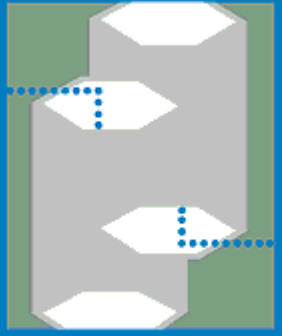


C A P E



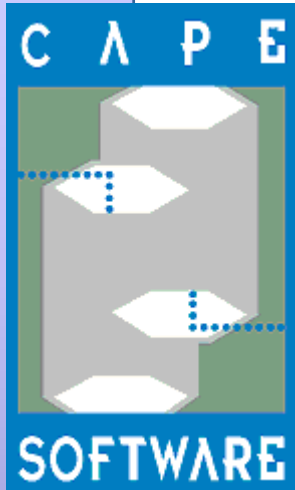
SOFTWARE

The background of the slide is a collage of various images related to industry and technology. It includes a green field with white circles, a glowing industrial structure, a person in a control room, a laboratory setting with a person in a white coat, and a 3D model of an industrial plant.

The Virtual Process Overview and Applications

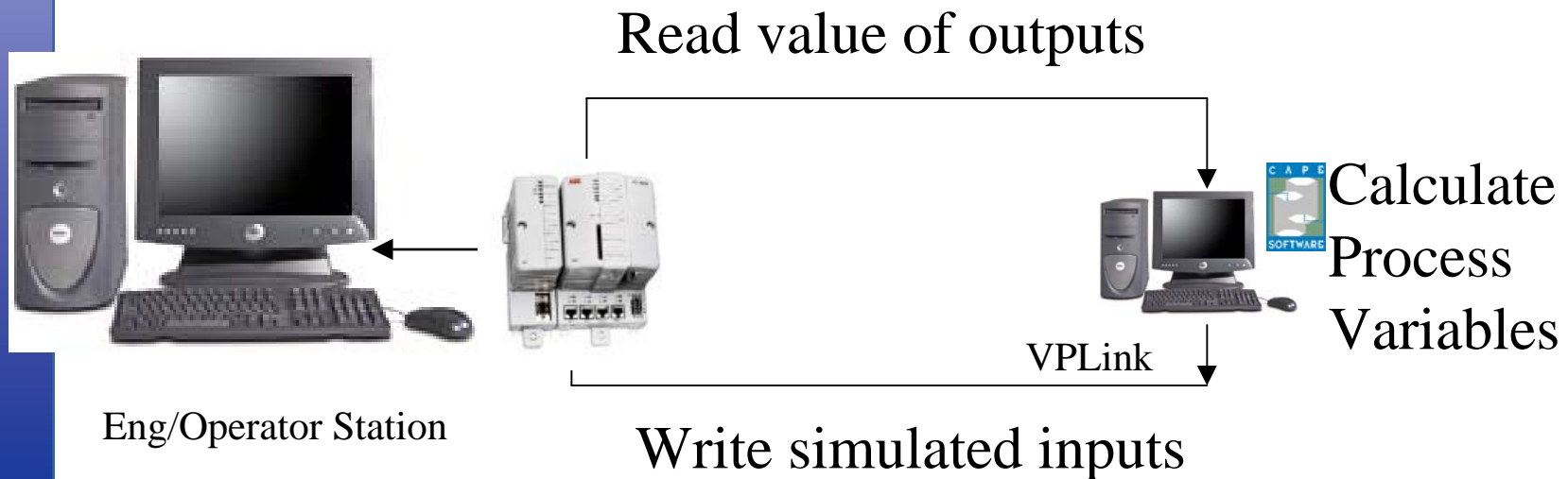
Cape Software Inc.

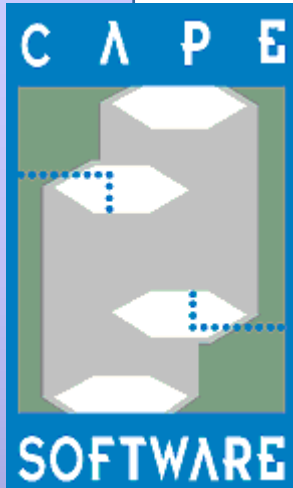
Houston TX



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

ConocoPhillips –San Francisco,CA

ChevronTexaco – Several Sites Licenses

Phillips Refining – Several Sites Licenses

Iron Ore Company – Labrador City ,CA



BP – several licenses at several sites

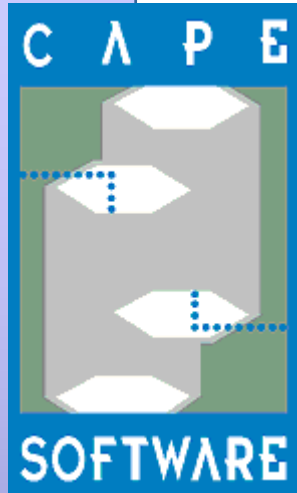
Shell Deepwater / Shell Chemicals,UK

Eli Lilly – Corporate licensing

Genentech – several licenses at different sites

General Mills – W/W licensing

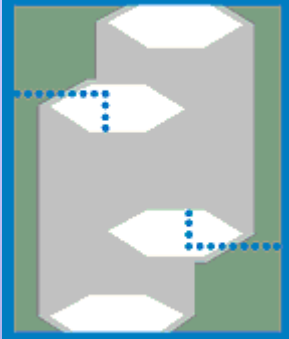
Murphy Oil - Mereaux, LA



Supported Systems

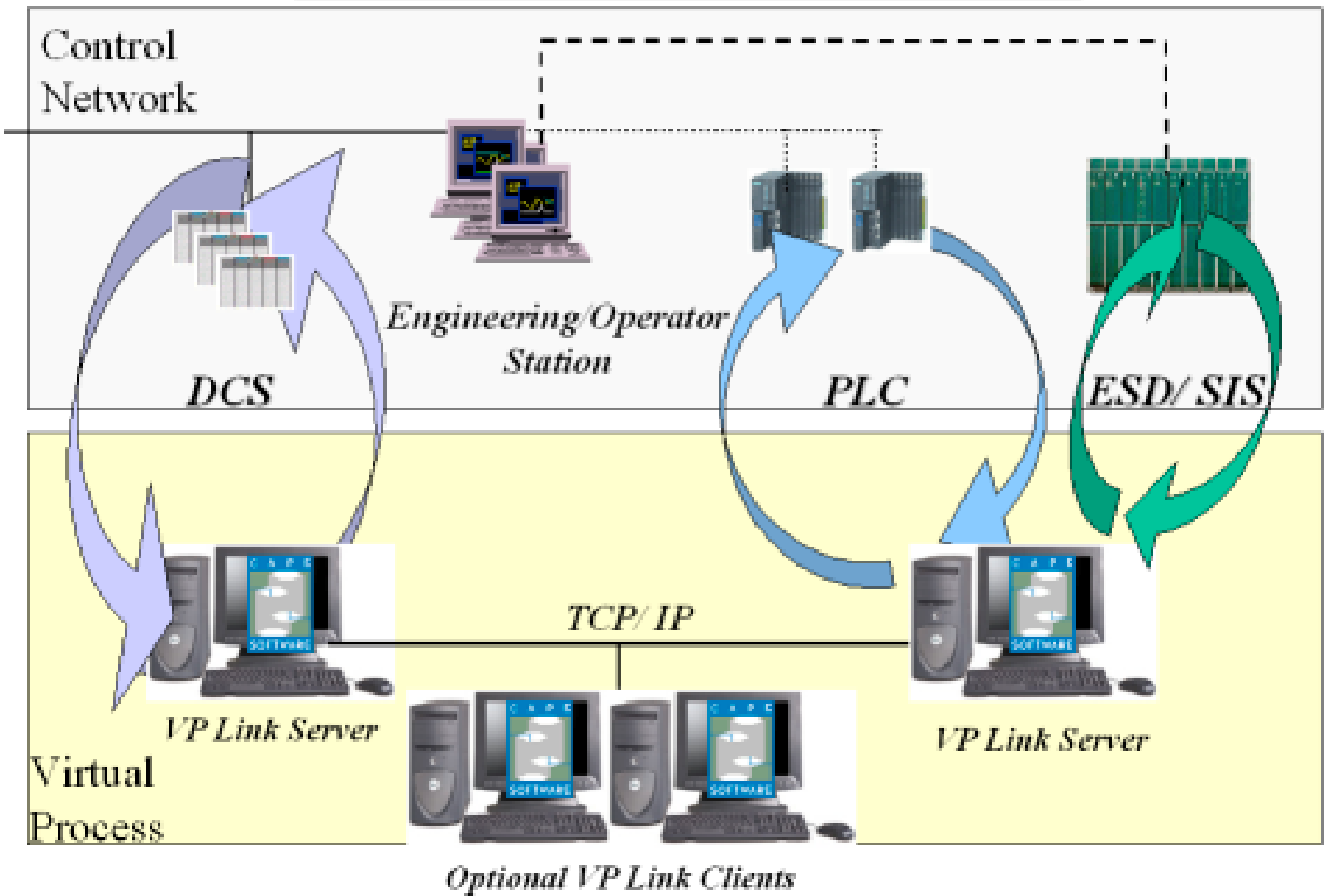
- ABB 800 xA, Industrial IT
- ABB Mod300, Advant
- Honeywell Experion PKS TDC, TPS , FSC
- Honeywell Plantscape / Rockwell ProcessLogix
- Triconex: Tricon/Trident
- GE Fanuc series 90
- A-B PLC5/SLC500, CLX, Modicon, Siemens-Ti 505
- Foxboro I/A, Archestra
- Siemens APACS, PCS7, S7
- Yokogawa CS3000/R3/ ProSafe
- Etc...

C A P E

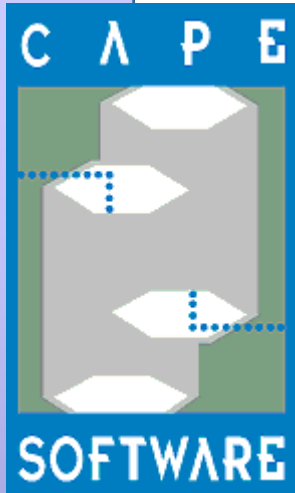


SOFTWARE

VP LINK 3.0 Sample Network

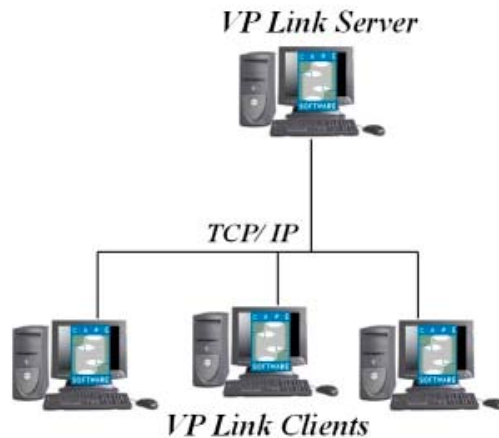


Control Network Systems are solving the logic, responding to simulated VP Link inputs



Different Architectures for different Applications

Integrated Training Setup

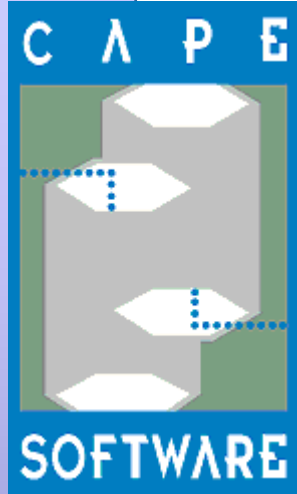


Trainees operate different units, interacting with each other

Parallel Training Setup



Trainees operate identical units, in parallel



The *Virtual Process* for ABB 800xA Systems

VP Link 3.0



Trainer Station

VP Link/ABB Interface
over Ethernet



ABB Connectivity Server
with VP3 driver

Optional
VP Link/SIS
Interface



SIS Station

Ethernet

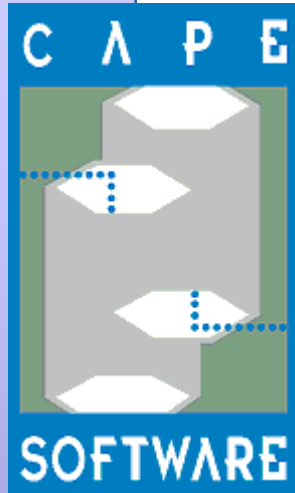


AC800 M
Controllers



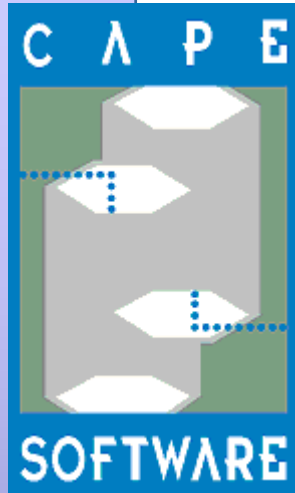
Operate IT
Station

VP Link



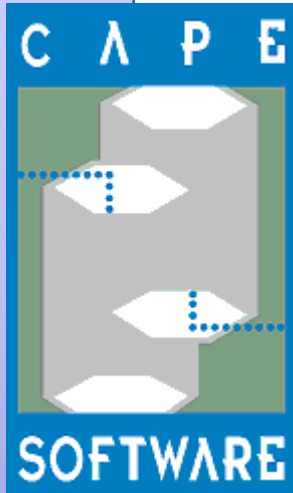
VP Link Specifics for Industrial IT

- Fast TCP-IP based interface
- Robust OPC based connectivity
- Optimized ABB API connectivity available
- Interface work in parallel with other simultaneous connections (such as ABB Portal,etc) for vertical integration



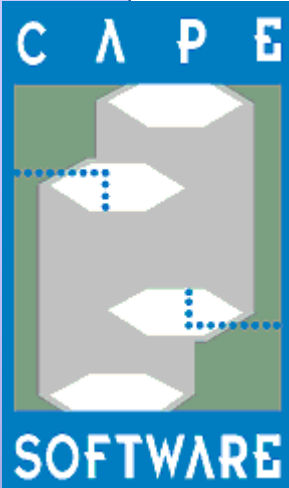
5 steps to simulation with ABB Platforms

- 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

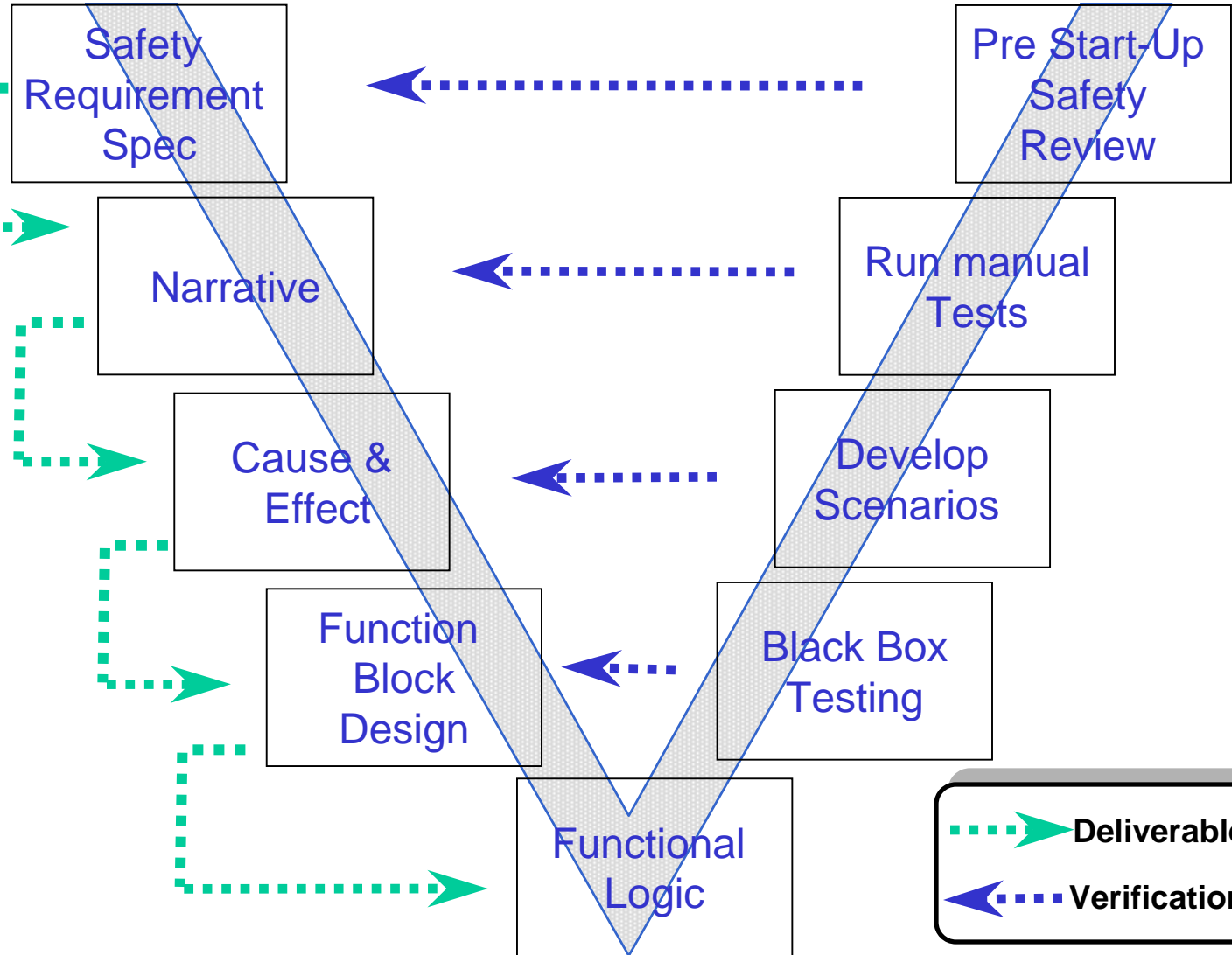


I - Logic Validation

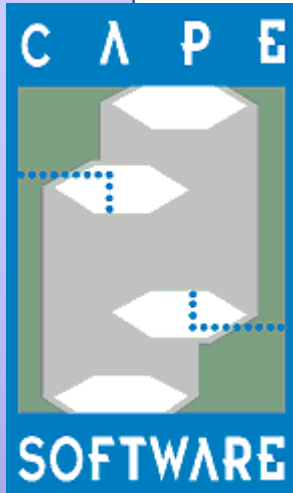
- **Graphics** verification
- **Logic** checkout
- **Automate** repetitive testing task (ie resets etc...)
- Facilitate Testing with practical graphics
- **Interlock** schedule approval
- **Mapping** to DCS and interaction between DCS/PLC logic (gateway points tests)
- Thoroughly debug prior to online download, ie, **Management of Change** and periodical testing
- **Test Compiler complies with IEC61508/61511**



V-Approach methodology: application to validation

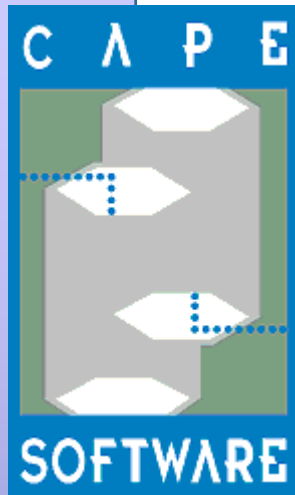


VP Link



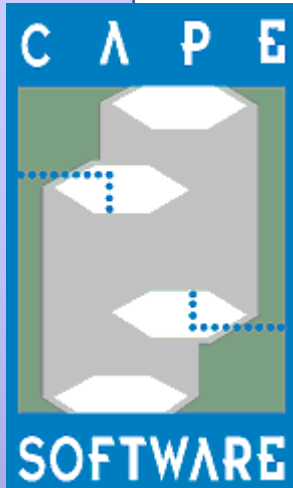
II-Operator Training

- **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



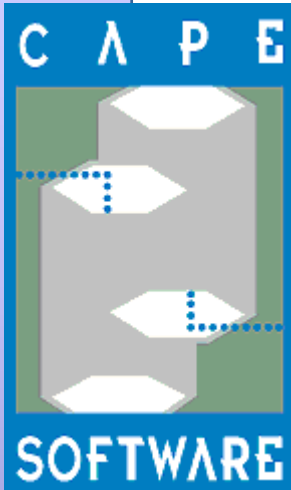
Operator Training System (OTS) using VP Link

- *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 *ore refining industry*



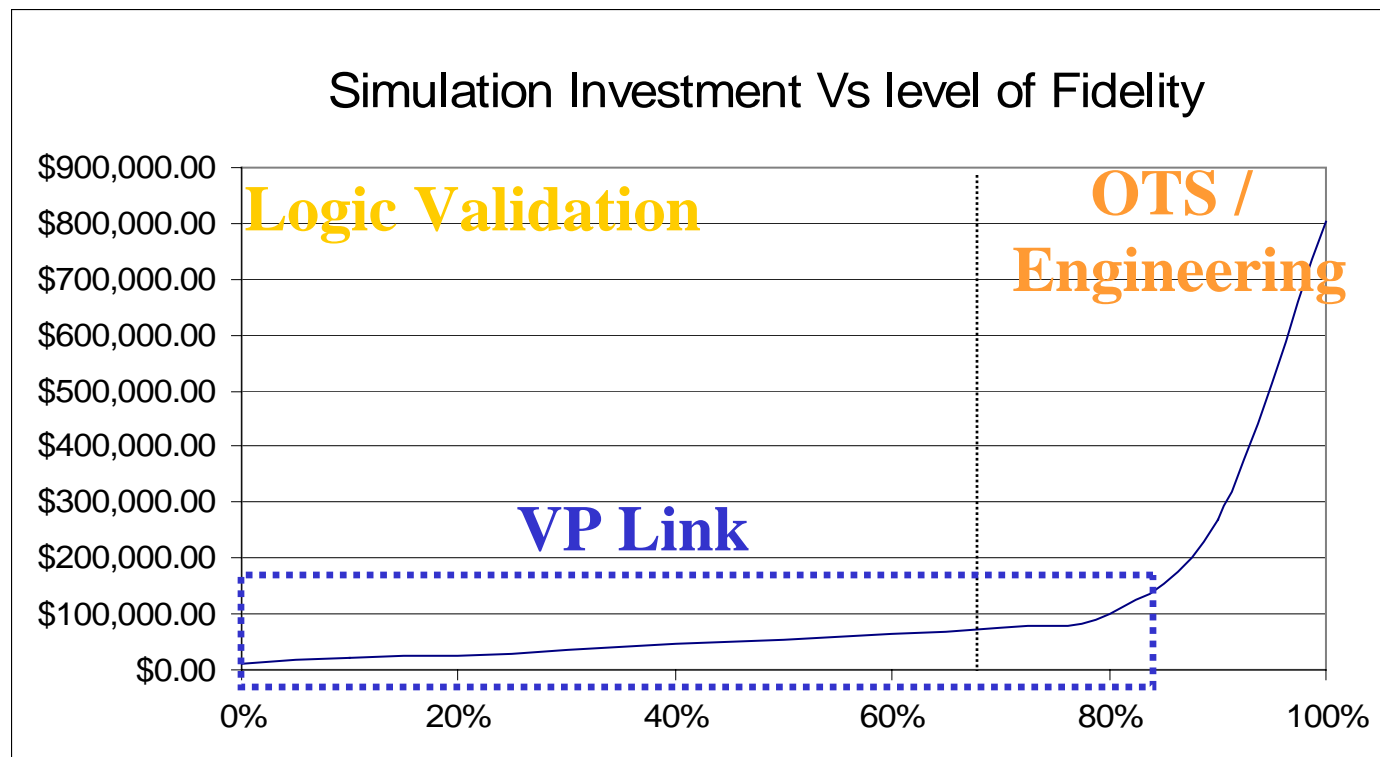
What kind of process simulation do I need ?

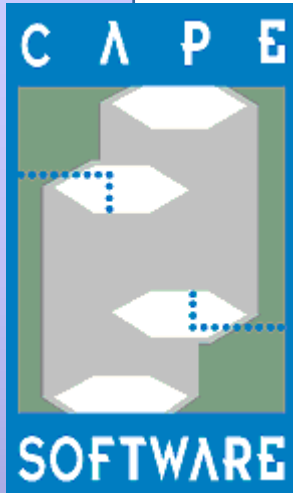
- Process simulation Fidelity
- Applications of process simulation



Cost Analysis of process model fidelity

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





Medium Vs High Fidelity Process model

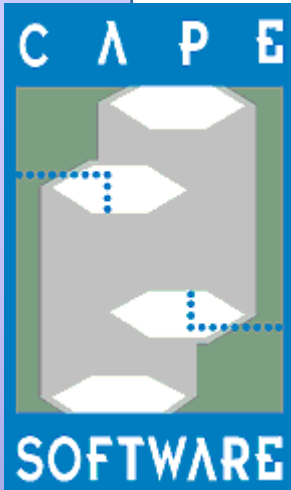
- **Medium Fidelity**

- validation & OTS
- Heuristic / Hybrid
- dynamic
- Connects to DCS
- Console graphics
- DCS upgraded during maintenance
- \$50k-\$150k

VP Link

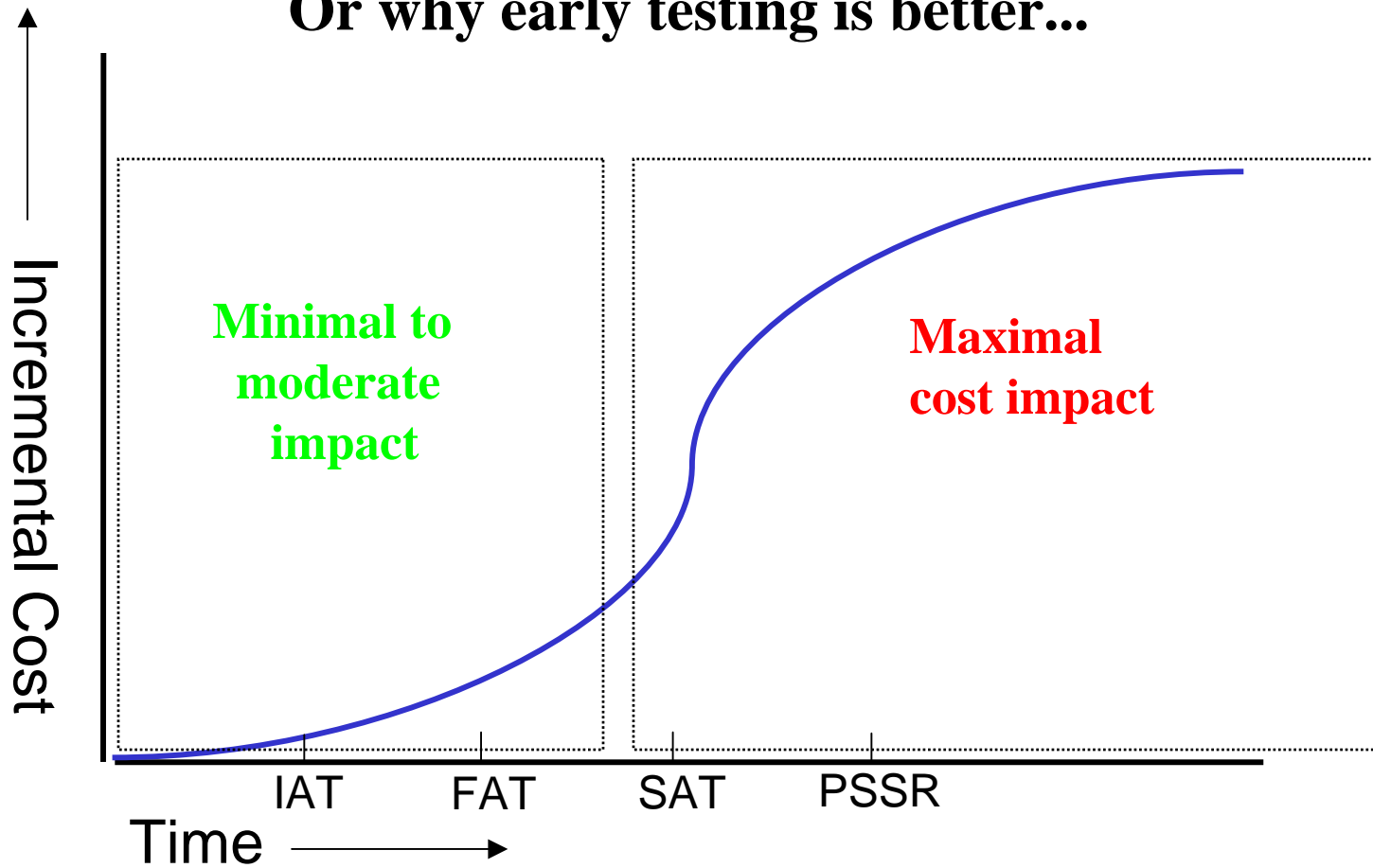
- **High Fidelity**

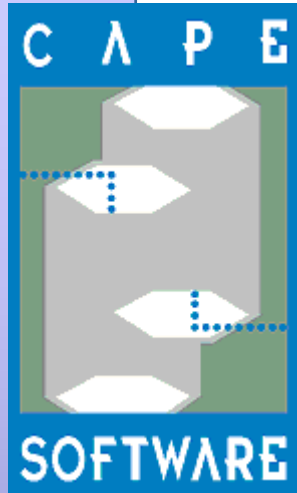
- Plant study (sizing)
- Predictive
- steady or approx.
- Invasive
- replicate HMI
- Heavy maintenance
- \$500k-\$1M



Impact of change during a project development cycle

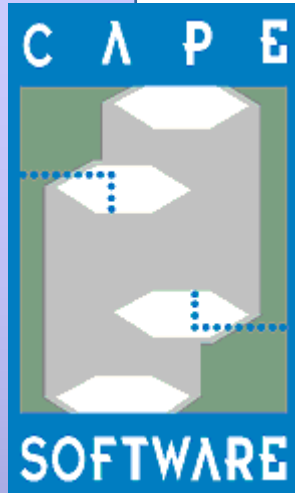
Or why early testing is better...





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

- 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*