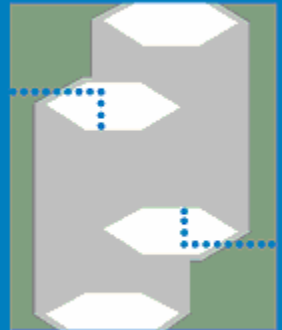


C A P E



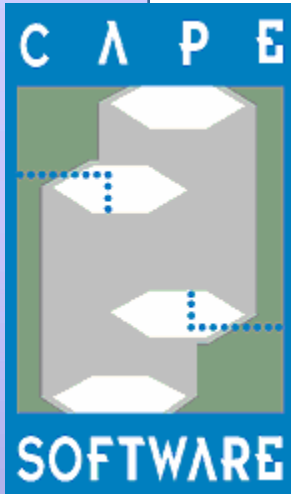
SOFTWARE

The background of the slide is a collage of various images related to industry and science. It includes a green circuit board, a glowing industrial structure, a person in a lab coat working at a computer, a person in a control room, and a complex industrial plant with many pipes and towers.

# *The Virtual Process Overview and Applications*

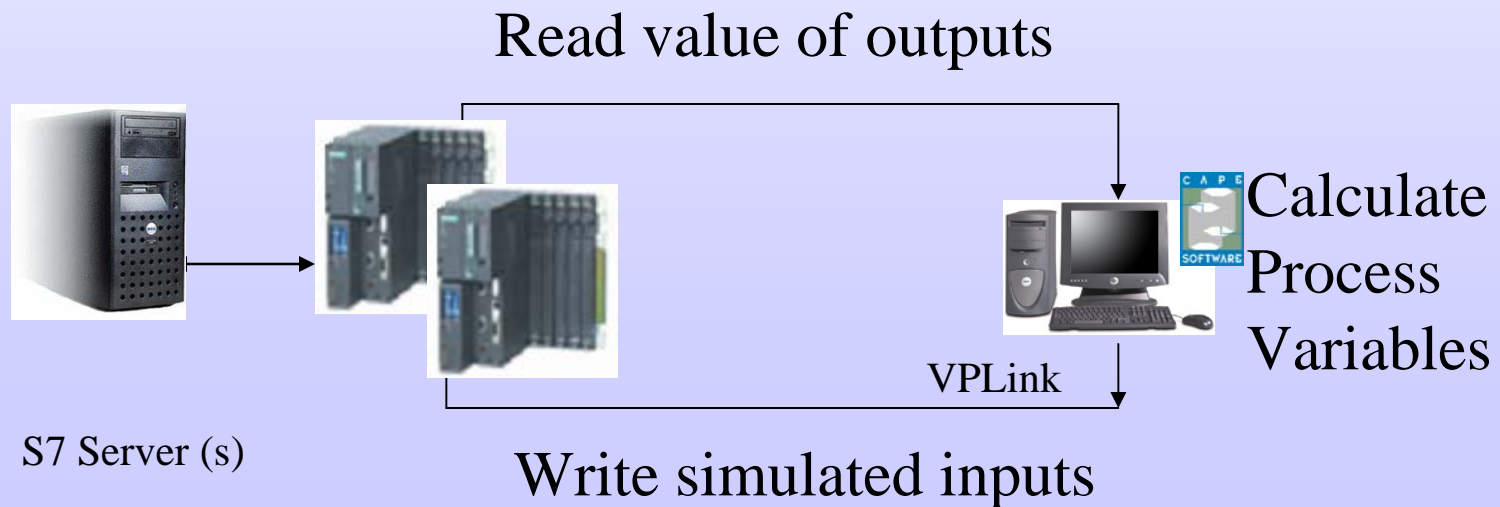
Cape Software Inc.

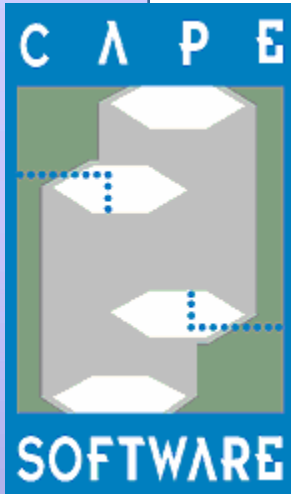
Houston TX



## *Virtual Process Overview*

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





## *Some of our customers...*

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

**TOTAL**–Netherlands

**Eastman** – several systems within Kingsport, TN

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

**Conoco Phillips** –San Francisco,CA

**Chevron Texaco** – Several Sites Licenses

**Phillips Refining** – Several Sites Licenses

**Iron Ore Company** – Labrador City ,CA



**BP** – several licenses at several sites

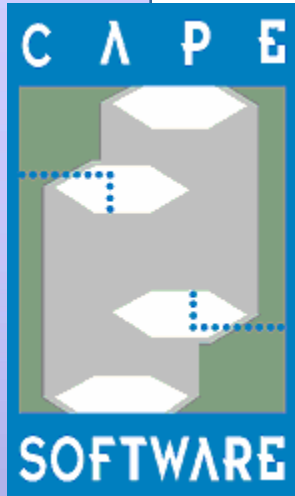
**Shell Deepwater / Shell Chemicals,UK**

**Eli Lilly** – Corporate licensing

**Genentech** – several licenses at different sites

**General Mills** – W/W licensing

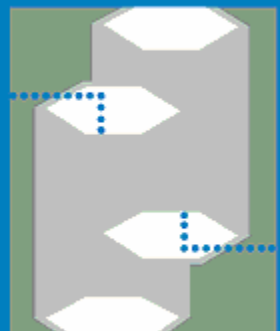
**Murphy Oil** - Mereaux, LA



## *Supported Systems*

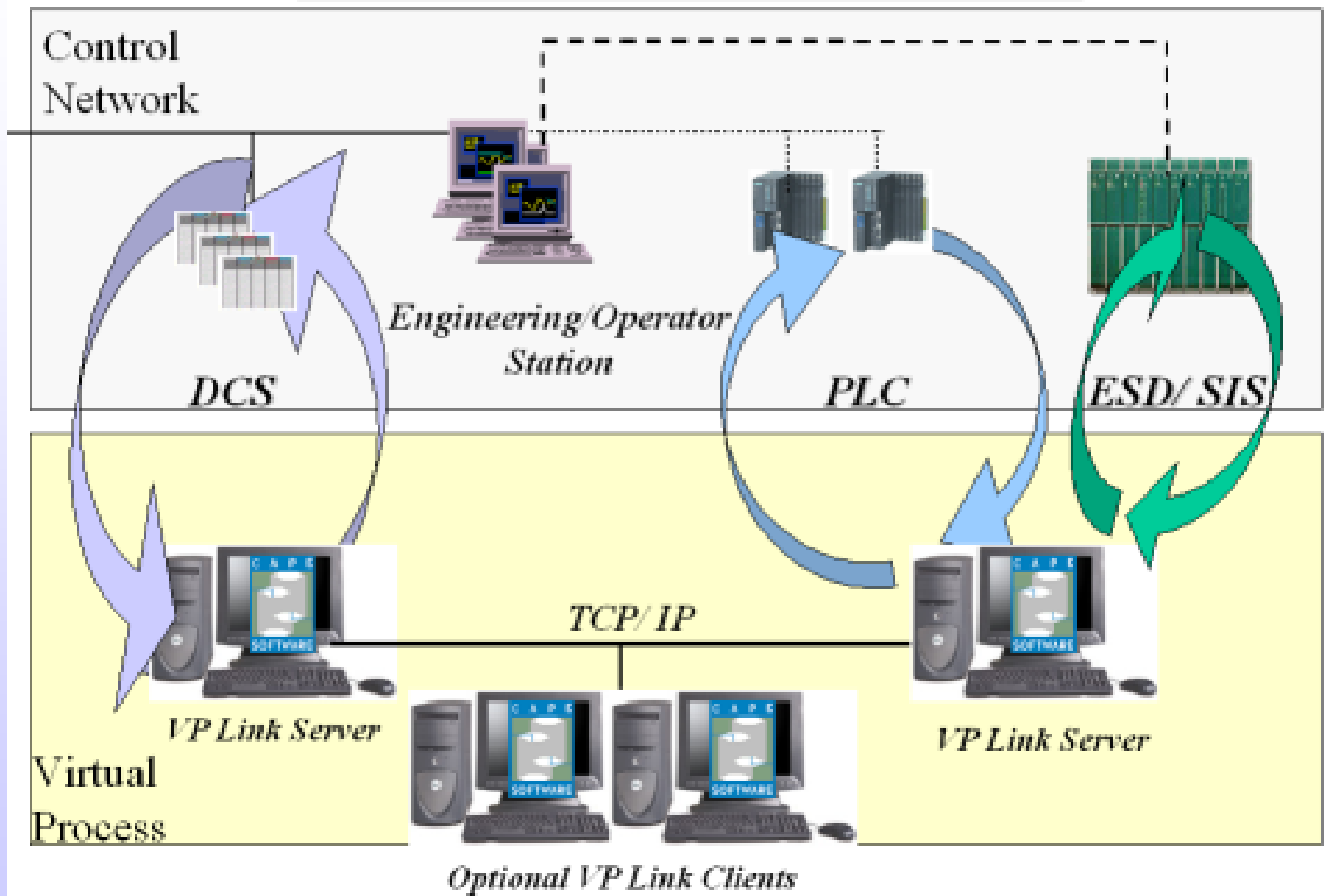
- Siemens APACS, PCS7, S7
- Honeywell Experion PKS TDC,TPS , FSC
- ABB 800 xA,Industrial IT
- Siemens APACS, PCS7, S7
- Honeywell Experion PKS TDC,TPS , FSC
- Honeywell Plantscape / Rockwell ProcessLogix
- Triconex:Tricon/Trident
- GE Fanuc series 90
- A-B PLC5/SLC500,CLX, Modicon,Siemens-Ti 505
- Foxboro I/A,Archestra
- Siemens APACS, PCS7, S7
- Yokogawa CS3000/R3/ ProSafe
- Etc...

C A P E

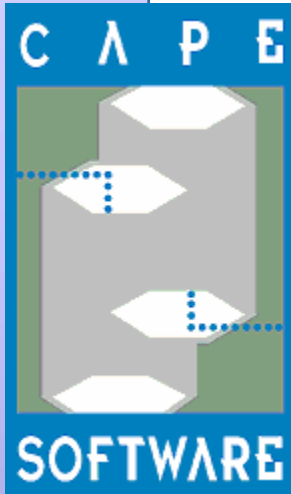


SOFTWARE

## VP LINK 3.0 Sample Network

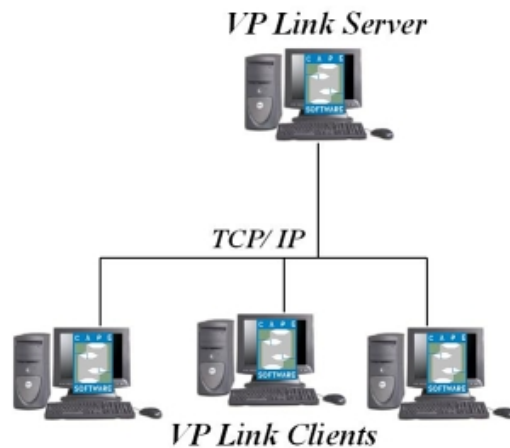


Control Network Systems are solving the logic, responding to simulated VP Link inputs



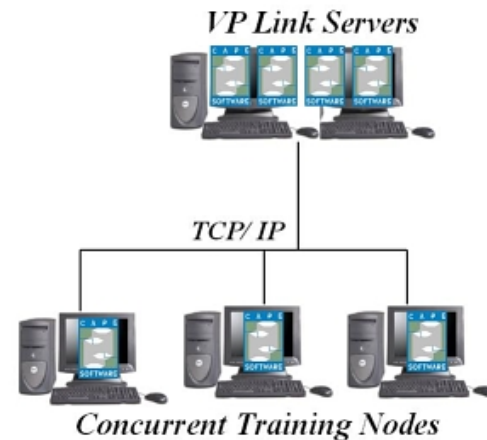
# *Different Architectures for different Applications*

## **Integrated Training Setup**

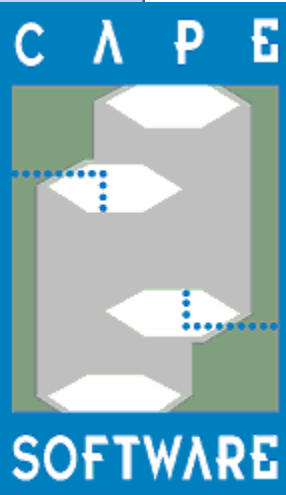


Trainees operate different units, interacting with each other

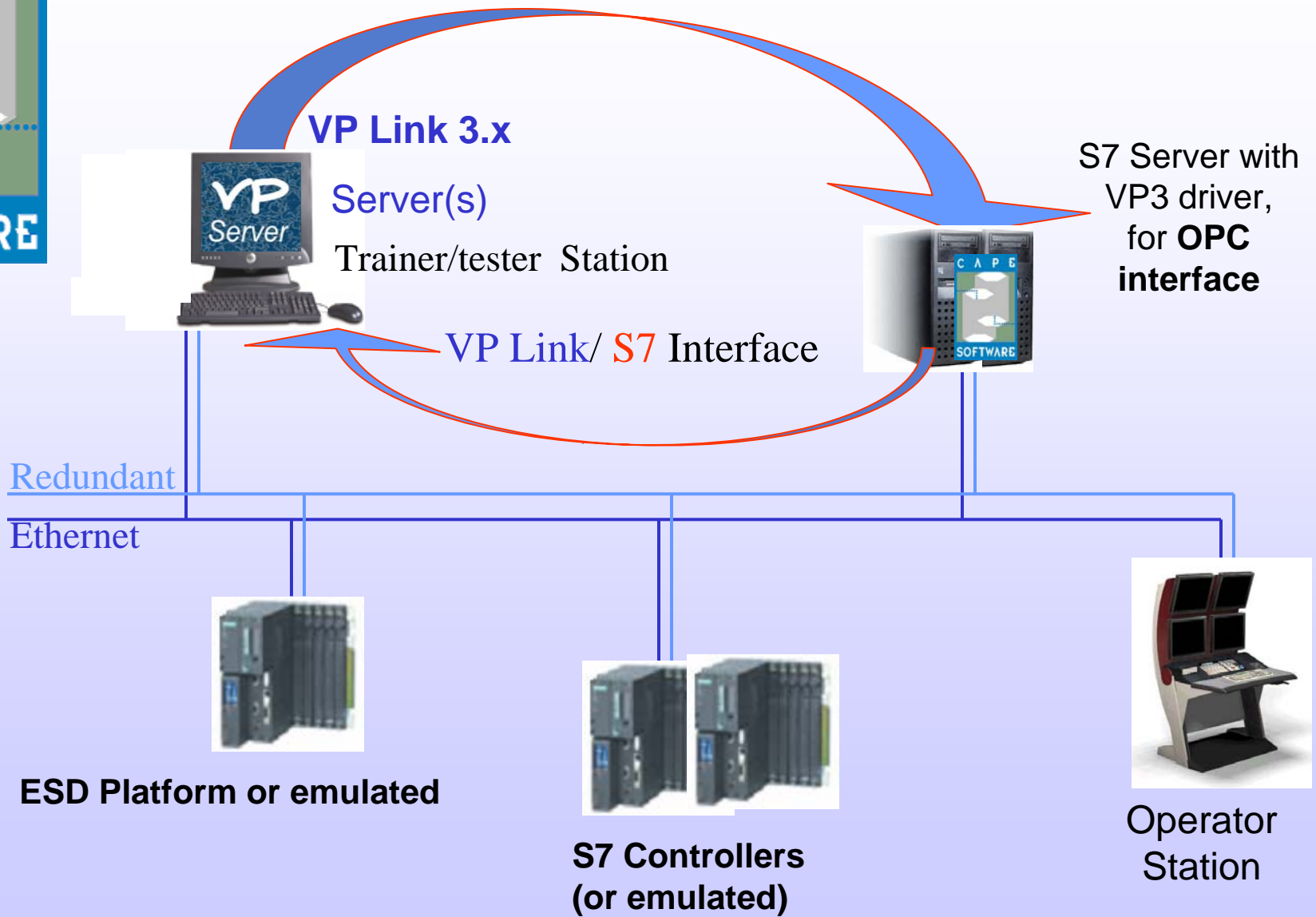
## **Parallel Training Setup**

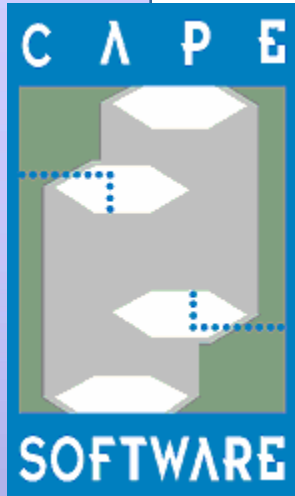


Trainees operate identical units, in parallel



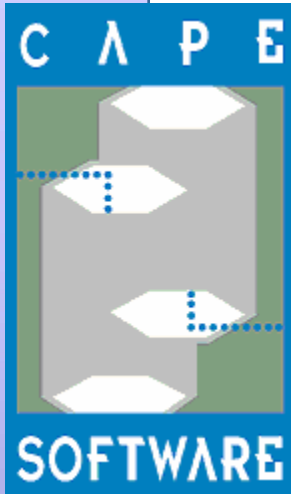
# *Virtual Process : Siemens S7 Systems*





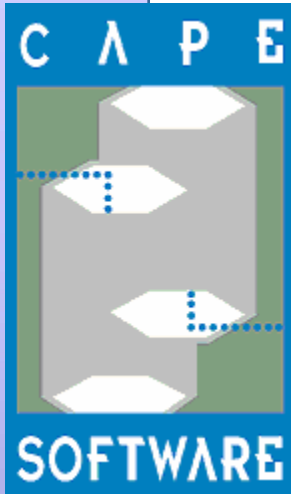
## *5 steps to simulation with S7 Platform*

- Extract the I/O image, using built-in platform specific tools
- Import the image (and HMI) in VP Link
- Model the process, using loop templates, algorithms and CalcBlock
- Write training/failure scenarios
- Connect to Control System via OPC over Ethernet



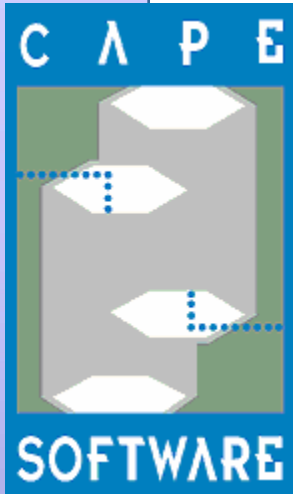
## *VP Link for Siemens S7 : Specifics*

- Automated Extraction utility for *easy model maintenance (less than a minute to extract full I/O image)*
- HMI Graphics Import in Toolbook for realistic trainer interface
- Fast *OPC over Ethernet* Interface



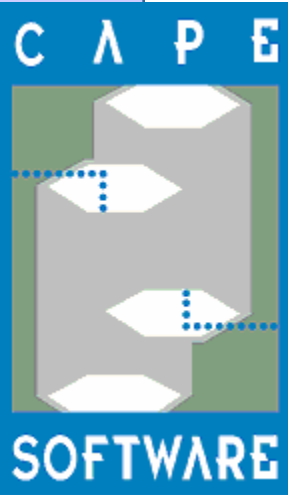
## *Does the type of process matter ?*

- VP Link is a proven solution for :
  - Batch (recipe / state control based strategy )
  - Semi-continuous
  - Continuous
- How ?
  - VP Link model is I/O based
  - Hence isolated from control strategy



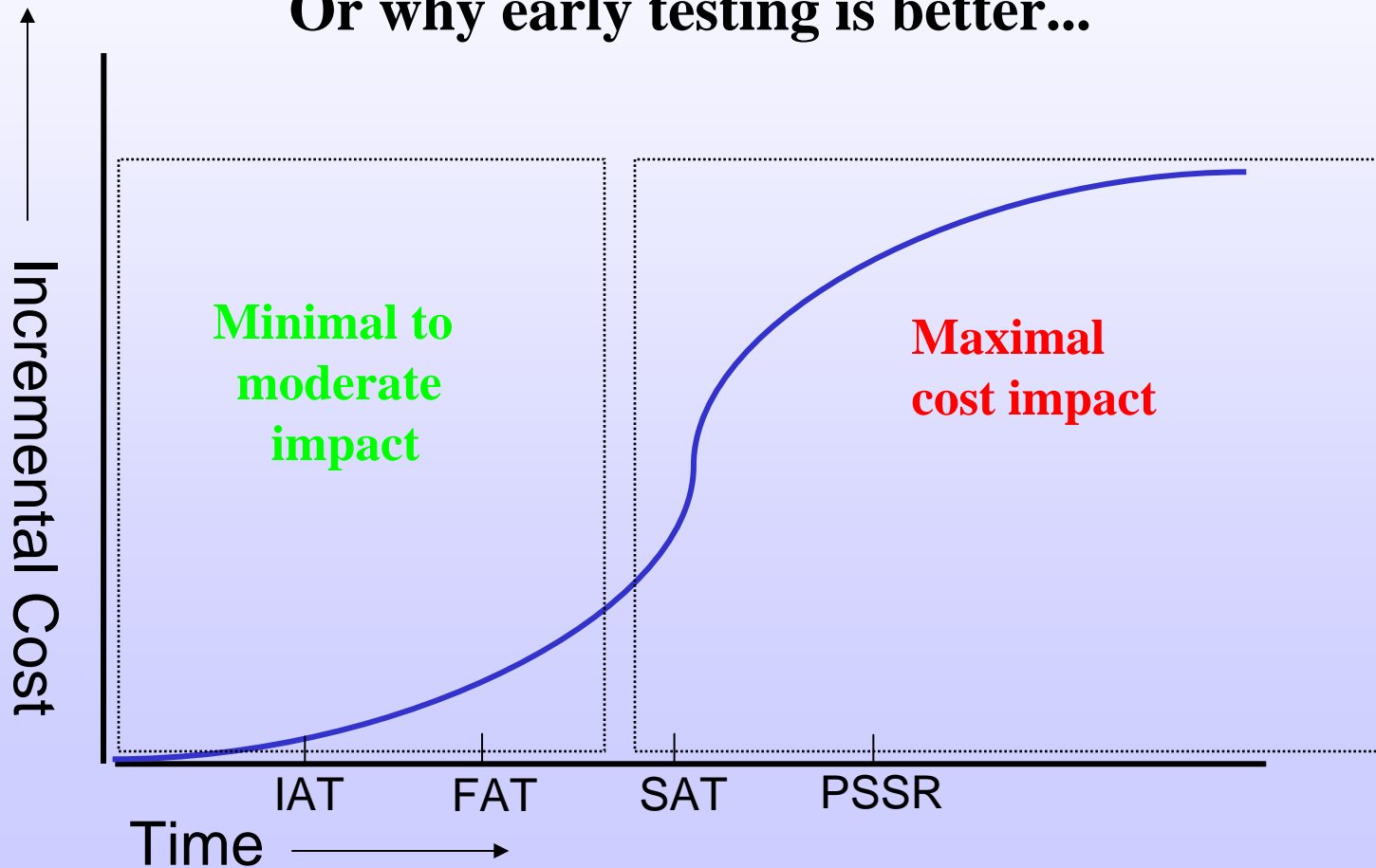
# *VP Link Applications*

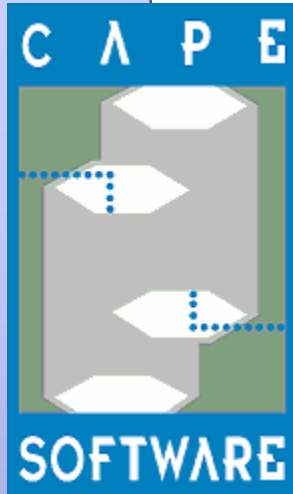
I - Logic Validation



# *Impact of change during a project development cycle*

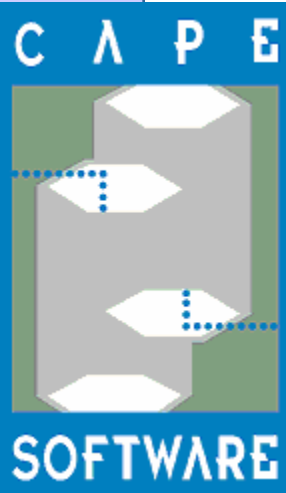
Or why early testing is better...



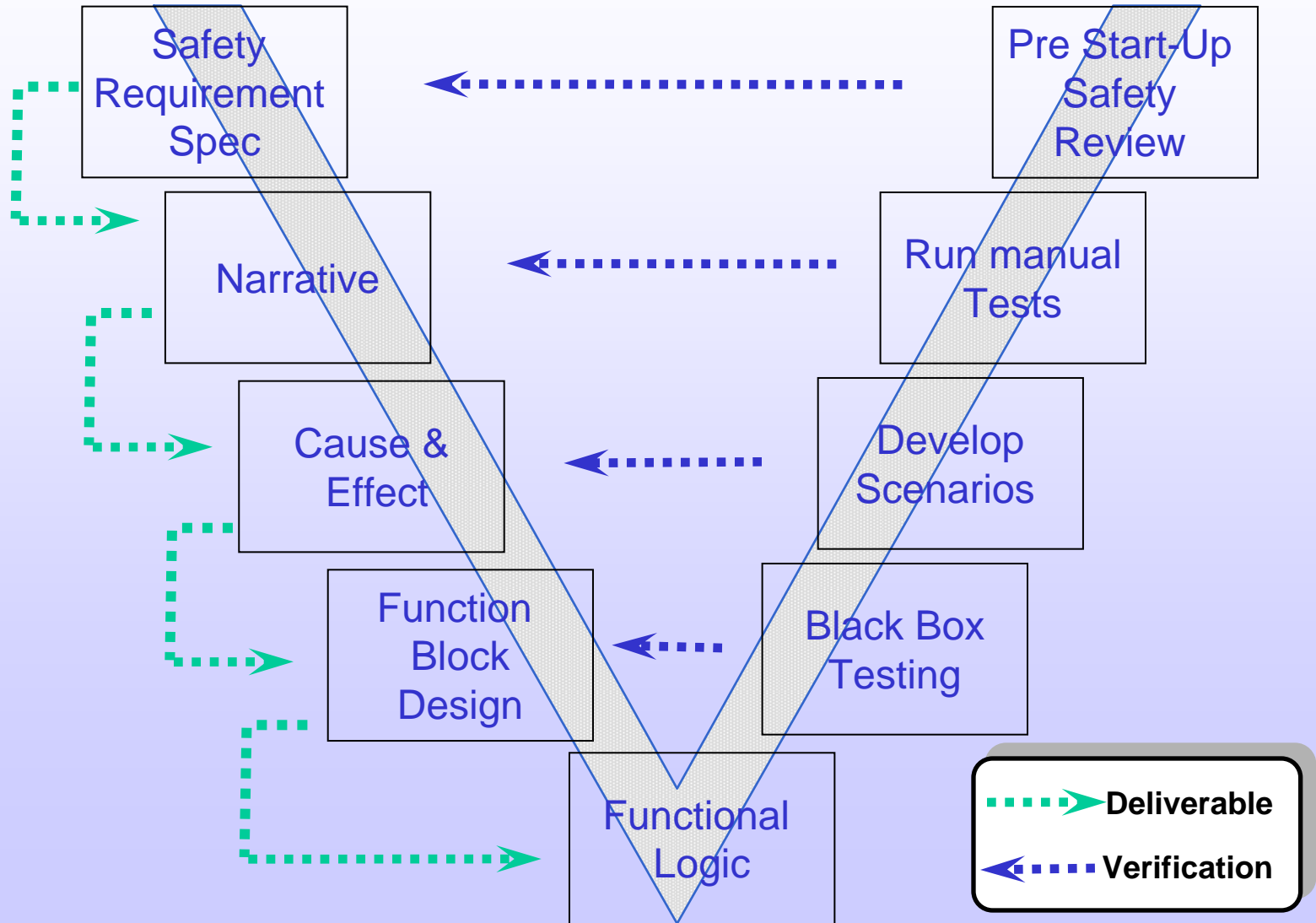


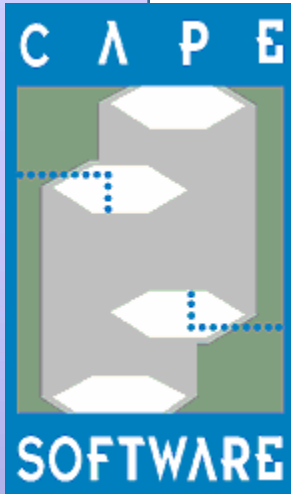
# *I - Logic Validation*

- 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
- **Test Compiler complies with IEC61508/61511**



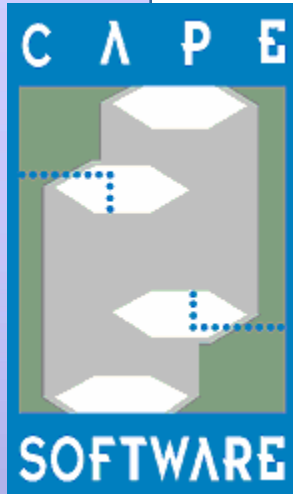
# *V-Approach methodology: application to validation*





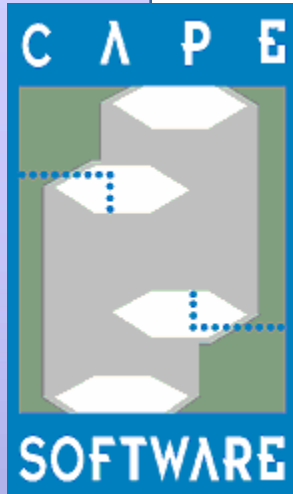
## *VP Link Applications*

II- Operator Training Simulator  
(OTS)



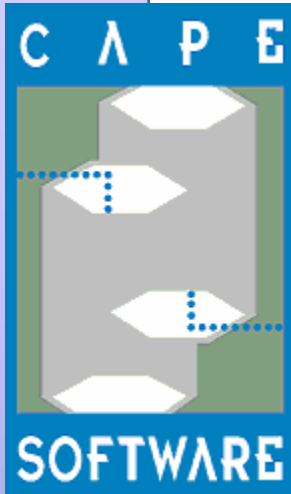
## *II-Operator Training*

- **Familiarize** staff with HMI, Overlays, Navigation, Alarm Pages, Trend Displays
- **Exercise Startup / Shutdown** Procedures
- **Test Emergency** Responses to Faults / **Malfunctions / Upsets** (Real or Instrumentation)
- Refresher Training or Re-certification
- **Track** trainee's **proficiency** (**Scoring Engine**)
- **Knowledge Transfer** Tool



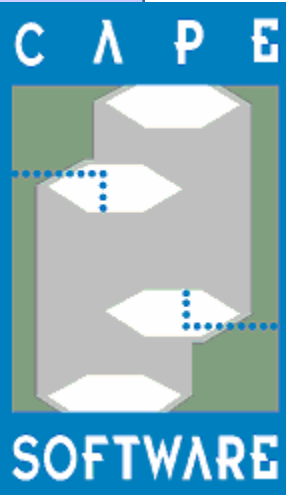
## *Operator Training System (OTS) using VP Link*

- *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 and OTS
- *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 the *chemicals & petrochemical industry*



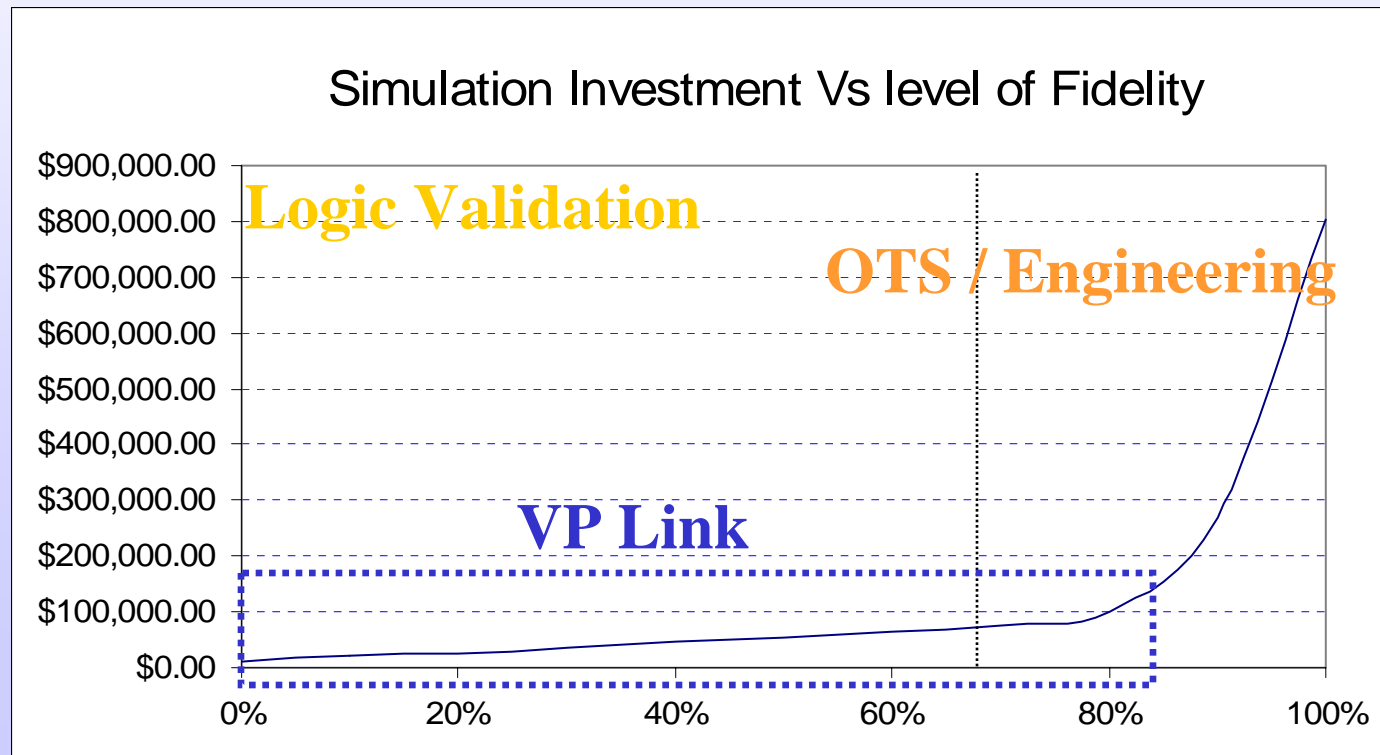
## *What kind of process simulation do I need ?*

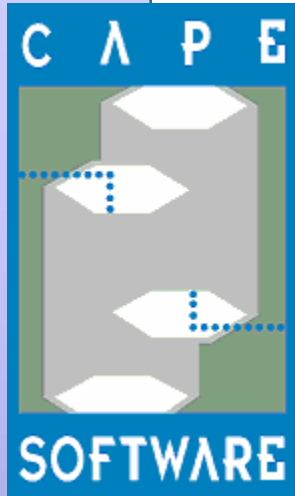
- **Process simulation Fidelity**
- **Applications of process simulation**



# *Cost Analysis of process model fidelity*

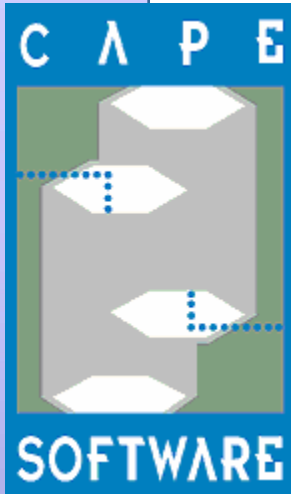
- ~ 2,000 I/O
- Oil Refining units





## *Maximize your ROI with VP Link*

- ROI = (Gains - Investment ) / Investment
- Minimize your operating costs & investment:
  - Fixed investment for simulation based on **I/O count**
  - **Low maintenance** cost (non-invasive,I/O based)
- Maximize your gain:
  - **Gains** calculated over **process lifecycle**
  - Highly **variable gains** depending on flexible implementation **timing** (if used for **validation AND OTS**) in terms of schedule AND software quality



## *Conclusion*

- VP Link solves simulation needs from *simple to sophisticated*, rigorous modeling.
- OTS node can be 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* functionalities makes VP Link an *evolutionary investment*