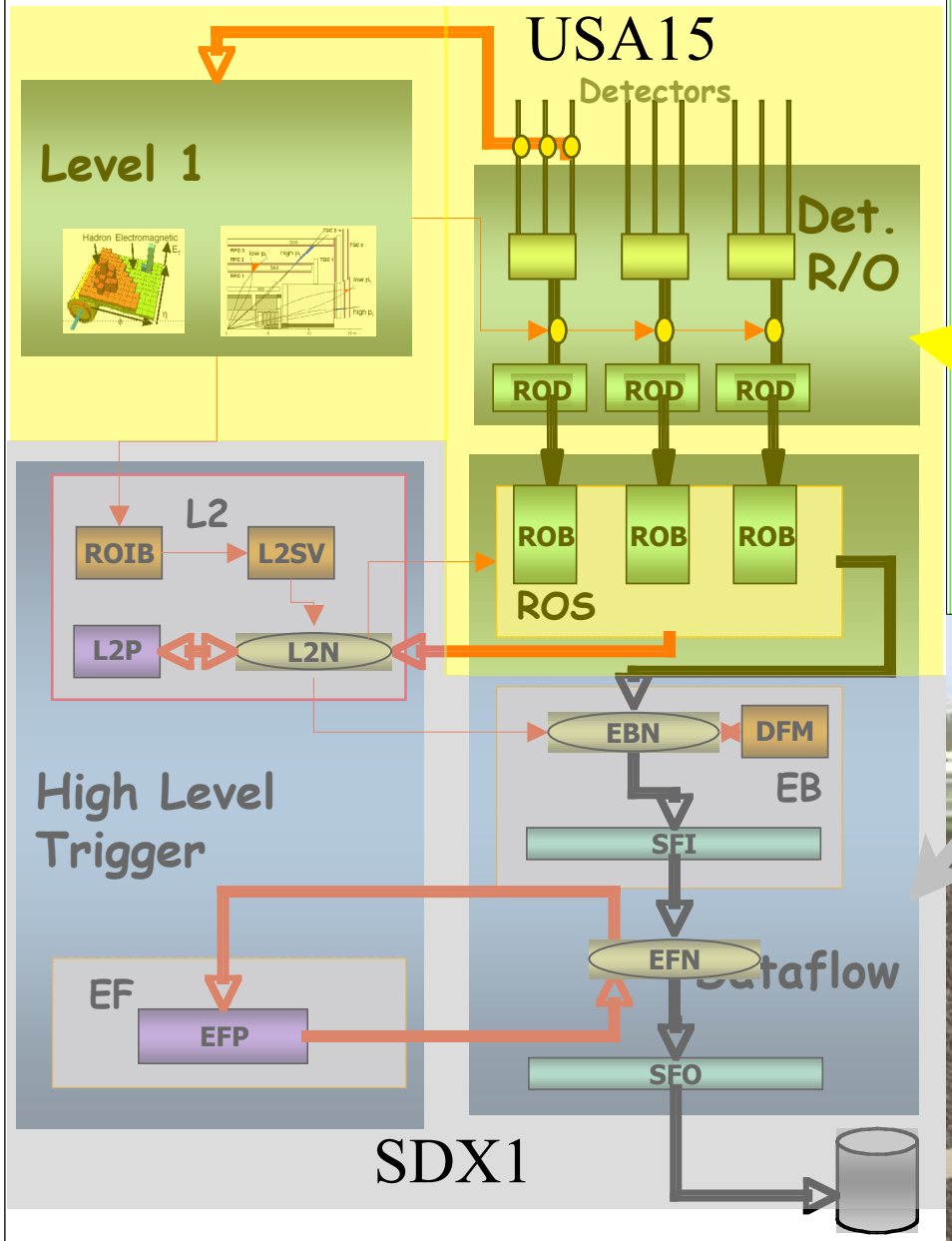
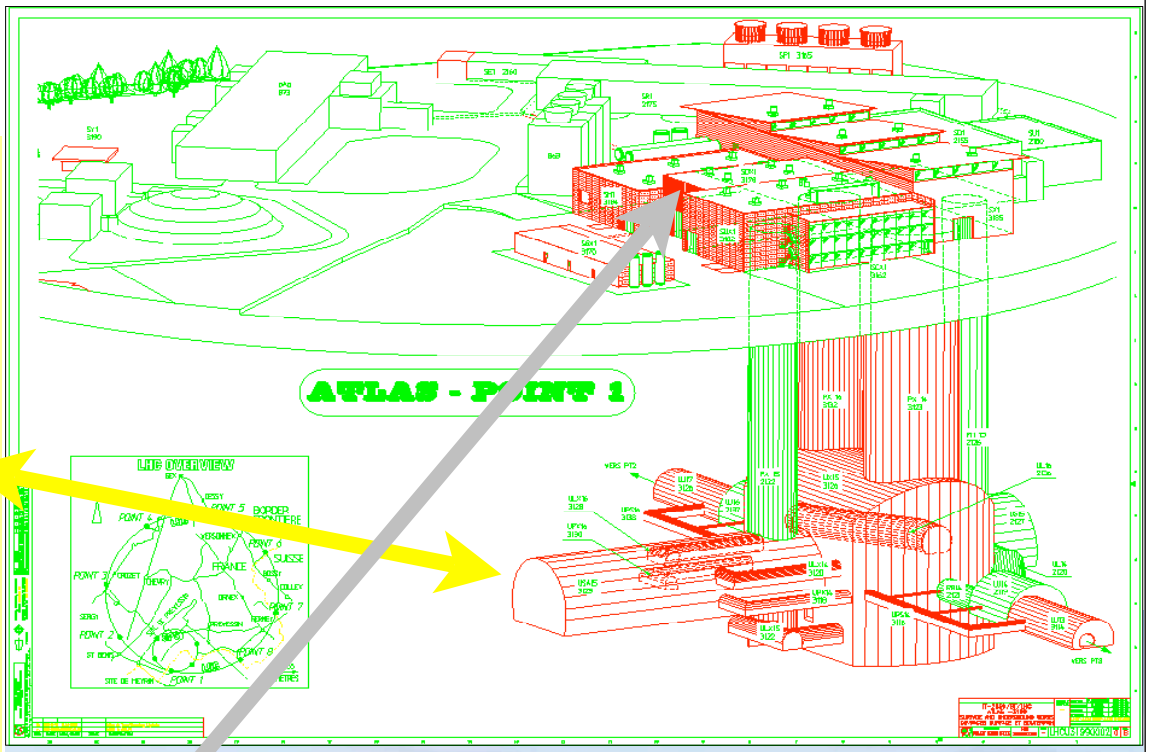
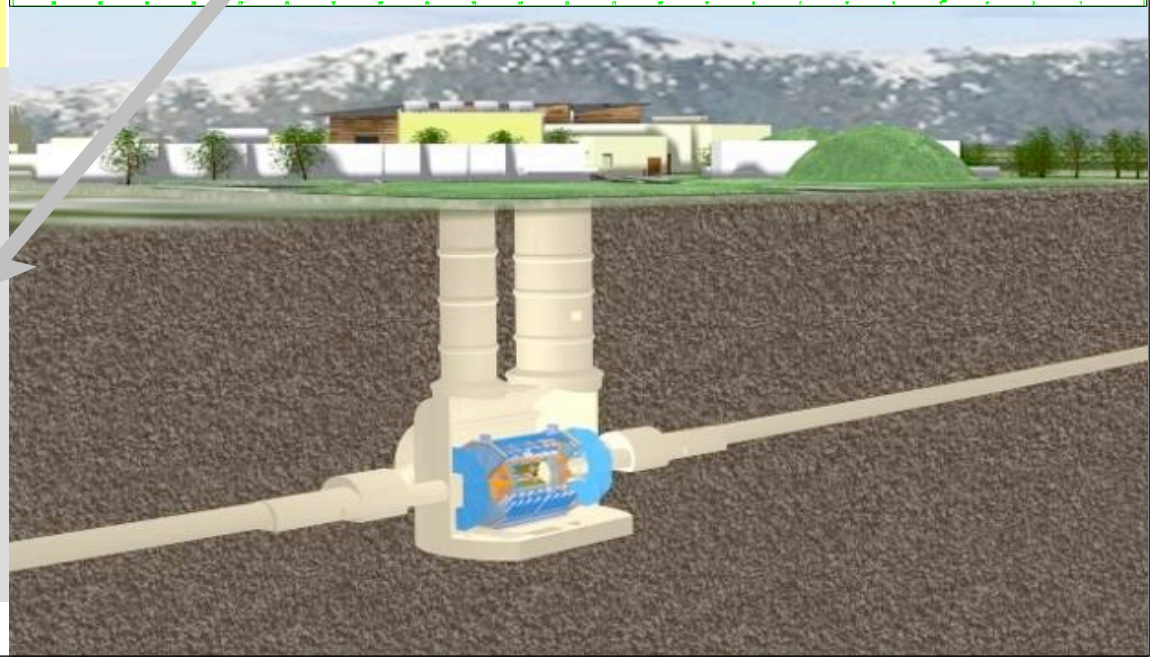
ATLAS DAQ: Deployment

- Two locations:
  - Underground (USA15)
    - 20 52U (ATLAS) racks with horizontal cooling
      - First level of DAQ
      - Detector readout (so called ROSs)
        - Each ROS equipped with up to 4 ROBINs (custom PCI card)
          Each ROBIN receives & buffers data on 3 ReadOut Links
          In total ~1600 ReadOut Links (~1kbyte @ up 75 kHz)
  - Surface (SDX1)
    - 94 Rittal server racks with horizontal cooling (52 and 47 U)
      - 15 racks of DAQ equipment
      - 51 Event Filter racks
      - 17 Level 2 racks
      - 11 Event Filter/Level 2 racks
      - 7 ‘other’ racks (Detector Controls, Patch panels, network back bone)

Deployment


USA15
Detectors
Level 1
Det.
R/O
ROD
ROD
ROD
L2
ROIB
L2SV
L2P
L2N
ROB
ROB
ROB
ROS
EBN
DFM
EB
SFI
High Level
Trigger
EFN
Dataflow
EF
EFP
SFO
SDX1


ATLAS - POINT 1
LHC OVERVIEW



ATLAS TDAQ: Schedule

- Detector commissioning schedule
  - July 06.
    - Combined calorimeters cosmic-ray run.
    - During Barrel Toroid test, combined barrel calorimeters & part of muon detector data taking
    - EndCap calo C starts commissioning
    - Inner Detector services installed, connection of barrel (SCT + TRT) starts + 16 weeks
  - September 06.: Read-Out for Inner Detector (SCT+TRT)
  - October 06.: Overall integration starts
  - Early 2007.: Continue overall integration
  - July 07.: Full cosmic-ray run
  - August 07.: Global commissioning

Support concurrent use of DAQ by several subdetectors

ATLAS TDAQ: Deployment in '06

- Complete ReadOut
  - 152 PCs
  - 610 ROBINS
- Networking
  - Some switches & all cables for Data, Control and switch management
- 30% event building capacity
  - 48 PCs (32 Event building nodes)
- All Control configuration & monitoring infrastructure
  - File servers, PCs for operations (e.g. GUIs)
  - 30 PCs for monitoring of TDAQ system
- 3 Event Filter racks
  - 100 PCs
- Spend profile foresees ~50% of complete system by 4Q07

ATLAS TDAQ: Current activities

- 50 ReadOut systems already installed and commissioned
  - Commissioning with detector input ongoing
  - Installation & commissioning of next 100 machines starting ‘now’
  - Model of electrical distribution within racks in SDX to be tested
- Networking
  - Initial orders placed
  - Population of cable database & labels
  - All cables & fibers labeled & installed by TDAQ
- Switch purchasing
  - Starting now, using IT frame contract, i.e. HP and Force10
- Event building system
  - Price enquiry completed ... evaluation in progress
  - First orders to be placed in ~10 dys
- Specifications
  - Finalise for Fileservers, montoring PCs & operations PCs

ATLAS TDAQ: current activities

- Level 2 & Event Filter nodes
  - Use latest IT Market survey
  - Final technical specification in preparation
  - Purchase as late as possible
    - ~4Q06: 3 Racks (100 nodes)
    - 2007:+33 racks (~1000 nodes)
  - Further purchasing deferred

ATLAS TDAQ: other activities

- Pre-series exploitation
  - Pre-series fully functional vertical slice of the TDAQ (since 2Q05)
  - Performance as function of different system parameters
  - Performance as a function of different software releases
  - Operational studies: Stability and Robustness of all software components
    - What happens if a software component ‘dies’?
    - 24 hr operation with user interaction
  - Cold start studies
- Large scale testing on Lxshare cluster
  - Testing of the software functionality on a large scale
  - Study optimal control structure
    - 2005: 100 - 700 nodes
    - 2006: 100 - 1000 nodes
- No test beam

Pre-series status: Exploitation

- Network management, monitoring & diagnosis
  - Network 'completely' isolated from CERN
  - Spectrum for management
  - In house tool for monitoring
  - Tools being put in place to go from 'IT world' to 'ATLAS world'
    - different naming conventions
    - Different databases: LANDB, MTF, ATLAS Installation databases
      - Consistency checks
  - Use of visio to generate netlists and input to ATLAS cable database
- Sys. admins.
  - Support group in place
    - Help desk at point 1; Web page; FAQ etc
  - Individual user accounts
    - Each account associated to allowed roles: *observer* ... *shift* ... *Expert*
- ATLAS specific desk top
  - At login only see functionality allowed by Role assumed by user

ATLAS TDAQ: some pending topics

- Monitoring and management of farms IPMI
  - Need a layer of software on top of Open IPMI
- Racks equipped with horizontal cooling
  - No fire detection in racks
  - Service contract needs to be put in place, for preventative maintenance
    - Joint contract probably more advantageous
- Central data recording
  - No ‘in anger’ testing performed of Central Data Recording
    - To date assumed ‘if ALICE happy, we are happy’
  - Information exchange would be useful for future tests