

Notes on first CAM rolling review meeting: 19Dec16

Present: P.Hanlet, C.Whyte, P.Frachini, K.Long, B.Martlew, P.Owens, A.Oates, I.Mullacrane, S.Griffiths, T.Hartnett, A.Kurup, M.Courthold, P.Hodgson, A.Bross

1. Introduction and timeline -- K. Long

- Principal issue is the investigation of the autonomous ramps by the E- and M-coil power supplies. The goal is to identify, and remove, the cause. If this is not possible, then the review should seek to define the measures that reduce the probability of a recurrence to an acceptable minimum.
- The review process should be exploited to benefit the change of leadership of the controls-and-monitoring effort from PMH to AK. The formal handover will be 13Jan17. PMH will not leave MICE until Feb17. All components of the CAM system (user-level code, communications and hardware-interface code) will be included in the review.
- The review will be carried out as a “rolling” process involving meetings to report progress on work that will be carried out by the relevant experts.
- Timeline; the objective will be to close the review before the start of the next ISIS User Cycle in February 2017.
- Goal of today’s meeting is to review the status, structure and organisation of the CAM systems, identify the key elements (e.g. communications, GUIs, Run Control, Alarm Handler, Data Archiver) and to agree the first set of actions.

2. Controls & Monitoring Overview: philosophy, architecture, implementation -- P.M. Hanlet

- See documentation uploaded:
 - CAMoverview.pdf and MICE note 431
 - StepIV-CAM_v4.pdf (work in progress)
- Points noted:
 - Logical subsystems: Beam line; Detectors; Channel; LH2; “other”:
 - “Other”: includes environment, services etc.
 - Each subsystem has an associated State Machine. The State Machines are all passive; i.e. they do not issue commands.
 - PMH has created the “MICE state machine”; this is the over-arching state machine the state of which is determined by the sub-system state machines. The MICE state machine did not exist at the time when the autonomous-ramp events occurred.
 - **Need clarification of whether the MICE state machine is running now and which state machines it oversees (PMH).**
 - Run Control integrates the state machines listed above.
 - **Read-only or read/write access:** It is possible to set read-only access to particular process variables and restrict read/write access to a particular IOC. This can be done PV by PV.
 - At present it is possible for all processes, in principle, to set PVs that correspond to commands (including the state machines and Run Control “wrappers”) without “going through” the low-level code provided by the system owners.

- **Version control:** The DL, h/w-interface, code is not version-controlled in the MICE system. It is of course version controlled at DL. There needs to be a way in which a “MICE production version” of the full CAM system is maintained, including the DL code (**action: AK: generate a plan by which to implement the required versioning**)
- **Documentation of PVs:** There was no complete documentation of the PVs. Since the PVs are the data structure of the CAM code, this it was felt that this was necessary and that steps be taken to document the PVs.
- **“OUT” statements are used to set OVs:** PVs are set through “OUT” statements. We agreed to search for the OUT statements and then review them to be sure all OUT statements are in appropriate pieces of code. **Action: PH:** search code for “OUT” statements and document the PVs and modules that write the values to the PVs.
- **IOCs + PVs:** Need to cleanup schematic to show which layers *write/create* and which ones *only read* PVs.
 - **Action: PMH:** initiate documentation of PVs by identifying all command PVs and documenting their values and actions.
- **Investigation of code:** will be driven by the PV search, i.e. focus on areas where “command PVs” are set. *Agreed* that **PMH** would identify the code/modules that set the PVs.
- **Alarm handler:** limits to the set values are provided through the spreadsheets. Require to get a list of outstanding ALH issues. **MC** agreed to contribute in this area once the Decay Solenoid ALH issues have been addressed.
 - We agreed that: **DR:** would liaise with PMH, PH S.Boyd and M.Uchida to generate a list of outstanding ALH issues.
 - **MC:** will continue to investigate ALH issues once decay-solenoid issues are resolved.

3. Magnet controls: hardware -- S. Griffiths, I. Mullacrane

- See documentation uploaded:
 - Controls_Review_Dec_16.pdf
- Points noted:
 - The controller for the FC power supply needs to be swapped (**action: CW:** organise controller swap).
 - PO reported that In the SS power-supply code, the AMI420 is told to go to 0A every second unless the interlocks remain set. If a stale value was in the register, and a ramp command was issued this could cause an autonomous ramp, e.g. for trim power supplies to ramp to 0A.

4. Magnet controls: communications, code -- A. Oates

- See documentation uploaded:
 - MICE3.ppt
- Points noted:
 - **Error rate in serial communications:**
 - Serial communication problems believed to be due to

equipment rather than controls.

- ABr had talked to engineers at Lakeshore & other deployments, no reports of these problems with other units, suggest further exploring IOC implementation & communications.
- It was *agreed* that the error rate was too high for the RS232 spec and that therefore there remains the need to investigate and remove the errors so that the error-rate comes in line with that which the h/w is capable of delivering.
- The communications issues with the FC compressors due to the long serial line remains and needs to be resolved.

5. Networking & configurations -- P. Franchini

- See documentation at:
 - Franchini-CMreview-2016-12-19.pdf
- Points noted:
 - Require a daemon or equivalent to close stale open GUIs. Perhaps require that only one can be open at any one time.
 - The benefits of hard vs soft monitoring of NFS discs was discussed.
 - **Network isolation test:** The network isolation test defined in MICE Note 431 must be completed.

Actions:

- **PMH:** Provide confirmation of status of MICE state machine and which state machines it oversees.
- **AK:** Define a plan by which the version of the DL code active in a particular release of the CAM code is stored alongside the MICE-specific code.
- **PH:** search code for “OUT” statements and document the PVs and modules that write the values to the PVs.

- **PMH:** initiate documentation of PVs by identifying all command PVs and documenting their values and actions.

- **PMH:** identify code/modules which access the command PVs
- **CW:** organise that power supplies be shorted so that tests can be made.
- **AO:** continue to record and investigate error rates, in particular of the AMI420s.
- **AO:** consider removing the “status” command for the AMI420s.
- **PMH:** generate list of command PVs
- **AO:** propose dates for visits to RAL to investigate communications (this so that we can prepare for his visit)
- **BM:** Send information on network “sniffer” that looks for the setting of values (believe to have been developed at the Canadian Light Source)
- **DR:** Generate list of outstanding ALH issues.
- **MC:** continue to investigate ALH issues when decay solenoid issues are addressed.
- **PF:** Implement backup of DL code
- **PF:** Schedule network isolation test