



DATA MANAGEMENT PLAN

Grant Agreement number 21NRM06

Project short name EMC-STD

Project full title Metrology for emerging electromagnetic compatibility standards

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Confidentiality Status:
PU - Public, fully open

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Data Management Plan

The project has received funding from the European Partnership on Metrology, co-financed from the European Union's Horizon Europe Research and Innovation Programme and by the Participating States.



Issued: May 2024

1 Data management plan

1.1 Data summary

Questions	Answers
1 Will you re-use any existing data and what will you re-use them for? State the reasons if re-use of any existing data has been considered but discarded.	The project will re-use no data.
2 What types and formats of data will the project generate or re-use?	The project will generate numerical data in CSV and mat format, images in JPEG format, plain text in TXT, DOC, DOCX.
3 What is the purpose of the data generation or re-use and its relation to the objectives of the project?	<p><u>Purpose of the data generation or re-use</u></p> <p>The data/research outputs will be generated from measurements (instrument calibrations, emissions testing of representative cases/scenarios), numerical simulations and measurement method procedures. Measurement results taken with newly developed methods will be used to make comparisons with respect to conventional methods. Newly developed methods will be documented as plain text as instructions, guides end etc. numerical simulations will be used to verify newly developed methods. All output will be published in good practice guides, conferences and peer-reviewed publications.</p> <p><u>Data generated in relation to the objectives of the project</u></p> <p>Data will be generated by the consortium in order to meet objectives 1 - 4. Each objective in the WPs mainly target to make contribution to the emerging and existing EMC standards.</p>
4 What is the expected size of the data that you intend to generate or re-use?	The overall size of the data is expected to be in the range of 500 Gigabytes – 1Terabytes
5 What is the origin/provenance of the data, either generated or re-used?	The origin of the data will be emission measurement values which may include a wide range of data from simple equipment emissions to large/high current complex device/systems emissions.
6 To whom might your data be useful ('data utility'), outside your project?	The data may be useful to standard committees, test laboratories, equipment manufacturers, compliance assessment bodies, electricity distribution companies, regulators.

1.2 Findable, Accessible, Interoperable and Re-usable (FAIR) Data

1.2.1 Making data findable, including provisions for metadata

Questions	Answers
7 Will data be identified by a persistent identifier?	Yes, repositories which provide DOI are selected. Where applicable, the metadata will include persistent identifiers for related publications and research outputs.
8 Will rich metadata be provided to allow discovery? What metadata will be created? What disciplinary or general standards will be followed? In case metadata standards do not exist in your discipline, please outline what type of metadata will be created and how.	Repositories where the metadata will be kept are searchable. The metadata will provide information on the following: datasets (description, date of deposit, author(s), venue, and embargo); the European Partnership on Metrology funding; grant project name, acronym and number; licensing terms; persistent identifiers, the authors involved. The data / research outputs will be deposited and published in trusted repositories located using the Registry of Research Data Repositories https://www.re3data.org/ . Specific community standards for data and metadata like ISO standards, and controlled vocabularies or ontologies, will be put in place which will allow metadata to be combined and exchanged. In addition, the datasets will use the trusted repository's basic metadata schema for administrative data, which is compliant with the recommended standards used by DataCite (https://search.datacite.org/) and OpenAIRE (https://www.basesearch.net/).
9 Will search keywords be provided in the metadata to	Vocabularies will make it possible to enable searchable data. For individual datasets, the following discipline specific vocabularies, standards, formats, and

optimise the possibility for discovery and then potential re-use?	methodologies will be used: e.g. GUM, OBO foundry, DICOM, NetCDF, HDF5, CityGML, INSPEC, ISO 9001.
10 Will metadata be offered in such a way that it can be harvested and indexed?	Zenodo complies with FAIR principles(https://about.zenodo.org/principles/). The metadata are indexed in a searchable resource. Metadata are licensed under CC0, except for email addresses. All metadata are exported via Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) and can be harvested.

1.2.2 Making data accessible

Questions	Answers
Repository:	
11 Will the data be deposited in a trusted repository?	Yes. Data and associated metadata, documentation, guides will be deposited in https://zenodo.org/ . However, if Zenodo is unavailable on that time, the coordinator will be informed and http://re3data.org/ and https://b2share.eudat.eu/ will be used respectively.
12 Have you explored appropriate arrangements with the identified repository where your data will be deposited?	No, the data will be uploaded via a standard procedure and require no special arrangements. A relevant community has been created for the project at Zenodo repository: https://zenodo.org/communities/21nrm06-emc-std/
13 Does the repository ensure that the data are assigned an identifier? Will the repository resolve the identifier to a digital object?	Yes, repositories which provide DOI are selected.
Data:	
14 Will all data be made openly available? If certain datasets cannot be shared (or need to be shared under restricted access conditions), explain why, clearly separating legal and contractual reasons from intentional restrictions. Note that in multi-beneficiary projects it is also possible for specific beneficiaries to keep their data closed if opening their data goes against their legitimate interests or other constraints as per the Grant Agreement.	<p>All of the data that are needed to validate the results presented in scientific publications will be made openly available by default unless there is a specific reason not to publish the data.</p> <p>When equipment or prototypes of stakeholders are used for testing and case studies, this data sharing has to be confirmed with the owner of the test device.</p> <p>The developer of the “LSIN Uncertainty calculation software” which has been published on Zenodo https://zenodo.org/records/11229783 (related paper is on https://ieeexplore.ieee.org/document/10466409/) left TUBITAK and he does not accept the software source code to be public open. Since GitHub requires the software is open-source, the software is uploaded to Zenodo.</p> <p>The papers published by EMC-BCN (as the corresponding authors) contain some emission results from equipment those are belong to some companies. Emission results cannot be published because they are private data. But general results of these emissions are evaluated in relevant papers.</p> <p>Results of live grid impedance measurements from WP1 will be uploaded to Zenodo as .csv files.</p>

Questions	Answers
15 If an embargo is applied to give time to publish or seek protection of the intellectual property (e.g. patents), specify why and how long this will apply, bearing in mind that research data should be made available as soon as possible.	The data used in scientific publications, posters and oral communications will be made available for re-use as soon as is reasonably possible.
16 Will the data be accessible through a free and standardised access protocol?	Yes, Zenodo provides well described conditions for free and standardised access (see http://about.zenodo.org/policies/).
17 If there are restrictions on use, how will access be provided to the data, both during and after the end of the project?	As some data have restricted access, in those cases access will only be provided after personal contact to the authors via the repository interface.
18 How will the identity of the person accessing the data be ascertained?	If necessary, an authentication system or a data on demand function will be provided.
19 Is there a need for a data access committee (e.g. to evaluate/approve access requests to personal/sensitive data)?	This consortium will not establish a Data Access Committee. The appointed corresponding author, with responsibility for the data, will decide alone about granting access to the data.
Metadata:	
20 Will metadata be made openly available and licensed under a public domain dedication CC0, as per the Grant Agreement? If not, please clarify why. Will metadata contain information to enable the user to access the data?	In Zenodo, metadata are licensed under CC0, except for email addresses. All metadata are exported via OAI-PMH and can be harvested.
21 How long will the data remain available and findable? Will metadata be guaranteed to remain available after data are no longer available?	The data will remain available and findable in the lifetime of the Zenodo repository, which is expected to be 20 years minimum. If data are withdrawn from Zenodo, the DOI and the URL of the original object are retained. In case of closure of the Zenodo repository, best efforts will be made by Zenodo to integrate all contents into suitable alternative institutional and/or subject based repositories.
22 Will documentation or reference about any software be needed to access or read the data and will this be included? Will it be possible to include the relevant software (e.g. in open source code)?	The data are in a common format and can be read using widely available software (open source or commercial).

1.2.3 Making data interoperable

Questions	Answers
23 What data and metadata vocabularies, standards, formats or methodologies will you follow to make your data	Specific community standards for data and metadata like ISO standards, and controlled vocabularies or ontologies, will be put in place which will allow metadata to be combined and exchanged. The datasets will use the trusted repository's basic metadata schema for

interoperable to allow data exchange and re-use within and across disciplines? Will you follow community-endorsed interoperability best practices? Which ones?	administrative data, which is compliant with the recommended standards used by DataCite (https://search.datacite.org/) OpenAIRE (https://www.basemsearch.net/). For individual datasets, the following discipline-specific vocabularies, standards, formats, and methodologies will be used: 1. GUM (procedure; subject-independent). 2. ISO 9001 (QM procedure;subject-independent).
24 In case it is unavoidable that you use uncommon or generate project specific ontologies or vocabularies, will you provide mappings to more commonly used ontologies? Will you openly publish the generated ontologies or vocabularies to allow their re-use, refinement or extension?	Mapping will not be required as the terminology used will be chosen to be compatible with the existing literature.
25 Will your data include qualified references ¹ to other data (e.g. other data from your project, or datasets from previous research)?	The project's datasets will not include any references to other datasets.

1.2.4 Increase data re-use

Questions	Answers
26 How will you provide documentation needed to validate data analysis and facilitate data re-use (e.g. readme files with information on methodology, codebooks, data cleaning, analyses, variable definitions, units of measurement, etc.)?	A short README file (e.g. Markdown) will be provided together with the data, in order to enable data analysis and to facilitate data re-use.
27 Will your data be made freely available in the public domain to permit the widest re-use possible? Will your data be licensed using standard re-use licenses, in line with the obligations set out in the Grant Agreement?	The data will either be licensed under the latest available version of the Creative Commons Attribution International Public License (CC BY) or a license with equivalent rights as set out in the Grant Agreement. Users will be required to acknowledge the consortium and the source of the data in any resulting publications. Alternatively, the Creative Commons Public Domain Dedication License (CC 0) will be used.
28 Will the data produced in the project be useable by third parties, in particular after the end of the project?	Any data published in open-access journals will be usable by third parties after the datasets have been deposited in Zenodo. The data that do not relate to peer-reviewed publications will be made available for re-use on a case-by-case basis.
29 Will the provenance of the data be thoroughly documented using the appropriate standards?	Yes, the provenance and context of the data will be thoroughly documented to meet relevant standards using the Provenance and Context Content Standard (PCCS) Matrix. Data will be accompanied by information on how they were captured, processed, analysed, and validated.

¹ A qualified reference is a cross-reference that explains its intent. For example, X is regulator of Y is a much more qualified reference than X is associated with Y, or X see also Y. The goal therefore is to create as many meaningful links as possible between (meta)data resources to enrich the contextual knowledge about the data. (Source: <https://www.go-fair.org/fair-principles/i3-metadata-include-qualified-references-metadata/>)

Questions	Answers
	Other information that enables interpretation and use will also be provided
30 Describe all relevant data quality assurance processes.	<p>Data quality will be assured through several quality assurance procedures:</p> <ul style="list-style-type: none"> • Repeated and comparison measurements. • Adherence to standards for data recording. • Use of controlled vocabularies and standard terminology. • Metrological characterisation of the measurement set-ups. • Validation of the data collected. • Provision of test results along with the data. • Peer-review of publications based on the data.
31 Further to the FAIR principles, DMPs should also address research outputs other than data, and should carefully consider aspects related to the allocation of resources, data security and ethical aspects.	<p>The estimated curation and storage/preservation costs (personnel) for making the data and research outputs FAIR are already considered as integral part of the technical activities, therefore, no dedicated budget is required. These costs will be kept to a minimum by using i) suitable trusted repositories from the Registry of Research Data Repositories https://www.re3data.org/ or Zenodo where no additional costs are associated with long-term preservation, and ii) by making only relevant data and outputs FAIR. The estimated curation and storage/preservation costs will be claimed if compliant with the Grant Agreement’s conditions.</p> <p><i>Security of other research outputs</i></p> <p>All participants are either accredited to, or work in compliance with, the ISO 17025 standard on the “General requirements for the competence of testing and calibration laboratories”. The participants will store other research outputs on their organisations’ networks, which are protected by firewall, backups etc. Other research outputs will also be stored in the project’s MS OneDrive folder (belongs to TUBITAK -coordinator-) with password-protected login.</p> <p>Deposition in public repositories will provide additional security as they have multiple replicas in a distributed file system which is backed up on a nightly basis. This project will not generate sensitive other research outputs. The other research outputs will be safely stored in open access repositories.</p> <p><i>Ethical aspects</i></p> <p>There are issues that could impact on the sharing of other research outputs.</p> <ul style="list-style-type: none"> • Information relating to other research outputs acquired from third parties, e.g. manufacturers, will not be shared without their explicit consent. • Information relating to other research outputs collected by the consortium at commercial sites will not be shared without the site owner’s explicit consent. <p>Ethical issues will be addressed as the project will prepare an ethics report.</p> <p>The project will not share other research outputs with identifiable personal information. Sensitive information relating to the other research outputs will be collected, separated as soon as possible and kept secure.</p> <p>Please also see the information provided in section 1.3 below.</p>

1.3 Other research outputs

Questions	Answers
32 In addition to the management of data, beneficiaries should also consider and plan for the management of other research outputs that may be generated or re-used throughout their projects. Such outputs can be either digital (e.g. software, workflows, protocols, models, etc.) or physical (e.g. new materials, antibodies, reagents, samples, etc.).	<p>Software solutions developed in the project may be released by some project partners free of charge to be used. The ultimate decision on whether software solutions produced will be free or not will be made by related project partners independently. Software solutions will be published in Zenodo https://zenodo.org/communities/21nrm06-emc-std . Alternatively, a GitHub account has been created and linked with Zenodo: https://github.com/Serdar-Buyuk/EMC-STD</p> <p>The new calibration methods, and protocols produced by the project will be stored in the Protocol Exchange repository.</p> <p>The management of the IP issues surrounding the new materials that will be developed in the project have been planned for in the project's consortium The consortium intends to seek patent protection. This project will only re-use existing data and will not re-use any other research outputs.</p>
33 Beneficiaries should consider which of the questions pertaining to FAIR data above, can apply to the management of other research outputs, and should strive to provide sufficient detail on how their research outputs will be managed and shared, or made available for re-use, in line with the FAIR principles.	As far as possible, the FAIR data approaches specified in questions 7-30 above will be applied to the management of this project's other research outputs. This commitment will be met by releasing the new software that will be developed in the project under license, by placing the new calibration methods, and protocols, in a repository and by patenting the new materials that will be developed in the project in line with the requirements of the project's consortium agreement.

1.4 Allocation of resources

Questions	Answers
34 What will the costs be for making data or other research outputs FAIR in your project (e.g. direct and indirect costs related to storage, archiving, re-use, security, etc.) ?	The estimated costs for making the data and other research outputs Findable, Accessible, Interoperable and Re-usable (FAIR) are indicated in personnel costs. This cost is approximately 12000 Euros including open-access publications fees. These costs have been kept to a minimum by using a free repository (Zenodo) and by making only relevant data and other outputs FAIR.
35 How will these be covered? Note that costs related to research data/output management are eligible as part of the European partnership on metrology grant (if compliant with the Grant Agreement conditions).	The costs for making the data FAIR are included in the project's budget and will be claimed if compliant with the Grant Agreement's conditions.
36 Who will be responsible for data management in your project?	This consortium will not establish a Data Access Committee. The coordinator, with support from the participants, will have overall responsibility for the management of data/research outputs and quality assurance. The coordinator will be responsible for coordinating updates to the data management plan and for deciding on a case-by-case basis which data/research outputs will be kept and for how long. The participants (s) that produced the data will be responsible for organising backup and storage, archiving, and for depositing the data/research outputs within the chosen repositories

37 How will long term preservation be ensured? Discuss the necessary resources to accomplish this (costs and potential value, who decides and how, what data will be kept and for how long)?	Long term preservation will be ensured by depositing the data within repositories (Zenodo, re3data.org). There are no costs associated with the long-term preservation of the data in these repositories. The coordinator, with support from the participants will be responsible of the long term preservation of data.
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1.5 Data security

Questions	Answers
38 What provisions are or will be in place for data security (including data recovery as well as secure storage/archiving and transfer of sensitive data)?	All participants are either accredited to, or work in compliance with, the ISO 17025 standard on the “General requirements for the competence of testing and calibration laboratories”. The participants will store data on their organisations’ networks, which are protected by firewall, backups etc. Data will also be stored in the project’s SharePoint environment, with password protected login. Deposition in the Zenodo public repository will provide additional security as it has multiple replicas in a distributed file system which is backed up on a nightly basis. This project will not generate sensitive data.
39 Will the data be safely stored in trusted repositories for long term preservation and curation?	Yes, the data will be safely stored in the Zenodo open access repository. Zenodo and the underlying Invenio Framework for digital repositories were designed according to the Open Archival Information Systems (OAIS) reference model. Zenodo is working towards ISO 16363 certification. Additionally, Re3data.org repository is also able to store data for long term preservation and curation.

1.6 Ethics

Questions	Answers
40 Are there, or could there be, any ethics or legal issues that can have an impact on data sharing? These can also be discussed in the context of the ethics review. If relevant, include references to ethics report(s) and the ethics section in the Annex 1.	Data acquired from third parties, e.g. manufacturers, will not be shared without their explicit consent. Ethical issues will be addressed as the project will prepare and submit a report on the Dual Use of the project’s results
41 Will informed consent for data sharing and long-term preservation be included in questionnaires dealing with personal data?	Informed consent for data sharing and long-term preservation will be included in the market and customer surveys, but the project has no plans to share data with identifiable personal information. If any sensitive data are collected, they will be separated as soon as possible and kept secure.

1.7 Other issues

Questions	Answers
42 Do you, or will you, make use of other national / funder / sectorial / departmental procedures for data management? If yes, which ones (please list and briefly describe them)?	Data management will be compliant with the research data policy of the European Partnership on Metrology.



2 Open science: research data management

Statement	Put an X in the box to confirm	Or, list any exceptions to this
All participants have adhered to the requirements of the project's GA and CA with respect to open science: research data management (GA Article 17 and its Annex 5) for this reporting period	<input checked="" type="checkbox"/>	