

SLHC – PP (WP3)

Co-ordination of the experimental upgrades – ATLAS

- The main significance of the work-package
 - Outlines a timescale for the equivalents of Lol, Technical Proposal, TDRs and Initial MoU for the ATLAS upgrade (becoming real projects)
 - Change the perspective of having a LHC detector lifetime of 10 years, to a long term project running well beyond 202(n) and having to deal with a substantial higher luminosity than foreseen
 - Brings some extra resources into the coordination of this work
- Be aware that extending the lifetime of the experiments alone will require substantial upgrades – Inner Detectors in particular

SLHC-PP Work Packages

Work Package No	Work Package Title	Type of Activity	Leading beneficiary No	Person-months	Start month	End month
WP1	SLHC-PP project management	MGT	1	42	M1	M36
WP2	Coordination for the SLHC accelerator implementation	COORD	1	48	M1	M36
WP3	Coordination for the S-ATLAS experiment implementation	COORD	1	102	M1	M36
WP4	Coordination for the CMS2 experiment implementation	COORD	1	90	M1	M36
WP5	Radiation protection and safety issues for accelerator and experiments	SUPP	1	116	M1	M36
WP6	Development of Nb-Ti quadrupole magnet prototype	RTD	1	187	M1	M36
WP7	Development of critical components for the injectors	RTD	1	181	M1	M36
WP8	Tracking detector power distribution	RTD	14	183	M1	M36
TOTAL				949		

What are the key timescales/issues?

▶ Phase 1

- ▶ How well do detector components handle the increasing luminosity?
 - ▶ Both instantaneous and integrated effects
- ▶ What detector elements will need replacement/modification to cope - if any ?
 - ▶ In ATLAS we plan new pixel B-layer around smaller beam-pipe, all inside the envelope of the current PIXEL system, we are evaluating what other measures are needed for other parts of ATLAS

▶ Phase 2

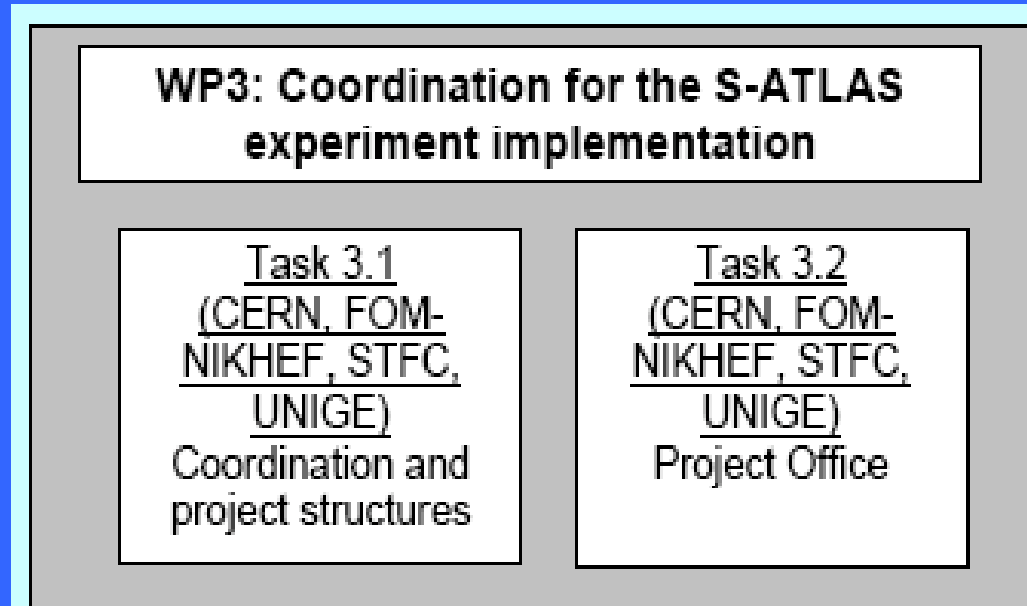
- ▶ What detector elements will need replacement?
 - ▶ ID and forward regions (machine interface, FCAL, muons) main victims, electronics and trigger in general
- ▶ Is there a requirement for a long shutdown? Yes
 - ▶ How long – 18 Months? (1 Full calendar year without beam +)
 - ▶ When – sometime after the middle of the next decade
 - ▶ Building new tracking detectors will take many years
 - ▶ ATLAS/CMS/machine must agree the date

Main interfaces

- Important to have a new working schedule (common for machine, ATLAS, CMS), as mention by Lyn this morning
 - We need understand the machine/experiment interface – relevant for detector changes, radiation/activation levels and performance
 - We need some early estimates of LHC radiation conditions
- We should coordinate the approval documents for phase II between machine, ATLAS and CMS – 2011? (Technical Proposals)

Detector work

- Objectives for the detector WPs:
 - Establish the formal structures needed for the ATLAS/CMS upgrade construction project, and through Technical Documentation, Cost and Schedule planning, establish an initial MoU for the Upgrade Construction.
 - Establish a Project Office to address the critical technical integration and coordination issues of the new detectors, and the technical and managerial tools needed for the project planning and follow up.
 - In addition will WP5 contain an experimental component (40%) and WP8 address a real R&D concern for SLHC detectors (powering)



SLHC-PP Milestones/Deliverables

SLHC Preparatory Phase WORK PACKAGE DESCRIPTIONS (with Deliverables and Milestones)		1st YEAR				2nd YEAR				3rd YEAR			
		Q1 3	Q2 6	Q3 9	Q4 12	Q5 15	Q6 18	Q7 21	Q8 24	Q9 27	Q10 30	Q11 33	Q12 36
WP1. SLHC-PP project management													
Task 1.1	Steering of the consortium and follow-up of the project	M			M	D		M	D				M
Task 1.2	Dissemination of information	D											
WP2. Coordination for the SHLC accelerator implementation													
Task 2.1	Project Management preparation						M	M		D		D	
Task 2.2	Networking and communication				D								
WP3. Coordination for the S-ATLAS experiment implementation													
Task 3.1	Coordination and project structures		D					M					D
Task 3.2	Project Office			M				D			D		D
WP4. Coordination for the CMS2 experiment implementation													
Task 4.1	Coordination and organisation of CMS2				D		M						D
Task 4.2	CMS2 Technical Coordination Unit				D		D						D
WP5. Radiation protection and safety issues for accelerator and experiments													
Task 5.1	Experiment Radiation & Activation				M				D				
Task 5.2	Accelerator Radiation & Activation				M				D				
Task 5.3	Impact Study												D
WP6. Development of Nb-Ti quadrupole magnet prototype													
Task 6.1	Design of advanced Nb-Ti superconducting quadrupole			M	D		M	M					D
Task 6.2	Construction and testing of short models			M			D	M	D		M		
Task 6.3	Construction and testing of a full-scale prototype									D	M		D
WP7. Development of critical components for the injectors													
Task 7.1	Development towards an H- source for the SPL				D	M	D					D	D
Task 7.2	Field stabilisation in pulsed superconducting low beta (v/c) accelerating structures				D		D					D	D
WP8. Tracking detector power distribution													
Task 8.1	DC-DC conversion				D						D		D
Task 8.2	Serial powering				D			D					D

Tasks 3.1-2 Overall organization

Deliverables task 3.1	Description	Nature	Delivery date
3.1.1	Project management structure and review office for R&D phase in place	O, R	M06
3.1.2	Establish the initial Memorandum of Understanding for the upgrade	R	M36
3.1.3	Develop detailed cost books for the upgrade including the installation phase	R	M36
Deliverables task 3.2	Description	Nature	Delivery date
3.2.1	Document the technical scope of the upgrade including an initial cost-estimate	R	M24
3.2.2	Schedule for the upgraded detector parts and for the S-ATLAS installation	R	M32
3.2.3	Technical documentation, drawing and CAD information for the existing experiment and the upgraded elements	R	M36
Milestones	Description	Nature	Expected date
3.1	Schedule for the R&D phase	R	M09
3.2	Upgrade project structures adapted to the implementation phase	O, R	M24



ATLAS Upgrade Project Office Organization and Operation.

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ATLAS Upgrade Project Office Organization and Operation.

Summary

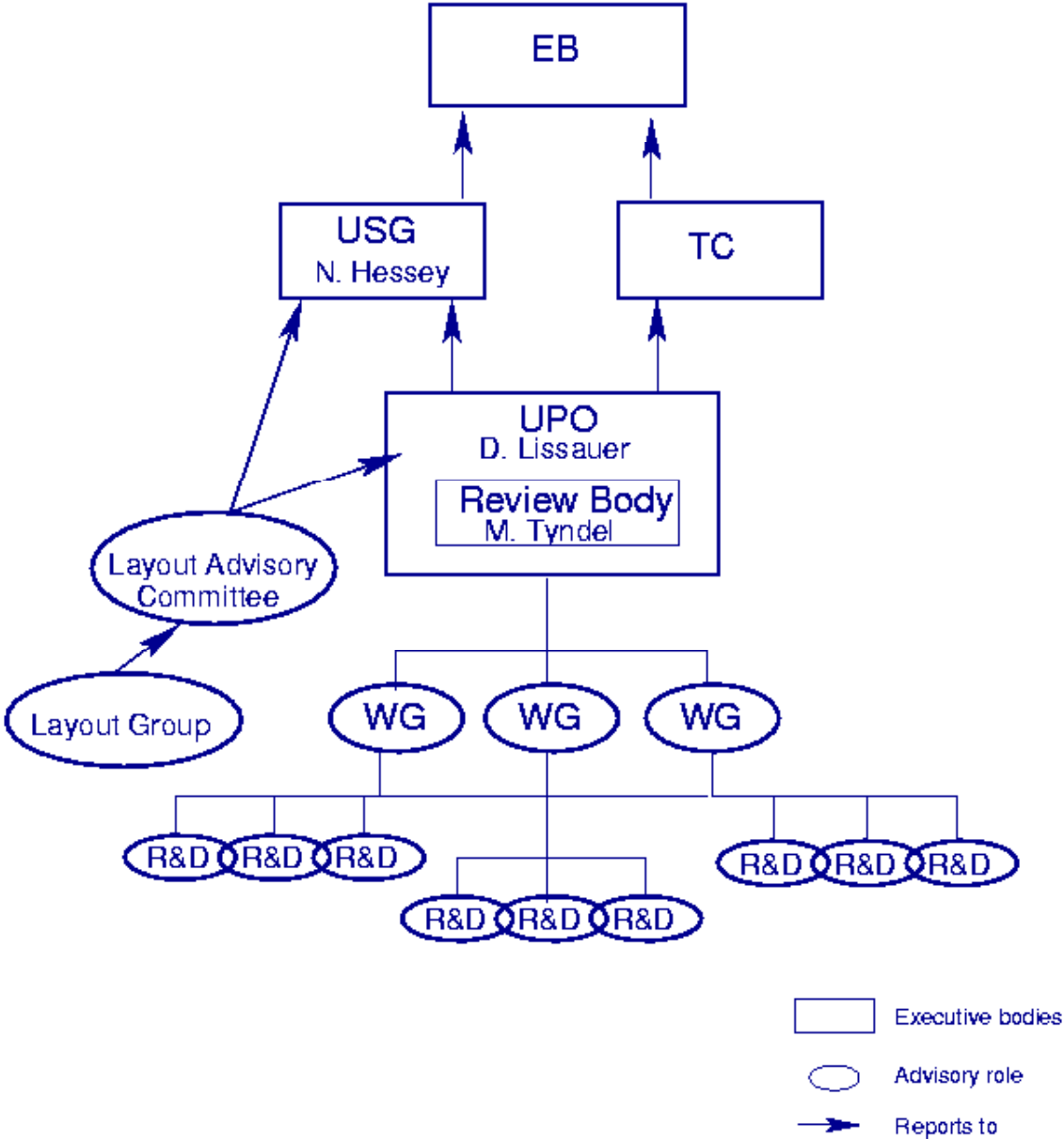
This is a proposal for the organization of the ATLAS Upgrade Project Office. The document also contains a brief overview of the composition of the ATLAS Upgrade Steering Group and the relationship between the Upgrade Steering Group and the Project Office. The aim is to build an effective organization that will be capable from the start to coordinate and integrate the R&D and design efforts of the ATLAS upgrade project. At a later stage the Project Office will follow and coordinate the construction and installation of the upgrade. This document will focus mostly on the operational mode at the R&D and design stages.

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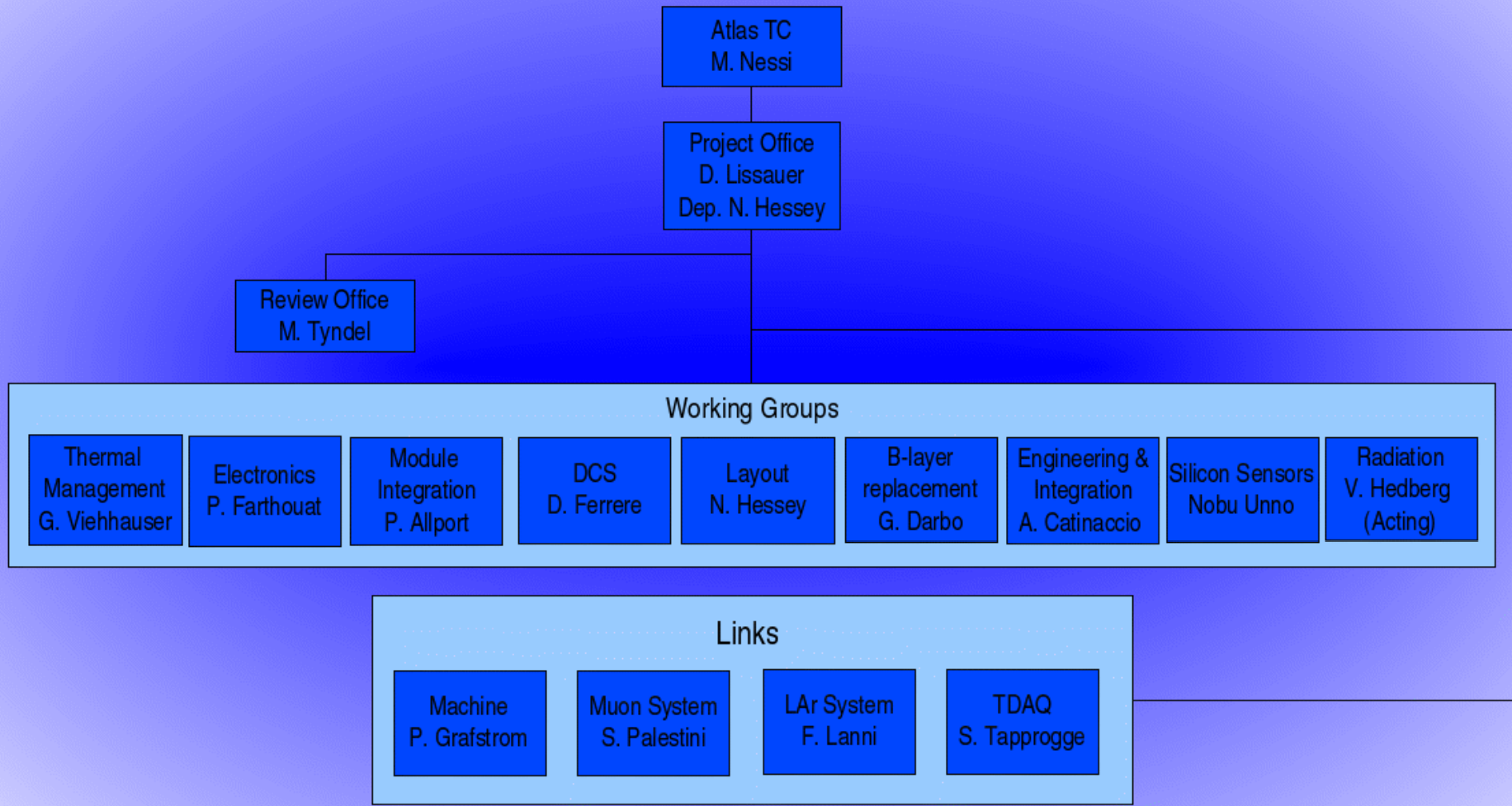
Checked by:
Peter Jenni

Approved by:

ATLAS Upgrade Organisation



PO Organogram















Milestones next 15 months

- First of all:
 - WP3 fully integrated with much larger efforts in ATLAS
 - Full ATLAS upgrade week this week, around 200-300 people present:
<http://indico.cern.ch/conferenceDisplay.py?confId=45460>

Tuesday 24 February 2009

[top](#)↑

08:30-→11:15 Plenary: Overall goals of this AUW (Convener:
Steinar Stapnes (*Fysisk Institutt, Oslo*)) ([Main Auditorium](#))

- | | | |
|-------|--|--|
| 08:30 | Main challenges for the ATLAS upgrade project the coming year (20') (Slides :  ) | Marzio Nessi
(CERN) |
| 08:55 | Towards a TDR for the IBL (20') (Slides :  ) | Giovanni Darbo (<i>Universita degli Studi di Genova Dipart. di Fisica</i>) |
| 09:20 | An overview of the upgrade scope for the full upgrade (20') (Original openOffice :  ; Slides : ) | Nigel Hessey
(NIKHEF) |
| 09:45 | Letter of Intent for the full ATLAS upgrade (15') (Slides :  ) | Steinar Stapnes (<i>Fysisk Institutt, Oslo</i>) |
| 10:10 | Layout of the ATLAS Inner Detector, towards a workplan (15') (Original openOffice :  ; Slides : ) | Nigel Hessey
(NIKHEF) |
| 10:30 | TDAQ Upgrade Issues for the upgraded ATLAS detector (15') (Slides :  ) | Norman Gee
(RAL) |

Overall status reviewed tomorrow

09:00->13:00 Upgrade Organisation (Convener: Marzio Nessi (*CERN*)

([Main Auditorium](#))

Description:

Machine plans, feedback on Lol structure, schedule (Phase I and II), wrap-up of key issues, work plan towards October AUW.

09:00	SLHC machine plans (30')	F Zimmermann (<i>CERN</i>)
09:30	ID layout task force first plans (15')	L Rossi (<i>Genova</i>)
09:45	ID layout, simulation, performance issues (25')	C Young (<i>SLAC</i>)
10:10	TDAQ plans and general TDAQ issues (20')	N Gee (<i>RAL</i>)
10:30	ID strip sensors, modules and its integration (sessions issues) (30')	P Allport (<i>U of Liverpool</i>)
11:00	--- coffee break --- (25')	
11:25	Pixel upgrade sessions main issues (25')	C Goessling (<i>U of Dortmund</i>)
11:50	Calorimeters sessions main issues (25')	C Bohm (<i>Stockholm U</i>)
12:15	Muon sessions main issues (25')	T Kawamoto (<i>U of Tokyo</i>)
12:40	Concluding remarks and outlook towards next Upgrade week in October (20')	N Hessey (<i>NIKHEF</i>)

The ATLAS upgrade project

- Our plan:
 - Lol the next year
 - Start working on IMoU (we need scope, schedule, cost to do so) in parallel
 - TP by 2011/12 linked to SLHC machine discussion/approval (which is also linked to LHC performance of course)
- Note that LHCC is expecting a Lol from us within the next year
- Scientific Reach of the Super-LHC, Assessment by the SPC:
 - The Council took note of the information set out in document CERN/SPC/919-CERN/2814 and endorsed the SPC's conclusion that there was a valid case for the proposed upgrade of the LHC to the Super-LHC and that, accordingly, the CERN Management should be encouraged to proceed with the preparation and planning for the SLHC project.
- Interim Memorandum of Understand, basis for negotiations with FAs, together with the Lol
- Physics goals (detailed benchmarks to be defined) same as for LHC
 - Will take several years to understand if we can release some of the requirements we have for ATLAS
 - Assume we need leptons, jets, photons, etmiss, B-tagging including a trigger for these key objects

Summary

- WP3 is fully aligned with the ATLAS upgrade work that currently include most groups in ATLAS
- First deliverable and milestones passed
- Resource use ok so far, all partners very active
- Next milestones are linked to Lol, preparation of IMoU – some critical items (simulations, reconstruction studies, trigger, backgrounds would be nice)
- Strong wish: Let us keep the schedules tuned (machine, ATLAS, CMS) – also for the Technical Proposals (phase II) I think