

|  |   |                                     |  |                                  |
|--|---|-------------------------------------|--|----------------------------------|
| 1. PROJECT CODE<br><b>ALICE</b>                |   | <b>ALICE TASK DESCRIPTION</b>       |  |                                  |
| 2. EDMS ID.                                    |   | 3. TASK NO.<br><b>MNF201026_001</b> |  | 4. PAGE<br><b>1</b> OF <b>17</b> |
| 5. DISCREPANCY REPORT SHEET(S) NUMBER(S)       |   |                                     |  |                                  |
| 6. CATEGORY<br><b>DETECTOR</b>                 |   | 7. PART NAME                        |  | 8. SERIAL NUMBER                 |
| 9. APPLICABLE DOCUMENTS                        |   |                                     |  |                                  |
| 10. TASK TITLE <b>Miniframe reinstallation</b> |   |                                     |  |                                  |
| 11. OPER<br>SEQ. NO.                           | 12. OPERATIONS<br>(Print, Type, or Write Legibly)   |                                     |  | 13. NOTE QA/PE                   |
|  | <b><u>SCOPE</u></b>   |                                     |  |                                  |
|  | <p>The purpose of the present document is to provide information and guidelines for the reinstallation of the miniframe (14T) and neighboring structures such as MCTS or compensator magnet platform (CMP).</p> |                                     |  |                                  |
|  | <p><b><u>WARNING</u></b></p> <p><b>This procedure requires working in a radiation supervised area, lifting operation and working at height. All Safety regulation and procedures must be followed</b></p>       |                                     |  |                                  |
| 14. ORIGINATOR                                 |   | 15. TASK PROJECT ENGINEER           |  |                                  |
| <b>Antonio Lafuente Mazuecos</b>               |   |                                     |  |                                  |
| 16. ALICE PROJECT ENGINEER                     |   | 17. QUALITY-SAFETY ENGINEER         |  |                                  |
| <b>Corrado Gargiulo</b>                        |   | <b>Elisa Laudi and Klaus Barth</b>  |  |                                  |
| 18. ALICE INTEGRATION                          |   | 19. ALICE TECHNICAL COORDINATOR     |  |                                  |
| <b>Antonio Lafuente Mazuecos</b>               |   | <b>Arturo Tauro</b>                 |  |                                  |
| 20. TASK CLOSED ACCEPTANCE SIGNATURE           |   |                                     |  | 21. DATE                         |
| APPROVAL (Printed or Typed and Signed)         |   |                                     |  |                                  |

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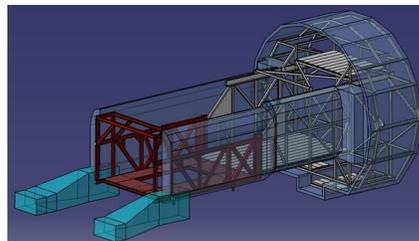
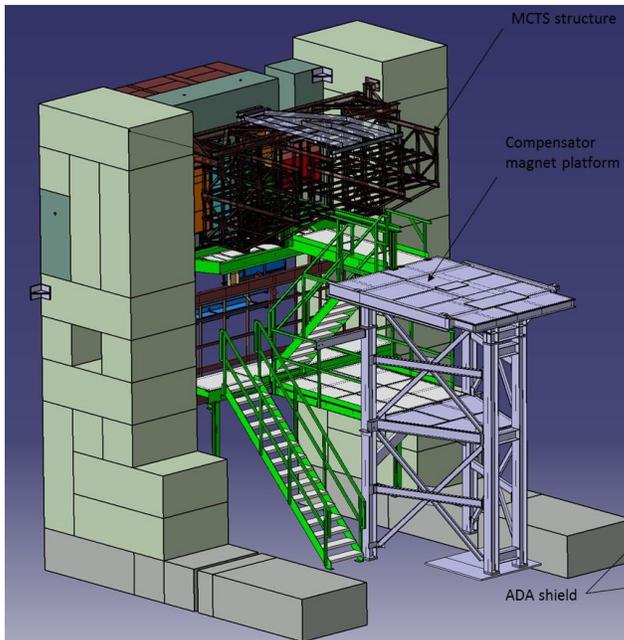
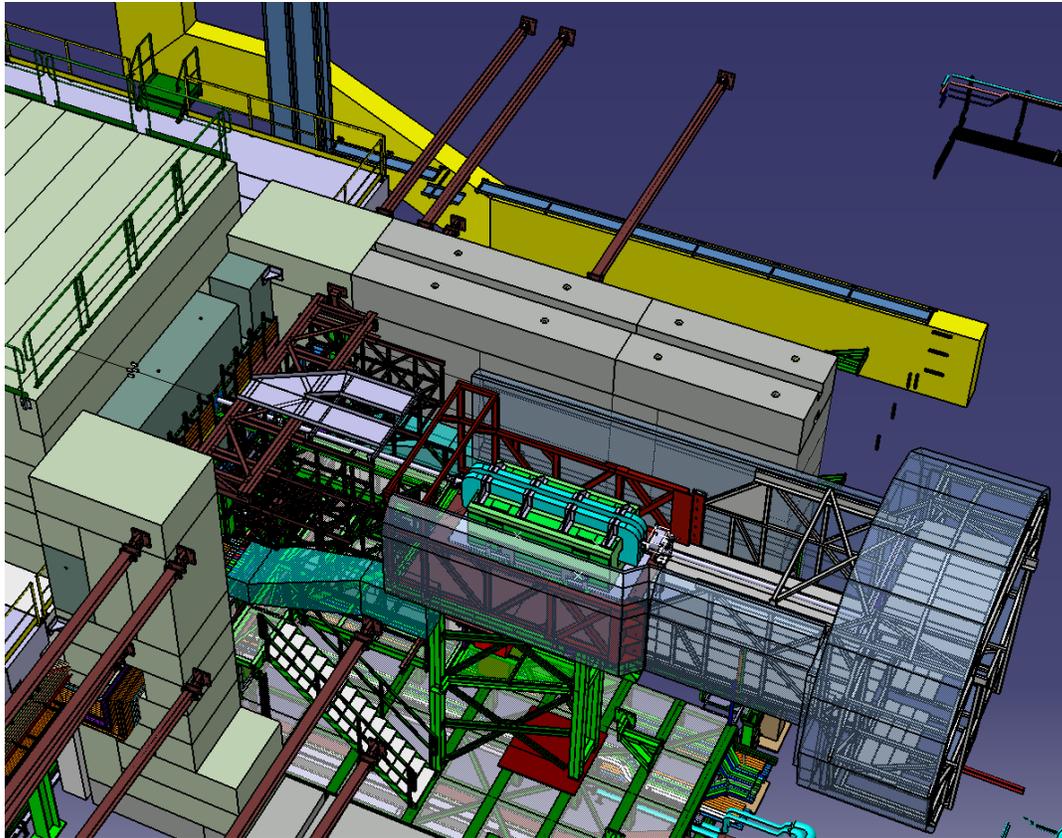
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13. NOTE QA/PWE



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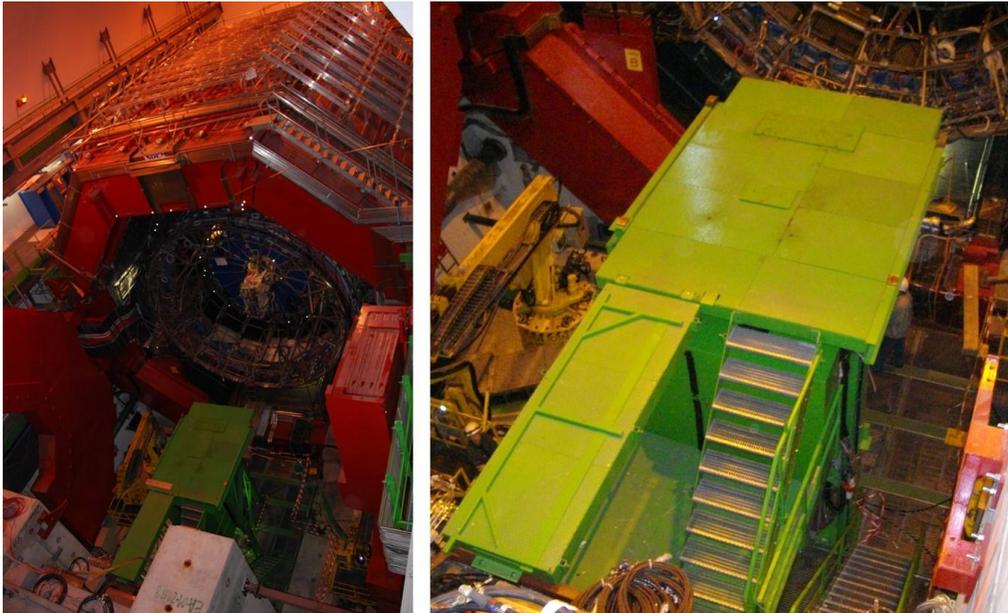
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13. NOTE QA/PWE

1. Open this Task Sheet.
2. Preliminary operations
  - 2.1 Remove scaffolding from PP0
  - 2.2 Remove scaffolding from Miniframe
  - 2.3 Coil and tidy-up all cables and services on Miniframe and leave ready for transport
3. Compensator magnet platform re-installation



- 3.1 Remove guard rails needed to provide space for compensator magnet platform and Miniframe from low beta platform. Install fall arrestor on the platform

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13. NOTE QA/PWE



3.2 Lift CMP and move it to low beta platform. Change crane and bring it to its final position



3.3 Engage fixations

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13. NOTE QA/PWE



Note that in this occasion the two lasers will be moved along with its power supply on a pallet at a later location

3.4 Re-install laser hut access gangway

3.5 Re-install upper gangway and staircase



4. Miniframe reinstallation

4.1 Check that no connections constrain the Miniframe motion

4.2 Install the Miniframe lifting frame

Miniframe lifting frame must be installed by parts following the right order. All cables and pipes should be removed at this stage to avoid any interferences

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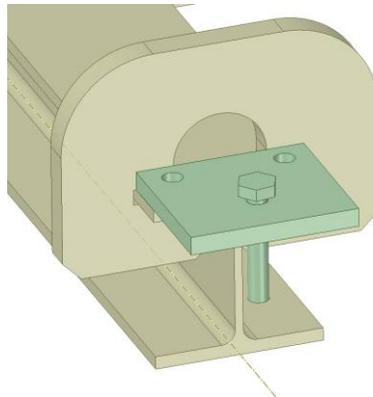
11. OPER  
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13. NOTE QA/PWE



- 4.2.1 Disassemble the jig and bring the central beam to the miniframe
- 4.2.2 Suspend arm number 1 from the Miniframe at the innermost position (shifted towards the front) with respect to attachment points in the central beam. This will leave more space to fold the cables inside the Miniframe

The new bearing plates must be mounted and pre-adjusted for this.



- 4.2.3 Suspend arm number 2 at its corresponding position by means of the bearing plates
- 4.2.4 Slide arm number 4 onto its corresponding position and fix it to the central beam. Bearing plates should not be installed in this case

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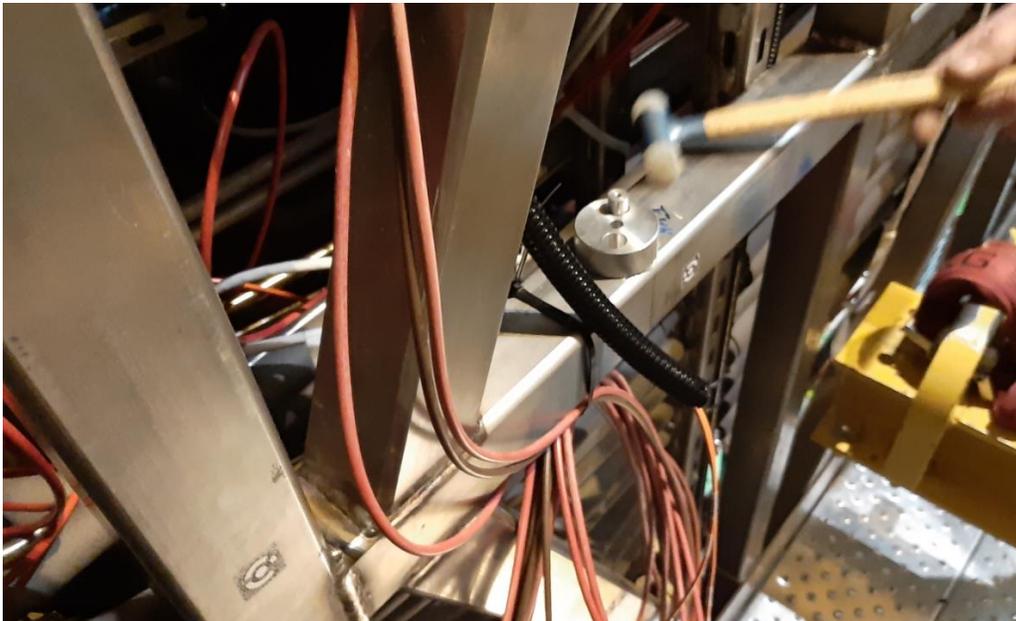
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13. NOTE QA/PWE



- 4.2.5 Lift central beam plus arm number 4. Once in position secure it by adding the bearing plate and connect it to the other two arms already suspended from the Miniframe



- 4.2.6 Install arm number 3
- 4.2.7 Install the load-bearing brackets

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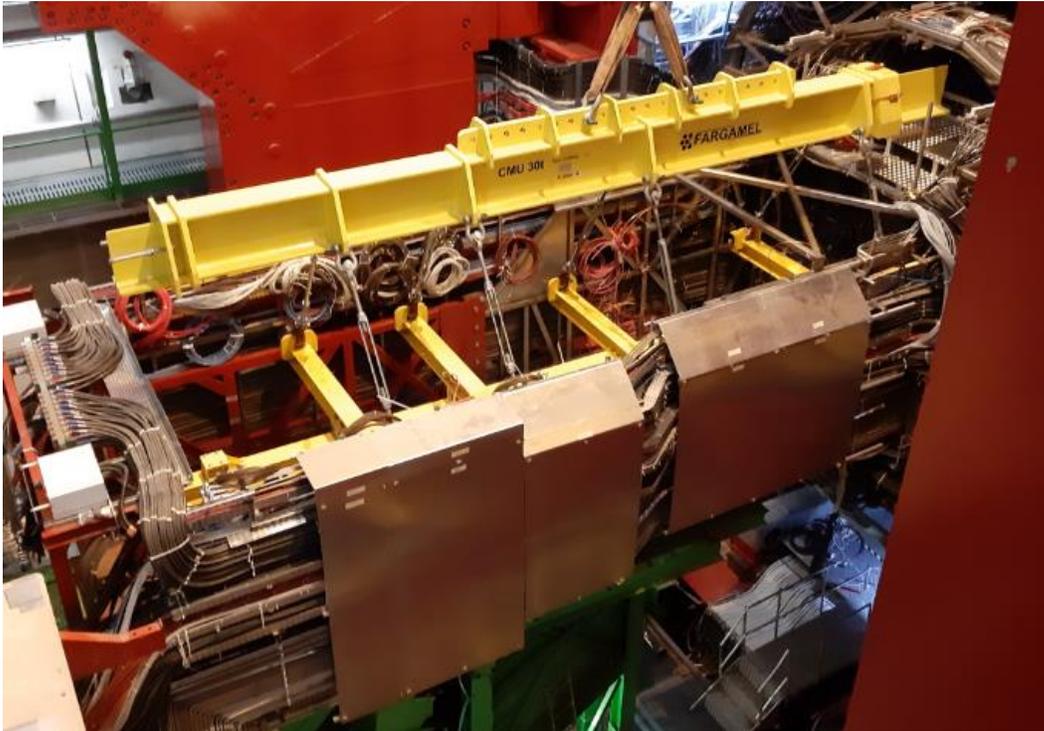
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13. NOTE QA/PWE



4.3 Bring the lifting jig over the Miniframe



4.4 Connect the lifting frame to the lifting jig via slings/turn buckles and adjust the center of gravity. *Do we want to give MNF right inclination?*

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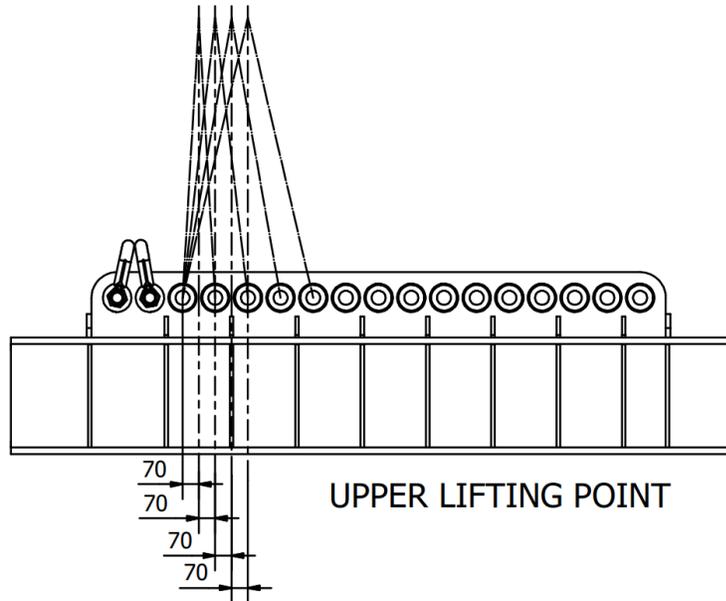
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13. NOTE QA/PWE



- 4.5 Prepare temporary supports (wooden block) on the low beta platform
- 4.6 Remove guard rails needed to provide space for Miniframe from low beta
- 4.7 Remove MNF dismountable part to avoid interference with trampoline and manual valve table
- 4.8 Remove FIT signal patch panel and the two lower ITS air manifolds to avoid interference with trampoline and manual valve table
- 4.9 Lift the miniframe and lower it to its temporary supports on low beta platform. Special attention at the level of PX24 plug (Available width : 6.1 m, real MNF width : 5.7 m). **Note there is no need to dismount the ventilation duct at this stage**

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13. NOTE QA/PWE



4.10 Change Miniframe from crane PR709 to PR774. Discharge the jig between crane transfer



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13. NOTE QA/PWE

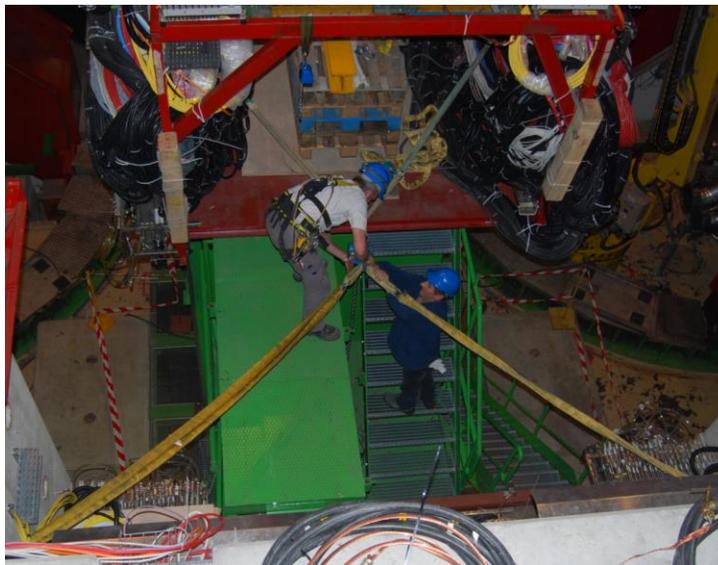
4.11 Transport Miniframe to final position in babyframe

4.11.1 Transport the MNF to baby frame with special attention to narrow passages. This will involve a 90 degree turn once it is still over the low beta platform.

**Check no interferences present with existing infrastructure or equipment**



4.11.2 Secure the miniframe to the low beta platform before inserting the miniframe head in the baby frame to control horizontal displacements during the lifting operation



4.11.3 Pre-align Miniframe brackets and baby frame rails. **Note that there is a lateral gap of only 6mm between the feet of the MNF and the truss members of the Babyframe that limit to 30 mm the vertical stroke before they interfere**

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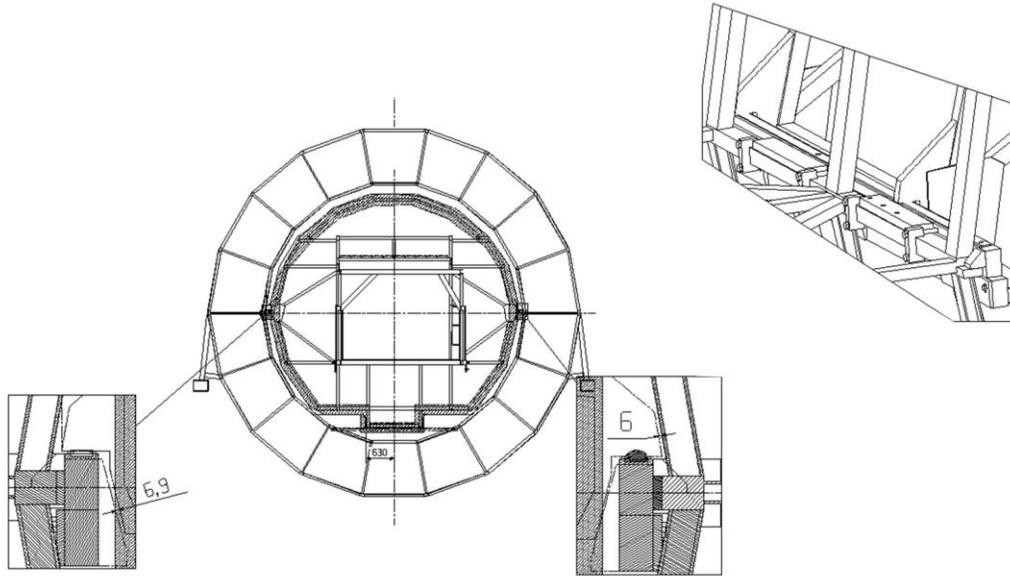
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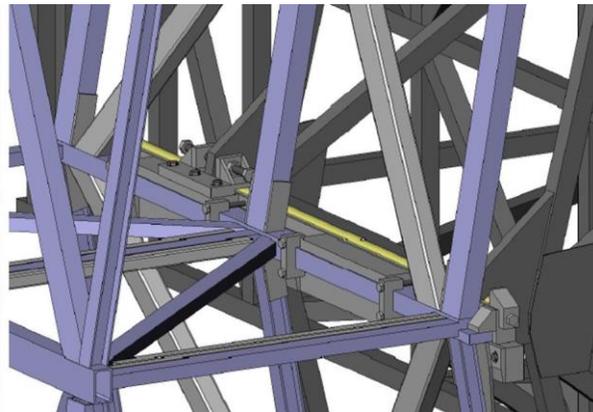
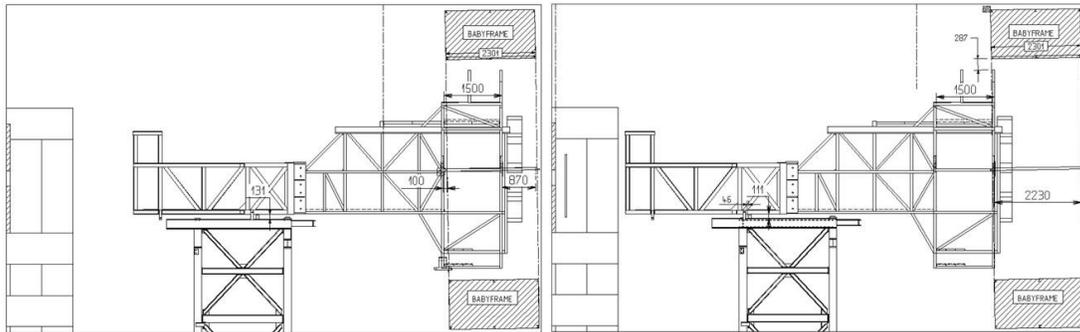
13. NOTE QA/PWE

4.11.4



4.11.5

Preinstall miniframe clamping system and shim. *Do we need survey?*



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13. NOTE QA/PWE

- 4.11.6 Unload Miniframe from crane
- 4.11.7 Lock clamping system screws and fixation system to compensator magnet platform



- 4.11.8 Remove lifting jig and spider following steps 4.2 and 4.3 in reverse order.
- 4.12 Remove securing line
- 4.13 Re-install hand-rails in upper part of compensator magnet platform
- 4.14 Re-install Miniframe dismountable part
- 4.15 Re-install FIT signal patch panel and the two lower ITS air manifolds
5. MCTS re-installation

Do we want to pre-install all the ADA shield beam?

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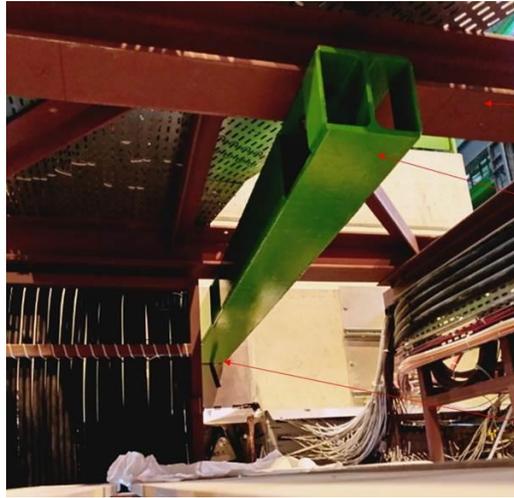
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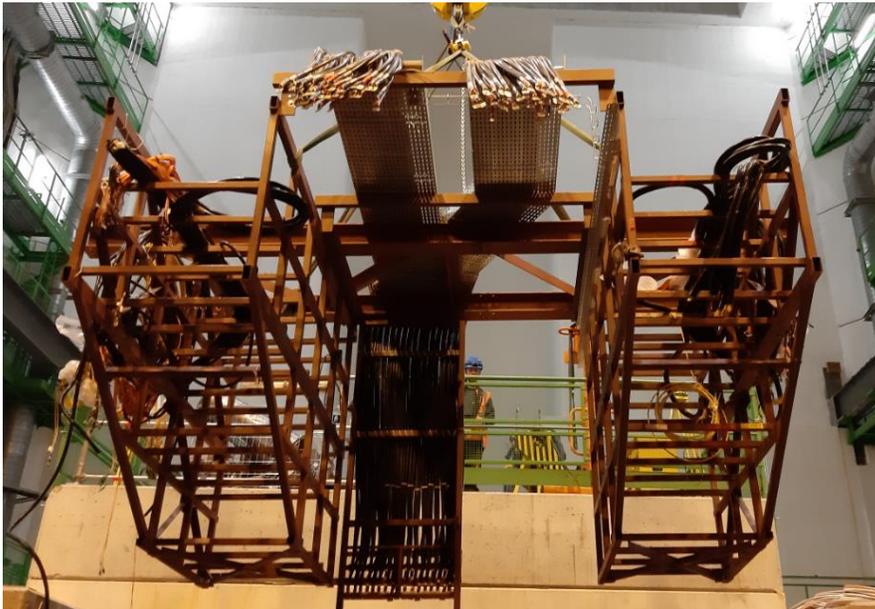


MCTS structure

Main supporting beam

Small gap

- 5.1 Release MCTS from its support in SX2 and attach lifting devices
- 5.2 Lower the MCTS through PX24 with special attention at the level of PX24 plug
- 5.3 Position the MCTS on temporary supports on low beta platform and change from crane PR709 to PR774.
- 5.4 Deliver MCTS to final position on brackets and secure



- 5.5 Lower MCTS on its support in SX2 in accordance with drawing ALIPA2A\_1405 and remove all lifting devices
- 5.6 Put scaffolding inside MCTS to enable unfolding the services

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13. NOTE QA/PWE

6. Install all services

6.1 Install beampipe protection between Miniframe and TPC before connecting TPC A-side

6.2 Unfold miniframe services onto trays and reconnect all services

6.3 Connect cooling hoses between PPO and Miniframe

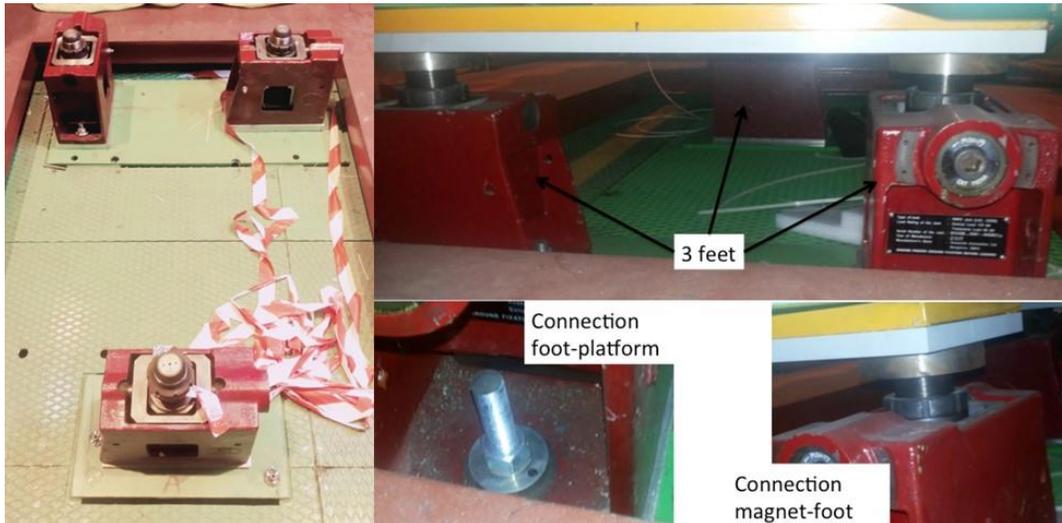
Nacelles needed to access from outside?

6.4 Complete ITS ventilation

7. Re-install RB24 beampipe sticking out of the LHC tunnel and install shielding around it

8. Re-install compensator magnet

8.1 Pre-install alignment feet and connect them to platform



8.2 Connect the compensator magnet to the bridge crane using 4 lifting handles in the 4 lifting points, and slings to the crane hook. The compensator magnet weight is 21 ton. Bring compensator magnet to low beta platform

Attention the Low Beta can carry a maximum weight of 30 tons

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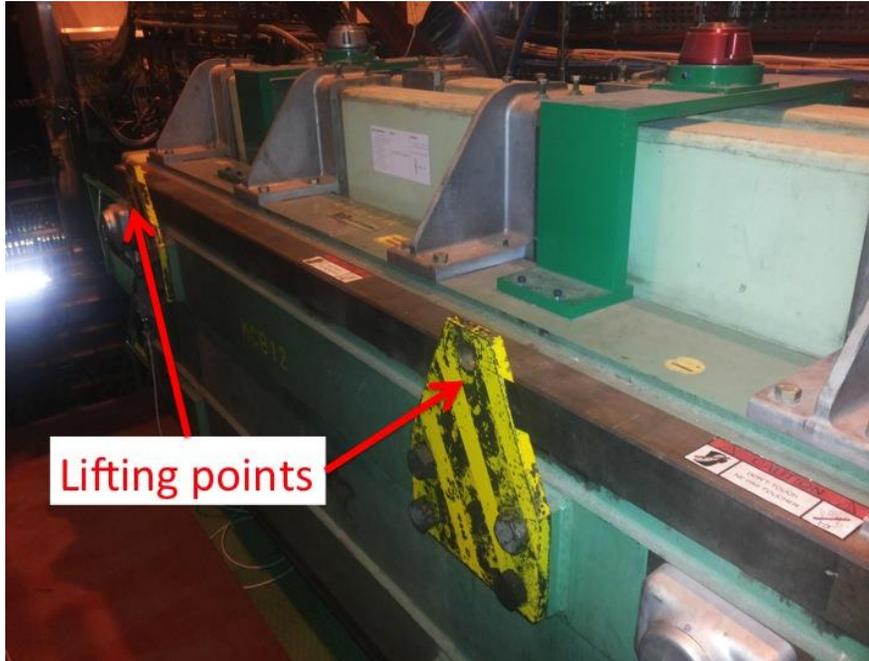
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13. NOTE QA/PWE



- 8.3 Deliver compensator magnet to its final position in the platform
- 8.4 Reconnect power and cooling from compensator magnet and remove cables and hoses
- 8.5 Reconnect power and cooling from compensator magnet
- These were cut during de-installation
9. Reinstall remainder of RB24 vacuum sector up to manual gate valve
10. Re-install forward detectors ADA, ZEM, BLM, BCM, PMD, V0, FMD, T0A

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