

CMS Project Needs

CMS CB Meeting

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On Behalf of the Project Managers (TRK, ECAL, HCAL, DT, RPC, CSC, L1, DAQ)



Brief Overview

- Included in this talk:
 - TRK, ECAL, HCAL, DT, CSC, (RPC), L₁, DAQ
- General Trends:
 - As expected, pp data has impacted involvement in sub-projects, but the rate of change was unexpectedly fast.
 - 2011 ~ok in most cases
 - Banking on automation & lower required shift coverage
 - Pledges
 - Deficits in most cases are probably “not real”: institute leaders did not always enter them
 - Many pledges are for shifts at a time when all subprojects are reducing need for shifters
 - Loss of expertise is a serious/critical concern.
 - Must find/train experts before we lose institutional memory
 - There are many potential single-point failures



Summary of current needs

- Tracker:
 - Expects to cover needs for 2011
- ECAL:
 - Need ~2 FTE in operations, and several FT to help in PF integration & AICa
- HCAL:
 - Expects to cover basic needs in 2011
 - NB: Had to descope a lot of important activities in 2010
- DT:
 - No outstanding problems but not far from critical.
- CSC:
 - At minimum but ~okay in 2011
- L₁T
 - 4 FTE needed in key areas!
- DAQ
 - ~4 People needed



Tracker manpower for 2011 run:

- Service needs for 2011 are well-understood and they may not need support from outside tracker.
- **Note:**
 - **It's not easy to maintain coverage:**
 - Contacting some Institute leaders that didn't pledge yet in 2010 and taking the opportunity to discuss 2011.
 - **Obtaining new commitments but not quite solvent yet.**
 - E.g. Alignment has not been as well covered as needed. Looking to recruit some people to strengthen it. Competition coming from physics activities
 - **To continue to operate this excellent detector for the coming decade, institutional commitments are needed.**

ECAL critical manpower 2011



- Operations at P5
 - ECAL Run coordination (2x0.5 FTE): **at risk (1 almost immediate)**
 - ECAL Field technical coordinator (2x0.5 FTE): **at risk (1 out of 2)**
 - ECAL DAQ: coordination (1 FTE) covered up to September 2011
 - **Manpower critical in general (need additional ~1-2 FTE for 2011)**

- Performance
 - DQM managers (2x0.5 FTE): 1 appointed as central PVT, **1 at risk**
 - PFG/certification coord. (2x0.5 FTE): 1 appointed as AICa convener
 - ECAL SW developers lacking in several areas
 - **ECAL DPG is needed in PF integration but w/o extra manpower**
 - ECAL Calibration and alignment
 - **Incoherent activity in TF and PAGs → back to ECAL DPG/POG**

- **Single-point failures**
 - **DCC & ES-DCC hardware/firmware coordinator**



HCAL Critical Manpower Needs

- Detector Systems
 - DAQ (hardware& software) and Power- DCS- Interlocks:
 - In both cases need to train a 2nd system expert for ~18 months commitment at CERN.
- DPG
 - CMSSW Integration: Release coordinator needed
 - Integration of new features, validation. Better if at CERN – not essential.
 - Prompt Feedback & Calibration: Need for ~4 additional people.
 - We are too light for the 2011 startup. Need not be at CERN.
- Notes:
 - **Had to reduce scope due to lack of resources**
 - New tasks had to be managed: E.g. Noise working group
 - Too many offers of shifts at a time when shifter need is falling
 - **Lack of system experts is a serious risk for operations.**
 - **Insufficient manpower to investigate operational problems**
 - Work on the “2016” upgrade is seriously limited by manpower



CSC Critical Needs

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- Detector operations
 - At minimum but ~okay in 2011
 - Shifts reduced to 1 DQM/day. Continue to automate procedures.
 - There are people who are absolutely critical and we need to find a way to lighten their load and criticality.
- Notes
 - DPG: Shorthanded by several people, losing more during 2011.
 - Basic work is being done by heroic and volunteer effort
 - We need to recruit from institutions already involved in CSCs.
 - 2011: for continued running we will shift from Operations towards DPG (around 5 FTE-years = 60 FTE-months).
 - Shift service requirements will be reduced.
 - May present a hardship on some institutions towards meeting their requirements in more "skilled" ways.



DT Critical Needs

- No outstanding problems but not far from critical.
 - Institutes carry responsibilities but community is small (~100) and has lost some coherence with arrival of data.
- Notes
 - Switch to unattended operation brought shift needs within reach of the community.
 - Run with (2 on-call shifters + 1 field manager+ 1 off-line shifter)/week
 - 2011-12 Plans
 - DT needs 28 FTE to cover Operation, DPG and shifts.
 - DPG work is becoming less and less attractive.
 - We have to review the DPG scope and make it better motivated.
 - Longer term, many tasks in detector operation are at risk
 - Many potential problems looming long term if we do not find new people to train before losing expertise



Muon Unification

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- Many problems common to DT, CSC and RPC.
 - One idea was to create a Muon DPG where people are not limited to only their detector but can span across the entire muon system.
 - May facilitate coordination between DPG and POG
 - Existence of 3 DPGs vs 1 POG created a barrier.



L1 Critical Needs: Uncovered tasks

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- **1) L1 trigger rate studies (0.5 FTE)**
 - rate studies vs bunch structure, luminosity using 2010 nanoDST's and tools
 - preparation of 2011 L1 menu for $2E32$ to $5E33$ luminosity
- **2) L1 trigger DQM (0.5 FTE)**
 - L1 occupancies, trigger efficiencies and quality tests
- **3) L1 trigger run certification tools (0.5 FTE)**
 - BPTX efficiency (plots & QTs).
 - Synchronisation and Rate DQM (plots & QTs).
 - Automated LS certification
- **4) L1 tau trigger studies (0.5 FTE)**
 - optimization of the L1 tau trigger algorithm parameters for the 2011 run
- **5) TTC software (1 FTE) – May be covered already**
 - upgrade of TTC software
- **6) Interconnection Test for the 904 and P5 (1 FTE)**
 - Develop and maintain a complete set of interconnection tests to assure the quality of the 904 and P5 work products (1 FTE)



DAQ Critical Needs

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- DAQ needs:
 - on-call personnel (~4 persons)
 - NB: on-call is very demanding on availability, there is concern to cover this in the medium term
 - B904 integration & operation (1 person ~50%)
 - Confdb developer (1 person full time)

- Central DCS (detector control system) and system administration are ~OK



Summary

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- With the transition to data-taking there has been a significant shift in priorities, as expected.
- We `re ~ok for 2011 but there are risks in all areas associated with losses of critical expertise
- Longer term, concerns are accentuated and solutions will need to be found.



ADDITIONAL INFORMATION

ECAL Operations in 2011

- Central CMS shifters
 - Monitoring
 - DQM
 - Trigger rates
 - DCS
 - Call ECAL DG if necessary

(*) Centrally or locally accounted, depending on Anders' proposal acceptance

ECAL Detector Guru (ex RFM) (*)

- On-call in quanta of 1 week
- 1st person called for problems at P5
 - Will then contact appropriate experts as necessary
- Attend weekly and daily Run meetings
- Schedule & monitor interventions

ECAL Online Expert on Call #1

- On-call in quanta of 1 week
- Mandatory to become ECAL DG
- Backup to ECAL DG, particularly during critical times (start of year etc.)
- Detailed DQM monitoring when necessary
- May also act as backup to ECAL Online EoC#2 when necessary

ECAL Online Expert on Call #2

- On-call in quanta of 1 week
 - Attend daily PVT meeting
 - Run standard/special PFG analyses upon request by experts
 - Perform weekly certification of runs

Upgrade Needs 2011

- ▶ **There is crucial Upgrade work to be done in 2011 –**
 - ▶ both R&D and construction which needs to be completed before the first long shutdown (whether it is in 2012 or 2013)
 - ▶ Substantial R&D work needed to prepare for the major suite of upgrades planned for the 2016 shutdown
 - ▶ We need to do this work to prepare cases to secure funding and prepare TDRs
- ▶ **Upgrade resources are *owned* by the sub-detectors they live in**
 - ▶ Any resource contention between operation of the sub-detector and work on upgrades is handled by the sub-detector project manager
- ▶ **Some upgrade resources will need to be credited**
 - ▶ Subsystems should be able to decide which upgrade counts as service
 - ▶ This must compete with operations, so will be limited, but is expected to grow with respect to last year's allocations
- ▶ **There are some specific areas where we wish to reinforce the request,**
 - ▶ particularly in the simulation where it is vital to have sufficient effort to prepare/debug code to be able to adequately simulate the upgraded detector, and the physics observables performance with the proposed upgrades
 - ▶ Upgrade Physics studies could be a special case (normally physics excluded).