

30 Years Of Innovation In Automation

Company Profile

MicroVerse
automation pvt.ltd.

DCS | PLC | SHUT-DOWN SYSTEM | RTU | CUSTOM-BUILT-HARDWARE

Background

Microverse was formed in 1989 by a group of technocrats with a mission to indigenously develop automation systems which compare well in terms of features & performance to those available from giant MNCs for an affordable price.

During last 30 years of operation, Microverse has bagged several prestigious contracts in competition with Giant MNCs. This includes some of the systems with over 10,000 I/Os & features like triple redundancy for mission-critical applications.



Besides over 150 installations in India, Microverse has established excellent references in Bhutan, Oman, Bahrain, and DR Congo.

From our recent developments, Microverse is executing a major project for TOTAL Oil India Pvt. Ltd. (100% owned subsidiary of TOTAL Gaz, France) for a critical project of their LPG handling facility at Mangalore Terminal.

MicroVerse
automation pvt.ltd.

Hitachi High-Tech

**We are proud to announce that
Hitachi Hitech Solutions Corporation, Japan
has partnered with Microverse to promote the
DCS in international markets**

Some of Our References

CAPTIVE POWER PLANTS

Boiler, Turbine, CHP, BOP

- Department Of Atomic Energy – Heavy Water Facility (Manuguru)
- SARDA Energy & Minerals Ltd. (Raipur)
- Shyam Century Ferrous Ltd. (Byrnihat)
- Shyam Sel Ltd. (Mangalpur)
- Shyam DRI Power (Sambalpur)
- Shyam Sel Ltd. (Burdwan)
- Jai Balaji Ltd. (Durgapur)



Some of Our References

CHEMICAL + PHARMACEUTICAL (API) PLANTS

Reactor Automation, Batch & Continuous Distillations, Utility Monitoring and Dispensing, Endothermic & Exothermic Reactions for Hydrogenation, Nitration, Separation, Solvent Recovery, etc.

- **Deepak Nitrite Ltd. (Taloja, Vadodara, Roha)**
- **Apcotex Industries Ltd. (Taloja, Ankleshwar)**
- **Zydus-Takeda (Navi Mumbai)**
- **Cadila Pharma (Ankleshwar)**
- **Acmechem Pvt. Ltd. (Panoli)**
- **Diamines and Chemicals Ltd. (Vadodara)**

Some of Our References

CHEMICAL + PHARMACEUTICAL (API) PLANTS (contd.)

- **Melog Specialty Chemicals Ltd. (Ambernath)**
- **Falcon Chemicals LLC (Dubai)**
- **Indofil Chemicals Ltd. (Mumbai)**
- **Department Of Atomic Energy Boron Enrichment Plant (Manuguru)**
- **Glaxo SmithKline Pharmaceuticals Ltd. (Thane)**
- **Advanced Fluorine Technologies Pvt. Ltd. (Hyderabad)**



Some of Our References

OIL AND GAS

Oil and Gas Handling, Storage, and Terminal Automation

- **Total Oil India Pvt. Ltd. – A subsidiary of Total Gaz, France**
 - **LPG Blending system at Jetty**
 - **Monitoring of Cross Country Pipeline**
 - **Remote Monitoring System**
 - **Main plant automation for LPG storage, blending, dispensing**
 - **Automotive Gas Distribution**
- **Aegis Gas Ltd. Distribution Network Monitoring - Various**

Some of Our References

OIL AND GAS

Oil and Gas Handling, Storage, and Terminal Automation



TOTAL OIL INDIA PRIVATE LIMITED - LPG DIVISION

Certificate of Appreciation

Awarded to

Mr. GIRISH MEHENDALE

of

MICROVERSE AUTOMATION PVT. LTD.

On 14th August 2015 for the services rendered towards completion of the
Unloading Arm project work at Jetty #13, New Mangalore Port Trust

CLAUDE LE DAMANY
CEO - LPG Division



GIRISH KOTBAGI
Vice President – Operations & Logistics

MicroVerse
automation pvt.ltd.

30 Years Of Innovation In Automation



Some of Our References

FERRO ALLOY, SPONGE IRON & COPPER SMELTING PLANTS

Raw Material Handling, Weighing & Batching, Furnace Feeding,
Resistance / Current Controls, Electrode Slipping, Utilities

- **SARDA Energy & Minerals Ltd. (Raipur)**
- **Al Tamman Indsil Ferro Chrome LLC (Sohar, Oman)**
- **Rubamin SPRL (D R Congo)**
- **Somika (D R Congo)**
- **SWIL Ltd. (Bharuch)**
- **Indsil (Raipur)**
- **SAL Steel Ltd. (Gandhidham)**
- **Visa Bao Ltd. (Jajpur)**

Some of Our References

FERRO ALLOY, SPONGE IRON & COPPER SMELTING PLANTS (contd.)

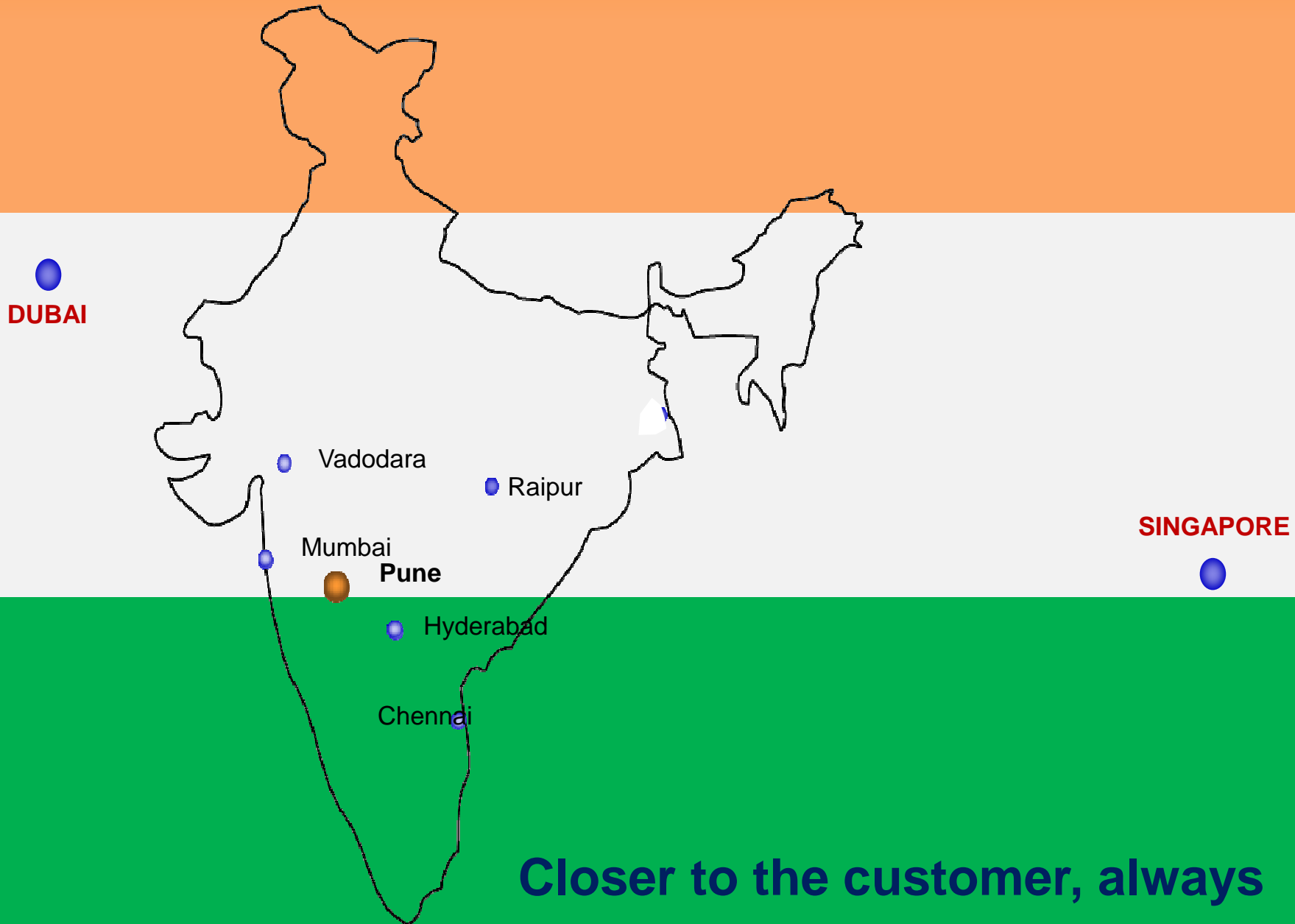
- Bahrain Alloys & Ferro Alloys Ltd. (Bahrain)
- Bhutan Carbide & Chemicals Ltd. (Bhutan)
- Druk Wang Ferro Alloys Ltd. (Bhutan)
- Druk Ferro Alloys Ltd. (Bhutan)
- Ugen Ferro Alloys Ltd. (Bhutan)
- Mangilal Rungta Ferro Alloys Ltd. (Dhenkanal)
- Stork Ferro Alloys Ltd. (Balasore)

Some of Our References

SOME SPECIALTY PROJECTS

- Terminal Automation Systems - Hindustan Zinc Ltd. (Chittorgarh)
- Automated Bridge Laying Systems For Tanks - DRDO (R & D Dighi)
- Automated Bridge Laying Systems For Amphibious Vehicles –
DRDO (R & D Dighi)
- Automated Test Jig For Aircraft Power Transmission
Components - Hindustan Aeronautics Ltd. (Koraput)

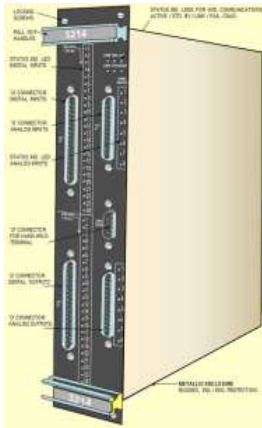
Our Sales and Support Centers



Product Range

DCS and PLC Systems

MICROSYS 3200E



MICROSYS 3200ET



Allied Products

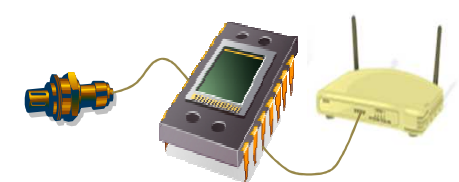
Signal Isolators



Terminal Automation Systems

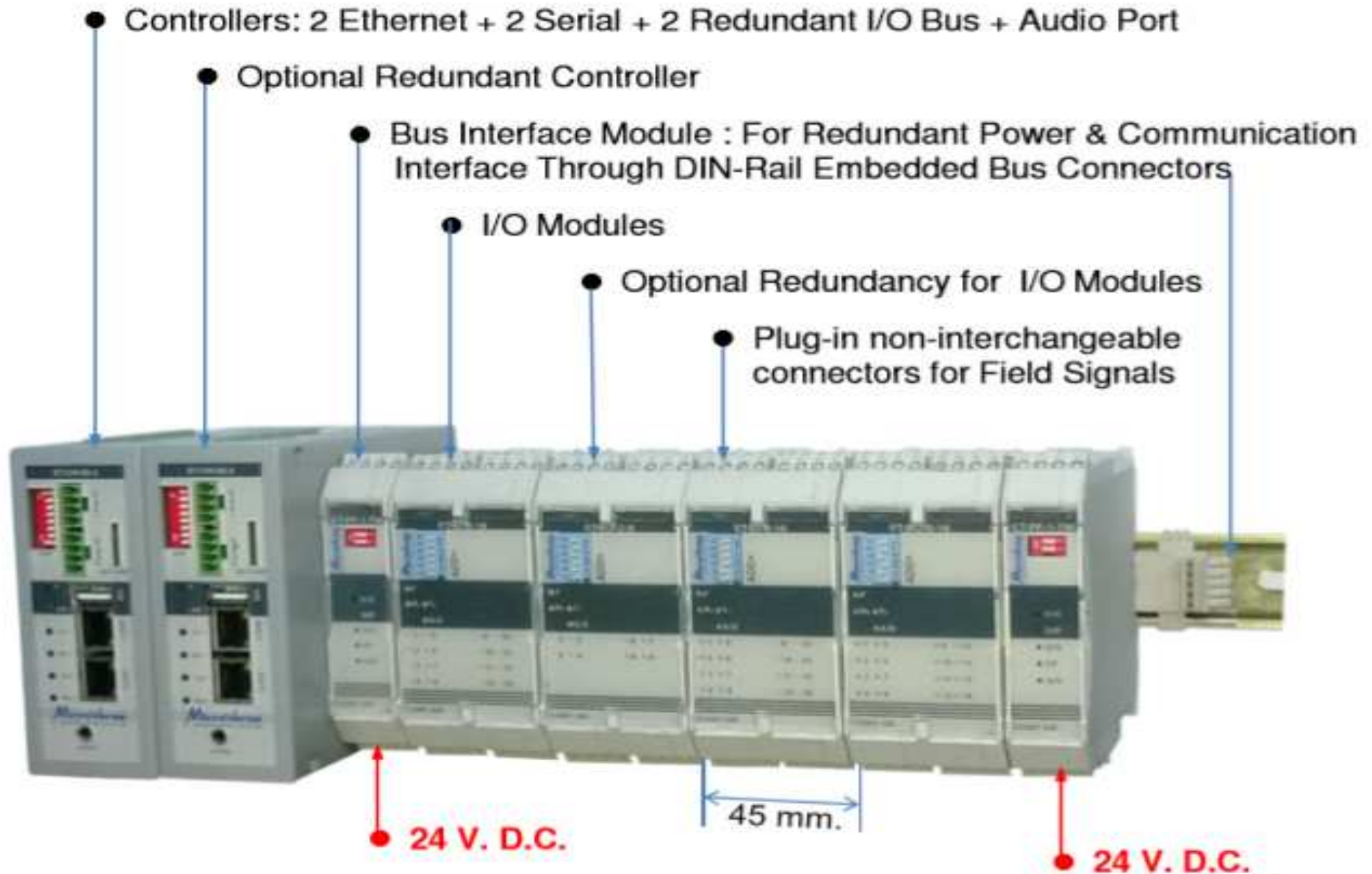


Custom-designed Products



MICROSYS 3200 ET System Elements

Advanced, Compact, and a True DCS



MICROSYS 3200 ET System Details

Some of the important features relevant to automation of Batch Processes

Software Features

- **Complete SOP defined and configured in the system with xl sheets**
- **Multiple Recipes can be configured for the same reactor**
- **Simultaneous operation of multiple recipes in multiple reactors**
- **Synchronization of steps among different reactors**
- **Individual Steps can be configured for Automatic / Manual / Semi Automatic**
- **Extensive library of Function Blocks like 'Time – Temperature Profile Curve'**
- **Simulation Tools for complete process control logic prior to actual implementation**

MICROSYS 3200 ET System Details

Some of the important features relevant to automation of Batch Processes

Hardware Features

- **Audio Output with Public Address Amplifier for Operator Guidance in the plant as well as in the Control Room**
- **Low power consumption, low temperature rise, system can be housed in enclosures close to individual reactors: Savings in cabling, easier maintenance**
- **All I/Os voltage and current limited to Haz Area Gr IIA / IIB / IIC specs**
- **SMS Alerts over Mobile Phones for Process Upsets**

MICROSYS 3200 ET Configurations

Small Compact System with optional local HMI

Stand-alone system

Can be housed in flame-proof enclosure
for hazardous area applications



Typical Configuration with Less than 500 I/Os

Redundant communication links between Controller & OS/ES

Redundant Controllers

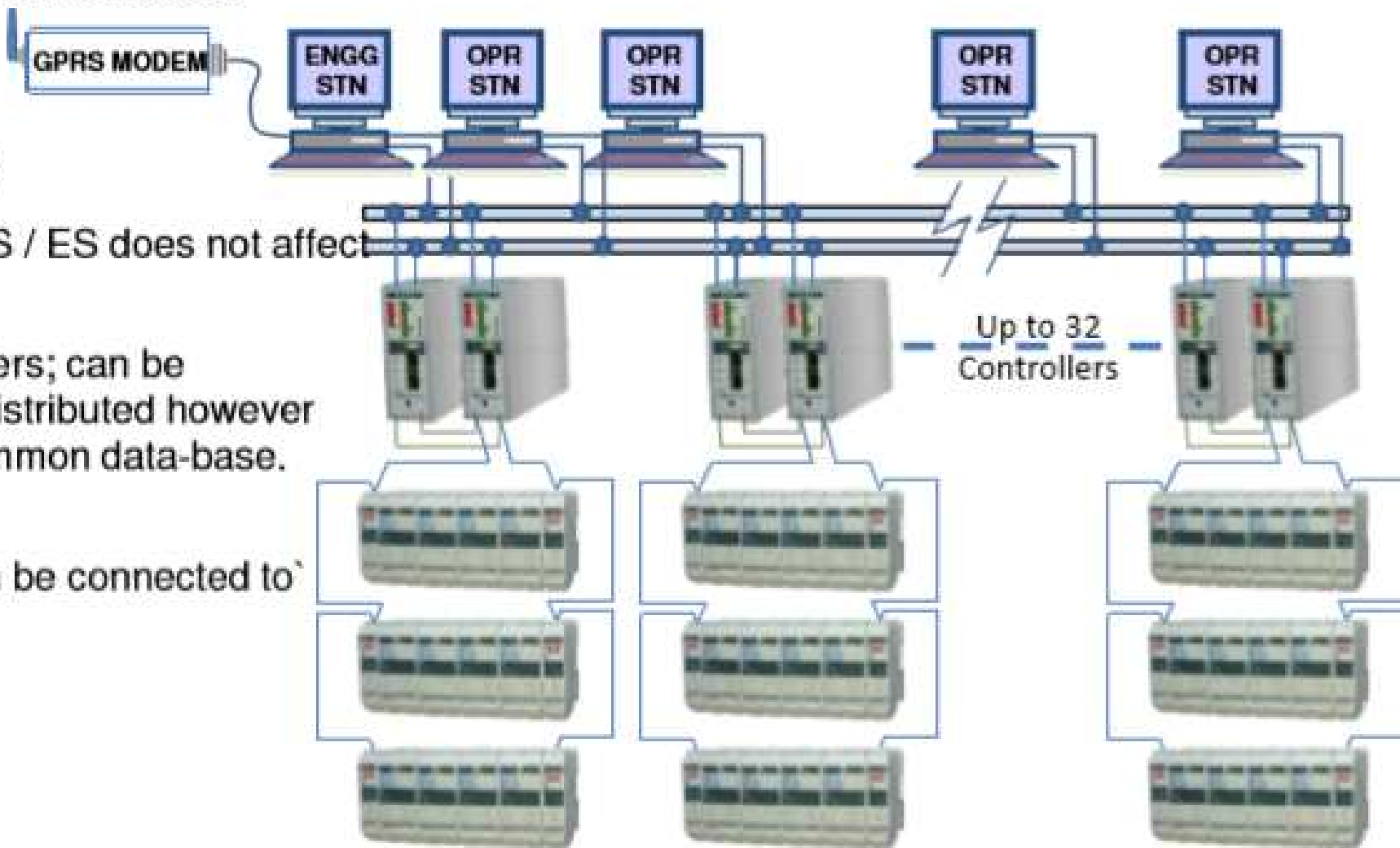
Event-based Audio Annunciation of pre-recorded messages

Redundant I/O Bus communication

Optional I/O Redundancy for critical channels



MICROSYS 3200 ET Configurations – Typical Large Installation



Multiple OS / ES

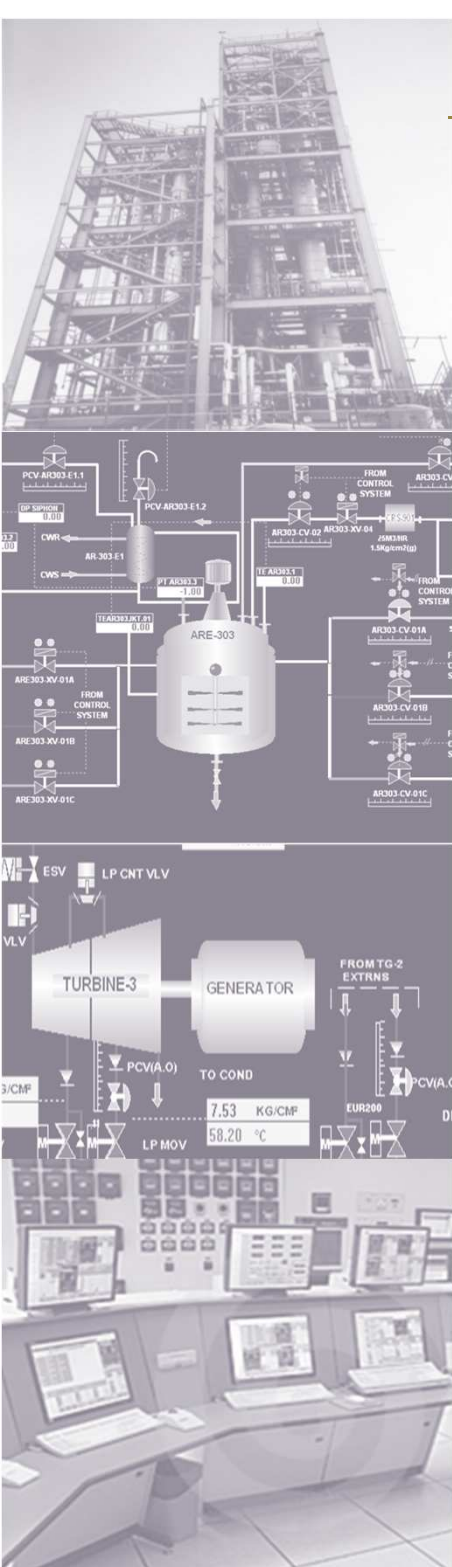
Failure of any OS / ES does not affect plant operation

Multiple Controllers; can be geographically distributed however operate on a common data-base. A true DCS.

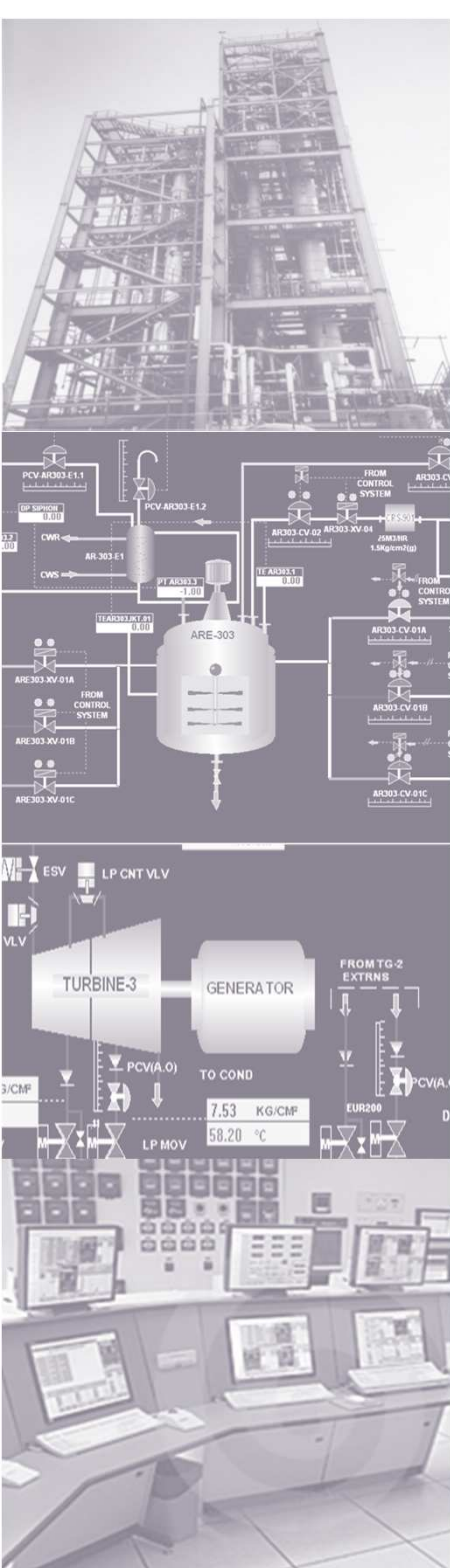
Remote I/Os can be connected to Controllers

SCADA Screens From Some Of Our Installations

- **CHEMICAL / API PROJECTS : HYDROGENATION, NITARTION, DISTILLATIONS, REACTOR AUTOMATION**
- **CAPTIVE POWER PLANTS**
- **FERRO ALLOYS**



Reactor Automation



InstantHMI: Runtime - [2R1_1.scr]

HOME SCREEN 5R1 REACTOR 3R1 REACTOR TRENDS RETURN REPORT ALARAM

KSM 6 - 2R1

0 **BATCH START??** ACK STEP

2R1 BATCH TIME

HRS : MIN : SEC

0 : 0 : 0

Date: 05/03/2018
Time: 09:54:20

2R1 BATCH BATCH START BATCH STOP

2R1 AGITATOR AGT START AGT STOP

2R1 VACUUM PUMP F/B ● ●

SETTINGS DISPLAY

UTILITY PARA.

UTILITIES

2R1 CV_N2 2R1 CV_VENT 2R1 VAC 2R1 CV_H2 2R1 H2

2R1 N2 2R1 CLWS 2R1 CHWS 2R1 HWS 2R1 CV_CLWR 2R1 CV_CHWR 2R1 CV_HWR

2R1 PT 2R1 TT 2R1 TT 2R1 TT 2R1 TT

0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

SEAL OIL PRESSURE 0.0

2R1-REACTOR

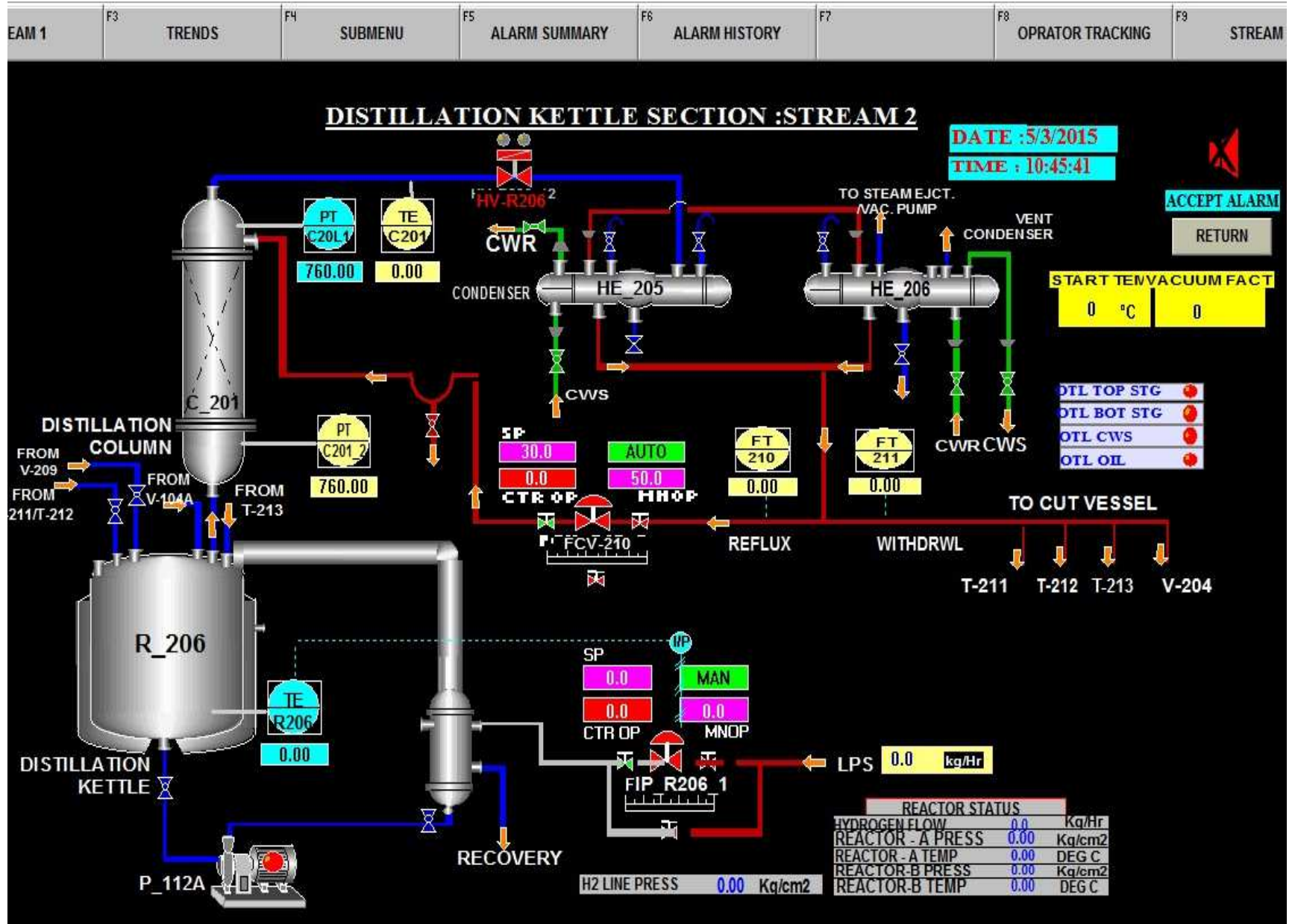
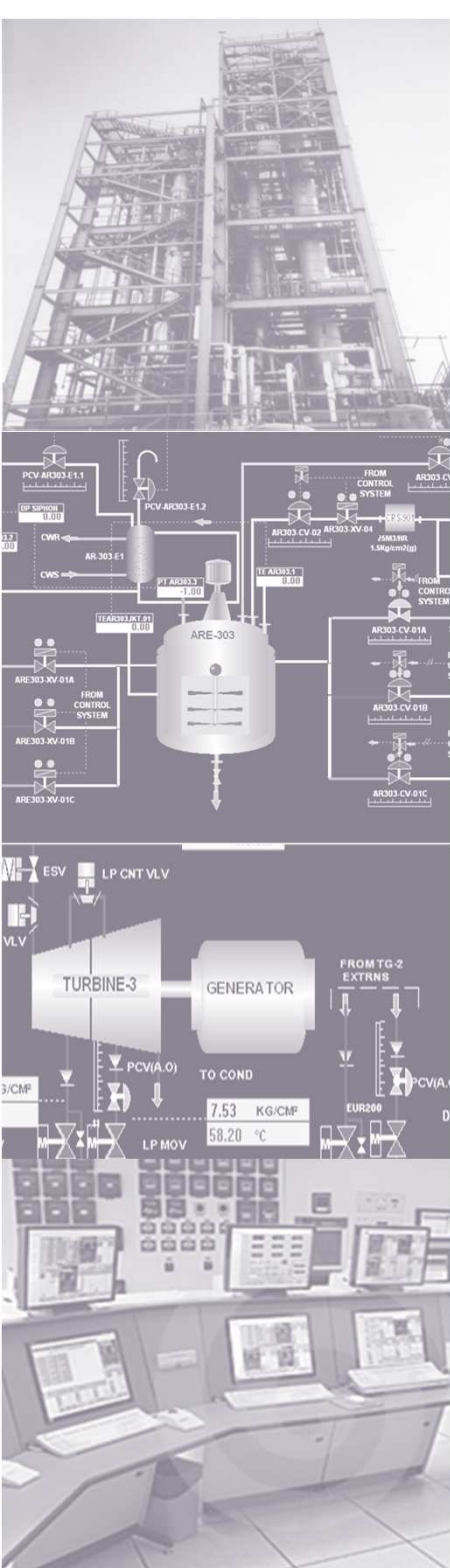
P = 0.0 KG/CM²

T = 0.0 °C

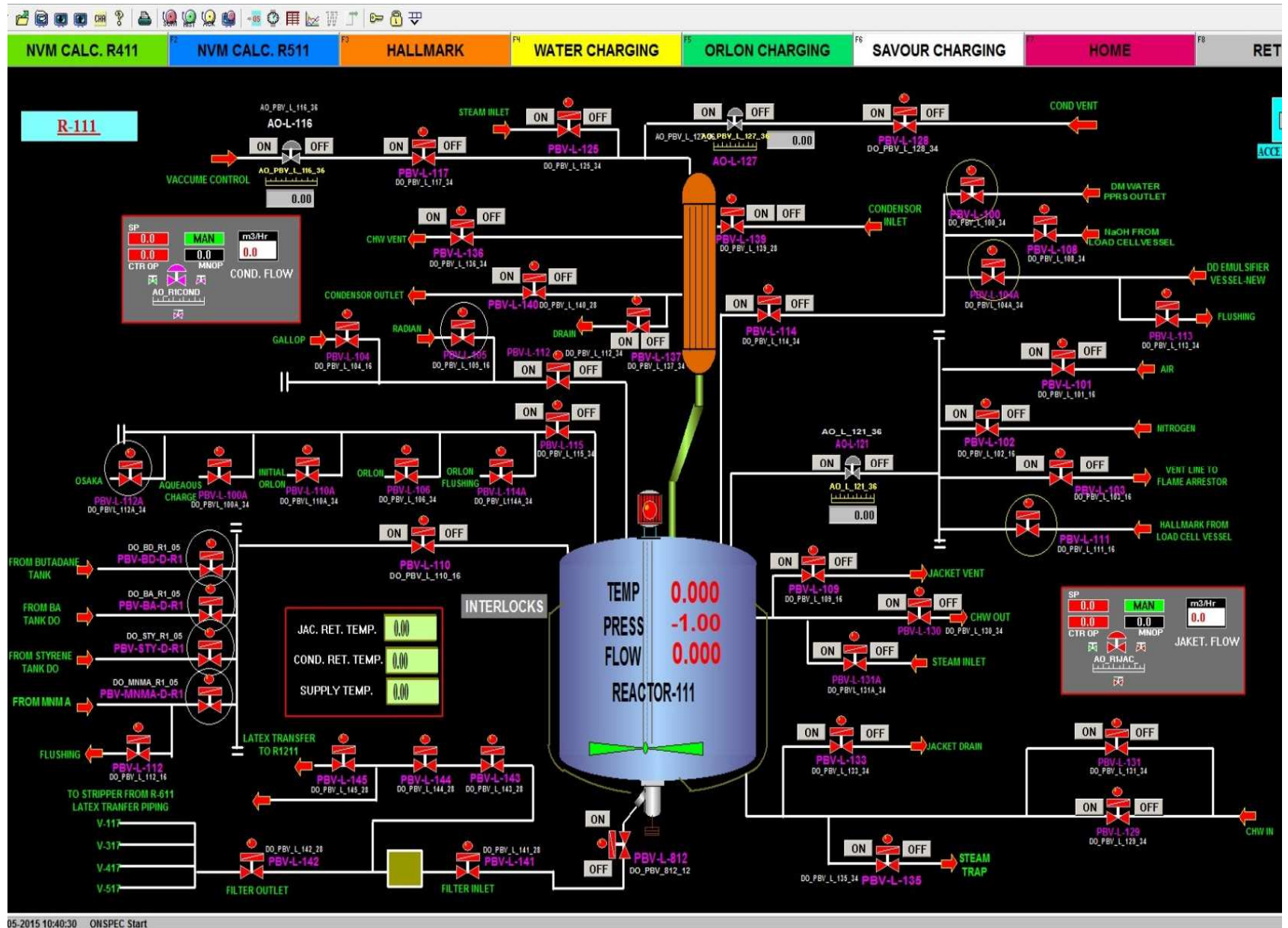
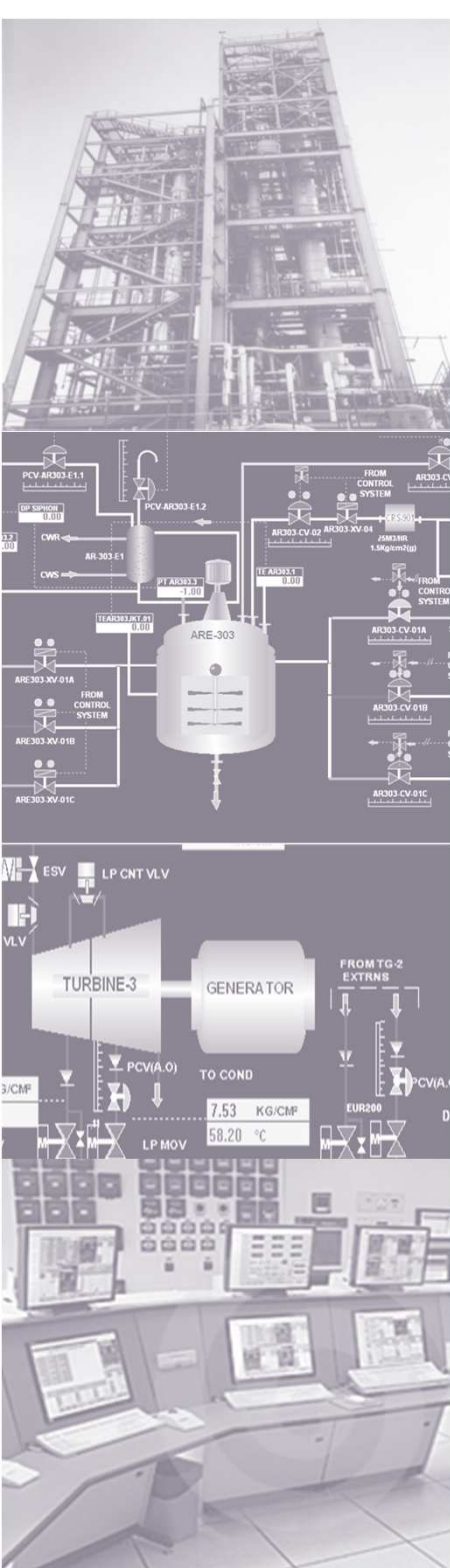
UTILITY TEMP. 0.0

Ready No Alarms No Errors Key OK NUN

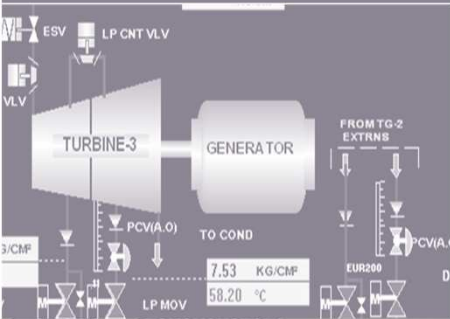
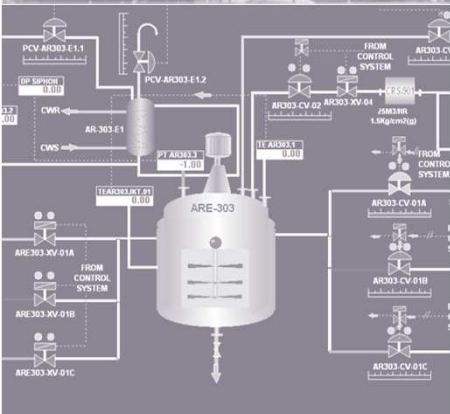
Batch and Continuous Distillations



Nitration Process Control



Polymerization Processes



STYRENE TO SCH (GLR-111)

BATCH NO : 0

DATE : 02/08/2016

TIME : 08:00:21 PM

BATCH NO : 0

STEP NO : 0

STEP TIME : 0 : 0 (HH:MM)

BATCH TIME : 0 : 0 (HH:MM)

Batch Start?

OK

BATCH START STOP PAUSE ACK DONE

BLACK GOLD ORG PVT LTD.

SYSTEM AUTOMATION BY

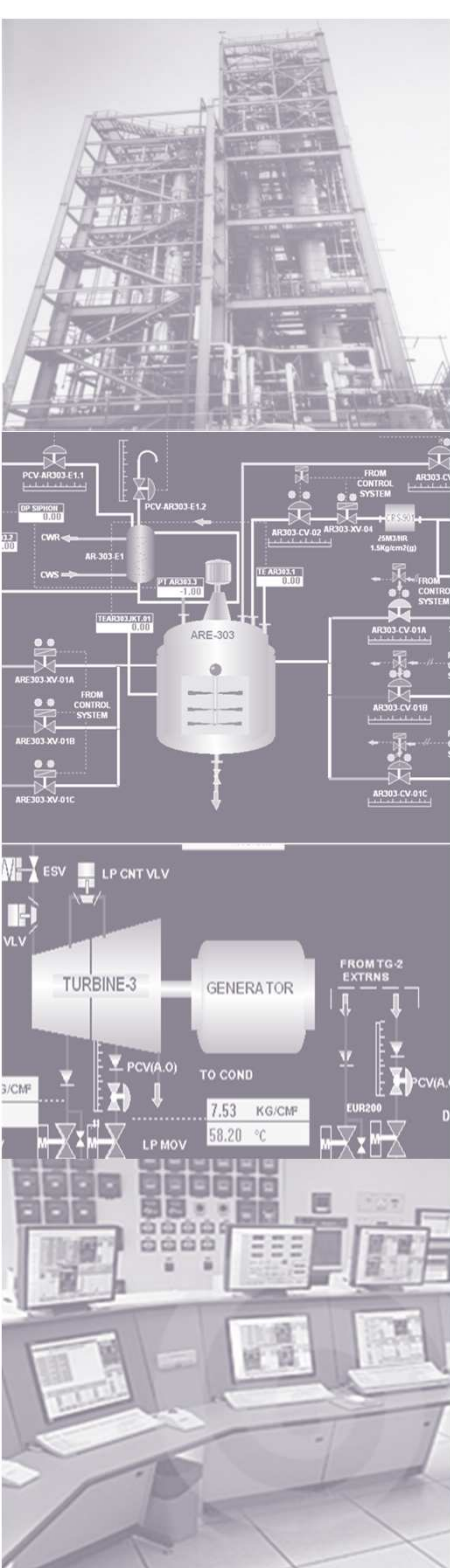
TOTAL QTY CHARGED IN REACTOR: 0

TOTAL OUTFLOW: 0

SETTINGS FOR STY TO SCH

STYRENE TO SCH
SCH TO SO
SO CRUDE TO SOTTO
SOTTO TO SO
HYDROGENATOR-A
HYDROGENATOR-B
PEA DISTILLATION
DISTILLATION
ALARM
SYSTEM DIAGNOSTICS
HOME

Hydrogenation Process Control



InstantHMI Runtime - [HR-103A.scr]

SLURRY AND MELTING VESSEL	CATALYST PREP	R-103A REACTOR	PHW SYSTEM	DEHYDRATION SYSTEM	CW SYSTEM	ALARM	PLANT OVERVIEW	HOME SCREEN	ALARM ACK
BATCH OVERVIEW		PARAM SETTING HR-103A			ALARM SETTING				

REACTOR-103A

NO OF TIME CYCLE REPEAT: 0
 LOW SP: 0.00 KG/CM2
 HIGH SP: 0.00 KG/CM2

BATCH NO: 0
 STEP NO: 0
 BATCH TIME: 0:00
 STEP TIME: 0:00

START WITH NEW BATCH? [OK] [CONFIRM] [TIME EXCEED]

ALL MAN

MANUAL AUTO

FROM MELTING VESSEL SOV_0109

NITROGEN IN FT0101 0.00 Kg/hr

HYDROGEN IN FCV_0101 0.00 Kg/hr

TOTALIZER - FT0101: 0.00
 TOTALIZER SP: 0.00 [RESET]

HOT OIL RETURN

HOT OIL SUPPLY TI_0108 0.0 °C

TO CATALYST FILTER

LS-122A, LS-122B, PS-122A, PS-122B, TP-122A, TP-122B

HR-103A

PI_0102 0.00 Kg/cm2
 PI_0103 0.00 Kg/cm2

SOV_0105, SOV_0103, SOV_0102, SOV_0106, SOV_0104, SOV_0101, SOV_0108

PCV_0101 0.00 Kg/cm2

TI_0106 0.0 °C, TI_0110 0.0 °C, TI_0107 0.0 °C, TI_0109 0.0 °C

SP-1 0.0 °C, SP-2 0.0 °C, SP-3 0.0 °C

AG 0 HZ

TCV_0101, TCV_0102, TCV_0103

MAN CTROP MNOP

AIR PRESSURE PT_0106 0.0 KG/CM2
 N2 PRESSURE PT_0107 0.0 KG/CM2

TO EXPANSION TANK

TO EXPANSION TANK

CATALYST IN

HOT WATER TO PHW TANK

TO COND 7.53 KG/CMF, 58.20 °C

1) ENTER O CONTAIN 0.00 %
 2) ENTER WTR QTY FOR CATALYST LINE FLUSH 0.00 KG
 3) ENTER WTR QTY FOR TRANSFER LINE FLUSH 0.00 KG

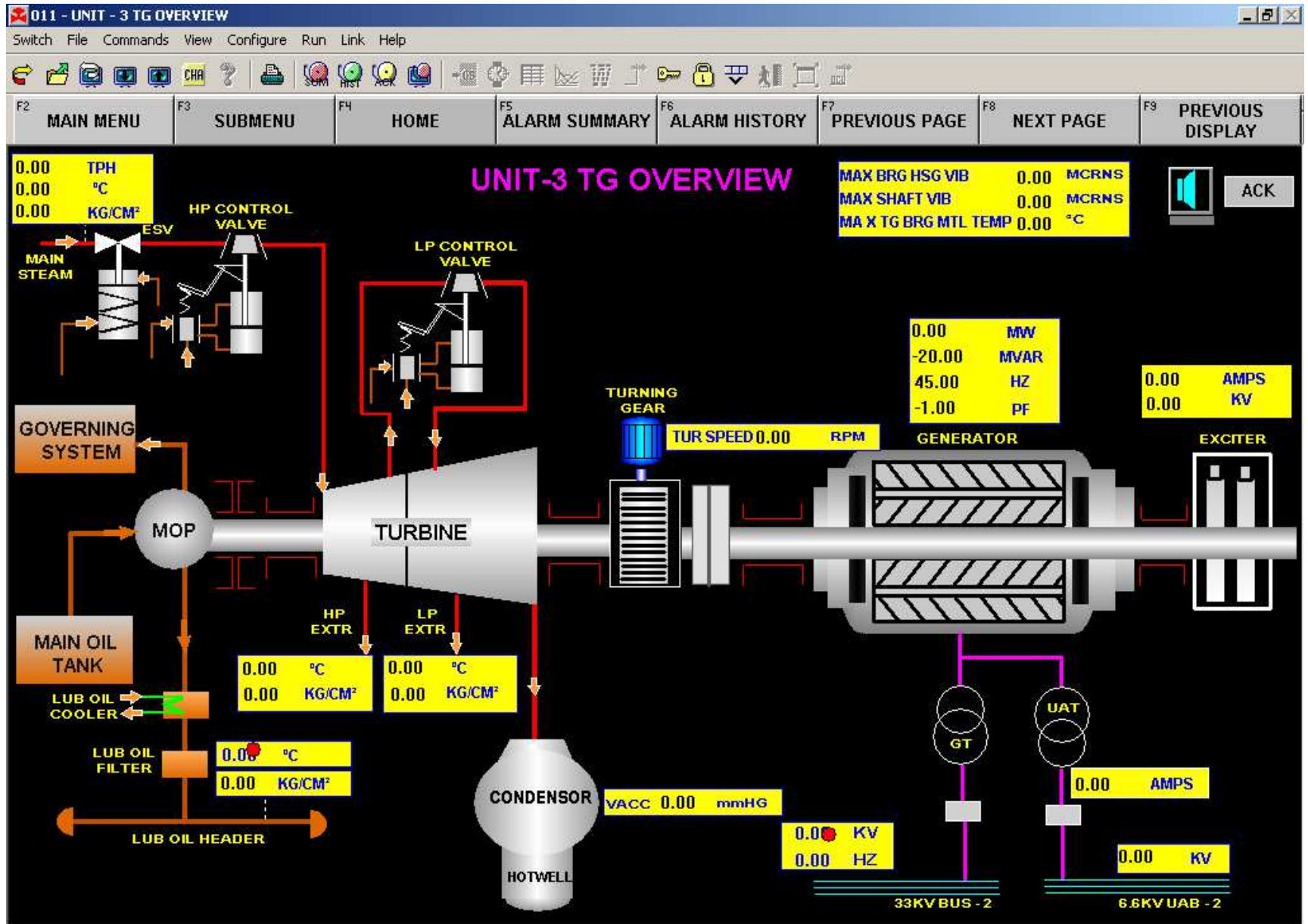
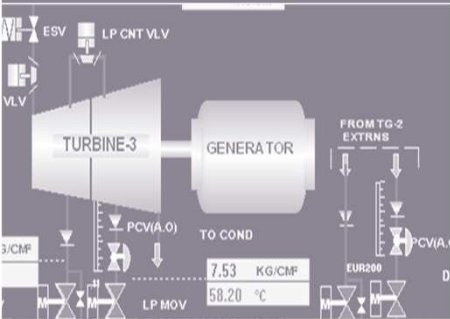
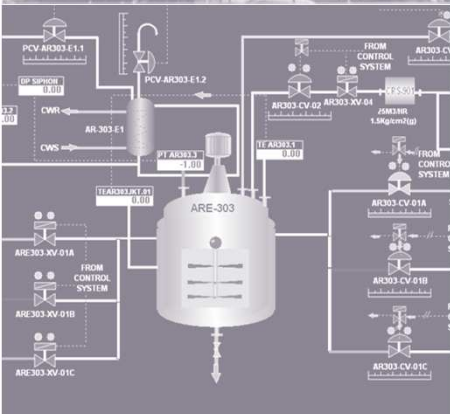
GAS DETECTORS
 GD_001 0.00
 GD_002 0.00
 GD_003 0.00

HOOTER ACK [OK]
 BEACON ACK [OK]

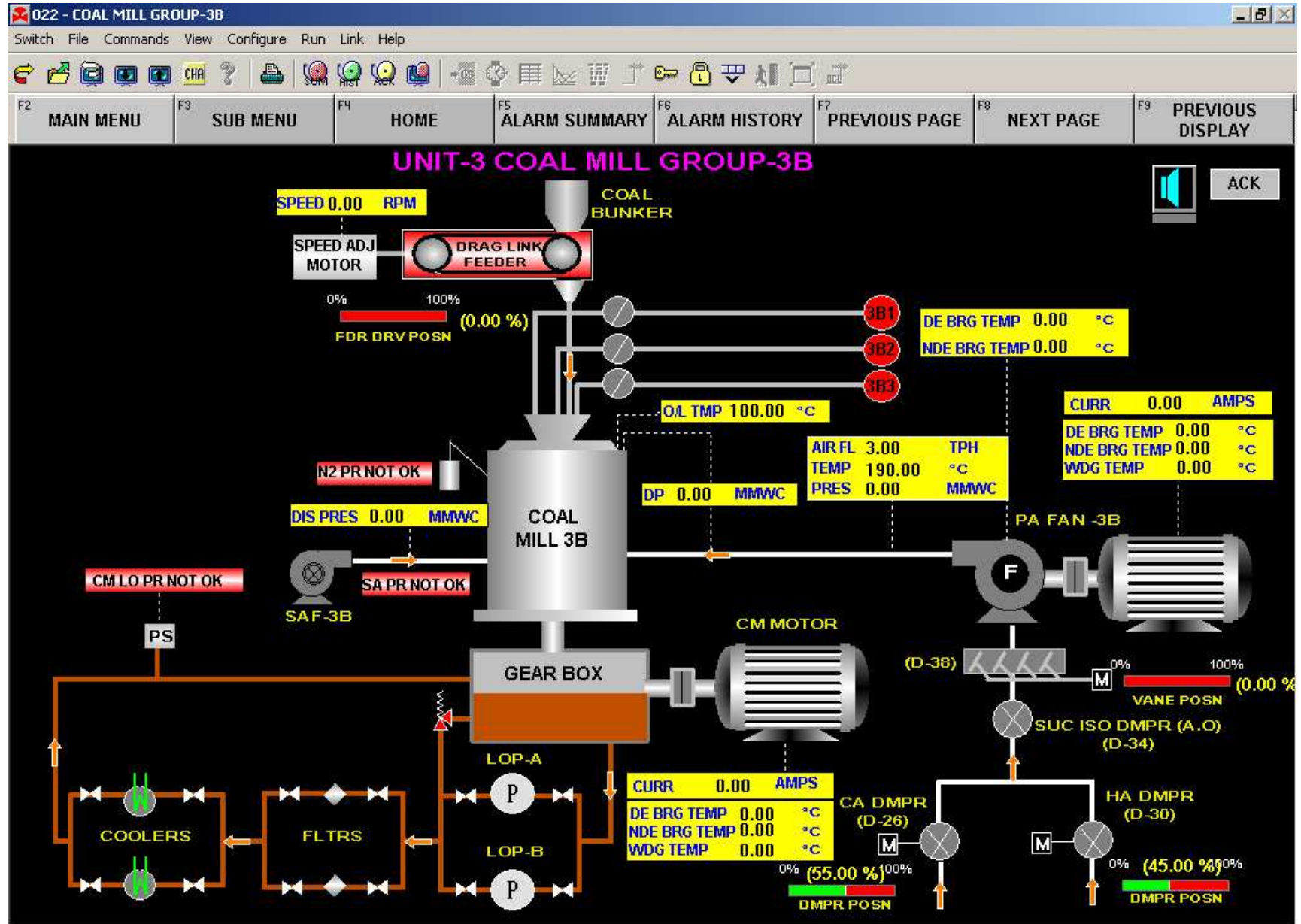
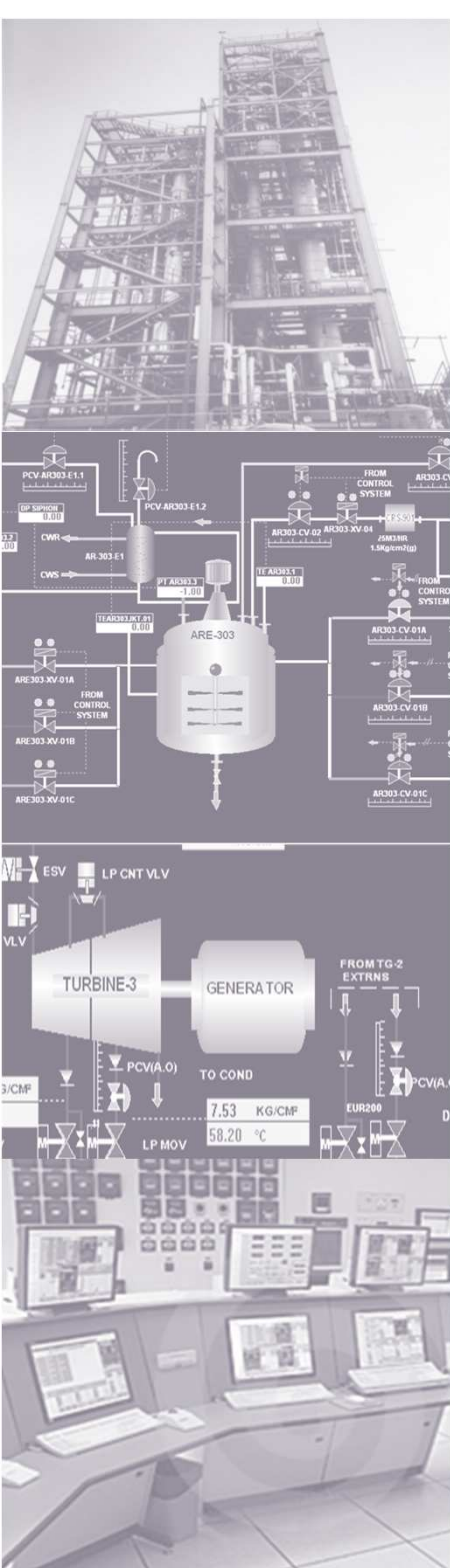
HOT WATER FROM PHW TANK

Ready 6 Alarms: POWER SUPPLY1A FAIL No Errors Key OK NUM

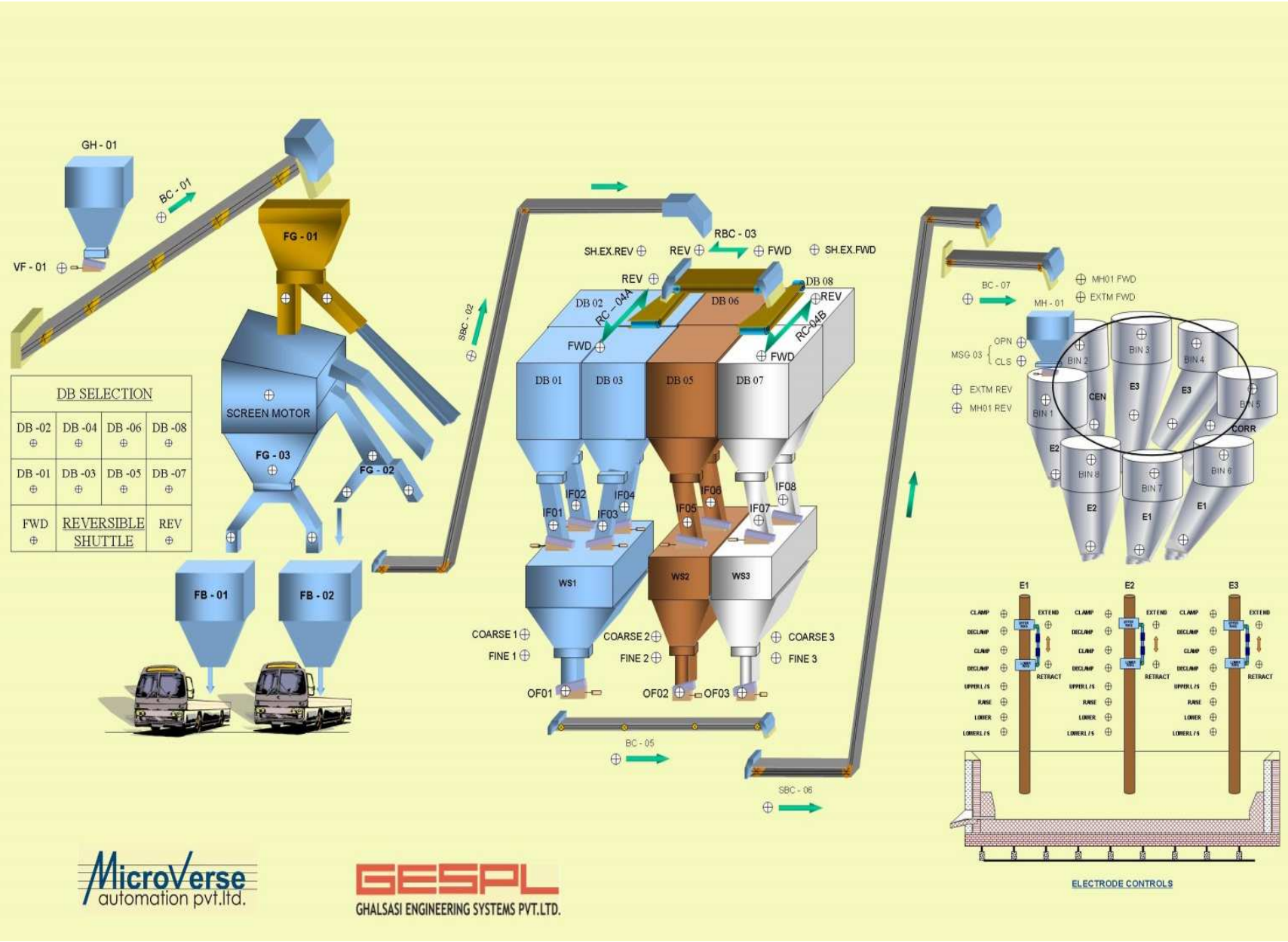
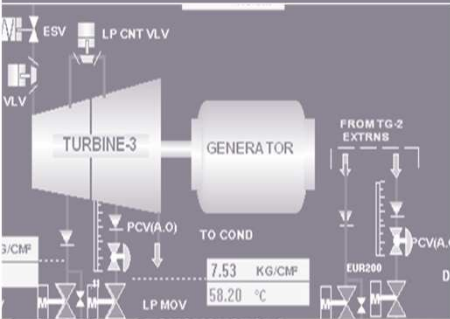
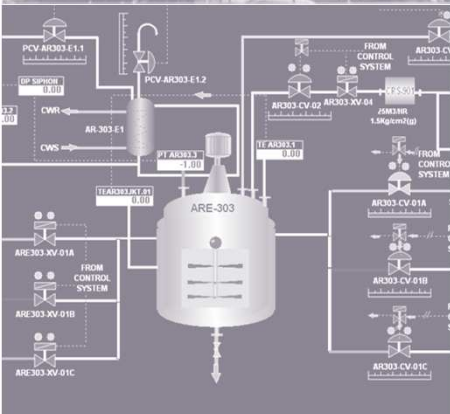
Power Plant Automation – Turbine Control



Power Plant Automation – Coal Handling Plant



Ferro Alloy Plant Automation



MicroVerse
automation pvt.ltd.

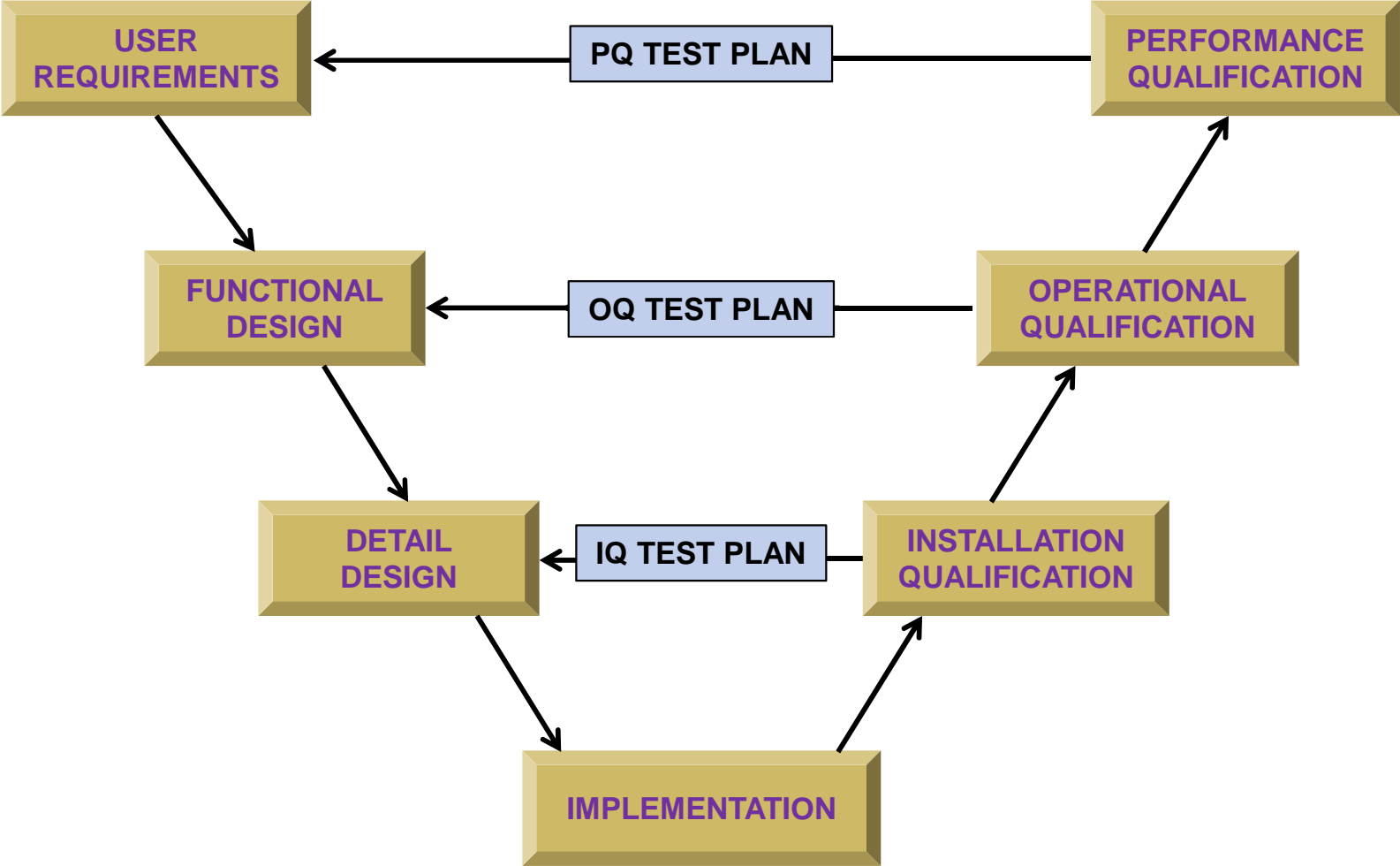
GESPL
GHALSASI ENGINEERING SYSTEMS PVT.LTD.

MicroVerse
automation pvt.ltd.

30 Years Of Innovation In Automation

cGMP COMPLIANCE FOR PHARMA PLANTS


The V Model: With 21 CFR Part 11 For Handling Of Electronic Data



Certificate of Appreciation - Department of Atomic Energy, India



For a DCS system with Triple Redundancy

Vikram Sarabhai Bhavan,
Anushaktinagar,
Mumbai - 400 094.
Web site : www.heavywaterboard.org
Fax.: 25563243 / 25563360
Tel. : (Board lines) 25563240 / 41/ 42
Dir: +9122-25554548
DID : 022-2548 7507
E-mail : ghgangoor@mum.hwbdae.org.


सत्यमेव जयते

GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
HEAVY WATER BOARD

ISO 9001 : 2000
Approved by IRQS

Ref : HWB/E&I/HWPM/ 2009/ March 17th 2009

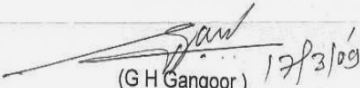
TO WHOMSOEVER IT MAY CONCERN

This is to certify that M/s **MICROVERSE AUTOMATION Pvt. Ltd. Pune**, have supplied Programmable Control System for Captive Power Plants for Unit 2 and Unit 3 at Heavy Water Plant - Manuguru. Each unit Programmable Control System of comprises of Hardware viz, Stand-alone Intelligent I/O Modules: Type 3215 : (16 channels AI) : 14 nos, Type 3216 : (48 DI + 48 DO) : 58 nos, Type 3219 : (24 DI + 8 DO + 8 AI + 4 AO) : 132 nos, Type 3220 : (48 DI + 16 DO) : 8 nos, CPUs: 12 nos, Operator Stations: 4 Nos, Engineering Stations : 1 No, Common Information Stations for Units 2 and 3 : 5 Nos, Sequence Of Event Recorder (256 channels) : 1 No, High-speed Acquisition Unit (8 channels) : 1 No. In addition to above each unit is supplied with 50 nos. back-up controllers as a third level of redundancy. These hardware is provided with necessary isolators, Power Supplies, cabinets etc.

The entire system was tested for Dry Heat, Damp Heat, Fast transient test at 2KV @ 5KHz, Vibration, Burn-in at elevated temperature, Response Time, System Diagnostics and Functional checks at approved Test Labs as per specifications. These systems were commissioned in October 2006.

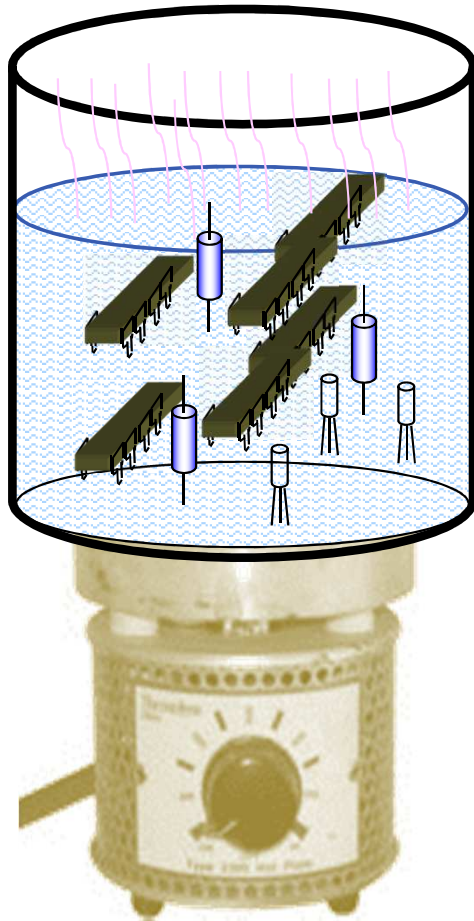
This is being a revamp job of replacing old running DCS, M/s Microverse were required to customize their system as per requirements. Initial problems were encountered during commissioning are attended and corrected satisfactorily. Post commissioning support provided by M/s Microverse was also satisfactory. At present both the systems are running satisfactorily

We appreciate the efforts put up by M/s Microverse on successful indigenous development of Programmable Control System of this complexity and wish them greater success.

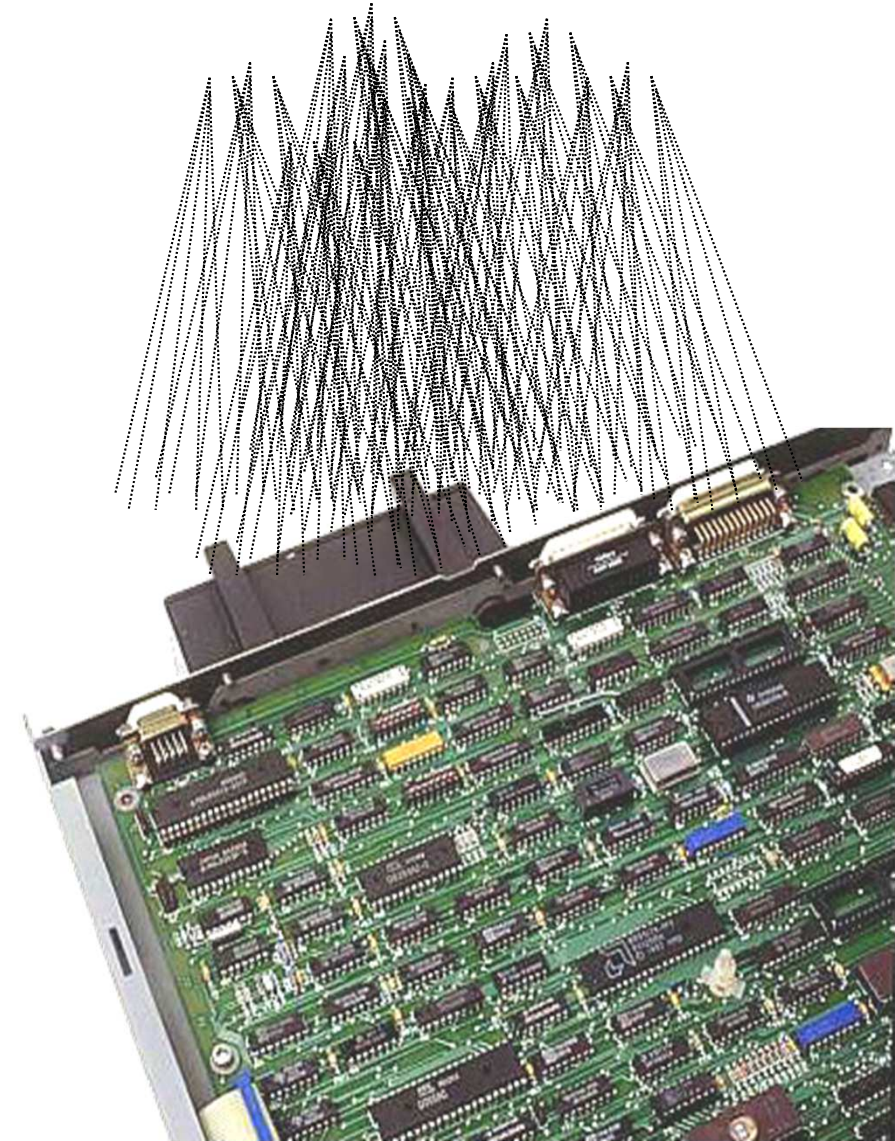

(G H Gangoor) 17/3/09
Chief Engineer(E&I)

Some of Our Interesting QAP Practices

Place components in boiling water prior to assembly, recheck the components after cooling



Sprinkle Carbon + Metal Dust on powered-up PCBs



(QAP to emulate certain screening processes meant for MIL-grade devices. Assured component reliability. Improved drift performance)

(QAP to emulate actual plant conditions)

Some of Our Interesting QAP Practices

- **3 Thermal Shocks : 10°C - 55°C; 30 minutes each**
- **Burn-in for 48 Hrs. @ 55°C in powered-up condition.**

Why Microverse?

- ✓ **Proven Track Record**
- ✓ **Domain Expertise**
- ✓ **Experienced team trained in cross-disciplinary skills**
- ✓ **Excellent Pre / Post Sales / Post Warranty support.**
- ✓ **Transparency with the customer**
- ✓ **We are large-enough to organize appropriate resources, small-enough to remain flexible to meet customer-specific requirements.**
- ✓ **100% Indigenous. WITH PRIDE!**

Thank You!

We look forward to a long-lasting association with you!

Appendix

Clients with CFR 21 Compliance

- Zydus Takeda
- Cadila Pharma
- Cipla
- Orchid

21 CFR Compliance Checklist

1.0 Password policy

- 1.1 Password-protected individual user accounts
- 1.2 Password and User ID policy (Individual unique ID and Password, minimum length and strength of ID and Password)
- 1.3 Automatically limit number of failed login attempts
- 1.4 Automatically record unauthorized login attempts
- 1.5 Electronically require users to change their passwords at regular intervals
- 1.6 Automatically password protects computer systems when idle for short periods

2.0 User management system & Privileges

- 2.1 Ensure that the user level based on functionality and authority is defined. e.g. Analyst, reviewer, Lab manager, Administrator, etc.
- 2.2 Ensure that the privileges like delete, copy, cut, paste, rename, overwrite etc. shall not be allowed to Analyst & reviewer level.

3.0 Electronic Data

- 3.1 Electronic data and report should be human readable and suitable for inspection and review
- 3.2 Ensure the content: Performed by with date and time, Print by with date and time, Reviewed by with date and time, system and analysis parameter related information, etc.

4.0 Electronic data storage

- 4.1 Generated data should be store in protected drive

21 CFR Compliance Checklist (contd.)

5.0	Audit Trail
5.1	System should track for all creations, modifications, and deletions performed in the system (All activity should be logged between login and log out) with time and date along with user details
5.2	All hardware related errors and warning should be logged in audit trail (System audit trail)
5.3	Maintain all entered data: Don't obscure original data when changes are made (shall maintain revision history for the changes made).
5.4	Time and date change automatically, it shall be locked and not editable unless performed by authorized user (shall be defined through user rights distribution)
5.5	Computer system shall be designed in a way that user to record reason for change through use of authorized login / password to go ahead with changes
5.6	Automatically record identity of individual who made change
5.7	System shall prevent to modify or delete audit trail
5.8	Audit trail documentation shall be retained for a period at least as long as that required for the subject electronic records and shall be available for agency review if required

21 CFR Compliance Checklist (contd.)

6.0	Electronic Signature
6.1	Electronically signature documents have following content (Automatically generated)
6.1.1	The printed name of the signer
6.1.2	The date and time when the signature was executed
6.1.3	The meaning (such as review, approval, responsibility, or authorship) associated with the signature
6.1.4	The items identified in paragraphs 6.1.1, 6.1.2, and 6.1.3 of this section shall be subject to the same controls as for electronic records and shall be included as part of any human readable form of the electronic record (such as electronic display or printout)
6.2	The unique ID and Password for electronic signature
6.3	Electronic signatures and handwritten signatures executed to electronic records shall be linked to their respective electronic records to ensure that the signatures cannot be excised, copied, or otherwise transferred to falsify an electronic record by ordinary means
6.4	Each process of electronic signature should be electronically logged in audit trail with time and date and user ID
6.5	Uniqueness to be maintained between password and ID, both being same is not accepted by system

21 CFR Compliance Checklist (contd.)

7.0 Data Backup

7.1 Software shall have facility for auto data back-up to any client or connected central server

8.0 Other

8.1 User shall not be able to save or relocate the result files, it should be controlled through software only

8.2 User shall not have rights to create folders or project in software. These rights shall be with administrator.