



MANUFACTURING AND TEST FOLDER FOR RF STRUCTURES AND RF COMPONENTS



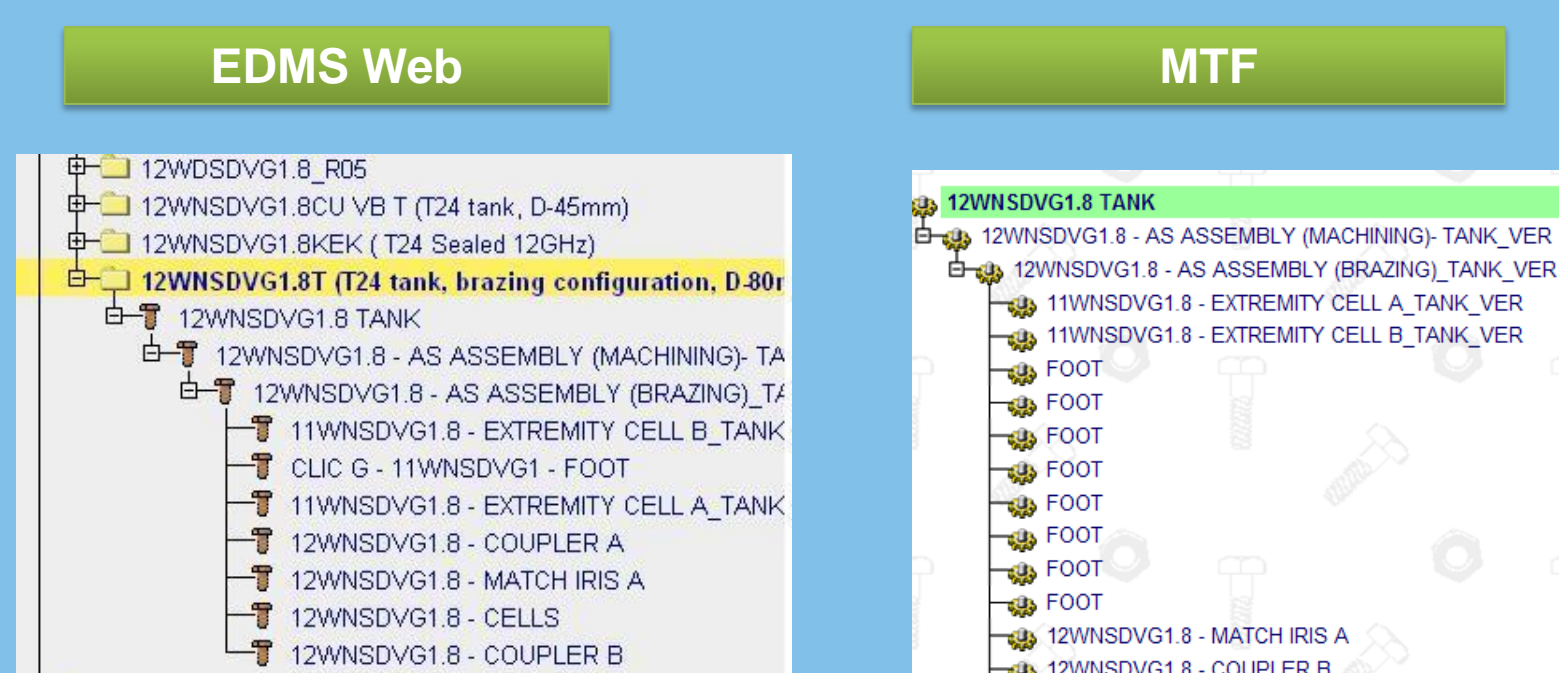
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Abstract

Manufacturing and test folder (MTF) is used in CERN for product life cycle management. It is closely linked to Engineering data management system (EDMS) and these two together enable us to follow through the whole lifecycle of product from design to the dismantling. MTF is the place to store information about production, tests, installation, operation and the end of project. It will also include log of use and log of maintenance. MTF replaces old paper folders and is easier to use. With MTF it is easy to follow the progress of manufacturing and it also makes it simple to find all the documents concerning specific structure. [1]

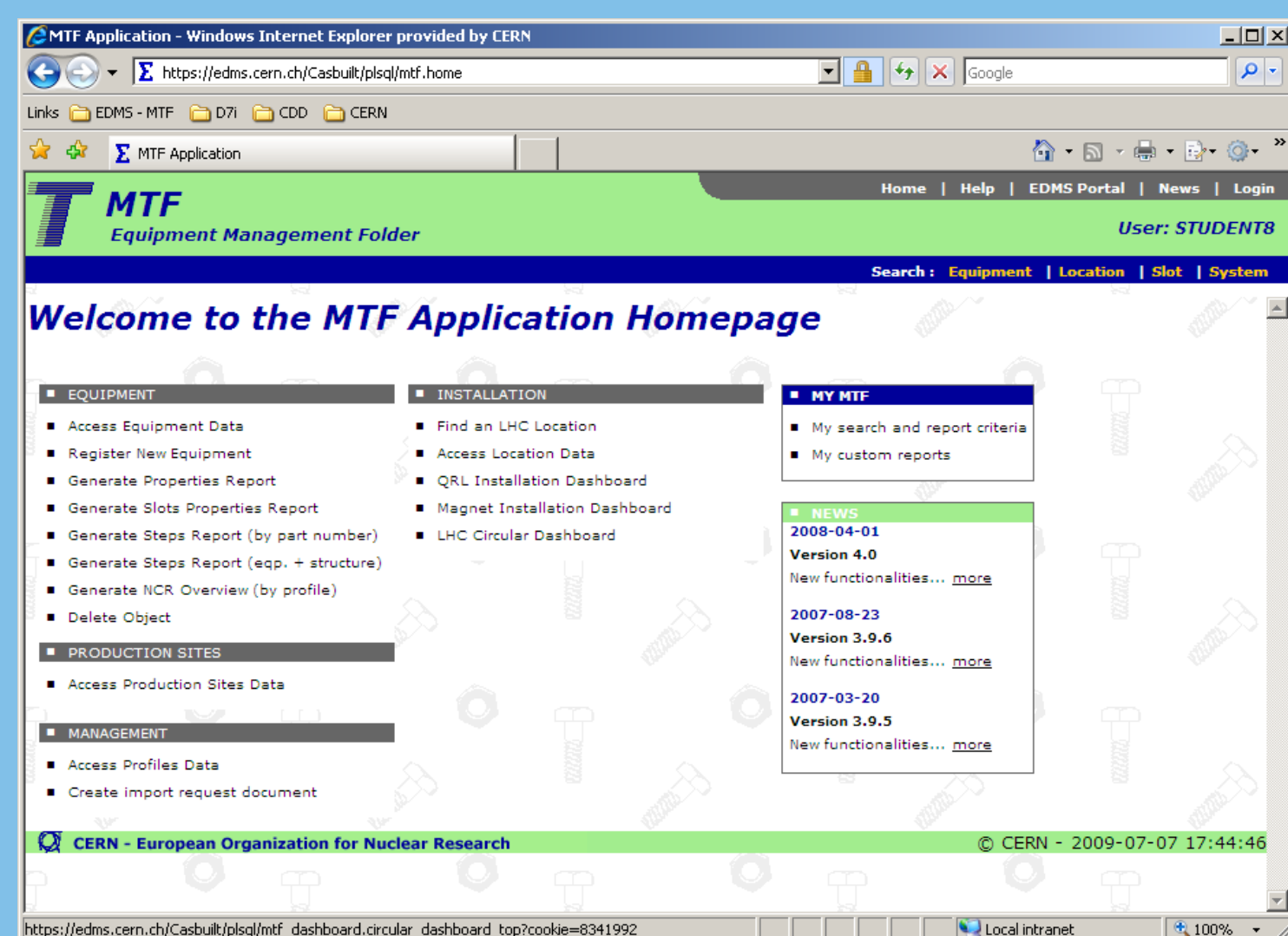
EDMS and MTF

EDMS and MTF complete each others. EDMS includes information of the design, such as structure, parameters etc. EDMS is also used to store documents which are then linked to MTF.



View of the same structure in EDMS and in MTF. In MTF you can see the listing of components needed.

MTF



MTF Application Homepage for registered users.

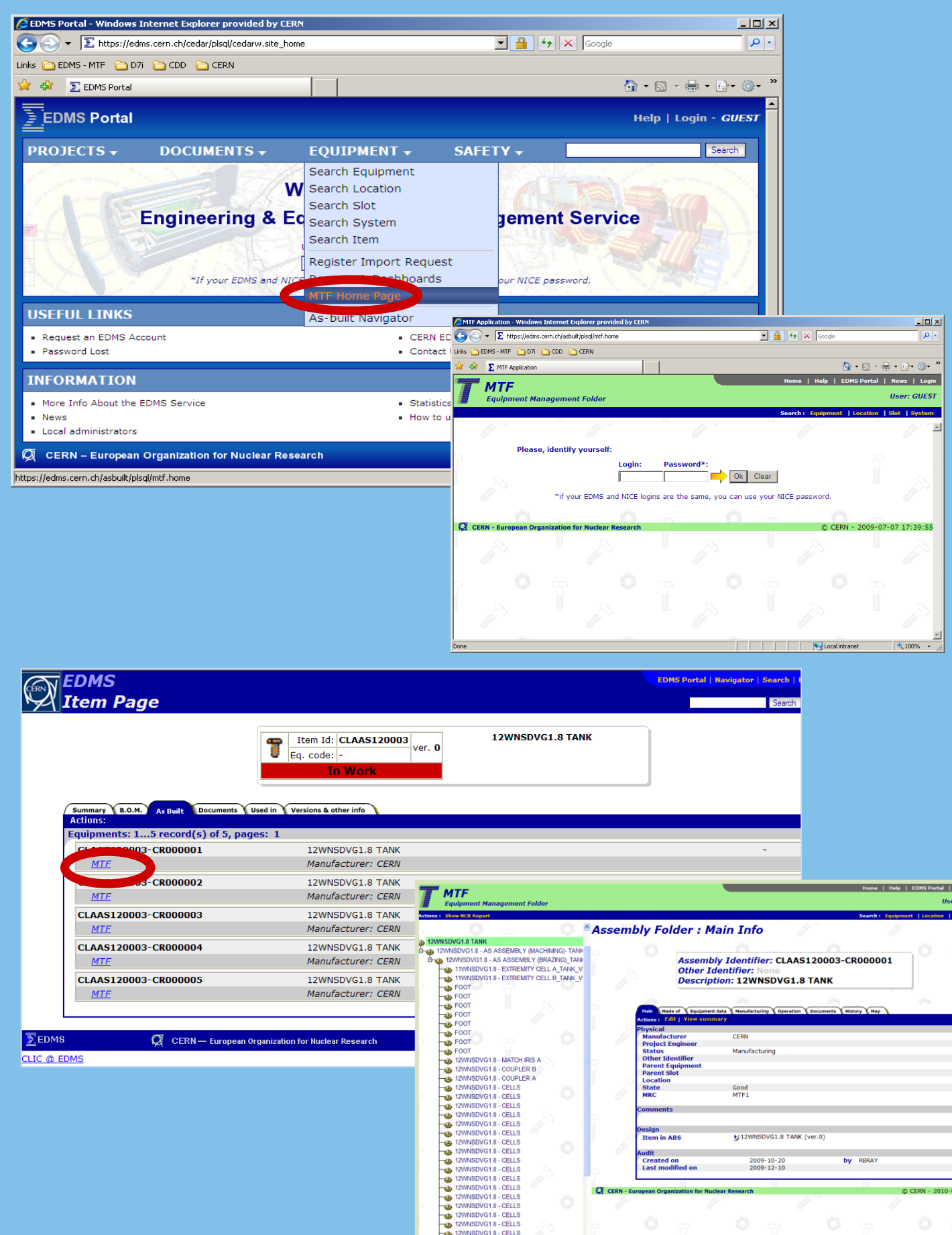
Assembly folder



Assembly folder is used to gather all the information of one assembly. Unique identifier separates manufactured assemblies from each other's and documentation and history can be used track differences in manufacture. Non conformities can also be added.

Ways to access MTF

You can log in to MTF with your NICE account from the EDMS front page or then via EDMS structures.



Bill of Material BOM

Bill of Material BOM is created from the drawings of structures. This information is the amount and type of parts needed for the structure. For now this part is done by hand but it will be automated in the near future.

Drawings can be found from Cern Drawing Directory CDD and linked to the structures in EDMS.

Workflow steps

With workflow diagram we can follow the progress of manufacturing. Additional steps can be added or steps can be cancelled. By clicking on the step you will find the results or non conformity documents.

Main	Made of	Equipment data	Manufacturing	Operation	Documents	History	Map
Workflow Diagram							
No workflow diagram is defined for this assembly							
Workflow Steps							
Step	ID	R/E	Other name	Description	Status	Result	INC
1	1	0	RF design (*)	RF design (*)	Done	OK	
2	2	0	Technical specification	Technical specification	Done	OK	
3	3	0	Quality control at factory	Quality control at factory	Done	OK	
4	4	0	Surface finish at VCL	Surface finish at VCL	Done	OK	
5	5	0	Inlet reception at CERN	Inlet reception at CERN	Done	OK	
6	6	0	Dimensional control	Dimensional control	Done	OK	
7	7	0	Coupler body (UNITES)	Coupler body (UNITES)	Done	OK	
8	8	0	SEM at CERN	SEM at CERN	Done	OK	
9	9	0	Cleaning (*)	Cleaning (*)	Pending	OK	
10	10	0	Pre-fire at 1000C and bonding couplers	Pre-fire at 1000C and bonding couplers	Done	OK	
11	11	0	Coupler machining (*)	Coupler machining (*)	Done	OK	
12	12	0	RF check before bonding	RF check before bonding	Done	OK	
13	13	0	Pre-fire at 1000C and bonding of structure	Pre-fire at 1000C and bonding of structure	Done	OK	
14	14	0	Bonding (*)	Bonding (*)	Done	OK	
15	15	0	Brazing of the cooling circuits	Brazing of the cooling circuits	Done	OK	
16	16	0	Final Brazing (*)	Final Brazing (*)	Done	OK	
17	17	0	Brazing couplers/tuning stud/cooling circuit	Brazing couplers/tuning stud/cooling circuit	Done	OK	
18	18	0	Welding Flanges	Welding Flanges	Done	OK	
19	19	0	Leak test	Leak test	Done	OK	
20	20	0	Baking of structure, 650 C for 4h (*)	Baking of structure, 650 C for 4h (*)	Done	OK	
21	21	0	RF check after bonding	RF check after bonding	Done	OK	
22	22	0	Installation in the tank (*)	Installation in the tank (*)	Cancelled	Cancelled	
23	23	0	Ready for shipment	Ready for shipment	Pending	Cancelled	

Different structures require different workflows. That is why diagram vary. By clicking on the step, you will find more information on the step including test results, non conformities etc.

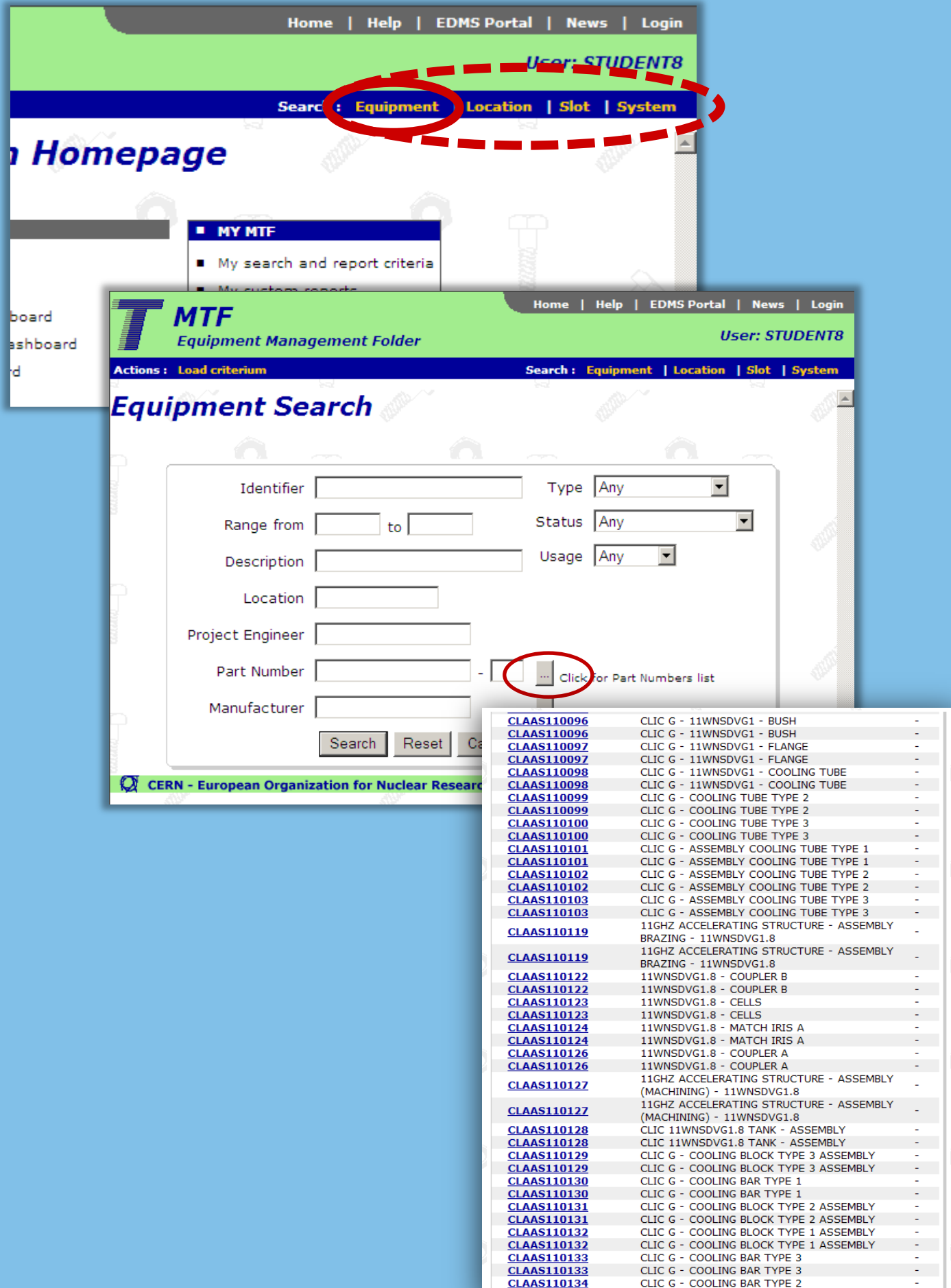
Workflow for PETS

Main	Made of	Equipment data	Manufacturing	Operation	Documents	History	Map
Workflow Diagram							
No workflow diagram is defined for this assembly							
Workflow Steps							
Step	ID	R/E	Other name	Description	Status	Result	INC
1	1	0	RF design (*)	RF design (*)	Done	OK	
2	2	0	PETS couplers - Quality control (*)	PETS couplers - Quality control (*)	Done	OK	
3	3	0	PETS couplers - Cleaning (NGL+chromic acid) (*)	PETS couplers - Cleaning (NGL+chromic acid) (*)	Done	OK	
4	4	0	PETS couplers - Sulfuric acid (body), vacuum, 800 °C (*)	PETS couplers - Sulfuric acid (body), vacuum, 800 °C (*)	Done	OK	
5	5	0	Brazing of PETS Coupler Cooling System Assem. (*)	Brazing of PETS Coupler Cooling System Assem. (*)	Done	OK	
6	6	0	PETS couplers - 2nd brazing (flanges, cooling), vacuum, 800 °C (*)	PETS couplers - 2nd brazing (flanges, cooling), vacuum, 800 °C (*)	Done	OK	
7	7	0	PETS couplers - RF check (*)	PETS couplers - RF check (*)	Done	OK	
8	8	0	PETS bars - Quality control (*)	PETS bars - Quality control (*)	Done	OK	
9	9	0	Dimensional control of PETS bar surface (*)	Dimensional control of PETS bar surface (*)	Done	OK	
10	10	0	PETS bars - Cleaning (NGL+solvent) (*)	PETS bars - Cleaning (NGL+solvent) (*)	Done	OK	
11	11	0	PETS bars - Baking (vacuum, 200 °C, 2h) (*)	PETS bars - Baking (vacuum, 200 °C, 2h) (*)	Done	OK	
12	12	0	Tank - Quality control (*)	Tank - Quality control (*)	Done	OK	
13	13	0	Tank - Cleaning (degreasing only) (*)	Tank - Cleaning (degreasing only) (*)	Done	OK	
14	14	0	SIC - Pre-fire (vacuum, 1000 °C) (*)	SIC - Pre-fire (vacuum, 1000 °C) (*)	Done	OK	
15	15	0	SIC - Quality control (*)	SIC - Quality control (*)	Done	OK	
16	16	0	Assembly - Brazing of the bars (*)	Assembly - Brazing of the bars (*)	Done	OK	
17	17	0	Assembly - RF check (*)	Assembly - RF check (*)	Done	OK	
18	18	0	Assembly - RF check (*)	Assembly - RF check (*)	Cancelled	Cancelled	
19	19	0	Assembly - Assembly of couplers-bars and mini-tank (*)	Assembly - Assembly of couplers-bars and mini-tank (*)	Done	OK	
20	20	0	Assembly - RF check (*)	Assembly - RF check (*)	Done	OK	
21	21	0	Assembly - Vacuum test (*)	Assembly - Vacuum test (*)	Done	OK	
22	22	0	Leak test of PETS 110Hz (*)	Leak test of PETS 110Hz (*)	Done	OK	
23	23	0	Assembly - Final bake-out (150 °C, 2h) (*)	Assembly - Final bake-out (150 °C, 2h) (*)	Done	OK	
24	24	0	Assembly - Packaging (N2) (*)	Assembly - Packaging (N2) (*)	Done	OK	
25	25	0	Assembly - Shipping to SLAC (*)	Assembly - Shipping to SLAC (*)	Done	OK	
26	26	0	Traveller	Traveller	Done	OK	

Manufacturing Power Extraction and Transfer Structure (PETS) requires 34 different steps. Every step includes results from the step.

Search in MTF

You can search in MTF by several different criteria. Main categories are Equipment, Location, Slot and System. You can also browse through categories.



Manufacturing step details

Assembly Identifier: CLCVG10100-CR000001 Other Identifier: None Description: CLIC 11WNSDV1 ASSEMBLY							
Main	Made of	Equipment data	Manufacturing	Operation	Documents	History	Map
Actions: Back to list Edit Detach results doc Attach non-conformity Repeat step							
Step Generic Data							
Step ID	5	Other name					
Description	Inlet reception at CERN	Result		Ok			
Status	Done	Expected by					
Completed on	2010-08-30	Executed by					
Provided by							
Responsible							
Comments							
Step Documents							
Applicable Standard							
Results							
Non Conformity							
Audit							
Created on	2008-10-23			by HTIAINEN			
Last modified on	2010-08-30						

Detailed view on step number 5. Most important information are the dates and results. Also non conformities can be added, but only administrator can remove them. All the documents are links to EDMS and they can be added by simply using their EDMS id. This field is updated by local MTF administrator.

CONCLUSION

MTF provides a strong tool for product life cycle management. It is also used with LHC and it will also be used as well in the future. In the near future data transfer from EDMS to MTF will be automated thus limiting changes of human errors. For members of CLIC MTF provides an easy tool for searching information and following progress of manufacturing. In the future MTF can be used for tracking the sources of non conformities and breakdowns. Unique id given to each part makes it possible to track down smallest errors. Also this id enables to follow, for example, the radioactive contamination of tools.

ACKNOWLEDGMENT

Authors would like to thank all members of EDMS – support team and members of CLIC for their valuable contributions and support.

REFERENCES

- [1] M. Saifoulina, "Item/Equipment Creating Process for CLIC Accelerating Structures in EDMS/MTF databases", EDMS id 1061835.
- [2] R. Bray, "Presentation for the CERN EDMS for EN-ICE", EDMS id 1003101