ATLAS project	**SR1 Building preparation** **Minutes integration meeting 29/4/02**		
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Minutes SCT integration meeting 29/4/02 at Cern

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Distribution List

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Minutes SCT integration 29/4/02

present: Eric Perrin, Brian Ottewell, Nick Brooks, David Howell, Georg Viehhauser, Heinz Pernegger, Markus Webel, Mike Tyndel, Neil Jackson, Nigel Hessey, Phil Allport

Services

David presented sample and specs for proposed power supply cable for assembly sides. Oxford and Cern SR plan to use identical cable and layout. Cable based on multicore (identical cores) AWG 24 cores. 4 cores used in parallel for power lines.

High voltage tested for several months at 750V, current limited, no leakage found, tested without connector. Connector to be used with left−out pins adjacent to HV lines. Cable rated UL 300V. High voltage specs & tests deemed to be sufficient. Pin layout matches PP1B connector as interface.

All the cables will in the end be used at CERN. During assembly of the barrels a fraction sufficient to read Barrel6 + 96 Modules will be used at Oxford. Cables to read out Barrel5 might be needed in Japan. Also, some of these cables will be needed at the EC assembly sites. We tried to establish a common length compatible with all sites. Requirements are CERN: 15−20m (rather on the higher side), Oxford: 13−30m, Nikhef/Liverpool: >10m. We decided to collect these numbers and make the decision about the cables mid May.

Actions:

David:

− investigate for halogen free version, check for IS−23 specs

− distributed specs for cable and part numbers for connectors to connect to SCTLV and temp. PPB1T (temporary patch panel 1 barrel)

Heinz:

− verify specs for cable with TIS for use at Cern.

− investigate possible current limit (e.g. 2mA) that installation does not need to be qualified as high−voltage installation.

George, David, Heinz, Nigel, Neil

− compile list of total cable length for Oxford, Cern, Japan, EC assembly sides.

− list to be finished by May 13th to start with procurement

− David to detail connector order for procurement.

temporary PP3

We had some discussion on the need for PPB3 during assembly and SR tests.

The idea is to use cheaper version with small board and filter + voltage limiter on. PP3 made in industry. installed with Cu−pipe as shield in situ (Oxford below floor, Cern in cable trays), use 2mm pitch connector (e.g. Molex) with 15u Au contact crimp pin.

Cost per board about 30CHF.

Would be needed for

− safety: No hard voltage limit in case sense lines break in SCTLV. Would require voltage limited for safety.

− noise: filter noise desirable but not strictly required (shorter cables)

Action:

Heinz: to verify with Jan Bohm, if voltage limiting is really not implemented. If implemented and safety given, then remove PP3. If safety not given, go ahead with PP3 procurement and design.

David, Heinz: Contact Ned, Martin for omission of temporary PP3 if not required for safety.
David: if need PP3 prepare production and costing,

Fibres:

Distribution based from ROD to PPB1T continous. Use 132−fibre ribbon. Terminated in MT12 connectors on PPB1T end. Total of 528 ribbons for full barrel.
Assembly to be done in Taiwan. Need to buy rad. soft fibre as rad. hard (11% spare) probably not available in tine for assembly sites..
Connection of readout fibres done to MT12 connectors. Those ribbons contain only readout fibres. FSI fibres have no break. FSI requires distribution rack close to detector. Readout fibre connection located between power PPB1T on service cage.

Heinz, Georg
− define length of fibres for production (number, length)

David:
− with defined length list, contact Tony and Shih−Chang for fibre assembly.

DCS:

temporary patch panel needed to bring out DCS cables and connect them to a power cable which leads to ELMB. Note: need additional panel for sensors on cooling system to lead to cooling control.

There is some confusion about the present layout of DCS cables and patch panels on the barrel,

DCS cable only very few (18?) therefore envisage permanently attached cable to DCS temp patch panel and DC S−cooling patch panel.

Action:

Georg, David:
− Contact Richard Brenner on layout of interface.

David:
− verify with Ned that DCS connection does not interfer with grounding scheme.

Evaporative Cooling interface.

use thin hose spooled in services cage for connection. Use angled exit in Oxford. Before leaving barrel in Oxford, this interconnection will be replaced by one that exists axially. The interface connector will be located at service cage ring at end.

E.g barrel 3 has 4 outlet and 8 inlets per side.
CERN SR plans to use 7−8 long flexible tubing to connect to the barrels/ECs at the SR building. Oxford will need about 3−5m to allow for rotating barrels.

The location, necessity and control of heaters and pre−cooling needs to be looked at. Nobody sofar.

Action:

Brian ?:

− define and circulate specs for connection and location of drawing.

X−ray specs

inner Transport container wall panels to be reinforced with 2mm lead panels when needed for X−ray.

Actions:

George:

− contact George Doucas for specs and distribute specs for X−ray for safety checks.

Heinz:

− contact TIS verify safety requirements at Cern for X−ray tests.

− distribute X−ray specs to EC community that EC enclosures can be studied and proposed.

Nigel, Phil:

− detailed X−ray tests for EC.

Transport/ Test container

Nick presented layout and design of outer and inner transport container. Outer container used just for shipping. Container has pre−loaded suspension wheels and 3mm Al wall. Outer container will be removed before entering clean room. Door space looks fine for entering and leaving Oxford, Ral and Cern sites.

Require outside tent in SR1 to remove outer transport container.

Each barrel will always stay within its container. Inner container will vary in size according to which barrel uses them. Outer container size is only 1 size.

Inner container serves as main test container with barrel on spindle. Barrel stays in inner container until it enters 4−barrel assembly. Panels at services cage position completely removable to allow access to service cage for inspection.

Inner container on pre−loaded suspension wheels . Wheels can cope with few mm level difference between panels in SR1 floor. Rotation system supplied with barrel to Cern.

Inner container will be gas tight. Shipping will be done with inner transport box under slight over pressure with inert gas.

Endplates to the inner container need to be designed to provide gas−tight feed throughs for services (power cables, DCS cables, Cooling sensor cables, Fibres, Cooling pipes (flexible?), gas) during testing. Services support for cables and fibres need to be designed. At the moment there is nobody working on the design for the end−plate.

B3 spindle needs to be removed for X−ray test, with B3 still located and being tested in inner transport container.

Once container is at Cern there is no rotation of barrel in container planned.

Actions:

Heinz:

− verify with Richard Apsimon that tent can be moved to Cern or 2 tents are made for removing outer transport container.

− verify complete door opening in SR1 air lock

Georg

− discuss with Eric, if first version of transport containers can be used to ship empty B3 to UK.

Heinz, Georg,

− find person to design Endplate for tests and check where they can be produced (can it be done e.g. in Freiburg? etc...)

Nick, Brian

− circulate drawings for outer and inner container, in particular to Eric and Geoff Tappern.

− plates on container shall be Cr plated aluminum for screening

− plates need to be electrically interlinked for screening (or conductive seals)

Eric

− verify layout of transport container for mechanical aspects, specs and assembly process (barrel removal, 4−barrel assembly)

− detail procedure for removing barrel from inner container for 4−barrel integration.

− give comments/ list of required changes/ production OK to Nick, Brian, Georg in two weeks.

Services cage:

Brian present layout and design for services cage. Contains 32 positions (B3?) for LMT. Final tapes will spooled inside a 2.5x5 cross section box. and go to PP1B. PP1B is connected through short (50cm) cables (6 signal + 6 power) to PP1BT. Cable carries PP1B connectors (JST 1mm pitch and FCI power connector). Each box accommodate 1.6m long tapes. Fibres will be rolled−up in boxes (12−way ribbons)

PP1BT needs to be able to fold out to allow connection. Services cage serves as main grounding point (star connection) with Cu ring outside. This ring may be used as additional "tooling"/support ring . During work both cages need to be electrically connected.

Services cage has to stay on during 4 barrel assembly. PP1BT and cage design needs to allow services connection/removal when all 4 barrels are in each other.

Plan is to get sign−off from Eric for mechanical integration in 2−3 weeks after engineering meeting in Oxford mid May.

Actions

Georg, Brian,

− reconfirm with Marko and Tony if tape and fibre spooling is ok for tapes (bending radius, bend compensation, stress on thermo−solder joint)

Brian, Eric

− study if services cage grounding ring can be used as additional support/tooling ring (carry weight of cage + services)

Brian, Georg

− distribute design and drawings for services cage in particular to Eric and Geoff Tappern.

Eric:

− verify cage design compatibility for integration and mechanical aspects

− provide comments/required changes/production OK to Georg

Georg

− contact Geoff Tappern: verify design and get sign−off from Geoff Tappern for cage and transport container.

Georg or Heinz

− supply design to EC community (Val O'Shea, Tim Jones, Nigel Hessey, Neil Jackson)

4−barrel integration

Eric presented outline of 4−barrel assembly. Detailed steps and drawings need to be updated and revisited (by Gva). B6 is the first one needed (speeding it up helps if possible).

The 4 barrel assembly has to be done in the assembly area for space reason.

Open question: how to remove B6 from transport container and put it on cradle.

Spindle on barrels only removed at 4−barrel integration; exception is B3, there spindle has to be temporarily removed to allow X−ray.

It was recommended that barrel 6 and 5 should be tested once they are inside each other for interference and before the other barrels are added. This requires moving the B−5+6 assembly to the test area.

During this assembly steps a cross−talk test with TRT should be studied for feasibility.

Clearly test procedures need to be detailed now for acceptance test and tests during and after 4−barrel assembly.

Actions:

Eric (with Geoff Tappern): Clarify if services cages need to be removed before insertion into TRT.

Endcap macro assembly:

Neil presented plan for macro−assembly in Liverpool. This means that EC−A and EC−C follow identical integration scenarios. Problems may arise if both EC arrive simultaneously. Therefore need to investigate if one EC can be speeded−up with respect to the other one. Nigel thought that this is possible but it needs to be checked.

Space requirements:

Main work steps in SR are addition of wings and thermal screen in assembly area and acceptance test in test area. For these works, the EC will be closed.

The only time that the EC would require opening is for a failure on disks and repairs of them.

The space in the SR AA does NOT allow to open both ECs simultaneously.

Nikhef will bring thermal screens for tests in SR1.

Nikhef will bring all tools from Nikhef to SR.

It is assumed that EC and barrel will use identical interfaces for all services in SR (cable, connectors, fibres, cooling pipes, N2 etc...) to facilitate connections with setup.

The EC soon needs to clarify the requirements for its services cage. This services cage needs to compatible with the services connections. Nigel, Craig, Tim will contact Oxford for design and study its adaptation to the EC.

Actions:

Nigel, Craig: detail space requirements for closed EC during

Nigel, Craig, Tim, Neil:

Present plan on services cage for EC at next meeting.

Nigel, Craig:

Confirm cable length requirement for EC in SR.

Nigel Craig:

Detail plan for optical survery and X−ray test for EC at SR. Send detailed requirements regarding infrastructure and safety to Heinz.