CERN-RRB-2002-111
21 October, 2002

Proposals for Accepting Offers for In-kind Contributions to the ATLAS Common Projects

1. Proposals

The ATLAS Management, supported by the ATLAS Executive and Collaboration Boards, invites the RRB to approve and take note of the following allocations of in-kind contributions to the ATLAS Common Projects:

2. Being finalized (Action: RRB to approve)

Toroids Power circuit components
Both End Cap and Barrel Toroid are in a common electrical system comprising a 24 kA powers supply, 2 switches, a resistor-diode ramp down units, about 200 m busbars, earth leak detection, switchboards, and powering controls interface system. The following parts of this system are offered as in-kind:

- ***Busbars (CORE: 420 kCHF; Russia)***
About 200 m of busbars have to be produced for connecting the toroids in the main cavern to the power supplies in the side cavern. The delivery includes all water-cooled bus bar sections and flexible connections required for installation including protecting casing. This technology is well understood in Russia (through Novosobirsk) and the busbars can be provided as an in-kind contribution within the original CORE cost envelope of 750 kCHF. The difference will be covered by the Common Fund.

- ***Diode-resistor dump & switch system (CORE: 400 kCHF + 80 kCHF; INFN)***
Across the toroids a diode-resistor unit is connected that protects the coils from over voltage and determines the safe ramp-down time of the toroids. The delivery includes the complete system in a few cabinets including connections and water-cooling features. A second part of the supply concerns the 2 multi pole 24 kA switches required to isolate the power supply from the toroids in the case of ramping down. INFN, through LASA, has already made several in-kind contributions to the BT, and has offered to provide the above-described system as an in-kind contribution. The system described above is associated with over-costs of ca. 80 kCHF which have been reported in the supplementary costs. INFN has indicated its willingness to make a contribution towards this over-cost which will be credited to INFN accordingly.

BT super insulation assembly (CORE: 150 kCHF; Russia)
Russia provides the multilayer superinsulation (MLI) as an in-kind contribution. This work is now in production at IHEP. IHEP now offers also to assemble the MLI on the BT coils during the integration at CERN. As it is preferred that the installation work is carried out by the producer, obtaining it from Russia is thus an optimal solution.

Infrastructure items
Detector-related support and shielding elements represent ca. 28 MCHF of the total Common Project items worth 208 MCHF. So far, Funding Agencies have made in-kind contributions up to 9 MCHF. New in-kind contributions include:

- ***Trucks for Feet & Rails (CORE: 400 kCHF; Poland)***
These trucks are needed for the ATLAS forward regions in order to carry the load of the various detectors during installation and access operations. The total CORE value of the trucks is 600 kCHF. Due to the availability of highly skilled engineering resources, the trucks can be produced in Poland for the original CORE value. The share of the Polish in-kind contribution amounts to 400 kCHF. Discussions are taking place to assess the possibility of contributing to the remaining 200 kCHF from their share to supplementary costs.

- ***Shielding components (CORE: 300 kCHF + 400 kCHF; Czech Republic)***
Metal shielding structures are needed in the ATLAS forward regions to protect the sensitive detectors from excess radiation and to provide safe access inside the detector for the service personnel during installation and maintenance periods. The Czech Republic can offer part of these structures for more than 30% below market prices, based on availability of highly qualified engineering skills in Czech institutes. The total contract for these mechanical parts amounts today to 1 650 kCHF. The Czech Republic has indicated it can contribute 300 kCHF from their CORE contribution and up to 400 kCHF from their supplementary contribution. The remaining part will be covered by the Common Fund.

3. Adjustments of previously agreed in-kind contributions (Action: RRB to approve)

Parts of LAr proximity and external cryogenics

In October 1999, the RRB approved the in-kind contribution of IN2P3 of **5.0 MCHF** for various parts of the LAr proximity and external cryogenics (LArCC).

Since then, additional work has been necessary on the cryogenics system. Following a request from ATLAS, IN2P3 has agreed to make additional contributions to complete the end-cap and barrel tooling, process control systems (the latter excluding the software; cost of which to be reviewed later on) as well as to execute the required project follow-up work. Part of this increased contribution

from IN2P3 is within the original CORE estimates (ca. 550 kCHF), resulting from reorganization of work. Part of the increased contribution includes a cost over-run (ca. 895 kCHF) which is included in the reported supplementary costs of 2.3 MCHF for LArCC. IN2P3 has agreed to make an equivalent (i.e. 895 kCHF) contribution towards the supplementary costs. Moreover, IN2P3 has also indicated its willingness to make additional in-kind supplementary contributions up to 1.3 MCHF for the LArCC.

The above-described additional contributions amount to 1 445 kCHF thus bringing the new in-kind contribution of IN2P3 for the LAr proximity and external cryogenics to **6.45 MCHF.**

4. Under negotiation (Action: RRB to take note)

BT cryoring (CORE: 0.6 MCHF + 1 MCHF; CEA/France)
The cryoring of the BT is a complex system with many interfaces to the coils. The system consists of 6 standard sections, a special bottom section including cryogenic valves and the top section connected to the proximity cryogenics. Discussions are ongoing to receive part the BT cryoring as an in-kind delivery from CEA (1 600 kCHF). The initial CORE value of the cryoring is 1.1 MCHF. It is associated with a cost over-run of ca. 500 kCHF, reported in the supplementary costs. CEA has indicated its willingness to contribute 1 MCHF towards the supplementary cost (details under discussion).

Movable air pads (CORE: 0.3 MCHF + 0.45 MCHF; Germany/MPI)
Movable air pads are needed for moving detector elements during the integration phase and later on, during maintenance and operation periods when the detector system is opened for service access. The CORE value of the air-pads is 300 kCHF. The air-pads are associated with a cost over-run of ca. 450 kCHF reported in the supplementary costs. Discussions are taking place with MPI to see whether the air pads could be provided as an in-kind contribution from Germany; the possible sharing of the over-costs is also being discussed.

Copper JD+JT shielding plugs (CORE: 450 kCHF + 150 kCHF; Australia, Armenia, Serbia, China)
Copper shielding plugs form an integral part of the shielding structures needed to protect the sensitive detector elements from excess radiation levels generated by the colliding beams. The CORE value of the shielding plugs is ca. 450 kCHF. Australia already provides copper shielding plugs as in-kind contribution to be placed inside the LAr cryostats to also protect the Muon chambers. The same raw material can be used for the radiation shielding elements. Armenia, Serbia and China have also indicated their interest to contribute. The shielding plugs are associated with an over-cost of 150 kCHF, reported in the supplementary costs. Discussions are taking place to assess the possibility of contributing towards these supplementary costs.

Solenoid power supply circuit (CORE: 0.9 MCHF; Japan)

The solenoid, which is an in-kind contribution from Japan, is powered through an electrical circuit comprising the 8 kA power supply, two switches, a diode-resistor ramp-down unit, bus bars, earth leak detector, the necessary switch boards and a power supply control unit that connects to the magnet control system. Discussions are on-going with Japan to cover these costs as an in-kind contribution.