

TAC 14 REPLIES FROM AD

Answers are also provided in JIRA at:

<https://jira.esss.lu.se/secure/RapidBoard.jspa?rapidView=230&projectKey=ARR&view=detail&selectedIssue=ARR-79&quickFilter=974>

Recommendation 1:

RF systems - Regarding the proposed procurements and system assembly which partly is done at IK partners

- Comment
 - Industry series production through IK partners require final signed agreements. It is apparent that agreements remain unsigned, and this represents a significant schedule risk
- Recommendation
 - Efficient procurement at ESS with experienced buyers is needed now

Reply:

ESS has strengthened the procurement organisation. Regarding the RF IK contracts, these are all signed with two exceptions: ESS Bilbao and Huddersfield University. Still, work is going ahead including procurements at both institutes. There is also an issue with the VAT and Italy. High-level activities are ongoing to address all these issues.

Recommendation 2:

RF systems - about the plans for integration in the RF gallery and installation?

- Comments
 - As previously commented, taken as a whole, the installation schedule is very aggressive, and unlikely to be met
 - Reasonable to have a plan for missing the 570 MeV proton beam in 2019 deadline
- We note that it is possible to generate neutrons at energies below 570 MeV, i.e. be sure the warm linac is in place
 - We endorse the installation support through IFJ-PAN
- Recommendation
 - Ensure a complete 3-d model with both technical components and utilities is in place prior to installation

Reply:

An updated 3D model is available at all times

Recommendation 3:

RF systems - about the proposed testing?

- Recommendation
 - All test stands need to be operational in time to validate the production prototypes (technical demonstrators)

Reply:

Test Stand 2 / Cryomodule test stand is being installed with the RF installation starting in March 2017.

Test stand 1 at LTH is fully operational. Some examples of work done are: Test of the ESS SML modulator, test of the ESS-CERN PPT modulator and operation of a CERN klystron with a measurement of heating from waveguides done. Preparations for the test of the ESS Toshiba klystron is on-going. It will later be used in Uppsala for elliptical cavity testing in collaboration with CEA.

Recommendation 4:

RF system - regarding the design and early prototyping

- Comments

- Reassuring to see progress on klystrons and modulators, but need to continue pushing for integrated full tests. Ensure procedures are in place for long term high power tests in Lund
- Multiple LLRF efforts are being undertaken by IK partners, and a strong coordination by ESS is important

- Recommendations

- Investigate LLRF lessons learned from XFEL and place a high priority on hiring an experienced digital LLRF person at ESS soon
- We recognize that full technical validation for the first of series production components may cause schedule delays. However, skipping these tests can cause even longer delays, and thus we encourage the full testing

Reply:

The LLRF team has been strengthened with a VHDL programmer now having been hired. ESS is testing all first units extensively, when this is possible.

Recommendation 5:

Schedule for the RF systems is challenging and delays are showing up. Success largely depends ...industry to deliver ...communicate experience on that matter: how likely is it that companies will deliver on time and what can be done to improve the situation?

- Comments

- Very unlikely that all industrial schedules will be met across the board
- Nearly all large industrial procurements need to be placed by next spring for the proposed schedule to be met

- Recommendation

- Have ESS staff spend meaningful time at vendors, during development and tests

Reply:

- ESS will have the staff spend time at vendor/partner sites both during developments and tests – a lot of time was spent on vendor sites for the IOT, klystron, and modulator prototypes
- Procurement for RFQ/DTL modulators (ESS Bilbao IKC) was launched on Dec. 2016. Contract signature estimated to take place in May 2017. Delivery of last modulator foreseen by Jan 2019;
- Procurement for Medium Beta modulators (ESS cash) to be launched end March 2017. Contract signature estimated to take place in May 2017. Delivery of last modulator foreseen for June 2019;
- Procurement of RF power stations for spokes (Elettra IKC) not known yet when it can happen due to an unresolved VAT issue.
- Delivery of last RF power station to take place in July 2019 at the earliest, if procurement launched in April 2017.
- The call for tender for the power converters cannot be done before 3rd July. The magnet power converters are not covered by the trilateral agreement like for the magnets but are in the same situation as the RF power stations for the spoke regarding the VAT issue.

–Therefore, the magnet power converters are to be dealt with similar way as the RFPS's for the spokes, meaning that a definition with respect to VAT and budget has to come from the Italian ministry.

Recommendation 6:

Integration on-going ... some aspects of accelerator integration with MPS, TSS and PSS are presented and also some aspects of documentation... comments and reactions?

- Comment

- For like-systems that are supplied by multiple IK contributors (LLRF, protection,...) important for ESS to serve as a strong integrator, ensuring commonalities and imposing project standards

- Recommendation

- Ensure documentation of IK contributed equipment is captured

Reply:

ESS is now restructuring the documentation/PIM/PLM/etc system CHES by cleaning up its repositories and introducing breakdown structures like FBS (Facility Breakdown Structure) and LBS (Location Breakdown Structure). These will allow documentation to be stored at well-defined nodes, and it will allow documentation to be easily retrieved for future use. In addition, a tool is being developed to facilitate upload of information (drawings, instruction manuals, test protocols, maintenance procedures, etc.) from in-kind partners. With this tool, which is expected to be launched before the end of March 2017, in-kind partners can submit information to ESS by drag-and-drop and get an acknowledgement from the respective work packages that it has been received. The tool then allows WP leaders to link that information to, e.g., the FBS or the LBS. Further developments to improve functionality based on feedback from internal users and in-kind partners are expected.

Recommendation 7:

NC Linac RF Systems

Comments

- The procurement of 3 solid state amplifiers and 6 klystrons for the NC linac does not include any spares
- The in-house production of waveguide components by ESS-Bilbao presents a certain risk, especially for more complicated items like splitters, directional couplers, phase shifters, etc. High-power tests of these items is mandatory before launching the series production
- Presently ESS-Bilbao cannot sign any contracts as Spain has not yet officially signed as ESS ERIC member. The modulator tendering is ongoing and should be ready for signature in Jan. – mid Feb. 2017. Signature delays will delay procurement
- Publication of modulator tendering notice is already 4 months late with respect to presented planning
- Delivery of 3 modulators and 3 klystrons is expected 1 year after signature, which seems unrealistic

Recommendation

- Provision of at least 1 spare solid-state amplifier and 1 spare 352 MHz klystron

Reply:

The RF group will act on the recommendation. We will ask for spares in the early operations budgeting, since the construction budget does not have funds for spares.

Recommendation 8:

Power converters - about the proposed testing?

- Recommendation

- All test stands need to be operational in time to validate the production prototypes (technical demonstrators)

Reply:

– One test stand has been available for concept testing (Integration test stand); one test stand is available for prototype testing (FREIA Uppsala); one test stand for cryomodule testing will be set up starting spring 2017, where modulators can also be run; one test stand for modulators in the RF gallery is under planning

Recommendation 9:

Does the TAC have comments on the organization for installation? Shared experience from other facilities is welcome ...

- Comments

- IK contributors should be expected to “live in Lund” during installation / commissioning activities to ensure their equipment works on site

- SNS installation lessons learned will be communicated to ES management

- Recommendations

- Make arrangements to accommodate long term stays for IK contributors

- ESS staff need to prepare to transition from coordination/ project management activities to “hands-dirty” activities with IK contributors, to a greater extent than presently occurring. E.g., be prepared to participate in development and acceptance tests at factories, partner labs

Reply:

The issue of accommodation for IK staff is being addressed at ESS level. The AD staff regularly visits the IK partners and vendors to participate in tests and reviews. The ERG group has done two “intern visits” at CNRS, CEA and LNS-INFN. Work on site for installation has also started and the first 24 AD staff moves to site in April 2017.