

# UPGRADING THE OPERATIONAL HYDROGEN GAS MANAGEMENT FOR SNS TARGET MODERATOR

The need to upgrade started with a request from the operations team to change a process variable for better pressure control while charging the moderator with hydrogen.

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Pictures of:  
Hydrogen gas supply "system" in use at ORNL-SNS.

Goal: Make a better system.

Considerations: Safety approved operational system.

Task: Duplicate operational parameters that is conducive to maintainability.



Pictures of:  
Additional equipment inside bldg 8760 ORNL-SNS.  
Along with the Hydrogen gas supply, a Helium gas supply system, the warm helium compressor, and the 120VAC voltage supply panel together maintain the target moderator.

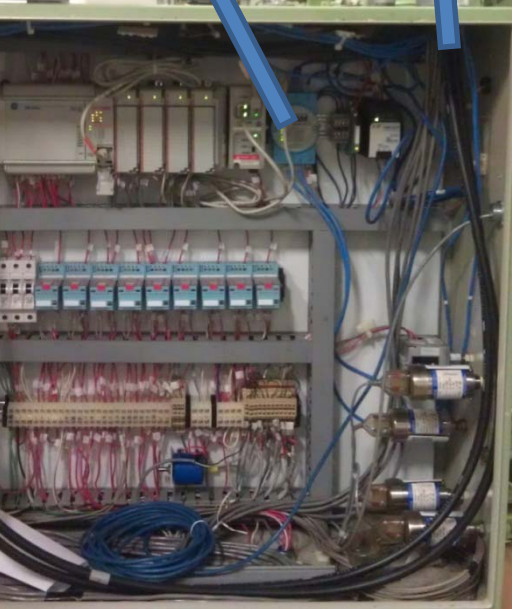
Included in this view: The exhaust safety fan system. (top left picture)



A picture of:  
Commutations main interface for all  
equipment inside bldg 8760 ORNL-SNS.



A picture of:  
Mixed signals



A picture of:  
Inside the warm helium compressor  
controls enclosure in bldg 8760 ORNL-  
SNS.



A picture of:  
Aging and mixed integration of hardware.

Goal: Make a better system.

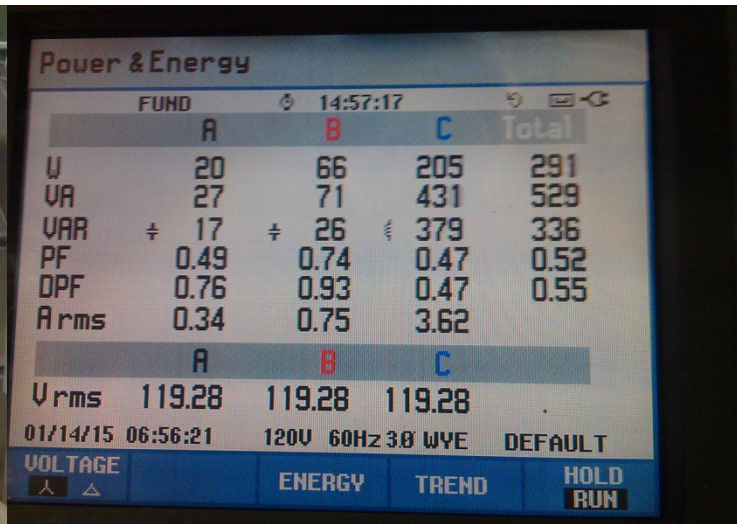
Considerations: Safety approved operational system.

Task: Duplicate operational parameters that is conducive  
to maintainability.

H2 GMS Upgrade Effort Nov 7 2014								
Warning: This is an explosive gas handling system. Use all precautions								Test Everything, do it again!
Area	Electrical	Epics	ICS Network	PLC Network	PLC Code		Items on the Test Plan	Long Term Plan
	??Enough UPS Power??						Safety Items	Move I/O
Panelview	Produce Print		Install Managed Switch		Epics Data Base		All I/O Points	Add Barriers
Back Panel		H2 GMS Screen	Route New Cables	Switch Switches			Epics Interface	Make existing plc cab safe
Back Panel	Install AC power	Test using PLC simulation	Done	Done	Test code with Epics			
Detectors	Done	Apply any edits			Test code on gas cab when it is not in use, empty, and allowed			
Fans		Done			Live Test			
Transducers					Change H2 charging PV			

A picture of:  
The upgrade plan

Make a better system.  
Considerations: Safety approved operational system.  
Duplicate operational parameters that is conducive  
maintainability.



A pictures of:  
Power studies controls power usage in bldg 8760



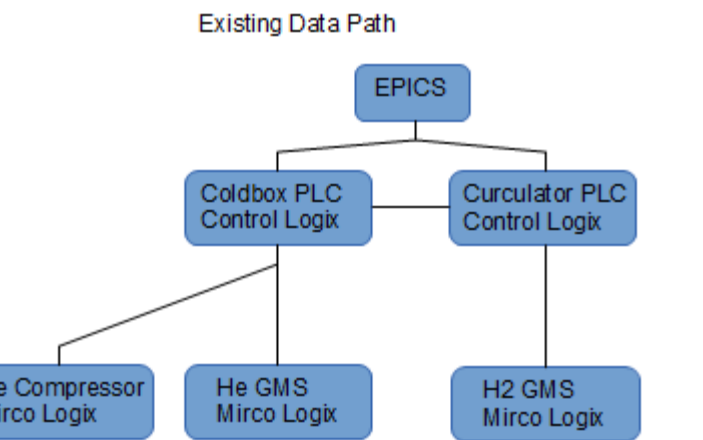
A pictures of:  
Installation of new control hardware.



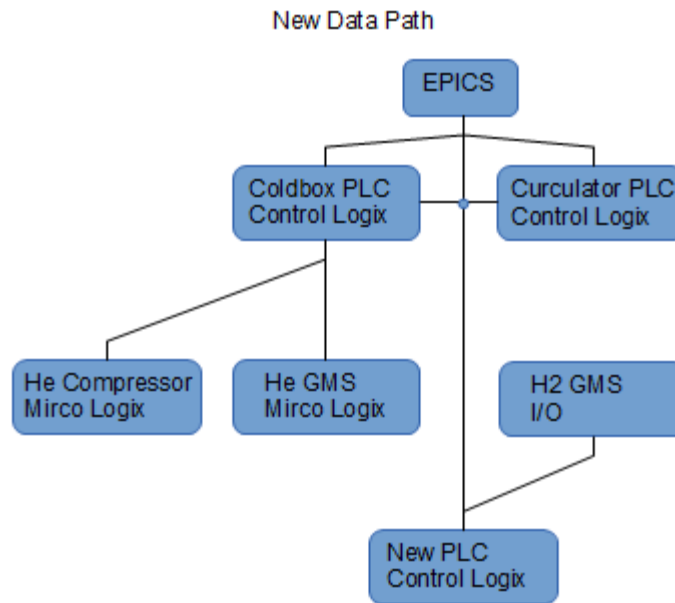
Make a better system.

Operations: Safety approved operational system.

Duplicate operational parameters that is conducive to maintainability.



A picture of:  
 Existing data network between bldg 8760 and bldg 8700

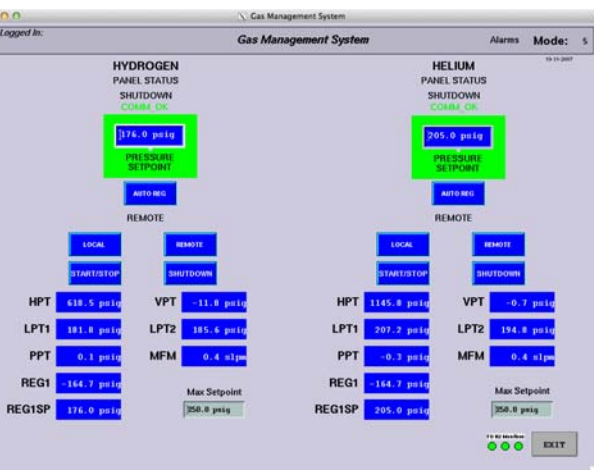


A picture of:  
 Purposed data network between bldg 8760 and bldg 8700.  
 NOTE: For H2 gas upgrade only

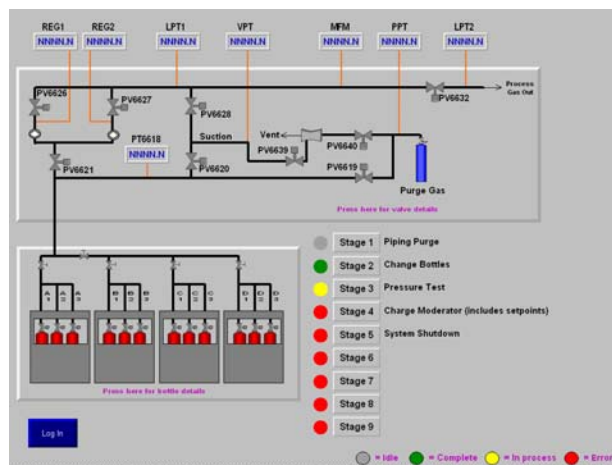
Goal: Make a better system.

Considerations: Safety approved operational system.

Risk: Duplicate operational parameters that is conducive to maintainability.



A picture of:  
Remote EPICS operations control screen for hydrogen and helium gas supply to ORNL-SNS FTS target moderator.



A picture of:  
Purposed local control screen for hydrogen gas supply to ORNL-SNS FTS target moderator.  
NOTE: Remote EPICS control will have limited options

Goal: Make a better system.

Considerations: Safety approved operational system.

Task: Duplicate operational parameters that is conducive to maintainability.



**al:** Make a better system.

- Build a system for integration into other moderator systems.

**nsiderations:** Safety approved operational system.

- Maintain and improve safety of explosive gas handling.

**K:** Duplicate operational parameters that is conducive to maintainability.

- Build a better system.
- Change process variable for improved pressure control of H<sub>2</sub> gas.

# Conclusion:

- Up front systems integration.
- Consider mounting gas bottles outside.

Thank You.