Partitioning And Transmuter Research Initiative in a Collaborative Innovation Action

DELIVERABLE

D14.4 Data Management and Quality Plan

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DOCUMENT CONTROL SHEET

DOCUMENT INFORMATION

Document title	Data Management and Quality Plan
Author(s), (organisation)	Mariano Tarantino (ENEA) + Philippe Planquart (VKI)
Document type	Deliverable
Document ID	D14.4
Work package n°	WP14 (Domain: MECT)
Work package title	WP14 Knowledge management, education and training
Lead beneficiary	ENEA
Dissemination level	Public
Date of issue	24/02/2022
Archive ID reference COO	SCK CEN/47289249

DOCUMENT SUMMARY

Following the recommendations provided by the European Commission (EU, 2016), this deliverable describes the Data Management and Quality Plan for PATRICIA for Dissemination of information.

DOCUMENT HISTORY

Version	Status	Date
v0	VKI version	07/01/2022
v1	final	24/02/2022

DOCUMENT APPROVAL

The author, WP Leader and Coordinator acknowledge and accept delivery of the work completed for this deliverable.

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14/01/22	Mariano Tarantino	ENEA

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DISTRIBUTION LIST

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1 Introduction

1.1 Context

Following the recommendations provided by the European Commission (EU, 2016), this deliverable describes the Open research data pilot for Dissemination of information.

The deliverable describes the data management life cycle for all datasets to be collected, processes and/or generated by the PATRICIA research project. As part of making research data **F**indable, **A**ccessible, **I**nteroperable and **R**eusable (FAIR), the **D**ate **M**anagement **P**lan (DMP) should include information on:

- The handling of research data during and after the end of the project,
- What data will be collected, processes and/or generated,
- Which methodology and standards will be applied,
- Whether data will be shared/made open access and
- How data will be curated and preserved (inclusion after the end of the project)

1.2 Scope

This document is developed as part of the PATRICIA project, which has received funding from the European Union's Horizon 2020 (call NFRP-2019-2020), under the Grant Agreement number 945077.

The Data Management and Quality Plan represents the Deliverable 14.4 of Work Package (WP14) – **Knowledge management, education and training**.

2 Data Summary

2.1 PATRICIA summary

PATRICIA, the **P**artitioning **A**nd **T**ransmuter **R**esearch **I**nitiative in a **C**ollaborative **I**nnovation Action, is established in NFRP-7 "Safety Research and Innovation for Partitioning and Transmutation" of the EURATOM work programme 2019-2020.

PATRICIA focuses on four technical domains: **partitioning**, **transmutation, driver fuel & fuel assembly safety** and **ADS system safety**.

The project focusses on a combination of experiments, theoretical studies, and numerical simulations.

2.2 PATRICIA objectives

PATRICIA follows that plan and answers the EURATOM call: Research and Innovation for Partitioning and/or Transmutation. It focusses on research on advanced partitioning to efficiently separate Am from spent fuel, on experimental and fuel-performance code development work studying the behaviour of Am bearing fuel under irradiation and on the safety related research supporting the licensing process of MYRRHA in its role in the development trajectory for a dedicated accelerator driven transmuter.

It may be noted that for first time, the communities working of partitioning, transmutation and the development of MYRRHA are joint in one project.

Besides the technical work described above, dedicated work packages deal with education focusing on pre-and post-graduate students, and with dissemination where besides the specific stakeholders also high school pupils and the general public is targeted. A further task on knowledge management includes both foreground data as well as metadata as to ensure that proper QA for V&V is possible.

2.3 PATRICIA Work Packages

The PATRICIA project is organized in 14 work packages, grouped in **4 technical domains** plus a fifth domain dealing with management, education and training.

Domain 1: Partitioning (Domain lead: CEA)

WP1: Basic data acquisition

WP2: Process development

WP3: Conversion

Domain 2: Transmutation (Domain lead: POLIMI)

WP4: Gas fission products behaviour under irradiation: thermo-chemical properties of Am-bearing fuel

WP5: Improvement of modelling and fuel performance codes

WP6: Application to simulation in normal conditions and off-normal conditions

Domain 3: Driver fuel and core safety (Domain lead: SCK CEN)

WP7: Fuel clad behaviour

WP8: Driver fuel safety

WP9: Fuel assembly safety

Domain 4: ADS System Safety (Domain lead: NRG)

WP10: Accelerator and beam line safety and reliability

WP11: System thermal hydraulics system

WP12: Chemistry control experiments and modelling

Domain 5: Management, Education and Training (Domain lead: SCK CEN)

WP13: Management

WP14: Knowledge management, education and training

2.4 PATRICIA project management structure

The management structure consists of the following components:

- A project coordinator (PCO), acting as single point of contact with the Commission

- A Governing board, which is the ultimate decision-making body
- A Technical Coordination Board (TCB), responsible for the technical part of the project
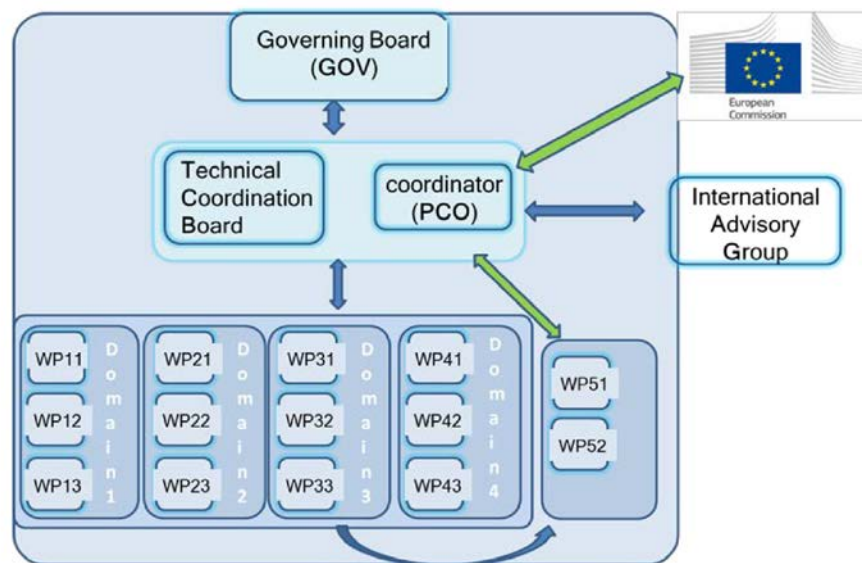- An international Advisory Group (IAG) that is consulted on scientific and technical matters.

Figure 1 - PATRICIA management structure

Additional information on the roles and responsibilities of the different boards are defined in the Grant Agreement.

2.5   Purpose of the data collection/generation and its relation to the PATRICIA Objectives

The PATRICIA project will mark a fundamental contribution to the back-end fuel cycle research and covers all technical domains of P&T, i.e. partitioning, conversion, transmutation and development of the transmuter.

PATRICIA will deliver key data to help increasing the TRL of the different domains defined in chapter 2.3.

2.6   Types and format of data

The PATRICIA project will generate a large amount of data among which the following:

- Dissemination results
- Concept information
- Design information (CAD data)
- Simulation model and simulation data
- Description of hardware
- Description of algorithms + algorithms
- Description of operation and procedures
- CFD and experimental results
- Verification and validation data

The type and format of the data will be linked to the program used to generate these data.

2.7 Existing data re-use and their origin

Any existing data from current of previous project that can be useful to carry out efficiently the PATRICIA project will be re-used.

2.8 Expected size of data

The size of the data may range from a few "Megabyte" to datasets of the order of "Terabytes", depending on the application.

2.9 Data utility

The original data will remain at the site of the different partners. Useful open data for the scientific community will be placed in an open project-site.

3 FAIR data

3.1 Make data Findable, including provisions for metadata

3.1.1 Identification mechanism

The databases generated in the project will be identified by means of a Digital Object Identifier and archived on the secure PATRICIA data repository together with pertinent keywords.

The choice of adequate keywords will be included to promote and ease the discoverability of data. The keywords will include several common keywords in the nuclear area but also generic keywords that can help to attract researchers from other research areas to use and adapt PATRICIA results to their scientific fields.

3.1.2 Naming convention

The following naming convention will be used during the project:

- MoM : Minutes of Meeting
- KOM: Kick of Meeting
- TN: Technical Note
- DS: Data Set
- DX.Y : Deliverable (and the associated deliverable number: "X,Y" as example)
- FR: Flash Report
- Meeting#0: Presentation during the technical meeting between the different partners of the consortium
- CP: Conference Presentation
- PU: Journal Publication

3.1.3 Clear version number

Authors, approvers and modifiers of any kind of documents (deliverables, technical notes,…) are recommended to use the Track changes functionality of Word or PDF when making changes to any version of a document. Correction and remarks can also be sent by Email or directly discussed with the consortium members.

Modifications brought to the documents are identified in the "Document history" section for example on the second page of this deliverable. The corresponding "status" column summarizes the implemented modifications.

3.1.4 Type of metadata

Where relevant, the database will be liked to metadata such as:

➢ **Descriptive metadata:** (describe a resource for purposes such as discovery and identification): it includes PATRICIA identifier, title, abstract, descriptive comments and keywords.
➢ **Structural metadata:** (metadata about containers of data and indicates how compound objects are put together): Table of contents (for each delivered document) but also Management Document describing the Types, Versions and Relationships between the PATRICIA digital materials (developed tools and experimental results)
➢ **Administrative metadata:** (provides information to help manage a resource): Author(s) and affiliation, reviewer(s) and affiliation, acceptance, type of document, dissemination level, document status, work package, estimated delivery date, actual delivery data and circulation list.
➢ **Process metadata**: (describe processes that collect, process or produce data): Description of calibration procedure and data acquisition method.

3.2 Make data openly Accessible

3.2.1 Data produced and/or used in PATRICIA openly available as the default

By default, all PATRICIA **scientific publications** will be made publicly available with due respect of the Green/Gold access regulations applied by each scientific publisher.

Whenever possible, the scientific publication will be made freely accessible through the project public web site (https://patricia-h2020.eu), described in deliverable D1.4 (Public web-site for information exchange).

With respect to dataset, in every deliverable, the main data produced should be identified and described. In the deliverable, the location of the dataset should be described as well as the data that needs to be kept as confidential and the ones that will be made public.

3.2.2 Datasets to be shared under restrictions

The PATRICIA consortium as a whole will examine the suitability of the datasets produced by the project for public dissemination, as defined in the Grant Agreement. If the dataset can be made public,

the owner of the data will take the necessary actions to make them available to the project. The data manager will afterwards verify it is deposited in an open data repository.

3.2.3   Data accessibility

The databases that will be selected to be made accessible, will be archived on a data repository selected by the owner of the data. It is recommended to use repositories maintained by international research organizations, like for example Zenodo (https://zenodo.org). The data will be listed and linked to the PATRICIA project website and referred to in any publications, which contain and report such datasets.

3.2.4   Methods or software tools; need to access the data

No specific methods or software tools are foreseen to get access to the PATRICIA data. A procedure will be available with the instructions to get access to the open data repositories. This procedure will be defined by the owner of the dataset.

3.2.5   Location of the data and associated metadata, documentation and code

The partners will be the only beneficiary of the PATRICIA project. The different partners will generate the data and associated metadata, documentation and code.

3.2.6   Data restrictions on use and data access committee

Final decision concerning the data access and data restrictions on use will be taken in accordance with the project coordinator. A data access committee, consisting of every partner, can provide recommendations on the accessibility of the data. Access to the PATRICIA datasets will be granted under the responsibility and supervision of the project coordinator.

3.3   Make data Interoperable

The interoperability of the PATRICIA published datasets will be enforced by the adoption of:

- generally used extensions, adopting well established formats (whenever it is made possible),
- clear metadata,
- keywords to facilitate discovery and integration of PATRICIA data for other purposes,
- and detailed documentation (such as user guide, for instance)

3.4   Increase data Re-use

PATRICIA is expected to produce a considerable volume of novel data and knowledge through design, modelling, simulation and development activities that will be presented to the outside world through a carefully designed set of dissemination actions described in the grant agreement.

Open data will be made available and accessible at the earliest opportunity on special repositories, referred by PATRICIA website.

This fast publication of data is expected to promote the data re-use by other researchers and industrials active in the launcher field. Possible users will have to adhere to a "Terms of Use" and to agree with the licensing content.

The PATRICIA consortium plans to make its selected data accessible to third parties up to a period of 10 years after the project completion.

All the methods are expected to bring their contribution to a long-term and efficient reuse of PATRICIA data.

4   Data quality plan

All partners are responsible for the quality assurance within their organization for the PATRICIA project. They should follow that quality plan of their own organization to ensure high quality results.

The quality of project activities and outputs will be monitored by task leaders, WP leaders, domain leaders and the coordinator according to the project management structure of PATRICIA and the project Grant Agreement.

4.1   Deliverables

Seventy deliverables need to be submitted to the European Commission during the PATRICIA project.

A template is provided on the PATRICA SharePoint for the deliverables, with general document information (including document history) that will guarantee that the tracking of the deliverables and quality; by document approval from the author, WP Leader and coordinator.

This review process is a key step in the preparation of the deliverable to guarantee that the document is up to the appropriate standard.

4.2   Milestones

Ten milestones have been identified within the PATRICIA project. Task Leaders and WP Leaders are responsible for the timely achievement of the milestones as identified in the Grant Agreement. A means of verification that the milestone has been reached has been defined for every milestone.

In case of potential delays, the coordinator will work with the responsible WP leader to develop a contingency plan.

4.3   Minute of Meeting

Several meetings are planned in the frame of the PATRICIA project, both a level of task, work package and domain. Task Leaders, WP Leaders and Domain Leader are responsible for the writing of the minute of the meeting, as reported in the Grant Agreement. Minute of meeting are relevant for catching the evaluation of the Project, allowing the Coordinator to be informed of the project implementation and thus interact with partners when needed to support the resolution of criticalities.

5   Allocation of resources

The project coordinator is responsible of the PATRICIA proper data archival (for a period of up to 10 years after the project completion), curation, maintenance and documentation. The handling of the different repository maintained by the project as well as all data management issues related to the project fall in the responsibility of the project coordinator.

Costs related to data management (dissemination, including open access and protection of results) are eligible for reimbursement under the conditions defined in the H2020 Grant Agreement.

6   Data security

6.1   Transfer of sensitive data

Transfer of sensitive data will be performed via a dedicated site for information and document exchange.

The project coordinator launched a PATRICIA-store project site for information and document exchange between the different partners. The site will be stored at SCK CEN.

All invited PATRICIA members will be granted to a personnel access.

7   Ethical aspects

The PATRICIA consortium complies with the ethical principal as set out in **Article 34 of the Grant Agreement**, which states that all activities must be carried out in compliance with ethical and research integrity principles:

The beneficiaries must carry out the action in compliance with:

    a. Ethical principles (including the highest standards of research integrity – as set out, for instance in the European Code of Conduct for Research Integrity – and including, in particular, avoiding fabrication, falsification, plagiarism or other misconduct)

    b. Applicable international, EU and national law

The beneficiaries must ensure that the activities under the action have an exclusive focus on civil applications.

These ethical principles also cover the data management activities. The data generated in the frame of the PATRICIA project are not subject to ethical issues.

8   Other issues

The PATRICIA project does not make use of other national/funder/sectorial/departmental procedures for data management.

9   Conclusion

The deliverable provides a first description on how the data produced during PATRICIA will be used during the project. The deliverable might me updated during the project if changes in the data policy are foreseen based on new inputs.

The DMP needs to be updated over the course of the project whenever significant change arise, such as (but not limited to):

 - ➢   New data
 - ➢   Changes in consortium policies (e.g. new innovation potential, decision to file for a patent)
 - ➢   Changes in consortium composition and external factors (e.g. new consortium members joining or old members leaving).

The consortium foresees to perform a review the DMP at each technical meeting.

10   References

[1]   NN: Grant agreement 945077 — PATRICIA, ANNEX 1 (part A) Research and Innovation action, Version date: 18/05/2020

[2]   European Commission (2016) – H2020 Programme Guidelines on FAIR Data Management in Horizon 2020. Version 3.0, July 2016.