# Work Package 2

*Text taken from "description of work" (Annex 1 of the proposal)*

The SLHC accelerator upgrade program is to be executed in collaboration between CERN and a set of institutes. While for preceding accelerator projects, like the building of the LHC, the collaborations were between CERN and one institute at a time for each issue, this time a more complete partnership is required. The new SLHC collaboration will be between a large number of partners as illustrated in Section B 1.3.6. The collaboration forming process has already started for specific sub-projects, e.g. for injectors, collimation and high-field magnets. For this purpose, the framework of the collaboration has to be formalized. This comprises the collaboration agreements and the establishment of the project management infrastructure and tools.

An accelerator project of this size needs modern management and coordination tools. The experience from the project management of the LHC machine construction and the LHC experimental collaboration management can be used to construct collaboration structures and project follow up tools, which will allow a globally distributed project to function and come to results.

To define the SLHC accelerator project, extensive networking will be needed. The collaborators have to communicate inside regular meeting circuits, working groups, committees and topical workshops while they are geographically distributed over several continents. Physical meetings and workshops have to be organized and electronically supported; remote meetings at regular time intervals have to be set-up. The last implies dissemination via the web of the meeting-related documentation in a structured way. The data storage and dissemination are very important in such a global project and have to be taken care of from the very beginning.

Multi-cultural collaborations, which produce hardware and software objects, will have to agree upon the standards to follow and the definition of quality related entities. Therefore a quality assurance plan has to be made for the SLHC accelerator project. The plan has to define quality standards on different levels, e.g. construction and test standards, document standards, computing standards and approval trees for deliverables.

## Objectives

- Project Management preparation. Set up the project monitoring structures, set up a finance management system and set up a quality assurance plan
- Put in place networking and communication. Set up collaboration communication structures and set up information storage and dissemination

## Description of work

Task 2.1 Project Management preparation

2.1.a Set up the project monitoring structures. The collaboration agreements formally define the responsibilities of the partners, which is a necessary input for setting up these monitoring stuctures. The Earned Value Management (EVM) system, which was

successfully used for the LHC, will be the basis for this. With respect to the LHC version, the system has to be extended to cope with collaboration structures (CERN). This task includes upgrading the EVM software, putting the project framework in the database and providing documentation and training to the users of the system.

2.1.b Set up a finance management system for the implementation. Up to now, for the CERN accelerators, there was no common fund for the collaboration entity. Such a common fund will be established (CERN). This includes getting support software, putting the project framework in the database and providing documentation and training to the users of the system.

2.1.c Set up a quality assurance (QA) plan for the implementation phase. Quality standards and approval trees have to be defined. The components and installations delivered by the various partners and industry have to be on a common high quality standard and according to their specification; a QA plan will be created for this (CERN).

Task 2.2 Networking and communication

2.2.a Set up collaboration communication structures. In preceding projects all technical, scientific and organisational issues were discussed and decided upon in CERN-based working groups and committees. These entities were able to meet on a weekly or bi-weekly basis. For the SLHC international collaboration such a structure is also needed, but distances (Europe and intercontinental) need to be overcome. In the experiments this problem has already been addressed by organising bi-monthly full weeks of meetings and workshop-type events. Video conferencing facilities are widely used. For the SLHC a system will be set up where the requisite bodies can function with monthly or bimonthly physical meetings and electronically supported remote contacts with the same communication quality as the physical meetings. It is essential that a small team keeps track of these meetings, provides minutes, follows up and takes care of documenting these on the web. Although many tools already exist, some software facilities will have to be written and conduct codes to be agreed upon (CERN, CEA-Saclay, STFC and CIEMAT).

2.2.b Set up the storage and dissemination of the technical information and knowledge. This includes making the databases, web-sites and making the scientific/technical publications concerning the upgrade of the machine available on web based systems. The SLHC database structure will cover among others: basic machine description and beam parameters, machine layout, component description and traceability. All reporting will be stored on the database. The databases will feature regulated input-output access via the internet as an extension of the existing CERN facilities (CERN).