An *Open Lab* for the Development of Technical Superconductors
Addendum addressing resources and schedule

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A cost and schedule exercise was performed to give a first estimate of the resources required to initiate and operate the Open Laboratory for R&D on Applied Superconductivity (SC Open Lab) described in the main document. Costs were divided among initial investment and construction, up to commissioning (CAPEX), followed by a period of operation and associated expenses to respond to the demands of superconductors R&D anticipated for projects such as FCC, and HE-LHC (OPEX). Cost evaluation does not include civil engineering, nor general overheads.

A total construction time of 3 years was estimated as realistic for tooling and commissioning (Phase I). The following operation was averaged over a time of 7 years (Phase II), for a total reference period of 10 years. Previous industrial experience has shown that this is the typical time span required to bring such an installation to fruition.

Finally, we have assumed that the focus is initially on LTS materials (including MgB_2). The plan is to include HTS materials in the operation of the SC Open Lab once an evaluation of potential and needs for HEP has taken place. We expect this to happen in the coming two to three years, as a consequence of the European Strategy recommendations, at the end of Phase I. As a consequence, the installation dedicated to HTS was not included in the cost and schedule quoted below. The result of the exercise is the following:

Phase I - Construction and commissioning (3 years)

- Equipment and labour: 10 MCHF
- Surface: 2000 m2
- Personnel: 10 FTEy (1 project engineer + 2 technicians)

Phase II - Facility ramp-up and initial operation (7 years, processed R&D material of the order of 25 kg/week, operation 40 weeks/year)

- Equipment and labour cost during operation: 2.5 MCHF/y
- Personnel: 5 FTE (1 applied scientist + 1 engineer + 2 electro-mechanical technicians + 1 laboratory technician)
- Support services (welding, analysis, testing, …): 1.0 MCHF/y

The expected result of Phase II are the production of technology demonstrators, i.e. conductors at advanced performance, and production "kits" (material specification and production instructions) that could be transferred to industry. The total capital expenditure (CAPEX), including personnel costs, is estimated at 12 MCHF, and operation expenditure (OPEX), also including personnel costs, is of 30 MCHF.

As mentioned earlier, depending on the result of Phase I (construction and commissioning), and the opportunities identified as a result of the European Strategy discussion, facilities for HTS materials would be included in parallel to Phase II.