Diagrams)



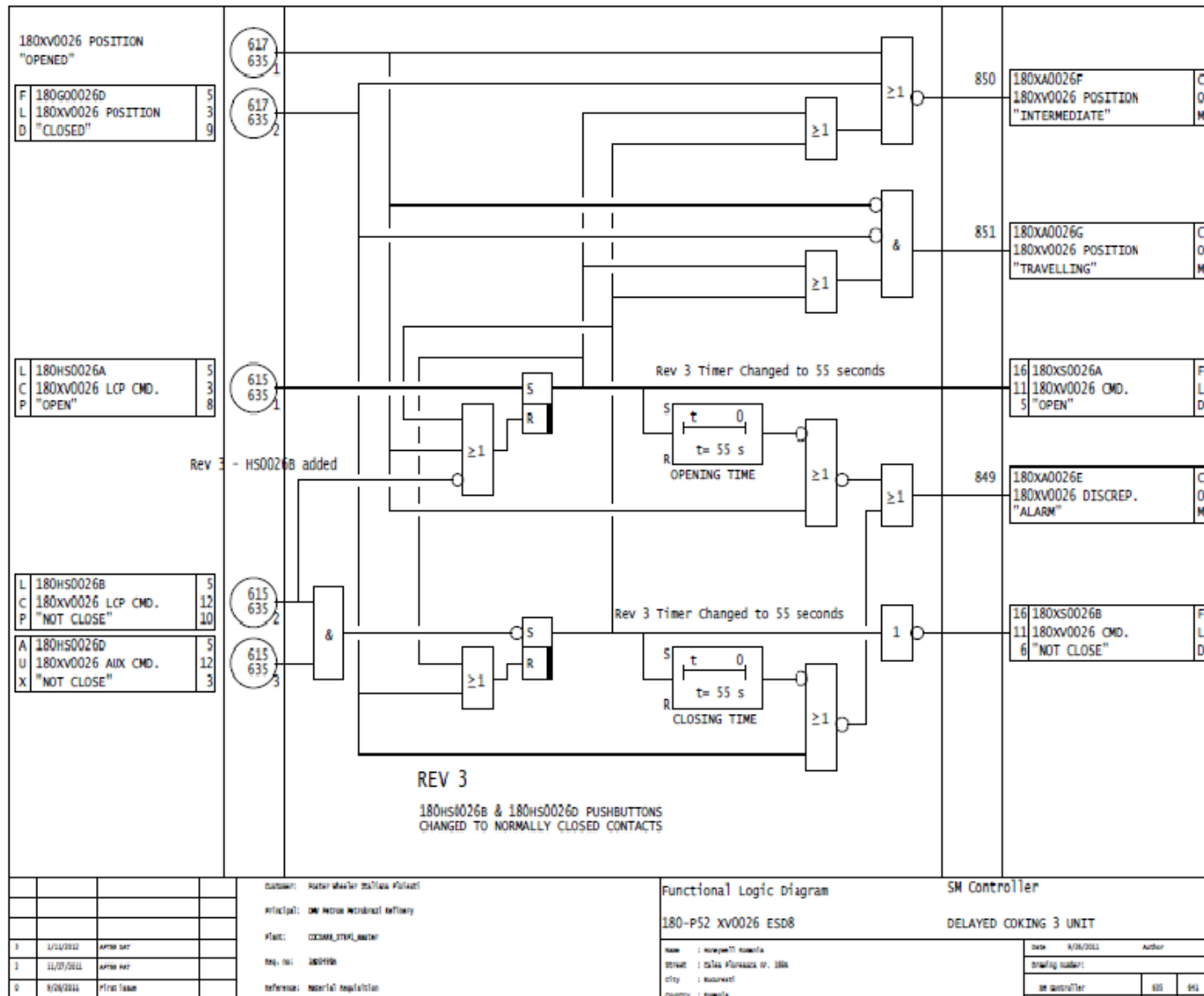


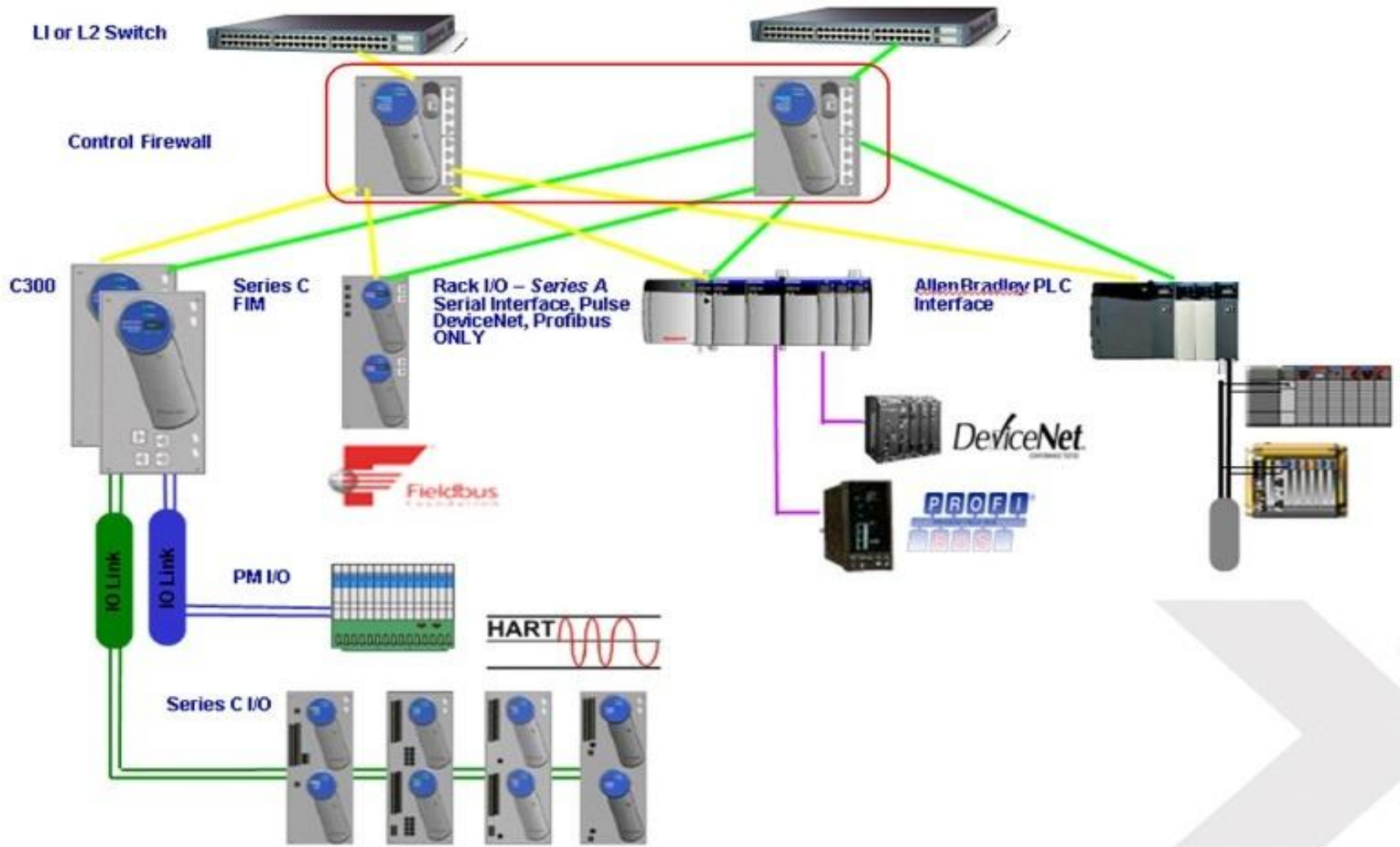


Control PID's with Override Selection

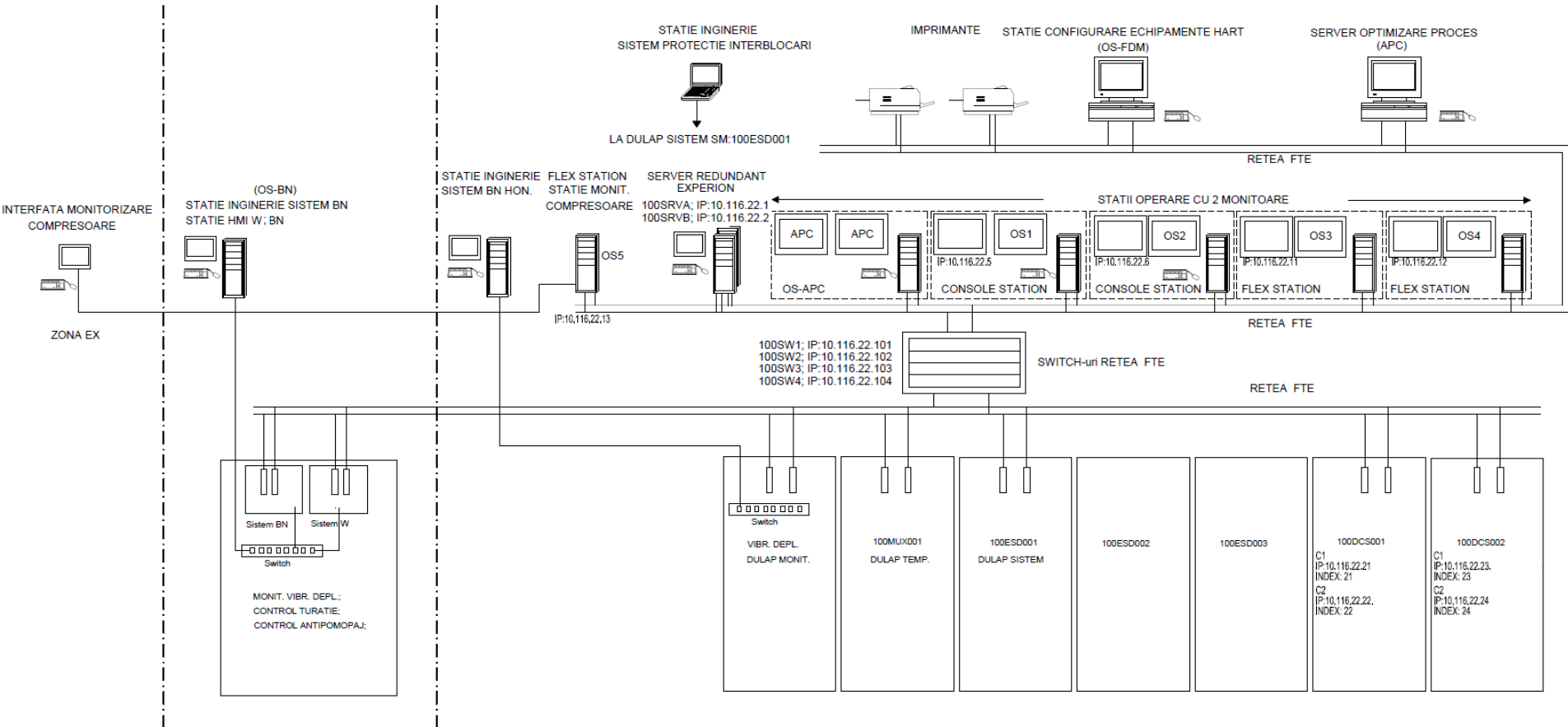


Safety Manager Output Logic

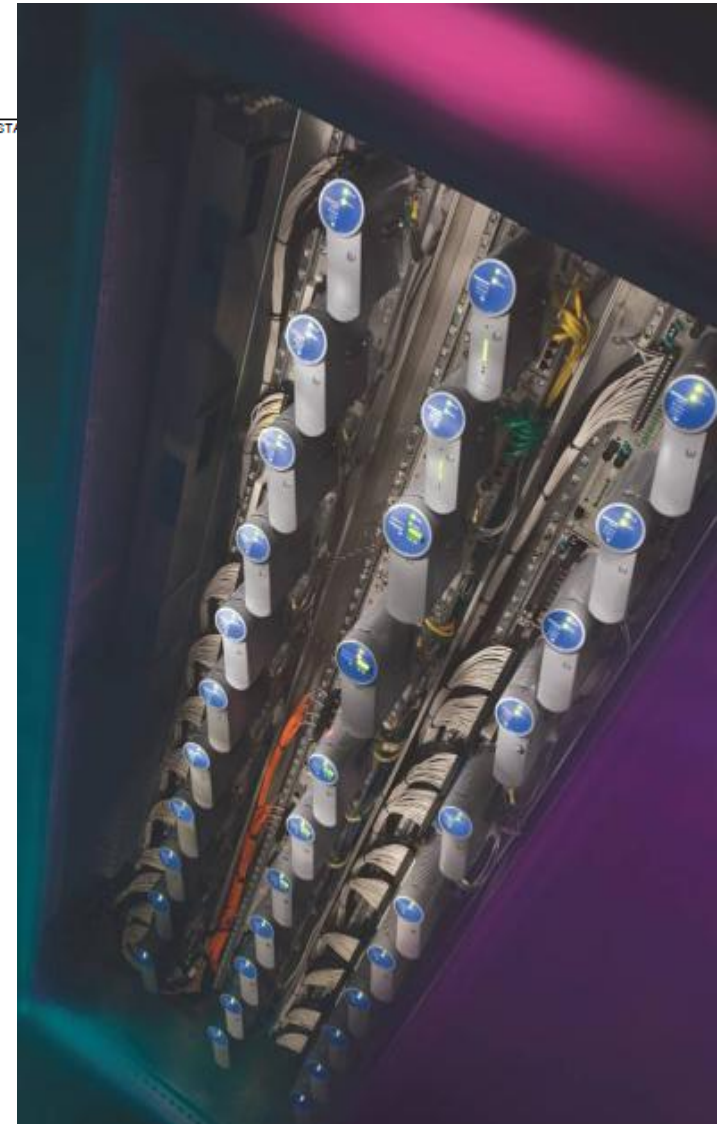
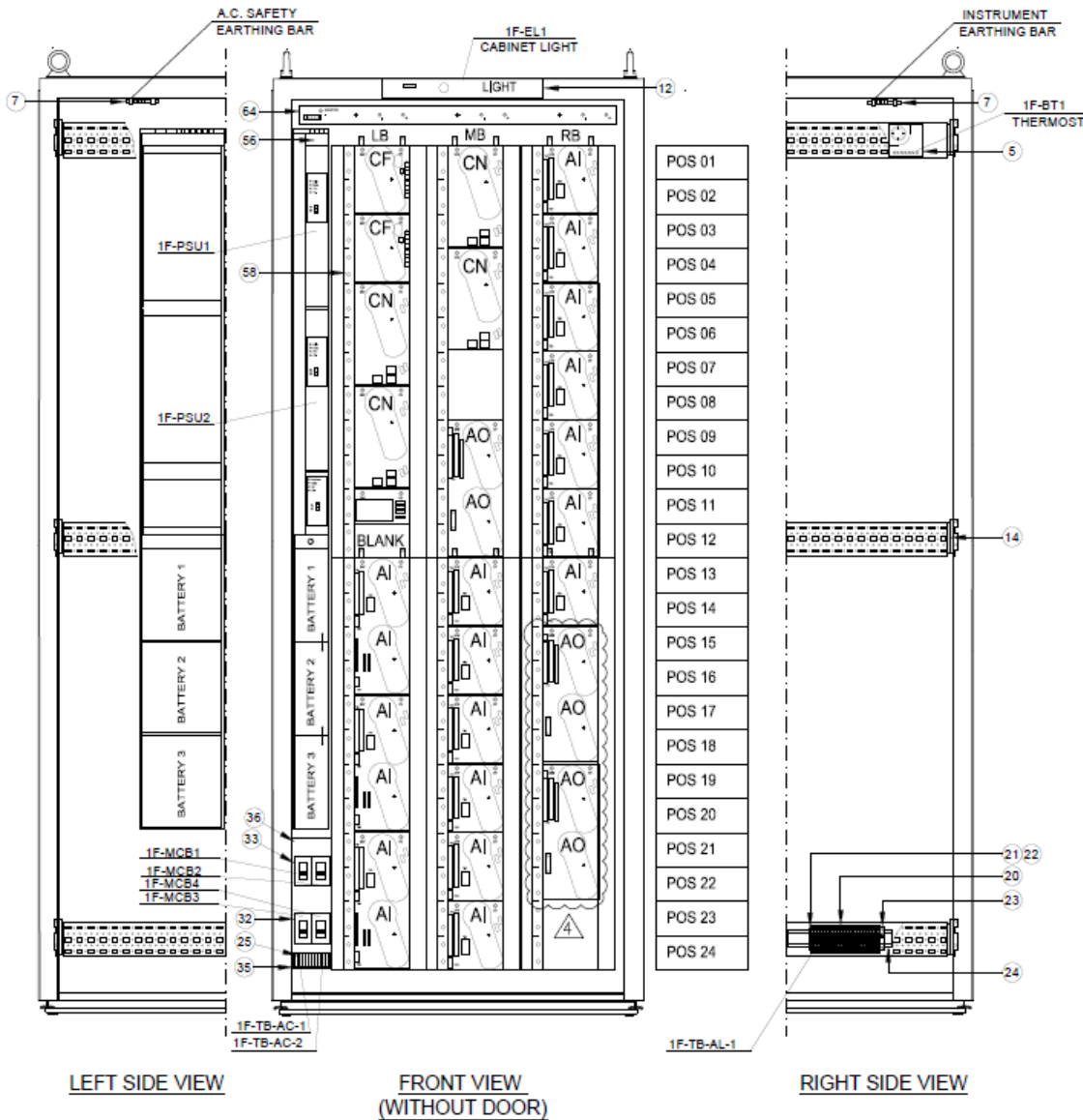




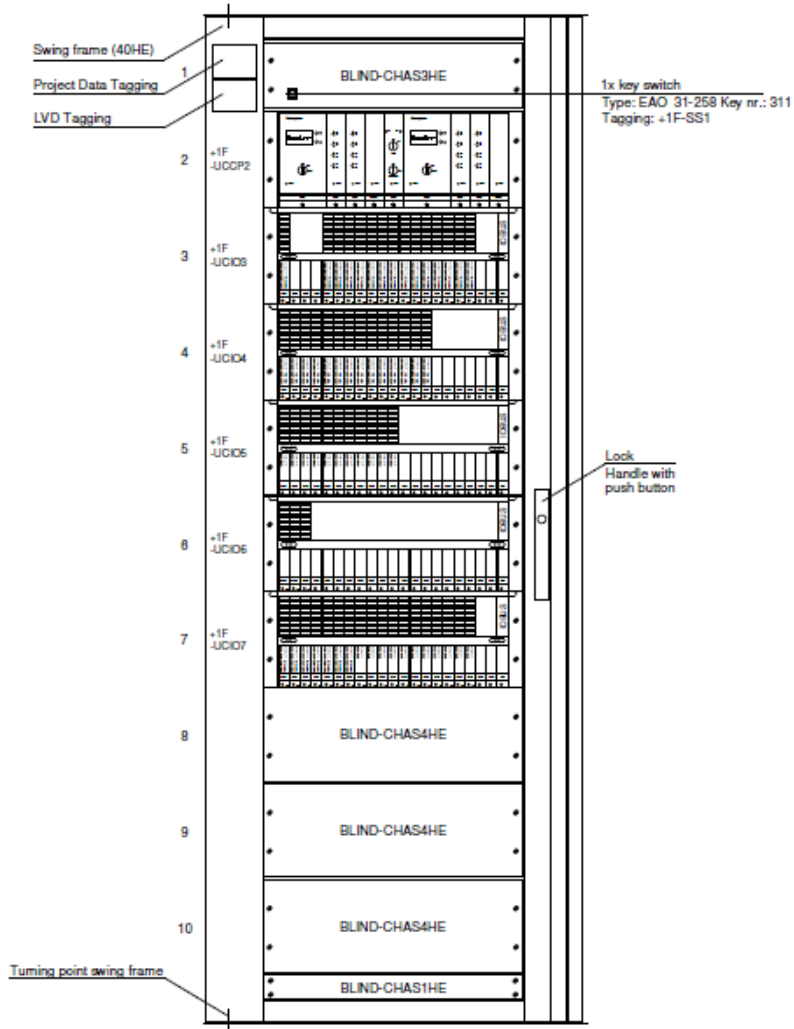
Hardware design - System architecture



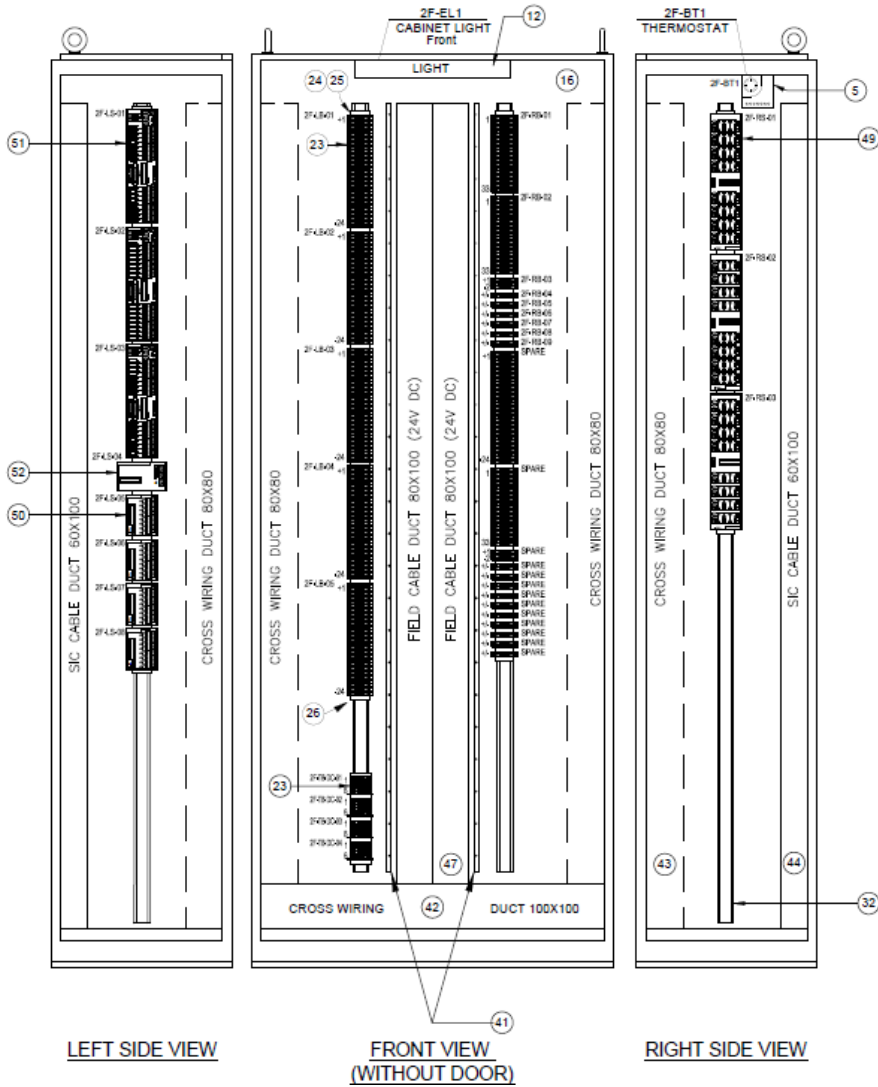
Hardware design – DCS C300 System Cabinet

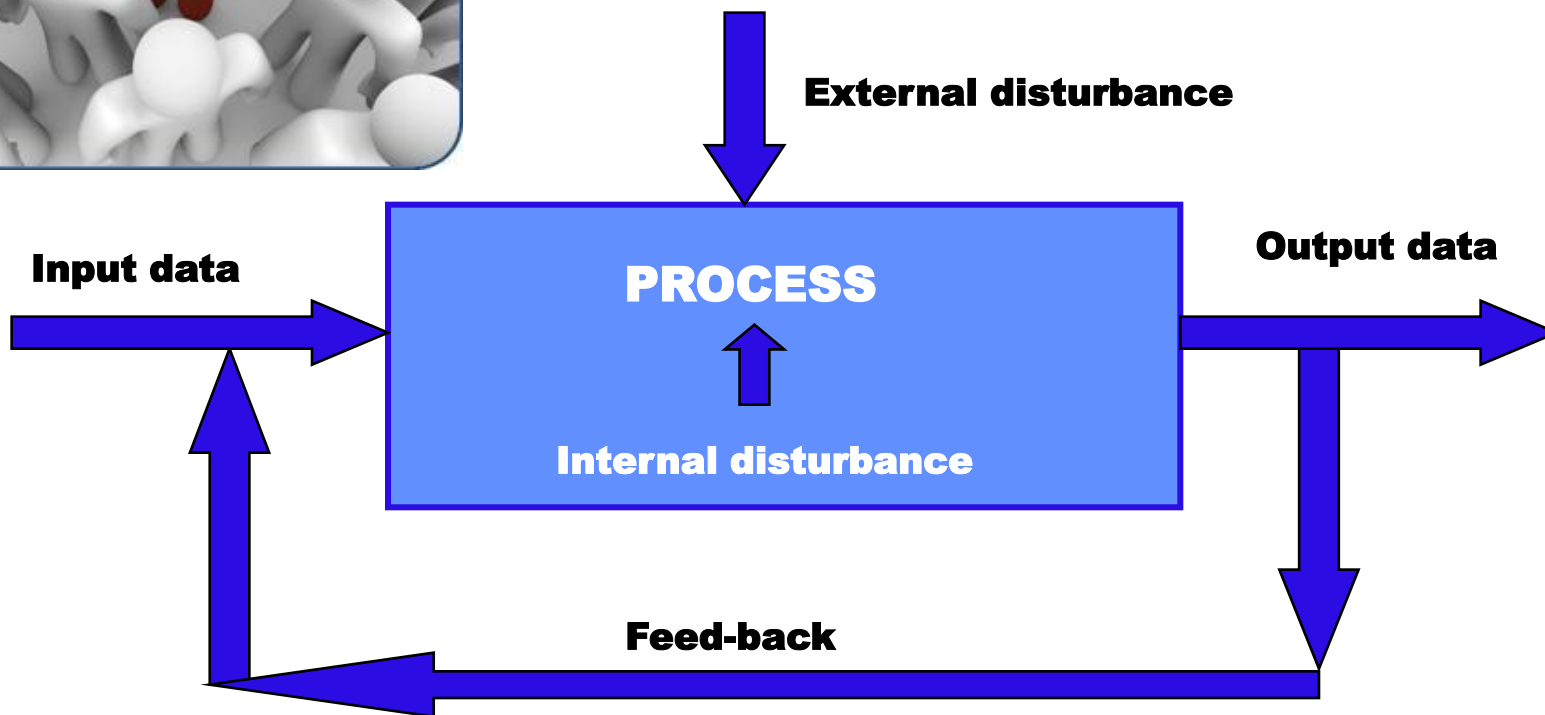


Hardware design – ESD, F&G Safety Manager System Cabinet **Honeywell**



Hardware design - Marshalling cabinet





Feed back loop

Implementarea unui sistem complet de conducere a unei instalații reale dintr-o rafinărie utilizând arhitectura Honeywell Experion PKS și Safety Manager.

Fiecare student va aborda toate disciplinele implicate în dezvoltarea unui proiect de implementare software pentru o instalație dintr-o rafinărie, după următorul program:

- Săptămâna 1 : Introducere în Honeywell și noțiuni generale despre soluțiile de automatizare ale proceselor industriale
- Săptămâna 2-4 : Honeywell Safety Manager – Emergency Shutdown System - dezvoltarea aplicației și comunicația SCADA
- Săptămâna 5-7 : Honeywell C300 – implementarea strategiilor de control
- Săptămâna 8-10 : HMI (Human Machine Interface) – elaborarea interfeței operator a procesului industrial studiat
- Săptămâna 11 : Teste de integrare și funcționalitate

Thank you for your attention !

