Implementing ISA101

A Case Study: High Performance, High Resolution, High Availability HMI Upgrade
ISA 101 Overview: The HMI of the Past

- Provided an overview of the process
- Many trends throughout
DCS effect on the HMI

- Early DCS displays lost the big picture
- Control via alarms
DCS graphics evolved
The HMI Evolves
What’s so bad about P&ID based graphics?

- Color use inconsistent and unhelpful
- Trends are relegated to a separate screen
- All data no information
- No way to scan screen and determine state of the plant
- Distracting, low value 3D or animated elements
High performance: Data in context is information

FLOW

100

93 KLB/S

Alarm

High Alarm range

Desired range

Low alarm range
High Performance: Data in context is information
<table>
<thead>
<tr>
<th>Value Needing Trend</th>
<th>Current Pressure</th>
<th>Alarm Limit</th>
<th>Shutdown Actuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>235.2 psig</td>
<td>250 psig</td>
<td>300 psig</td>
<td></td>
</tr>
</tbody>
</table>
High Performance: Level example
High Performance: Use of color

• Gray backgrounds are used to minimize glare and provide low contrast depiction to allow alarms to be obvious
• Bright colors are only used for alarms and abnormal situations
• Colors used for alarms are not used elsewhere
High Performance: Status indication example
High Performance: Faceplates
High Resolution

- Implemented on 43” - 3840 × 2160 monitors

<table>
<thead>
<tr>
<th>1920 x 1080</th>
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High Resolution

• Each operator will use two

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HP HMI - Hierarchy

• Level 1 – Process area overview
  – At a glance display

• Level 2 – Process Control Unit
  – Controllers, Values, Alarms, Trends, Status

• Level 3 – Process Unit Detail
  – Small equipment groups

• Level 4 – Diagnostic, Interlocks, First-Outs, Procedures, Documentation
High Resolution

• Navigation:
Level 2
High Availability

Loop 15

CIU - 1
LOOP 15

CIU - 2
LOOP 15

Loop 15
High Availability

Interface Server: OPC90 – A

Interface Server: OPC90 – B

COM Redundancy
3 CIUs: CIU15A, CIU1A, CIU11A

Loop 15

CIU - 1
LOOP 15

CIU - 2
LOOP 15
High Availability

Horizon View

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IDC 1
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FT View

Thin Client Server Redundancy
managed by Horizon View

FT View Server Redundancy
managed by FT View

OPC Redundancy managed by FTView

Horizon View

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IDC 2
--------
FT View

Interface Server:
OPC90 – A

Interface Server:
OPC90 – B

COM Redundancy
3 CIUs: CIU15A, CIU1A, CIU11A

CIU - 1
LOOP 15

CIU - 2
LOOP 15

Loop 15
High Availability

Loop 15

SI  
Thin Client NIC Redundancy managed by OS

Thin Client

Horizon View
IDC 1
FT View

Thin Client Server Redundancy managed by Horizon View

FT View Server Redundancy managed by FT View

FT View
IDC 2

FT View Server Redundancy managed by FT View

OPC Redundancy managed by FTView

Interface Server: OPC90 – A

OPC90 – A

Interface Server: OPC90 – B

OPC90 – B

COM Redundancy
3 CIUs: CIU15A, CIU1A, CIU11A

CIU - 1 LOOP 15
CIU - 2 LOOP 15

Loop 15
Operator Buy-in

- Operators miss the color
- Project performed in phases
- Solicit feedback throughout and after project
Wrap-up

• High Performance

• High Resolution

• High Availability
For more information

Acknowledgements

Thank you