

The Virtual Process

CAPE Software

Summer 2002

VPLink® Operator Training Solutions

VPLink executes on a Windows PC modeling process dynamics and simulated I/O values to the offline control system.

Trainees work with duplicates of control room graphics, trends, alarm pages, keyboard & mouse while logic, PID, etc execute.

VPLink® Solves Simulation Needs for Yokogawa CS1000 and CS3000 customers

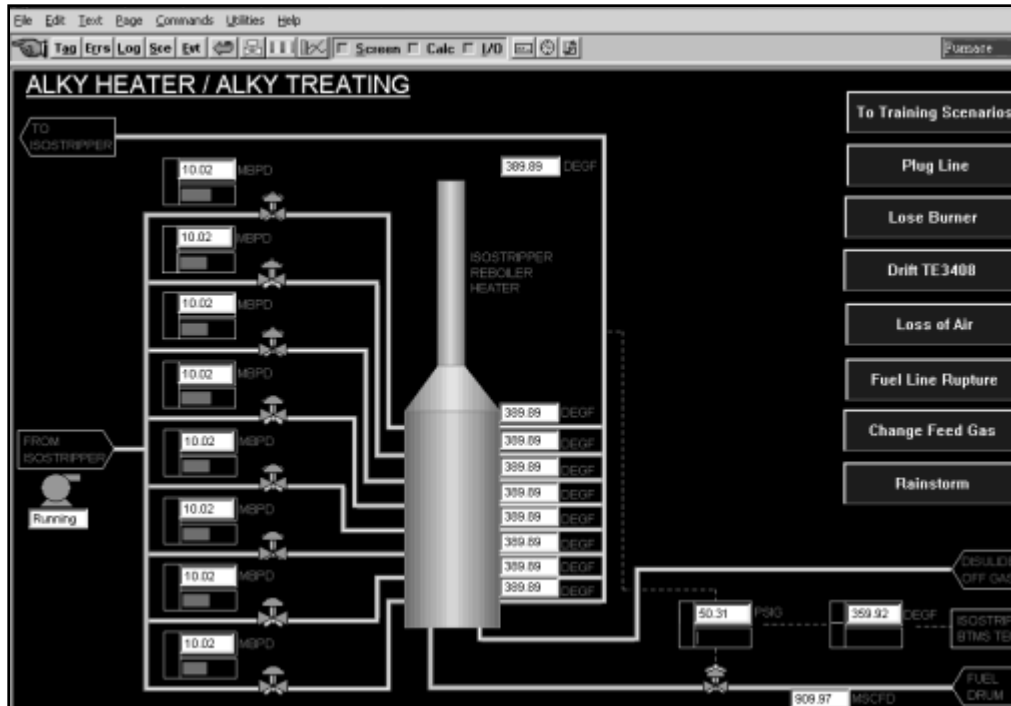
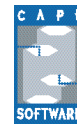
Yokogawa's "Test Mode" personality executes an exact copy of control room configuration on a low cost PC platform. Trainee's interface is identical to the real thing.



Instructor



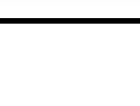
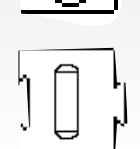
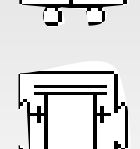
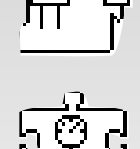
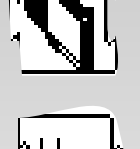
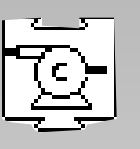
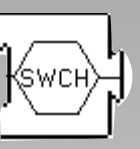
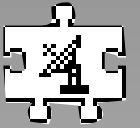
Trainee



Cape Software delivers turn key training simulators

This illustrates an instructor's view during training. The graphic is a copy of the trainee's display overlaid with the functionality to present fault/upset scenarios.

Yokogawa Corporation is among the leaders in delivering low cost operator training platforms to their customers. YCA delivers what customers require for qualifying their operators: (a) Exact copy of control room configuration executing on a low cost PC platform (b) Trivial to switch into "simulation mode" (c) High speed. Cape Software delivers Best-In-Class dynamic models and I/O simulation to these systems. More inside.



Supported Systems

Triconex and Trident systems
 Honeywell FSC
 Yokogawa CS1000/CS3000
 Siemens - Moore APACS
 Siemens TI Series 5x5 PLC
 Siemens Simatic S5/S7 Series
 Foxboro I/A Series Systems (51&70)
 Honeywell TPS
 Honeywell Plantscape
 RA Allen Bradley PLC5& SLC500
 Rockwell Automation PLX
 Rockwell Automation CLX
 ABB - Bailey- F&P System 6
 ABB Mod300
 ABB IMS Advant
 Emerson Process DeltaV
 Emerson - Fisher Provox
 GE Fanuc Series 6 and 90
 Modicon 984 and Quantum

Cape Welcomes ...

DOW Chemicals - Freeport, TX
 Chevron Texaco - Richmond, CA
 Coors Brewery - Golden, CO
 Curry Controls - Lakeland, FL
 Honeywell - Richmond, CA
 Yokogawa Corp of America - Houston, TX
 The Foxboro Company - Foxboro, MA
 Pharmacia - Puerto Rico
 General Mills - Minneapolis, MN
 Merck - West Point, PA
 GE Automation - The Netherlands
 The Foxboro Company - The Netherlands

Plug in the Process...

... The Virtual Process

Call us for more information at:
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Visit our Web Site

<http://www.capsoftware.com>

The Virtual Process newsletter is published for the benefit of friends and users of VP Link®. Edited by Michael Sullivan.

Technical Tip

Functions defined within VPLINK.DLL (shown below) are available within Script files: both BUTTON SCRIPTS and Scenario Files. An example of putting one to work is shown within VPLink's Scenario Manager. We've created this sample using the Scenario Generator Wizard, and now add a RampUp command using the notepad.

VP LINK HELP

File Edit Bookmark Help

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External Commands Via DLL

The following VP Link internal commands can be issued from ToolBook scripts or the Co

SetPV	SetPVE	@PV	PVE
setAuto	setMan	Mode	WaitNP
DoSINE	DoRAMP	DoRampUp	DoPULSE
DownLoad	Upload	SearchTags	TagSheet
InitPV	SimInit	SimEnd	setWarpFactor
DOUG	HelloDriver()	CalcAIPV	AIF
DeleteTag	StartScenario	StopScenario	FormatALog
Delete File			

To incorporate a RAMPUP (or RAMP) within a scenario file, see the syntax above. Any of the TOOLBOOK functions are available: simply follow the example shown. To find these functions within the online help screens, SEARCH on the keyword EXTERNAL.

Case History - FMC Utilizes VPLink During Delta V Project

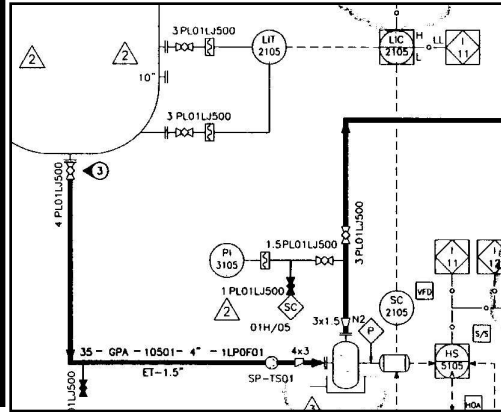
John Halajko of FMC Engineering presented his experiences deploying a Delta V project to the Emerson Process User's Conference 2001. Here are a few highlights of how VPLink was put to work during system validation and operator training. VPLink is proven on Delta V controllers as well as Delta V Simulate.

On the Simulation of FF Devices

- Batch Unit Ops
- Continuous Cases
 - Shutdown
 - Standby
 - Operate @ SOC
 - Change Production Rate

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VP Link Tag Definitions

Tagname: S35LIC2105_PV

Description: EU="S"; "HQS AIR STRP LVL"

Value %: 46.2221006 Decimals: 2 ELH: 100.0 RawHi: 100.0

EU Value: notOpen Cycle Time: 0.05 ELLo: 0.0 RawLo: 0.0

Driver: LOCAL Address: 35LIC2105PID1/SIMULATE_IN IOChar: Linear

Algorithm: AccumPVE Mode: AUTO Type: ANLOUT

Algorithm Parameters: s35lic21108_pv,0.005,s35hs19108a_ds,s35lic2105_out,0.01,s35hs5105a_ds

Download: Search > S35LIC2105_OUT, S35LIC2105_PV

Upload: Previous Unused g

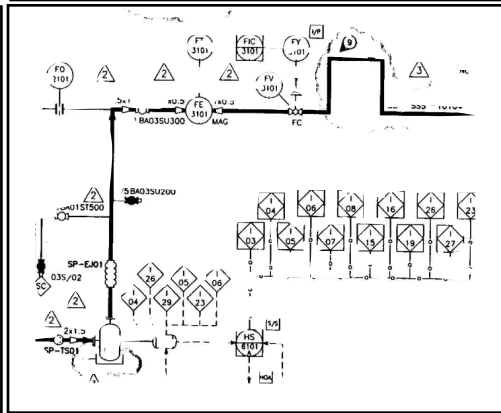
Suffling Simulation Options

On Simulation Examples

- We will show via examples how to simulate motors, flows, levels, XCVs, pressures & temperatures
- Will there be a difference between Batch & Continuous Unit Ops ?

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VP Link Tag Definitions

Tagname: S35FIC3101_PV

Description: EU="GPM"; "NASULFIDE SOL SULFIDE RX"

Value %: 9.99008078 Decimals: 2 ELH: 10.0 RawHi: 100.0

EU Value: notOpen Cycle Time: 0.05 ELLo: 0.0 RawLo: 0.0

Driver: LOCAL Address: 35FIC3101PID1/SIMULATE_IN IOChar: Linear

Algorithm: CLagPV Mode: AUTO Type: ANLOUT

Algorithm Parameters: S35FIC3101_OUT, 0.1,s35hs6101a_ds

Download: Search > S35FIC3101_OUT, S35FIC3101_PV

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Suffling Simulation Options

Introduction

FMC management values the simultaneous development of an operator simulator while constructing of a new chemical facility. We thought the Foundation Fieldbus posed only a minor problem to our twelve year old practice.

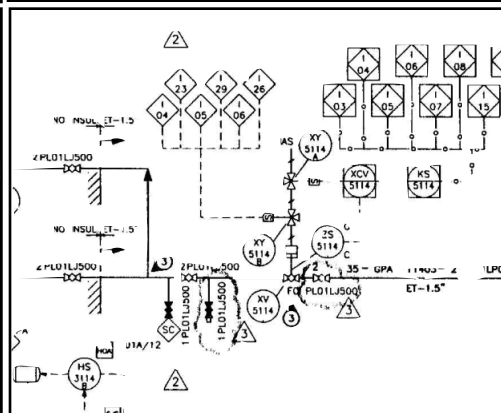
We learned that we must change our paradigm on database development.

Conclusions

- Batch & Continuous Unit OPS are the same logic for simulation.
- A task master is used to change from one state (Standby) to a second state (Operate).
- Write the taskmaster in the DCS and you get for free a draft of the shutdown, standby and operate logic.

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VP Link Tag Definitions

Tagname: S35XCV5114_DS

Description: EU="BODY FD, SULFIDE RX"

Value %: T.0 Decimals: 2 ELH: On RawHi: 1.0

EU Value: notOpen Cycle Time: 0.05 ELLo: Off RawLo: 0.0

Driver: LOCAL Address: 35XCV5114/DC1/SIMULATE_IN_D IOChar: Linear

Algorithm: TrackPV Mode: AUTO Type: DIGOUT

Algorithm Parameters: S35XCV5114_DC

Download: Search > S35XCV5114_DC, S35XCV5114_DS

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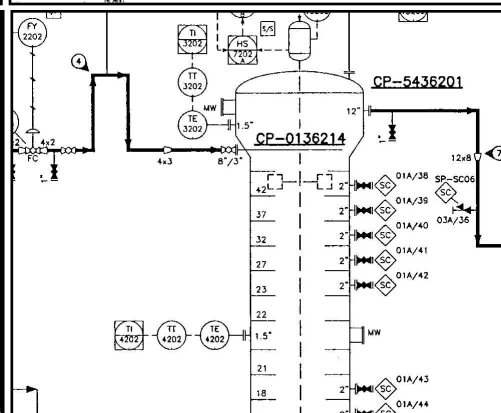
Suffling Simulation Options

On Temperatures

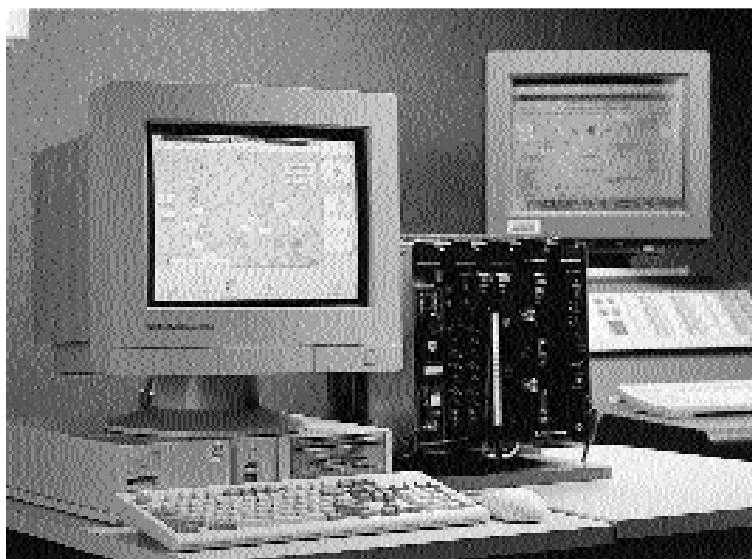
- Use the accumulator with temp rise = accumulation of heat in minus heat out
- Account for reactions as reactants into vessel times a heat kick

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Plug in the Process... ...The Virtual Process



VPLink Solves Dynamic Simulation Needs for Engineers:
Control System Validation and Software Verification and
Operations: Board Level Certification for Console Operators.

CAPE Software
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Suite 313, Houston, Tx 77060

Look Inside For:

Yokogawa CS1000 CS3000 Systems Support

Case Study: FMC Delta V Example from Emerson Process User's Conference

Technical Tip