



Honeywell Users Group 2010

**Dynamic Solutions. Endless Possibilities.**

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**A(bout) with Obsolescence – Moore Micro DCS Transition to Experion**

**Honeywell**

## Background

- Finch Paper LLC is located in Glens Falls, NY
- Originally built in 1865 as a sawmill, shortly converted in to a paper mill.
- 700 tpd of sulphite pulp.
- Variety of end products including uncoated text & cover, and digital papers.
- No mill standard for control systems.
- Variety of vendors including pneumatic panel boards, Bailey, MX Open, single loop controllers and Moore Micro

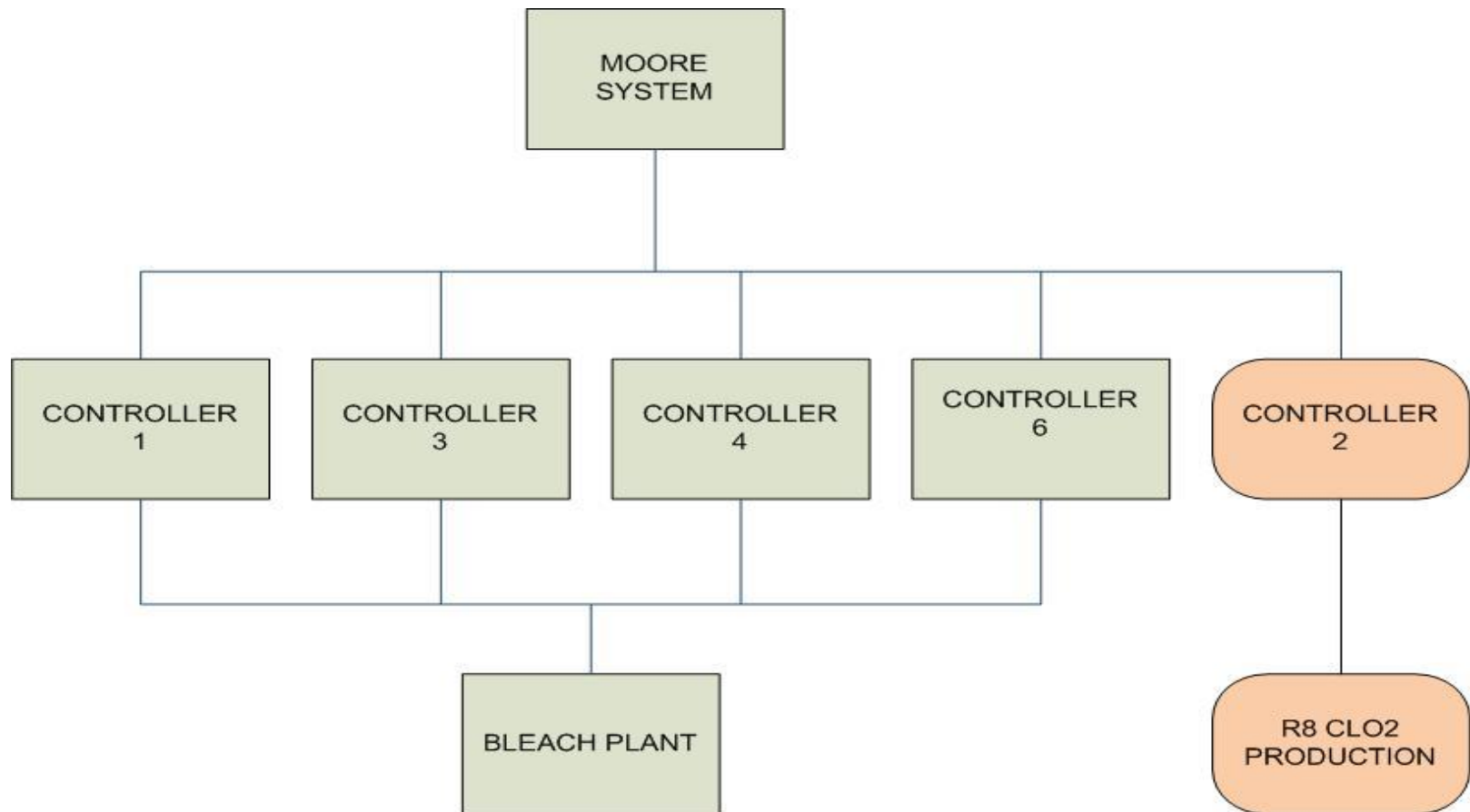
## Why Even Consider an Upgrade in a Tough Economy?

- Safety
  - Ensure regulatory compliance
  - Reduce risk of incident due to obsolescence
- Business continuity
- Improved maintenance
  - Training
  - Common spares
  - Improved engineering and user tools
- Improved product quality
- Expandability
- Connectivity and information sharing

## Phase I – Baby Steps

- In early 2010 company launched a modernization strategy called “Get Safe” aimed at identifying key process areas that could impact overall Safety, Compliance or Reliability
- R-8 chlorine dioxide generator was selected as first process area for modernization project due to potential impact on operations and worker safety
- 1980’s vintage Moore Micro had growing history of failure compounded by difficulty securing spare parts and support

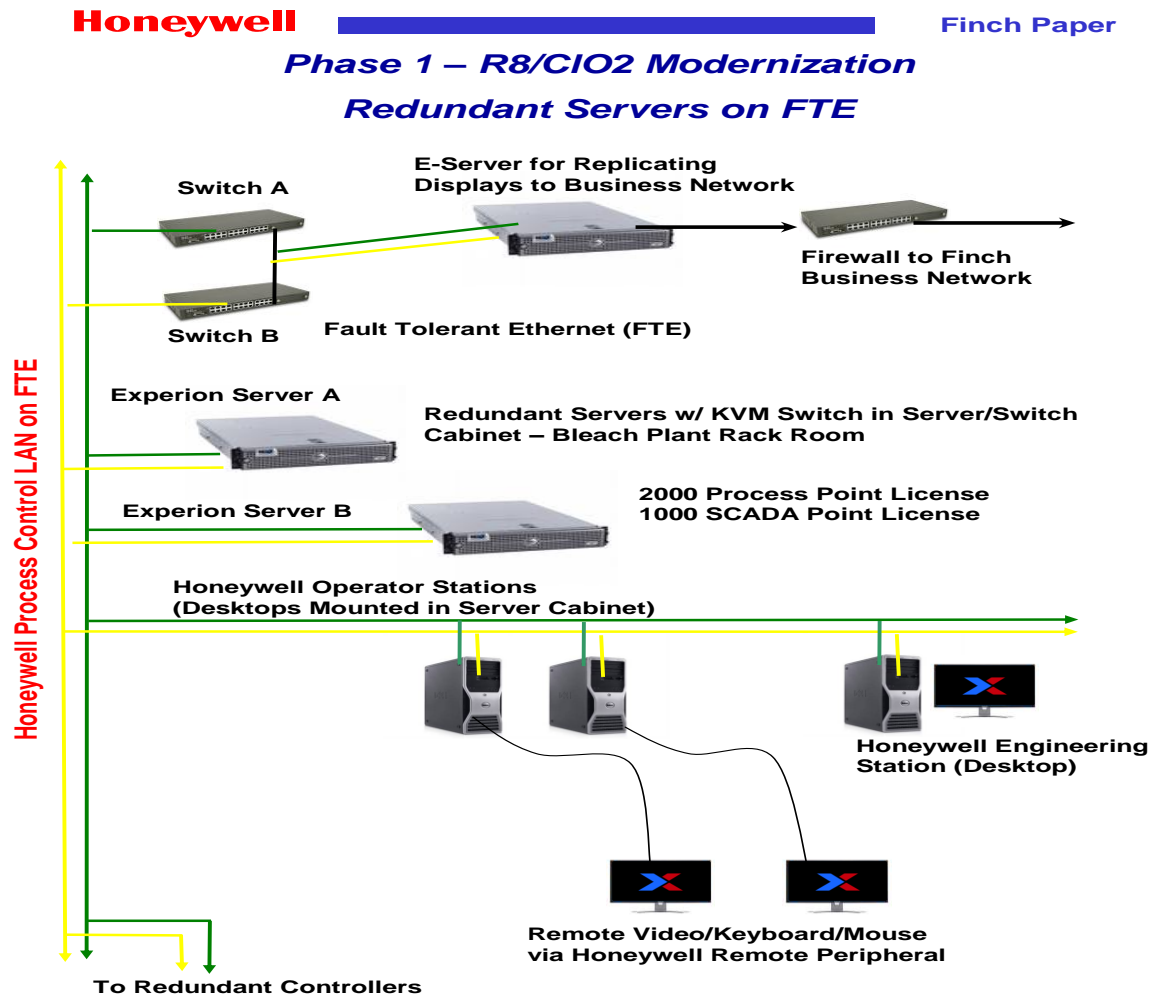
## Conversion Approach



## The Plan

- Finch and Honeywell resource scheduling
- Contractor availability
- Schedule
  - Drawing package
    - Termination drawings
    - Software functional description
  - Hardware build
    - Equipment locations
    - Equipment deliveries
  - Software build
    - PLC communication link
    - Software factory acceptance test
  - Shutdown coordination
    - Installation and loop testing
    - Process validation and licensing

## Implemented System Architecture



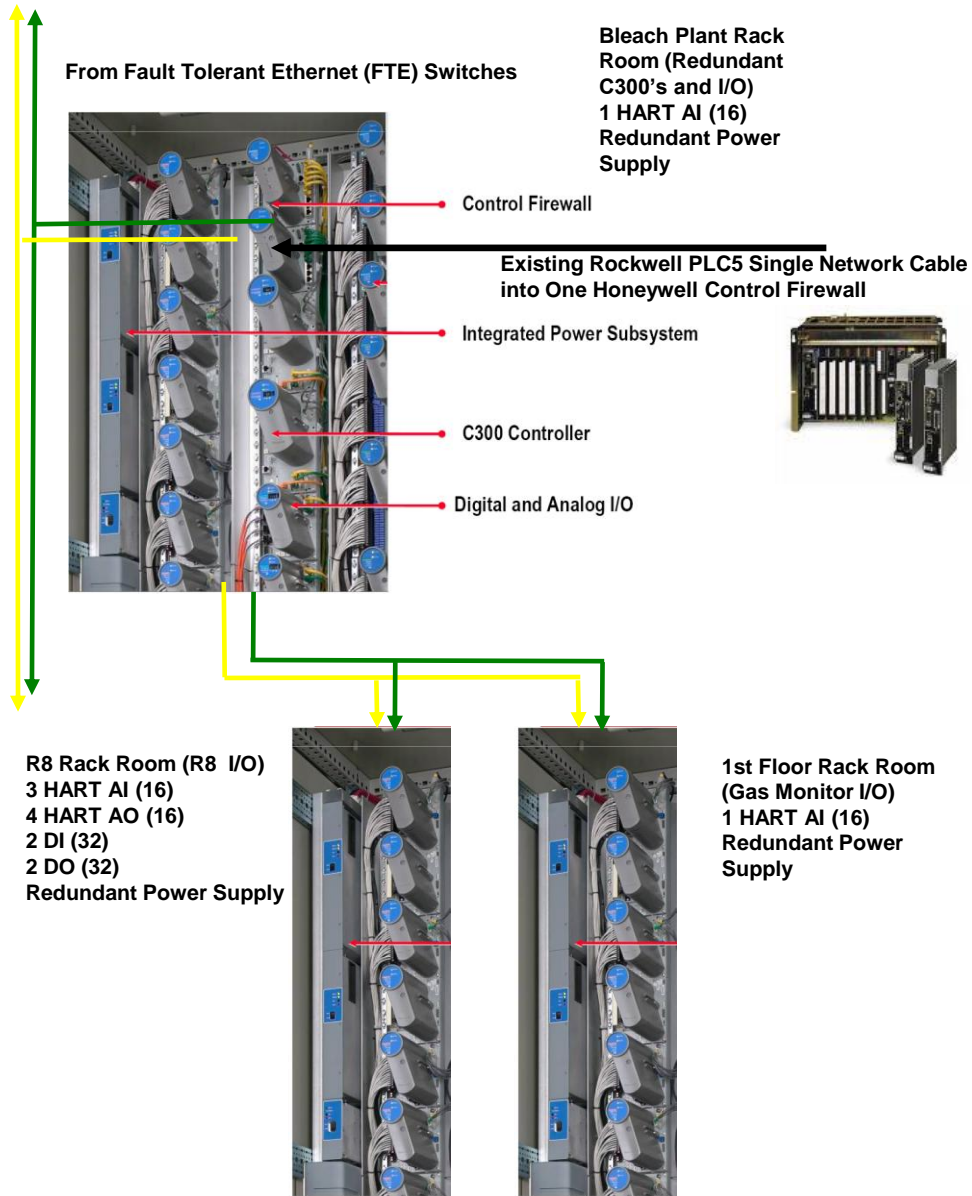
## Project Highlights - Training

- Use of simulation for a side-by-side comparison of the existing system while the Experion PKS was simulated and checked thoroughly for matching functionality
- Operator Training conducted in a preliminary manner using an Experion PKS interactive demo to acclimate the operations on how to navigate and utilize the Honeywell control system.
- Training system utilized virtualization of Unisim, Sim C-300 and Experion Server via VMware.



## Project Highlights – System Design

- Deploying similar methodologies around the system graphics, layout, and control strategies. This allowed operations to quickly transition to a newer platform and understand where to find the key information to run the plant.
- Certification by ERCO who had originally designed the process. This included a detailed audit of interlocks and functionality to ensure safe, reliable operation.
- Control System design which included full system redundancy including communication down to the I/O level.
- Cabinet and Controls layout to allow for future enhancements and modernization of other Pulp Mill Controls as desired.



## Project Timeline

- Purchase order for R8 DCS Replacement was issued January 19, 2010
- Hardware order placed on January 22
- Hardware received on site March 19
- Software configuration commenced on January 25
- Customer Software Acceptance Test the week of March 8
- Operator training the week of March 15 utilizing an Experion PKS Training Simulator
- Pre-shutdown installation work the week of March 15
- Shutdown commenced March 19
- ERCO Process Interlock Verification commenced on Tuesday, March 23
- ERCO certified system for safe operation on Thursday, March 25
- The R8 Chlorine Dioxide Generator commenced operation as scheduled on Friday morning, March 26, 2010

**COMPLETE CONVERSION IN JUST 8 WEEKS!**

## Ongoing Assessments and Future Plan

- Control Tuning optimization for the R8 Control Loops
- Evaluating adding a 'startup mode' scenario for differing maximizing control system effectiveness on startup conditions versus process 'steady state' conditions
- Refining benefits assessment from deploying an Advanced Process Control Strategy for improving overall efficiency and/or reducing chemical usage while maintaining product quality and efficiency
- Defining additional control strategies for asset management (such as interlocks that could improve equipment health and lifespan)
- Complete conversion of remaining Moore System functionality

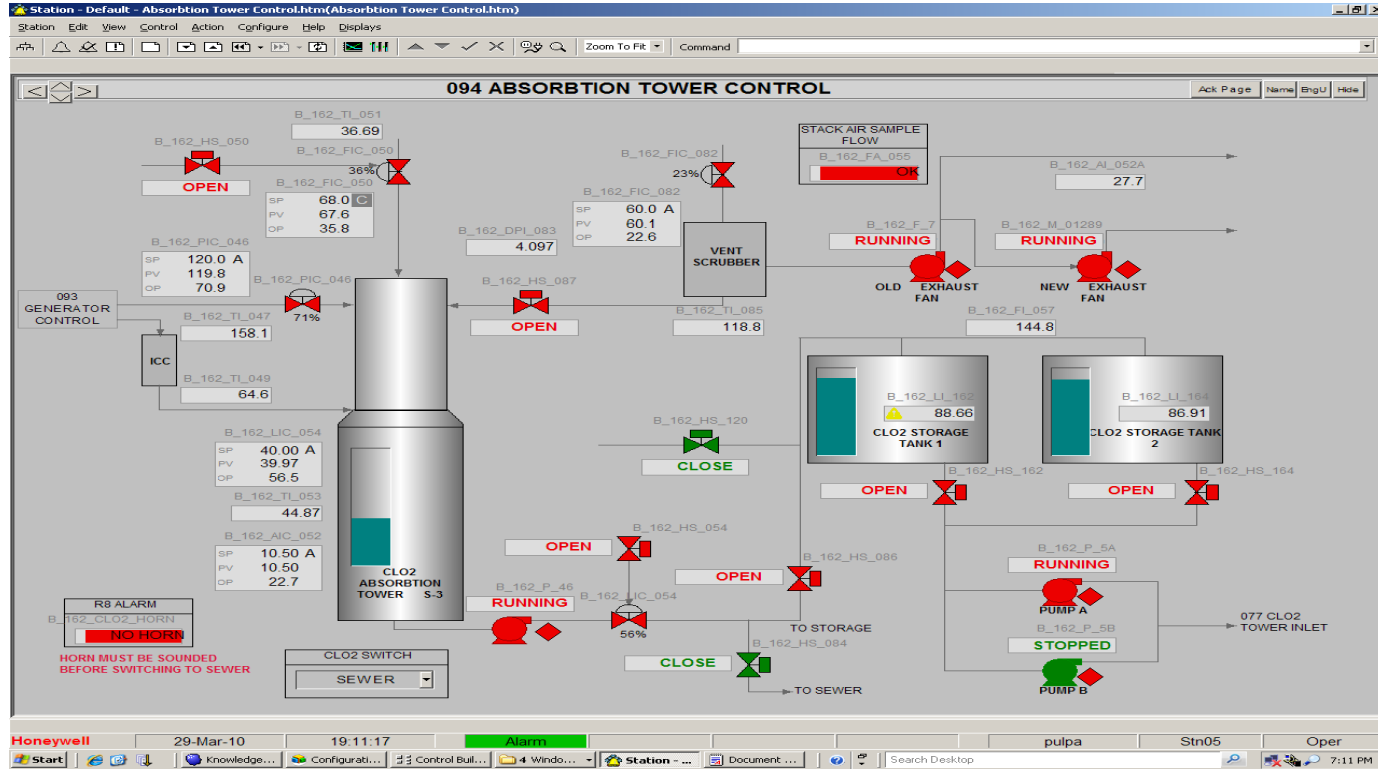
## Benefits to Date- Alarm Management

The screenshot displays a Honeywell alarm management interface. The main window is titled "Station - Default - Alarm Summary(sysAlarmSummary.htm)". It features a menu bar (Station, Edit, View, Control, Action, Configure, Help, Displays) and a toolbar with various icons. The central area is a table of alarms, with a "View: (urgent and high priority alarms)" dropdown. The table columns are: Date & Time, Location Tag, Source, Condition, Priority, Description, Trip Value, Live Value, and Units. Each row is color-coded: red for high priority, yellow for medium, and green for low. Below the table, there are summary statistics: Unacknowledged alarms: 1, Acknowledged alarms: 20, and Shelved alarms: 0 of 0. At the bottom, there are buttons for "Shelve Alarm", "Unshelve Alarm", "Pause", "Resume", and "Acknowledge Page". The taskbar at the bottom shows the date and time as 26-Mar-10 18:29:47, and the current alarm is highlighted in red: R8\_CIO2 B\_162\_FIC\_050 DEVLOW H 00 CLO2 ABSORBER CHILLED H2O FLOW -50.2202 GPM.

Date & Time	Location Tag	Source	Condition	Priority	Description	Trip Value	Live Value	Units
3/26/2010 18:29:47	R8_CIO2	B_162_FIC_050	DEVLOW	H 00	CLO2 ABSORBER CHILLED H2O FLOW	-50.22	-32.95	GPM
3/26/2010 18:28:32	R8_CIO2	B_162_AIC_052	DEVLOW	H 00	CLO2 STRENGTH	-9.65	-9.67	G/L
3/26/2010 17:59:58	R8_CIO2	B_162_FI_057	PVLOW	L 00	CLO2 FLOW TO STORAGE	-5.38	0.25	GPM
3/26/2010 17:43:33	R8_CIO2	B_162_AIC_052	PVLOLO	U 00	CLO2 STRENGTH	1.50	0.33	G/L
3/26/2010 17:42:42	R8_CIO2	B_162_AIC_052	PVLOW	H 00	CLO2 STRENGTH	1.99	0.33	G/L
3/26/2010 16:59:07	R8_CIO2	B_162_PI_107	PVLOLO	U 00	SALT CAKE FILTER VACUUM	24.73	25.03	H2O
3/26/2010 16:52:27	R8_CIO2	B_162_PIC_101	PVLOLO	U 00	FILTER FEED PRESSURE	0.80	1.61	PSI
3/26/2010 16:52:26	R8_CIO2	B_162_PIC_101	PVLOW	H 00	FILTER FEED PRESSURE	3.36	1.61	PSI
3/26/2010 16:52:03	R8_CIO2	B_162_IL_100	PVLOLO	U 00	FILTER FEED PUMP AMPS	0.03	0.05	AMP
3/26/2010 16:51:57	R8_CIO2	B_162_IL_100	PVLOW	H 00	FILTER FEED PUMP AMPS	0.82	0.05	AMP
3/26/2010 13:41:43	R8_CIO2	B_162_TI_114	PVLOW	H 00	HYDROCLONE RETURN TEMPERATU...	106.79	109.97	DE...
3/26/2010 11:07:52	R8_CIO2	B_162_LI_156	PVHIGH	H 00	CHLORATE UNLOADING TANK LEVEL	30.02	55.43	%
3/24/2010 17:15:18	R8_CIO2	B_162_PIC_126	PVLOW	H 00	COLD H2O PRESSURE	53.27	50.07	PSI
3/24/2010 13:32:14	R8_CIO2	B_162_PI_107	OFFNRM	H 00	SALT CAKE FILTER VACUUM LOW	ALARM		
3/24/2010 13:32:12	R8_CIO2	B_162_LI_160	PVHIGH	H 00	METHANOL STORAGE TANK LEVEL	93.45	92.52	%
3/24/2010 13:32:12	R8_CIO2	B_162_LI_160	PVHIHI	U 00	METHANOL STORAGE TANK LEVEL	93.45	92.52	%
3/24/2010 13:32:12	R8_CIO2	B_162_TI_113	PVLOW	H 00	SEPERATOR TANK TEMPERATURE	96.36	99.73	DE...
3/24/2010 13:32:12	R8_CIO2	B_162_TI_085	BAD PV	U 00	R-8 SCRUBBER TEMP.	NaN	NAN	DE...
3/24/2010 13:32:12	R8_CIO2	B_162_LL_154	PVLOW	H 00	H2SO4 STORAGE TANK LEVEL	69.58	64.85	%
3/24/2010 13:32:12	R8_CIO2	B_162_PIC_101	DEVLOW	H 00	FILTER FEED PRESSURE	-48.32	-48.39	PSI
3/24/2010 13:32:12	R8_CIO2	B_162_PI_107	PVLOW	H 00	SALT CAKE FILTER VACUUM	-0.23	25.03	H2O

- Color coding of alarms based on severity focuses operators attention
- Clean –up exercise of nuisance alarms performed as part of conversion

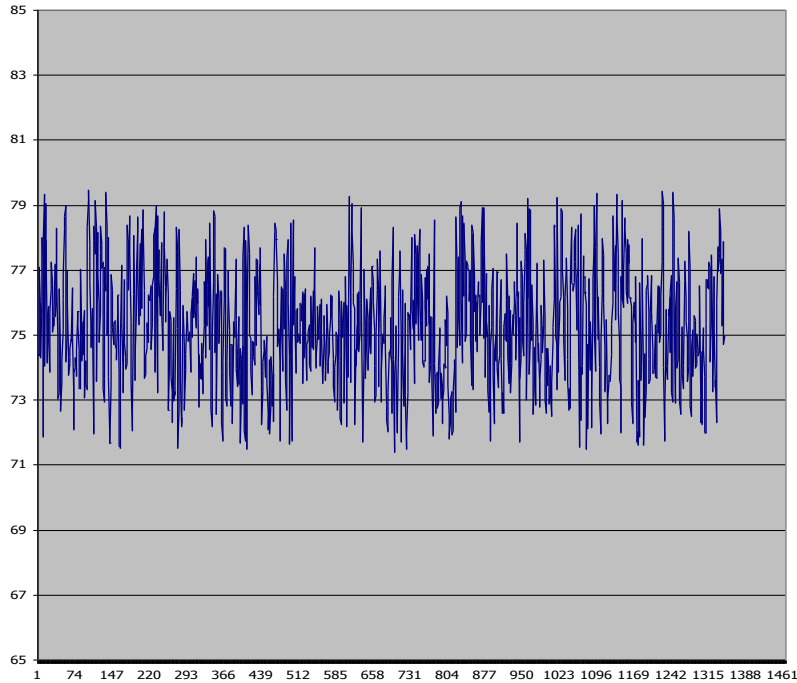
## Operator Graphics



- Designed with input from Operators
- Simple, logical was stressed

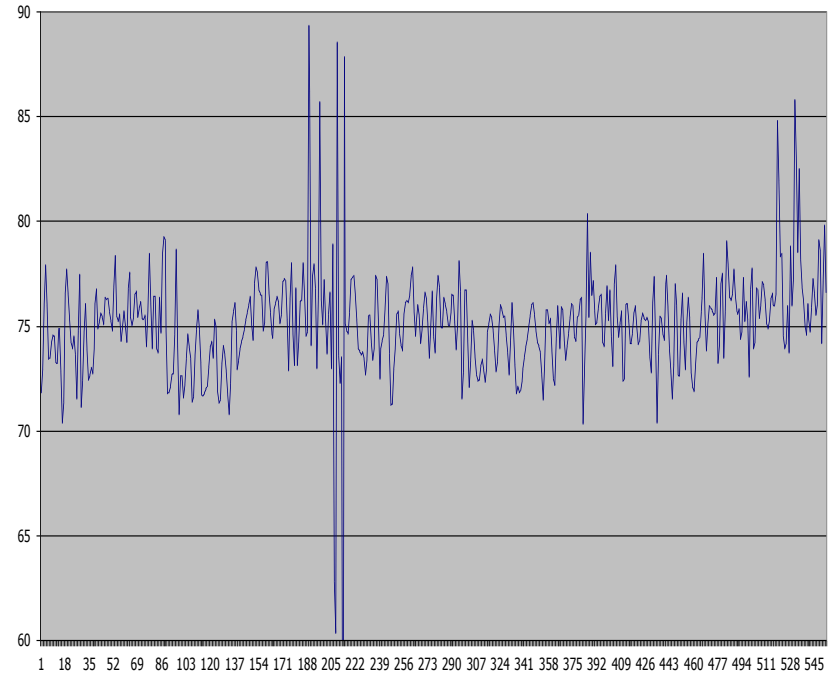
## Benefits to Date- Generator Level

Finch Paper CLO2 Generator Level



MOORE

Generator Level



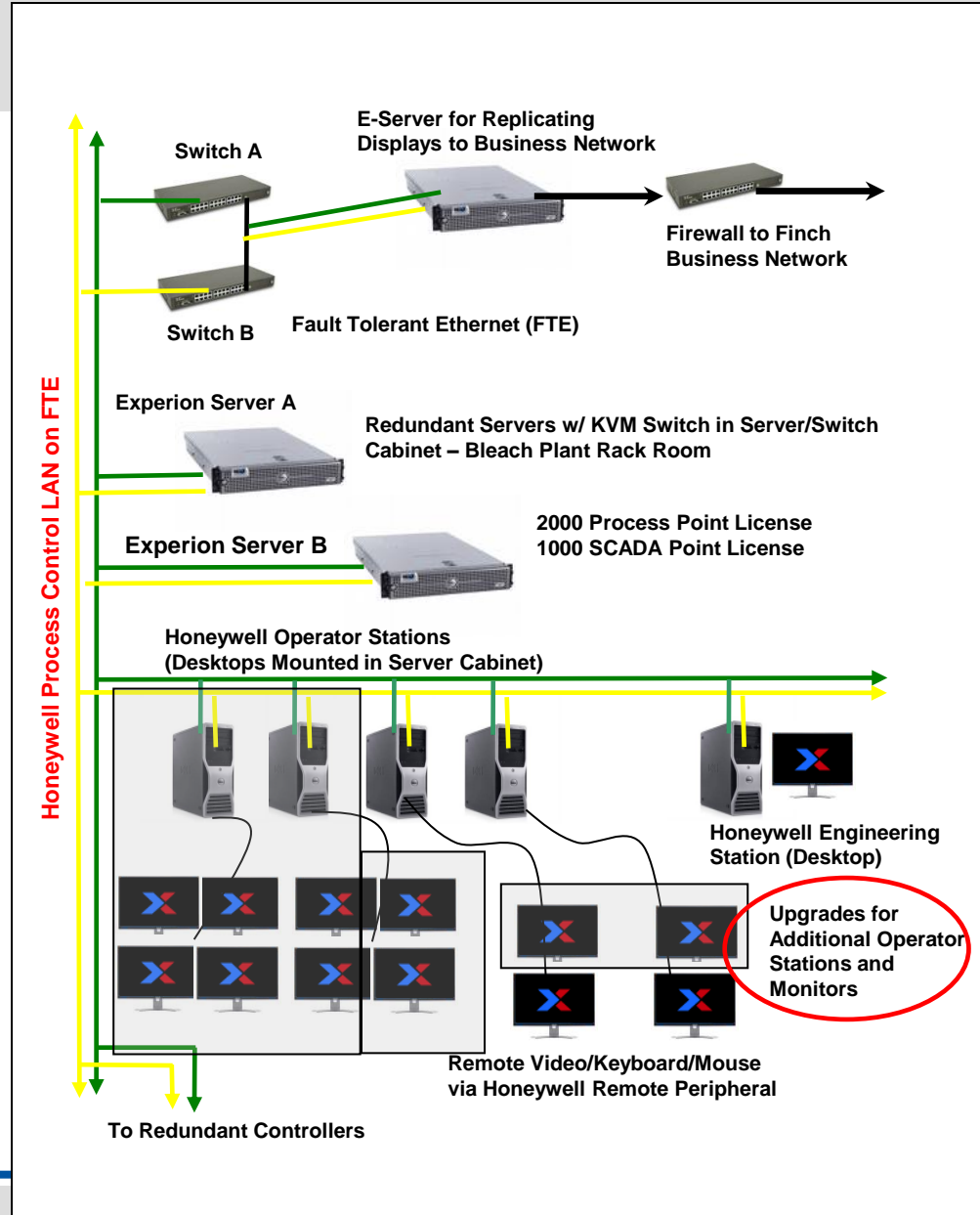
EXPERION

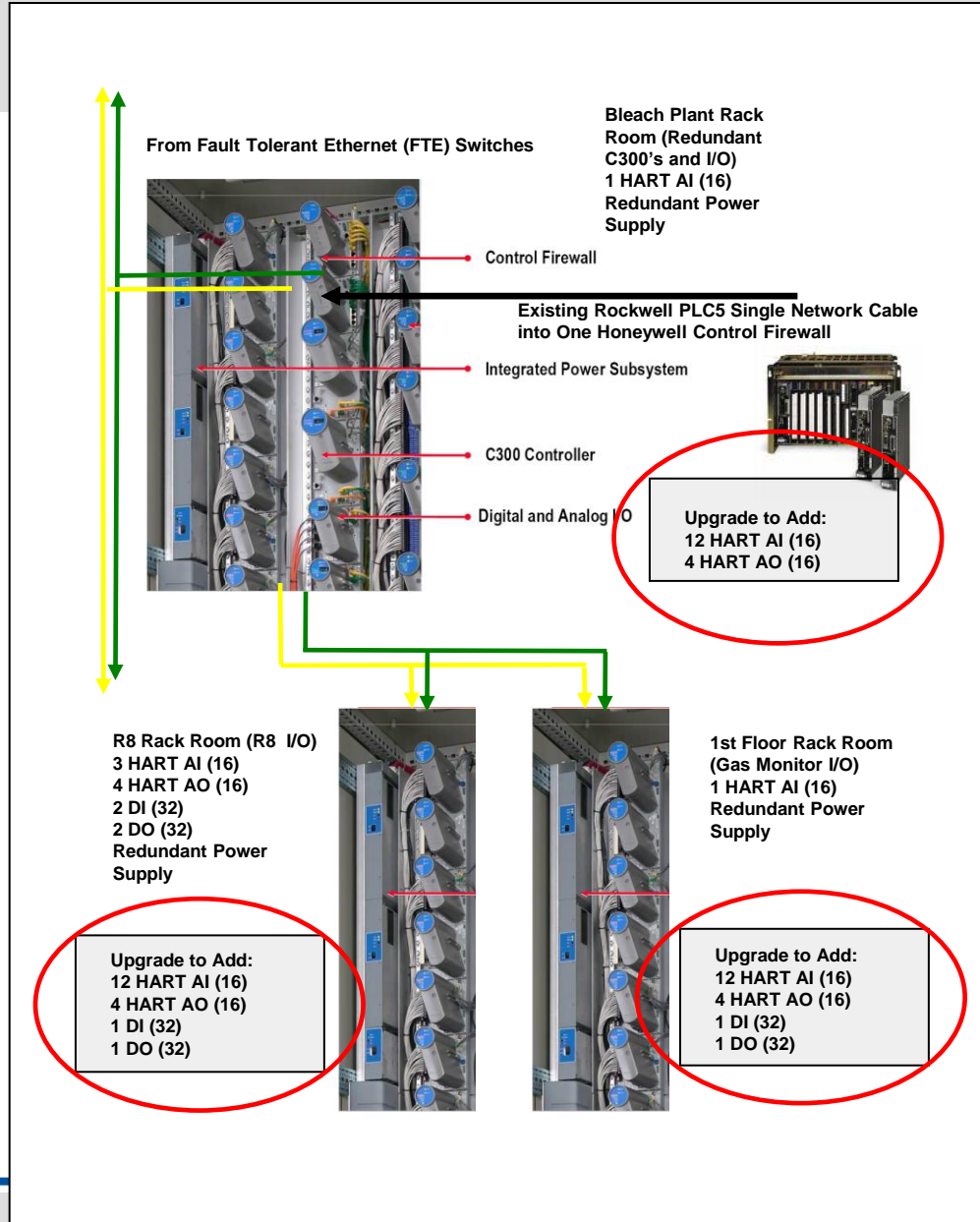
## Phase II – Beginning to Crawl

- Study has been conducted to add Profit Controller APC on Generator
- Improved chemical consumption – projected savings of 2-3 %
- Coordinated production rate based on Bleach Plant consumption
- Automated batch start-up of process – consistent operations
- Study under way to produce System's Migration Document, SMD, which will cover remaining bleaching process.



## Proposed Phase 2 – Bleach Plant Modernization Redundant Servers on FTE





## Lessons Learned

- More pre-shutdown logic configuration and checkout is required, lessen the need for expensive specialists during outage.
- SMD will be critical such that entire scope and plan of attach well defined
- Allowance for pre-shutdown checks of actual interlocks is critical. Clean up of abounded logic is necessary
- Use of process simulator well worth the efforts and may be expanded for future projects and for operator certification as well as logic and configuration check out functions
- Continue to show project success to Management by meeting pre-project goals in order to secure funding for future projects.

# **The Finch Story Continues!**

**THANK YOU**