ATLAS Beam Vacuum Workshop VI section 16 October 2001

PRESENT

Present:		Excused:	
• E. Anderssen	LBL	• D. Lissauer	EP
• F. Butin	EST	• M. Nessi	EP
• W. Cameron	EST		
• M. Gilchriese	LBL		
• M. Olcese	EP		
• G. Tappern	EP		
• R. Veness	LHC		

Prepared by :	*Checked by*	*Approved by*
F. Butin		

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• Personnes présentes et excusées		• T. Nyman	EP	• E. Tsesmelis	EST
• C. Benvenuti	EST	• K. Potter	EST		
• A. Carter	QMW London	• J. Knaster	LHC		
• P. Chiggiato	LHC	• A. Rossi	LHC		
• I. Collins	LHC	• V. Rouzinov	EST		
• O. Gröbner	LHC	• S. Stapnes	EP		
		• P. Strubin	LHC		

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1. Introduction (F. Butin)

It was reminded that this meeting was intended to be the first part of the ATLAS beam pipe workshop, and particularly devoted to the central section VI, located inside the inner detector.

The objectives were to define the goals to reach, and the directions of work, when aiming at the ATLAS beam pipe final design review, planned for the beginning of 2002.

2. Beam pipe supports in inner detector (E. Anderssen)

E. Anderssen presented a recent re-design of the pixel support (PST, standing for Pixel Support Tube), making use of a 7m long tube.
This tube, made of composite materials is proposed to be supported from the SCT. It will support the pixel with its services (17 kg on each side), and in this scheme, would also support the VI section of the beam pipe. This tube in the forward sections, would be made of fibre glass composite, 0.47 mm thick. This corresponds to roughly 0.8 mm of beryllium in terms of interaction length.

The ECR for this tube is planned to be submitted by the end of 2001. The impact of the increase of material budget on the LAr calorimetry and on muons tracking is not well known yet.

The consequences of this change on the beam pipe are important, in particular for what concerns the support techniques: the planes of support are shifted, and their number could be increased to 4 planes of wire supports, plus one rigid support (for stability along the beam axis). This is globally considered as favourable for the beam pipe. The consequences of a larger distance proposed between the last support point and the ion pump in front of the LAr cryostat have to be checked.

There are a number of points that will be investigated in the coming weeks, in particular:

- beam pipe buckling calculations
- definition of the beam pipe position adjustment systems
- identification of failure possibilities
- definition and reservation of survey holes
- position and support of the moderator shielding.

A follow-up discussion has to be planned for the 2nd week of december.

3. Services and installation (G. Tappern)

3.1. Services

G. Tappern showed a few slides from C. Menot, indicating that the requests of space for beam pipe services have been taken into account.

It was indicated that space had been reserved for the VI services in sectors 12C and 13C (see drawings AT722221PL and ATLICS__0029).

The possibility of using the pump system of the LAr cryostat for the insulation vacuum of the beam pipe was tackled. This needs to be re-looked at in detail by the ATLAS technical co-ordination and the LAr engineers, since it may save on the amount of services, in a tight environment.

3.2. Installation

G. Tappern gave a presentation of the installation scenario for T. Nyman, who was not able to participate. The currently considered installation scenario was displayed: the PST, the pixel and the VI beam pipe, would be lowered in the cavern as a single object, 700 kg, 7.2 m long.

It would be installed on a chariot resting on ATLAS rails, rotated, translated and finally installed in place inside the inner detector.

This scenario is only at the feasibility stage yet, and many aspects require a significant amount of engineering:

- check envelopes
- check handling sequences
- design a support chariot for rotation / translation on ATLAS rails
- develop the insertion into the inner detector scenario
- define survey and alignment operations.

It was mentioned that, for pixel delivery schedule reasons, the possibility to close the LHC ring end 2005, using a commissioning VI section (possibly made of stainless steel) was studied. This was considered to be wise by the participants.