

EFFECTS OF THE COMPRESSED SCHEDULE ON THE INSTALLATION - DISCUSSION

Chair: T. Pettersson, CERN, Geneva, Switzerland

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UPDATE ON LHC INSTALLATION SCHEDULE

S. WEISZ

R. Saban : Contrary to one of your assumptions in the last slide, the planning for commissioning starts with more than two sectors being commissioned at the same time.

S. Weisz : It is true. The planning should be considered as a proposal where no restriction of resources is taken into account. The main constraints are: a) the commissioning of the first two sectors can not start before June 06; and b) the machine should start up with beam in July 07.

J.P. Quesnel : You said that cooldown of LSS8L and installation in the DS are activities which cannot co-exist and that this creates conflict in the schedule. Why? We should be able to work during the cooldown periods.

C. Hauviller : During the temperature transitions it is not allowed.

J.P. Quesnel : I do not see how to skip the work which has been planned in parallel to the cooldown of the magnets.

P. Lebrun : I do not understand either why there should be no co-activity during these periods.

S. Weisz : This has been prescribed by the Safety Commission.

P. Lebrun : There are documents containing detailed risk analysis on the likelihood of sudden and massive helium losses in the tunnel. According to these, there should be no reason to avoid co-activity during cooldown. This matter has to be reviewed.

D. Forkel-Wirth : Concerning co-activities foreseen during X-raying of the welds (mainly transport), the Radio-Protection Service has to agree formally. This point has not yet been clarified.

S. Weisz : I agree, a solution must be found.

O. Brüning : You have mentioned the need for additional resources. Have the training and integration issues been considered by the different groups? I fear that skipping tests and adding more work in parallel could lead to a difficult situation.

S. Weisz : It is sure that many groups will need more resources. We will prepare Schedule Change Requests (SCR) which will be sent to the equipment groups for comments, discussion and approval.

N. Holtkamp (Oak Ridge National Lab.) : How many more resources will be needed?

S. Weisz : Many groups are involved and during the SCR process they can see what can be done in what time.

S. Myers : The details on resources have to be worked out by the different departments. Coming back to one of the questions asked by the chairperson: if the QRL cold tests are skipped, what implications would this have for beam commissioning if leaks pass undetected due to the absence of those cold tests?

R. Saban : Those leaks will be detected during the Hardware Commissioning phase.

N. Holtkamp : What is the validity of the planning exercise that you have presented?

S. Weisz : We know that the only way to compress the schedule will be paralleling of activities.

F. Bordry : You have not talked about other equipment that need to be installed and for which their individual system tests are not shown anywhere in your presentation.

S. Weisz : This will be addressed during the SCRs phase. At that time we will try to include all the systems.

R. Schmidt : You have not included the cold checkout period. I suppose that after the last activities that you show in your planning, 6 weeks (see talk by J, Uythoven) have to be added.

S. Weisz : This is correct.

THE LAYOUT POINT OF VIEW

S. CHEMLI

R. Schmidt : Concerning the beam mechanical aperture, is it in the layout? Can values be provided?

S. Chemli : It is in the database and data include the layout of the warm vacuum chambers with their parameters together with the cold beam screens. A file written for MAD is also available. For version 6.5, the file will be updated and delivered to AB-ABP.

S. Myers : All equipments mentioned are known with the exception of "beam stoppers": what are they?

G. Roy : They do not exist yet. They are access safety elements which need to be defined.

INSTALLATION OF LSS

S. BARTOLOMÉ JIMÉNEZ

V. Mertens : In LSS8R the beam pipe from TI8 into LHC is in a very "squeezed" position which makes installation difficult. How is this translated into the planning?

S. Bartolomé : The organisation of the installation in that area has to be optimized. The SCR for the installation of LSS8R (including the TI8 components in this area) will be sent for approval next month.

P. Lebrun : Why have you mention no co-activity in RA tunnel during the short-circuit tests of the power converters if the latter are not in the tunnel?

F. Bordry : The short-circuit pieces are installed in the RA in order to test the complete warm parts of the circuits before connection of the power cables to the DFB current leads. This is part of the baseline for the commissioning of the converters.

P. Lebrun : Whether or not these tests are crucial should perhaps be reviewed.

MAGNETS COLD TESTS AND THROUGHPUT

V. CHOHAN

K.H. Mess : In Sonia's presentation the last DS+MS's SSS are needed for installation by September 2006, while in your planning testing for those units is only completed by December 2006.

V. Chohan : Tests of these magnets should be done as soon as possible, depending on their availability. This has to be analysed in detail.

O. Brüning : You mentioned sampled or type magnetic measurements for IR quadrupoles. I think that the measurements on these magnets should get high priority. This point should be further discussed.

V. Chohan : I fully agree.

S. Baird : Concerning your question about the AB-OP staff supporting magnet tests in 2006, I can confirm that in 2006 you will have the same number of operators as in 2004 (i.e. seven).

S. Myers confirms this point.

HARDWARE COMMISSIONING

R. SABAN

There was a question by *P. Lebrun* about the number of circuits considered in the calculations of commissioning times. This point was clarified.

N. Holtkamp : You have not mentioned any time for repairs or contingencies.

R. Saban : We are planning for success.

CONTROLS

R. SCHMIDT

R. Saban : Your talk is a proof of the awareness of AB/CO with respect to all the milestones you showed. The application to analyse signatures of quenches was stated in my talk as an essential time saver. I did not see it mentioned in your table.

R. Schmidt : There will be automated procedures which still need to be defined. Post-Mortem should not only be a data repository but also include analysis tools.

R. Lauckner : The experience from the test benches in SM18 will be applied.

S. Myers : I like this milestones approach. What about the planning for the production of all the applications needed?

B. Frammery : There is no such a planning because we do not have yet a list of all the applications. This list has to come. We can not go faster than the specifications coming from the user groups. Some applications will be put in operation already during the Hardware Commissioning phase.

R. Saban : Many applications will come from LSA. The "system commissioners" (ref. to H. Schmickler's presentation) can certainly help in the identification and preparation of specifications.

B. Goddard : The time to analyse the fault during the TI8 tests was too long. The experience from these tests and more specifically at TT40 shows that Post-Mortem is fundamental...

K.H. Mess : ...yes but it is not enough. You need to have evidence of the correlations between different systems (e.g. setting of correctors, information from BLM, BPM, etc).

R. Schmidt : I agree.

R. Lauckner : In response to the previous two comments, it is necessary to explain that the large majority of logging clients (including the TT40 systems) are still in a development phase and will not be introduced into the LHC operational logging environment until certain criteria are met. These included adherence to the approved naming convention for LHC parameters and time of data stamping with a valid UTC time source. These criteria are necessary to enable fast analysis and correlation between systems and it must fall upon the client to implement them.

B. Dehning : After the tests in TT40 and TI8, milestones are needed for improvements in terms of Post-Mortem [for BDI equipment].

R. Lauckner : This has been discussed and the BDI proposals for continuous logging of BLMs by far exceed data rates that may be expected with the logging system.

O. Brüning : How will priorities be applied to the list of applications: which applications are important for first commissioning with beam in day-1 and which ones are not so important?

R. Schmidt : The talk focused mainly on applications for Hardware Commissioning without beam.

B. Frammery : The sector test with beam will be crucial to check this point.