

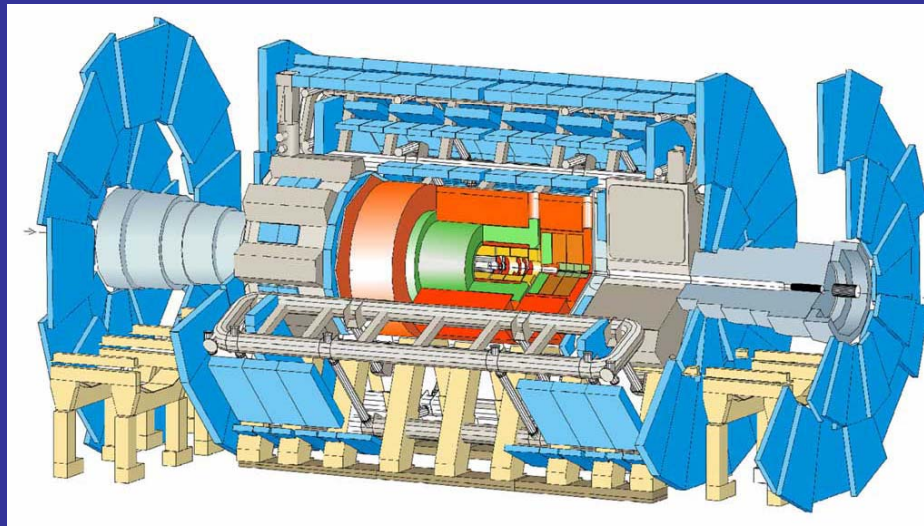
Control of the ATLAS experiment



EST fellow: **Olivier Gutzwiller**
Supervisor at CERN: **Helfried Burckhart**



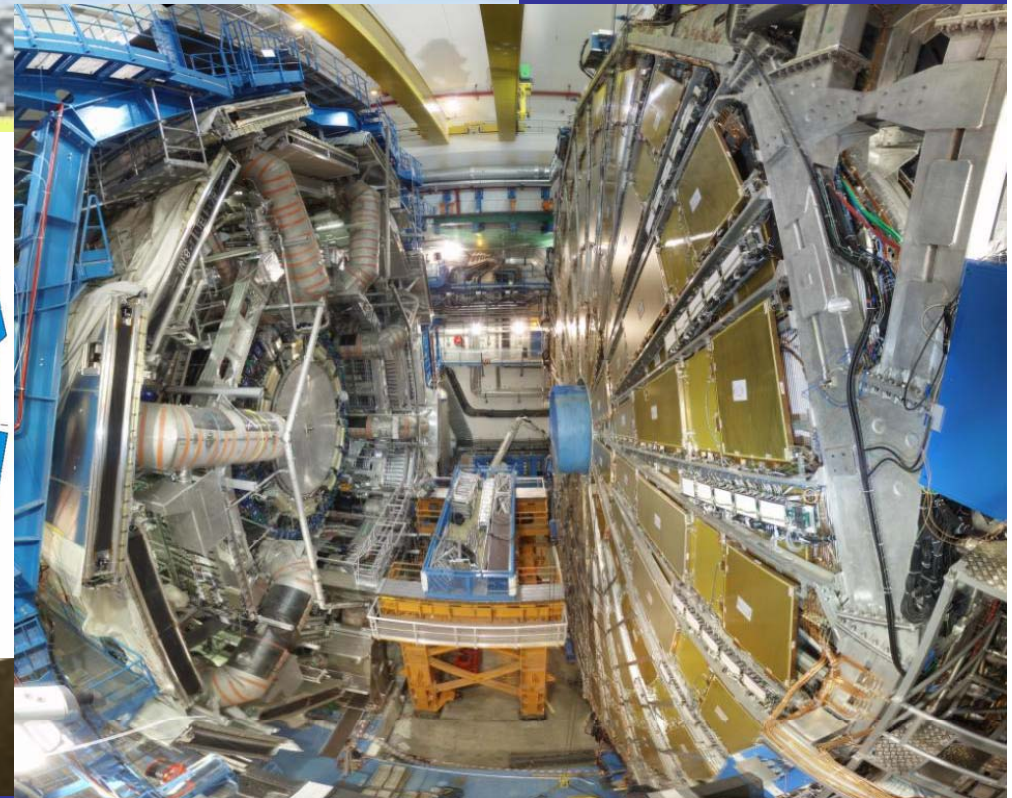
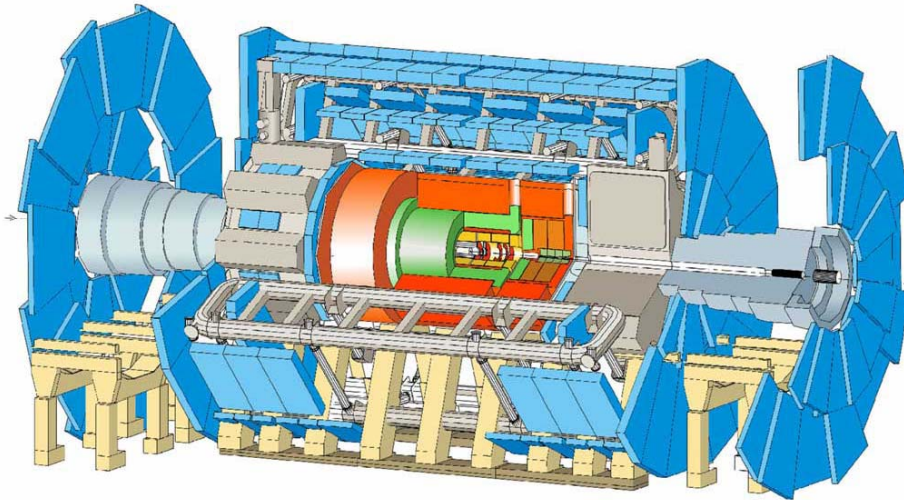
ELACCO project - Controls of LHC experiments
Fellowship started in January 2007



ATLAS experiment

One of the experiments of the LHC

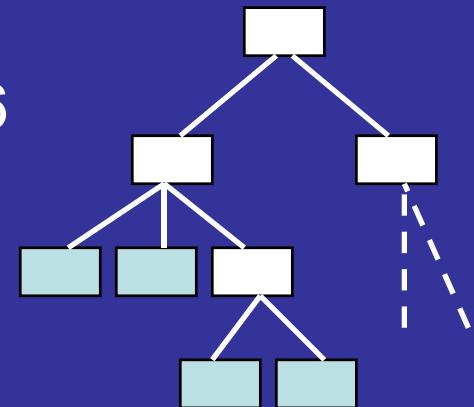
- Study of particle collisions at 14 TeV
 - Calorimeters
 - Muon system



ATLAS DCS

- Equipment supervision
- Safe operation of the detector
- Distributed system – 100 PCs
- Based on the industrial software PVSSII 3.6
- Tree hierarchically organized
- DCS in the Control Room:
 - FSM mechanism
 - Alarm handling
- Main Information displayed on the web:

<http://pcatdwww.cern.ch/atlas-point1/dcs/>



LHC	ID	CALO	MUON	SERVICE
LHC UNKNOWN E	PIX ???	LAR W	MDT F	CIC E
No Beam	SCT	TIL W	RPC W	EXT W
Energy 2.0 GeV	TRT OK		TGC E	TDQ D
Detector Standby N	IDE W		CSC OK	FWD OK
Handshake			SAF OK	

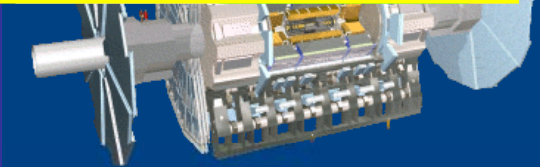
S Object

CIC: CSC	
CIC: CSC	
E: CIC: SAFETYSYSTEM	2008.11.08 08:46:??
GCS: MAGNETS	2008.11.10 14:28:??
TDQ: CP3 OVERVIEW	2008.11.04 16:32:??



ID Calo Muon Services

State	Status
ATLAS	READY ERROR
???	???
SCT	READY OK
TRT	NOT_READY OK
IDE	READY WARNING
LAR	READY WARNING
TIL	NOT_READY WARNING
MDT	UNKNOWN FATAL
RPC	UNKNOWN WARNING
TGC	NOT_READY ERROR
CSC	NOT_READY OK
CIC	READY ERROR
EXT	NOT_READY WARNING
TDQ	DEAD DEAD
LHC	UNKNOWN ERROR
FWD	READY OK
SAFETY	READY OK

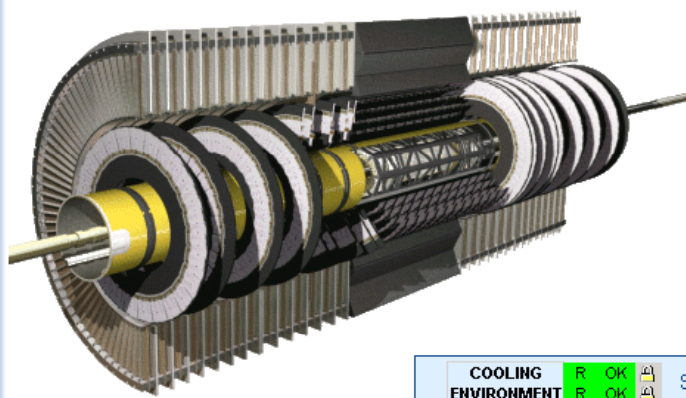
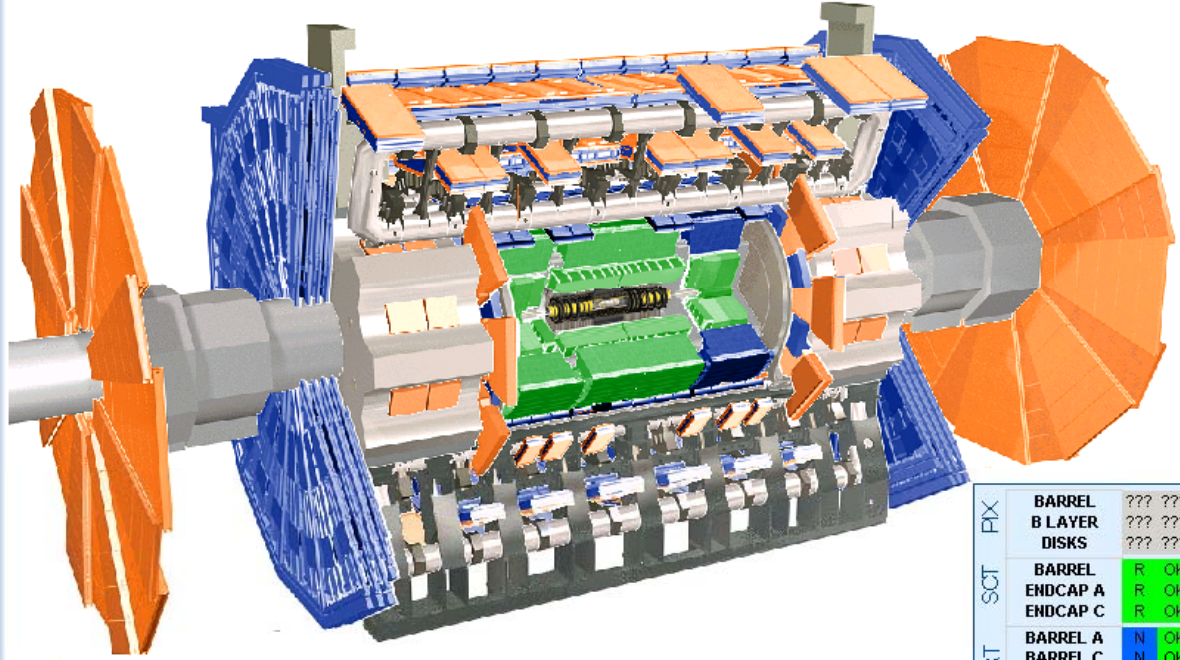


3D View All connected

ATLAS

ATLAS DCS
???

ATLAS DETECTOR CONTROL



Inner Detector	Calorimeter	Muon Spectrometer
BARREL	EMBA	BARREL A
B LAYER	EMBC	BARREL C
DISKS	EMECA	ENDCAP A
	EMECC	ENDCAP C
	HEC FCAL A	
	HEC FCAL C	
	LBA	
	LBC	
	EBA	
	EBC	
		BARREL A
		BARREL C
		ENDCAP A
		ENDCAP C
		RPC SIDE A
		RPC SIDE C
		TGC SIDE A
		TGC SIDE C
		CSC SIDE C

COOLING	SAF	DSS	SERVICE
ENVIRONMENT		SNIFFERS	
RACKS USAL1		MAGNETS	
RACKS USAL2		Toroids	
RACKS USL2		Solenoid	
RACKS SDX1		TRIGGER L1	
RACKS UX			

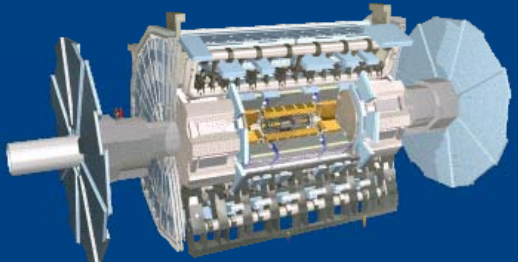
USA15 L2 READY OK ✓

GOTO_ON

ACKNOWLEDGE

LHC	ID	CALO	MUON	SERVICE
LHC UNKNOWN E	PIX ???	LAR E	MDT F	CIC OK
No Beam	SCT W	TIL W	RPC W	EXT W
Energy 2.0 GeV	TRT W		TGC E	TDQ D
Detector Standby N	IDE W		CSC OK	FWD OK
Handshake			SAF OK	OK

S	Object	Time	365
	CIC: CSC		W
W	GCS: MAGNETS	2008.11.11 13:25:25	E
W	TDQ: CP3 OVERVIEW	2008.11.04 16:32:08	F
E	MDT: MDT BA	2008.11.11 14:40:53	D
W	IDE: Q4: LOOP_166	2008.11.11 14:41:19	
W	SCT: TEMP MCOOL	2008.11.11 14:41:22	



3D View All connected

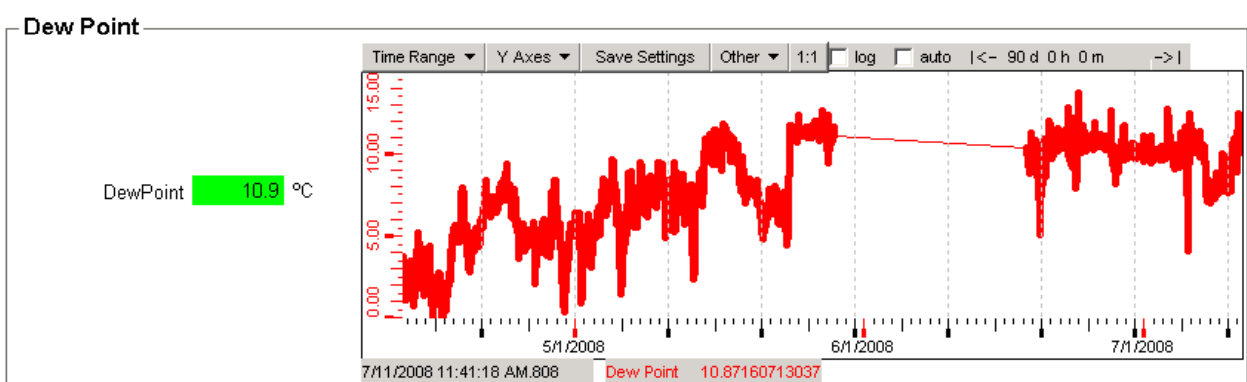
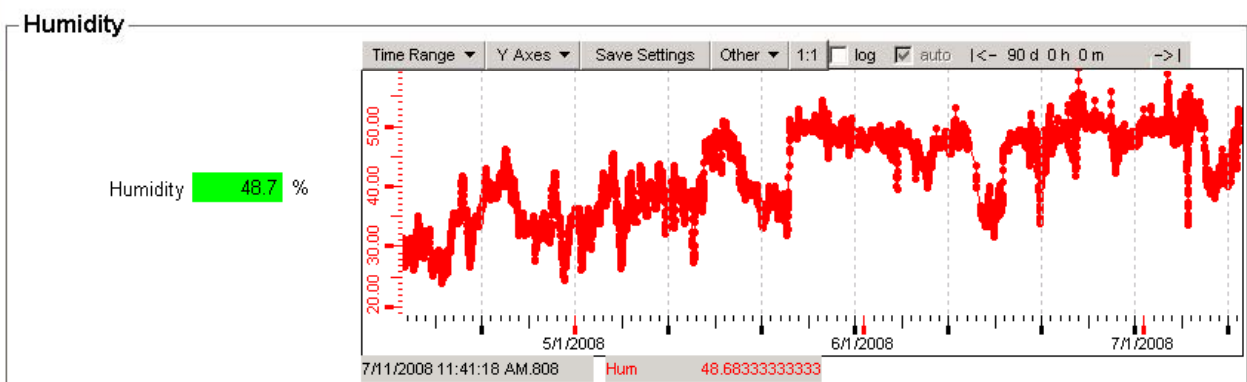
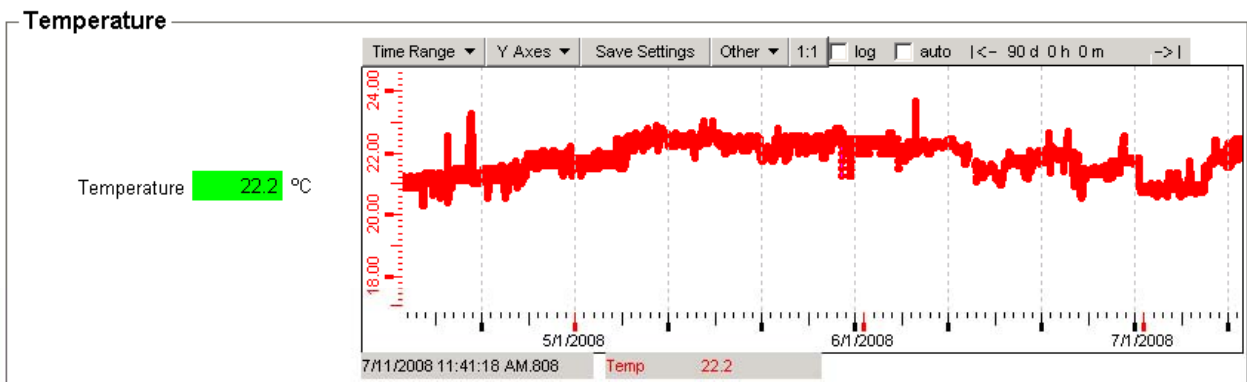
ATLAS

ATLAS DCS

???

?

ENVIRONMENT USA15L2



PIX	???	???	LAR	NOT_READY	E	MDT	???	???
SCT	???	???	TIL	???	???	RPC	???	???
TRT	???	???				TGC	???	???
IDE	READY	W				CSC	???	???
TDO	???	???	CIC	READY	OK	EXT	NOT_READY	W

S	Object	Time
0		

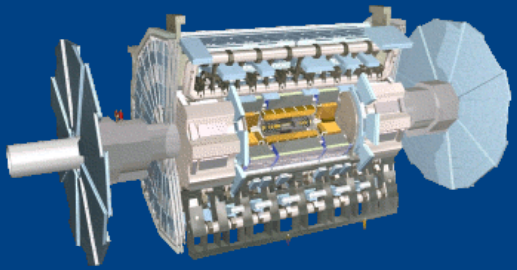
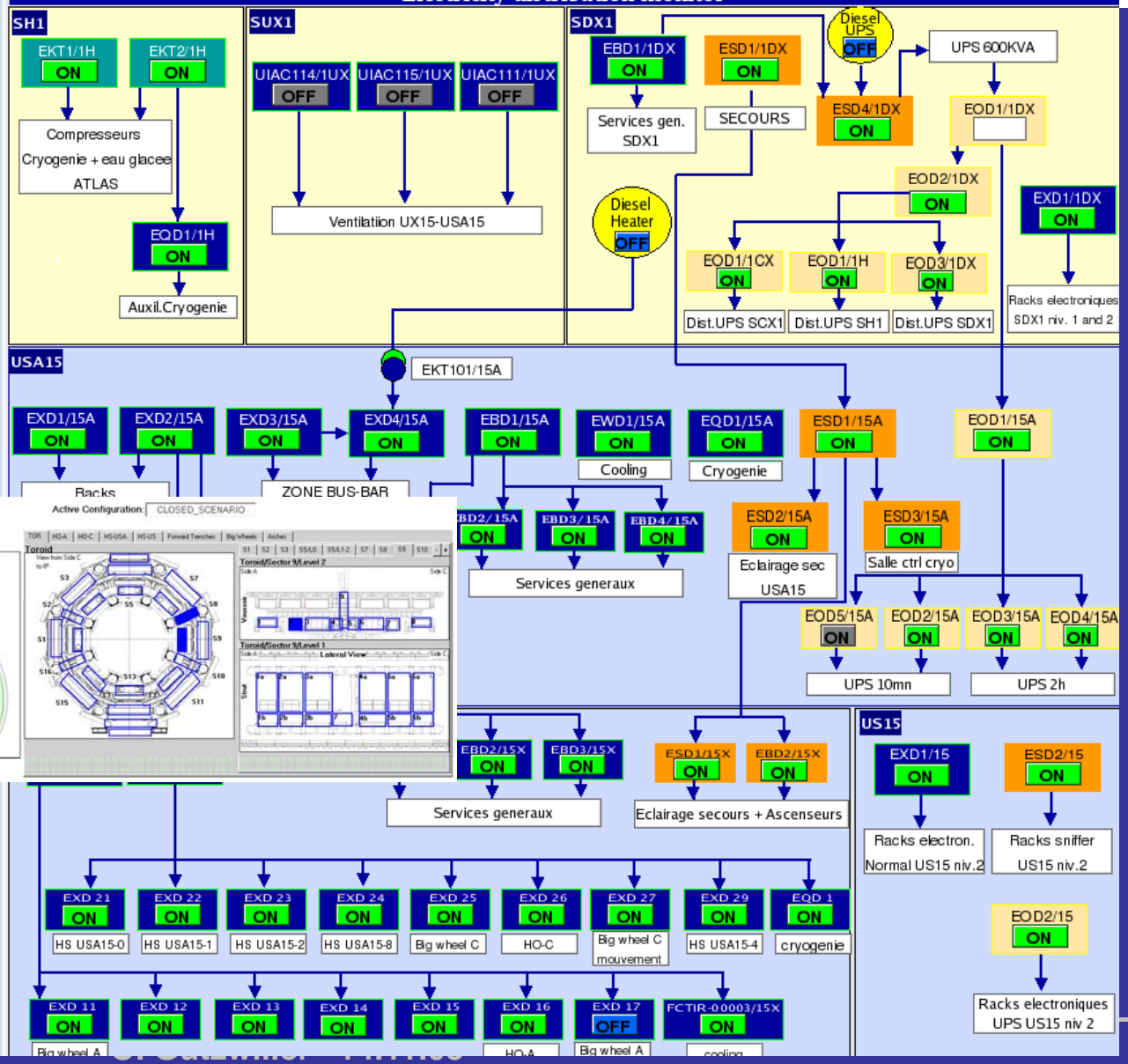
0
WARNING
ERROR
FATAL
 DEAD
 Restart



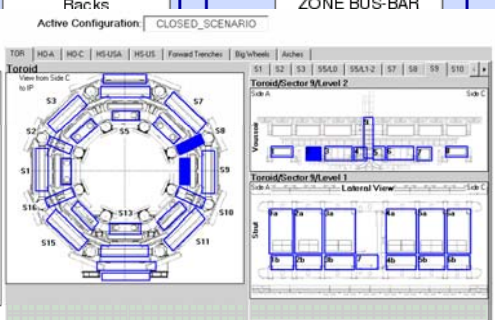
ATLAS
 EXT
ELECTRICITY

Switchboards READY OK ✓

Electricity distribution monitor



3D View



No panel available!
 Add panel within panels/fwAtlas for: ATL_EXT

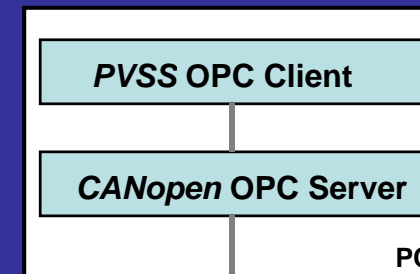
ATL_EXT \$node
 ATL_EXT \$obj

My Contributions

➤ Supervision of the services

➤ ELMB support

- Embedded Local Monitor Board
- General-purpose board developed by NIKHEF for the experiments
- 5000 ELMBs at ATLAS





My Contributions

- **Supervision of the services**

- **ELMB support**

- **Software development and support**
 - PVSS 3.6 II

 - Generic frameworks (CAN PSUs, GAS components)
 - Customized applications

 - Coordination of the DCS
 - Writing guidelines
 - Help to the users/developers
 - Shifts in the control room



My Personal Development

➤ Professional and Social skills developed at CERN

➤ Papers

- The Detector Control System of the ATLAS experiment
- The Common Infrastructure Control of the ATLAS experiment

➤ Books (Physics and Computing) & Training in C++ at CERN

➤ Workshops/Conferences

- ESOF2008, Barcelona, Spain
- CSC08, Gjøvik, Norway
- TWEPP08, Naxos, Greece
- GO-Automation07 / Inelec Expo07, Basel, Switzerland

➤ Thank you !



