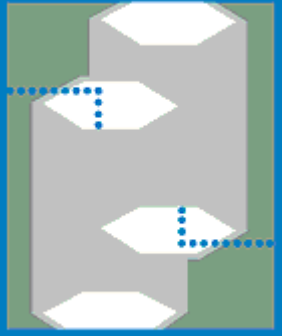


C A P E

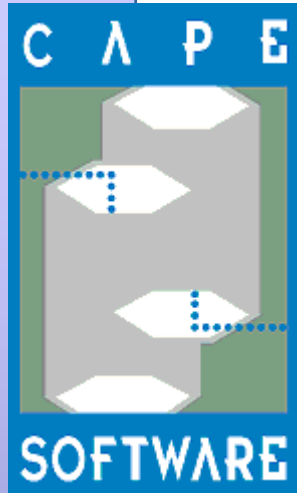


SOFTWARE

# *The Virtual Process Overview and Applications*

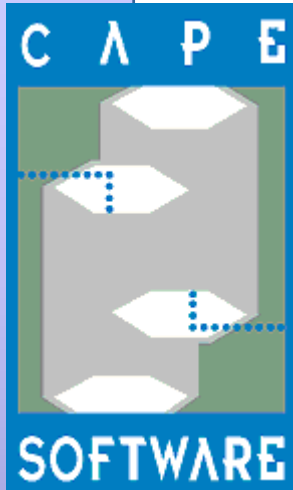
Cape Software Inc.

Houston TX



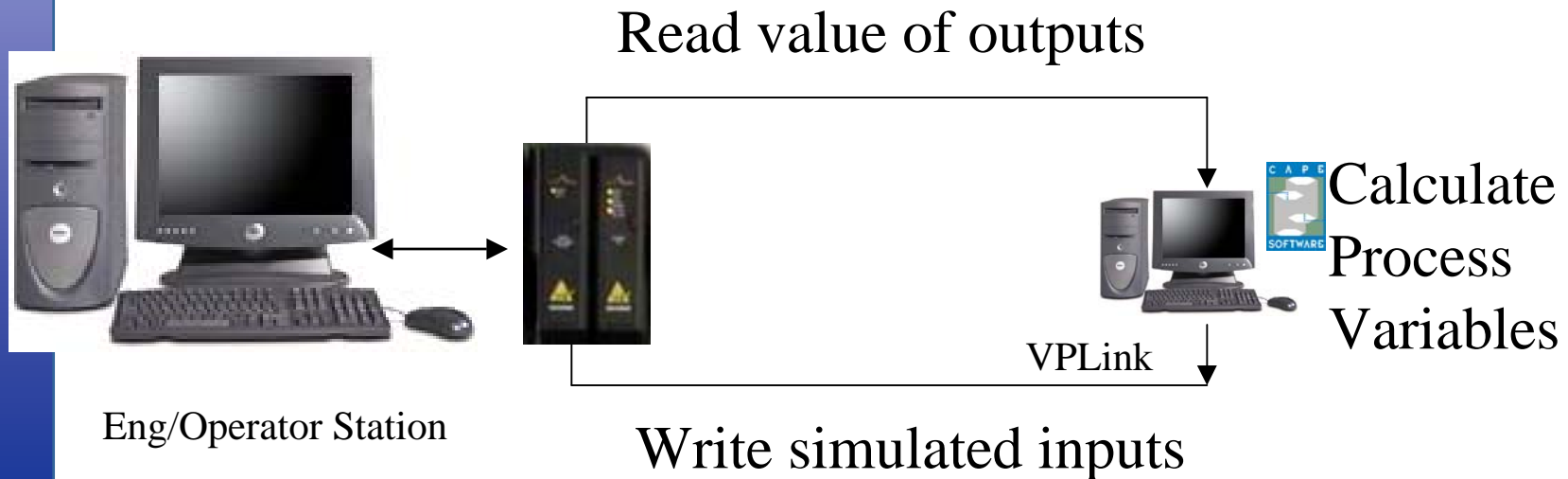
## *What is VPLink ?*

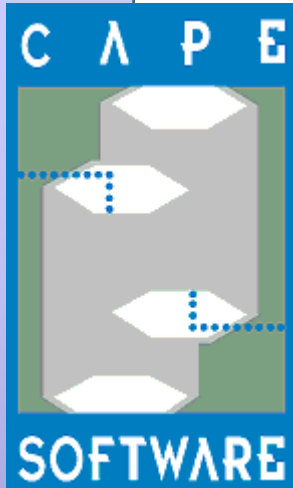
- A **representation** of the process **inputs** to an **offline control system**
- What does VP Link do?
  - **Read** control system **outputs**
  - **Calculate** the Virtual Process State – ie, Process Model
  - **Write values** for Process Variables
  - **Offer GUI** for engineer or instructor to present scenarios such as equipment fault, process upset, or transmitter drift (failure)



## *Virtual Process Overview*

- Windows based interface: intuitive
- No Changes to Logic programs: non-invasive
- I/O board Hardware not required (cost advantage)
- Interfaces with emulated or real controllers





## *Some of our customers...*

**BASF** – many plants across several sites W/W

**TOTAL**– Vlessingen, Netherlands

**Eastman** – Several Sites Licenses

**Air Products & Chemicals** – several systems W/W

**ConocoPhillips** –San Francisco, CA

**ChevronTexaco** – Several Sites Licenses

**Phillips Refining** – Several Sites Licenses

**TrunkLine LNG** – Baton rouge, LA



**Lubrizol** – multiple licenses Deer Park, TX

**BP** – several licenses at several sites

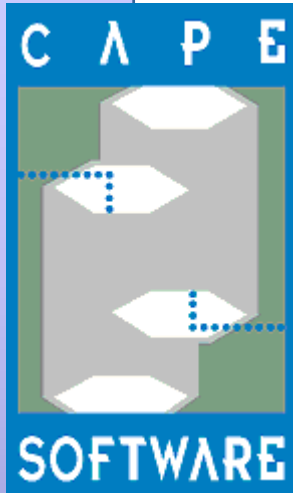
**Shell Deepwater / Shell Chemicals, UK**

**Eli Lilly** – Corporate licensing

**Genentech** – several licenses at different sites

**General Mills** – W/W licensing

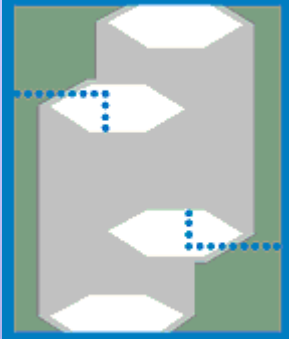
**Murphy Oil** - Mereaux, LA



## *Some Supported Systems*

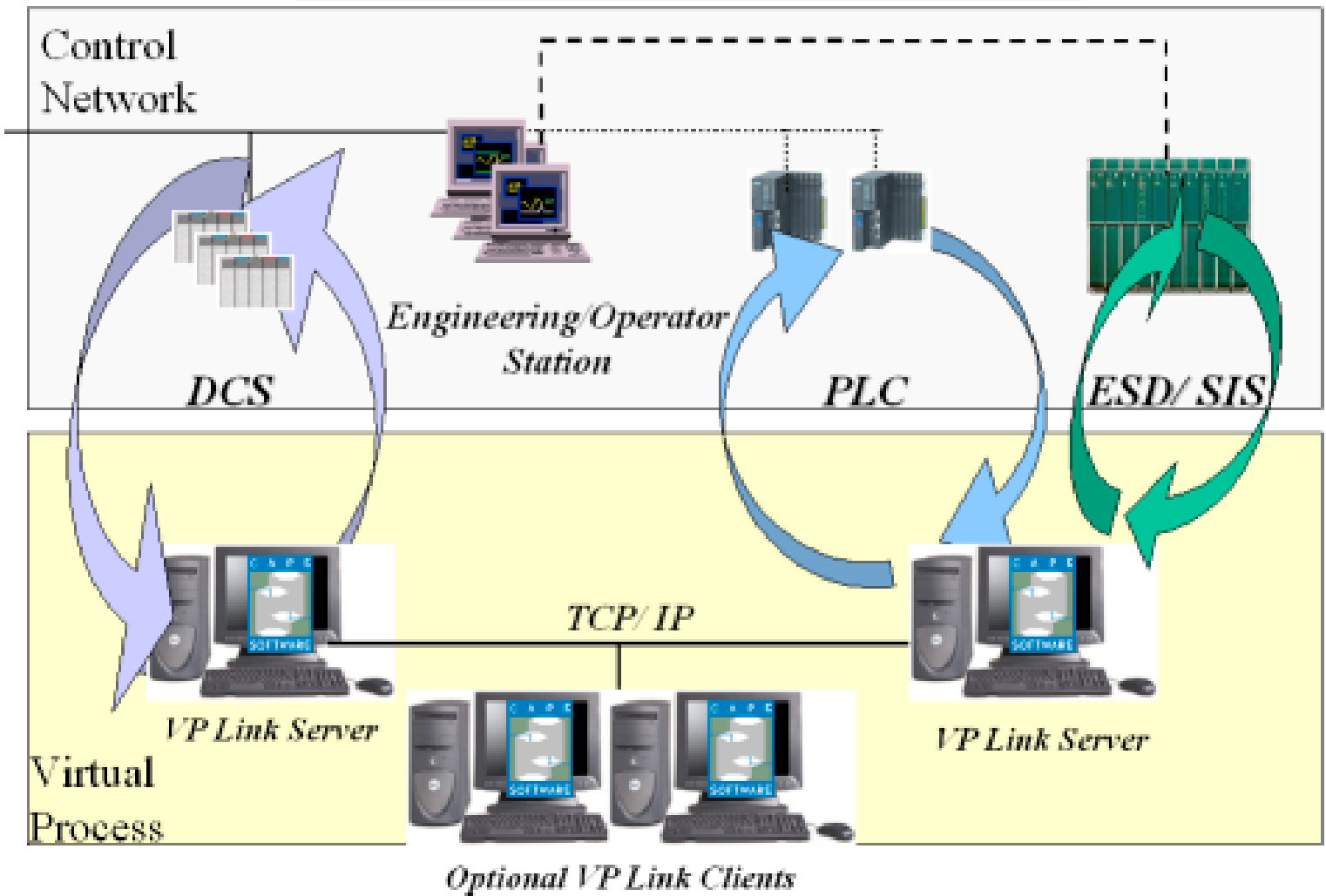
- Emerson DeltaV,PROVOX
- Yokogawa CS3000/R3/ ProSafe
- Triconex:Tricon/Trident
- ABB Mod300, Advant,Sattline
- Siemens Quadlog
- Foxboro I/A,Archestra
- Honeywell Plantscape / Rockwell ProcessLogix
- Honeywell TPS Honeywell FSC,PKS
- A-B PLC5/SLC500,CLX, Modicon,Siemens-Ti 505
- Siemens APACS, PCS7, S7
- Etc...

C A P E

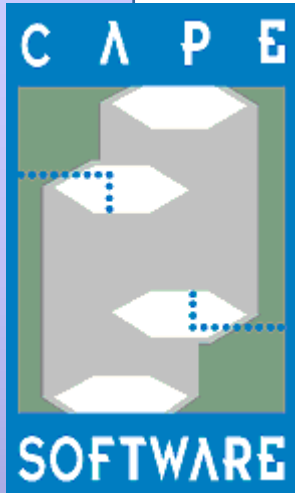


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## VP LINK 3.0 Sample Network



Control Network Systems are solving the logic, responding to simulated VP Link inputs



# *Different Architectures for different Applications*

## **Testing Setup**

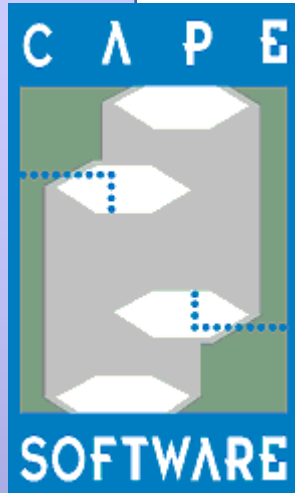


Engineers test logic in a collaborative fashion

## **Parallel Training Setup**



Trainees operate identical units, in parallel

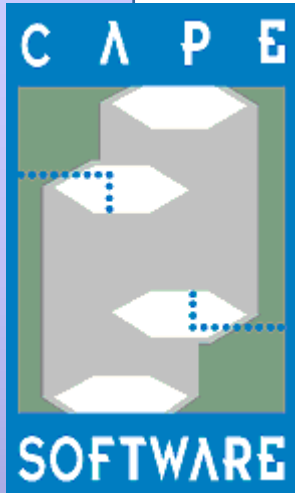


## *VP Link 3.0*

### *5 steps to simulation*

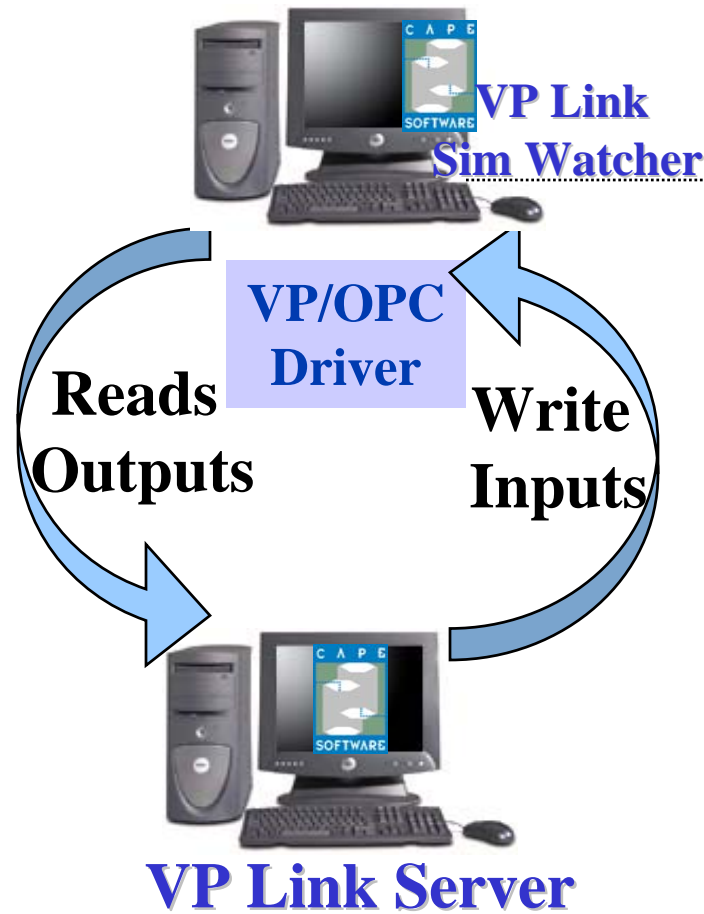
- Extract the control systems I/O images, using platform specific tools
- Import the images in VP Link
- Model the process, using loop templates, algorithms and CalcBlock
- Write training/failure scenarios
- Connect to Controllers(real or emulated ) through OPC





# *Sample VP Link Network For Emerson DeltaV*

Proplus / DeltaV Simulate



*Training Nodes*

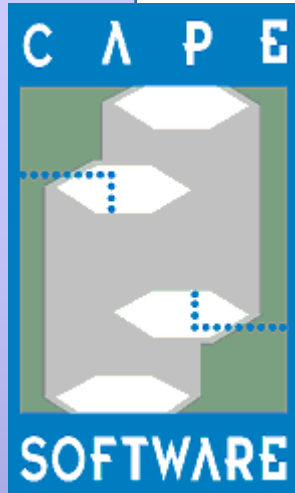


**Operator Stations**



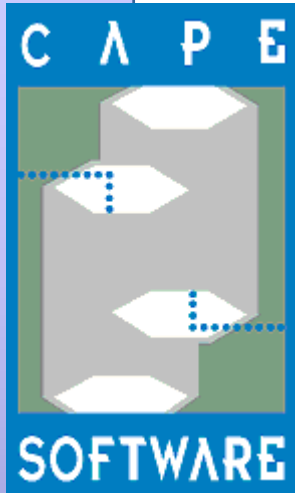
**Optional DeltaV Controllers**

**DeltaV Network**



## *Specifics :* *VP Link for Delta V Interface*

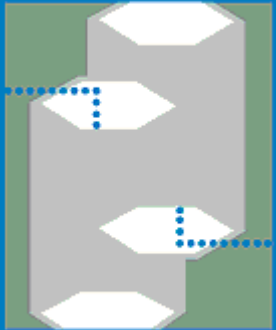
- Automated Extraction utilities
  - Based native fhx export file
- Easy Graphics Import in Toolbook
- Fieldbus conversion Tool
- DeltaV Sim Watcher
  - maintains blocks in Simulation mode,unattended
- Fast,Robust OPC Interface to Proplus /Stand Alone DeltaV Simulate



# *VP Link Applications*

## I - Logic Validation

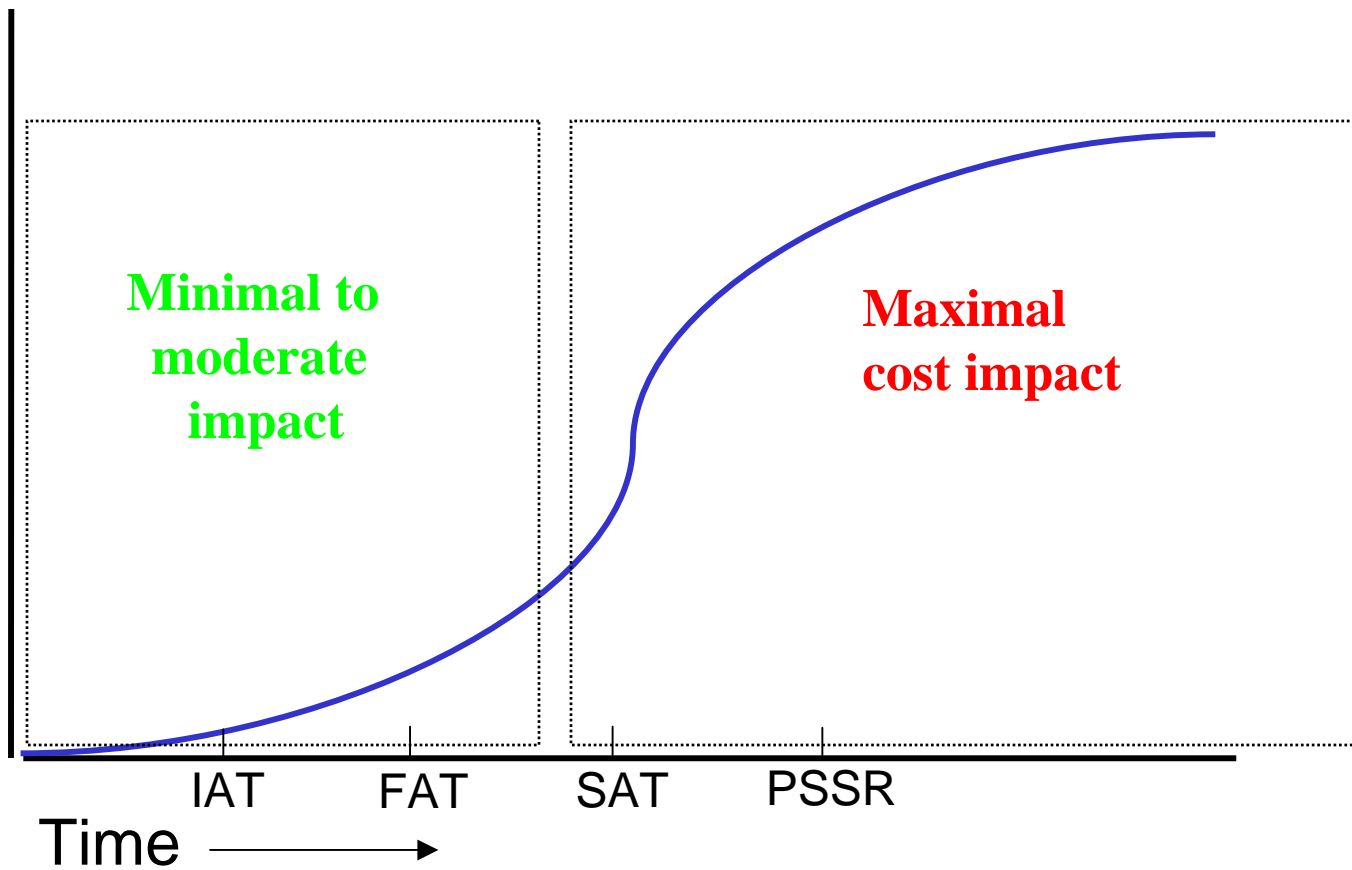
C A P E

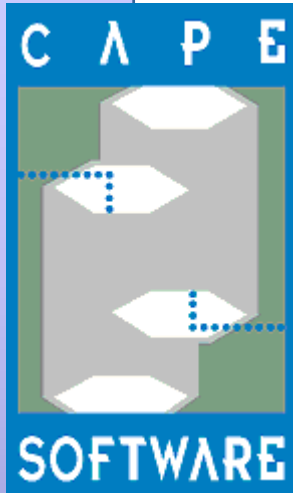


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# *Impact of change during a project development cycle*

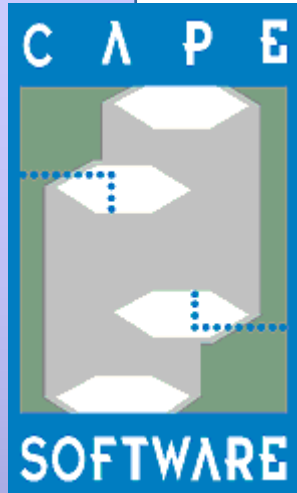
Incremental Cost





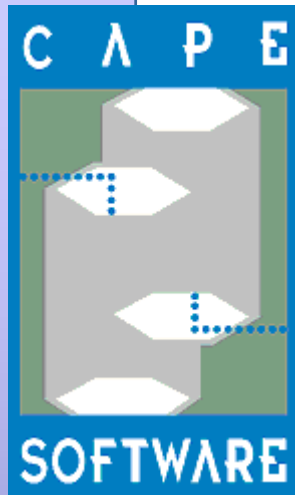
# *I - Logic Validation*

- VP Link Allows:
  - Graphics verification
  - Logic checkout at I/O / block / module / system level
  - Interlock schedule approval
  - Integrated Testing :**Mapping** to DCS and interaction between DCS/PLC logic ( gateway points tests)
- How ?
  - **Automates** repetitive testing task (ie resets etc...)
  - **Facilitates** FAT with customized graphics
  - **Collaborative** testing framework thru distributed architecture
- Thoroughly debug prior to online download, ie, **Management of Change** and periodical testing



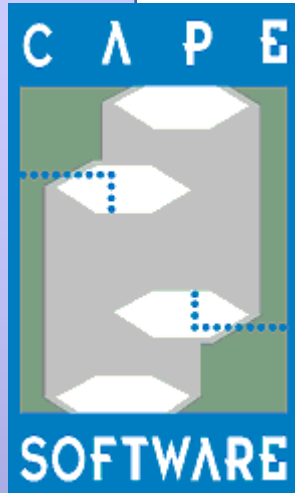
## *VP Link Applications*

### II- Operator Training Simulator (OTS)



## *Goals of Operator Training*

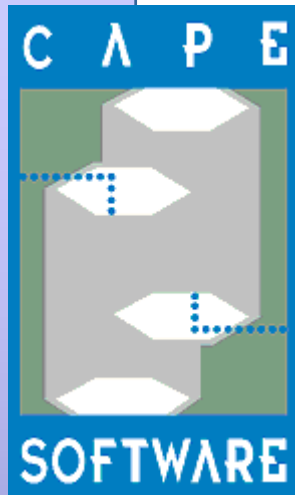
- Familiarize staff with HMI, Overlays, Navigation, Alarm Pages, Trend Displays
- Utilizing actual Programs / GUI for efficient training
- Exercise Startup / Shutdown Procedures, using simulated ESD for real process trips
- Test Emergency Responses to Faults / Malfunctions / Upsets (Real or Instrumentation)
- Refresher Training or Re-certification
- Track trainee's proficiency (*Scoring Engine Module*)
- Knowledge Transfer Tool



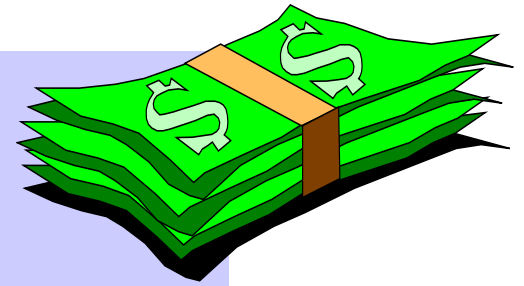
## *Operator Training System (OTS) using VP Link*

- *Real control program* is used, in same field controllers for realistic control response
- Trainees operate the virtual plant using the real *field consoles, graphics and keyboards*
- *ESD* (Emergency Shutdown Device) is easily integrated in the process model
- *HMI graphics are imported* in VP Link to offer a intuitive trainer interface
- *High Quality* process modeling tools, simulating the most complex chemical processes
- *Experienced* simulation staff in several industries, including *Chemicals, Pharmaceutical...*

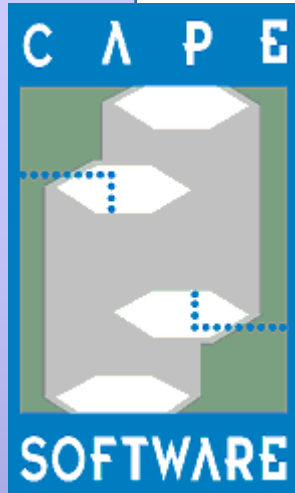




## *Resulting In...*



- Reduced start-up time, due to thorough off-line testing of start-up logic.
- Reduced down time, due to on-going logic testing
- Reduced Factory Acceptance Test Time
- Reduced Risk of Equipment Damage
- Reduced Risk of Wasted Product.
- Reduced Risk of Environmental Release.
- **Documented, Validating Operator Sessions Logs**
- **Compliance with IEC/OSHA regulations**



## *Conclusion*

- VPLink solves simulation needs from *simple to sophisticated*, rigorous modeling.
- OTS node can used as an engineering Test Bed system, for *preventive / periodical logic validation*
- *Unattended Real Time* trainee performance logs
- Modeling environment is *flexible, easy to learn and maintain*
- Available *New Version Service* keeps VP Link components up to date, with free technical support
- *Cost Effective* simulation package for *OTS*, using Off the Shelf components for process model and control or emulated control
- *Cross platform* functionalites makes VP Link an *evolutive investment*