

MEMORANDUM

To : H. Braun
From : J.P. Delahaye
Subject : Reviewer of the Laser Ion Source Study

This is to confirm your appointment as the Internal Reviewer of the Laser Ion Source Study with effect from 7th October 2002. Please find attached to this memorandum a mandate for your task.

I would like to take this opportunity to thank you for accepting this difficult and important task and I look forward to your conclusions.

c.c.°: PS Management Board
H. Kugler
R. Scrivens

MANDATE FOR AN INTERNAL REVIEWER OF THE LASER ION SOURCE STUDY

Context

The CERN Laser Ion Source (LIS) is the key component of an alternative scenario to fill the LHC with heavy ions (using the chain LIS-Linac3-PSB-PS-SPS rather than ECR source-Linac3-LEIR-PS-SPS). The study started around 1990. Initial results, done with a 30 J infrared CO₂ — Laser, were rather promising, thus it was decided to have a 100 J/1 Hz laser (Master Oscillator — Power amplifier system, MOPA) built by ITEP/TRINITI in the Moscow region, partly financed by the EU.

The delivery of this laser system was initially scheduled for September 2000 (see MoU ISTC-CERN 1. December 1997), but was actually delivered to CERN in April 2002; the system is presently being commissioned by Russian experts.

This unforeseen delay is the problem. In order to ensure Pb collisions in LHC by 2008, CERN had to take a decision in early 2002, where the only known safe way to produce Pb ions was the basic option via LEIR, although the LIS route would have given rise to potential savings (in particular, exploitation of LEIR). Regrettably, the decision had to be taken without actually having relevant results from this new LIS set-up.

CERN has already spent some 4 MCHF (M&P) on this study. Once the Laser system is working reliably, the R&D on the ion source proper could start provided that appropriate resources can be found. It will take some time (years?) and significant resources to make it work as a Pb ion source with the quality, reliability and reproducibility required by the LHC.

Under the present financial pressure, can CERN justify to pursue this R&D?

Mandate

1. Get familiar with the MOPA system installed in the Linac 2 pre-injector Faraday cage, the transport path of the laser beam, and the planned tests on LIS (bldg 236).
2. Check whether the MOPA performance matches the design specifications; if not, estimate how much consolidation work would still be required to fulfil them.
3. Assess the proposed test programme on LIS
 - until end 2002;
 - until end March 2003
 - beyondand check its feasibility and potential for delivering convincing results. Some ideas on the resources (FTEs, material budget) to pursue the study would be welcome.
4. Advise the PS and/or AB Management on how to continue with the Laser Ion Source study and, in case of discontinuation, what to do with the installed hardware, before the end of 2002.

Obviously, all the activities proposed here shall be performed in close collaboration with the people working on LIS and in particular with the Study Leader.