STATUS OF THE SC IMPROVEMENT PROGRAMME

(Report presented by B. G. Michaelis at Physics III Meeting of 29.9.71.)

1. Date of the SC Shutdown

The decision to continue MSC Operations until at least April 1972, announced in Dr. Herz's letter of 3rd August, 1971, represents a postponement of the SCIP Shutdown by a minimum of three months.

This decision was not caused by a new delay in the manufacture of the SCIP equipment but represents a change of policy on the part of CERN.

Our previous aim, formulated by Professor Gregory, had been to bring the modified machine into operation as soon as possible by starting the shutdown before the new equipment was complete. It was understood that this involved a risk of the shutdown being lengthened, e.g. if the final tests of the new radio-frequency system should show the need for any modifications before delivery.

The heavy demand for physics time before the shutdown and the danger of possible further delays in the completion of the RF showed a need to revise our policy. A meeting of a number of physics users with the Director General, the Chairman of the Physics III Committee and Professors Steinberger and Schopper agreed that we should aim at the shortest shutdown rather than at the earliest start-up of the modified SC.

To achieve this we must await a significant test of the new RF under conditions resembling as closely as possible those of future operation.
Such a test was planned immediately prior to delivery, i.e., in May/June, 1971. In the light of our new policy this would have meant a delay of the shutdown by nearly six months. To avoid such a postponement CERN suggested performing the full-power test before making the final corrections of the range of frequency modulation.

This proposal has been accepted and the test is now planned for March/April, 1972. If it is successful the shutdown will start immediately; if the test is delayed or shows unexpected difficulties we will be ready to continue operation for a few more weeks.

2. Present Status

Recent information from the manufacturer of the new RF is encouraging:—

- the very complicated machining procedure of the first rotor is completed and balancing is in progress.

- the first rotor housing, a vacuum vessel of nearly 2 m diameter is completed and tested.

- power tests of the high frequency oscillator and modulator have begun.

- fears about excessive power losses in the resonator or in the support insulators have been dispelled.

- machining of the new pump manifold is completed.

Further balancing and running tests before Christmas, 1971, will check the mechanical performance of the rotary condenser and of its drive and controls. The one open major problem will then be to establish if the surface quality necessary to permit high electric fields in the...
condenser has been achieved. The full-power tests in March/April will provide the answer.

The remaining equipment required for SCIP will be available at the end of 1971. Since the report given to this Committee on 12th May, 1971, the welding and leak testing of the new vacuum tank has been completed and the first few epoxy-impregnated pancakes of the new main field coils can be seen in the BEPC Hall.

A proposal for the layout of pion beams from external targets has been worked out by J. Domingo and P. Skarek; it will be briefly explained by Domingo.

3. **Emergency Programme**

Despite the recent progress of the project we cannot altogether dismiss the possibility of a major setback which would prevent us from carrying it out as planned.

To take account of this unlikely development Dr. Herz has already asked in his letter of 3rd August for an emergency programme of physics which would permit continuation of the experimental programme if the SCIP shutdown had to be cancelled. The users' demands for 900 shifts of machine-time against the 400 actually available provide any necessary reserve.

However, there will be a need for a break to rethink the further programme and NSC is making contingency plans for a major NSCIF Shutdown in the latter half of 1972 to meet any possible emergency. During such a shutdown we would install some of the new material whose functioning does not depend on the availability of a new RF system but which could give useful gains in operation.

R. G. Michaelis