

Development and management of reference IFMIF-DONES neutronics document: Nuclear Analysis Handbook

April 10th, 2025

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UNIVERSIDAD
DE GRANADA



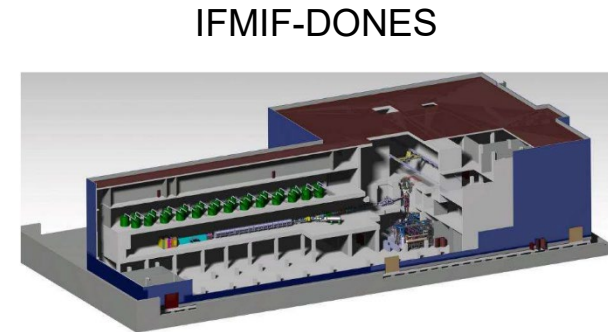
This work has been partially financed/supported by the Regional Government of Andalusia through the project "TAN19_UGR_IFMIF-DONES" and European Regional Development Fund (ERDF) "A way to make Europe"/ "Andalusia moves with Europe"

Introduction

- Nuclear fusion as energy source: we need **material research facilities**

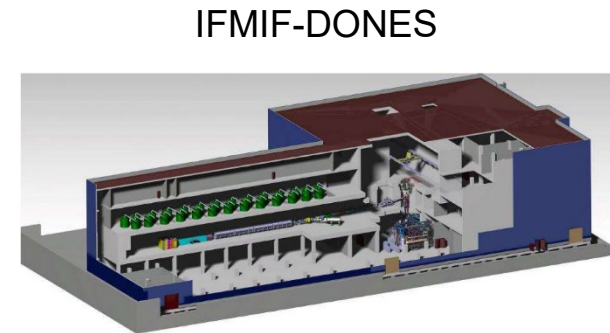
Introduction

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- IFMIF-DONES: International Fusion Material Irradiation Facility - DEmo Oriented Neutron Source



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- IFMIF-DONES: International Fusion Material Irradiation Facility - DEMO Oriented Neutron Source
- Provide irradiation data for the construction of DEMO

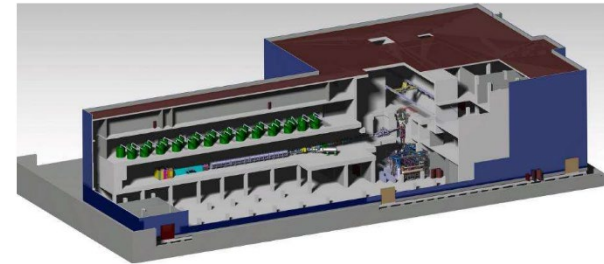


Introduction

- Nuclear fusion as energy source: we need **material research facilities**
- IFMIF-DONES: International Fusion Material Irradiation Facility - DEMO Oriented Neutron Source
- Provide irradiation data for the construction of DEMO
- Work Package Early Neutron Source (WPENS)
 - Contributions from 16+ beneficiaries
 - One of the important facilities of the European fusion roadmap



Granada
site plan



IFMIF-DONES

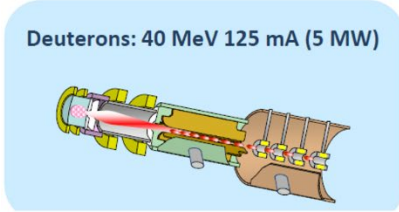


Introduction

- IFMIF-DONES schematic plant configuration

Accelerator

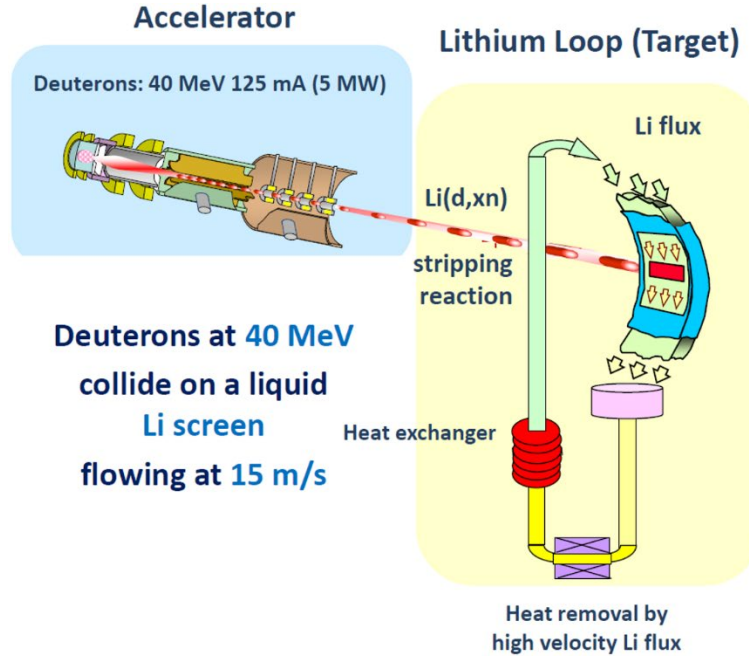
Deuterons: 40 MeV 125 mA (5 MW)



Deuterons at 40 MeV
collide on a liquid
Li screen
flowing at 15 m/s

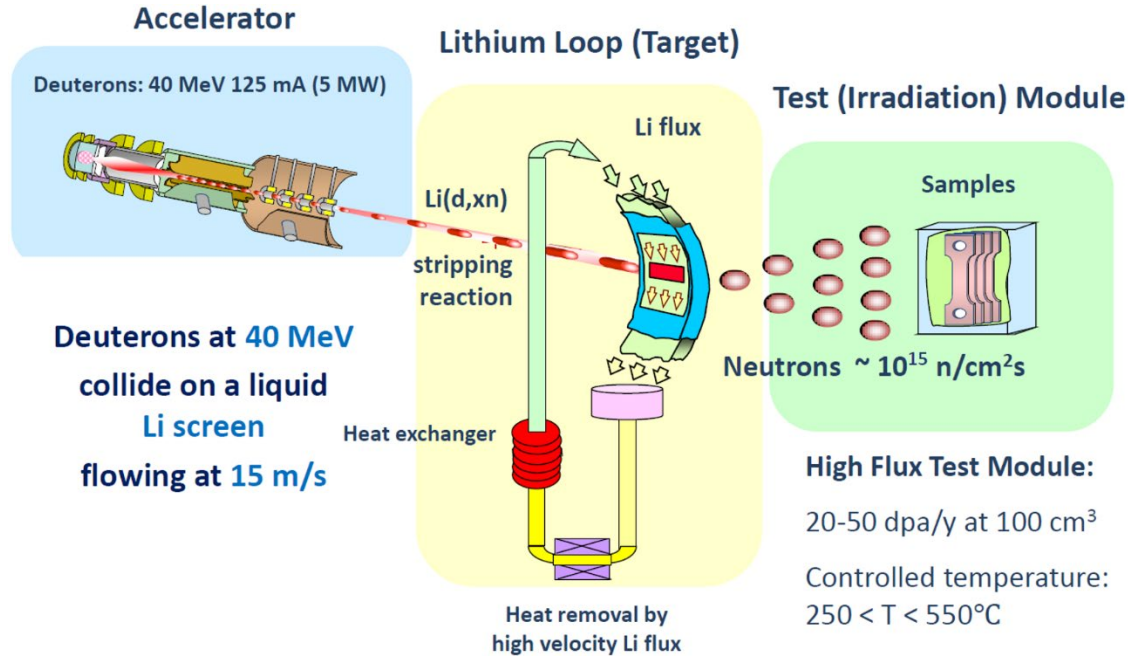
Introduction

- IFMIF-DONES schematic plant configuration



Introduction

- IFMIF-DONES schematic plant configuration



A neutron flux of $\sim 10^{15} \text{ cm}^{-2}\text{s}^{-1}$ is generated with neutron spectrum up to 55 MeV energy

Introduction

- Information management



Nuclear Analysis Handbook (NAH)

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Gather IFMIF-DONES up-to-date nuclear analyses, suitable for both design and safety needs. User's feedback

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Based on project Plant Breakdown Structure (PBS). Nuclear analyses are organised into groups

Nuclear Analysis Handbook (NAH)

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- Main properties of NAH

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Structure

Based on project Plant Breakdown Structure (PBS). Nuclear analyses are organised into groups

Sources/references

Reports of the EUROfusion IDM platform (WPENS). Document updated in a yearly basis

Structure of NAH

Plant Breakdown Structure

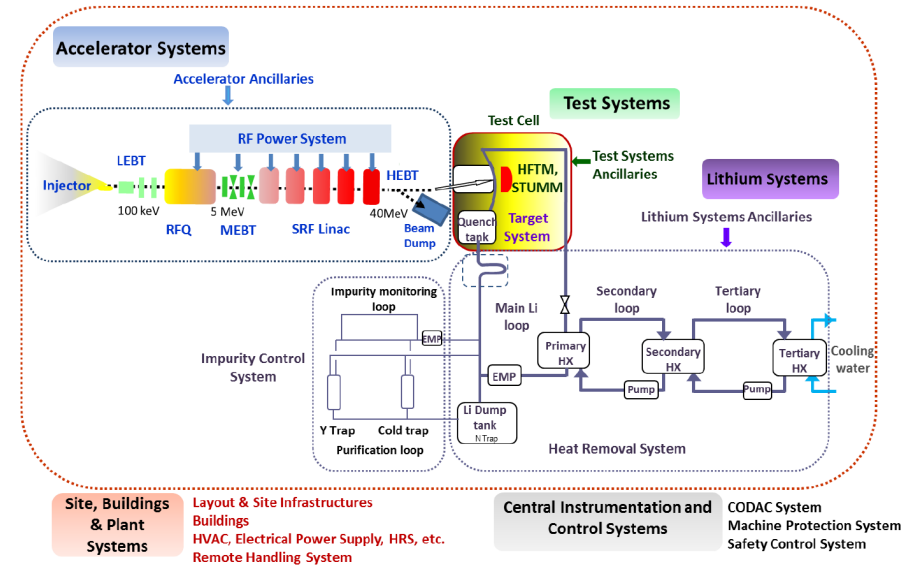
- Site, Buildings and Plant Systems (PBS 3.0)

- Test Systems (PBS 4.0)

- Lithium Systems (PBS 5.0)

- Accelerator Systems (PBS 6.0)

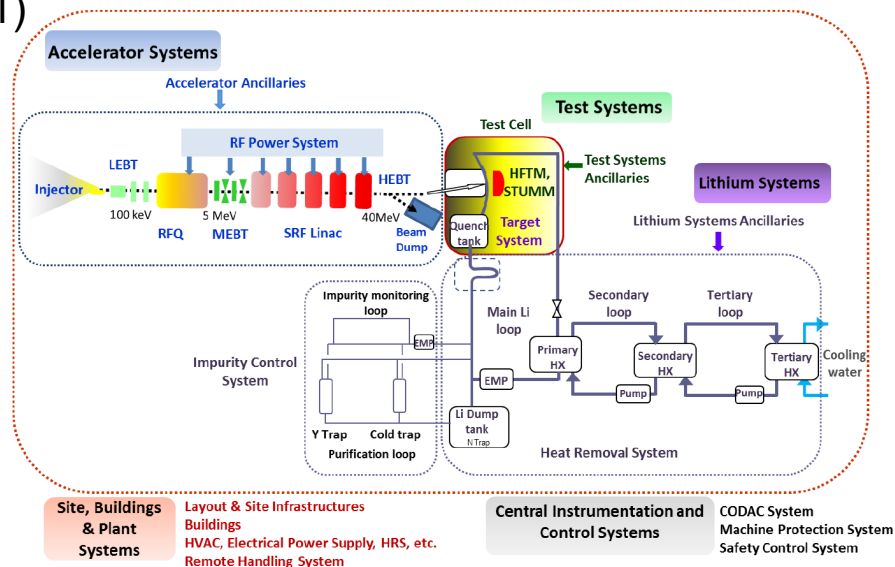
- Central Instrumentation and Control Systems (PBS 8.0)



Structure of NAH

Plant Breakdown Structure

- Site, Buildings and Plant Systems (PBS 3.0)
 - Nuclear analyses
 - Layout and Site Infrastructures (PBS 3.1)
 - Main Building (PBS 3.2)
 - ...
 - Commissioning plan
- Test Systems (PBS 4.0)
 - Nuclear analyses
 - Test Cell (PBS 4.2)
 - ...
- Lithium Systems (PBS 5.0)
 - ...
- Accelerator Systems (PBS 6.0)
 - ...
- Central Instrumentation and Control Systems (PBS 8.0)
 - ...



Structure of NAH

Nuclear analysis categories

- Dose rate maps
- Absorbed dose rate maps
- DPA analysis
- Nuclear heating
- Activation
- Gas production
- Radiation flux maps
- Others

+

Neutronics models

- Neutronics models

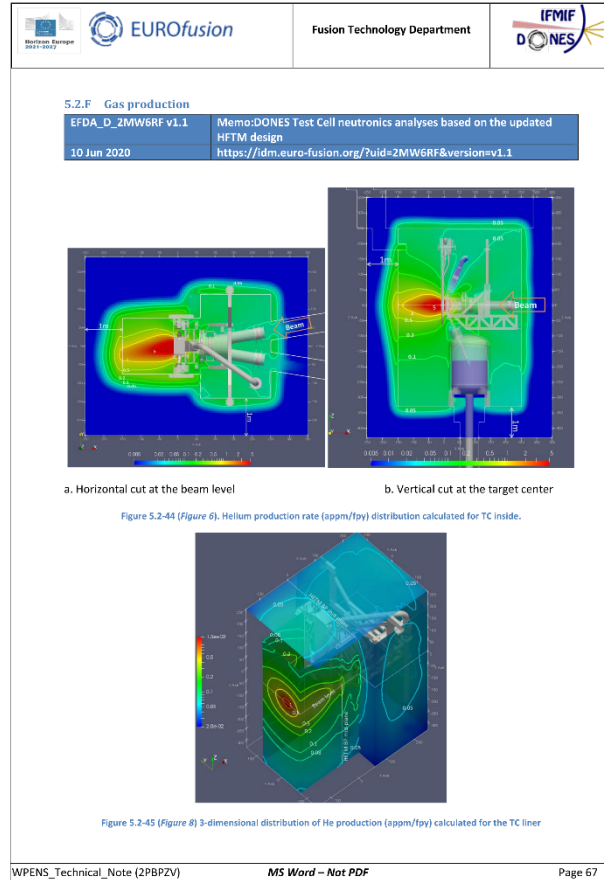
Content of NAH

- Summary table (NAH version 2.0 (year 2024))

PBS Item	Nuclear analysis									
	Dose rate maps	Absorbed dose rate maps	DPA analyses	Nuclear heating	Activation	Gas production	Radiation flux maps	Others	Total (by system)	Total (by area)
Site, Buildings and Plant Systems (PBS 3.0)										11
Test Systems (PBS 4.0)										47
Nuclear analyses									0	
Test Cell (PBS 4.2)	2	2		3	3		2	1	13	
High Flux Test Module (HFTM) (PBS 4.3)	3	1	5	2	4	2	1		18	
Start-Up Monitoring Module (STUMM) (PBS 4.4)	1		1	2	2	1	2		9	
Other irradiation Modules (PBS 4.5)									0	
Test Systems Ancillaries (PBS 4.6)	1				3			1	5	
Facilities for Complementary Experiments (PBS 4.7)	2								2	
Lithium Systems (PBS 5.0)										15
Accelerator Systems (PBS 6.0)										27
Central Instrumentation and Control Systems (PBS 8.0)										0
TOTAL (by type/class of nuclear analysis)	31	11	7	12	25	3	7	2	100	100

Content of NAH

- Nuclear analysis
 - Reference table
 - Result(s)

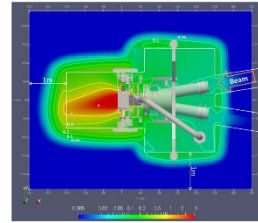


Content of NAH

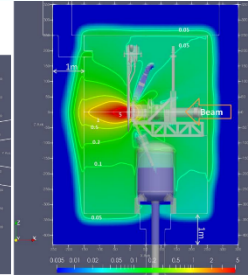
- Nuclear analysis
 - Reference table
 - Result(s)



EFDA_D_2MW6RF v1.1	Memo:DONES Test Cell neutronics analyses based on the updated HFTM design
10 Jun 2020	https://idm.euro-fusion.org/?uid=2MW6RF&version=v1.1



a. Horizontal cut at the beam level



b. Vertical cut at the target center

Figure 5.2-44 (Figure 6). Helium production rate (appm/fpy) distribution calculated for TC inside.

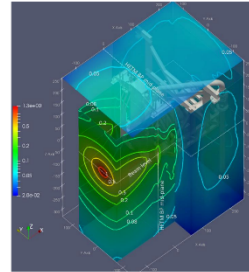
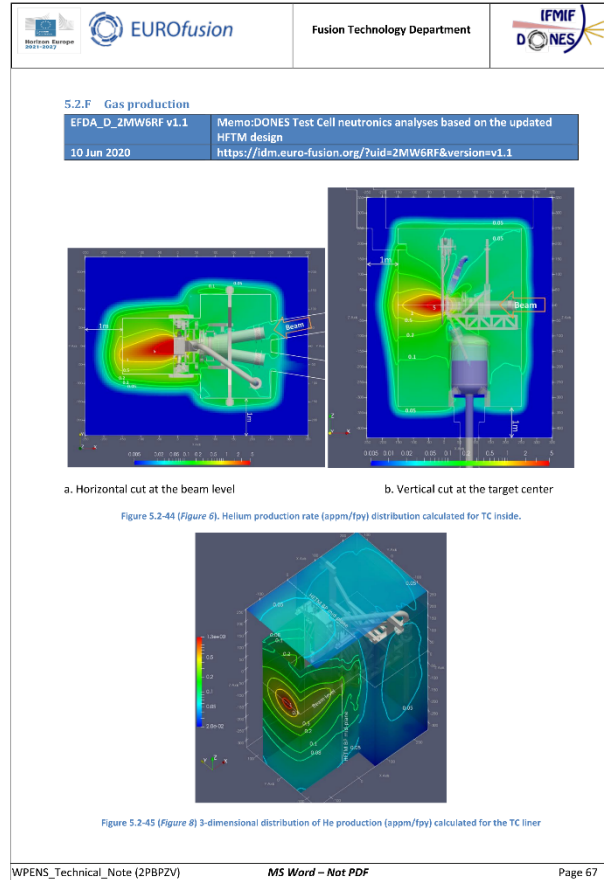


Figure 5.2-45 (Figure 8) 3-dimensional distribution of He production (appm/fpy) calculated for the TC liner

- IDM number and version
- IDM name of the report
- Issue date
- Link to the IDM platform

Content of NAH

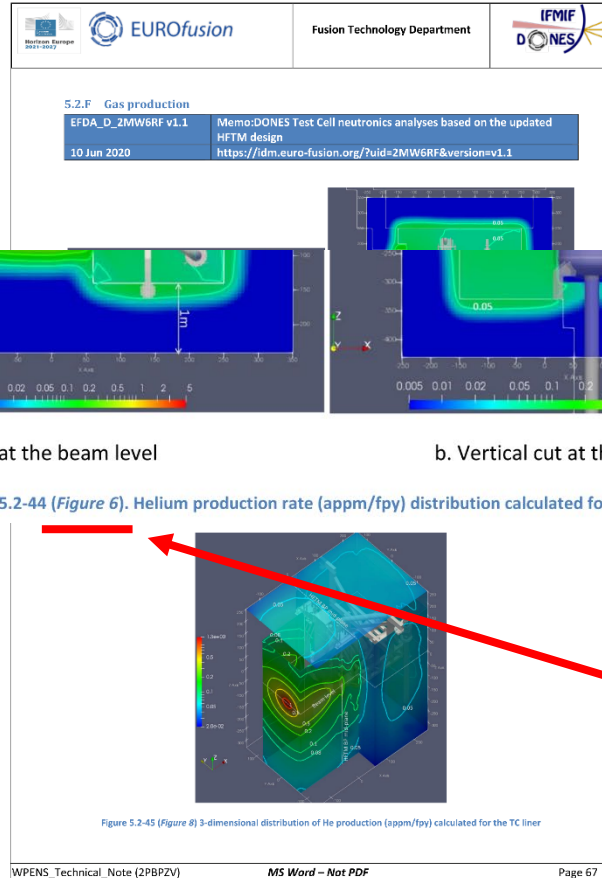
- Nuclear analysis
 - Reference table
 - Result(s)



Essential results
(figures, graphics and
tables)

Content of NAH


- Nuclear analysis
 - Reference table
 - Result(s)




Original table or graphic
numeration (for
reference purposes)

Content of NAH

- Neutronics model
 - Double reference table
 - Model(s)

 EUROfusion

Power Plant Physics & Technology



6 Test Systems (PBS 4.0)

6.1 Nuclear analyses

6.1.A Neutronics model

Neutronic model file	EFDA_D_2N1343 v1.1 21 Sep 2020	2020_Neutronics_KIT_IFMIF-DONES_TC_md19.2.1 https://idm.eurofusion.org/2uid=2N1343&version=v1.1&action=get_document
Neutronic model report	EFDA_D_2NP1T8 v1.0 02 Oct 2020	ENS-2.2.1.2-T46-01-N1 TC Neutronics model update in 2020 https://idm.eurofusion.org/2uid=2NP1T8&version=v1.0&action=get_document




Figure 6.1.1 CAD and MCNP plot representations of Test Systems (PBS 4.0). MCNP plot at PZ=0 of Test Systems and Main Building (upper) [MCNP plot taken from MCNP model 2N1343 v1.1], CAD view of the Test Systems (lower left) [CAD view taken from CAD model 2N1343 v1.1] and MCNP plot at PZ=0 of Test Systems (lower right) [MCNP plot taken from MCNP model 2N1343 v1.1]

Title of the report (IDM_file_ID)Page 32

NAH update

- **NAH property:** document updated in a yearly basis

NAH update

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- **Methodology:** Identification of new reports in EUROfusion IDM platform

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NAH update

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- **Methodology:** Identification of new reports in EUROfusion IDM platform
- **Discarded approach:** manual identification of new or updated reports
- **Chosen approach:** semi-automated identification of new or updated reports using Python scripting

NAH update

- Download information from EUROfusion IDM platform (12 folders)

12 folders

The screenshot shows the EUROfusion IDM platform interface. The left sidebar displays a tree view of folders, including '2.2 Neutronics FPP'. The main content area shows a table of records for '2.2 Neutronics FPP'. A red arrow points from the '2.2 Neutronics FPP' folder in the sidebar to the '2.2 Neutronics FPP' folder in the main content area.

Title	Last change date	Signatory
2.2.1 Neutronics model of DONES	14 Jul 2021 09:27	RO: Qiu Y.
2.2.2 Radiation dose maps for beam-on and beam-off periods	24 Sep 2021 10:27	RO: Qiu Y.
2.2.3 Activity inventories and decay heat for waste evaluation and decommissioning	24 Sep 2021 10:30	RO: Qiu Y.
2.2.4 Neutronics analyses upon requests	24 Sep 2021 10:31	RO: Qiu Y.
2.2.5 Performance and certification analyses	24 Sep 2021 10:32	RO: Qiu Y.
2.2.6 Code and data developments and experiments	24 Sep 2021 10:44	RO: Qiu Y.
2.2.7 Archive	24 Sep 2021 10:49	RO: Qiu Y.
2.2.8 Data	24 Sep 2021 10:50	RO: Qiu Y.
2.2.9 Meetings	24 Sep 2021 10:50	RO: Qiu Y.
2.2.10 Models	24 Sep 2021 10:50	RO: Qiu Y.
2.2.11 Nuclear Analysis Handbook	21 Dec 2022 09:54	RO: Qiu Y.
2.2.12 Software	24 Sep 2021 10:53	RO: Qiu Y.

Link: <https://idm.euro-fusion.org/?uid=2NM228> Copy link

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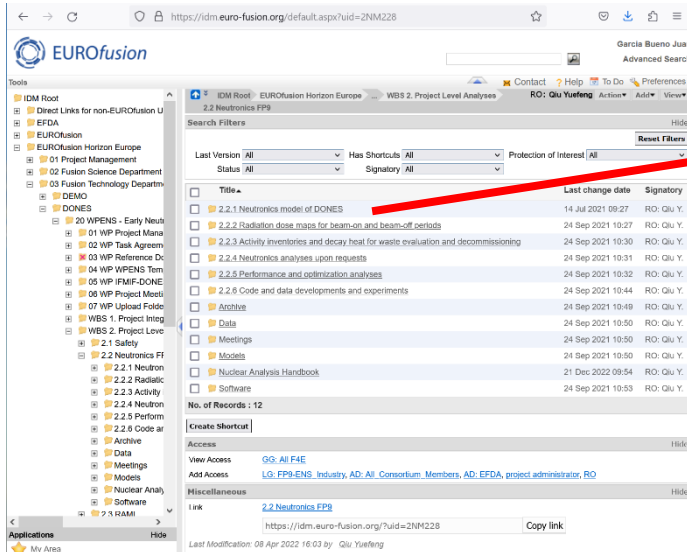
Title	Last change date	Issue date	Status	Signatory
EN5-2.2.1.0.744-06-N1 Accelerator Systems Neutronics Model (EPDA_D_2NM228 v1.0)	20 Jun 2023 18:30	25 Nov 2020	Approved	Ogando F.
EN5-2.2.1.1.744-01-N1 Report on updating needs for DONES model (EPDA_D_2NM228 v1.0)	21 Jun 2023 09:32	22 Dec 2019	Approved	Qiu Y.
EN5-2.2.1.2.705-11 Update of neutronics model of the accelerator system (EPDA_D_2NM228 v1.0)	31 May 2022 14:54	09 Feb 2022	Approved	Ogando F.
EN5-2.2.1.2.705-11 Report on updates of DONES TC neutronics model 2021 (EPDA_D_2NM228 v1.0)	17 Jun 2022 10:11	11 Apr 2022	Approved	Qiu Y.
EN5-2.2.1.2.705-11-N1 TC Neutronics model updates in 2022 (EPDA_D_2NM228 v1.0)	28 Jun 2023 05:54	29 Jun 2023	In Work	Servicio A.
EN5-2.2.1.2.705-11-N1 Neutronics model updates in 2022 (EPDA_D_2NM228 v1.0)	01 Sep 2023 14:56	29 Jun 2023	Revision Required	Order A.
EN5-2.2.1.2.712-01-N1 Report on updates of DONES neutronics model 2018 (EPDA_D_2NM228 v1.0)	20 Jun 2023 18:30	08 Mar 2017	Approved	Qiu Y.
EN5-2.2.1.2.712-01-N1 Report on updates of DONES neutronics model 2017 (EPDA_D_2NM228 v1.0)	20 Jun 2023 18:30	26 Apr 2018	Approved	Qiu Y.
EN5-2.2.1.2.712-01-N1 Update 2018 of the neutronics model of the Accelerator Systems (EPDA_D_2NM228 v1.0)	20 Jun 2023 18:30	16 Mar 2019	Approved	Ogando F.
EN5-2.2.1.2.712-01-N1 DONES neutronics Target Assembly model (EPDA_D_2NM228 v1.0)	20 Jun 2023 18:30	13 Jun 2019	Approved	Qiu Y.
EN5-2.2.1.2.712-01-N1 Accelerator Systems Neutronics Model (EPDA_D_2NM228 v1.0)	20 Jun 2023 18:30	11 Jan 2020	Approved	Castelan J. P.
EN5-2.2.1.2.712-01-N1 Accelerator Systems Neutronics Model 2020 (EPDA_D_2NM228 v1.0)	20 Jun 2023 18:30	15 Jan 2020	Approved	Qiu Y.
EN5-2.2.1.2.712-01-N1 Description of MCNP Main Building Model 2020 (EPDA_D_2NM228 v1.0)	20 Jun 2023 18:30	16 Dec 2020	Approved	Mota F.
EN5-2.2.1.2.712-01-N1 TC Neutronics model update in 2020 (EPDA_D_2NM228 v1.0)	20 Jun 2023 18:30	02 Oct 2020	Approved	Qiu Y.

Link: <https://idm.euro-fusion.org/?uid=2NM228> Copy link

NAH update

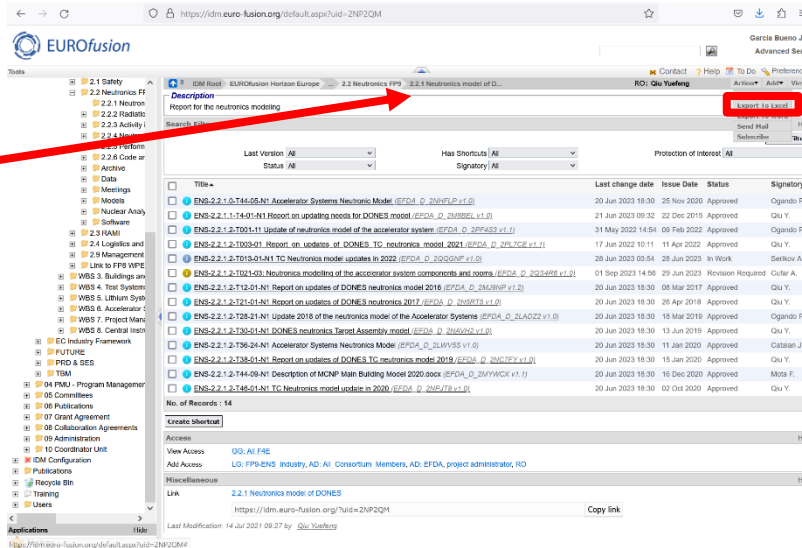
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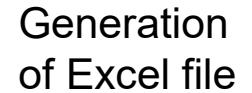
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EN5-2.2.1.2.74-01-N1 Report on updating needs for DONES model (EPDA_D_2024B2 v1.0)	21 Jun 2023 09:32	22 Dec 2019	Approved	Qiu Y.
EN5-2.2.1.2.70-01-N1 Update of neutronics model of the accelerator system (EPDA_D_2024F3 v1.0)	31 May 2022 16:54	08 Feb 2022	Approved	Ogando F.
EN5-2.2.1.2.70-01-N1 Report on updates of DONES TC neutronics model 2021 (EPDA_D_2024G4 v1.0)	17 Jun 2022 10:11	11 Apr 2022	Approved	Qiu Y.
EN5-2.2.1.2.70-01-N1 TC Neutronics model updates in 2022 (EPDA_D_2024H5 v1.0)	28 Jun 2023 05:54	29 Jun 2023	In Work	Serice A.
EN5-2.2.1.2.70-01-N1 Neutronics model of the accelerator system components and systems (EPDA_D_2024I6 v1.0)	01 Sep 2023 14:56	29 Jun 2023	Revision Required	Order A.
EN5-2.2.1.2.71-01-N1 Report on updates of DONES neutronics model 2018 (EPDA_D_2024J7 v1.0)	20 Jun 2023 18:30	08 Mar 2017	Approved	Qiu Y.
EN5-2.2.1.2.72-01-N1 Report on updates of DONES neutronics model 2017 (EPDA_D_2024K8 v1.0)	20 Jun 2023 18:30	26 Apr 2018	Approved	Qiu Y.
EN5-2.2.1.2.72-01-N1 Update of the neutronics model of the Accelerator Systems (EPDA_D_2024L9 v1.0)	20 Jun 2023 18:30	16 Mar 2019	Approved	Ogando F.
EN5-2.2.1.2.73-01-N1 DONES neutronics Target Assembly model (EPDA_D_2024M0 v1.0)	20 Jun 2023 18:30	13 Jun 2019	Approved	Qiu Y.
EN5-2.2.1.2.73-01-N1 Accelerator Systems Neutronics Model (EPDA_D_2024N1 v1.0)	20 Jun 2023 18:30	11 Jan 2020	Approved	Castelan J. P.
EN5-2.2.1.2.74-06-N1 Description of MCNP Main Building Model 2020 (EPDA_D_2024O2 v1.0)	20 Jun 2023 18:30	15 Jan 2020	Approved	Qiu Y.
EN5-2.2.1.2.74-06-N1 Description of MCNP Main Building Model 2020 (EPDA_D_2024P3 v1.0)	20 Jun 2023 18:30	16 Dec 2020	Approved	Mota F.
EN5-2.2.1.2.74-06-N1 TC Neutronics model update in 2020 (EPDA_D_2024Q4 v1.0)	20 Jun 2023 18:30	02 Oct 2020	Approved	Qiu Y.

Generation of Excel file



- Download information from EUROfusion IDM platform (12 folders)

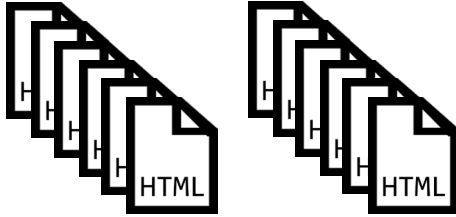
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tool to show
the page
source



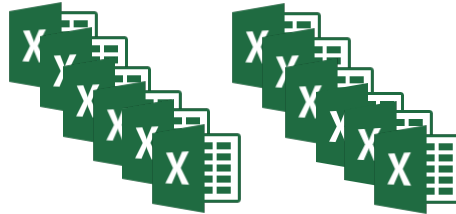
NAH update

- 12 IDM folders. Content exportation to Excel files and to HTML code (Excel files do not have report version)

2 sets of 12 files



Merge 12 HTML files
into 1 single file

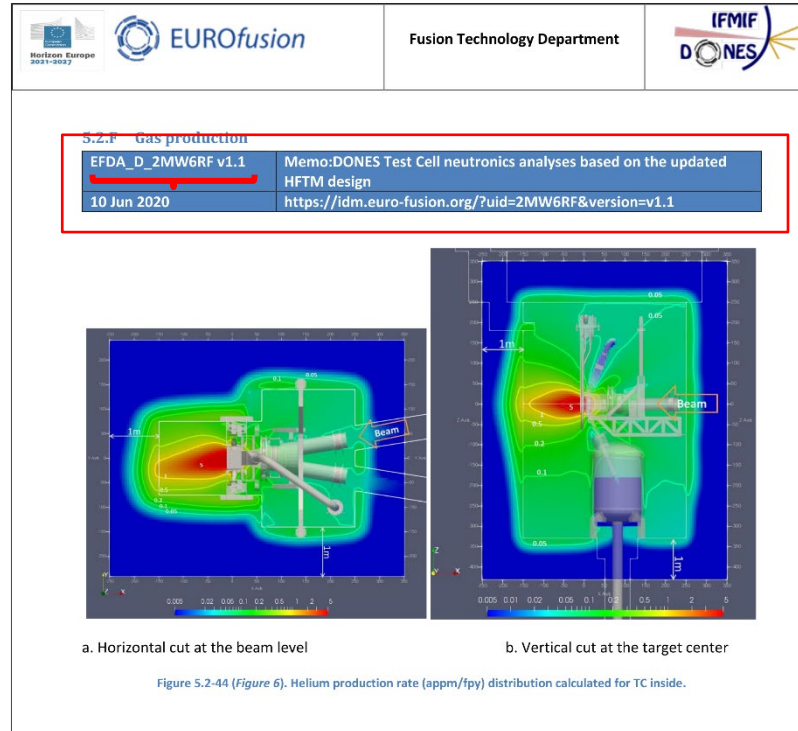


Create a new Excel file
with the 12 Excel files
(imported sheets)



NAH update

- NAH identification: summary table



NAH update

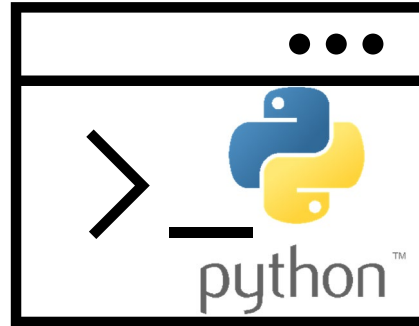
- Run Python script to create an extended IDM Excel file

Inputs

- Excel file
- HTML file (with report versions)
- NAH (word)



Python script



Output

- Extended Excel file



NAH update

- Original IDM Excel file

2.2 Neutronics FP9_xls_raw.xlsx - Excel

File Home Insert Page Layout Formulas Data Review View Tell me what you want to do...

B50

1	IDM Root/EUROfusion Horizon Europe/03 Fusion Technology Department/DONE\$						
2							
3	InfoLink	Title	t change c	Type	Issue Date	Status	Signatory
4	2P9VY7.A	2015-202C	24/09/202	Hyperlink	-	-	-
5	2QXMPV	McDeLicio	05/07/202	zip	05 Jul 202	Signed	Qiu Y.
6	2L6PV6	McDeLicio	21/06/202	zip	19 May 20	Signed	Qiu Y.
7	2MSYB8	McDeLicio	21/06/202	zip	20 Jun 201	In Work	Qiu Y.
8	2M5DLR	The srcUN	21/06/202	zip	23 Nov 20	Approved	Ogando F.
9	2PR33E	The srcUN	15/01/202	zip	21 Jul 202	Approved	Ogando F.
10							
11	Link	https://idm.euro-fusion.org/?uid=2P9VY7					
12	Last Modii	24/09/2021 10:53 by Qiu Y.					
13							
14	View Acces Authenticated (with individual accounts)						
15	Add Acces Authenticated (with individual accounts)						
16							

Ready

2.2.1_Neutronics_model 2.2.2_Radiation_dose 2.2.3_Activity_inventories 2.2.4_Neutronics_analyses 2.2.5_Performance 2.2.6_Code_and_data Archive Data Meetings Models NAH Software

12 IDM folders

NAH update

- Extended IDM Excel file

Original columns

	A	B	C	D	E	F	G	H	I	J	K	L
	InfoLink	Title	Last change date	Issue Date	Status	Signatory	IDM ID	NAH match	Comments			
1	2NHFLP	ENS-2.2.1.0-T44-05-N1 Accelerator Systems Neutronic Model	20/06/2023 18:30:32	25 Nov 2020	Approved	Ogando F.	EFDA_D_2NHFLP v1.0	FALSE				
2	2M8BEL	ENS-2.2.1.1-T4-01-N1 Report on updating needs for DONES model	21/06/2023 09:32:22	22 Dec 2015	Approved	Qiu Y.	EFDA_D_2M8BEL v1.0	FALSE				
3	2PF4S3	ENS-2.2.1.2-T001-11 Update of neutronics model of the accelerator system	31/05/2022 14:54:27	09 Feb 2022	Approved	Ogando F.	EFDA_D_2PF4S3 v1.1	TRUE				
4	2PL7CE	ENS-2.2.1.2-T003-01_Report_on_updates_of_DONES_TC_neutronics_model_2021	17/06/2022 10:11:02	11 Apr 2022	Approved	Qiu Y.	EFDA_D_2PL7CE v1.1	FALSE				
5	2QQGNF	ENS-2.2.1.2-T013-01-N1 TC Neutronics model updates in 2022	28/06/2023 03:54:18	28 Jun 2023	In Work	Serikov A.	EFDA_D_2QQGNF v1.0	FALSE				
6	2QS4R6	ENS-2.2.1.2-T021-03: Neutronics modelling of the accelerator system components and rooms	01/09/2023 14:56:55	29 Jun 2023	Revision Required	Cufar A.	EFDA_D_2QS4R6 v1.0	FALSE				
7	2MJ9NP	ENS-2.2.1.2-T12-01-N1 Report on updates of DONES neutronics model 2016	20/06/2023 18:30:34	08 Mar 2017	Approved	Qiu Y.	EFDA_D_2MJ9NP v1.2	FALSE				
8	2NSRT5	ENS-2.2.1.2-T21-01-N1 Report on updates of DONES neutronics 2017	20/06/2023 18:30:35	26 Apr 2018	Approved	Qiu Y.	EFDA_D_2NSRT5 v1.0	FALSE				
9	2LADZ2	ENS-2.2.1.2-T28-21-N1 Update 2018 of the neutronics model of the Accelerator Systems	20/06/2023 18:30:31	18 Mar 2019	Approved	Ogando F.	EFDA_D_2LADZ2 v1.0	FALSE				
10	2NAVH2	ENS-2.2.1.2-T30-01-N1 DONES neutronics Target Assembly model	20/06/2023 18:30:36	13 Jun 2019	Approved	Qiu Y.	EFDA_D_2NAVH2 v1.0	TRUE				
11	2LWV5S	ENS-2.2.1.2-T36-24-N1 Accelerator Systems Neutronics Model	20/06/2023 18:30:30	11 Jan 2020	Approved	Catalan J. P	EFDA_D_2LWV5S v1.0	FALSE				
12	2NC7FY	ENS-2.2.1.2-T38-01-N1 Report on updates of DONES TC neutronics model 2019	20/06/2023 18:30:33	15 Jan 2020	Approved	Qiu Y.	EFDA_D_2NC7FY v1.0	FALSE				
13	2MYWCX	ENS-2.2.1.2-T44-09-N1 Description of MCNP Main Building Model 2020.docx	20/06/2023 18:30:31	16 Dec 2020	Approved	Mota F.	EFDA_D_2MYWCX v1.1	FALSE				
14	2NPJT8	ENS-2.2.1.2-T46-01-N1 TC Neutronics model update in 2020	20/06/2023 18:30:34	02 Oct 2020	Approved	Qiu Y.	EFDA_D_2NPJT8 v1.0	TRUE				
15												
16												
17												

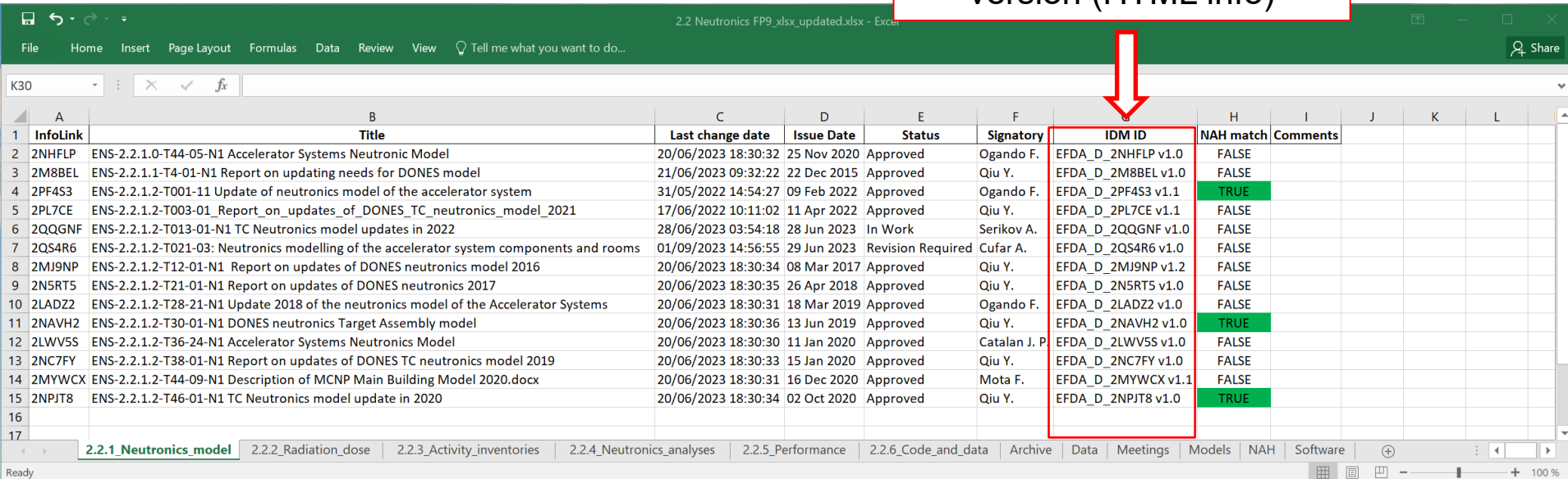
2.2.1 Neutronics_model 2.2.2 Radiation_dose 2.2.3 Activity_inventories 2.2.4 Neutronics_analyses 2.2.5 Performance 2.2.6 Code_and_data Archive Data Meetings Models NAH Software

12 IDM folders

NAH update

- Extended IDM Excel file

New column: IDM ID with version (HTML info)



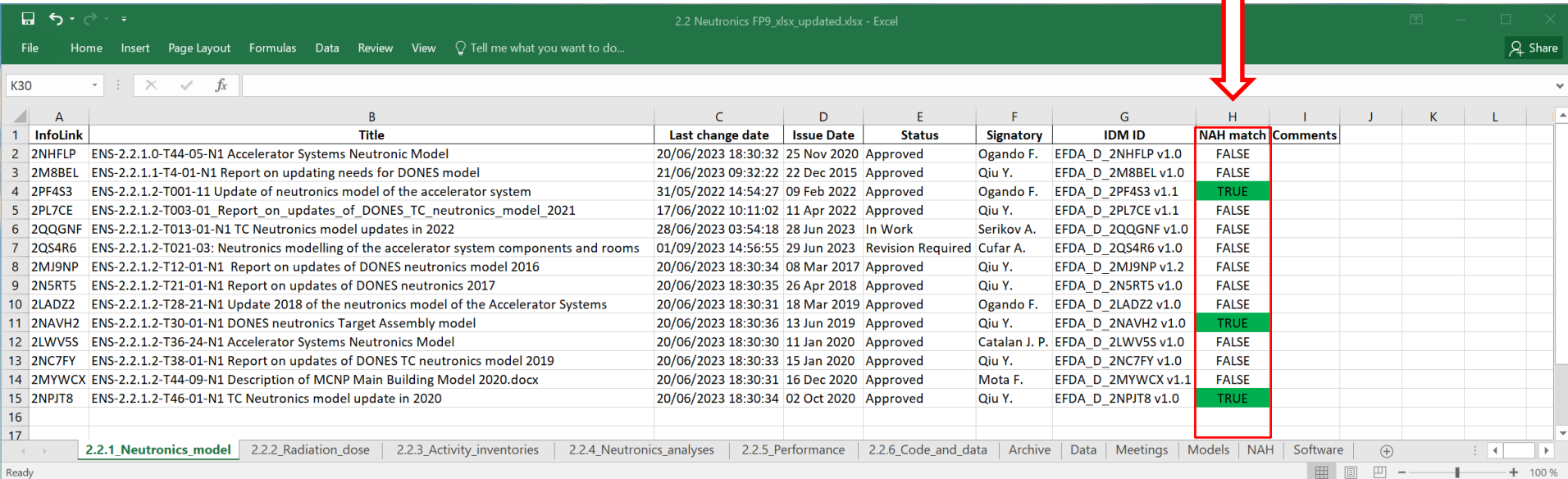
	A	B	C	D	E	F		H	I	J	K	L
	InfoLink	Title	Last change date	Issue Date	Status	Signatory	IDM ID	NAH match	Comments			
1	2NHFLP	ENS-2.2.1.0-T44-05-N1 Accelerator Systems Neutronic Model	20/06/2023 18:30:32	25 Nov 2020	Approved	Ogando F.	EFDA_D_2NHFLP v1.0	FALSE				
2	2M8BEL	ENS-2.2.1.1-T4-01-N1 Report on updating needs for DONES model	21/06/2023 09:32:22	22 Dec 2015	Approved	Qiu Y.	EFDA_D_2M8BEL v1.0	FALSE				
3	2PF4S3	ENS-2.2.1.2-T001-11 Update of neutronics model of the accelerator system	31/05/2022 14:54:27	09 Feb 2022	Approved	Ogando F.	EFDA_D_2PF4S3 v1.1	TRUE				
4	2PL7CE	ENS-2.2.1.2-T003-01_Report_on_updates_of_DONES_TC_neutronics_model_2021	17/06/2022 10:11:02	11 Apr 2022	Approved	Qiu Y.	EFDA_D_2PL7CE v1.1	FALSE				
5	2QQGNF	ENS-2.2.1.2-T013-01-N1 TC Neutronics model updates in 2022	28/06/2023 03:54:18	28 Jun 2023	In Work	Serikov A.	EFDA_D_2QQGNF v1.0	FALSE				
6	2QS4R6	ENS-2.2.1.2-T021-03: Neutronics modelling of the accelerator system components and rooms	01/09/2023 14:56:55	29 Jun 2023	Revision Required	Cufar A.	EFDA_D_2QS4R6 v1.0	FALSE				
7	2MJ9NP	ENS-2.2.1.2-T12-01-N1 Report on updates of DONES neutronics model 2016	20/06/2023 18:30:34	08 Mar 2017	Approved	Qiu Y.	EFDA_D_2MJ9NP v1.2	FALSE				
8	2NSRT5	ENS-2.2.1.2-T21-01-N1 Report on updates of DONES neutronics 2017	20/06/2023 18:30:35	26 Apr 2018	Approved	Qiu Y.	EFDA_D_2NSRT5 v1.0	FALSE				
9	2LADZ2	ENS-2.2.1.2-T28-21-N1 Update 2018 of the neutronics model of the Accelerator Systems	20/06/2023 18:30:31	18 Mar 2019	Approved	Ogando F.	EFDA_D_2LADZ2 v1.0	FALSE				
10	2NAVH2	ENS-2.2.1.2-T30-01-N1 DONES neutronics Target Assembly model	20/06/2023 18:30:36	13 Jun 2019	Approved	Qiu Y.	EFDA_D_2NAVH2 v1.0	TRUE				
11	2LWV5S	ENS-2.2.1.2-T36-24-N1 Accelerator Systems Neutronics Model	20/06/2023 18:30:30	11 Jan 2020	Approved	Catalan J. P	EFDA_D_2LWV5S v1.0	FALSE				
12	2NC7FY	ENS-2.2.1.2-T38-01-N1 Report on updates of DONES TC neutronics model 2019	20/06/2023 18:30:33	15 Jan 2020	Approved	Qiu Y.	EFDA_D_2NC7FY v1.0	FALSE				
13	2MYWCX	ENS-2.2.1.2-T44-09-N1 Description of MCNP Main Building Model 2020.docx	20/06/2023 18:30:31	16 Dec 2020	Approved	Mota F.	EFDA_D_2MYWCX v1.1	FALSE				
14	2NPJT8	ENS-2.2.1.2-T46-01-N1 TC Neutronics model update in 2020	20/06/2023 18:30:34	02 Oct 2020	Approved	Qiu Y.	EFDA_D_2NPJT8 v1.0	TRUE				
15												
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2.2.1_Neutronics_model 2.2.2_Radiation_dose 2.2.3_Activity_inventories 2.2.4_Neutronics_analyses 2.2.5_Performance 2.2.6_Code_and_data Archive Data Meetings Models NAH Software

NAH update

- Extended IDM Excel file

New column: automatic match of IDM database and NAH nuclear analyses (both ID and version)



	A	B	C	D	E	F	G	H	I	J	K	L
1	InfoLink	Title	Last change date	Issue Date	Status	Signatory	IDM ID	NAH match	Comments			
2	2NHFLP	ENS-2.2.1.0-T44-05-N1 Accelerator Systems Neutronic Model	20/06/2023 18:30:32	25 Nov 2020	Approved	Ogando F.	EFDA_D_2NHFLP v1.0	FALSE				
3	2M8BEL	ENS-2.2.1.1-T4-01-N1 Report on updating needs for DONES model	21/06/2023 09:32:22	22 Dec 2015	Approved	Qiu Y.	EFDA_D_2M8BEL v1.0	FALSE				
4	2PF4S3	ENS-2.2.1.2-T001-11 Update of neutronics model of the accelerator system	31/05/2022 14:54:27	09 Feb 2022	Approved	Ogando F.	EFDA_D_2PF4S3 v1.1	TRUE				
5	2PL7CE	ENS-2.2.1.2-T003-01_Report_on_updates_of_DONES_TC_neutronics_model_2021	17/06/2022 10:11:02	11 Apr 2022	Approved	Qiu Y.	EFDA_D_2PL7CE v1.1	FALSE				
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7	2QS4R6	ENS-2.2.1.2-T021-03: Neutronics modelling of the accelerator system components and rooms	01/09/2023 14:56:55	29 Jun 2023	Revision Required	Cufar A.	EFDA_D_2QS4R6 v1.0	FALSE				
8	2MJ9NP	ENS-2.2.1.2-T12-01-N1 Report on updates of DONES neutronics model 2016	20/06/2023 18:30:34	08 Mar 2017	Approved	Qiu Y.	EFDA_D_2MJ9NP v1.2	FALSE				
9	2NSRT5	ENS-2.2.1.2-T21-01-N1 Report on updates of DONES neutronics 2017	20/06/2023 18:30:35	26 Apr 2018	Approved	Qiu Y.	EFDA_D_2NSRT5 v1.0	FALSE				
10	2LADZ2	ENS-2.2.1.2-T28-21-N1 Update 2018 of the neutronics model of the Accelerator Systems	20/06/2023 18:30:31	18 Mar 2019	Approved	Ogando F.	EFDA_D_2LADZ2 v1.0	FALSE				
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12	2LWV5S	ENS-2.2.1.2-T36-24-N1 Accelerator Systems Neutronics Model	20/06/2023 18:30:30	11 Jan 2020	Approved	Catalan J. P.	EFDA_D_2LWV5S v1.0	FALSE				
13	2NC7FY	ENS-2.2.1.2-T38-01-N1 Report on updates of DONES TC neutronics model 2019	20/06/2023 18:30:33	15 Jan 2020	Approved	Qiu Y.	EFDA_D_2NC7FY v1.0	FALSE				
14	2MYWCX	ENS-2.2.1.2-T44-09-N1 Description of MCNP Main Building Model 2020.docx	20/06/2023 18:30:31	16 Dec 2020	Approved	Mota F.	EFDA_D_2MYWCX v1.1	FALSE				
15	2NPJT8	ENS-2.2.1.2-T46-01-N1 TC Neutronics model update in 2020	20/06/2023 18:30:34	02 Oct 2020	Approved	Qiu Y.	EFDA_D_2NPJT8 v1.0	TRUE				
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NAH update

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Comments column
(working space)

	A	B	C	D	E	F	G	H	I	J	K	L
1	InfoLink	Title	Last change date	Issue Date	Status	Signatory	IDM ID	NAH match	Comments			
2	2NHFLP	ENS-2.2.1.0-T44-05-N1 Accelerator Systems Neutronic Model	20/06/2023 18:30:32	25 Nov 2020	Approved	Ogando F.	EFDA_D_2NHFLP v1.0	FALSE				
3	2M8BEL	ENS-2.2.1.1-T4-01-N1 Report on updating needs for DONES model	21/06/2023 09:32:22	22 Dec 2015	Approved	Qiu Y.	EFDA_D_2M8BEL v1.0	FALSE				
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13	2NC7FY	ENS-2.2.1.2-T38-01-N1 Report on updates of DONES TC neutronics model 2019	20/06/2023 18:30:33	15 Jan 2020	Approved	Qiu Y.	EFDA_D_2NC7FY v1.0	FALSE				
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16												
17												

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- Key document for the licensing of the commissioning and operation
- To identify new or updated reports, EUROfusion IDM data base is compared with NAH reports, using a Python script