NEWBORN - NExt generation high poWer fuel cells for airBORNe applications

WP12 – Project and Consortium Management

Data Management Plan

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Prepared by	Author	Dorin Maxim	26-Jun-2023 DocuSigned by: Dorin Maxim F97C03BE7952428...
Approved by	Work Package Leader	Mirek Matousek	26-Jun-2023 DocuSigned by: Mirek Matousek BD56D76F17454D7...
Approved by	Configuration Manager	Dorin Maxim	26-Jun-2023 DocuSigned by: Dorin Maxim F97C03BE7952428...
Approved by	Project Coordinator	Mirek Matousek	26-Jun-2023 DocuSigned by: Mirek Matousek BD56D76F17454D7...

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Table 1: Revision history

INTELLECTUAL PROPERTY

Section/Chapter/Item	Owning Entity	Nature of IP	Comments
Entire Document	Honeywell	Exclusive, Foreground	N/A

Table 2: Intellectual property

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1 INTRODUCTION AND GENERAL CONCEPTS

This document describes the Data Management Processes, Conventions and Tools that shall be used throughout the consortium of the NEWBORN Project.

The data generated, handled and preserved, as part of the NEWBORN project, will be in digital form. Data formats will include numerical datasets, models, computer codes, text data, and might originate from measurements, software simulations, modelling outputs and calculations as well as from other existing data such as databases, scientific publications, books and peer-reviewed articles.

The NEWBORN Project will involve the production and collection of several types of data, including numerical and experimental data from different sources such as software simulations, measurements, calculations and literature review, as well as numerical data provided by consortium partners (technology experts) derived from sources such as own calculations, modelling outputs, or secondary data from existing databases, scientific publications, books and peer-reviewed articles.

2 NEWBORN PROJECT SUMMARY AND APPROACH TO DATA MANAGEMENT

2.1 Responsibilities, roles, and consortium policy

The NEWBORN Project aims to create a technology demonstrator of fuel cell based Aircraft propulsion system that will be used for flight demonstration in Clean Aviation Phase 2. The main technological goal of the project is to achieve a propulsion system efficiency of 50% by 2026, which is calculated as the ratio of energy on the propeller shaft to the hydrogen lower heating value. This goal is significantly higher than what is expected from the HPA-02 Call. Additionally, by the end of 2025, the project will showcase scalable fuel cell power source technology with a power density of over 1.2 kW/kg and a stack power density of over 5 kW/kg. The NEWBORN Project will also address high power density high voltage energy conversion, propulsion systems, and the next generation of microtube heat exchangers. Furthermore, an accurate digital twin of the entire system will be developed.

The NEWBORN consortium consists of 18 partners, of which 3 are non-traditional aerospace entities and 2 small and medium-sized enterprises (SMEs). The consortium will collaborate on developing 28 essential technologies which will be refined and enhanced to facilitate the entry into service (EIS) of CS-23 aircraft by 2030 and regional aircraft by 2035.

From an organizational and management point of view, the NEWBORN Project is structured into 12 distinct Work-Packages, in addition to the Project Management Committee (PMC) and Technical Committee (TC), collectively forming the General Assembly. The Project Coordinator together with the PMC ad TC, oversees the management of the consortium, ensuring, among other, coordination across all work-packages and monitoring compliance by the parties with their obligations.

As part of the PMC, the Configuration Manager (CM) holds the responsibility of data management and storage while ensuring compliance with the FAIR data management guidelines set forth by CAJU (Clean Aviation Join Undertaking). The FAIR approach to data management, which is further detailed in Section 3, requires that data is stored in a Findable, Accessible, Interoperable, and Reusable manner, promoting transparency and effective data management practices inside and outside of the consortium.

2.2 Data nature, links with other projects

The data utilized, generated, and managed within this project primarily pertains to technical aspects and is obtained through various research and technical activities, including measurements, simulations, modeling, experimentation, and other research endeavors. The data is instrumental in achieving the project's objectives and facilitating scientific advancements in the respective field. Furthermore, it is important to note the following characteristics of the data:

- **Technical Focus:** The data collected and analyzed within the project is primarily technical in nature, encompassing measurements, experimental results, computational models, algorithms, software code, and similar technical artifacts. The data serves as a foundation for research, analysis, and innovation, driving the development of new technologies, methodologies, and scientific knowledge.

- **Absence of Personal Data:** The project does not involve the processing or handling of personal data, apart from the business contact information of contributors involved in the project's execution. The business contact data is necessary for effective communication, collaboration, and coordination among project partners, ensuring smooth project implementation. The project consortium acknowledges the importance of respecting privacy and will handle the business contact data in compliance with applicable data protection regulations.

- **Compliance with EU Regulations:** All data management activities related to this project will adhere to the relevant European Union (EU) regulations, including but not limited to the General Data Protection Regulation (GDPR) and other applicable data protection and privacy laws. The consortium will ensure that the processing, storage, and sharing of data comply with the necessary legal requirements and ethical considerations, safeguarding the rights and privacy of individuals.

- **Data Protection Measures:** Adequate data protection measures will be implemented to ensure the security, confidentiality, integrity, and availability of project data. The data management practices will be aligned with the principles of data minimization, purpose limitation, and data accuracy to enhance data quality and integrity. Business contact data will be stored and managed securely, accessible only to authorized personnel with a legitimate need to access the information for project-related activities.

- **Data Sharing and Open Science:** The project promotes openness and collaboration by following the principles of open science whenever possible. Non-sensitive project data, excluding any confidential or proprietary information, may be shared with the scientific community, stakeholders, and the public through appropriate channels, such as data repositories or publications, fostering transparency and knowledge dissemination.

The project consortium is committed to upholding the highest standards of data management and will continuously monitor and evaluate the data practices to ensure compliance with applicable regulations, promote responsible data handling, and contribute to the advancement of scientific knowledge in an ethical and secure manner.

As part of the collaborative nature of this project, data sharing with other projects within the CAJU will be facilitated based on the Grant Agreement and Cooperation Plans that are currently being established. These agreements and plans outline the terms, conditions, and modalities of data sharing among the EU projects. Additionally, it is important to note that other bilateral agreements may be established throughout the project's duration if deemed necessary.

The **NEWBORN Grant Agreement**, signed by the consortium members and CAJU, sets out the framework for collaboration and outlines the rights and obligations of the involved parties, including data sharing provisions. **Cooperation Plans**, currently being developed, will further detail the specific arrangements for data sharing among other CAJU projects, addressing aspects such as data formats, access mechanisms, intellectual property rights, and confidentiality requirements. The sharing of data aims to foster collaboration, leverage synergies, and promote collective scientific progress within CAJU, maximizing the impact and outcomes of the individual projects.

In addition to the Grant Agreement and Cooperation Plans, specific bilateral agreements may be established between NEWBORN and other EU projects. These agreements will address project-specific data sharing requirements, considering factors such as the nature of the data, its sensitivity, access control, intellectual property rights, and any additional considerations specific to the project under consideration.

2.3 Storage locations: public and internal

The NEWBORN project will use a combination of storage locations for storing data produced and handled during the project's lifetime:

- Sharing data **within the consortium**: Data collected and produced by NEWBORN will be shared within the consortium partners through a project-internal repository. The repository keeps track of users uploading or editing data files. This enables to restore the availability and accessibility to the data in a timely manner in the event of a physical or technical incident.
- Sharing data **outside the consortium**: All public and non-confidential data generated by the NEWBORN Project will be made available through scientific articles and publications, workshops and educational activities, where all participants will have access to specific materials (e.g. training material), and, most notably, documents such as deliverables, milestones, or other relevant dissemination materials, will be stored and shared on the NEWBORN website, which is currently in the process of being developed.

3 FAIR DATA

The NEWBORN Project is committed to follow the FAIR Data Management guidelines. The following sub-sections describe the approaches taken to ensure that the FAIR Data Management aspects are respected.

3.1 Making Data Findable

For ease of **finding**, data available on repositories will be associated with necessary metadata, which may be formulated as a list of content in a “read_me” text file – each data package may have it’s own “read_me” file. Metadata (e.g. list of data treatment procedures, detailed model documentations, assumptions, with justifications/arguments, etc.) will also accompany modelling data to ensure transparency and reproducibility. Data internal to the project members are shared on a SharePoint repository (hosted by project coordinator and meeting access security requirements). Public data will be made available via the NEWBORN website as well as via repositories supporting scientific publications.

Versioning of the files will be clearly provided in the documents themselves (when relevant) and/or in the file name. File naming will follow the below naming convention (the entire naming convention is detailed in the Configuration Management Plan, which is a document internal to the project):

- NEWBORN Project ID: always N
- Doman ID: such as M (Management), G (General), S (System-level), H (Hydrogen), etc.
- WP number: from WP02 to WP12, and also WP00 representing multiple work-packages, with their involvement being detailed in the document.
- Sensitivity: RE (Restricted), IN (Internal), SE (Sensitive), PU (Public)
- Export Control: NO (No Export classification), EU (EU Export Controlled), US (US Export Controlled), UK (UK Export Controlled), LS (Multiple Export Classifications which are listed in the document)
- Type: such as DOC (Document), DEL (Deliverable), MOM (Minutes of Meeting), SLD (slide-decks, presentations), DIA (Diagram), etc.
- Base number: composed of six digits with hierarchical meaning defined by the System Decomposition Diagram, with the 4th, 5th, and 6th digit assumed to be assigned sequentially
- Revision: initial revision is marked as “00” and is then incremented with every new release of the document

Example: NM-WP12-IN-NO-DOC-000002-01 - Document Naming Convention.pdf

3.2 Making Data Accessible

As described in Section 2.3, the NEWBORN project will use a combination of internal and external storage locations for storing data produced and handled during the project's lifetime.

Public data will be shared outside of the consortium in multiple ways:

- NEWBORN website: the main dissemination repository of the project public data is the project website which will provide access to documents such as deliverables, milestones, or other relevant dissemination materials.
- Selected public and non-confidential data generated by the NEWBORN Project will be made available through scientific articles and publications, workshops, and educational activities, where participants will have access to specific materials (e.g., training material).
- Specific dissemination activities and venues will be used for making public the activity and results of the projects. Among such activities and venues, we may list legacy media such as press releases and also modern/digital media such as posts on LinkedIn and other social media venues.

3.3 Making Data Interoperable

For **interoperability**, standard vocabulary from each involved domain will be used in the data collected and/or generated by the NEWBORN Project to allow interoperability across the different disciplines. Acknowledged names, symbols and units for target variables will be used and documented in the data

created and shared. Where relevant, internal and external reports, deliverables, datasets, or any other dissemination materials will include a glossary to clarify the nomenclature used (e.g. for variables) and ensure interoperability.

3.4 Making Data Re-usable

Data **reuse** will be maximized using data repositories, which will support documentation of the project outcomes, either as complement of scientific publications or as support of project deliverables. Embargo periods for a full disclosure of the data may be exercised in the project to enable sufficient time for scientific publications, for which the peer review process may take several months. Decision with regard to an embargo for research data will be addressed on a case-by-case basis upon request from the deliverable authors. The decision will be discussed between the authors, the related WP leaders and the project coordinator.
The publication of data in the form of scientific publications will be strongly encouraged throughout the project. Data published in these settings will therefore gain credibility and be subject to quality assurance via the peer review process.

4 DATA SECURITY

Ensuring the security and confidentiality of data is of paramount importance within the NEWBORN project. A series of measures will be implemented to safeguard the integrity and privacy of the data. Access to project data is granted only to authorized personnel who have a legitimate need to access the data for project-related activities. Access privileges are defined based on roles and responsibilities within the project. All confidential data collected and stored during the project will be encrypted both in transit and at rest. When data is transmitted between project partners or to external entities, secure communication channels will be employed, such as encrypted email.

Project data will be stored on secure, password-protected servers hosted in physically controlled environments. Adequate security measures will be implemented to protect against unauthorized access, including firewalls, intrusion detection systems, and regular security updates. Regular backups of the data will be performed to prevent data loss and ensure data recoverability in case of incidents. Data will be retained only for the duration necessary to fulfill the project's objectives and comply with legal obligations.

The project consortium acknowledges that data security is an ongoing responsibility, and the above measures will be regularly reviewed, updated, and improved throughout the project's lifecycle to adapt to emerging threats and ensure the confidentiality, integrity, and availability of project data.

5 ETHICAL ASPECTS

No legal or ethical issues have been identified, that can have an impact on the research data used, generated and shared within the NEWBORN Project.

6 OTHER ISSUES

The Data Management Plan is a living document and will be updated during the course of the project. The first version is delivered on M6 (June 2023).