

INFORMATION RECEIVED FROM IHEP ON MY LAST VISIT TO SERPUKHOV
(15.2.71 - 5.3.71)

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A. BUILDING AND CONSTRUCTION

1. In accordance with item A.1 of TN-258^{*)}, IHEP transmits to CERN an installation drawing of the supports for the hydraulic tubing from the exit of the tube trench to the foundation of the actuator (drawing M8-8032).
2. In accordance with item A.3 of TN-258, IHEP confirms finally the dimensions and the position of the supporting plate of the actuator in SS 24 (drawing 1024-3).
3. In accordance with item A.4 of TN-258, IHEP submits to CERN the engineering drawings of all foundations in SS 16 (drawings 1017-3 and 1018-3), SS 24 (drawing 1020-3), and in SS 26 (drawing 1019-3).
4. In accordance with item A.5 of TN-258, IHEP transmits to CERN an up-to-date plan (drawing M8-18304) of the pump station and of its sections (drawing M8-18309).
5. In accordance with item A.6 of the TN-258, IHEP transmits to CERN the design of the double floor for agreement, namely :
 - a) the installation plan of the supports and beams of the double floor (drawing M8-18661);
 - b) the installation plan of the plates (covers) of the double floor (drawing M8-18662).
6. IHEP transmits to CERN for information the plan and sections of the auxiliary rooms (drawing M8-18305) and the external views of the ejection building (drawing M8-18310).

*) Minutes of technical discussions on fast ejection dated 14.12.1970.

B. CABLE PLAN

1. In accordance with item B.5 of TN-258, IHEP communicates to CERN the position of the cable terminals (2 standard racks) for SS 16, SS 24, SS 26 (drawings 1028-3, 1027-3, 1026-3, respectively).
2. IHEP requests CERN to submit the final cable plan as soon as possible (items B.1, B.2 and B.11 of TN-258).

C. SUPPLY WITH COOLING WATER, COMPRESSED NITROGEN AND COMPRESSED AIR

1. IHEP informs CERN that the cooling system for the hydrostatic bearings in SS 24 will be supplied with not more than 10 liters per minute of an ordinary water with a temperature of $7 - 8^{\circ}\text{C}$.
2. IHEP transmits to CERN the specifications for the normal nitrogen bottles with a filling pressure of 150 kg/cm^2 (appendix A), which will be used for the nitrogen filling of the vacuum tanks. As for the charge of the hydraulic accumulators from nitrogen bottles with a pressure of $190 - 200 \text{ kg/cm}^2$, this problem seems to be rather serious since the stationary compressors used at IHEP cannot give more than 150 kg/cm^2 . This is why IHEP requests CERN to consider the possibility to reduce the filling pressure of the accumulators.
3. IHEP informs CERN that the pressure in the air main is equal to 20 kg/cm^2 and the spark gaps will be supplied with the compressed air through the corresponding reductor.

D. TRANSPORT AND INSTALLATION OF FES EQUIPMENT

1. IHEP transmits to CERN the transport conditions offered by the Soviet companies concerned (see TN-278). CERN is requested to send the necessary specifications (dimensions, weight, precautions, etc.) for all FES equipment to be transported. For the BTS and RF separator equipment such information has been received.
2. IHEP transmits to CERN the specifications for the crane (appendix B) used in the ring hall up to SS 26. CERN will be given full priority for the utilization of the crane. IHEP requests CERN to distinguish separately the specifications mentioned at the previous item for the FES equipment which has to be installed in the ring hall. This information is needed to choose the suitable method for delivering the equipment and putting it in its place. IHEP would like to receive from CERN the installation plan with indication of the necessary man-power, mechanisms and materials, to be prepared in advance.
3. In accordance with item F.5 of the TN-258, IHEP transmits to CERN a written forecast of the radioactivity levels in SS 16, SS 24, SS 26 and SS 28 for the summer shutdown of 1971 (appendix C).

E. CONTROL ROOM

1. In accordance with item D.1 of the TN-258, IHEP communicates to CERN the final layout of the LCR (drawing 1023-3).
2. In accordance with item D.3 of TN-258, IHEP transmits to CERN the final design of the CCD which is already ordered (drawing 01-05). IHEP requests CERN to send more detailed information about the CERN display panels on the CCD (the front and rear views, the dimensions, the cable communications, etc.).
3. In accordance with item D.4 of TN-258, IHEP transmits to CERN for information the front view of the display racks in the MCR (drawing 1022-3) and requests CERN to send the information mentioned in the previous item concerning the CERN display panels proposed for the MCR.
4. IHEP will put the 50 data link cables between the LCR and the MCR.

F. BEAM DIAGNOSTICS

1. Problems concerning the TV system

- a) According to item E2 of TN-258, IHEP transmits to CERN the drawing 1025-3 of the 19 inch panel with 3 small auxiliary receiver screens and remote channel selection buttons which will be placed in the fast ejection racks. IHEP urgently needs to know the exact position of this panel to determine the length of the cables.
- b) According to item E4 of TN-258, CERN considers the transfer optics and location and supports of the cameras. For this purpose IHEP confirms the following parameters of the cameras :

| | |
|--------------------------------|------------|
| focal length of objective | 85 mm |
| relative aperture of objective | 1 : 2.5 |
| size of vidicon | 24 × 32 mm |

IHEP would like to receive from CERN the drawings of the camera supports as soon as possible to have sufficient time to manufacture them.

- c) According to item E5 of TN-258, CERN considers the possibility of the temporary installation of the flipping screen inside the enlarged electrostatic pick-up vacuum box at the end of magnet unit 28. IHEP requests CERN to furnish this replaced part, using the ready-made CERN flipping screen since it is too late now to design and manufacture the latter at IHEP.

2. Problems concerning the beam transformer

- a) According to item E6 of TN-258, IHEP transmits to CERN the sketch of the insulated piece of vacuum chamber in SS 14 for the "internal" beam transformer (appendix D). Ordinary plexiglass has been chosen as insulator taking into account the experience of the IHEP vacuum group. However, IHEP would like to know CERN's opinion on material and construction proposed.
- b) IHEP requests CERN to consider the possibility of the installation of the similar beam transformer for the channel C and of the utilization of the same electronics as for the channel A to calculate the FES efficiency for the channel C as well.

3. Problems concerning the beam profile monitor

CERN requested IHEP to communicate the radiation level around the accelerator, averaged for a normal run, to place the transistorized head amplifiers as near as possible to the BPM detectors. IHEP transmits to CERN the rough estimation of the radiation conditions during the run :

| | |
|-------------------------------|----------------------|
| on the floor of the ring hall | 1 to 10 rad / hour |
| on the shielding of the ring | |
| in the experimental hall | 0.1 to 1 rad / hour. |

G. OTHER PROBLEMS

1. IHEP agrees with CERN's proposal for the layout of the pulse transmission system for the septum magnets SM 24 and SM 26 described in TN-269, drawings 306-143-0 and 306-150-0.
2. IHEP communicates to CERN the following information about the IHEP program sequencer :
 - a) the output line voltage :

| | |
|--------------------|----------|
| "inhibit" state | + 5.8 V |
| "permission" state | + 0.1 V. |
 - b) the output line current ("inhibit" state) not more than 30 mA.
 - c) the output line state is started by the pulse "RESET" (~ 100 ms before the pulse "START").
3. IHEP communicates to CERN the present durations of the time intervals of the IHEP PS magnetic cycle to know whether they are long enough for the execution of the calculation part of the PDP-8/L program :

| | |
|---|----------|
| fall time of the magnetic field | 2.6 sec |
| pause | 1.5 sec |
| rise time of the magnetic field (to an energy of 30 GeV) | 1.1 sec. |

Bottles for storage and transport of nitrogen under
pressure of 150 kg/cm²

The bottles are made of a carbon steel or an alloy steel with geometric volume of 0.4 to 55 litres. The 40 litre bottles are mostly used.

Specifications of the 40 litre bottles

| type | dimensions (mm) | | | weight (kg) |
|------|------------------------|-------------|---------------|----------------|
| | wall thickness S | length l | diameter D | |
| 150 | 7.0 | 1390 | 219 | 60 |
| 150A | 5.2 | 1340 | 219 | 43.5 |

The bottle valve has a stamped brass body with a side nipple of the 3/4" right-hand pipe thread to connect a reductor.

Specifications of the auxiliary lift of the bridge crane

| | |
|---|-------------------|
| Lifting capacity | 2 tons |
| Lifting speed | 8 m/min |
| Transversal speed | 20 m/min |
| Speed on the rails | $V_1 = 29$ m/min |
| | $V_2 = 9,4$ m/min |
| Full lift from the mark of -2.15 | 3650 mm |
| Distance between the hook and the crane rails | |
| a) of external radius | 750 mm |
| b) of internal radius | 950 mm |

Manual control from remote control box.

For information

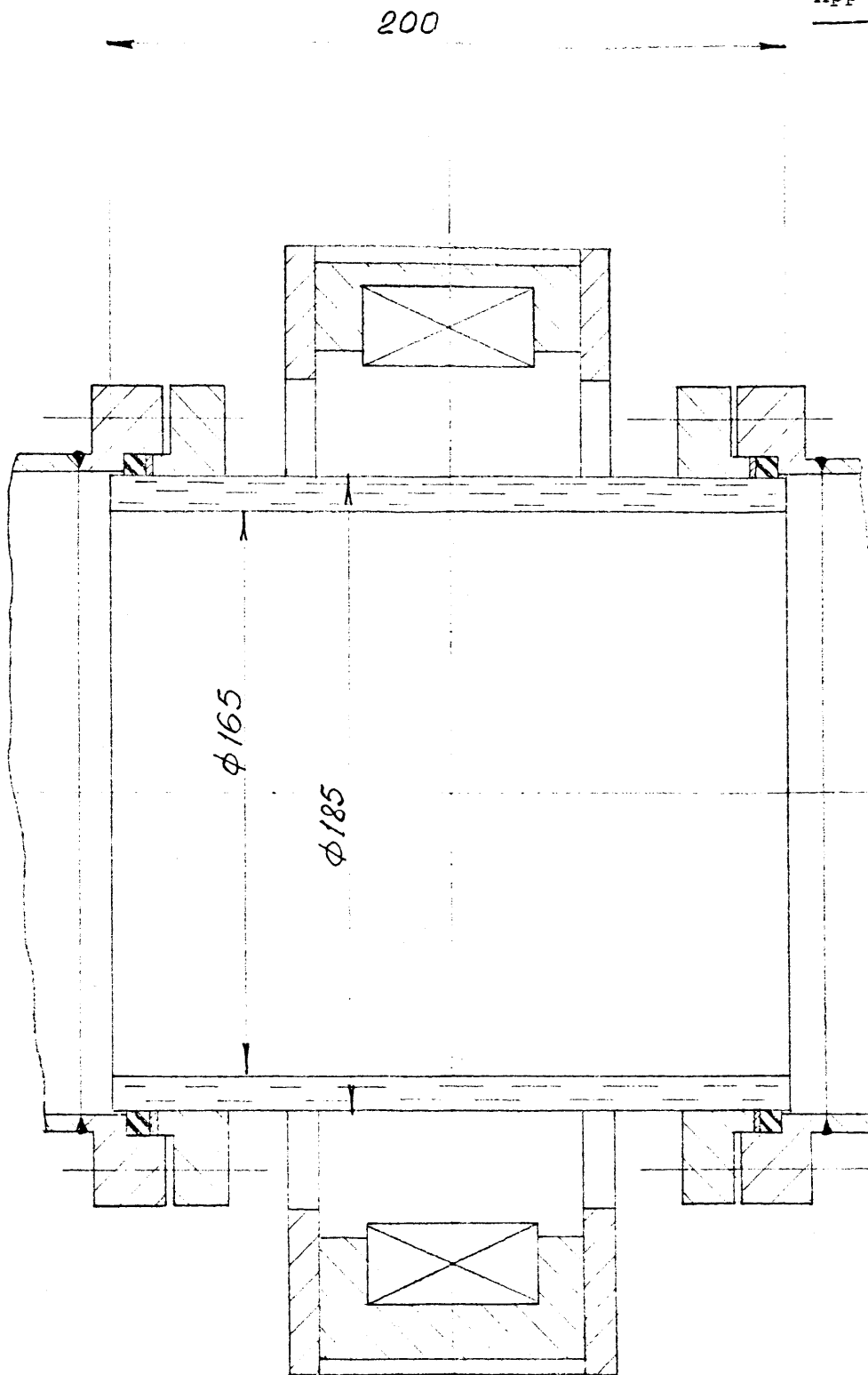
The lifting speeds of the main lift of 40 tons are equal to 1.7 m/min and 0.385 m/min.

Forecasted radioactivity levels for summer shutdown of 1971

| straight section | | radioactivity level (mrad/hour) | | |
|------------------|------|---------------------------------|-------------------------------|--|
| No | edge | just after the stopping | | in week after the stopping on vac. chamber |
| | | on vacuum chamber | 0.5 + 1 m from vacuum chamber | |
| 16 | up | 200 | 5.0 | 20 |
| | down | 10 | 0.25 | 1 |
| 24 | up | 30 | 0.75 | 3 |
| | down | 1000 | 25.0 | 100 |
| 26 | up | 300 | 7.5 | 30 |
| | down | 200 | 5.0 | 20 |
| 28 | up | 500 | 12.5 | 50 |
| | down | 200 | 5.0 | 20 |

Note :

The radioactivity levels are decreased 2 to 3 times when the straight sections are demounted.



Insulated piece of
vacuum chamber in SS 14
scale 1 : 2