



DIV-IDTT.P.1-T016-D004

Deputy for the integration of the DTT RHS-2022_CREATE

Giuseppe Di Gironimo,
S. Buonocore, F.G. Lanzotti, A. Zoppoli (CREATE)

MTM WPDIV IDTT

22-24 june 2022

DTT Consortium (DTT S.C.a r.l. Via E. Fermi 45 I-00044 Frascati (Roma) Italy)



Maintenance Manual



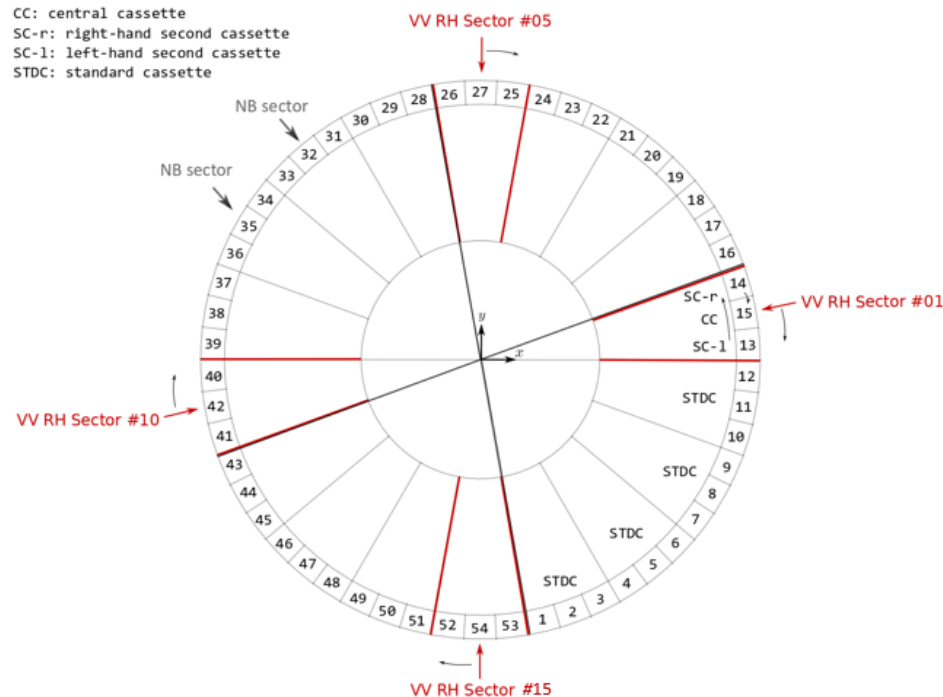
- RH operations require procedures that describe each phase of the inspection, maintenance and installation of components in the DTT facility.
- The objective of this activity is **to provide a preliminary version of the DTT RH maintenance manual that will be implemented on the basis of the information available until the first half of 2022.**
- The 2022 task consists of the following activities:
 - 1. Brief description of the DTT RHS and of the RH strategy.**
 - 2. Definition of the skeleton of the RH manual.**
 - 3. Preliminary mapping and classification of components that needs to be remotely maintained and assembled.**

DTT Remote Handling System (RHS) and strategy



Principle operations of Remote Handling System (RHS):

- Handling of First Wall (FW) modules by HyrMan
- Handling of Divertor modules by CMM and CTM
- Cut and welding of cooling pipes and weld inspection
- Inspection and auxiliary operations on heatings and diagnostics



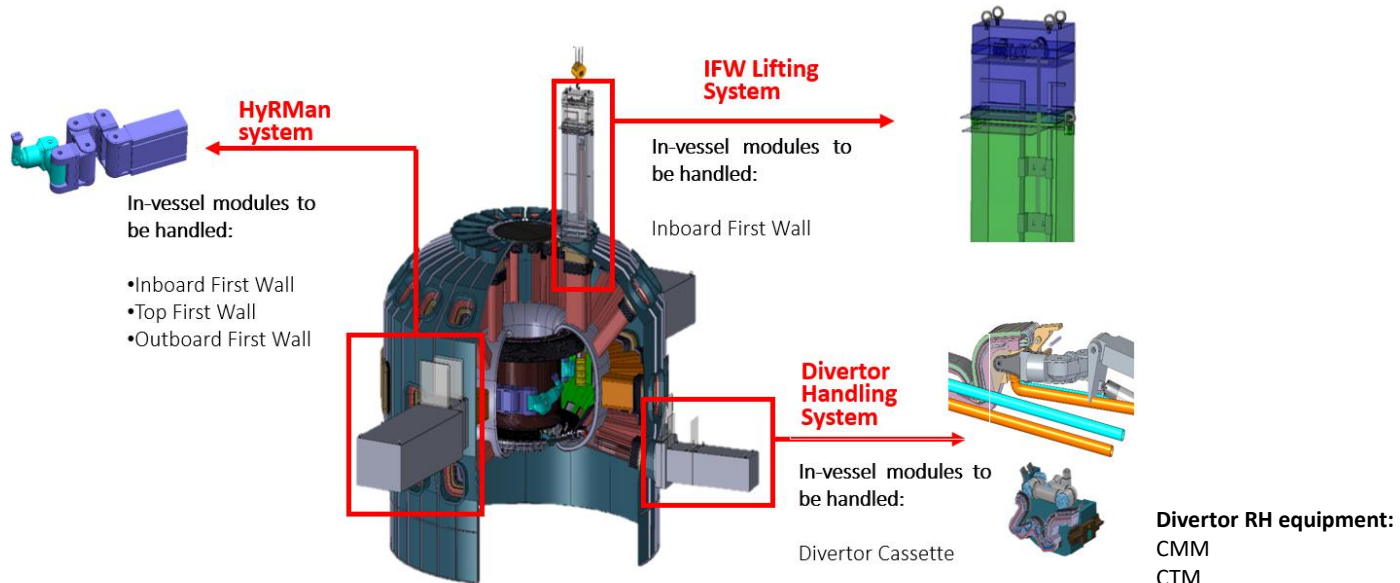
4 sectors for RH:
1, 5, 10, 15

DTT Remote Handling System (RHS) and strategy



Strategy:

- IFW handled by HyrMan and then lifted in port #1
- OFW and TFW handled by Hyrman through port #3
- Divertor Central and Lateral Cassettes handled by CMM through port #4
- Divertor Standard Cassettes handled firstly by CTM for toroidal positioning in front of Port #3 of nearest RH sector, and then by CMM for removal through the duct. Cut and welding of cooling pipes and weld inspection
- Inspection and auxiliary operations on heatings and diagnostics



Skeleton of the RH Manual

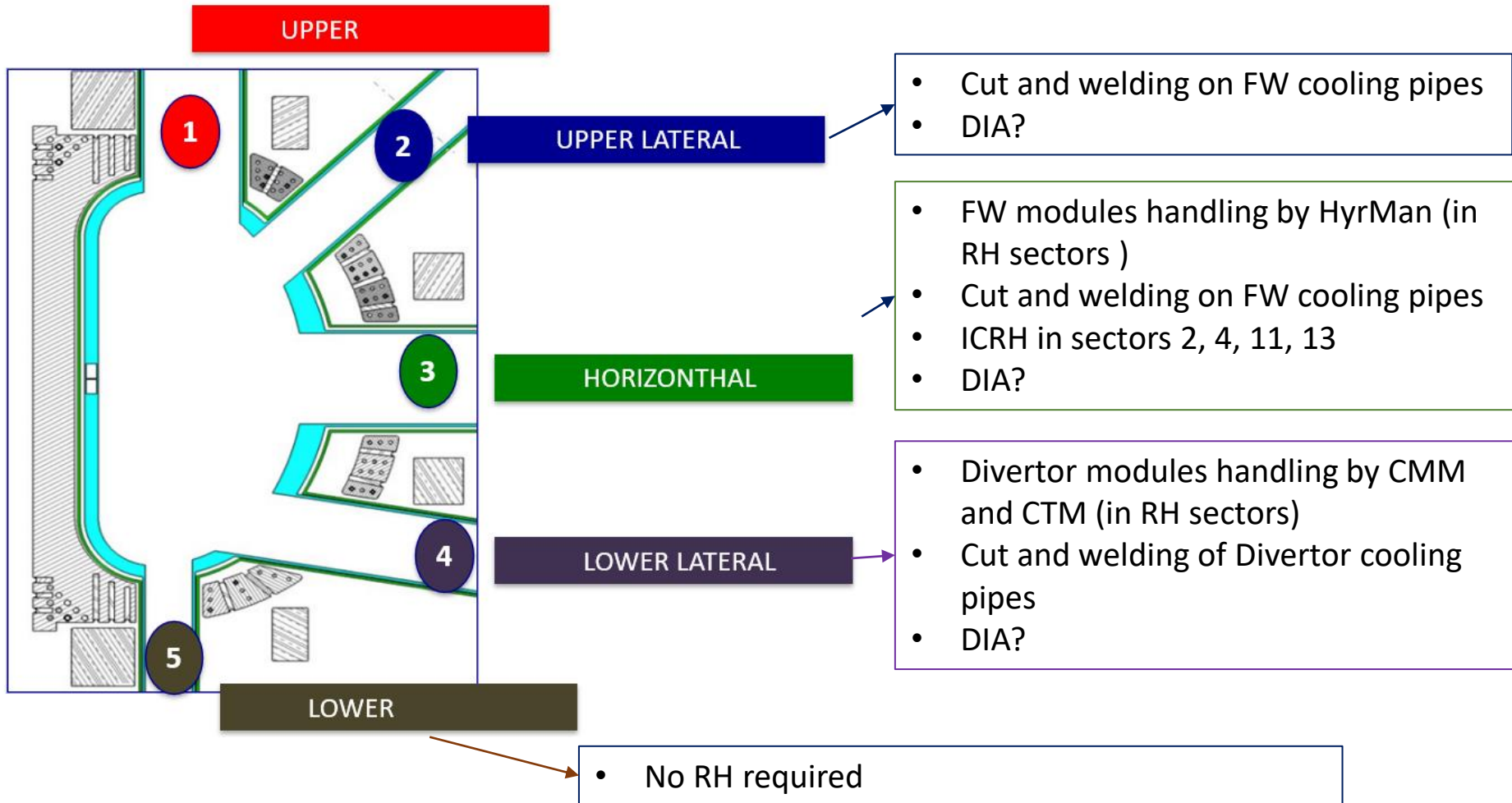


1. Recommendations for radiation exposure of personnel:
 - Laid down by the International Commission on Radiological Protection (ICRP), a worldwide recognized institution
 - The annual dose rate should not exceed 20mSv/year, averaged over 5 consecutive years;
 - The dose rate in a single year should not exceed 50mSv;
 - The dose rate for non-radiation workers should be kept below 1mSv/year.
 - Will to keep the limits of these projects well under the recommendations
2. Components RH classification:
 - **RH class 1st**: components requiring regular planned replacement
 - **RH class 2nd**: components that are likely to require repair or replacement since
 - **RH class 3rd**: components that are not expected to require maintenance or replacement during the lifetime of the facility but would need to be replaced remotely should they fail
 - **RH class 4th**: components that do not require remote handling
3. Ports mapping

Ports mapping



- IFW modules handling (in all sectors)
- Cut and welding on FW cooling pipes
- DIA?



Questionnaire



SUBSYSTEM xxx

- To be maintained
 - Classification
- To be inspected
 - Tool
- Weight
- Vessel Positioning
- Cooling
- Electric connections
- Handling positioning
- Center of Mass
- Interfaces with other systems