

# TG2 Review Process

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# Outline

- Purpose
- Grading System
- Criteria to be assessed
  - Technical Feasibility
  - Budget Completeness
  - Schedule
  - Risk Analysis
  - Other
- Workflow
- Conclusions and Recommendations
- Questions

# Purpose

- Co-ordinate, manage and ensure integration of motion components
- Phase 1 – planning phase
  - what is going to be built
  - formulate the associated budget
  - identify resources needed to build it
- Tollgate 2 assessment
  - the partners are free in choosing the form to collect the information for TG2
  - ESS MCAG strongly recommends to follow the order and definitions given in ESS-0049514
  - MCAG is assessing instrument teams documentation according to appendix A of ESS-0049514

# Criteria to be assessed

- **Technical Feasibility**
- **Budget Completeness**
- **Schedule**
- **Risks Analysis**

- Stem from the *Table of Motion* for the generic motion control axes and the detailed description of the special purpose motion solutions

# Technical Feasibility – Table of Motion

- The *Table of Motion* must be completed as accurately as possible

All sections of ESS MCA Table of Motion Excel spreadsheet have been completed for each axis.	
All safety shutters have been included in the table as an axis.	
Other pneumatic actuators have been included in the table (if applicable)	
Special environmental conditions have been identified for each axis (if applicable)	
Special relationship between axes (gear ratio, synchronisation etc.) have been identified (if applicable)	
Similar or identical multiple axes have been identified (if applicable)	

# Technical Feasibility – Special Purpose Motion Control

- Detailed description of the technical solution is required

Justification is provided stating why the special purpose motion is necessary or desired.	
The proposed special purpose motion solution has been described in adequate technical detail including interfaces to other technical systems.	
At least one alternative has been proposed and reason is given as to why this not as desirable.	
A proposal how to integrate the control system into EPICS has been given.	

- The budget will be checked to ensure that nothing has been omitted
- It is important to indicate what is included or excluded in the budget calculation
- It is important to present the budget (at least to MCAG) so that it is broken down to an adequate level to allow this

- MCAG will assess this budget with regards to motion and automation

Instrument budget for MCA is broken down into the three MCAG deliverables: Generic Motion, Special Purpose Motion Control and Electronics and Control Racks.	
Figures are given for labour and non-labour for each of the three deliverables.	
Each of the figures is broken down in a similar manner to that described section 4.3.3 of <i>ESS-0049514</i> .	
Special purpose motion control (if any) e.g. robots, hexapod, piezo motors control have been identified and included in the budget.	
Sufficient budget is allocated for electrical drawings.	
An estimate for the number of electrical cabinets and/or racks is given for budget purposes.	
Instruments components that require a SAT/FAT have been identified and included in budget (either MCA specific or Instrument budget).	
All development costs for motion control (if any) been included in the budget.	

# Criteria - Schedule

- Schedule will be most important in projects where development is required
- The schedule of the whole project will be considered
- MCAG will flag unrealistic timelines

# Schedule

Sufficient information exists in the Toll Gate 2 instrument documents for the schedule of the MCA work units.	
Milestones are identified throughout all stages of the project in regards to MCA.	
Important schedule links between MCA work units and other parts of the instrument projects are identified.	

# Criteria – Risk Analysis

- A risk analysis should be conducted to where deemed necessary
- This shall include general electrical, cabling and rack related issues
- It may also include budget, project schedule and management type risks

# Risk Analysis

Axes that may be difficult to implement with the generic solution have been identified e.g. high speeds/accuracy/repeatability/stability/demanding environment.	
Technical risk analysis of special purpose motion has been performed and the risks and mitigations identified.	
All moderate technical risks (if any) are addressed or an alternate solution stated.	

- Each instrument project is different
- Sometimes more information will be required
- Some of the things that MCAG may require are...

- Information on any special shutters e.g. where they need to act as a dual device for safety and beam conditioning, or if they need some kind of special control or synchronisation.
- Information on axes that may be linked to choppers e.g. if a chopper is mounted to a motion stage and should in and out of the beam.
- Any special maintenance that may be required during operations period.
- Procurement strategy for any long lead-time components.
- Potential for training for personnel at ESS.
- Identify resources available for EPICS integration for motion control.
- Plan for production and delivery of E-Plan electrical schematics.

# Grading System for Criteria

-  **GREEN:** All aspects of the criterion in question have been addressed satisfactorily to permit endorsement by the MCAG to the detailed design phase.
-  **ORANGE:** Some aspects of the criterion in question have not been addressed satisfactorily. However, if additional information is supplied, MCAG endorsement of the instrument to the detailed design phase may be possible.
-  **RED:** Some aspects of the criterion in question are in serious doubt. Additional information and serious consideration by the NSS management is necessary to continue commencement to the detailed design phase
-  **WHITE:** Not applicable

# Conclusions and Recommendations

- **GREEN LIGHT** for the overall proposal with regards to MCA aspects.
- **YELLOW LIGHT** for the overall proposal with regards to MCA aspects.
  - E.g. the budget is not detailed enough to get an impression of whether it is accurate and it appears to be low
  - Some detailed information is missing
  - Details are given in the comments of the appropriated sections
- **RED LIGHT** because it is not deemed to technically possible with the proposed solution.
  - Details are given in the comments of the appropriated sections.

# Interaction and Communication

## (Instrument team – ESS MCA Group)

- Provide guidelines and templates to instrument team
- Send completed Table of Motion (ToM)
- Feedback and questions – agree in Final version of ToM
- Send documentation for scope setting meeting - MCA budget numbers for equipment and labor (Scope Setting minus 2 weeks)
- Give the go to ESS management for the scope setting meeting (Scope Setting minus 1 week)
- **Scope Setting Meeting**
- Assess documentation according to appendix A of ESS-0049514
- Meeting (Skype), discussion and final agreement of assessment list (TG2 minus 4 weeks)
- Forward assessment list to ESS management as input to the TG2 review (TG2 minus 2 weeks)
- **TG2 Review Meeting**

# Questions?

- Thank you!