Tri-angle simulation pvt. ltd.

"AN ISO 9001 : 2008 CERTIFIED COMPANY"

*deliver*

# We design and distinctive Training Processes

## "Operator Training Simulator" (OTS) with DCS HMI / PANEL HMI for Controls

## Acquire Process Knowledge in Safe Environment

Office: 2/64, Darshan, R. A. Kidwai Road, King's Circle, Mumbai - 19, Maharashtra, India Tel: +91 22 3290 6369
Telefax: +91 22 2409 5682 E-mail : enquiry@trianglesimulation.com / triangle_simulate@yahoo.com

# COMPANY PROFILE - TRI-ANGLE SIMULATION PVT. LTD.

We take great pleasure in introducing ourselves as the leaders in the field of Computer Based Training Simulator. With our pioneering efforts we have built some of the most prestigious simulators in India and around the Globe.

Founded in 1979, Tri-angle Simulation Pvt. Ltd., was the first Indian process simulation company, and it has maintained this leadership position by executing various high fidelity complex simulation projects for some of the largest organizations in India and around the Globe.

## VISION

- To be the preferred supplier of competitively priced high fidelity simulation software and training equipments for Refineries, Power Plants, Fertilizer plants and Academic Institutions.
- To consistently meet customer delivery, support and value expectations.
- To be a preferred company with which employees want to build a long-term career.

## MISSION

- To be an innovative and consistently reliable supplier.
- To always display the best working standards and values in all we do.

## GOALS

- Continuously improve our products, practices, technologies and services.

## MAJOR ACHIEVMENTS

- Received Order for Pneumatic Trainer Kit with Siemens PLC from I. I.T, Kanpur – 2015
- Delivered Generic DCS Based Multi-op animated Simulation Package to GSFC Ltd., Baroda – 2015
- On-Site Training Conducted at CRISP, Bhopal (M.P.) on Simulator For Unit Operation related to Thermal Power Plant Operation – 2015
- Delivered Lab-Scale Equipment pH Control System to NIT Warangal – 2015
- On-Site Training at ITM / Sangam University, Bhilwara (Rajasthan) for 210 MW Power Plant Operation – 2014
- Successfully Completed training on “210 MW Thermal Power Plant Simulator” at Dr. NTTPS Training Centre of APGENCO , Vijayawada (A.P) – 2014
- Delivered Bubble Cap Distillation Pilot Plant (Computerized) to RCF Ltd. Chembur, Mumbai – 2014
- Delivered Lab-Scale Equipments to B.I.T. Sindri, Jharkhad & Government Engineering College, Ajmer – 2014
- Delivered PLC Trainer Kit to Instititute of Textile Technology, Cuttack – 2014
- Successfully Completed Training on “Refinery Process Simulators” at Bharat Oman Refinery Ltd., Bina (M.P.) – 2013
- Delivered “Innovative Coiled type Heat Exchanger Control System” to G. G. S. Indraprastha University, New Delhi – 2013
- Delivered “Solid-Liquid Extraction Setup (Computer Controlled)” to Guru Ghasidas University, Bilaspur – 2013
- Supply, installation, commissioning & training of Process Training Simulator to Bharat Oman Refineries Ltd., Bina - June 2009.
- Installed Commissioned & Customized 500 MW Power Plant Simulator at MAHAGENCO (CSTPS), Chandrapur- 2008
- Delivered PC based Generic 210 MW Thermal Power Plant Simulator to Gujarat Electricity Board at the Wanakbori - 2013
- Delivered PC based Generic 210 MW Thermal Power Plant Simulator to Chattisgarh State Electricity Board, Korba (W) - 2003.
- Delivered PC based Generic 210 MW Thermal Power Plant Simulator to Punjab Electricity Board at the Ropar - 2001
- Delivered one PC based process training simulator with DCS – Emulation of Tata Honeywell TDC –3000 with process models for FCCU, CDU & VDU on hire basis to BPCL, Since 2000 upto 2006
- Successfully completed a simulator based on Direct Connect using TDC-3000 console & DEC Alpha for HPCL-Mumbai in year 1999.
- Successfully completed in collaboration with ASI, USA. The “State of the art” Simulator, on Fluidized Catalytic Cracking Unit, Unit for Hindustan Petroleum, India having Emulated TDC – 3000 console. Year of completion 1997.
- Successfully completed in joint collaboration with CMC Ltd. Simulation of crude distillation Unit for IOCL, Baroda Refinery - 1996.
- Successfully completed in collaboration with ABB-Simcon Project in USA simulation for Lube Refinery - 1995.
- Successfully completed in collaboration with ASI, USA. Project in Saudi Arabia for the Design, Development and Supply of Ammonia and Urea plant Simulation Based on Yokogawa DCS Console -1995.
- Delivered one to One Emulated Panel base 210 MW Thermal Power Plant Simulator to Maharashtra State Electricity Board at the NASIK & KORADI Training Centre - 1996.
- Delivered the first digital computer simulator in India to Bharat Petroleum Refinery in 1985.
- Developed and Installed the first process simulator at Advanced Training Institute, Madras in 1983.

# Products

## REAL TIME SIMULATORS

### *THERMAL POWER PLANTS*

- 210 MW Power Plant ABL & BHEL Boiler
- 210 MW Power Plant KWU & LMZ Turbines
- 500 MW Power Plant

### *FOR OIL & GAS INDUSTRIES*

- LEF, LPG & NG
- Cold Box
- Feed Gas Drying System
- Gas Oil Separations System
- Glycol / Water Injection System

### *FOR REFINERIES*

- FCCU
- CDU-VDU
- SRU
- MEK-Dewaxing
- Catalytics Reformer

### *FOR PAPER AND PULP INDUSTRIES*

- CEH/DED Bleaching Plant
- Digester Plant
- Multi-Effect Evaporation Plant
- $O_2$ Bleaching Plant

### *FOR FERTILIZERS INDUSTRIES*

### *FOR AMMONIA PLANT*

- AMMONIA Synthesis
- Purification
- Reforming

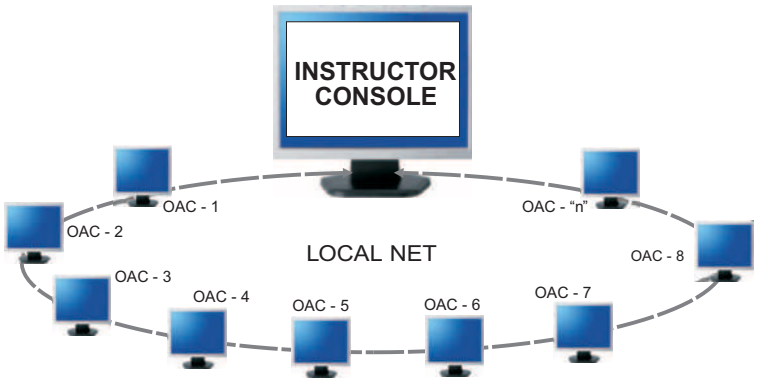
### *FOR UREA PLANT*

- UREA Synthesis
- Evaporation
- Recirculation
- Absorption, Desorption & Hydrolysis

## ACADEMIC SIMULATION SOFTWARE (UNIT OPERATION MODULES)

- Level & Flow Control
- Temperature & Pressure Control
- Level Control In Coupled Tanks
- Three Element Boiler Control
- Stirred tank Reactor
- Centrifugal Pump
- Multi Effect Evaporator
- Pressure Control in Different Sized Vessel
- Heat Exchanger
- Filtration
- FCCU (Regenerator)
- Compressor Utilities
- Super Heated Steam Generator
- Absorption
- Binary Distillation for Benzene & Toluene
- Rotary Drier
- Catalytic Reformer
- Crystallizer
- Cyclone Separator
- Multi Component Flash Distillation
- Furnace Modules (FBC) (Circulating Type Fluidized Bed Boiler)

# Real Time Simulator




Overall System Configuration

- ✦ Give your Students a Competitive Edge.
- ✦ Expose them to "State of the Art" Technology

## ASK TRI-ANGLE SIMULATION PVT. LTD

### What is a Simulator?

The word "SIMULATOR" is defined as an apparatus, which provides (for training purpose) conditions like those, which are encountered in real operation or replica of "Real Plant with real time data."

### Simulator System

A Process looks very complicated like, Refinery, Petrochemical, Fertilizers, Complex Chemicals & Power plant etc; therefore you may ask yourself "How will I ever learn how to operate this equipment." The answer is a "Structural Simulator and Training Program".

You may think of simulator-based training. You have a computer, and a computer program. The process simulator is similar to system used in the airline and aerospace industries. It enables trainees to practice operating a continuous process plant in normal as well as critical operating conditions without risk.

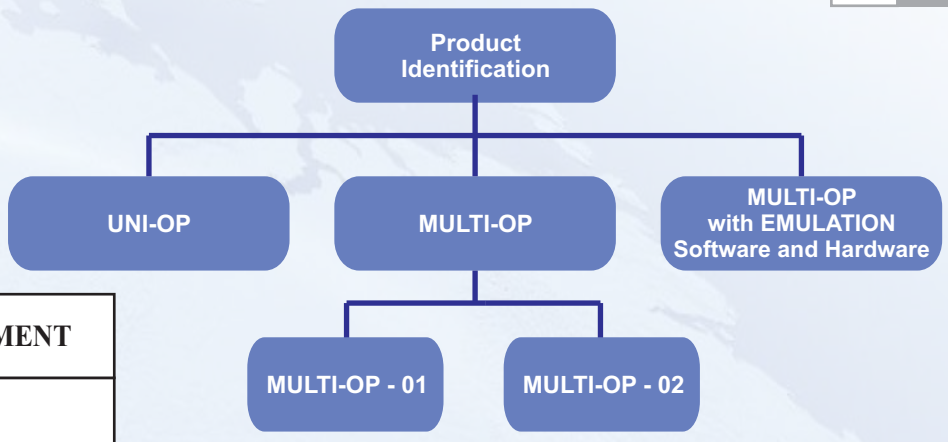
You may also know that astronauts, airlines pilots and nuclear power plant operators are trained extensively through the use of simulators, so you may ask, "Why do refinery, chemical plant, pulp and paper operators need them?"

### NEED OF A SIMULATOR

- ➢ Reinforce process knowledge
- ➢ Introduce engineers/ operators to computer controlled system operation
- ➢ Increase process understanding
- ➢ Stimulate students to think and develop analytical skills
- ➢ Develop a level of proficiency by practicing process trouble shooting & emergency conditions
- ➢ Simulator use promotes safe operating procedures
- ➢ Economical
- ➢ Government Legislations
- ➢ Environmental Compliances
- ➢ Lower simulator cost / higher performance
- ➢ New Process / control systems are also available
- ➢ **And Success is Ensured !!!**

**"Mistake on Simulator Avoids Mistake in Plant"**

# Simulator Architecture



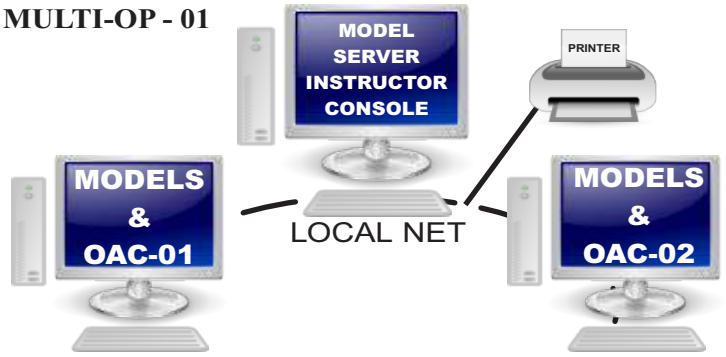

## ARCHITECTURE OF UNI-OP ENVIRONMENT


### UNI-OP

In Uni-Op the Instructor Console and Operator Console is the same.

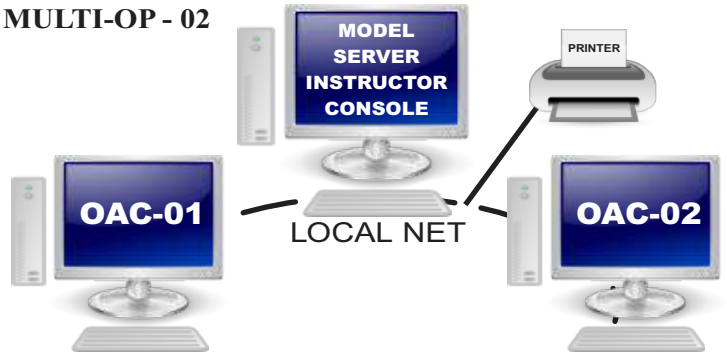
## ARCHITECTURE OF MULTI-OP ENVIRONMENT

### MULTI-OP - 01




In this Architecture the Operators are working on independent Unit-Operations Model/Plant. Each Operator Console has its own Plant/Model. The Instructor Console can Control the IC's loading, Malfunctions on Individual Operator Console & can record Operator Actions.

### MULTI-OP - 02



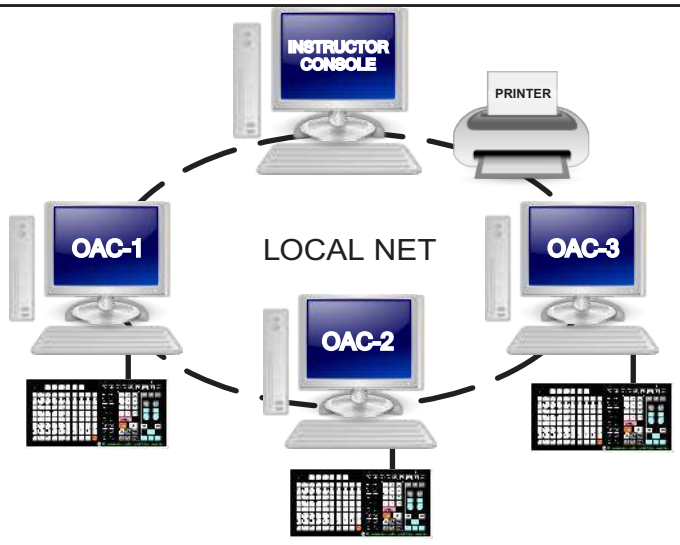

In This Architecture, the Operators are working on the Same Plant/Model. There is one Plant/Model between all operator Consoles. They learn how to collaborate to operate the Plant / Model as in the real DCS/SCADA based Plant.

## MULTI-OP WITH EMULATION SOFTWARE & HARDWARE

Earlier in the Industry, conventional panel based control rooms were used to control plant operations. With the advent of technology in simulation, these conventional panels have been effectively replaced by sophisticated Distributed Control System (DCS). Through the DCS, the entire plant can be controlled by just sitting in the control room where all plant operations can be reviewed. Various Emulations of the DCS are available such as ABB, Yokogawa, TATA, Honeywell TDC-3000 etc. We also supply Robust and Advanced Human Machine Interface hardware like

- Touch Screen Facilities
- Look-alike DCS Keyboards
- DCS Look-alike Cabinet.

## ARCHITECTURE OF MULTI-OP WITH EMULATION SOFTWARE & HARDWARE




**"A mistake on the simulator is an opportunity to learn, Without any Capital Loss or Catastrophe."**

# Simulator Features

## REAL TIME SIMULATION SOFTWARE FEATURES

- **Software is available in two form i.e.** Multi-Op (1-Instructor + Multiple Operator Action Consoles) & Uni-Op
- Data Acquisition System.
- Auto/ Manual Control mode.
- P, PI, PD & PID modes.
- Animated graphic (mimic) representation of the process including SP, OP, and PV.
- Online data display in tabular chart and graphical form,
- Powerful graphics with trend and bar page.
- Alarm function
- Data printing facility.
- GUI Based User-Friendly Software.
- Freeze
- View logs
- Load/save the exercise
- Snap shot
- Speed up / slow down simulation speed
- Configuration utility of Simulation Software i.e. Wingraph utility
- Connectivity of Simulation Software with Honeywell® TDC®-3000 look alike Keyboard

## ADVANCED FEATURES OF TRAINING SIMULATOR

- Auto Recording
- Preprogram Malfunction
- Context Sensitivity Online Help
- Performance Evaluation of Operator
- Performance Evaluation of equipments in power plant
- Event Log
- Alarms
- Trend History
- Trend history associated with Initial Conditions (IC`s)
- Instructor-Less Training
- Remote Operations


## INSTRUCTOR CONSOLE FEATURES

Major Functions Available At Instructor Console Is As Follows:

- **Malfunction**
  A multipage display is provided at the instructor station to allow the instructor to insert malfunctions, such as a pump failure and to adjust the severity of the malfunctions such as the percentage opening of the failed valve etc.

- **BackTrack**
  The Simulator provides the instructor with backtrack capability. When the backtrack is requested by the instructor the simulator saves the model variables as an initial conditions with minimum interval of one minutes

- **Instructor Logging**
  The instructor actions to be logged include insertion/deletion of the malfunctions, freeze/speed-up slow down etc.

- **Trainee Logging**
  The trainee action to be logged includes manipulation of the set point, controller outputs, control mode, pump switch, etc. The log is printed on the printer upon demand.

**Other features include**

- Program Selection
- Initial Conditions
- Alarm Reporting Facilities
- Hard Copying

## MULTI-OP CONSOLE FEATURES

- Instructor Console will approve the password and allow it to connect
- Performance Evaluation will track and sort out Operator action
- Instructor can configure set of training variable selected to Malfunction and watch the history of Performance of Variables on the Trend Display

# Scope of Power Plant Simulators

## SIMULATED EQUIPMENTS OF POWER PLANT

### CONDENSER TO BOILER DRUM

- Condensate cycle from Hotwell to Deaerator / Feed tank
- Feed water cycle from feed tank to drum
- C.W. & B.C.W. System including cooling towers and fans
- Condenser make up system
- Steam Extraction system
- Secondary condensate / drip system
- LP/HP bypass system
- Air vent system
- L.P. Dozing System
- H.P. Dozing System ($Na_3 PO_4$)
- Auxiliary PRDS system
- Air ejection system

### ELECTRICAL SYSTEM

- GENERATOR:
  - Seal oil system
  - $H_2$-$CO_2$ system
  - Stator Water system
  - Barring Gear System
  - Static Excitation system
  - Generator Protection System
- 220 KV switchyard / 400 KV switch yard
- Station Board 6.6 KV
- Unit Board 6.6 KV
- Station auxiliary Boards 415 V
- Emergency Board
- Batteries and D.G. et
- U.P.S. Board / 220 VDC
- Generator and Aux systems stator water, $H_2/CO_2$, seal oil

## Following plant area is covered

- FSSS (FANS & SADC)
- FSSS (OIL GUNS & MILLS)
- BFP & PRDS & Steam temp control
- HPLP bypass, BCW, CW, LP/HP heaters
- ATRS (with SGC & SLC, Vacuum and condensate system)
- Generator System (with Lube oil & seal oil system)
- Co-ordinated Master Control (CMC)
- Automatic Turbine Tester (ATT)
- Soot Blower
- Electro Static Precititator (ESP)

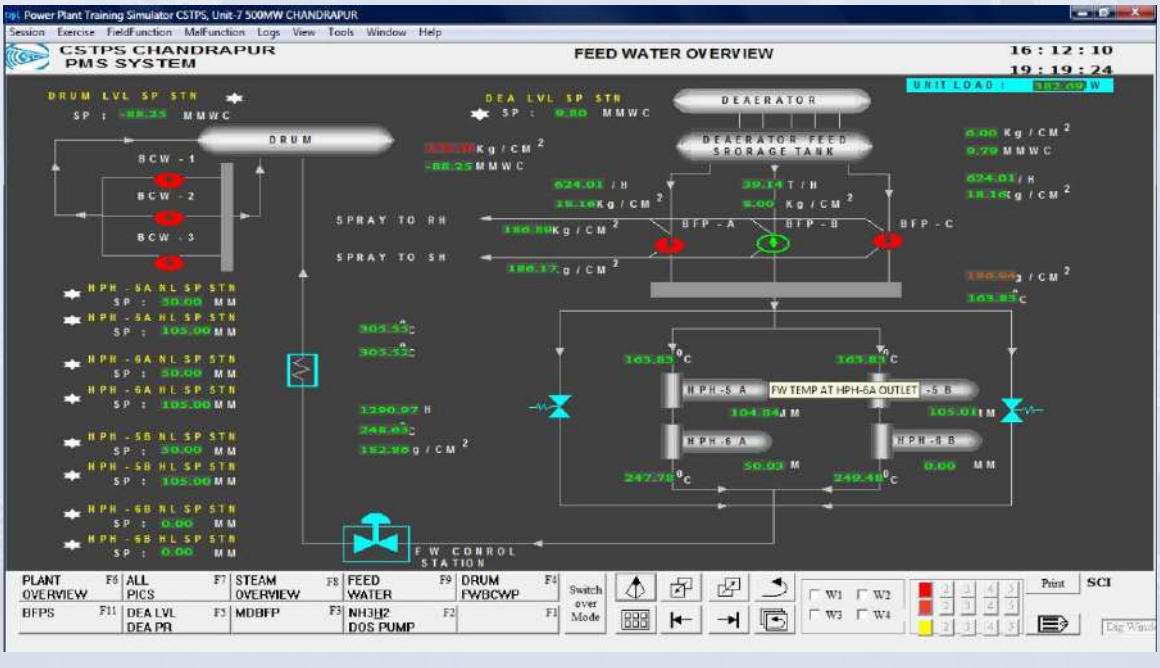
### BOILER

- Coal Handling Plant
- Air and Gas Cycle
- Pulveriser Fuel firing System wind box – Furnace – Burners.
- F.S.S.S.
- Water and system circuit in Boiler
- Boiler protection / interlocks

### TURBINE

Sub system – Main Oil tank purifier system

- Governing oil and lube oil system
- Governing system – over speed protection.
- Vacuum rising – Gland sealing system
- Auxiliary P.R.D.S.
- HP/LP bypass system
- Turbo visor – Brg. Vibrations eccentricity, differential expansions.



# Scope of Power Plant Simulators... (contd)

## CONDENSATE AND TURBINE

Mathematical models along with mimics for the following:

### ATRS

- Starting device
- Tracking device
- Speeder Gear
- Electro hydraulic controller
- Load controller
- Load gradient
- Load limit
- Speed reference limiter and controller

### ELECTRO HYDRAULIC GOVERNING SYSTEM (EHC)

It consists of speed control loop, load control loop and Pressure control loop influencing the steam control valves actuated by Electro Hydraulic Converter and valve lift converter

### SPEED CONTROL LOOP

The speed reference limiter and speed controller form the Speed Control Loop for the following operations

- Startup of Turbine and raising speed upto 3000 rpm
- Synchronization of unit
- Provide a minimum load operation (app. 40 MW)
- Operation of turbo-set in complete power range in case Load controller is defective.

### LOAD CONTROL LOOP

The load reference and the maximum load limiter form this loop to load the machine up to full load.

### PRESSURE CONTROL LOOP

The pressure controller and the CMC form this loop for unloading the set proportional to available boiler pressure.

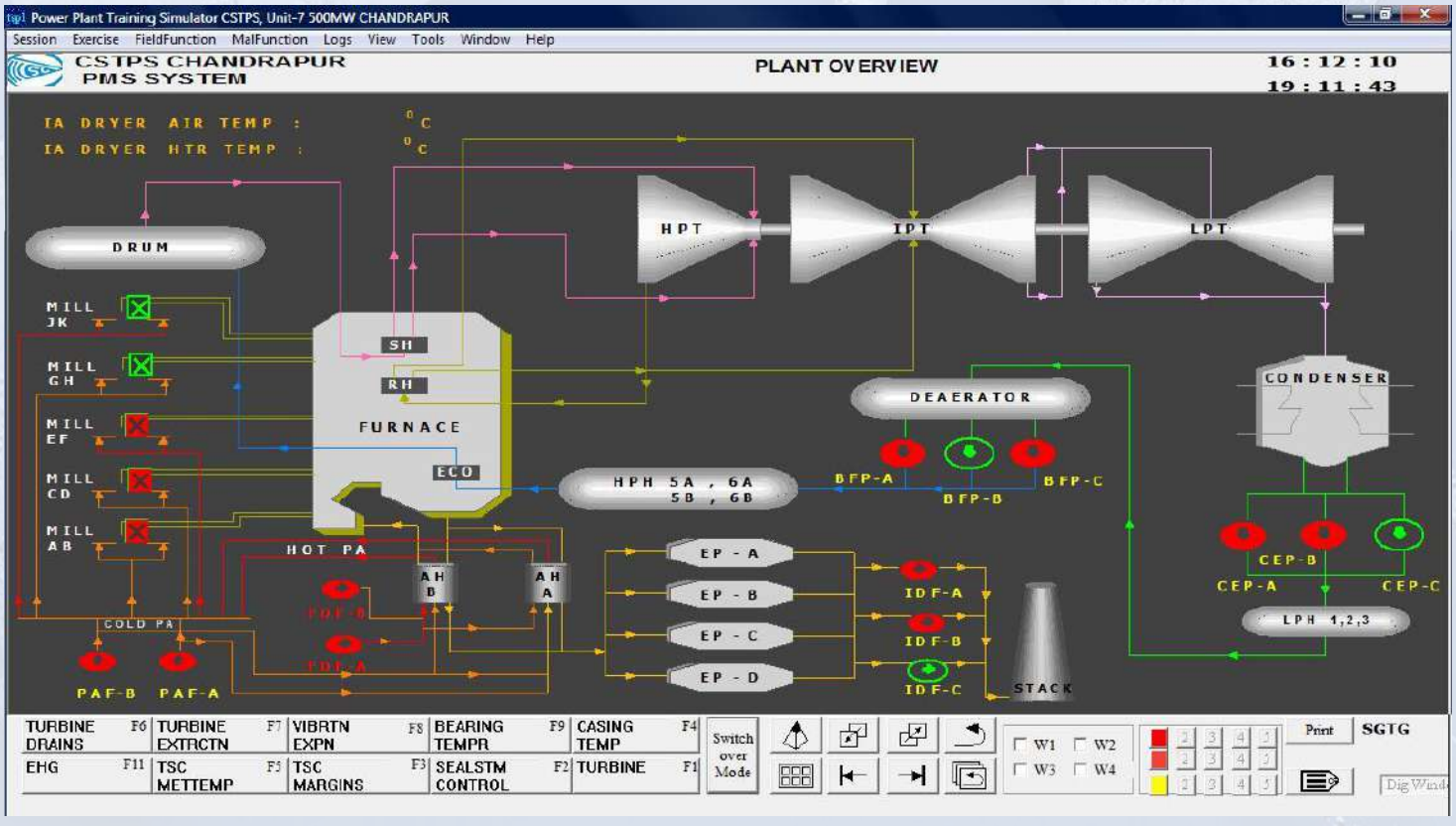
### TURBINE START UP/ SHUT DOWN LOGIC AND PROTECTIONS

The turbine is started / shut down as per sub group controls and sub loop controls as follows:

- Startup and shut down sub group controls of Turbine, Turbine lube oil supply, Condensate and evacuation system.
- Sub Loop controls of different equipments relating to Turbine i.e. AOPs, EOPs, JOPs, turning gear valve, CEPs, Lube oil temperature control and Turbine drains.
- Permissive and Protective interlocks of different auxiliaries of Turbine i.e. CEPs, Vacuum pumps etc.

### TURBINE STRESS EVALUATOR

The TSE will be simulated to determine the turbine stress margins on basis of difference of temperatures at middle and inner turbine casing / shaft and to influence rate of turbine rolling and loading.



# Scope of Refinery Simulators

## Simulated Equipments for Refinery Modules

## FCCU

**FCCU EQUIPMENTS**

- Reactor Stripper
- Regenerator
- Fractionator
- Light Cycle Oil Stripper
- Heavy Cycle Oil Stripper
- Equilibrium Catalyst Storage Hopper
- Slurry Settler
- Waxy Feed Surge Drum
- Main Column Overhead Receiver
- Stripped LCO/BFW Exchanger
- Main Column Bottoms Steam Generators
- Clarified Oil/BFW Exchanger
- Clarified Oil Coolers
- Circulating Oil Steam Generator
- Main Column overhead Air Fin
- Condensers
- Main Column O/H Trim Coolers
- HCO/ Cold Waxy Preheater
- Steam ejector on hoppers
- Charge Heater
- FCC Main Air Blower
- Waxy Feed Pumps
- Main Column Bottom Pumps
- Clarified Oil Pumps
- Stripped HCO Pumps
- Circulating Oil Pumps
- Stripped LCO Pumps
- HCO Circulating Pumps
- Main Column Overhead Reflux Pumps
- Main Col. Overhead pumps
- Hydraulic Oil Pumps
- MAB Condensate Pumps
- LCO Circulating Pumps
- JCW Supply Pumps
- MAB Lube Oil Pumps
- Light naphtha pump

**GCU EQUIPMENTS**

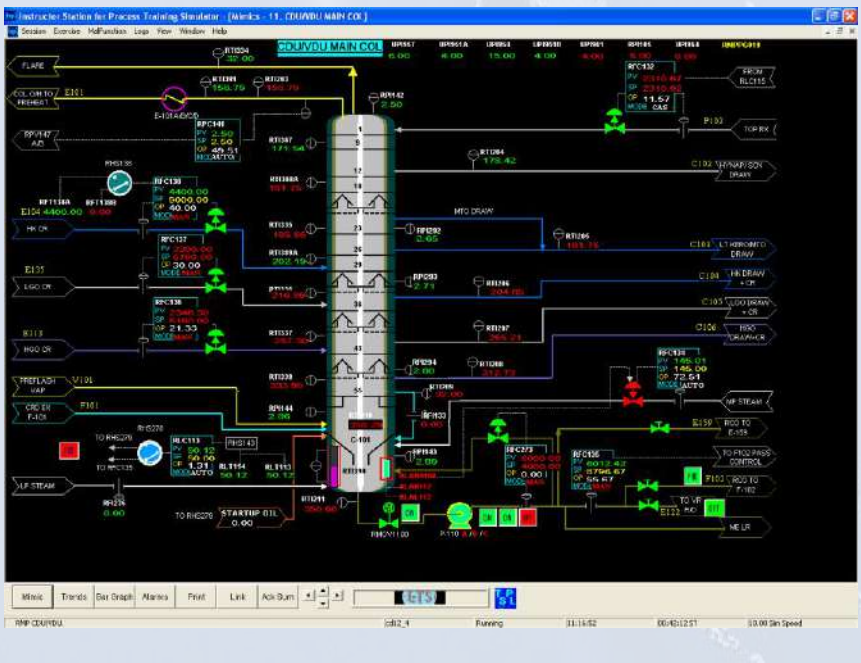
- Primary Absorber
- Sponge Absorber
- Stripper
- Debutanizer
- High Pressure Receiver
- Debutanizer Overhead Receiver
- High Pressure Coolers
- Sponge Oil Exchangers
- Stripper Btm/LCO Reboiler
- Sponge Absorber O/H Gas Cooler
- Debutanizer Btm/HCO Reboiler
- Debutanizer Overhead Air Fin
- Condenser
- LPG Trim Cooler
- Gas Compressor
- Stripper Feed Pumps
- Sponge Absorber Lean Oil Pumps
- Debutanizer Overhead Reflux Pumps

## SULPHUR RECOVERY UNIT

- Acid Gas Preheater
- BFW Peheater
- Sulphur Condensers
- Steam Condenser
- Waste Heat Boiler
- Acid Gas Ko Drum
- SWS Sour Gas Ko Drum
- SWSII Nh3 Rich Gas Ko Drum
- Acid Gas Cond Collection Pot
- Fuel Gas Ko Drum
- Sulphur Pit
- Reaction Furnace
- Line Burner
- Incinerator
- Claus Catalytic Convertr
- Catalytic Convertr-ii (regeneration)
- Catalytic Convertr-iii (dew Point-1)
- Catalytic Convertr-iv (dew Point-2)
- Combustion Air Blower
- Incinerator Air Blower
- Sulphur Pump
- Condensate Pump

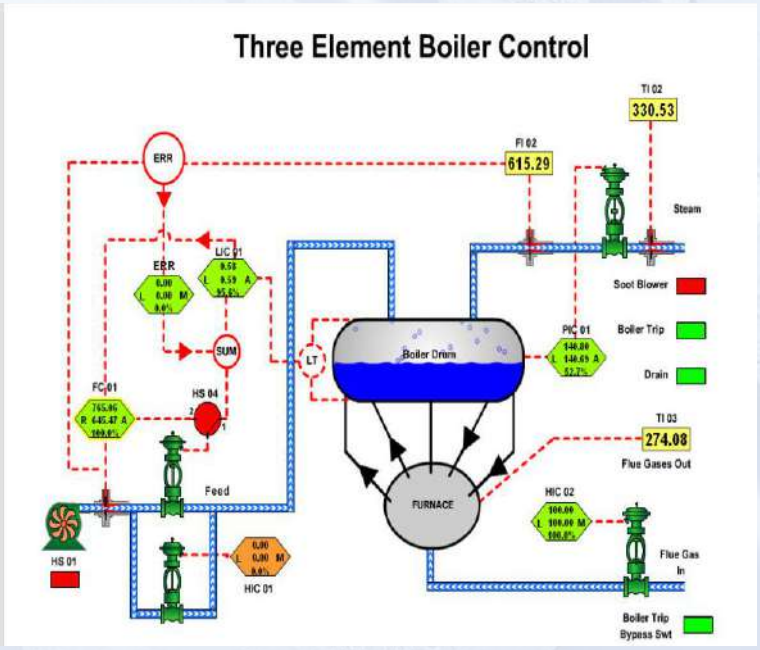
## CDU - VDU

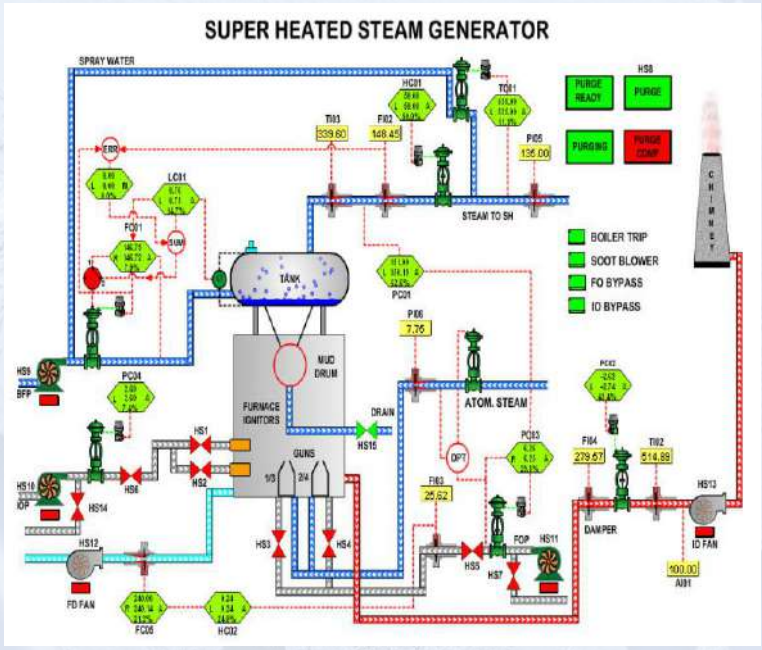
- Preheat Trains and Desalter
- Preflash Drum
- FD and ID Fans for F101 Heater
- Crude Column (Atmospheric Distillation Unit)
- Reflux Drum
- OVHD Naptha Accumulator
- Heavy Naptha Stripper (C102)
- Light Kerosene Stripper (C103)
- Heavy Kerosene stripper (C104)
- Light Gas Oil Stripper(C-105)
- Heavy Gas Oil Stripper (C106)
- Naptha Stabilizer (C-107)
- Naptha Stabilizer Reflux Drum
- F102 [Vaccum Heater]
- FD & ID Fans for F102 heater
- Vaccum Distillation Column
- Slop Drum
- Hotwell and Steam Drum
- Vaccum System

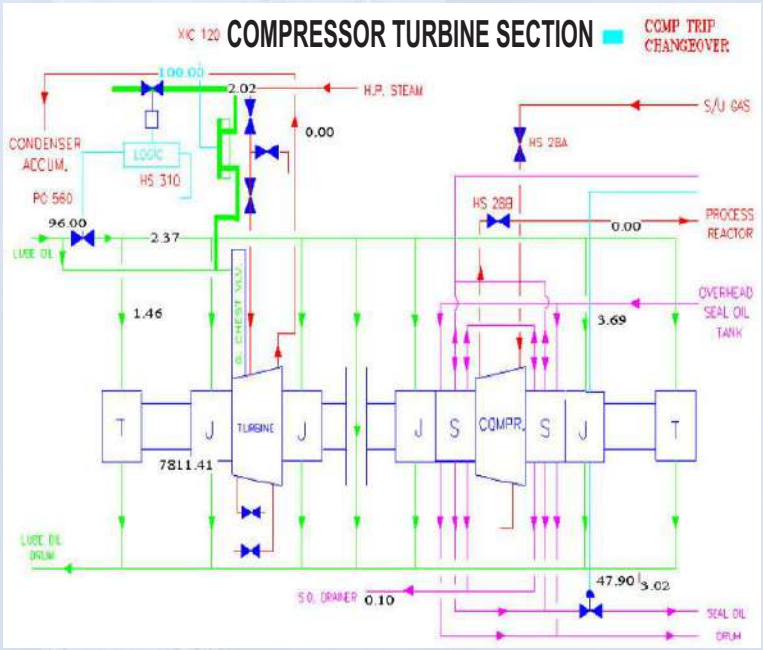


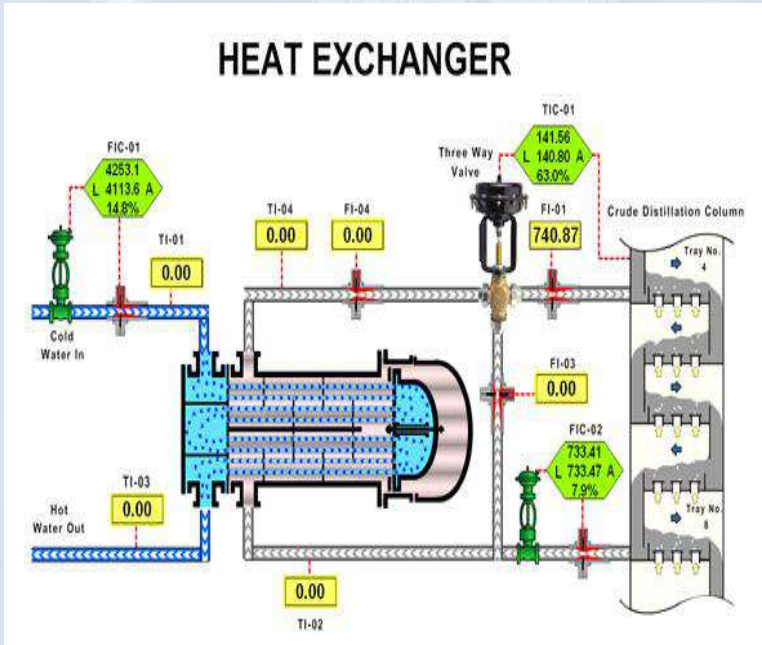
# Real Time Simulators with Animations

## ACADEMIC UNIT OPERATION MODULES




ACCELERATES YOUR CAREER
OUR SIMULATOR GIVE YOU EXPOSURE TO THE REAL TIME UNIT OPERATIONS

# Real Time Simulators with Animations

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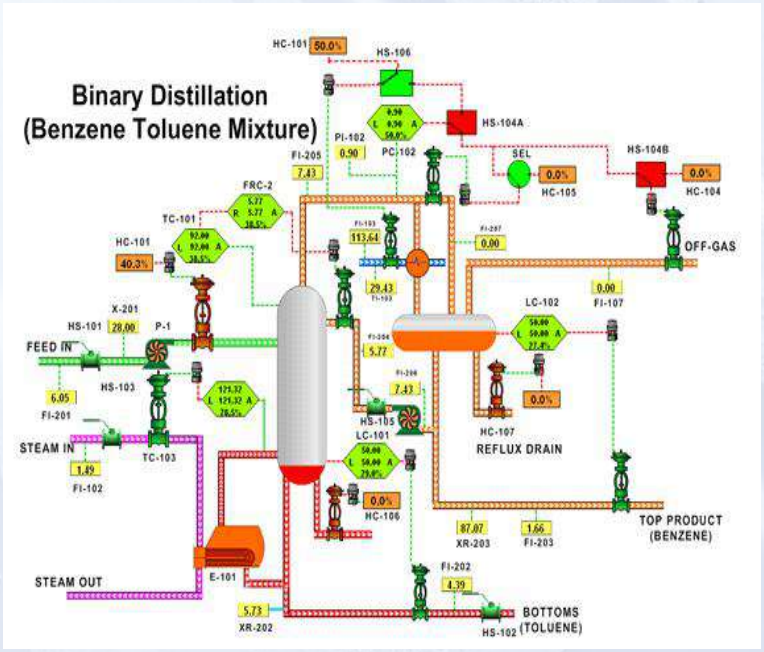


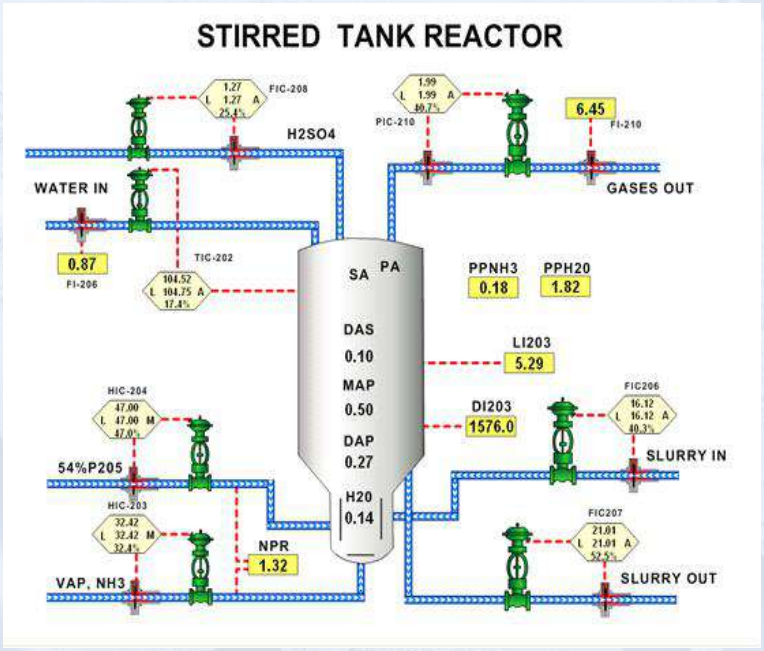


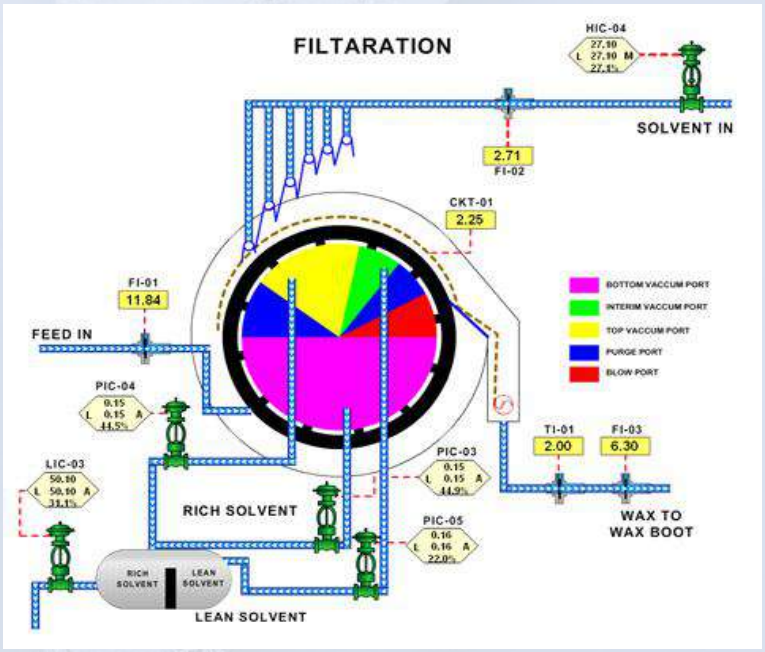


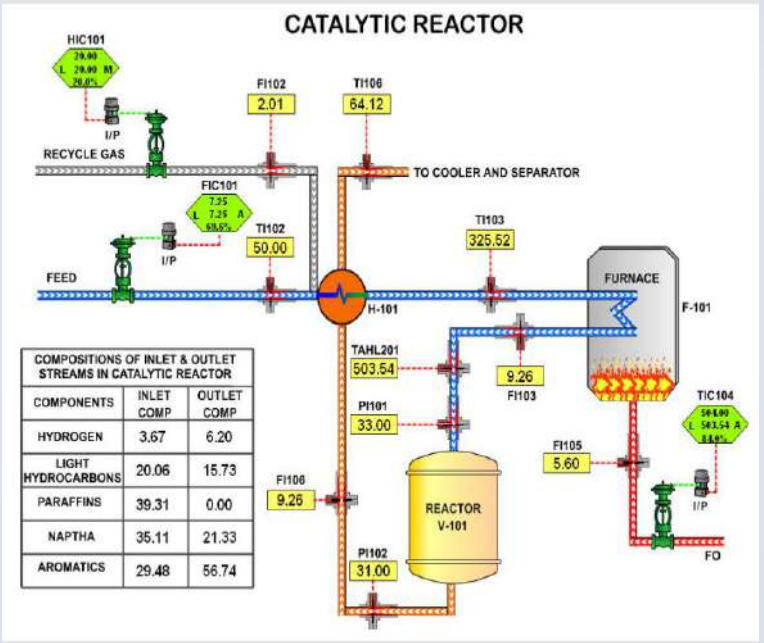


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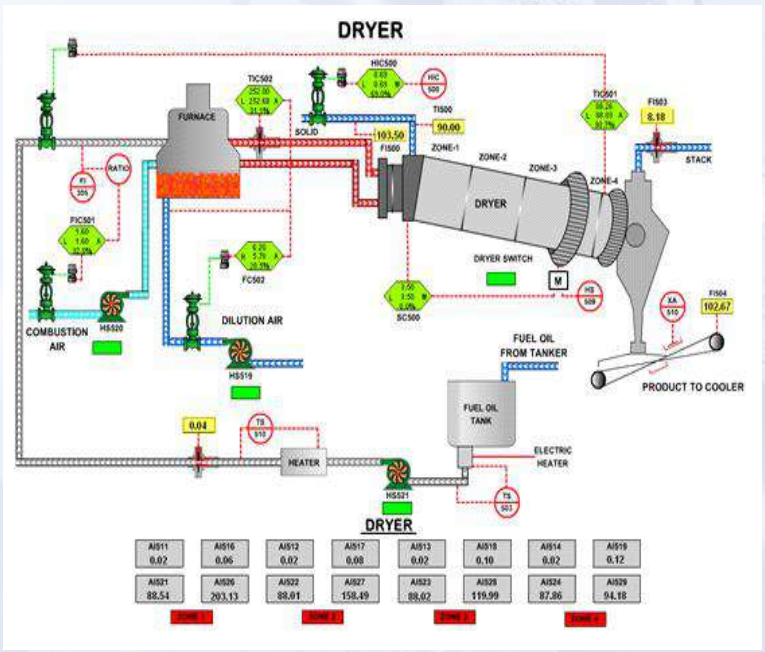


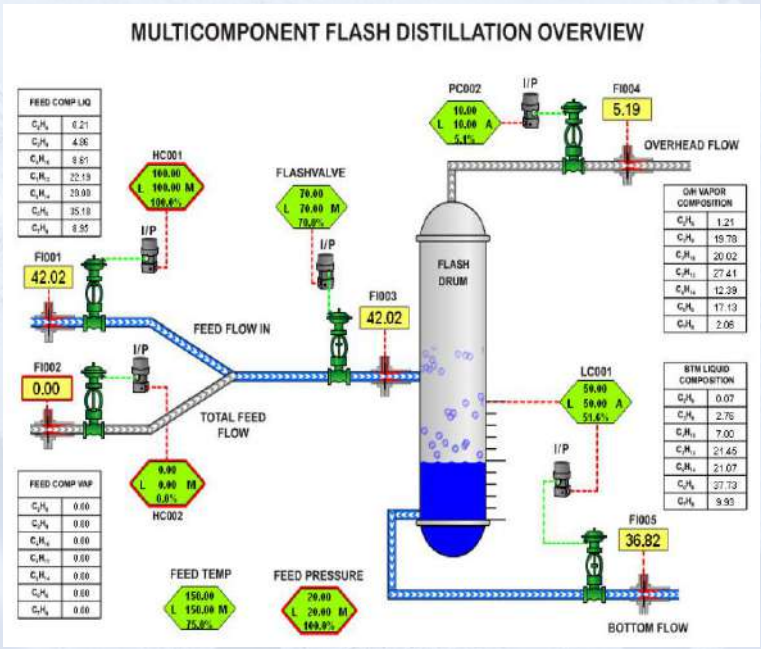


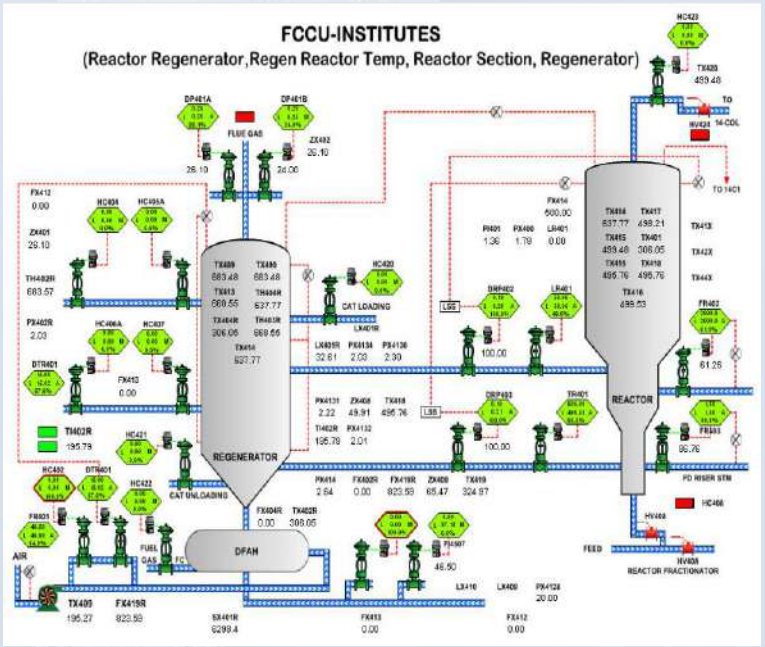


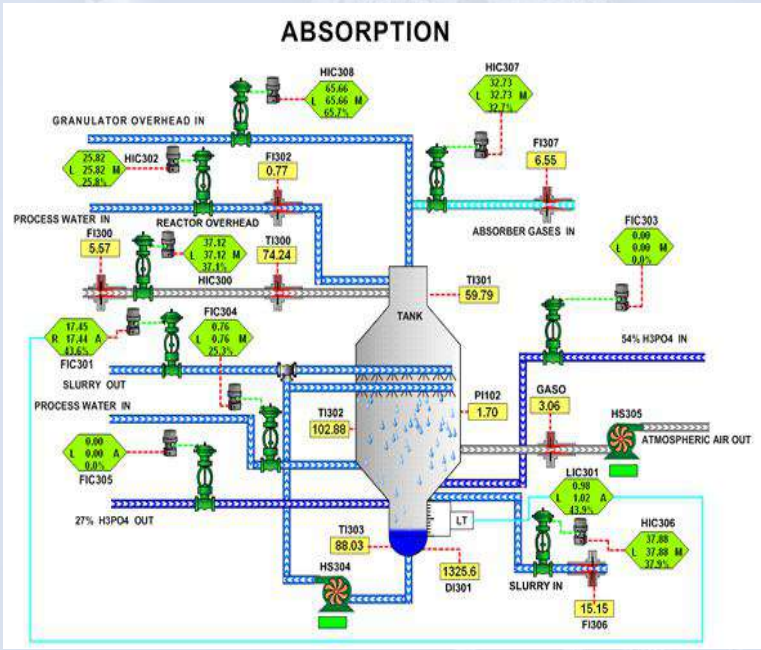


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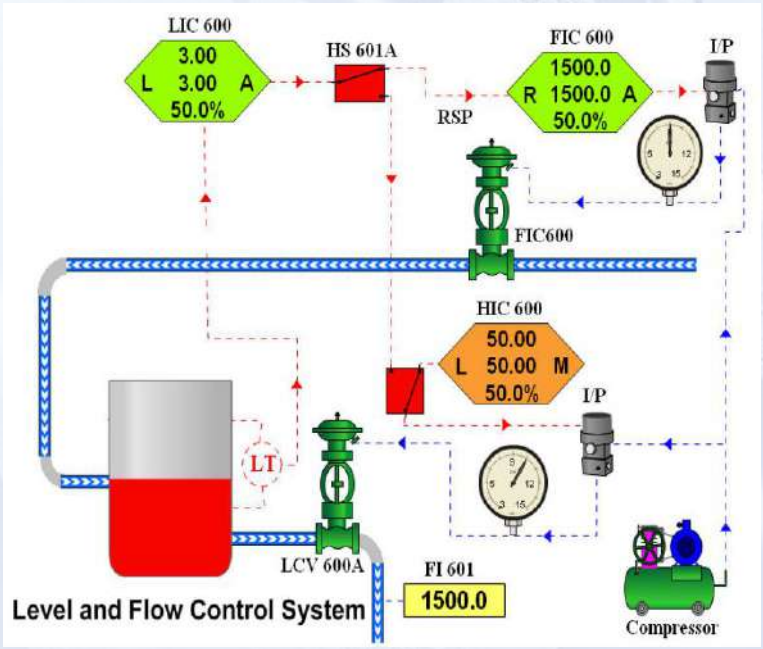
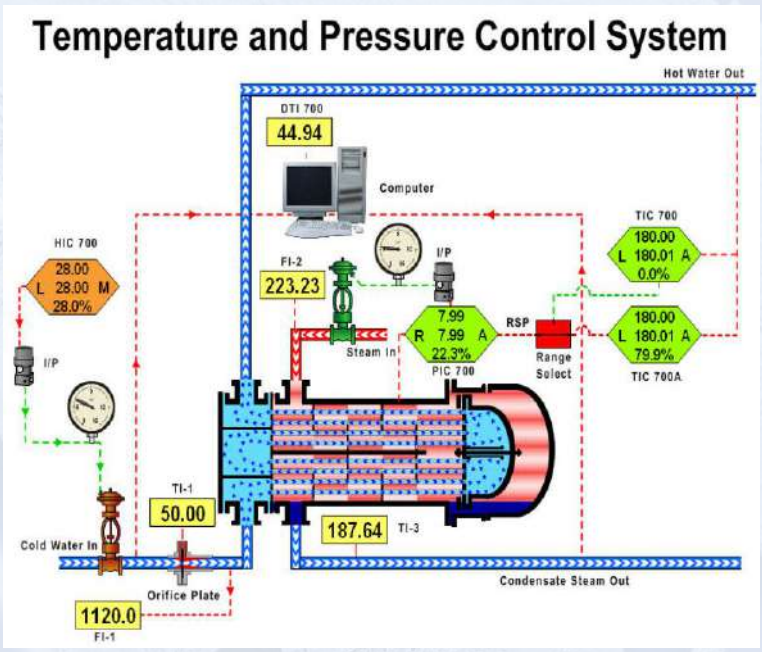
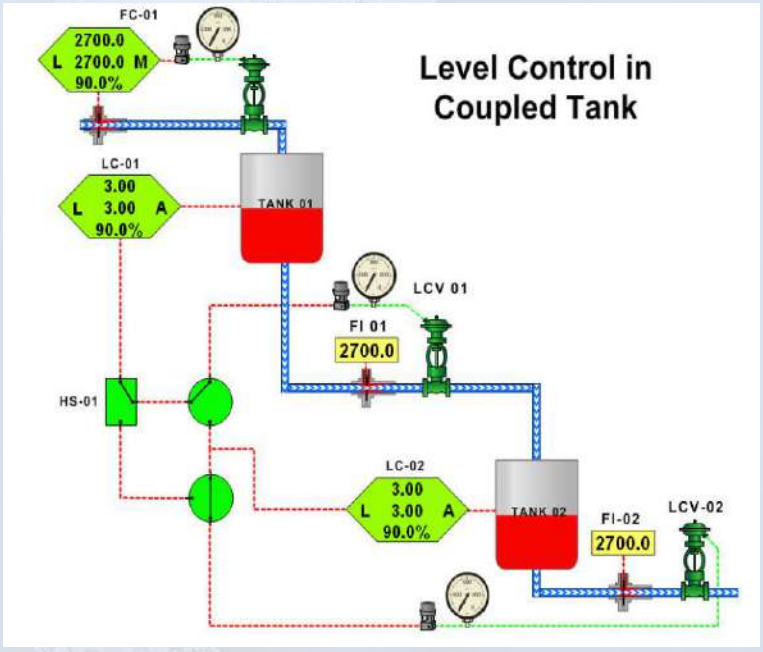
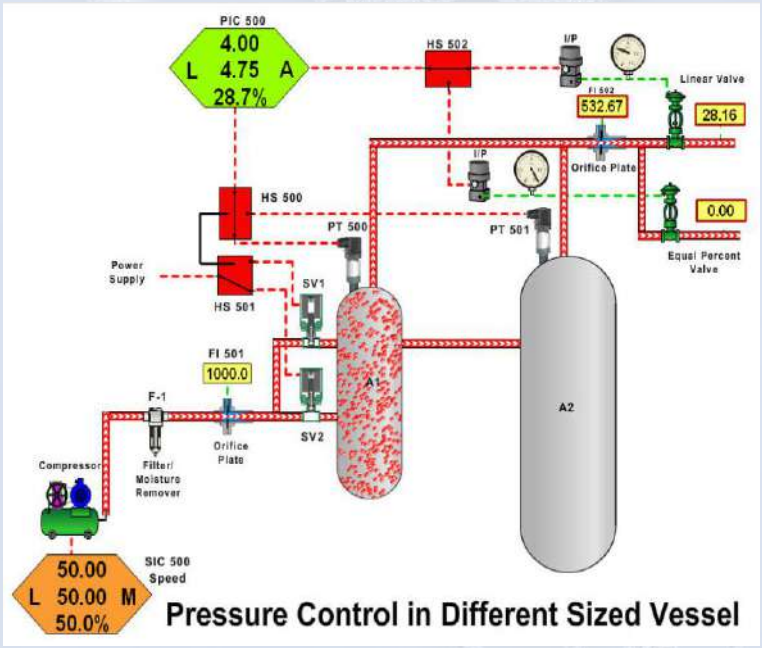
# Real Time Simulators with Animations

## ACADEMIC UNIT OPERATION MODULES




ACCELERATES YOUR CAREER
OUR SIMULATOR GIVE YOU EXPOSURE TO THE REAL TIME UNIT OPERATIONS

# Client List

## POWER PLANT

- Maharashtra State Electricity Board - (MSEB)
- Punjab State Electricity Board - (PSEB)
- Chattisgarh State Electricity Board - (CSEB)
- Gujarat Electricity Board - (GEB)
- Bombay Suburban Electricity Supply - (Reliance Energy)
- Maharashtra State Power Generation Company Ltd. - (MAHAGENCO)
- Andhra Pradesh Power Generation Corporation Ltd., - (APGENCO)

## REFINERY & PETROCHEMICAL

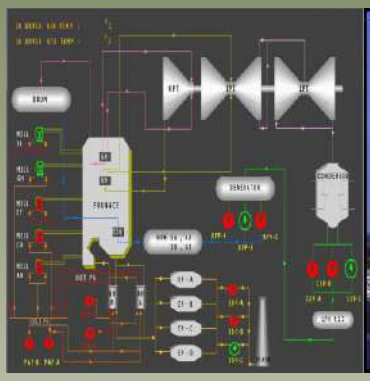
- Bharat Petroleum Corporation Ltd. (BPCL)
- Oil & Natural Gas Company, Bandra, - Mumbai (ONGC)
- Oil & Natural Gas Company, - Panvel (IOGPT)
- CMC, Mumbai,
- Indian Oil Corporation Ltd. (IOCL)
- Hindustan Petroleum Corporation Ltd. (HPCL)
- Bharat Oman Refinery Ltd, (BORL) - (Rental)

## FEW INSTITUTES

- I.I.T., Delhi
- I.I.T., Roorkee
- I.I.T., Mumbai.
- I.I.T., Guwahati
- I.I.T., Kanpur
- N.I.T., Warangal
- N.I.T., Trichy
- N.I.T., Jalandhar
- N.I.T., Rourkela
- N.I.T., Nagpur
- BIT, Sindri
- Thaper Institute of Technology, Patiala.
- KREC, Karnataka.
- Andhra University.
- Annamalai University.
- Advanced Training Institute, Mumbai
- Directorate of Technical Education, Gandhinagar
- Government Engineering College, Valsad
- Guru Ghasidas University, Bilaspur
- MSBTE, Mumbai
- MERI, Mumbai.
- BHU, Varansi.
- Punjab University, Chandigarh.
- Siksha 'O' Anusandhan University, Bhubneshwar
- Government Engg College , Ajmer.
- L. D. Engineering College, Gujarat.
- SVRCET Surat.
- Siksha 'O' Anusandhan University, Bhubneshwar
- Bharati Vidyapeeth College of Engg, Navi Mumbai
- ITM, Bhilwara
- CRISP, Bhopal

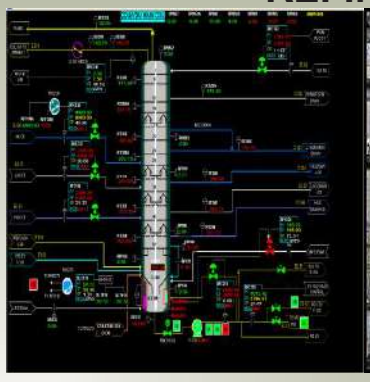
## POWER PLANT

DCS HMI EMULATION



ACTUAL PLANT

## REFINERY



## OVERSEAS PROJECTS

- AUTO DYNAMICS INC, USA
- PMI RUSSIA,
- GASCO ABU DHABI
- ARAMCO SAUDI ARABIA
- CHEVERON WYOMING USA,
- CHEVERON PERTH AMBOY
- MOBIL OIL ENGLAND
- MARATHON OIL
- PERTAMINA CILACAP INDONESIA
- PERTAMINA DUMAI INDONESIA
- ATLANTIC SIMULATION INC. USA
- ABB-SIMCON SOFTWARE

## FERTILIZER PLANT

- GSFC Ltd., Baroda
- SAFCO, Saudi Arabia
- RCF Ltd, Mumbai

Triangle Simulation Academy

# On-Site Training
at
Power Plant / Refinery
Engineering Colleges / Training Institutes

# Guiding Your Way To Success In Plant Operation

The power industry in India is growing by leaps and bounds. The Central Electricity Authority projects the trained man power requirement by the Power Sector during the 12th plan in the order of one million.

## Training Programs

| Course Name | Duration |
|---|---|
| **DCS Based Plant Operation Training for** | |
| Thermal Power Plants | 1 Week |
| Petroleum Refineries | 1 Week |
| **Multi Loop Process Control** | 1 Week |
| **Process Control (PID)** | 3 Days |

## Scope of Training

- Conceptualization of Plant Operations
- Practical Training on Process Dynamic Simulators
- Training for Graduate Engineering Trainees (GET) Apprentice

## Facilities Available

- SCADA / DCS based simulator for process control / Adv. Process Control
- Thermal Power Plant Replica Control Room
- Petroleum Refinery Replica Control Room

## Eligibility

- Degree / Diploma in Engg.
- Science Graduates

**Placement assistance assured, Limited Seats Available**


**Triangle Simulation Academy** ( A venture of Triangle Simulation Pvt. Ltd. )
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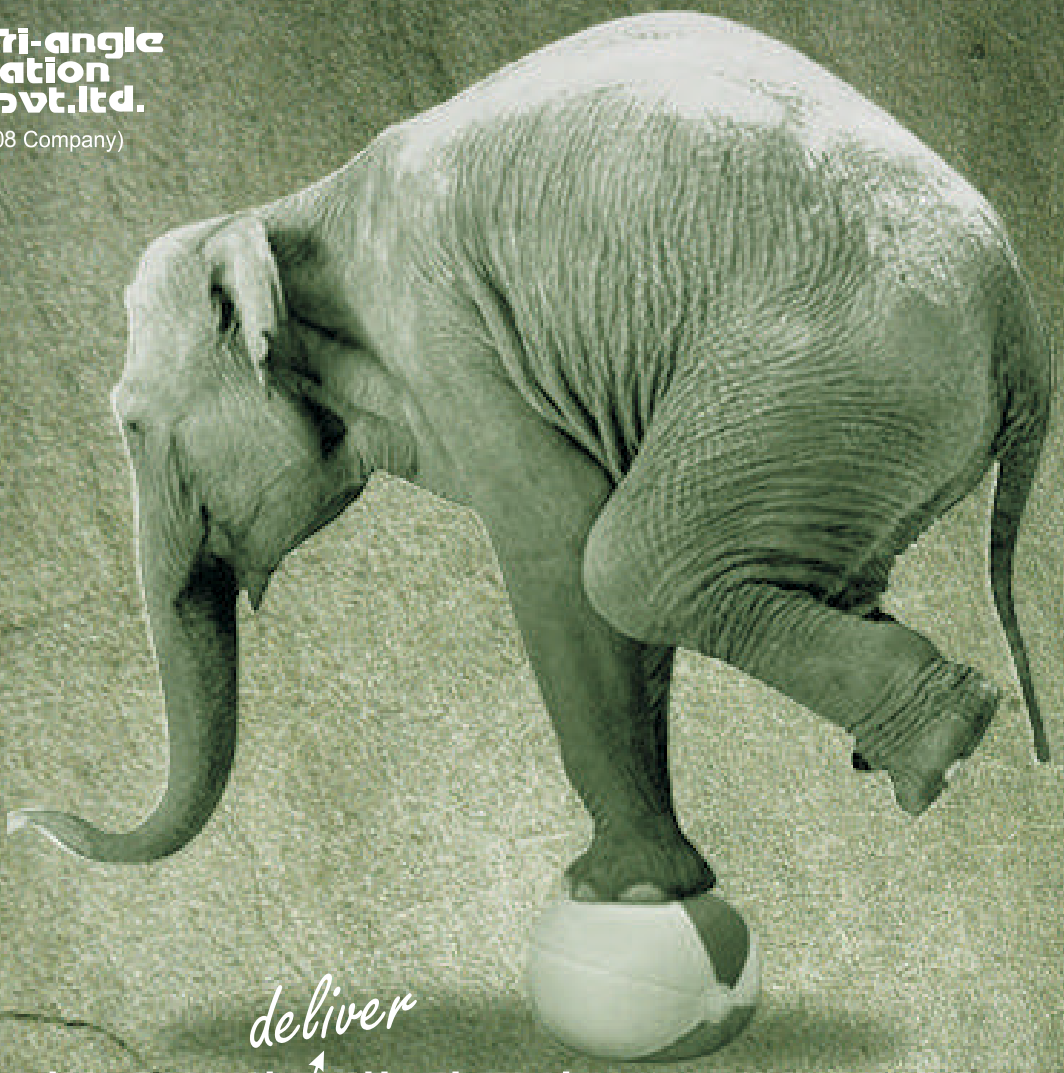
Tri-angle Simulation pvt.ltd.

(ISO 9001 : 2008 Company)



Design Elements

# We design and *deliver* distinctive Training Processes


With our innovative products like soft panel & DCS based one to one replica Operator Training Simulator **(OTS) for Thermal Power Plants, Refineries and Fertilizer plants.** TSPL is the only Indian Company having vast experience in these fields.

Our Simulators have features of Auto recording, Animation of level / flow and rotating equipments. Online display of Trip and Interlock logic and provides printouts of performance evaluation report.

Our in house development center has a dedicated team of engineers, and some of our prominent clients include **ONGC, BPCL, BORL, CSEB, MAHAGENCO, IITs, NITs** and many other establishments. We also provide training modules like **PLC, SCADA** etc for technical institutes. **TSPL** also offers Operator Training Simulator systems on hiring basis.

**TSPL** products are a boon to the developing power and refinery sector to meet the growing need for trained personnel and to upgrade the skills and retraining of the staff not exposed to modern complex plants.

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http://www.indiamart.com/trianglesimulation/

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