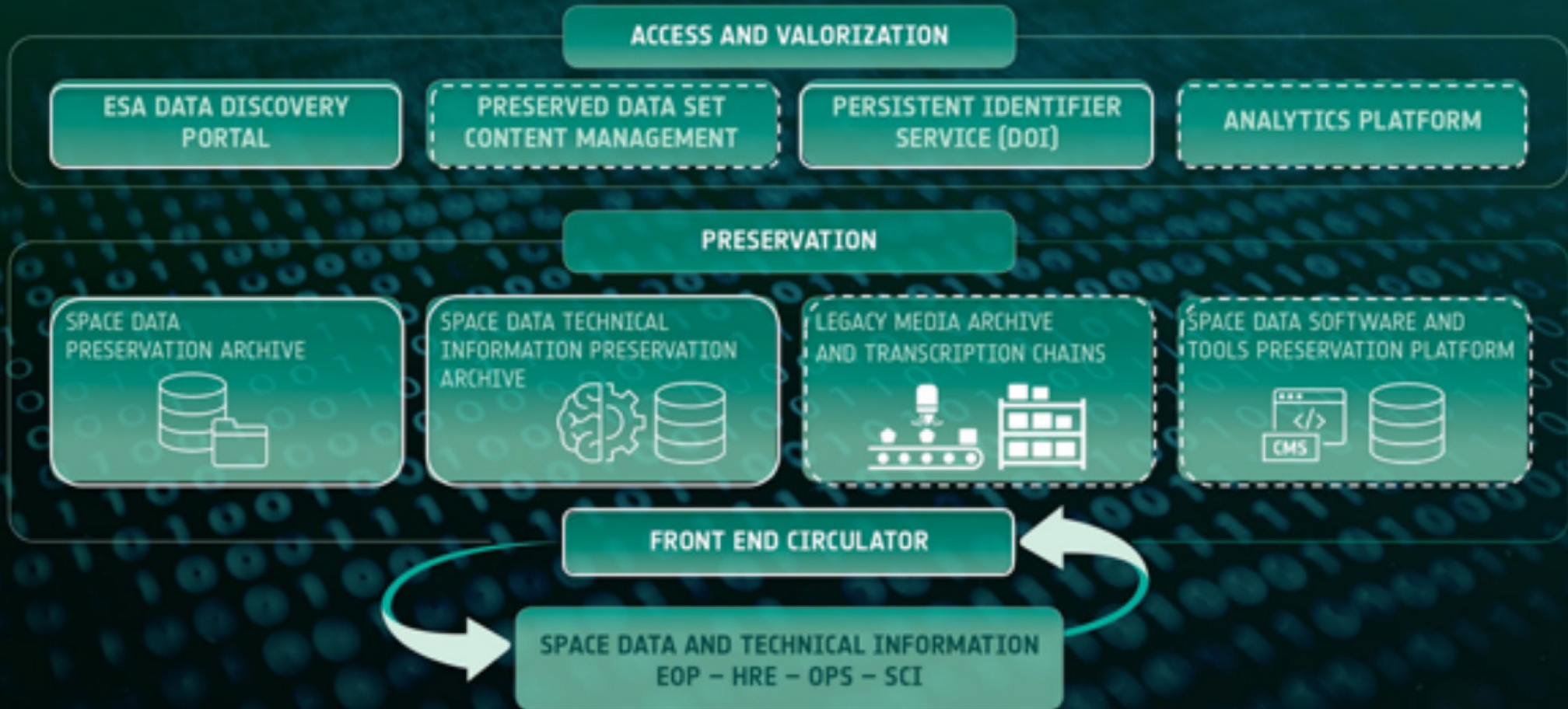
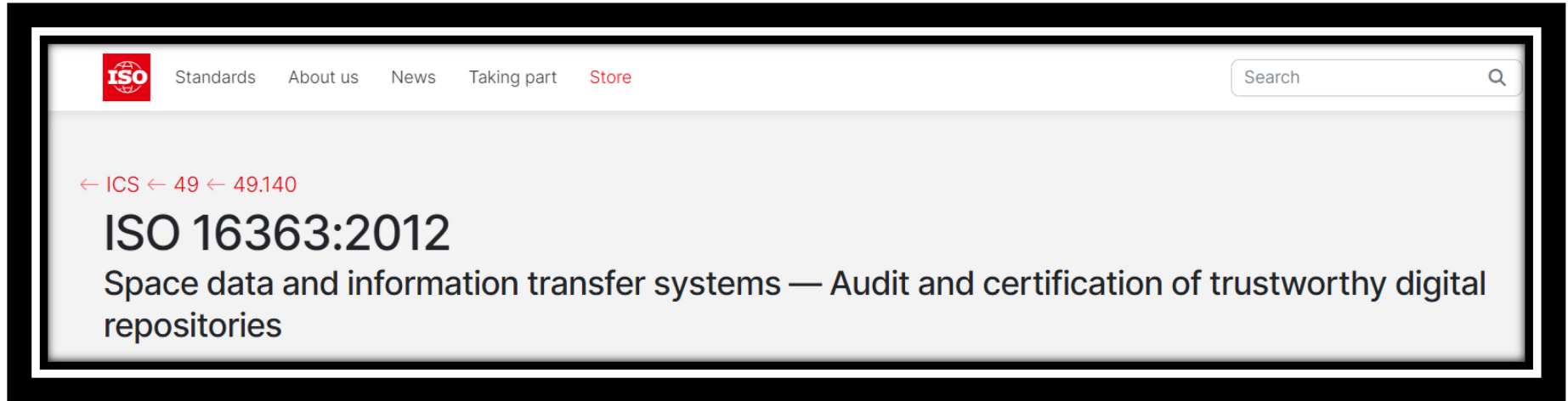


ISO 16363 AND CORETRUSTSEAL INTERNAL SELF-ASSESSMENT (ISA)

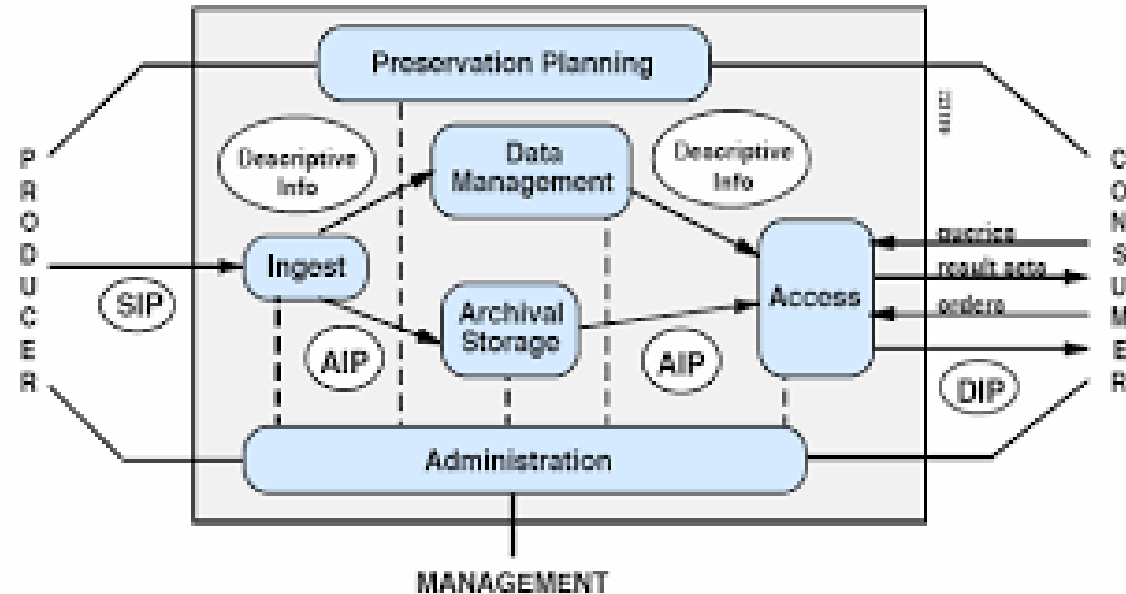
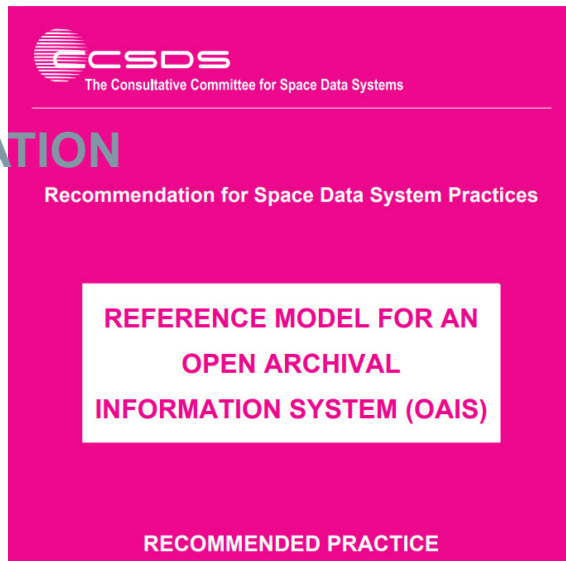
I. Maggio (Rhea for ESA) OLOS September 25, 2023

HERITAGE SPACE (LTDP+) DATA AND ASSOCIATED TECHNICAL CONTENT SHARED SYSTEMS/SERVICES





NO CERTIFICATION



CoreTrustSeal is the certification organisation launched by the World Data System of the International Science Council (WDS) and the Data Seal of Approval (DSA). CoreTrustSeal offers to any interested data repository a core level certification based on the DSA–WDS Core Trustworthy Data Repositories Requirements catalogue and procedures (see ref. [1], [2] of this document).

This requirements catalogue is the result of the joint effort between DSA and WDS under the umbrella of the Research Data Alliance to merge their data repositories certifications. The requirements reflect the core characteristics of trustworthy data repositories.

CoreTrustSeal is an international, community based, non-governmental, and non-profit organisation committed in promoting sustainable and trustworthy data infrastructures and in offering certification tools and services. For details see ref. [3] of this document.

The CoreTrustSeal certification can be considered as the first step in a global framework for repository certification which includes the extended level certification (Nestor-Seal DIN 31644) and the formal level certification (ISO 16363).

0. Context	R0
1. Mission/Scope	R1
2. Licenses	R2
3. Continuity of access	R3
4. Confidentiality/Ethics	R4
5. Organizational infrastructure	R5
6. Expert guidance	R6
7. Data integrity and authenticity	R7
8. Appraisal	R8
9. Documented storage procedures	R9
10. Preservation plan	R10
11. Data quality	R11
12. Workflows	R12
13. Data discovery and identification	R13
14. Data reuse	R14
15. Technical infrastructure	R15
16. Security	R16

List of CoreTrustSeal Requirements

CORETRUSTSEAL - ISA



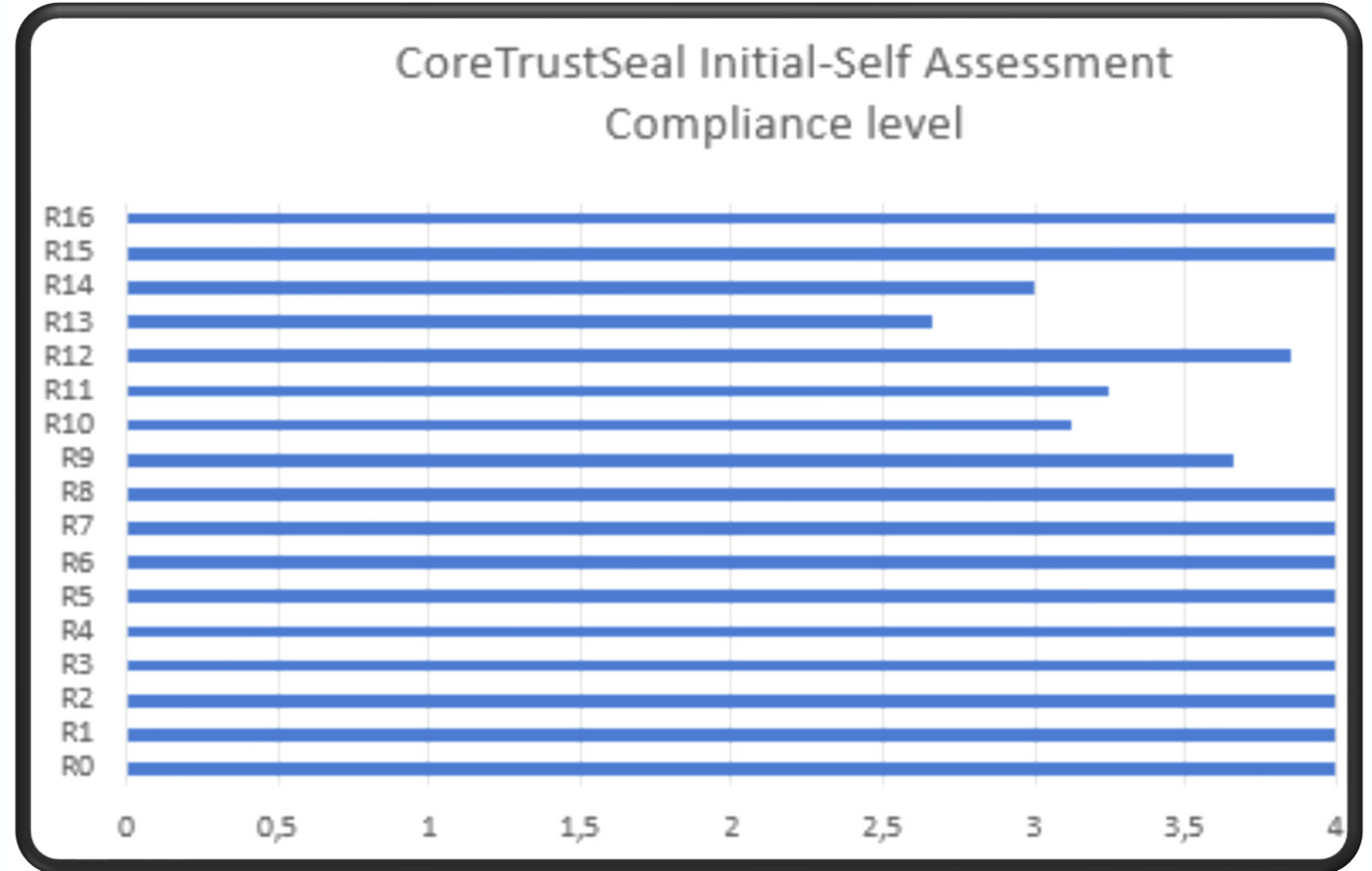
Internal Self Assessment (ISA) Questionnaire				Internal Self Assessment (ISA) CoreTrustSeal		ESA/ESRIN Archives: Space Data Preservation Archive and EO Data (Technical and Scientific) Information Preservation Archive			
Context	Context Description	Requirement	Id Re	Requirement Questions	Requirement Sub-Questi	Compliance level	Compliance phase	Compliance ISA description	Evidence
Background Information	Context	R0. Please provide context for your repository.	R0	1. Repository Type. Select all relevant types from:	A. Domain or subject-based repository	N/A	ISA	N/A	
Background Information	Context	R0. Please provide context for your repository.	R0	1. Repository Type. Select all relevant types from:	B. Institutional repository	4	ISA	ESRIN, the ESA Centre for Earth Observation, is one of the five ESA specialised centres situated in Europe. To curate, preserve and maintain the Space Data Packages in the long term, the ESRIN archives (Space Data Preservation Archive and Space Data Technical Information Preservation Archive) are supported by services that are carried out to fulfil the achievement of Agency Space Data heritage objectives as expressed in corporate policies, procedures and in relevant Heritage Data Programme (LTDP+) documentation. ESRIN repositories includes OAIS conformant Archive and non OAIS Archives. These archives are part of the Agency institutional Archives.	https://www.esa.int/About_us/news/ESA_factsheet%20Corporate%20news-The%20European%20Space%20Agency%20is%20Europe%20to%20space.organs%2022%20Member%20Sta
Background Information	Context	R0. Please provide context for your repository.	R0	1. Repository Type. Select all relevant types from:	C. National repository system, including governmental	N/A	ISA	N/A	
Background Information	Context	R0. Please provide context for your repository.	R0	1. Repository Type. Select all relevant types from:	D. Publication	N/A	ISA	N/A	
Background Information	Context	R0. Please provide context for your repository.	R0	1. Repository Type. Select all relevant types from:	E. Library	N/A	ISA	N/A	
Background Information	Context	R0. Please provide context for your repository.	R0	1. Repository Type. Select all relevant types from:	F. Museum	N/A	ISA	N/A	
Background Information	Context	R0. Please provide context for your repository.	R0	1. Repository Type. Select all relevant types from:	G. Archive	N/A	ISA	N/A	
Background Information	Context	R0. Please provide context for your repository.	R0	1. Repository Type. Select all relevant types from:	H. Research project repository	N/A	ISA	N/A	
Background Information	Context	R0. Please provide context for your repository.	R0	1. Repository Type. Select all relevant types from:	I. Other (Please describe)	N/A	ISA	N/A	
Background Information	Context	R0. Please provide context for your repository.	R0	2. Brief Description of Repository		4	ISA	European Space Agency (ESA), in conducting its programmes and activities, produces or receives from external entities (including contractors and third parties), space data and associated technical content (i.e. technical information, software tools) also referred as 'Space Data Packages'. Space Data Packages and their Archives are an integral part of the Agency's overall mission assets. They constitute the scientific and technical heritage that needs to be managed, preserved, curated, and valued. ESA has the mandate through its convention to assure sharing, inviolability, long-term preservation, access and exploitation of such data and technical content, according to the applicable policies, rules and regulations. For the purpose of this initial assessment the Space Data Archives have been analysed. The Heritage Space Programme Management Plan and the Policy on ESA Space Data Management and Curation describe the repository mission and the associated principles and guidelines and provide the evidences on repository usage by the involved organization for Space Data curation and heritage.	https://www.esa.int/About_us/news/How_can_space_cultural_heritage

COMPLIANCE
 0 – Not applicable
 1 – The repository has not considered this yet
 2 – The repository has a theoretical concept
 3 – The repository is in the implementation phase
 4 – The guideline has been fully implemented in the repository

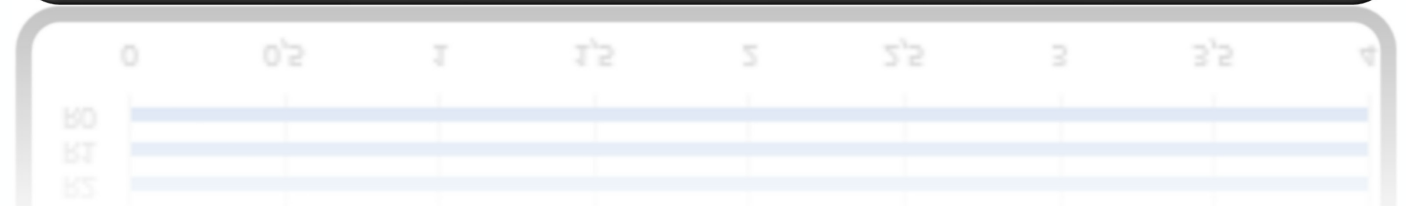


CORETRUSTSEAL – ISA OUTCOMES

Context	Description	Req. ID	Compliance level
Background Information	0. Context	R0	4
Organizational Infrastructure	1. Mission/Scope	R1	4
Organizational Infrastructure	2. Licenses	R2	4
Organizational Infrastructure	3. Continuity of access	R3	4
Organizational Infrastructure	4. Confidentiality/Ethics	R4	4
Organizational Infrastructure	5. Organizational infrastructure	R5	4
Organizational Infrastructure	6. Expert guidance	R6	4
Digital Object Management	7. Data integrity and authenticity	R7	4
Digital Object Management	8. Appraisal	R8	4
Digital Object Management	9. Documented storage procedures	R9	3,66
Digital Object Management	10. Preservation plan	R10	3,125
Digital Object Management	11. Data quality	R11	3,25
Digital Object Management	12. Workflows	R12	3,85
Digital Object Management	13. Data discovery and identification	R13	2,66
Digital Object Management	14. Data reuse	R14	3
Technology	15. Technical	R15	4
Technology	16. Security	R16	4



Technology	15. Technical	R15	4
Technology	16. Security	R16	4



Req. Id.	Control Areas	Finding and recommendation	Improvement actions	Areas of improvement		
				Preservation Plan	Monitoring tools and services	System enhancement
R0	Context	The term "Designated Community" derived from OAIS is not used. Potential consumers are described in the introduction of the ESA policy. The procedure under review describes the user community for the Space Data Archives.	A0 Complete review/approval cycle for the data curation and <u>long term</u> data preservation procedure.	✓	✓	
R10	Preservation Plan	1) According to the policy and draft procedure the preservation planning is managed by the Steering Board for LTDP+ Inter-Directorate. To manage long term preservation services for the producer in a planned documented way, the key document is the Preservation Plan (not yet drafted). 2) The level of responsibility for the preservation of each item is understood by the LTDP Team. It is defined in the ESA Data	A10.1 Drafting the Preservation Plan for the ESA/ESRIN Space Data Archives A10.2 Complete review/approval process for ESA Data	✓	✓	

ISO 16363:2012 defines a recommended practice for assessing the trustworthiness of digital repositories. It is applicable to the entire range of digital repositories. ISO 16363:2012 can be used as a basis for certification.

3.1	GOVERNANCE AND ORGANIZATIONAL VIABILITY
3.2	ORGANIZATIONAL STRUCTURE AND STAFFING
3.3	PROCEDURAL ACCOUNTABILITY AND PRESERVATION POLICY FRAMEWORK
3.4	FINANCIAL SUSTAINABILITY
3.5	CONTRACTS, LICENSES, AND LIABILITIES
4.1	INGEST: ACQUISITION OF CONTENT
4.2	INGEST: CREATION OF THE AIP
4.3	PRESERVATION PLANNING
4.4	AIP PRESERVATION
4.5	INFORMATION MANAGEMENT
4.6	ACCESS MANAGEMENT
5.1	TECHNICAL INFRASTRUCTURE RISK MANAGEMENT
5.2	SECURITY RISK MANAGEMENT

List of ISO 16363 Control Areas

Period: May 2021- November 2021

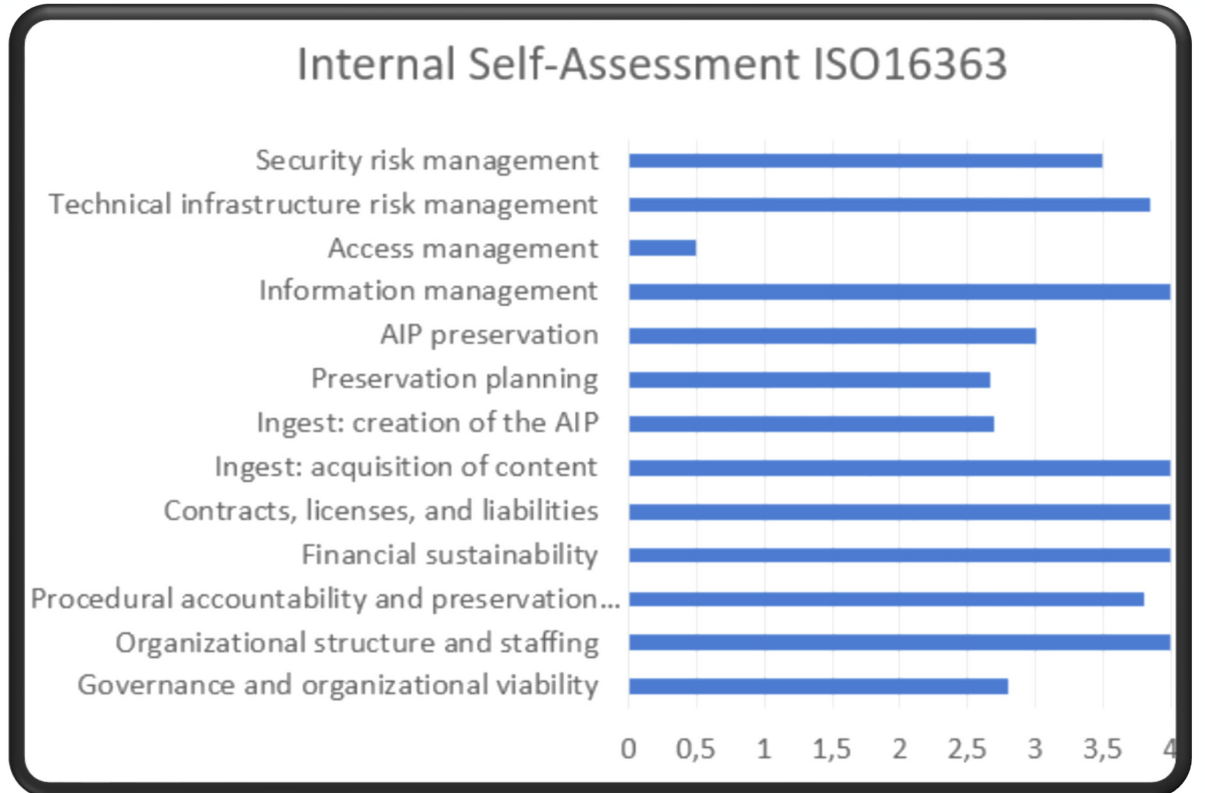
Organization: ESA

Archive: ESA EO Archive located at ESRIN, Frascati Italy

ISO16363 - Internal Self-Assessment Questionnaire (ISA)

[1] Ref.	Control Area	Control ID	Question ID	Requirment ID	Assessment questions	Estimated Compliance Level	Compliance check Phase	Evidences	Actions	Compliance ISA description
5.2	SECURITY RISK MANAGEMENT	SEC-5.2	SEC-5.2.1	5.2.1	Does the repository maintain a systematic analysis of security risk factors associated with data, systems, personnel, and physical plant?	3	ISA	Partially existing, to be completed	Risk assessment at archives level is under implementation.	A systematic analysis of security risk factors associated with data, systems, personnel, and physical plant related to archives is maintained in accordance with ISO27001, ISO9001 and ISO22301 in the context of application to Business Continuity Management based on a process approach to risk management. In particular, the ESI is managed in the respect of the previous version and is monitored by the LTDP Team and subject to regular audits maintained at ESA. In the service team, functional administrators resolve incidents as an intermediary between the central team. When an incident occurs, it is reported applying the internal procedures. Risk assessment implementation for ESA
5.2	SECURITY RISK MANAGEMENT	SEC-5.2	SEC-5.2.2	5.2.2	Does the repository have implemented controls to adequately address each of the defined security risks?	3	ISA	Partially existing, to be completed	Risk assessment at archives level is under implementation.	The controls to adequately address each of the defined security risks are implemented at archives level.
5.2	SECURITY RISK MANAGEMENT	SEC-5.2	SEC-5.2.3	5.2.3	Does the repository staff have delineated roles, responsibilities, and authorizations related to implementing changes within the system?	4	ISA	ESA Data Policy; ESA Space Data Policy (Archiving Policy for ESA Earth Explorers, Heritage Missions and Third Party Missions Earth Observation Space Data);	Fully implemented. No action are required.	According to the applicable policies, the repository staff have delineated roles, responsibilities, and authorizations related to implementing changes within the system. In compliance with ISO27001, ISO9001 requirements foreseen in the context of Business Continuity Management based on a process approach to Risk Management based on a process approach to risk identification, and risk management. In

ISO16363 Control Areas	Compliance level
Governance and organizational viability	2,8
Organizational structure and staffing	4
Procedural accountability and preservation policy framework	3,8
Financial sustainability	4
Contracts, licenses, and liabilities	4
Ingest: acquisition of content	4
Ingest: creation of the AIP	2,7
Preservation planning	2,66
AIP preservation	3
Information management	4
Access management	0,5
Technical infrastructure risk management	3,85
Security risk management	3,5



Control Areas	Finding and recommendation	Proposed action	Areas of improvement		
			Preservation Plan	Monitoring tools and services	System enhancement
Governance and organizational viability	The Preservation Plan is not yet in place for the analysed archives, even if specific documents exist with the definition of the strategic approach taken in the long-term data preservation for supporting ESA mission.	Drafting Preservation Plan for ESA/ESRIN Space Data Archives	✓		
	Specific processes and procedure in the analysed archives are not in place to monitor its organisational environment to determine when to execute its succession plan, contingency plans, and/or escrow arrangements.	Evaluate processes and procedure for succession plan if applicable in the context of the Agency	✓		
Preservation Planning	No tools or mechanisms are in place for monitoring and notification when Representation Information is inadequate for the users to understand the data holdings of the in-scope archives.	Improving Representation Information monitoring	✓		
	CEOS guidelines are applied for Technology Watch. The Preservation Plan for the archives does not exist. No	Drafting Preservation Plan for ESA/ESRIN	✓		

OAIS – Open Archival Information System

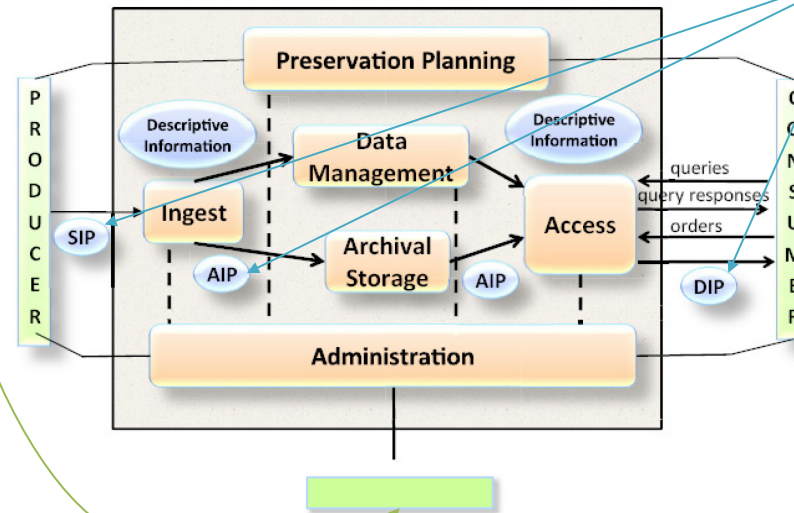
OAIS is an Archive, consisting of an organization, which may be part of a larger organization, of people and systems that has accepted the responsibility to preserve information and make it available for a Designated Community.

Functional Key Terms:

- **Producers:** people, organizations or systems that provide the information to be preserved
- **Managers:** those who establish and are responsible for conservation policies and procedures
- **Consumers:** people, organizations or systems that interact to find and use the information stored

Three kind of Information Package:

- **SIP – Submission Information Package:** negotiated and accepted by the **Producers**
- **AIP – Archival Information Package:** information package for preservation management
- **DIP – Dissemination Information Package:** package of information provided to **Consumer** subjects



OAIS – Functional Mapping

OAIS ref.	OAIS Functional Entity	Functions	ESA Space Data Preservation Archive Services	ESA Space Data Technical Information Preservation Archive Services
4.1.1.1	Common Services	Operating system services	These services are provided by ESA LTDP Team for Space Preservation Systems. Managed services are common for all the system components.	These services provided by ESA LTDP Team for Space Preservation Systems. Managed services are common for all the system components.
4.1.1.1	Common Services	Network services	The network services are managed by GTT, current contractor responsible for the services.	The network services are provided by ESA LTDP Team for all Space Preservation System as part of the current IaaS portfolio and are common for all the system components.
4.1.1.1	Common Services	Security services	The security services are managed by GTT, current contractor responsible for the services.	The security services are provided by ESA LTDP Team for all Space Preservation System as part of the current IaaS portfolio and are common for all the system components.
4.1.1.2	Ingest	Pre-ingest	Current pre-ingest services include the following activities: <ul style="list-style-type: none"> - activate Front-End (PE-FE and Mercury) for data circulation - validate and verify received data and metadata - create basic common EO-SIP - enrich data and metadata of basic common EO-SIP - circulate EO-SIP and dedicated API to transfer area. 	Current pre-ingest services include the following activities: <ul style="list-style-type: none"> - activate Front-End (Mercury) for data circulation - validate and verify received data and metadata - create basic common SIP - enrich data and metadata of basic common SIP - circulate SIP and dedicated API to transfer area.
4.1.1.2	Ingest	Transfer	Current transfer consists of the following activities: <ul style="list-style-type: none"> - register transfer in the Archive System Directory (File Store) - verify transfer compliance - approve transfer - rename with transfer UUID - assign files with UUID and checksums - preformat metadata files - verify transfer checksums - quarantine for managing corrupted or not compliant formats of both data and metadata - generate transfer struct report - save directory tree - clean-up names - identify file format - extract packages - characterize and extract metadata 	Current transfer consists of the following activities: <ul style="list-style-type: none"> - register transfer - verify transfer compliance - approve transfer - rename with transfer UUID - assign files with UUID and checksums - preformat metadata files - verify transfer checksums - generate METS.xml document - quarantine - scan for viruses - generate transfer struct report - save directory tree - clean-up names - identify file format - extract packages

