

48th Session of CERN Council

The Council met on 15, 16 June under the Presidency of Professor W. Gentner.

Progress Reports

Progress at both CERN Laboratories was covered in reports from Professor W. Jentschke and Dr. J.B. Adams.

At Laboratory I the 28 GeV proton synchrotron has been in fine form and further refinements of its abilities have been achieved. Within recent weeks running in of the Booster has been going smoothly and a new ejection scheme has been successfully tested (both these topics are amplified later in this issue). Performance of the Intersecting Storage Rings has continued to improve and luminosities only a factor of four lower than the design value (4×10^{30} per s per cm^2) have been reached. Peak currents are now 11 A in Ring I and 9 A in Ring 2 and physics runs are possible with sufficiently stable beams in the 6 to 7 A region. No basic limitation on performance has yet been reached. The 600 MeV synchro-cyclotron is supporting a very full

research programme and has developed a technique for sending very short bursts of particles needed for an experiment on the mu-mesic Lamb shift in helium. The improvement programme on the machine is still, unfortunately, in abeyance waiting for the rotary condenser. It is hoped to start final tests on the condenser late summer.

Major detection systems are nearing the time when they will be involved in their first experiments. The Omega spectrometer has one superconducting coil operating and has received its first particles. The Split Field Magnet at the ISR is coming together and should be ready at the end of this year. The large proportional chambers which will be installed in the magnet aperture are being manufactured and a lot of work is going into developing the analysis programmes which will be needed to understand the information that the chambers collect. The large

European bubble chamber, BEBC, is now in the midst of its initial cool down. (This is being done very carefully over a fourteen day period in this first test.) A leak of oil into the helium cooling circuit has caused delays in the commissioning of BEBC and the project is running four or five months behind schedule. It is not now expected to start physics until the middle of next year. The heavy liquid bubble chamber, Gargamelle, has, of course, already had many physics runs with both freon and propane fillings and has yielded some preliminary results of great interest. In particular there is clear evidence of the production of strange particles (such as lambdas and sigmas) in neutrino interactions. Total neutrino cross-section measurements are in line with the simple quark model.

At Laboratory II the number of staff involved in the construction of the SPS

An important event at the Council Session was the approval of the revised Agreement between CERN and France concerning the legal status of the Organization in France. The initial Agreement was signed in 1965 when land was made available to CERN by the French government for the construction of the Intersecting Storage Rings. This land is enclosed with access only from Switzerland. The revised Agreement takes account of the fact that Laboratory II, where the SPS is being built, is largely in France with, of course, access from France. In essence, the Agreement is designed to protect the international status of CERN in all matters relating to its efficient and independent functioning. After the Council Session the Agreement was signed by M. G. Curien (left) representing France and the CERN Directors General Dr. J.B. Adams and Professor W. Jentschke.



CERN 160.6.72

Not strictly related to the latest CERN Council session but very much an affair of Council was a farewell dinner held at the end of May for two of Council's most celebrated delegates who now no longer participate directly in its work.

Edoardo Amaldi from Italy and Gösta Funke from Sweden have both contributed a very great deal to the success of CERN. We have already recorded appreciations of their work (Professor Amaldi vol. 12, page 5, Dr. Funke vol. 9, page 377). At the dinner they were presented with albums

of photographs which traced major events in the life of CERN and incidents in which they were personally involved during the past twenty years. The presentations were made by Professor W. Gentner, the present President of the Council:

1. To Edoardo Amaldi (on Amaldi's right is Dr. J.B. Adams, Director General of CERN Laboratory II) ;

2. To Gösta Funke (on Funke's left is Professor W. Jentschke, Director General of CERN Laboratory I).

has now risen to about 200 and is expected to reach 300 by the end of the year. Two full-size (over 6 m long) model magnets have been built and field measurements are starting. Offers to build the bending magnets have been received from European industry and are now being analysed. It is hoped to adjudicate the contracts in July. Tenders for construction of the quadrupole focusing magnets are expected soon. Work on the magnet power supplies has reached the stage where specifications for the rectifier modules, transformers and passive filters have been written and invitations to tender are being sent out.

Inquiries concerning manufacture of the r.f. accelerating system are also being made. It has been decided that the power amplifiers will be based on the use of tetrodes, contracts to be adjudicated in July. Tests on models of the accelerating structure (which will involve three cavities 20 m long) are continuing. Work on injection, ejection and beam transport has progressed to the stage where design of many components is complete. Some decisions, which are necessary to finalize the beam transport system design, remain to be taken (for example the energy of the beams to be fed to the West Experimental Hall and the method of supplying neutrinos to BEBC). These important decisions will be taken at the meeting of the ECFA Working Group on the SPS experimental programme to be held in Tirrenia in September.

Preliminary enquiries have gone out to a very large number of firms concerning the control system of the accelerator which is based on a hierarchy of computers. (Since the last report on SPS design it has been decided to have the large computer at the top of the hierarchy divided into units each performing comparatively few duties.)



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The most visible activity is on the site itself where construction of the laboratory blocks and assembly hall has started and where the access shafts are being dug. Two of the shafts are now down 45 m and are being joined by tunnelling underground ready to take the 'Mole' — the large tunnelling machine scheduled to arrive in September. In order that the machine can be pointed in the right direction, a very precise geodetic network has been established on the site. A series of survey monuments have been set up and their positioning is remarkably accurate — a standard deviation of 2.4 mm over an area of about 10 km². Negotiations concerning the vital supplies of electricity (Electricité de France) and cooling water (Swiss authorities) are well advanced.

The most invisible activity is the administrative work. This has involved discussions with French and Swiss authorities concerning acquisition of the required land, customs and fiscal arrangements, etc. There have also been many contacts with representatives of local communities since it is aimed to cause as little disruption as possible in the region where the machine is being built. One important step in solving all these complex problems, which come from CERN's unique position of being built across an international frontier, is the revision of the Agreement between France and CERN (see photograph caption on page 195) which puts CERN's legal status in France in order.

Scales of contribution

Every three years the percentage contributions of the Member States to the budgets of CERN are adjusted in accordance with figures on net national income provided by the United Nations Statistical Office. The agreed scales for the years 1972, 73 and 74 are as follows :

	<i>Laboratory I</i>	<i>Laboratory II</i>
Austria	2.06 %	2.07 %
Belgium	3.71 %	3.72 %
Denmark	2.16 %	2.17 %
France	21.55 %	21.65 %
Germany FR	24.59 %	24.70 %
Greece	0.46 %	—
Italy	13.82 %	13.89 %
Netherlands	4.66 %	4.69 %
Norway	1.54 %	1.54 %
Sweden	4.78 %	4.80 %
Switzerland	3.12 %	3.13 %
U.K.	17.55 %	17.64 %

Following the decision of Denmark earlier this year to join in the 300 GeV programme the Council agreed that the total project cost should revert to 1150 million Swiss francs over the eight year construction period as originally foreseen.

Appointments

The Council renewed for three years the appointments of G.H. Hampton as Director of the Administration Department, K. Johnsen as Director of the ISR Department and C. Peyrou as Director of the Physics II Department. E. Picasso was appointed as Leader of the Nuclear Physics Division and L. Resegotti as Leader of the ISR Division. (F. Bonaudi will succeed L. Resegotti at the end of 1972.)

The mandate of the Danish 'Revisions-department' as external auditors expires with the completion of the audit of the CERN accounts for 1972. The Council appointed the Deutscher Bundesrechnungshof to succeed them.

Booster coming smoothly into action

On 26 May the Booster, which is now being commissioned, accelerated protons to the design energy of 800 MeV for the first time. During subsequent runs other systems were successfully brought into play and first measurements on the beam indicate that no unforeseen problems have been encountered. The Booster is well on the way to achieving its design intensity of 10^{13} protons per pulse to feed to the main ring of the synchrotron.

The Booster has been built in the context of the improvement programme at the 28 GeV machine. By boosting the injection energy from the 50 MeV of the existing linac to 800 MeV, the 'space charge limit' of the synchrotron ring will be raised considerably so that beams with intensity in the 10^{13} protons per pulse region can be accepted by the synchrotron rather than the few times 10^{12} reached at present.

A novel design with four superposed rings was evolved. The rings are 50 m in diameter with a separated function magnet structure — bending and quadrupole focusing magnets are separate units, each magnet being in one block with apertures for the vacuum chambers of the four rings. The rings are fed at 50 MeV from the linac for a maximum pulse duration of 100 μ s. A vertical kicker and septum magnets direct protons to the four levels, a 25 μ s pulse feeding each ring (multi-turn injection for fifteen turns). The r.f. system accelerates five bunches of particles in each ring and, after ejection at 800 MeV, septum magnets again come into action to bring the protons to the PS ring. The bunches can be transferred sequentially to establish the twenty bunches which are normally accelerated in the PS. Also, a trick that the Booster has up