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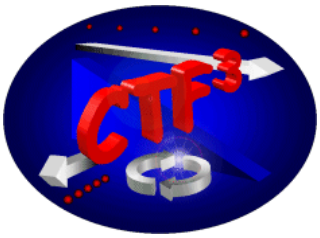

CTF3-Note-079

MINUTES OF FRASCATI MEETING FOR THE TRANSFER LINE TL1 AND THE COMBINER RING OF CTF3

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Abstract

This note gives a summary of the meeting held at Frascati on 31st July and 1st August 2006 concerning the CERN/LNF Collaboration for the Transfer Line TL1 and the Combiner Ring of CTF3.

Geneva, Switzerland
11 September 2006

1. INTRODUCTION

The participants were:

From LNF/INFN: C. Biscari, G. Fontana, A. Ghigo, A. Zolla, V. Lollo

From CERN: N. Chritin, J. Hansen, L. Rinolfi.

The goal of the meeting was to make a detailed review of all components to be delivered at CERN, with the corresponding deadline and review the planning of installation accordingly.
Annex 1 gives the Agenda.
Annex 2 gives the layout of the Transfer Line TL1 and Annex 3 the layout of the Combiner Ring CR with names.

We started the meeting checking the CERN and Frascati layouts. The layouts are identical; they have the same circumference and each straight section and bending have the same length.

2. TL1

- A problem was discovered in the region of the vacuum chamber inside the bending magnet CT.BHE 0540.
INFN proposes to move the CT.BPR0532 to make space for a new vacuum chamber to avoid a step inside the vacuum chambers after the bending magnet.
Action: choose between 3 solutions:

1. Use special adapter made by Nicolas
2. Move BPR to make room for taper.
3. Make taper inside bending chamber.

We choose solution 3. Therefore INFN will make everything including bending chamber.
INFN will send the new drawing of the vacuum chamber as soon as possible to Nicolas.
Action: INFN

- The tapers on each side of the sector valve CT.VVS 0752 in the TL1 line is under the responsibility of CERN. The total length VVS + 2 Tapers = 535 mm.

- INFN will remove two bellows in the straight section of the TL1 line between:
CT.BHE 0540 and CT.VPI 0600
CT.DHF/DVF 0755 and CT.BPI 0758
(Bellows were foreseen in Nicolas layout)

3. COMBINER RING

3.1 RF deflector:

- According to the drawings, the RF deflector have DN63 flanges with an external diameter of 113 mm. Gianni will inform Nicolas which flanges are fitted on the RF deflectors CR. HDS 0150 and CR.HDS 1050.

Action: Gianni

3.2 Sector valves:

- Nicolas will provide the necessary chambers and supports to replace the missing sector valves CR.VVS 0196 and CR.VVS 0680.

Action: Nicolas

3.3 Installation of vacuum chambers in all magnets:

- We have checked that the 2 vacuum chambers foreseen in the Q*J quadrupoles should be cut in 3 parts in order to insert the vacuum chamber inside these quadrupoles. This action should be done for the four quarters of the ring. Gianni will check that we can insert the vacuum chambers in all magnets after the magnets are installed.

Action: Gianni

3.4 Change of vacuum chamber profile

- INFN proposes to change large parts of the straight sections to racetrack in both regions of injection and ejection. (See layout drawing with Nicolas).
- Andrea will contact Gunther in order to check if CERN is willing to advance the money (for BPI instead of BPM) in case this proposal is accepted.

Action: Andrea

4. GENERAL REVIEW

4.1 Vacuum

4.1.1 Bending vacuum chambers:

- Frascati has changed the height of the bending chambers from 37 mm down to 36 mm.
- The clearance between the poles and the vacuum chamber is 0.2 mm.
- The bending vacuum chambers have been ordered.

4.1.2 Layouts and production drawings:

- INFN will put all drawings in 2D and in 3D on the download area.

Action: INFN

4.1.3 Curved vacuum chambers:

- All chambers must have a split flange so they can be inserted into the dipoles.

Action: Gianni

4.1.4 Straight Vacuum chambers
- There will be about 8 different lengths of vacuum chambers.

4.1.5 Bellows:
- Initially it was foreseen 10 bellows in TL1. After discussions, this number has been reduced to 8. LNF has ordered 30 bellows in total and cannot make another order this fiscal year. Therefore it remains: 30 – 8 = 22 bellows for the Combiner Ring.

4.1.6 Shielding for CERN bellows:
- Nicolas will make a drawing of each shielding. There are 3 types: 1 for diameter 40 mm bellow, 1 for BPM bellow, 1 for VPI bellow in the CT line. The inner diameter should be minimum 39 mm. CERN and INFN (in parallel) will check the best delay to make the shielding.
Action: First Nicolas, then INFN and CERN

4.1.7 Tapers
- LNF has foreseen 8 short tapers with L = 342 mm. After analysis, LNF has requested a minimum length of 400 mm for all tapers. After a careful review, there will be 8 tapers in the CR and INFN will make these tapers 400 mm long.
Action: INFN

4.1.8 Seals:
- INFN will provide all the seals for the installation (estimation of 300 roughly).
Action: INFN

4.1.9 Nuts Bolts and Washers:
- CERN will order this material when INFN has provided the length and amounts of bolts. Andrea will use the CERN Team Account budget to pay this contribution.
Action: First INFN and then AT/VAC

4.1.10 Problems with pumping ports:
It was observed that the pumping port in production is not the latest version. The length defined by Nicolas to connect to the VPI is L = 225 mm. INFN will send the drawing with updated information.
Action: INFN

4.1.11 Weight constraints on pumping port:
Nicolas will check the weight of VPI to see if the pumping port is strong enough to support the pump.
Action: Nicolas

4.1.12 Impedance:
5 unshielded bellows with 10 convolutions (CERN type) is equal to 1 RF deflector.

4.2 Beam Diagnostic

4.2.1 BPI:
Manufacturer: Kyocera
(Drawing number: GMM-A6123A)
28 ceramics have been ordered to Kyosera on 27 June 2006. There requested 11 weeks for fabrication. Therefore they are expected to LNF at the end of September.
Taking into account the BPI ordered for CERN, a total of 62 flanges have been ordered.
Action: INFN

4.2.2 Move BPIs:
INFN will take contact with Frank Tecker to check if INFN can move (one or two) BPIs to make longer vacuum chamber in the TL1 Line.
INFN will send their proposal to Frank and Frank will forward the proposal to Nicolas if he agrees.
Action: INFN, Frank and Nicolas.

4.3 Manpower

4.3.1 Manpower needs:
Andrea mentioned that 2 vacuum persons + 1 mechanical + 4 other persons worked 3 weeks to install the Delay Loop vacuum system. So to install the TL1 and the CR in two month we will need permanent 5-6 people.

4.3.2 Manpower from INFN:
LNF/INFN will provide 1 mechanical person full time during the installation and hope to provide another one (or two?) person starting from October to the end of November 2006.
Action: INFN
CERN will provide 1 mechanical person + 1 vacuum person + support from Transport group + support from Surveyors group.
Action: CERN

4.3.3 Next Meeting:
Andrea and Gianni will come to CERN the first week of September to implement all the modifications of the layout.
Action: INFN and CERN

5. DELIVERY DATES FROM FRASCATI
(ALL DATES ARE CALCULATED DATES, NOT CONFIRMED DATES.)

5.1 Bending vacuum chambers:

16 chambers shipped directly from company to CERN	At CERN 20 Oct 06

5.2 Pumping ports:

14 pumping ports from company to CERN (Race track with multi ports)	At CERN 20 Oct 06
14 pumping ports from company to CERN (Race track simple ports and rounds type)	At CERN 01 Nov 06

5.3 Wiggler chamber:

Delivery	At CERN 06 Nov 06

5.4 Bellows:

15 bellows delivered from company to CERN	At CERN 06 Nov 06
15 bellows delivered from company to CERN (This last order is not yet issued).	At CERN 29 Nov 06

5.5 Chambers and tapers:

19 straight vacuum chambers and 2 tapers	At CERN 06 Nov 06
30 straight vacuum chambers and 6 tapers (This last order is not yet issued).	Date unknown

All chambers are delivered directly to CERN cleaned, leak tested and baked according to INFN specification.

5.6 BPIs:

14 BPIs (+ 3 already ordered) are delivered at INFN	At INFN 16 Sep 06
Metallization, assembly and shipment	At CERN 16 Oct 06
11 BPIs are delivered at INFN	At INFN 30 Oct 06
Metallization, assembly and shipment	At CERN 20 Nov 06

5.7 Delivery date of the vacuum components from CERN: 30 October 06

5.8 Supports for vacuum chambers:
Nicolas has ordered all vacuum supports for the arcs, these supports should have been delivered the 1st of July 06, but they will arrive probably the 1st of September 06. Nicolas estimates that we have enough support even if we decide to make the straight sections with race track profile.

6. CTF3 NEW SCHEDULE

After having analyzed the status of the delivery of components, it was obvious that the CTF3 schedule which foresees to close the machine at the end of September 2006 (with the installation of TL1 and Combiner Ring completed) became obsolete.

LNF/INFN requested to continue the installation until the end of the year 2006 in continue in order to finish the installation of TL1 and CR.

CERN proposed to complete only TL1 in order to send beam in TL1 and CRM line this year. Since the CERN Services will stop on 8 December 2006, it is necessary to close the machine at the end of October, in order to have enough time to perform all necessary hardware tests and do some beam measurement before the 8 December. After a careful analysis, it was also obvious that it would be not possible to have all components ready on time (15 October 2006) to complete the TL1 installation for the end of October 2006.

7. SPARC EMITTANCE MEASUREMENT

A short visit to the facility which allows making emittance measurements from the RF gun for SPARC was done. The idea was to discuss the possibility to get this device (or some components) at CERN to perform emittance measurements for the CTF3 RF gun. LNF/INFN agrees to loan this device to CERN after November 2006 when SPARC will have completed their measurements.

CERN thanks warmly LNF/INFN for this proposal.

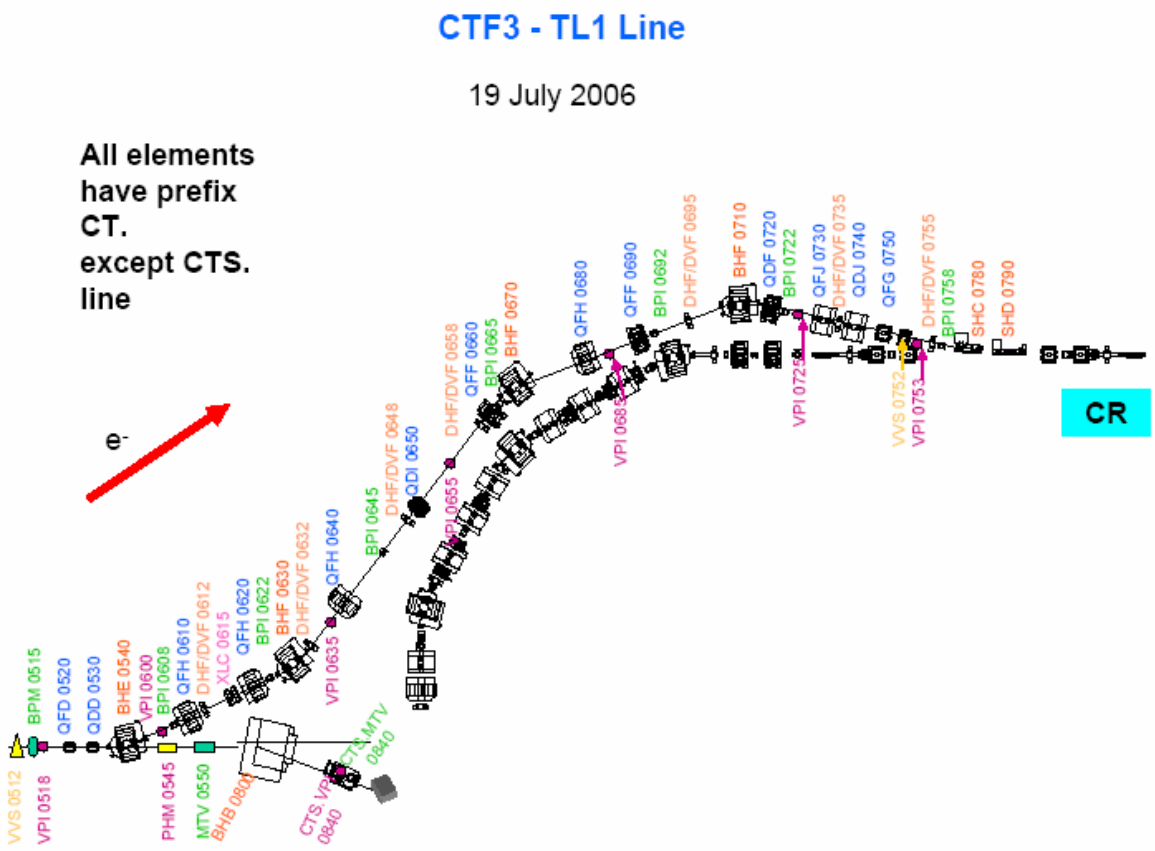
Annex 1

Agenda:

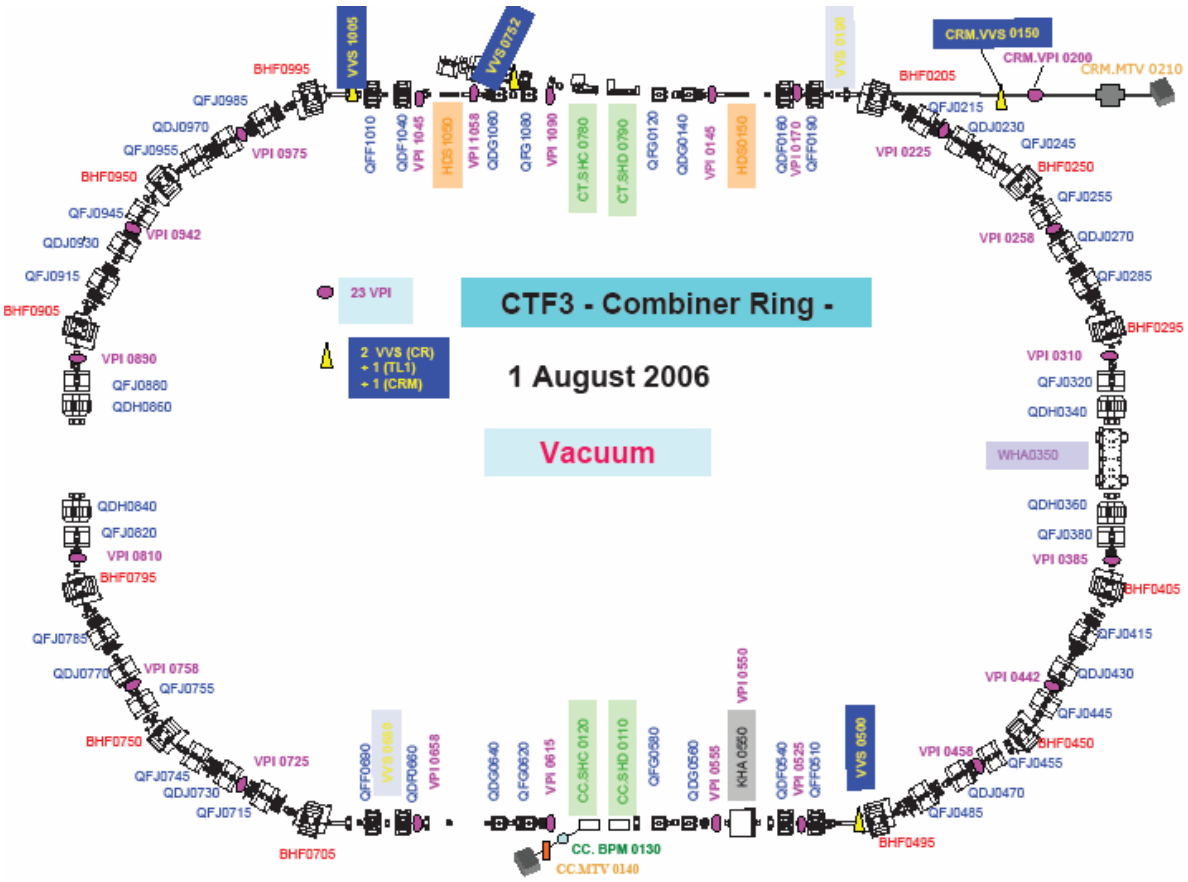
0) Presentation of the general vacuum layout (2D and 3D) by Nicolas
1) Fabrication drawings of all TL1 and CR components (vacuum chambers, pumping ports, bellows,...).
2) Status of all vacuum valves (shielded and not shielded)
3) Positions in the Transfer Lines and Combiner Ring (=> Vacuum chambers and supports for empty places)
4) Status of the shielded pumping ports and bellows (CERN type)
5) Planning for the delivery of each type of vacuum chambers (curved, ...)
6) Planning for the delivery of BPI (Delay Loop, TL1 and Combiner Ring)
7) Status of the different orders
8) Interfaces (and limits) between INFN/CERN at injection and ejection regions
9) Review of what CERN should provide for TL1 and CR (supports,...)
10) Review of the general vacuum layout (after the above exercise)
11) Status of the impedance issues
12) Who supply seals, nuts, bolts ? (=> cost)
13) Approbation of final vacuum layout by INFN and CERN
14) Review of Installation planning
15) Support foreseen from INFN during the installation period
16) Collaboration for assembling the 5 BPI coming from CERN (ceramics,...)
17) AOB.

Extra: Data for the beam diagnostic (multi slits mask) from SPARC

Annex 2


CTF3 - TL1 Line
19 July 2006
All elements have prefix CT. except CTS. line
e-
CR
VVS 0512
VPI 0518
BPM 0515
QFD 0520
QDD 0530
BHE 0540
VPI 0600
BPI 0608
QFH 0610
DHF/DVF 0612
XLC 0615
QFH 0620
BPI 0622
BHF 0630
DHF/DVF 0632
QFH 0640
BPI 0645
DHF/DVF 0648
QDI 0650
DHF/DVF 0658
QFF 0660
BPI 0665
BHF 0670
QFH 0680
QFF 0690
BPI 0692
DHF/DVF 0695
BHF 0710
QDF 0720
BPI 0722
QFJ 0730
DHF/DVF 0735
QDJ 0740
QFG 0750
DHF/DVF 0755
BPI 0758
SHC 0780
SHD 0790
VPI 0725
VPI 0753
PHM 0545
MTV 0550
BHB 0801
CTS MTV 0840
CTS VPI 0840

Annex 3


CTF3 - Combiner Ring -
1 August 2006
Vacuum
23 VPI
2 VVS (CR)
+ 1 (TL1)
+ 1 (CRM)
VVS 1005
VVS 0752
VVS 0135
CRM.VVS 0150
CRM.VPI 0200
CRM.MTV 0210
BHF0995
QFJ0985
QDJ0970
QFJ0955
VPI 0975
BHF0950
QFJ0945
VPI 0942
QDJ0930
QFJ0915
BHF0905
VPI 0890
QFJ0880
QDH0860
QFF1010
QDF1040
VPI 1045
HDS1050
VPI 1058
QDG1060
QFG1080
VPI 1090
CT.SHC 0780
CT.SHD 0790
QFG0120
QDG0140
VPI 0145
HDS0150
QDF0160
VPI 0170
QFF0190
BHF0205
QFJ0215
VPI 0225
QDJ0230
QFJ0245
BHF0250
QFJ0255
VPI 0258
QDJ0270
QFJ0285
BHF0295
VPI 0310
QFJ0320
QDH0340
WHA0350
QDH0360
QFJ0380
VPI 0385
BHF0405
QFJ0415
VPI 0442
QDJ0430
QFJ0445
BHF0450
VPI 0458
QFJ0455
QDJ0470
QFJ0485
BHF0495
QDH0640
QFJ0620
VPI 0810
BHF0795
QFJ0765
QDJ0770
VPI 0758
QFJ0755
BHF0750
VPI 0725
QFJ0745
QDJ0730
QFJ0715
BHF0705
QFF0680
VVS 0680
QDF0660
VPI 0658
QDG0640
QFG0620
VPI 0615
CC.SHC 0120
CC.SHD 0110
QFG0580
QDG0560
VPI 0555
VPI 0550
KHA 0550
QDF0540
VPI 0525
QFF0510
VVS 0500
CC. BPM 0130
CC.MTV 0140