t-TAC17 Recommendations and Replies

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| Item | Recommendation | Responsible |
| Process controls and joint plan with ICS | 1. **In view of project budget constraints, external consulting contracts might be reduced** 2. **Given the level of staffing, controls support for instruments must be increased as soon as possible** 3. **Increase integration of controls in mechanical hardware detailed design process as early as possible** |  |
| Answer | 1&2) The ICS resources for target station controls have unfortunately not materialized as planned. There has been challenges in the recruitments and the available staff has been tasked largely to accelerator controls rather than target station. Target has had 1 project manager and approximately 1.5 FTE of developers since the last TAC.  3) Those controls staff available to Target Division have participated very closely with the hardware engineers.  However, there is a risk as more target station systems are moving into/past critical design without correspondingly increased level of development for controls, including machine protection. | Linda Coney |
| Target monolith and instrument  bunker interface | 1. **The committee recommends that the bridge beam guide be retained** 2. **Explore reducing the thickness of the BBG windows** 3. **Engineering controls should be used for the access system in the bunker** |  |
| Answer | 4) The bridge beam guide is still part of the mechanical design of the neutron beam extraction system, allowing the light shutters to be closed prior to any beam line maintenance operations within the instrument bunker.  5) The design team recognizes that reduction of the BBG window thickness is highly desirable and will make all reasonable efforts to achieve an optimal technical solution in line with this objective. BBG windows are 0.5-1.0 mm.  Also Note the NBW is 4.2 mm, it is not pressure related but projectile related (safety for Monolith).  6) The design of the bunker access safety system (BASS) has progressed. It was presented in some detail at the bunker system CDR#2. It should be noted that the responsibility for the bunker system design and delivery, including definition of operation and maintenance scenarios, remains with the ESS science directorate, see answer to item 11 below. | Rikard Linander |
| Waste management and the Active  Cells Facility | 1. **The committee recommends that a workshop be organized quickly where relevant experts from existing facilities (e.g., JPARC, SNS, and PSI) can meet with ESS and RACE staff to share their experiences and provide feedback on cell designs** 2. **There will be active handling activities in accelerator, target station and NSS. The committee recommends that an ‘Active Handling’ working group be set up at an appropriate time to coordinate active handling activities and promote a common approach both in methods and equipment.** |  |
| Answer | *7) A dedicated workshop has not yet been held, there is a forum established that is derived from the BSBF -18 workshop that is managed by UKAEA with the intent of sharing experience around remote handing. This forum includes ESS, ITER, CERN and ESA amongst others. Mitigating actions on the active cells in-kind procurements has been implemented including:*   * *Changed procurement strategy from an “open procedure” to a “negotiated procedure” allowing supplier to point to cost driving requirements* * *Excluding “nuclear” requirements where possible to allow a larger pool of suppliers* * *Grading requirements from “must have” to “desirable”*   *We have also been visible to the market via meetings (BSBF-18), Conferences (Hotlab -18) and UKAEA/RACE has had an industry day with a large number of attendance and companies visiting. The industry day had two main focuses, both to engage non-nuclear industry as well as to facilitate companies to engage in joint ventures to be able to take part in the RACE procurements. Furthermore, ESS (including Target and ES&H) are planning to visit KTE – Karlsruhe who are specializing in radiological waste treatment and storage.*    *So far, one change request has been presented and approved by the ESS Program Change Control Board. Additional funding was granted for the procurement of a shaft cutting station in a horizontal direction compared to the PDR horizontal design. This tender included some of the key features as mentioned above, as examples, even though the cutting station will deal with highly radioactive components – rather than giving the radiation field – a number of possible materials for plastic was included as an aid for the companies. Also, the negotiated procedure was used reveling that the allowable heat generation from cutting (15 kW) was a very costly to implement in design. The number was therefore increased to 40 kW (with a small additional cost to the HVAC) which excluded costly cooling systems on the cutting station itself”*  *8) The Active Cells Facility is designed to receive, size reduce and segregate radioactive components derived from the monolith. This is planned to an extent that the pieces and components leaving the facility will fit into the Swedish nuclear waste stream. The components that will be handled are the Target Wheel, Moderator and Reflector Plug, Proton Beam Window, Proton Beam Instrumentation Plug, Target Monitoring Plug as well as the Neutron Beam Inserts and blind plugs*  *The radiological hottest parts to be handled will be derived from the monolith, we are currently focusing on Monolith maintenance and make sure that we can ensure safety for personnel for these re-occurring sequences. The beam dump design included planning for remote handling, this is a life of facility component and therefore detail planning for replacement will be done after initial operations. Regarding general radiological waste from the facility, ES&H Per Persson is the point of contact and program owner for waste management, waste stream segregation plans, and disposal to make sure all licensing requirements are fulfilled.* | Magnus Gohran |
| Worker Radiation Safety Strategy  and Policy | 1. **ESS is encouraged to proceed with the presented strategy** |  |
| Answer | ESS Adapted the new rules for worker analysis and classification and it has been accepted by SSM – leads to minimum number of safety SSCs and lower requirements on target station components/systems. ESH is the owner of the new program.   * The new worker radiation safety strategy is being implemented at ESS. The following documents are being updated to reflect the new approach:   + General Safety Objectives (GSO) (ESS-0000004) – in review   + HA Guideline for Radiological Hazard Analysis (ESS-0041755) – in development   + ESS rule for identification and classification of safety important components (ESS-0016468) – in review   + ESS rules for radiation safety classification of Electrical and Instrumentation & Control equipment including design and quality requirements (ESS-0054158) – in review * New documents/procedures are also being created for a new committee   + Worker safety committee charge   + Worker safety committee procedure * Updates to impacted documents describing the new approach is also on track to be released before end 2018. | Linda Coney |
| TOAST experimental results and  impact on licensing | 1. **Adopt the TOAST results and complete the safety analysis** |  |
| Answer | SSM used our source terms for the EPZ.  They concluded that ESS is a threat category 2 facility.  This implies an approval by SSM of our conclusion, at least for that purpose.   * TOAST results have been incorporated into the relevant AAs * AA3 – loss of cooling accident – is in final review – anticipate released by November 2018   We are now working on the detailed analysis of the data, e.g. regarding the size of the particles. | Per Nilsson |
| Bunker | 1. Focused effort on the bunker should be a priority is still a valid concern. We recommend:  * t-TAC recommends that the bunker become part of its purview. * Increased effort on the bunker * The bunker design continues to struggle. This scope should be added to t-TAC and presented at TAC18 |  |
| Answer | ESS EMT has decided the scope and responsibility to complete the final design, procurement, installation and commission of the Bunker remains within the science directorate. However, the CDR (conducted Oct 15-17) includes 2 t-TAC committee members that will by their participation thoroughly review the progress made by the bunker team and assess the overall maturity of the design and functional specifications in order for them to proceed into manufacturing. | Mark Anthony |