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Neutron Optics and Shielding Group
TG2 Summary
MAGIC Instrument

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Review

Date
18 January 2017

2017 TG2 Round for ESS Instruments

Technical Reviewer:
Phil Bentley

Input received from
Damian Martin Rodriguez
Valentina Santoro

Preamble

This document is the review summary of the instrument's optical and shielding system preliminary design. Systems outside of this scope have not been considered, except where they significantly impact on optics and shielding.

1. Executive Summary

The reviewer considers that from the *perspective of optics and shielding systems* the concept of the design is sufficiently complete and mature. However, there are significant deficiencies in working practice and risk assessments.

2. Proposal Grading

The proposal is graded as a whole and by subcategory.
For each item, a grade is given for the preliminary system design *as it stands now* (column "NOSG status"),

"GREEN": All aspects of the criterion have been addressed satisfactorily to permit endorsement by the NOSG to the detailed design phase.
"ORANGE": Some aspects of the criterion have not been addressed satisfactorily. However, if additional information is supplied, NOSG endorsement of the instrument to the detailed design phase may be possible.
 "RED": Some aspects of the criterion have not been addressed satisfactorily and there are reasons to doubt they can be achieved without changes. Currently it is not recommended to proceed.

Grades are indicated as traffic lights: = green, = orange, = red.

Criterion	NOSG Status	Comments
Has adequate planning been done to move the project into Phase 2?	🟢	
Is the proposed budget consistent with the proposed scope?	🟢	
Does the preliminary design satisfy the requirements?	🟢	
Is the presented baseline technically sound?	🟢	
Has anything been forgotten or neglected?	🔺	ESS-0059811 appears to have not been considered.
In case where several In-kind partners are collaborating – are roles and responsibilities adequately defined and agreed?	🟢	
Have safety-related aspects in accordance with ESS-0043330 ref [6] been appropriately considered?	🔺	The list of documents under ref [6] from ESS-0043330 is incomplete.
To what extent have appropriate connections been made with the critical project interfaces, such as software, data storage hardware and sample environment?	NA	
Has the instrument context been appropriately considered in terms of physical interfaces, such as bunker, beam extraction, ICS etc?	🟢	
To what extent have available engineering standards been implemented appropriately?	🔺	NOSG document ESS-0059811 appears to have not been considered.
Are the cost and duration estimates reasonable?	🟢	Within the project as an isolated case
To what extent has the team planned appropriately for the risks, both technical and otherwise?	🔺	NOSG document ESS-0059811 appears to have not been considered.

3. Currently identified issues

There are absences in the areas defined in ESS-0059811. In specific:
1. There appears to be no mention of H1/H2 scenarios.
2. Options are not fully documented and evaluated on equal level with the preferred option.
3. There appears to be no version control on the simulation work.
4. The risk of guide misalignment "Settlement of building" is underestimated.
5. The dose rate requirements for the shutter needs to be compatible with ESS safety requirements for access – 25 uSv/h is not.

4. Detailed/other comments

The shielding design as a whole is excellent for the current status in the project.

There seems to be no optics comparison with other systems, just a little paragraph saying that this was the best option for them (which we are not so sure)

Their baseline optics design could be converted into a ballistic-elliptic configuration (our standard) with little (or no) impact in performance and cost, and positive impact during fabrication and installation, plus mitigation of damage due to large sections in the middle that are interchangable and can have spare parts.

There are two figures in the preliminary system design (4.3.1.2 and 4.1.4.2) that have some conversion problem, and are not visualized correctly (neither in Windows nor in Linux)

Addition During Meeting