



MICE: Controls & Monitoring

Pierrick Hanlet

ILLINOIS INSTITUTE
OF TECHNOLOGY

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Outline

- Progress since CM38
- C&M Organization
- Testing State Machines
- Building C&M Production Version



Since CM38

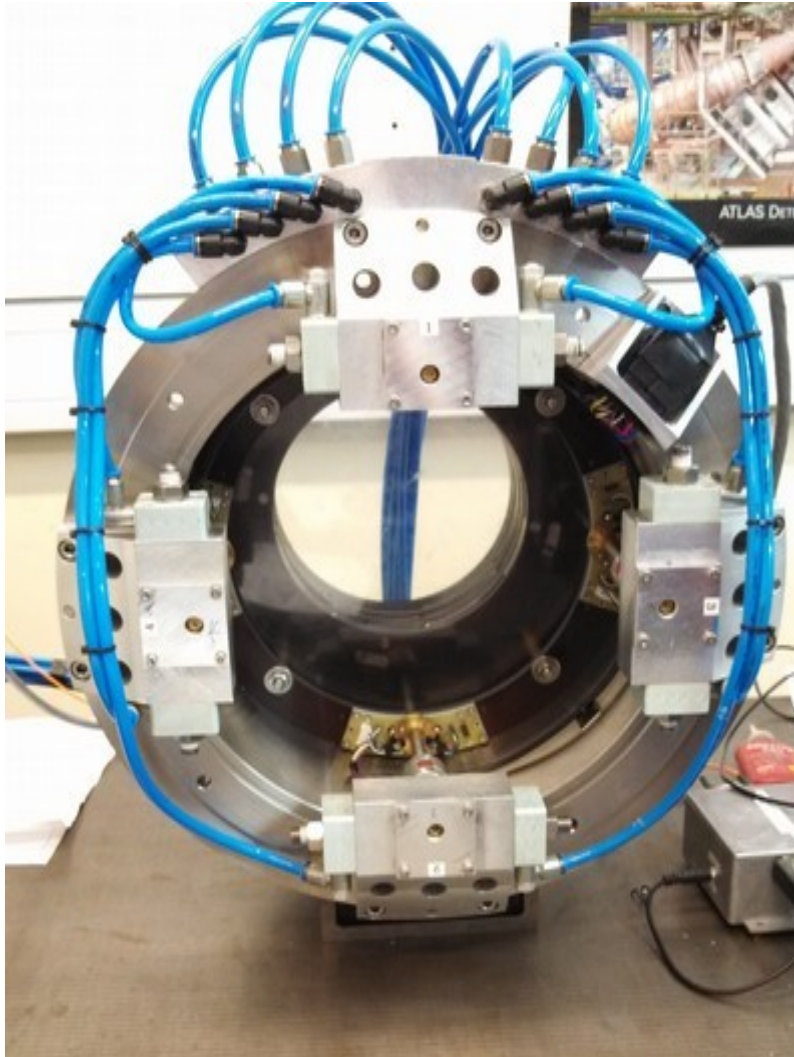
- C&M organization
- CKOV
- diffuser
- proton absorber
- ISIS beam loss monitoring

More on all of these later



New purge monitoring

- hardware from UMiss
- installed
- reading out
- **needs calibration**
- **need to add to gui**



Hardware is complete

Control developed with
LabView



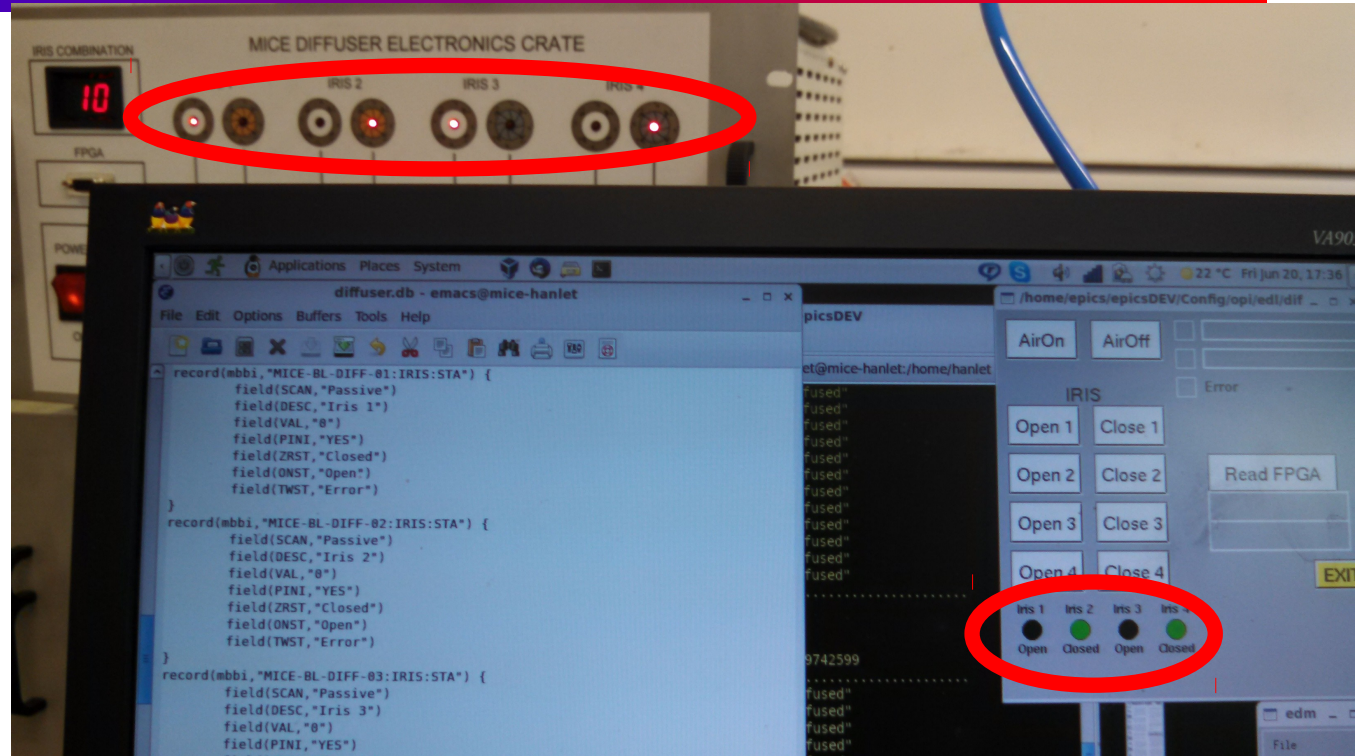


Since CM38 - Diffuser





Since CM38 - Diffuser

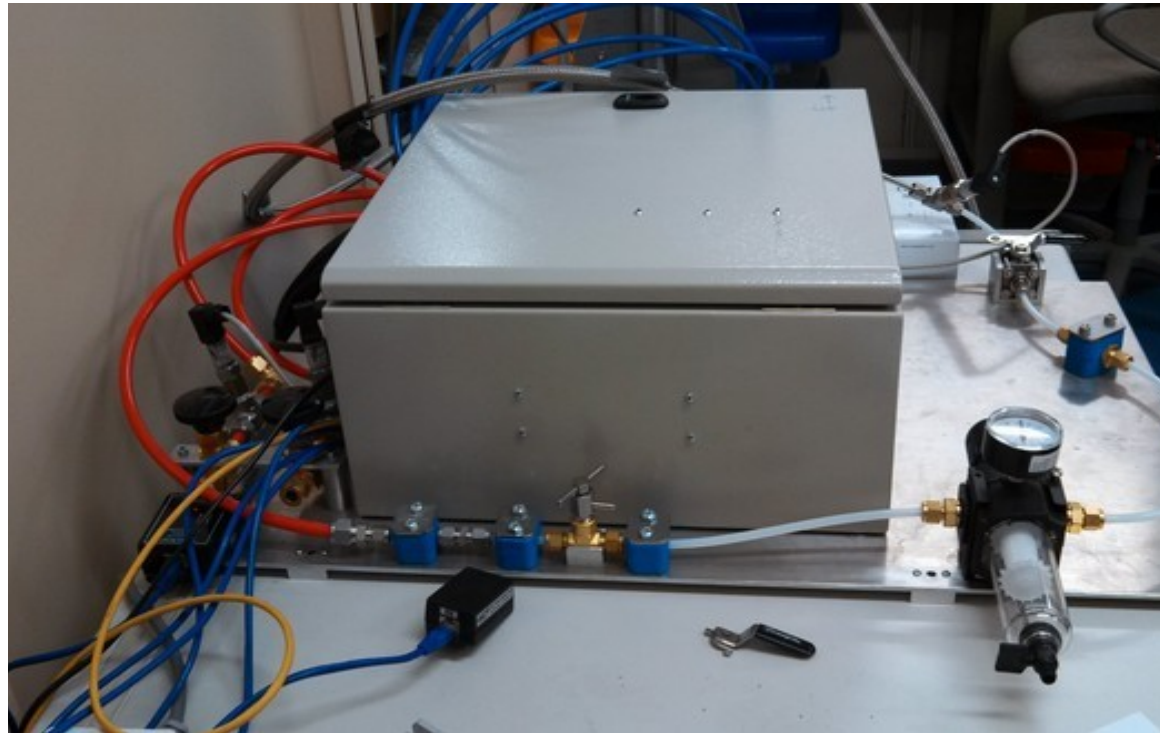
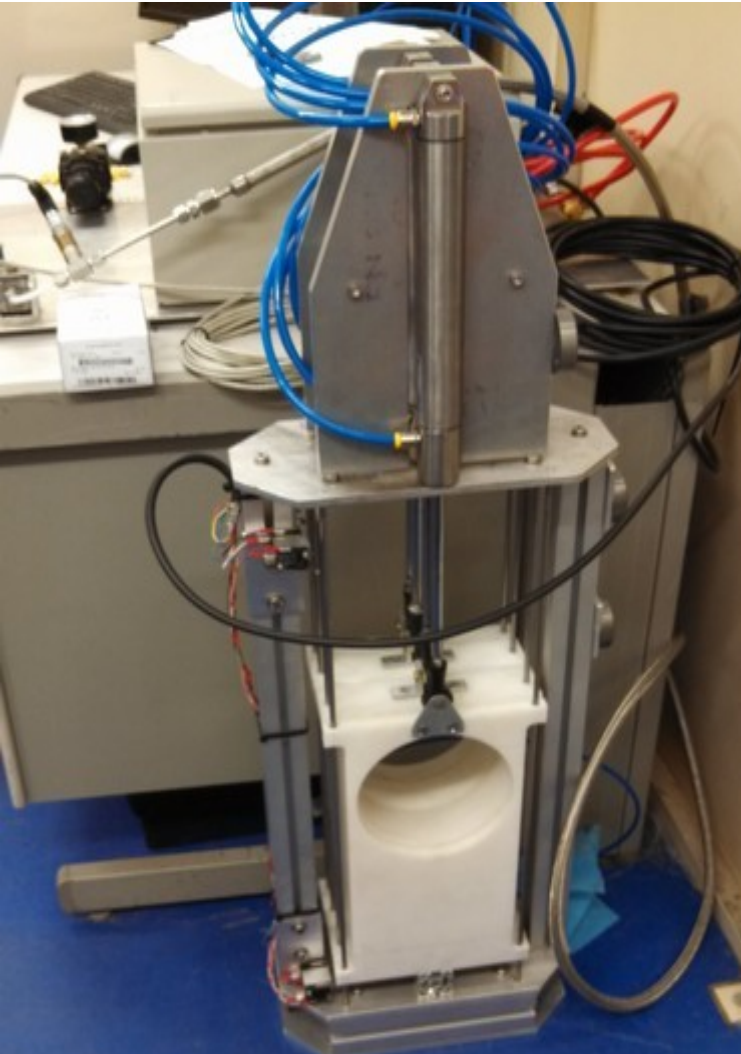


EPICS Control

- working control in 2013
- resurrected in May 2014
- control worked immediately
- read back, more problematic
- 22 June, overcame readback problem
- need to complete parsing data

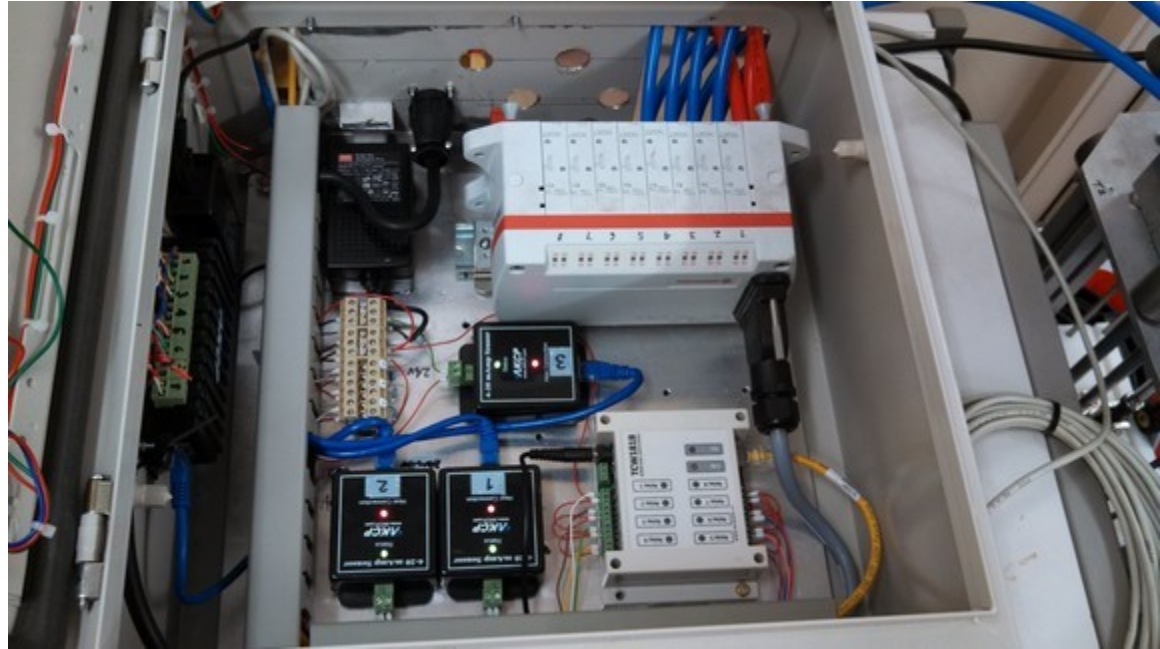


Since CM38 - Proton Absorber





Since CM38 - Proton Absorber

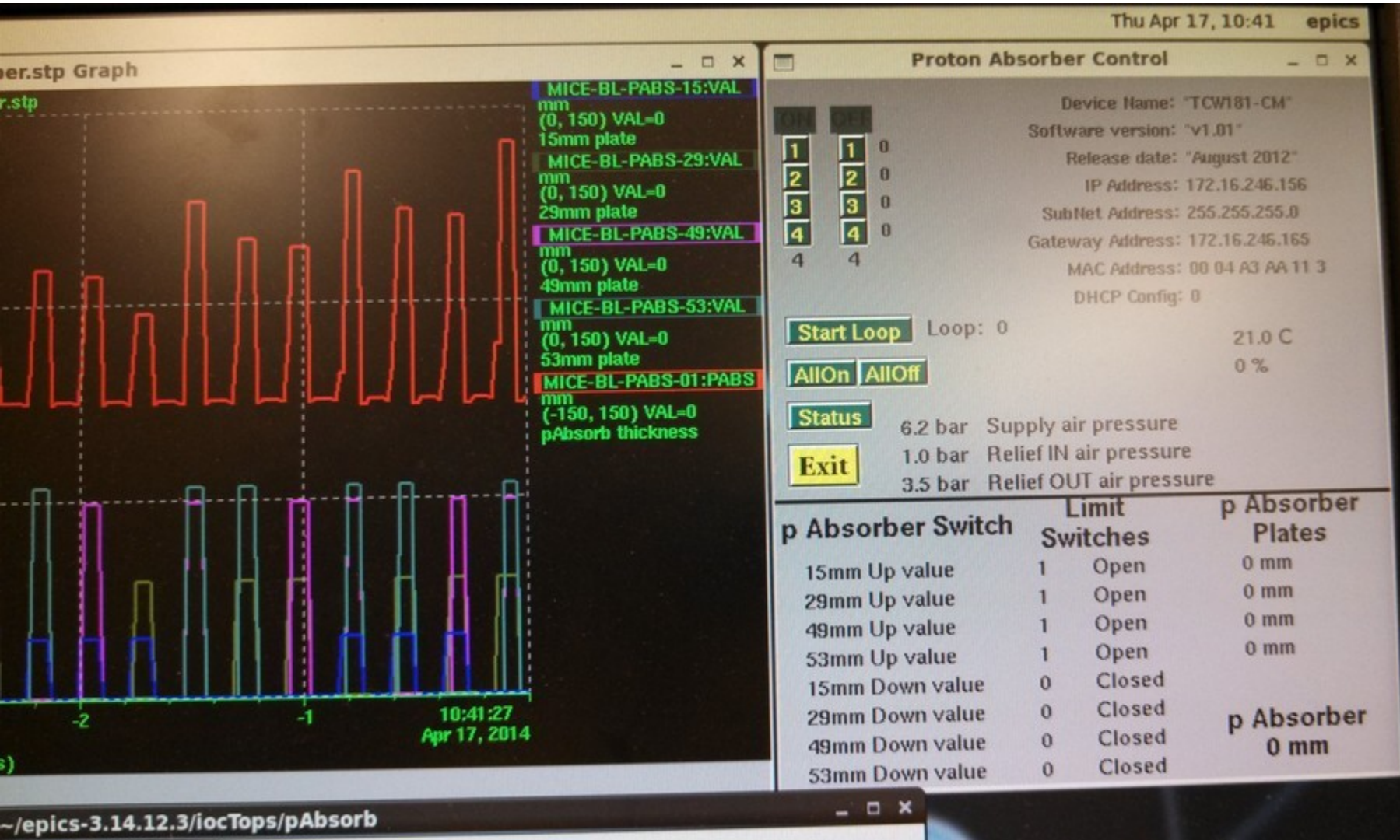


Control

- reported at CM38
- completed control system and bench tested
- installed in beamline and control box in east end of trench
- completed final control system
- now displayed in GUIs
- **needs final leak check and final soak test (during next shutdown)**



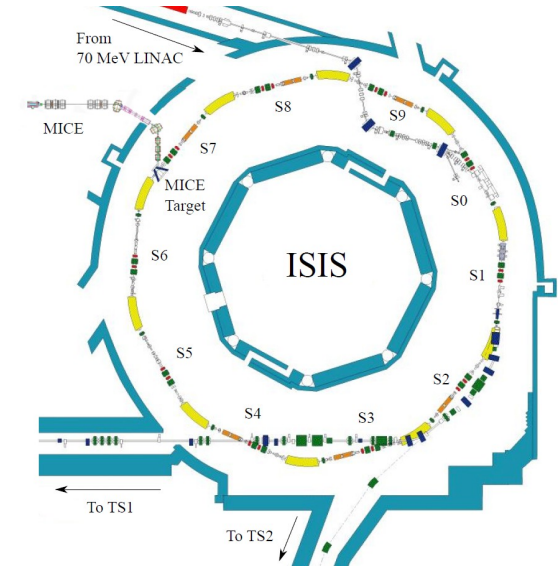
Since CM38 - Proton Absorber





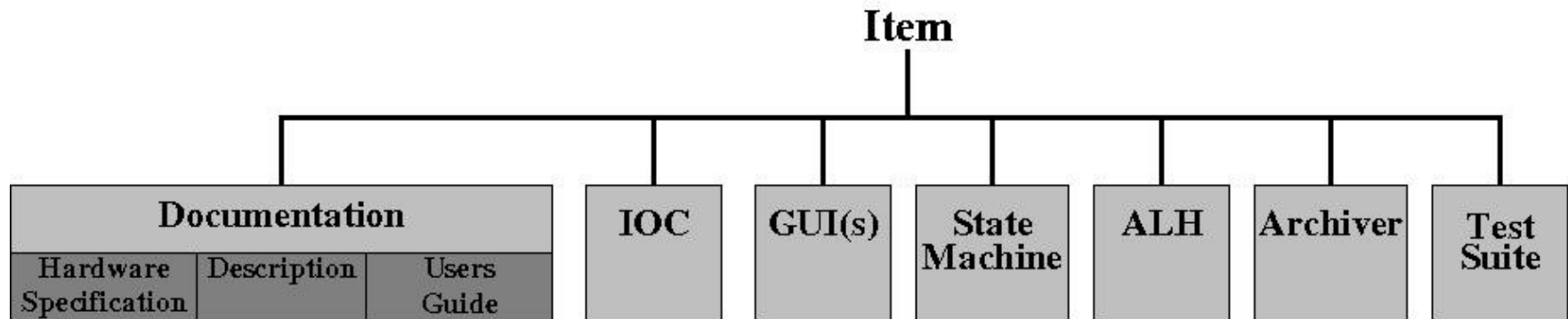
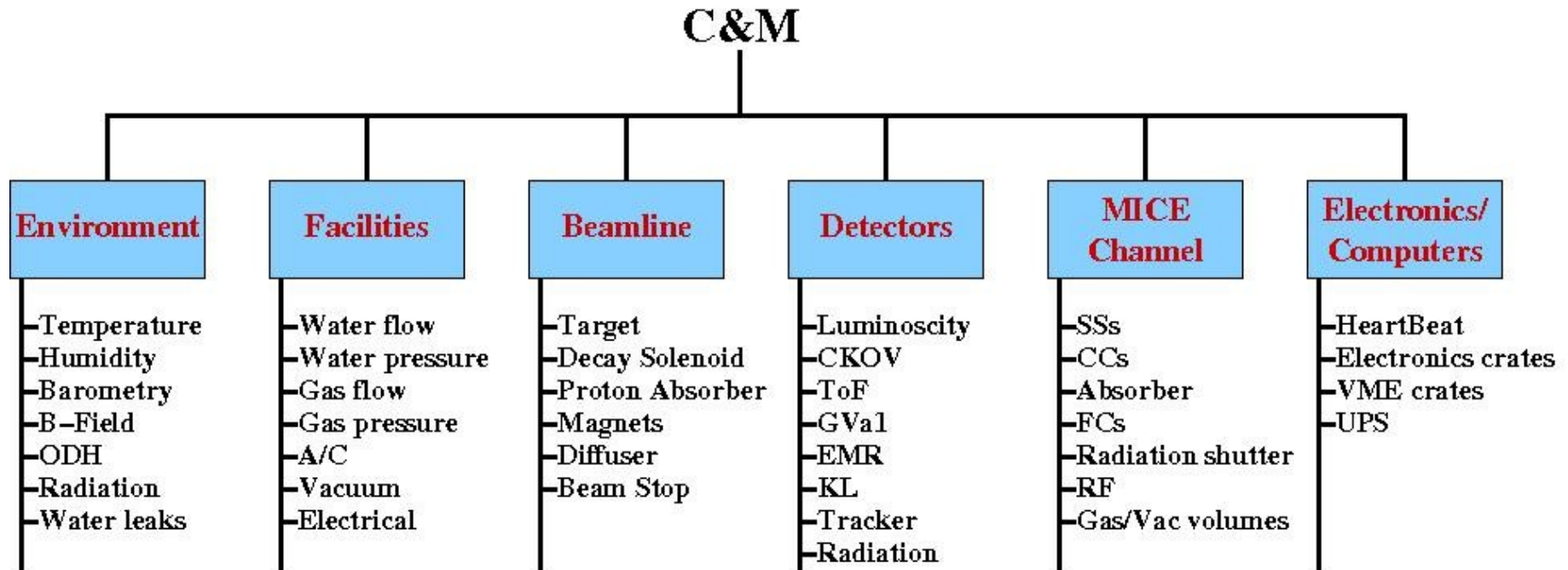
Since CM38 - ISIS Beam Loss Monitor

- Initiated by ISIS
- ISIS has 10 sectors
- 4 beam loss monitors (BLM) per sector
- sector 2 has only 3 → 39 BLMs
- MICE trips ISIS in BLM 7-3, 7-4, 8-1
- ISIS uses LabView readout
- C&M provides EPICS PVs which ISIS fills
 - losses during MICE dip - 39 element array
 - average of ISIS losses on all but MICE pulse - 39 element array
 - ISIS proton count/pulse - used to calculate ISIS current
- Regenerate ISIS beam loss plot for MICE triggers
- Generate a difference plot so indicate MICE induced losses
- Will use to alarm at 80% of threshold level*
- Tested and used during recent ISIS BLM tests
- Will receive data independent of MICE target





C&M Organization





C&M Organization

| | | | Owner | Support | Required Time (Hours) | Proportion Done | Person Occupancy | Modifier | Estimated Task Time (Days) | Actual Time Taken | Priority | Dependencies |
|---------------|--|---------------|-----------|-----------|-----------------------|-----------------|------------------|----------|----------------------------|-------------------|----------|--------------|
| Environment | Temperature Humidity Barometry WaterLeaks | IOC | Hanlet | | 40 | 95.0% | 60.0% | 1 | 0.42 | | 3 | none |
| | | GUI(s) | Hanlet | | 1 | 95.0% | 60.0% | 1 | 0.01 | | 3 | none |
| | | ALH | Heidt | | 1 | 80.0% | 5.0% | 1 | 0.50 | | 2 | none |
| | | Archiver | Heidt | | 1 | 80.0% | 5.0% | 1 | 0.50 | | 2 | none |
| | | Documentation | Taylor | | 0 | 0.0% | 50.0% | 1 | 0.00 | | 3 | none |
| | B-Field | IOC | Hanlet | | 120 | 0.0% | 60.0% | 1 | 25.00 | | 2 | hardware |
| | | IOC | | MacWaters | 120 | 0.0% | 50.0% | 1 | 30.00 | | 2 | hardware |
| | | GUI(s) | Hanlet | | 3 | 0.0% | 60.0% | 1 | 0.63 | | 3 | ioc |
| | | ALH | Heidt | | 1 | 0.0% | 5.0% | 1 | 2.50 | | 3 | ioc |
| | | Archiver | Heidt | | 1 | 0.0% | 5.0% | 1 | 2.50 | | 3 | ioc |
| | Documentation | Uchida | | 0 | 0.0% | 5.0% | 1 | 0.00 | | 3 | none | |
| | ODH | IOC | Hanlet | | 20 | 0.0% | 60.0% | 1 | 4.17 | | 3 | none |
| | | GUI(s) | Hanlet | | 3 | 0.0% | 60.0% | 1 | 0.63 | | 3 | none |
| | | ALH | Heidt | | 1 | 0.0% | 5.0% | 1 | 2.50 | | 3 | none |
| | | Archiver | Heidt | | 1 | 0.0% | 5.0% | 1 | 2.50 | | 3 | none |
| | | Documentation | Nebransky | | 0 | 0.0% | 50.0% | 1 | 0.00 | | 3 | none |
| | Radiation | IOC | Hanlet | | 40 | 0.0% | 60.0% | 1 | 8.33 | | 4 | hardware |
| | | GUI(s) | Hanlet | | 3 | 0.0% | 60.0% | 1 | 0.63 | | 4 | ioc |
| | | ALH | Heidt | | 1 | 0.0% | 5.0% | 1 | 2.50 | | 4 | ioc |
| | | Archiver | Heidt | | 1 | 0.0% | 5.0% | 1 | 2.50 | | 4 | ioc |
| Documentation | | Torun | | 0 | 0.0% | 1.0% | 1 | 0.00 | | 4 | hardware | |



C&M Organization

Hanlet

Heidt

| | | | | | | | | |
|---------|--------|---------|---------|--|---------|-------|--------|--------|
| 264.875 | 82.760 | 188.917 | 249.667 | | 541.750 | 0.000 | 98.250 | 98.250 |
| All | "=1" | "<=2" | "<=3" | | All | "=1" | "<=2" | "<=3" |

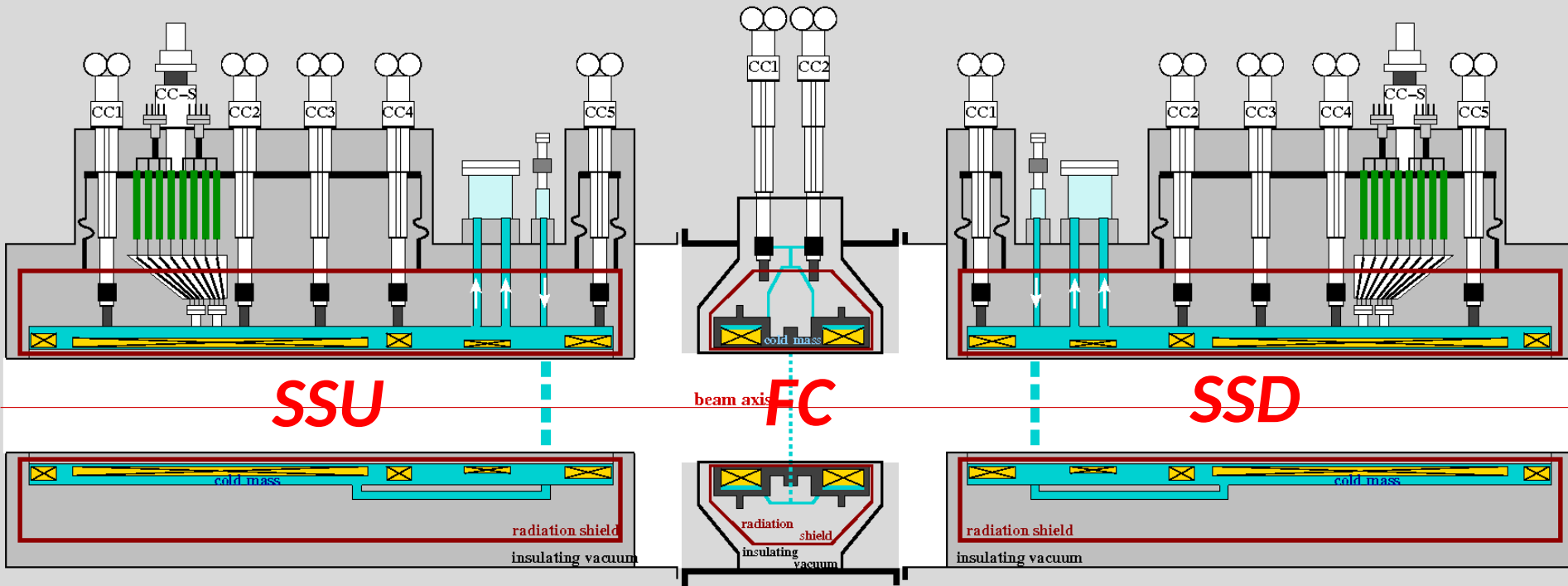
- top row in days
- bottom row is priority:
 - 1)Must have for Step IV
 - 2)Should have for Step IV
 - 3)Would like to have for Step IV
 - 4)Wait until Step IV is operational



C&M Organization

- With items developed and functional
- Next task is integration
 1. hardware installation/commissioning
 2. higher level operations – StateMachines
 3. integrated operations – RunControl

Step IV Operations



- Vacuum
- Compressors
- Cryogenics
- Pressure
- Power Supply

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Testing State Machines

- Until now, required HW to test the SW
- W/Chris Heidt, developing mock IOCs to mimick real PVs
- Using same test GUI which was used to verify settings with each state (sorry, no screen shot)
- FC mock IOC is nearly ready, still need to add interlocks
- Plan:
 - run real state machine
 - run mock IOC
 - use test GUI, to set PV values
 - can force transitions and test functionality
 - can test alarm handler
 - can test archiver
 - can test critical variables
- Will use this for all SMs



Building Production Version

- Before leaving Ian made great inroads into establishing a production version of the C&M software
 - developed structure
 - developed automation scripts
 - verified SL6.4 OS
- Expectation was that only OS upgrades and running scripts would establish production version
- ..., but ...
- This was NOT a good expectation
- Because of this expectation, started down a path from which I could not turn back. This jeopardized smooth activation run.



Building Production Version

Feature #1493

Freezing a production verion of C&M

Added by Hanlet, Pierrick 4 days ago. Updated 2 days ago.

| | | | |
|------------------------|------------------|--------------------|-----------------------------------|
| Status: | Open | Start date: | 23 June 2014 |
| Priority: | High | Due date: | |
| Assignee: | Hanlet, Pierrick | % Done: | <input type="text" value="0"/> 0% |
| Category: | - | | |
| Target version: | - | | |

Description

- 1) Software does not all build with SL5.7
- 2) We are moving back to micecserv because it has SL6.4 and micecserv2 has SL5.7:
 - cron job for UpdateMasterIndex
 - connect speakers
 - connect screen
 - fix ArchiveViewer
 - ensure that Archiver and ArchiveDataServer start correctly in /etc/rc.local
 - ensure that CmdExServer is started correctly in /etc/rc.local
 - ensure that rsync jobs for ArchiveData to hepInv151 are running
- 3) Fix Server Launcher
- 4) Update miceiocpc1 to SL6.4
- 5) Unify passwords
- 6) Close out miceiocpc's: miceiocpc1, miceiocpc2, miceiocpctest to access; once EpicsAdmin_rsa is used, connection remains open
- 7) Update miceopipc3, miceopipc4 to SL6.4
- 8) Update EPICS software on all machines

Subtasks

Related issues

| | | | |
|---|------|--------------|--|
| related to Controls and Monitoring - Bug #1494: Fix Server Menu | Open | 24 June 2014 | |
|---|------|--------------|--|

History

Updated by Hanlet, Pierrick 4 days ago

More items:

- 9) Mount target1ctrl disk on miceiocpc2 and miceiocpctest
- 10) Build scripts do not allow changes to epicsENV; this needs to be fixed
- 11) Build script does not build root

Updated by Rogers, Chris 3 days ago

ROOT is installed by yum... lib files are at /usr/lib/root/, include files are at /usr/include/root/ and binary at /usr/bin/root. This is v5.34/18.



Building Production Version

- Goal was to have problems solved for activation run
- Thanks to help from Chris Rogers and Matt Robinson, most of these problems are solved
- Must move to SL6.4, some software does not build on SL5.7
- Still tasks to do, but activation run is safe



Summary

- Much progress since CM38: diffuser, proton absorber, CKOV purge monitoring, ISIS BLM
- Organization is defined and added to master SW
- Major hiccough with establishing production version; problem under control
- Now have plan for future development and initial testing of State Machines