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# PS Booster Upgrade

The LHC Injectors Upgrade (LIU) should plan for delivering reliably to the LHC the beams required for reaching the goals of the high luminosity LHC (HL-LHC). This includes LINAC4, the PS Booster, the PS, the SPS, as well as the heavy ion chain.

Within the LIU project the PS Booster upgrade project ( LIU-PSB ) coordinates all activities related to an upgrade of the PS Booster in order to deliver ultimate LHC beams. This had included the study of two scenarios to replace the PS Booster by a new PS injector : PSB Energy Upgrade and Rapid Cycling Synchrotron (RCS). In August 2011, it was decided not to go further in the RCS study (a link to the study remain here), and to go for the PSB Energy Upgrade.

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## Mandate: Energy Upgrade of the CERN PS Booster

The aim of the working group is to evaluate the technical feasibility of an increase in beam energy of the CERN PS Booster from presently 1.4 GeV to about 2 GeV as proposed at the Chamonix 2010 workshop [↗](#).

The study comprises:

- Confirm the potential gain in terms of intensity and brilliance for LHC-type beams as presented at the Chamonix 2010 workshop.
- Confirm the technical feasibility. Identify accelerator components and equipment that need to be upgraded or exchanged. Identify potential showstoppers and point out solutions. Assign the responsible groups/units. Provide first rough time estimates for the various interventions needed.
- Provide a first estimate of material and personnel resources needed to complete the upgrade. Draft a project break-down into work packages, in preparation for a project to be launched by the director of accelerators.

The main coordination activities are:

- Constitute a working group with a core team, define the work, coordinate activities.
- Evaluate/Confirm the actual maximum performance of the accelerator.
- Propose the optimum scenario for the accelerator upgrade - imply forming task forces when needed to study specific subjects.
- Prepare WP (M+P), establish roadmap EVM.
- Follow the procurement, tests and implementation of the changes.
- Prepare and commission the upgraded accelerator.

## Members

Activity Coordinator	G.P. Di Giovanni	BE-OP-PSB
Deputy Coordinator	B. Mikulec	BE-OP-PSB

- The complete Working Break-down Structure (WBS) is available here [↗](#).

### A bit of history:

- K. Hanke has been the previous Activity Coordinator of the PS Booster Upgrade Project leading the studies from its inception and until 2017. He is currently the Activity Coordinator of the PS Upgrade Project [↗](#).

## LIU-PSB Documentation Guidelines

The instructions for accessing the LIU-PSB templates for preparing the documentation are available [here](#).

### Document Handling in the LIU-PSB Project:

- The access rights allow all the project members to create documents.
- Any project member can put documents through an engineering check process.
- A decision is made as to whether a document is long term or not **by the Project Management**.
- All long term documents must undergo a formal approval ( under approval ) before release . **The approval process is handled by a restricted group.**
- First point of contact is T. W. Birtwistle  
(thomas.william.birtwistle@NOSPAMcernNOSPAMPLEASE.ch).

### Step-by-step Instruction on How to Create a Document for the LIU-PSB Project:

- Create a document in the appropriate EDMS node of the LIU-PSB Project, link [here](#).
- Select the correct document type from the list, see how to select the appropriate template [here](#).
- **Please pay attention in changing the version number from 1.0 (default) to 0.1.**
- Select an appropriate equipment code. If a suitable code doesn't exist, cancel the registration and contact: Accelerators-naming.service@cernNOSPAMPLEASE.ch.
- In case of doubts, please contact T. W. Birtwistle  
(thomas.william.birtwistle@NOSPAMcernNOSPAMPLEASE.ch).

### More Information:

- The templates for the LIU documentation are available on EDMS at <https://edms.cern.ch/nav/P:LIU-000000:V0/P:LIU-000012:V0/TAB3>.
- All equipment codes are stored [here](#).
- T. Birtwistle's presentation "LIU-PSB Configuration Management" [done](#) at the LIU-PSB WG meeting the 9<sup>th</sup> September 2014.

kiTableCol1" valign="top" width="35%"> Interlock Systems B. Puccio, C. Martin, P. Dahlen TE/MPE 18. Alarms --/-- 19. Access Systems - Doors --/-- 20. Survey T. Dobers BE/ABP 21. Commissioning and Operation B. Mikulec BE/OP 22. Dismantling --/--

	<b>Linkpersons</b>	<b>Unit</b>
Safety	D. Hay	EN/MEF
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Integration	Y. Muttoni	EN/MEF
Optics Database		--/--
Layout Database	T. Birtwistle, P. Le Roux	EN/MEF, BE/CO
Technical Coordination	D. Hay	DG/DI
HSE Correspondant	A. Jorge Henriques	DGS/SEE
Consolidation and Shut-Down Work	D. Hay	EN/MEF
PS	S. Gilardoni, R. Steerenberg	BE/ABP, BE/OP

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