# Replies for aTAC18 recommendations:

Lund 3 April 2019

Mats Lindroos and Accelerator Division

## Recommendation:

Streamline the effort spent on planning to free resources for installation and
commissioning. Find pragmatic compromises between detailed planning and the tracking of
critical milestones, which have impact on interfaces between activities. Detailed planning
should be left to the equipment responsible and installation managers. Where possible,
reduce formal procedures and documentation to a reasonable level to free resources.

*Reply: The planning for accelerator is now in a much better position with two full time planners doing all follow-up, reporting and updating of the P6 schedule. They are supported by a planning manager which provides the high-level schedule and helps with details for the technology. The new Testing and commissioning manager which just been hired will have the overall responsibility for accelerator and related ICS systems during testing and commissioning. The commissioning coordinator work with the testing and commissioning manager and provides the detailed commissioning planning and also performs commissioning with the support of the operations team from the control room.*

## Recommendation:

Installations & infrastructure readiness must have first priority.

*Reply: The plan for infra follow the strategy and time plane as outlined. The needed priorities have been done e.g. move of cabinets, and priority on mechanical installation in parallel with definition and routing of cables. When entering in to the spoke installation phase, the infra installation should be more or less ahead of the components and causing less issues and overall delays.*

*There are two areas which need special attention since they cut through the entire accelerator.*

1. *The Phase ref line, need an interim/temporary solution and this will be created I two phases.*
2. *The cryo distribution line need mechanical installation to be moved up for secondary steel and cable trays above cabinets.*

## Recommendation:

We support the installation of the HV cables for all couplers and purchase a limited number of HV supplies. For the spoke couplers we recommend to pursue the biased version with the same approach as for the medium beta couplers.

*Reply: The CDB contains HV cables for all couplers, and the installation is in the infrastructure project scope. IPNO has finalized the design of the bias version of the doorknob and ordered two prototypes, which are in advanced phase of production. Tests will be performed in the following months. The tender for the procurement of the series spoke doorknobs has been launched at IPNO, and is based on the bias-capable design. Bias testing capabilities will be implemented at the test stands, and a limited (~30%) number of power supplies will be initially procured by WP17.*

## Recommendation:

Continue using / improving the direct involvement of ESS system owners in the external IK activities to prepare for later successful testing, installation and commissioning. The system owner has the ultimate responsibility to get his systems delivered and has to adapt his follow-up to the different IK partners.

*Reply: We fully agree that preparations together with IK partners for testing, installation and commissioning is vital. Tools for this include regular - often weekly - video conferences with the partners, frequent although not regular visits, and, importantly, site acceptance reviews (SARs) and installation readiness reviews (IRRs). An example of a complicated system soon to be installed is the MEBT. Installation will start in the summer, a comprehensive SAR was held in Bilbao in the last week of March, an IRR at ESS will follow, and visits have been made by engineers and technicians from the system owners, representing mechanical design, electrical installations, quality, vacuum, beam instrumentation, controls, RF, survey & alignment, etc. In the ideal case, there were sufficient resources to allow ESS personnel to be posted for longer periods at our in-kind partners, but the staffing situation unfortunately does not allow for this.*

## Recommendation:

During commissioning there has to be enough staff to operate and write

instructions for operation. One 8 hr shift per day may prove inadequate; 2 shifts can

provide an opportunity for catch up on the AD schedule. Means must be provided to

facilitate conditioning of RF components for long periods when beam is not present.

*Reply: Unfortunately, we didn't get a permission to hire staff (control room operators/shift leaders) for the beam commissioning stage of Ion Source and LEBT. Therefore, we still haven't written good set of instructions for operation. We have moved to extended shifts (8 am to 9 pm) in the period between March 18 and April 26 to try to help for catching up on the schedule. We are currently hiring 2 shift leaders/operators, which will help with writing the operating instructions as well as be present in the next stages of commissioning, including RF conditioning. However, this number is not enough to allow 24/7 for longer periods of time. We are considering either bringing additional staff. At the same time, we are exploring with HR and the unions, the possibilities we have with existing personnel.*

## Recommendation:

Finalise use cases and probable fault modes. Work with the

science/instrument specialists and those knowledgeable of target damage scenarios.

*Reply: Both Inigo Alonso and Lali Tchelidze will address this recommendation in their presentations at the next TAC meeting.*

*Lali’s response: the operation of the neutron source (accelerator and target) and related technical infrastructure will occur from the main control room. Integrated approach was taken, and the control room team will be trained and responsible for operating the neutron source.*

## Recommendation:

In the readiness reviews make sure that the process documents focus on the readiness of infrastructure and controls. The new HOTC and the installation and commissioning managers must be strongly involved in the preparation for these reviews, and be confident that rapid turn-on will be achieved.

*Reply: A distinction needs to be made here between Installation Readiness Reviews (IRRs) and Safety Readiness Reviews (SRRs). While both infrastructure and controls are discussed at the IRRs it is not a requirement that these systems be complete prior to the start of installation. Doing so would add an add unnecessary delay to the project. For example, we will start the 6 month long installation of the cryogenic distribution system in April 2019 well before either the instrumentation cables are pulled or all the control software is developed. Waiting for these activities to be completed would add 4 – 6 months to the schedule. The IRR does check that start of component installation does not preclude later installation of controls or infrastructure.*

*In the case of the SRR, the situation is different. It is the expectation that the system can move into operations immediately after the SRR. ESS will ensure that controls and infrastructure are ready prior to the SRR. The HOTC and installation mangers will contribute to making sure that rapid turn-on is achieved.*