

HL-LHC

Review of WP 1

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3rd general meeting for application

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WP 1 – Project Management Objectives

- Effective management and coordination of all Work Packages inside the DS and of the WPs not included in this application, follow up of budget and plan.
- Install an HL-LHC Parameter and Lay-out Committee (PLC) to serve as a common reference for the vast community and canalise and make effective the various efforts
- Install and endorse a strict QA plan for the project
- Assure that safety, and environmental responsibility, is built-in in the design phase at each level, with particular care of radiobiological effects and long-term operation and dismantling issues
- Assure the coherence of the project with strong ties with LHC Physics Center, LHC detector upgrades plans, LHC injector upgrades plans.
- Dissemination of information and innovation inside and outside the member of the consortium and in particular to Industry.

Participants

- CERN
- PSI (safety) ?
- LBNL
- SLAC ?
- ?

Task 1.1. Management and administration

- The activities of this task are for the work package leader [CERN] to oversee and co-ordinate the work of the whole project as well as of all other work package tasks, to ensure the consistency of the work according to the project plan and the financial follow up.
- Installing structure (CB, etc.)
- Distribution of info
- General Meetings
- Take care of meeting the goal, defining the interfaces
- Form and follow up budget and plans

Task 1.2. Parameter and Lay-out Committee

- A Parameters and Lay-out Committee (PLC) is a key instrument to maintain a consistent set of parameters that enable the various groups all over the world to work with up-to-date values. Indeed the complexity of LHC and of all variants of the upgrades may generate confusions and waste of resources. Hypothesis of work that may appear very attractive must be compatible with all the other hardware of the project and with the actual operation of LHC.
- Define data-base easy readable and accesible
- Process for change request and follow up implications.
- Define, for approval of SC, baseline and accepted variants
- Defien criteria for evaluting the merits of various variants

Task 1.3. Quality assurance plan

- The quality assurance plan will define the standards of design, construction and integration of the various components. It will specify the norms to be followed, and their equivalence, which is a very important task for a project whose hardware is coming from many different region and laboratories, each one following their national standard. Installation, integration and hardware commissioning will be part of the definition of the QA: very likely a team will commission components designed by a different Institute and manufactured by a third one. Furthermore, the LHC upgrade, by definition, does not work in the vacuum: the existence of given hardware, technical infrastructure and operation modality pose hard constraints that have to be kept into account since the very beginning.
- Define usable technical standards and norms
- Methodolgy of work (different level of review)
- WG integrating experience of LHC and LHC detectors and other medium-large projects with in-kinds (SNS?)

Task 1.4. Radiological impact

- All equipment to be installed and operated on the CERN site must comply with the CERN HSE (Handling of Safety and Environmental) regulatory framework. The main objectives of this task is to define:
 - the duties and responsibilities on HSE matters of the participating parties,
 - the foreseen procedures to be followed in the different project phases,
 - the set of applicable CERN rules, design standards and certifications to be supplied
- The focus among the **radiological HSE** aspects will be on:
 - choice of material in view of activation for dose to personnel and for future radioactive waste disposal,
 - calculation of material activation and associated residual dose rates due to beam losses,
 - optimization of the layout according to the ALARA principle for handling during installation, maintenance and removal of components,
 - activation and releases of cooling liquids and air,
 - shielding of personnel against stray radiation,
- The focus among **the conventional HSE** aspects will be at this early stage on:
 - hazard identification
 - risk analysis and definition of mitigation actions
 - cryogenic safety and safety of handling
 - other relevant safety domains such as fire prevention or environment protection

Task 1.5. Liaison with Detector and LHC Injector Upgrades

- The final effective performance of HL-LHC will be strongly affected by the performance of the injectors. Actually the needs of the HL-LHC may require substantial upgrades of the injector themselves. Conversely the possibility and performance of the injectors may orient the LHC upgrades toward certain scenario rather than other. The impact of the baseline scenario and main variants has to be carefully evaluated (with WP 2) and request to injectors will be an important chunk of the figure of merits of the variants (see task 1.2).
- Strong ties exist also between the performance of HL-LHC and detectors. Hardware boundary may change either for request by detectors (example: beam pipe diameters or material) or for request by the machine (example: distance of first quadrupole from interaction point). Each possibility must be evaluated and also in this case there is a feed back in the figure of merit of task 1.2.

Task 1.6. Dissemination of Information and Industry outreach

- Forming a panel with ILOs
- Final workshop with Industry for technological opportunities

Milestones and Deliverables

- 15 Milestones
- 12 Deliverables

Tentative budget

2070 k€ (around 900 requested to EU)

- 14 FTE = 1400 k€
- This includes secretariat & administrative support for PC and various committee.
- Cost of support of structure:
 - 50 k€ per year = 200 k€
- Travel rules:
 - 1 trip 500 €
 - 1 day 100 €
- Counting
 - 150 trip: travel 75 k€
 - 150x2px3days = 900 days = 90 k€
- Exchange:
 - 10x45days x100 €= 45 k€
 - 10 trips = 5 k€
- Meeting organisation:
6X 50 K€ = 300 K€
- Total : 470 k€