

Guidelines for Drafting Technical Design Reports for Experimental Equipment at FAIR

FAIR Expert Committee Experiments (ECE) - August 2014

Motivation

Any equipment to be installed and operated for the experiments at FAIR requires a Technical Design Report (TDR) approved by the FAIR Research Director. Normally, those TDRs are composed after all design considerations have been evaluated, the technical layout is defined and before construction is to start. Often funding agencies require an approved TDR before granting funding for construction. The ECE is tasked to review the TDRs for the experiments at FAIR in all their scientific, technical and resource aspects and issue a recommendation with respect to their approval to the FAIR Research Director. The following requirements are meant as a guideline to increase the efficiency of the process.

General Requirements

Any TDR should comprise all information needed to review:

- The scientific merit of the device
- Its technical feasibility and challenges
- The performance requirements and demonstration that the requirements are met
- A description of the technical specifications and current details
- Its feasibility w.r.t. the given timeline and resources

It should be written in a clear, concise and legible form in English. In particular, it should not contain obsolete information or contradicting statements. Care should be taken to use a unique and consistent naming convention for items of the detector throughout the TDR.

Structure and Minimal Content

The detailed structure and, in particular, the size of a TDR may vary significantly depending on the device. However, any TDR should at least contain the following information, preferably also in a similar order:

1. Authors highlighting:
 - a. The contact person and
 - b. Indicating the Collaboration

2. Executive summary of a few pages (at most 5 pages)
3. Scientific case highlighting the importance of the device
4. Technical design highlighting:
 - a. Design choices
 - b. Advantages with respect to other designs
 - c. In the exceptional case where, at the time of the TDR evaluation, a choice remains open (not recommended), this needs to be well motivated, the future choices have to be clearly detailed together with, the timescale, the procedure to take the decision and the impact on the funding.
 - d. Include technical references that could expedite the proposal review.
5. Project organization, responsibilities, work packages and timelines with critical milestones
6. Cost estimate including expected funding¹

Constraints

The size should be appropriate and not exceedingly large in order to make a review possible within a short time span. On average, documents with about 100 pages seem appropriate. Larger devices may require more, while for smaller devices less may be sufficient. Much shorter documents are considered appropriate in cases where devices are already partially or fully built. Sizes beyond 200 pages are normally considered exceeding the appropriate size for a TDR.

Submission

All TDRs are to be submitted in electronic format to the FAIR Research Director on behalf of one of the FAIR Collaborations, normally by its respective spokesperson. The following should be indicated at submission.

- The contact person
- The status of the device, i.e. whether
 - The TDR, or parts of it, had undergone a previous review²
 - There has already been funding allocated to it
 - It has already been partially or fully built³
- A list of potential experts, which could be consulted in the review, is welcomed. Those must not be members of the respective collaboration.

Normally, the TDR will be reviewed in a procedure defined by ECE taking into account the provided information. Exceptions may arise if no review is required, e.g., if a device is (almost) fully built.

¹ This may be a separate document if preferred.

² In case of a previous review, details should be provided like members and outcome of the review.

³ In such a case a shorter document is considered appropriate.