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ATCABOC Days 2007

Session 2: Issues of a General Nature

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9 February 2007

T. Pettersson/TS EDMS: 815929



Accelerators Technical and Operation Review (ATC/ABOC Days)

22-24 January 2007 CERN, 874-1-011

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Session 2: Issues of a General Nature

Place: CERN, 874-1-011
1211 Geneva, Switzerland

Dates: Room: 874-1-011
Monday 22 January 2007 14:00

Conveners: **BENEDIKT, Michael**
PETERSSON, Thomas

Contribution List | **Time Table**

Monday, 22 January 2007	
14:00	[66] Requirements on StandBy and intervention services for accelerator operation <small>by Michael BENEDIKT (CERN, AB-OP) (874-1-011: 14:00 - 14:20)</small>
	[27] General Safety Aspects and PS Access System Issues <small>by Ghislain ROY (874-1-011: 14:20 - 14:45)</small>
15:00	[28] The Holiday effect, reliance on experts for operations, Standby and intervention services <small>by Claude Henri SICARD; Alberto PACE (874-1-011: 14:45 - 15:45)</small>
16:00	Coffee break (15:45 - 16:15)
	[29] PLC programming QA <small>by Stefan LUEDERS; Philippe GAYET (874-1-011: 16:15 - 16:45)</small>
	[30] Quality assurance – documentation and diagnostics during interventions <small>by Peter SOLLANDER (874-1-011: 16:45 - 17:15)</small>
17:00	[37] Infrasctructure consolidation - roofs, tunnels, etc. <small>by Cristiana COLLOCA (874-1-011: 17:15 - 17:35)</small>

Standby and Intervention services

M. Benedikt(AB/OP) - Piquet vs Standby issues. (Paid vs good-will; SR&R; practical issues : uptodate address management etc.). Waiting for Freddy's WG to make proposals.

- Follow-up of interventions: cmp. TI's ODM. Job is finished when ODM is filled in – not before. This approach offers traceability of interventions.
- Some unclear lines of responsibilities – need better definitions both internally AB & between AB/AT. (E.g B-train, timing, magnet interlock....).
- Piquet technical training must be improved in some areas (RF equipment is fragile).
- In general: system (still) works but depends on good-will but a global policy would clarify issues.

Standby and Intervention services

Recommendations:

- Clarify support relations and responsibilities both internally in AB and with AT. Written service level agreements are useful tools to solve conflicts.
- Clarify the SR&R for standby interventions with HR to ensure a coherent global approach .
- Maintain an uptodate address list of people to call.

General Safety Aspects and PS Access System Issues

G. Roy (AB/OP)

- PS Access issues not treated in presentation – no time for preparation.
- GL's do not set a good example when seen running out of the room when Safety is discussed.
- Safety is the responsibility of everyone – it cannot be delegated or wished away.
- Safety training has to be improved and possibly given a "best-before" date.

The Holiday effect, reliance on experts for operations, Standby and intervention services

Two talks – AB/CO and IT/IS.

A.Pace (IT): Large service with small staff and many users.

- Strong standardisation with polyvalent staff. No single point of failure. No single expert-single project.
- Strong monitoring of activities with fast feedback loop. Adapt tasks to adequate competence levels.
- Extensive outsourcing which forces documentation and process understanding.
- Regular homebuilt/industry product review of new services.
- Culture management and recruitment policy to bring in new expertise.
- Relevance to accelerators: standardisation of platforms, common services where possible between groups, staff polyvalence.
- Conflict : fix fast or deploy well debugged systems “slowly”. Beam instrumentation can be standardised up to a certain level only.

The Holiday effect, reliance on experts for operations, Standby and intervention services

CH Sicard (AB/CO) – Standby Service or reliance on Experts

- Present model: 5-6 technicians on a rotating weekly (24/24 h) basis.
- Team needs regular training and adequate diagnostic tools for any new tool or service introduced.
- Performance indicators exists but could be improved – to judge the effectiveness of an intervention is difficult. High frequency of interventions on front-end sw, on/off reset & timing.
- Plans for a standardisation of diagnostic tools and knowledge sharing with OP.
- Standby service considered a good model but very dependent on final expert back-up availability in CO and in main equipment groups. Maintenance of an Up-to-date call list to find the right expert immediately is a recurrent problem.
- Request for more support from OP/TI on PLC;s (from TS).

The Holiday effect, reliance on experts for operations, Standby and intervention services

Recommendations:

- Avoid “at any cost” the single expert-single system approach for systems required for 24/24 h beam operation.
- Push for standardisation of platforms, generic software etc.
- Improve diagnostics tools for OP – this might save your night’s sleep.
- Fix problems with a high rate of recurrence once and for all.
- Improve monitoring of interventions.

PLC programming QA

Two talks – AB/CO and IT/CO; presently about 400 plcs installed and many more are coming online in the next months.

S. Lüders (IT/CO) – PLC Security

Principal points:

A Fact: Controls goes Information Technology (not only digital devices).

- The Problem: No Inherent PLC Security; PLCs now come loaded with features of a PC - and with the same weaknesses. Remove/do not use what is not appropriate for controls purposes in a PLC at CERN!
- Mitigation project - CNIC: Isolate the Technical network – limit PLC connectivity to “as-needed” basis. Strict supervision and overall configuration management required.
- Conclusion – please follow the CNIC rules even if they seem to be obnoxious and a waste of time to your specific case!

PLC programming QA (1/2)

P. Gayet (AB/CO)

His ideal case:

- *Buyer* requires conformance to the Technical Specification written beforehand.
- *Seller* builds the product with the intent of meeting the conformance requirement of the purchaser. Products that undergo testing are called Implementation Under Test (IUT).
- *A Test Laboratory (TL)* performs the operational testing of the IUT .
- *A Certificate Issuer (CI)*, issues a Certificate of Conformance for IUTs that have successfully completed the testing process.
- *A Control Board (CB)*, resolves dispute and answers queries on behalf of the CI.

Real case – somewhat different at CERN...

- Recommendations (very minimalist)
 - Even in case of use of local PLC consoles always store the operating version in the central repository.
 - Store several versions of the application with a clear naming convention and documented evolution. Do not keep only one version!
 - Use software versioning tools either to store the complete application but remember the program modules and the libraries to be able to build a complete task image.

PLC programming QA (2/2)

P. Gayet (AB/CO) – suite:

- The rejuvenated GUAPI (PLC Users group) will organize seminars and training :
 - PLC program organization, and new programming methodologies to offer safer alternatives.
 - Share and promote best practices in the PLC community
 - The use of the PLC simulators for program validation
 - Methods to master versioning tools applied to complete project or to source codes
- The PLC support groups (AB-CO, IT-CO) will provide new tools or procedures adapted to the CERN PLC users needs
 - Adaptation of CVS
 - Generalize existing data driven generation tools. This helps avoiding manual coding...
 - ...

PLC programming QA

Recommendations:

- Create a central PLC software repository.
- Use the central repository to manage your software.
- Disable explicitly anything in the PLC not needed for your application! Do not read your mail on a process PLC.
- Join the PLC GUAPI and contribute with your knowledge!

Quality assurance – documentation and diagnostics during interventions

P. Sollander (AB/OP)

- Alarms and other “events” are the OP/TI’s main source of information
- Alarms and alarm system must be correct, complete and reliable. False information is worse than no information.
- Quality assurance is achieved by procedures and follow-up of actions
- Heavy user of the CERN Asset Management and Maintenance Management System –(CAMMS). If you use MTF for manufacturing follow-up you can use CAMMS for equipment management immediately!
- Every intervention is followed by a work order and the intervention is not considered terminated before the work order closed. (For subcontractors – intervention not paid until ODM closed).
- TI makes a strong case to extend the use of this tool (which is freely available and supported by TS) to more AB equipment groups. It will help both the TI and the accelerator operators to do a better job with correct and timely information about equipment and interventions.

Quality assurance – documentation and diagnostics during interventions

Recommendations:

- Control that your system's alarm signals are coherent.
- Use the CAMMS to trace interventions and provide documentation for your system.

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Cristiana Colloca TS/FM

**BA80
BA2
BB4
BA7
BA6**



Consolidation of machine buildings roofs



-> TOT 1'180 kCHF

= 70% of TS expenditures

Comment: The regular inspections from SC are not sufficient to (dis)cover all potential problems in the many buildings – we need input from you, the users!

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PS

Cristiana Colloca TS/FM

Stopped due to PS Magnet cooling water problem (13-Nov-2006)



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Conclusions

- A good overview of general issues.
- Standby vs piquet will become a major issue with the LHC startup and operation. HR has to give recommendations.
- Safety- is everybody's business!
- Standardisation and staff polyvalence to avoid single points of failure – both human and material.
- PLC's can be dangerous if not handled correctly all the time
- PLC software must be handled like any other software: design, configuration and code management is required. On-line modifications possible but extremely dangerous – experts only and even then....
- Tools to follow accelerator complex interventions exists – please use them and do not reinvent!
- Yes, TS has fixed the leaking roofs and tunnels – please let us know when you see a problem!

