Work package 7 - Dissemination and data management

This WP includes all actions aimed at the dissemination of the results of the project and the management of the data produced in it. Since the project abandoned the Open Research Data Pilot (AMD-755039-30) during the second reporting period, part of the objectives and work that had been initially set and foreseen concerning data management have been downscaled accordingly. None the less, in terms of dissemination significant effort was invested to advertise the project and its results on several occasions, as reported below. The WP is subdivided in three tasks, the first originally linked to the ORD pilot and now limited to the collection of nanoindentation data according to established standards, the second one specifically dedicated to the standardisation and use of the data on naonindentation in the framework of a standardisation body (CEN), the last one related with dissemination and communication activities.

Task 7.1: Research data management and open access (M1 – M48)

Task leader: S. Austin, JRC; other partners: CIEMAT, ENEA, SINTEC

With M4F having withdrawn from the H2020 ORD pilot, the project is no longer obliged to undertake activities related to management of test, characterisation and modelling data set out in the DMP. However, prior to the withdrawal, two partners, namely JRC and NCBJ uploaded a total of 687 individual data sets to the MatDB engineering materials database hosted at https://odin.jrc.ec.europa.eu. Taking advantage of the MatDB data citation feature, all data sets are enabled for citation and hence can be referenced in the exact same way as a traditional publication i.e. authors, title and abstract. This feature ensures that the owners of the data (and the M4F project) are accredited in any derivative works. Further, the data sets are listed in a citable data catalog entitled 'Database of H2020 M4F nanoindentation test data' at https://doi.org/10.5290/55.

Task 7.2: CEN Workshop on standards-compliant data formats (M1 – M48)

Task leader: S. Austin, JRC; other partners: -

During the period 1 March 2019 through 31 August 2020, the larger part of the work of the NATEDA CEN Workshop (CEN/WS NATEDA) on nanoindentation test data was completed. This included completion of a 4-point workplan, extending to (1) analysis of the data generated during application of ISO 14577-1:2015; (2) analysis of existing and development of new tools for data export; (3) development of computer readable terminology; and (4) case studies. The data specification, the development of which was the primary objective the CEN/WS NATEDA, underwent a number of development iterations and were subject to review by both CEN/WS NATEDA registered participants as well as equipment manufacturers. With a view to delivering a robust solution, the CEN Workshop Agreement (CWA) underwent two periods of public commenting, the first in June 2019 and the second in May 2020. Thereafter and with a view to verification of the efficacy of the data technologies, two CEN/WS NATEDA registered participants, namely JRC and NPL undertook an interlaboratory data exchange study. By extending the reporting software of the testing equipment to support a module capable of exporting data in the CEN/WS NATEDA format, the test results were seamlessly transferred to the MatDB engineering materials database. Again, the corresponding data sets have been enabled for citation individually and as a citable

catalog entitled 'CEN/WS NATEDA nanoindentation test data' at https://doi.org/10.5290/51. CWA 17552:2020 will be published early November, 2020. The successful outcome of CEN/WS NATEDA delivers data technologies that significantly reduce the data management overhead, thereby allowing straightforward collection, publication and reuse of data, which in turn ensures effective utilisation of the research investment (in the form of test data available in perpetuity) and promotes data reuse.

Task 7.3: Dissemination and communication activities (M1 – M48)

Task leader: L. Malerba, CIEMAT; other partners: ENEA, SINTEC

A PhD and post-doc event was organised on 23rd-25th June 2019 at "La Cristalera", in Miraflores de la Sierra, Madrid, Spain. The objective was to provide the occasion for PhD students, post-doc researchers and in general early career researchers working within M4F, to know each other, get awareness of the project they are working for and present orally their work to their peers. Invitations were extended, however, well beyond the community of early career researchers, in order to convert the event into a true scientific workshop. Non PhD/post-docs could present posters. Full accommodation for PhDs/post-docs was paid directly by the project. The programme included 20 presentations and the event had 33 attendees.

In addition to this event, the participants in the project presented their work on the occasion of several **conferences, symposia and workshops** (at least before the COVID19 lockdown). A **non-exhaustive list** is given in **Table 1**. In particular, the project as a whole has been presented on three occasions, namely:

- **FISA conference**, Pitesti (Romania), 4-7 June 2019; the presentation given there gave rise also to a publication: L. Malerba *et al.*; "Advances on GenIV structural and fuel materials and cross-cutting activities between fission and fusion", EPJ Nuclear Sciences & Technologies 6 (2020) 32. DOI: 10.1051/epjn/2019021.

- **SMINS conference** (Structural Materials for Innovative Nuclear Systems), Kyoto (Japan), 7-11 July 2019. At this conference, four presentations were directly connected with M4F:

  "The Joint Programme on Nuclear Materials (JPNM) of the European Energy Research Alliance and the M4F Project", Lorenzo Malerba (CIEMAT, Spain, and EERA-JPNM)

  "On the role of Ni, Si and P on the nanostructural evolution of FeCr alloys under irradiation – link with hardening", Cristelle Pareige (Uni. Rouen, France) *et al.*

  "Radiation-induced formation of minor solute clusters in ferritic/martensitic Fe-Cr alloys", Lorenzo Malerba (CIEMAT, Spain)

  "Primary damage in structural materials at the quantum scale", Pär Olsson (KTH, Sweden).

- **EUROMAT conference**, Symposium D7, Stockholm (Sweden), 1-5 Sept. 2019. Several M4F results were presented as part of this symposium, e.g.:

"EERA-JPNM and M4F project in the context of qualification, development and modelling of structural and fuel materials for sustainable nuclear energy", Lorenzo Malerba (CIEMAT, Spain).

"Influence of temperature and initial microstructure on the microstructural evolution of some neutron irradiated FeCrNiSiP alloys", Papa-Modou Gueye (Univ. Rouen, France)

"Atomic modeling of the impact of magnetism on thermodynamics and kinetics of Fe-Cr alloys", Mickaël Trochet (CEA, France).

"Grain scale modelling of plastic microstructure evolution in structural nuclear materials", Tuncay Yalcinkaya (METU, Turkey).

More than 40 peer-reviewed publications have been either published, or submitted for publication, or are in preparation within the project. The **22 published ones** are listed in **Table 2.**