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Principal objectives

The principal objective of the International Design Study of the Neutrino Factory (the IDS) is to deliver a design report in which:

- The physics performance of the Neutrino Factory is detailed and the specification of each of the accelerator, diagnostic, and detector systems that make up the facility is defined;
- The schedule for the implementation of the Neutrino Factory facility is presented;
- The cost of the Neutrino Factory accelerator, the diagnostics, and the detector systems are presented at a level of accuracy appropriate for the report to inform a decision to initiate the Neutrino Factory project; and
- The outstanding technical and financial uncertainties are documented and an appropriate uncertainty-mitigation plan is presented.

This report, the Reference Design Report (RDR), is required in 2012/13. As a step on the way, an Interim Design Report (IDR) is required in 2010/11. The purpose of this note is to define the terms RDR and IDR.

The Interim Design Report

The Interim Design Report has three functions: it marks the point in the IDS at which the focus turns to the engineering studies required to deliver the RDR; it documents the baseline for the accelerator complex, the neutrino detectors, and the instrumentation systems. It also defines example sites to be taken forward in the RDR; and it forms the basis of the proposals required to deliver the RDR. The IDR must therefore contain engineering designs of each of the accelerator, diagnostic, and detector systems that make up the facility together with estimates of the cost and schedule accurate at the 50% level. In addition, the IDR must contain a detailed, precisely-costed, plan of the work required to deliver the RDR. This plan must include a description of the hardware R&D work required to address any outstanding technological or systems-integration issues that must be addressed before the RDR can be completed. To avoid the additional cost incurred unnecessary engineering multiple designs, the transition from IDR phase to the RDR phase implies the implementation of an appropriate change-control procedure.

The Reference Design Report

The Reference Design Report is conceived as the basis on which a request for the resources to carry out the first phase of the Neutrino Factory project can be made. The Neutrino Factory project necessarily encompasses detailed design work, a continuing R&D programme by which the technical and cost uncertainties are managed, and the initial stages of the construction of the facility itself.

For the RDR to be used to support such a proposal requires that the cost and schedule estimates must be robust, accurate at the 30% level, and that an appropriate evaluation of contingency has been carried out. The RDR must therefore contain sufficient engineering detail on each subsystem to demonstrate that the cost and schedule estimates are robust at this level.