

Meetings on experimental support work for the ISR

Meeting n° 1, 18.11.1970

Meetings to coordinate the preparation work for ISR experiments will be held with the attendance of one or more representatives of each ISR group involved. The meetings will take place on Wednesdays at 14h30 in the B3 conference room (French site). It is proposed to have one meeting every week until the end of this year in order that the urgent questions and problems can be cleared. From the beginning of next year, the frequency of these meetings could be once a fortnight.

The following persons were present:

- General Layout / Experimental Support Group: F. Bonaudi (chairman),
E. Herz (responsible for electrical work),
N. Siegel (responsible for intersection I2), (*)
- Magnet Group : S. Pichler
- Vacuum " : E. Fischer, E. Jones, R. Samuel, T. Wikberg
- RF " : M. de Jonge
- BT " : H. Isch
- Engineering " : J.C. Brunet, M. Harris, C. Grünhagel, E. Horisberger,
E. Hugli, G. Leroy
- Survey " : E. Menant
- Controls " : B. Sagnell
- R.S.O. : M. van de Voorde

It was agreed to call in, when necessary, people from other divisions working for ISR experiments. The minutes will be distributed to the attendants to the meetings, the Parameter Committee, Technical Committee, W. Sax (ISR), W. Albrecht (ISC), J.C. Sens (IP).

F. Bonaudi gave a short description of how the physics experimental programme for the ISR was arrived at, of the functions of the ISRC, of

(*) B. Couchman, responsible for intersections I1, I4, I6 was excused from this meeting

which Dr. Jentschke is the chairman. The physics coordinator of the ISR experiments is J.C. Sens.

On 1st January 1971 the Experimental Support Group will come into existence formally, led by F. Bonaudi. The budget foreseen for experimental support work will be communicated to the attendants to this meeting.

General time schedule foreseen for ISR experiments :

The entrance and installation of equipment for experiments into the ISR tunnel will start from the 1st April 1971. No storage or installation of equipment inside the tunnel will take place before that date.

However, it must be clear that the experimental equipment allowed in the Ring must not interfere with the running-in or additional installation of the ISR machine (i.e. stray field affecting ISR orbit, interference with the surveying of the machine, space obstruction which blocks maintenance and repair work on machine components etc.) Installed equipment must also not block further installation of experiments.

The planning of the installation of experimental equipment will be discussed in these meetings. The Experimental Support group will appoint inspectors to control entrance and installation of this equipment.

Counting rooms will be installed on the earth embankment on top of intersections I2, I4 and I6. The following completion dates are foreseen:

- Counting room for I2: Mid-April 1971
- Counting rooms for I4 and I6: Mid-May 1971

Colliding beams for experiments are nominally foreseen from 1st July 1971 onwards. It was pointed out, however, that the running-in period of the ISR will last during the whole year 1971.

E. Jones proposes to discuss soon the second generation chambers for I6. It was agreed to discuss intersections I1, I4 and I6 when B. Couchman, responsible for these intersections, is back again.

Experiments in I2

Experiments in the ISR have been numbered with three digits (first one indicates intersection region, the two last ones identify the experiment) preceded by R (for "Ring"). (See document issued by J.C. Sens, listing all approved ISR experiments and indicating the groups, references and numbers. This document will be distributed).

Experiments in intersection 2 have the following numbers:

- | | |
|---------------------------------------------------------------------------------------------------------|-------|
| 1) Small Angle Spectrometer
(CERN-Holland / Lancaster-Manchester) | R 201 |
| 2) Medium Angle Spectrometer
(Argonne, Bologna, Michigan) | R 202 |
| 3) Wide Angle Spectrometer
(collaboration of British and Scandinavian Universities and Laboratories) | R 203 |
| 4) Muon detector
(collaboration of British Universities and Laboratories) | R 204 |

The general layout of experiments in intersection I2 is shown in drawing ISR 260-217-0.

Status of experimental support work for I2

Vacuum chambers (E. Jones)

The design of the first generation vacuum chamber for crossing point in I2 (installed at present in the machine), was shown (Drawing ISR 251-357-0 E). First generation chambers were designed primarily for ISR machine running-in and take only partly into account the wishes of the experimenters. Details of the design were shown. The reinforcements on the upper and lower side of the central X, leave free regions with diamond shape, located above and below the crossing point, which permit to monitor the crossing of the beams, measure the luminosity with counters etc. The downstream arm of ring 1 has a transition from circular to elliptical cross-section to accommodate experiment R 201 (small angle particle production). The supporting columns have been placed to interfere as little as possible with the layout of the experiments. The supporting of the chambers proper was designed to avoid interference with the production of particles seen by the different experiments.

The main vacuum pumps (SU type) are located on each end of the straight sections of the X. Two additional sublimation pumps are mounted on the chamber, on the muon detector side.

The present chambers are made of stainless steel sheets 1.5 to 2.3 mm thick.

Second generation chambers will be designed to suit particular experiments. For the crossing point of I2, truncated thin-walled cones for the central X and transitions from cylindrical to elliptical cross-section made of thin corrugated stainless steel are

being studied and tested. Supporting will require special attention and external reinforcements on the chambers will have to be used. The number and position of vacuum pumps would be similar to the ones foreseen at present.

A prototype second generation chamber for I2 will be ready by the end of this year. Production of the final chamber will start in Spring 1971 and could be finished by Summer or Autumn 1971.

Signal cables (B. Sagnell)

The ordering and installation of signal cables from the counting rooms (CR) to the intersections (at present I2, I4 and I6) will be carried out by the ISR Control Group. Specifications for the number and type of cables have been given by J.C. Sens.

The proposed lay-out of cable ladders inside the chimneys was presented (drawing n° 605-75-0). The chimneys will be terminated on the top by prefabricated concrete cylinders of same diameter as the chimneys, with vertical slots for the passage of the cables. These cylinders will be closed by concrete discs. A design will be presented as soon as available.

Terminal boards are foreseen inside the ISR ring tunnel (alternatively if convenient in the by-pass tunnel).

Cables running from the terminals in the CR to the terminal boards in the tunnel will be a fixed facility. From these terminal boards, the cables for experiments R 201 and R 202 must cross the ISR machine towards the equipment. Possible passages for these cables will be proposed at the next meeting. The detailed drawings of the CR's will be distributed.

Power supplies (H. Isch)

The power supplies for the I2 experiments will be located on the floor level of the A2 building, with the exception of the two 20 KA power supplies for the septum magnets of experiment R 201. These supplies, at the special request of J.C. Sens, will be installed in the pit of I2. The positioning of these power supplies is under study. Their installation inside the ring will save the construction of a special building which was to house them and makes the 20 KA bus bar shorter. However, serious problems will arise coming from lack of space, reduced accessibility, difficult maintenance, radioactive environment, etc.

The lay-out of the power supplies in the A2 building was shown (drawing n° 602-28-1).

Water cooling (E. Hugi)

The approximate power dissipation of experimental water cooled equipment in I2 will be 3.1 MW. The cooling water will be obtained from the existing cooling plant, which has sufficient reserve capacity. The required pressure drops across the cooling circuits of the experimental water cooled magnets and power supplies are not uniform. Equipment for $\Delta p \leq 5$ atm will be cooled from one of the ISR auxiliary circuits. Taps will be made on these circuits during the present shutdown. Equipment for $\Delta p > 5$ atm will be cooled from a special line (nominal pressure 25 atm) which must be installed. This line will come directly from the cooling plant (using the capacity originally foreseen for TT 3) via the tunnels TP 3, TL 42, TA, TL1 and TL 2.

The proposed lay-out of the 25 atm line and of the pipes for cooling experimental equipment in I2 were shown. The 25 atm line will be ordered by the end of February 1971. The order would include a fixed price part and a part executed on a unit price basis.

E. Hugi asked for the following information:

1. Cooling requirements for power supplies in A2 building (this is contained in a table compiled by H. Isch)
2. Allowable temperature rise in each water cooled component in I2 (N. Siegel will collect this information).
3. The 20 KA bus-bars (aluminium tubes) could be cooled with raw water. Cooling requirements and location of bus-bars (connections) are requested (B. Couchman will supply this information on his return).

The next meeting will be on Wednesday 25th November 1970 at 14h30 in the same place. The discussion of intersection I2 will be continued. No special invitation will be sent.

N. Siegel

Distribution (open)

Attendants to the meeting
 ISR Parameter Committee
 ISR Technical Committee
 W. Sax (ISR)
 W. Albrecht (ISC)
 J.C. Sens (IP)