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Document title

**Investigation Data Blank Book (Multi-Experiment)**

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**Change log**

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| First release of the multi-experiment template (content inherited from SDC-TN-PROC002) | i1, r0 | 18/01/2022 |

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| **Description of change** | **Page(s)** | **Paragraph(s)** |
| Minor updates after the document review to improve the clarity of the instructions for the data producer | All |  |
| Removed columns ‘number of files’ and ‘expected total size (GB)’ from the overall product summary table. This information will be tracked at experiment level (sub-section 5.3.1.1. Products delivered) | 6, 7 | 5.1.1, 5.1.2 |
| Specify the units of the metadata values | 7 | 5.1.3 |
| Fixed the section numbers | All |  |

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# Introduction

This document provides the data and specific metadata definitions for the *[investigation name]* investigation necessary for the investigation data archival by the SDC (Science Data Centre) on behalf of the ESA.

This investigation consists of several experiments, which are listed in section 3, the data products and documents of all the experiments are defined in sections 4.1 and 4.2, and the specific products corresponding to each experiment are detailed in section 4.3. Finally, the inputs provided for the User Interface are included in section 5.

Please, carefully read the instructions (in blue) and remove them when the document has been completed.

This document shall be filled in by those entities (data producers) that will deliver data to the SDC for archival of investigations composed of more than one experiment. Those entities can include (depending on the investigation and platform):

* the operations entity, responsible for the operations execution of the investigation,
* a representative of the science team, whenever they generate data that will be archived by the SDC,
* any other entity generating data to be archived by the SDC,
* the ESA project scientist or ERD Book Captain.

# Acronyms and abbreviations

Complete this list with the acronyms and abbreviations used throughout the document.

ARD Activity Requirements Document

ESA European Space Agency

ERD Experiment Requirements Document

ESR Experiment Science Requirements

EST Experiment Sequence Test

ICD Interface Control Document

MOIC Mission Operations and Implementation Concept

PoC Point of Contact

RD Requirements Document

TP Test Procedure

SDC Science Data Centre

SVT Science Verification Test

# Investigation data producers list

The following table lists the entities that will deliver investigation data to the SDC.

|  |  |  |
| --- | --- | --- |
| **Entity** | **PoC** | **Role in investigation** |
| *Your entity* | *Name of your PoC* | *The role of your entity in the investigation* |

# Experiment list

Complete the table below with the information on the experiments1 belonging to the assessed investigation2.

|  |  |  |
| --- | --- | --- |
| **Experiment name** | **Mission(s)** | **Execution start date/end date** |
| *Experiment #1 name* | *e.g. ISS Inc 61* | *e.g. 2021-01-01 to 2021-02-01* |
| *Experiment #2 name* | *…* | *….* |

1Experiment: a test designed to test a single hypothesis or test objective. In common usage, this has often been used as a synonym for investigation, but it may take multiple experiments in order to develop a set of results that can be published.

2Investigation: a set of activities and measurements (observations) designed to test a scientific hypothesis, related set of hypotheses, or set of technology validation objectives. When the set of activities are completed, the data would be expected to form a publication of results.

# *[investigation name]* investigation data definition

## Products definition

Within this section, information related to the products to be delivered is presented. A product is defined as a set of digital files with the same format (e.g. csv) and content description (e.g. description of parameters in the file).

### Science products summary

Complete the table below with the scientifically relevant products to be delivered to the SDC. A product is considered scientifically relevant if it is necessary to understand or to exploit the data from the investigation. For instance:

* Data listed as a science deliverable in the ESR/ERD (or equivalent)
* Data not listed in the ESR/ERD (or equivalent) but delivered to the science team as accompanying data (e.g. checksum files)

|  |  |  |  |
| --- | --- | --- | --- |
| **Product name** | **Proprietary (Yes/No)** | **Processing level** | **Extension** |
| *product #1*  *(e.g. scientific image)* |  |  | *e.g. FITS* |
| *product #2*  *(e.g. scientific image)* |  |  | *e.g. jpg* |
| *product #3 (e.g. scientific telemetry)* |  |  | *e.g. csv* |

Where:

* Product name (e.g. scientific image, operational image, raw telemetry, calibrated telemetry, video, …).
* Proprietary (Yes/No): Specify whether the product format requires proprietary tools to be read (yes) or not (no).
* Processing level: Data processing level of the product:
  + 0 = raw
  + 1 = calibrated
  + 2 = post-processed
* Extension: files extension (e.g. bin, csv, txt).
* Number of files
* Expected total size (GB)

### Ancillary products summary

Complete the table below with the ancillary products to be delivered to the SDC. All other investigation data products which are not scientifically relevant (listed above) will be considered ancillary.

|  |  |  |  |
| --- | --- | --- | --- |
| **Product name** | **Proprietary (Yes/No)** | **Processing level** | **Extension** |
| *product #1*  *(e.g. housekeeping telemetry)* |  |  | *e.g. csv* |

### Investigation specific metadata

Specific metadata parameters are only defined for scientifically relevant products.

The investigation specific metadata parameters are those that complement the generic file metadata already defined in SDC-RP-PROC004 “SDC Processes: Science and Operational Data to SDC” (e.g. investigation name, experiment name, acquisition time, integrity information…) and that are specific for each investigation (e.g. experimental run number, sample identification, rotor/incubator/ other specific devices used to acquire a data file…). These metadata parameters ensure that the scientific data is understandable/usable by a user not involved in the development or operation of the investigation.

The table below lists the investigation specific metadata parameters that are included in some of the file metadata of this investigation. Since these metadata parameters are optional (and probably only used in some of the provided files/products), the specific metadata parameters related to each product are listed in section 5.1.3.

If there is investigation specific metadata, please complete the following table with the following information:

* Metadata name (e.g. *run number, sample id, rotor/incubator*). Include measurement units in the metadata name when applicable (e.g. *[ºC])*.
* Description: Short description of the metadata.
* Type of metadata:
  1. String
  2. Number
  3. Datetime (*YYYY-MM-DDThh:mm:ss)*
  4. Boolean (*True/False*)
* Possible values: In case the parameter has a known set of possible values (discrete and small), list them in this section. Please indicate the units whenever possible.
* Comments: Additional comments on the metadata.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Metadata name** | **Description** | **Type of metadata** | **Possible values and units** | **Comments** |
| *Metadata #1 (e.g sample material)* | *e.g. material of the sample under observation* | *e.g. string* | *e.g. Water, Ethanol, Chocolate* | *e.g. Each experimental cell contains a sample of material, there are two cells with each material* |
| *Metadata #2 (e.g. temperature [ºC])* | *e.g. temperature of the sample during the incubation phase* | *e.g. number* | *e.g. (1-100)* |  |
| *Metadata #3 (e.g. incubation start time)* | *e.g. time when the incubation of the sample started* | *e.g. datetime* | *e.g. 2021-08-18T12:24:30* |  |
| *Metadata #4 (e.g. valid measurement)* |  | *e.g. boolean* | *True/False* |  |
| *…* |  |  |  |  |

### Products details

Details for each scientifically relevant product are provided in the following subsections.

Add a subsection (named as the product) foreach scientifically relevant product listed in 5.1.1.

#### *[Product #1]*

Complete the following table with the product details

|  |  |
| --- | --- |
| **Product description** | Short description of the product. |
| **File format** | Type/encoding of the product files and information needed to read the files. |
| **Naming convention** | Product file naming convention. |
| **Content description** | Indicate the information included in the file, and how it is arranged, e.g. for tabular data, list of parameter names and their description.  A separate template/sample file may be included when convenient.  Please note that the usability of the information reported here greatly depends on the level of detail that is provided. As a general rule, the information which is deemed more relevant for science should have greater detail. |
| **Investigation specific metadata** | List of the investigation specific metadata parameters (from those defined in 4.1.2) that will be included in the metadata files for this product. |
| **Comments** | Additional comments on the product definition. |

## Documents

Complete the table below with the documents to be delivered to the SDC. Please, reference the documents (RD1, RD2, etc) throughout the rest of the Blank Book if needed.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Document reference** | **Document title** | **Description** | **Document Type** | **Scientifically relevant** |
| 1. *e.g. ESA-ESR-XXX* |  |  |  |  |
| 1. *…* |  |  |  |  |

Where:

* Document type: e.g. ESR, ERD, EST, ICD, MOIC, RD, TP, SVT, etc.
* Scientifically relevant (Yes/N­­o): A document is considered scientifically relevant if it is necessary to understand or to exploit the data from the investigation.

## Experiments data

Information related to each experiment listed in section 4 is presented in the following subsections.

Add a subsection foreach experiment listed in 4.2.1.

### *[Experiment #1 name]*

#### Products delivered

For the products listed in section 5.1.1 fill out the table below with the following information:

* Product name (e.g. *scientific image*, *operational image, telemetry, video, …*).
* Number of files: Number of files that will be delivered of each declared product.
* Expected total size: Expected total size (in GB) of all the files of a product that will be delivered.

|  |  |  |
| --- | --- | --- |
| **Product name** | **Number of files** | **Expected total size (GB)** |
| *product #1 (e.g. scientific image)* |  |  |
| *product #2 (e.g. operational image)* |  |  |
| *product #3 (e.g. telemetry)* |  |  |

#### Foreseen execution summary

This section must be filled by the operations entityfor investigations that have not been yet executed.

This section can optionally be filled by the operations entity for investigations executed in the past.

The operations entity shall provide information about the foreseen experiment execution sequence, e.g. list and order of investigation runs, with their defining parameters (as defined in the ESR/ERD or equivalent). Tabular format shall be used whenever possible.

The information provided here is aimed at grouping the archived experiment data in scientifically relevant blocks.

If this information is already contained in a Product in section 4.2 or in a Document in section 4.3, this section shall refer to it.

#### As-run execution summary

This section must be filled by the operations entity to provide the as-run investigation sequence after the execution of the experiment (as an update of the foreseen execution summary from section 5.3.1.2, and in the same format).

If this information is already contained in a Product in section 4.1 or in a Document in section 4.2, this section shall refer to it.

## User interface

This section can be filled by ESA/Science Team in case they have recommendations on how to disseminate/valorise the investigation data in the archive portal.