Response to CCSDS's comments on the

OAIS Five-year review: recommendations for update, 2006

Compiled on behalf of members of

The Digital Curation Centre

and

The Digital Preservation Coalition

by

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Digital Curation Centre and Digital Preservation Coalition

Response to comments received from the Consultative Committee for Space Data Systems (CCSDS), Data Archiving and Ingest Working Group on the report *OAIS Five-year review: Recommendations for update*, 2006

Introduction

The Digital Curation Centre and the Digital Preservation Coalition were pleased to receive a response to their report: *OAIS Five-year review: Recommendations for update*, 2006, from the Consultative Committee for Space Data Systems (CCSDS), Data Archiving and Ingest Working Group.

The Working Group has clearly made careful consideration of the comments and the DCC/DPC welcome the acceptance of many of these, and the planned revision of the text to reflect our concerns.

However, the DCC and the DPC are concerned that the limited scope of the revision will reduce the current influence of the standard within the digital curation and preservation communities. A more far reaching or forward thinking review would ensure that the revised standard:

- remains up-to-date until the next planned review;
- remains applicable to the current heterogeneous user base;
- will be easier to understand through a structure which clearly delimits normative text, use cases and examples;
- contains guidelines on how to achieve an implementation;
- follows ISO practice by clearly referencing other applicable standards;
- clarifies its applicability to digital material.

More details of our concerns are given below, where some of the original submissions are considered in turn.

ID:	DCC/DPC-1
COMMENT CATEGORY:	General recommendation
COMMENT:	There is a formatting issue throughout the document. There should be a clear distinction between examples and use cases, which should be separated from the normative text in order to create a better document structure.
PROPOSED DISPOSITION:	No changes are planned
RATIONALE:	A comprehensive restructuring would be necessary and this is outside the scope of this revision.
DCC/DPC RESPONSE:	A comprehensive restructuring of the document so that it conforms to ISO/IEC Directives, Part 2. 'Rules for the structure and drafting of International Standards' would clarify the standard. There should be a clear distinction between normative and informative sections.

ID:	DCC/DPC-3
COMMENT CATEGORY:	General recommendation
COMMENT:	The standard should provide supplementary documents for full understanding, such as OAIS-lite for managers. A self-testing manual to establish bench marks would be useful along with a detailed checklist of the steps required for an implementation. Best practice guides, at a national level, through national standards bodies such as the British Standards Institution would be helpful.
PROPOSED DISPOSITION:	No changes are planned for this document.
RATIONALE:	Outside the scope of this review, but other documents such as best practice guides would be useful and should be produced.
DCC/DPC RESPONSE:	The CCSDS view that best practice guidelines would be helpful is welcomed. The production of these should be added to the roadmap in Section 1.5 (page 1-4)

ID:	DCC/DPC-4
COMMENT CATEGORY:	General recommendation
COMMENT:	Better, more concrete and more up-to-date examples are needed. The CD-Rom example and moon rock example are particularly unhelpful.
PROPOSED DISPOSITION :	This proposal is rejected.
RATIONALE:	Upon reviewing the use of the CD-ROM example, it is found to be very effective and very concrete. The use of a directory structured medium allows many issues to be brought forward. It should be easy to map this to any directory structured data storage medium or technique and it can be simplified to a single file approach as needed. The use of the moon rock is brief and is an example of a physical data object. In this sense, it serves the purpose well.
DCC/DPC RESPONSE:	This would have greater resonance with the wider community if we were to use the term CD rather than CD-ROM. The term CD-ROM has particular connertations with the wider community as a specific publishing genre rather than a storage medium. The moon rock example is not helpful. This is a physical object which has different properties and requirements from records or digital materials. Physical objects are better managed within an appropriate specialised framework such as the CIDOC Conceptual Reference Model (ISO 21127:2006).

ID:	DCC/DPC-5
COMMENT CATEGORY:	General recommendation
COMMENT:	The standard needs to decide whether it is applicable to digital data or physical objects. Just now it tries, unsuccessfully to cover both which is both unhelpful and confusing.
PROPOSED DISPOSITION :	No changes are planned
RATIONALE:	Many archives hold both physical and digital materials and the potential relationships between them need to be addressed even though the primary focus of the OAIS is on digital. For example, even when the primary information being preserved is digital, the end point of the representation network may be a physical document.
DCC/DPC RESPONSE:	See DCC/DPC-4 response above

ID:	DCC/DPC-6
COMMENT CATEGORY:	General recommendation
COMMENT:	The model appears quite definitive in many places, and not always true to its high level roots: "This reference model does not specify a design or an implementation. Actual implementations may group or break out functionality differently" (page 1-2, final paragraph). The model is sometimes too prescriptive and this could constrain implementers.
PROPOSED DISPOSITION :	Add to end of 4.1.1 - "and actual implementations are not expected to have a 1-to-1 mapping to the functions shown, and may for example choose to combine functions or break out functionality differently."
RATIONALE:	Details in the functional model are there to provide useful terminology, concepts, and relationships, and are therefore necessary. Such details are not to be interpreted as an implementation, as stated in the document.
DCC/DPC RESPONSE:	See response to DCC/DPC-1.

ID:	DCC/DPC-7
COMMENT CATEGORY:	General recommendation
COMMENT:	There needs to be some re-iteration that it is not necessary to implement everything and section 3.1 should clearly establish what the minimal requirements are.
PROPOSED DISPOSITION :	No changes are planned
RATIONALE:	The conformance section states what is required. The OAIS does not specify an implementation.
DCC/DPC RESPONSE:	See response to DCC/DPC-1.

ID:	DCC/DPC-9
COMMENT CATEGORY:	General recommendation
COMMENT:	The concept of the designated community should be extended to take account of the user community which extends beyond it. The knowledge base of the designated community, and the designated community itself, will change over time.
PROPOSED DISPOSITION :	No change needed
RATIONALE:	The first sentence may reflect a fundamental misunderstanding of the term designated community. The second sentence is covered by OAIS already.
DCC/DPC RESPONSE:	Section 4.1 (page 4-2) paragraph 'Preservation Planning' replace "designated user community" with "designated community". The introduction of this one-off term causes confusion and is inconsistent with the rest of the standard. The term is not defined in the document. The designated community may change over time and would need to be redefined as part of an appraisal process. This should be acknowledged in definition of the term in Section 1.7.2 (page1-10)

ID:	DCC/DPC-10
COMMENT CATEGORY:	General recommendation
COMMENT:	Interaction with internal and external systems and services: the OAIS seems to imply an 'insular' stand-alone archive but it reality it's likely to be part of a bigger organisation or network.
PROPOSED DISPOSITION :	Words added in Purpose and Scope, Glossary and section 2.1. (1.1) "An 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." (2.1) "Management is the role played by those who set overall OAIS policy as one component in a broader policy domain, for example as part of a larger organization."
RATIONALE:	This point needs to be made clearer.
DCC/DPC RESPONSE:	Although changes to the text are welcome, some cross referencing to Section 6 would be helpful to ensure that the community is aware of the section on "Archive Interoperability".

ID:	DCC/DPC-13
COMMENT CATEGORY:	General recommendation
COMMENT:	Section 5 is overly specific about details and insufficient on concepts. Most of the discussion of migration should be removed; it is simply storage management, and belongs in the reliable storage layer.
PROPOSED DISPOSITION :	No changes are planned
RATIONALE:	Section 5 makes a number of useful distinctions and provides useful terminology to capture these. While 'replication' would be handled in Archival Storage, it is postulated that more complex migrations involving repackaging and transformations should involve other OAIS functions including Administrations. The entire topic is critical and thus deserves to be its own section.
DCC/DPC RESPONSE:	Section 5 should be labelled 'Informative'.

ID:	DCC/DPC-17.1
COMMENT CATEGORY:	Updates needed for clarification
COMMENT:	A new definition is required for the term: Active archive e.g. as used in 2 (page 2-1) paragraph beginning "The explosion of computer processing power…"
PROPOSED DISPOSITION :	No changes are planned
RATIONALE:	The phase is felt sufficiently clear for the purposes of this reference model.
DCC/DPC RESPONSE:	See response DCC/DPC-26

ID:	DCC/DPC-17.5
COMMENT CATEGORY:	Updates needed for clarification
COMMENT:	A new definition is required for the term: IP templates e.g. as used in 4.1 (page 4-2) in paragraph beginning "Preservation Planning…"
PROPOSED DISPOSITION	No changes are planned
RATIONALE:	Template is used in a common sense.
DCC/DPC RESPONSE:	It would be better to expand 'IP' to 'Information Package' so that people are not confused by the normal usage of the term 'IP' i.e. Intellectual Property.

ID:	DCC/DPC-17.9
COMMENT CATEGORY:	Updates needed for clarification
COMMENT:	A new definition is required for the term: Preservation Planning Functional Entity
PROPOSED DISPOSITION :	The definitions of the functional entities in the Glossary will have 'functional' inserted prior to the word 'entity'.
RATIONALE:	This will improve consistency with the text in section 4.1. The capitalization of the functional entities serves to distinguish them from any confusion with other possible uses. Incorporating 'Functional Entity' into the name of the entity would significantly impact common usage of OAIS terms and complicate the diagrams.
DCC/DPC RESPONSE:	To clarify our original suggestion, we propose that all functional entities should be defined in your glossary. At present Access, Administration, Archival Storage, Data Management and Ingest are all defined and each of these definitions starts with the words "The OAIS entity that…". There is no similar definition for Preservation Planning, and this is required for completeness. A suggested definition is "The OAIS entity which contains the services and functions which transforms user and service requirements into implementation plans for the OAIS"

ID:	DCC/DPC-17.10
COMMENT CATEGORY:	Updates needed for clarification
COMMENT:	A new definition is required for the term: Repository this term is increasingly used by the digital curation community. All RLG work uses this term and it would be helpful if the terms were consistent across the user community
PROPOSED DISPOSITION :	No changes are planned
RATIONALE:	The term "repository" is used in a variety of circumstances, including outside the preservation context, and on the other hand is not used universally in the preservation community. Therefore rather than cause confusion we opt to limit the use of the term in OAIS.
DCC/DPC RESPONSE:	The term repository is used twice in this document, both in the Section 1.7.2 definitions for Data Dictionary (page 1-9) and Long Term (page 1-11). If a new definition is not acceptable then, for consistencies sake, the second case should be changed to "an OAIS".

ID:	DCC/DPC-17.12
COMMENT CATEGORY:	Updates needed for clarification
COMMENT:	A new definition is required for the term: Staging area e.g. as used in 4.1.1.2 (page 4-5) in paragraph beginning "The Quality Assurance function…"
PROPOSED DISPOSITION :	Change 'in staging storage' under 4.1.1.7 Access, pg 4-16, to 'in the staging area'. Also make the change in 4.3.2, 4.3.3, 4.3.4,
RATIONALE:	Staging area is used in a general way that is understandable. The change of 'staging storage' to 'staging area' is made for consistency.
DCC/DPC RESPONSE:	For consistency and comprehensibility "staging server" may be a better phrase which does not require definition.

ID:	DCC/DPC-17.16
COMMENT CATEGORY:	Updates needed for clarification
COMMENT:	A new definition is required for the term: User Community e.g. the wider community who may use the OAIS but who are not the designated community
PROPOSED DISPOSITION :	No changes are planned
RATIONALE:	The term is used in a very broad and obvious way.
DCC/DPC RESPONSE:	See response in DPC/DCC-9

ID:	DCC/DPC-17.17
COMMENT CATEGORY:	Updates needed for clarification
COMMENT:	A new definition is required for the term: Functional entities The definition for the terms defining functional entities should spell out that these are Functional Entities so that they cannot be mixed up with verbs for other possible actions e.g. • Access Functional Entity NOT Access • Administration Functional Entity NOT Administration • Ingest Functional Entity NOT Ingest • Archival Storage Functional Entity NOT Archival Storage • Data Management Functional Entity NOT Data Management
PROPOSED DISPOSITION :	The definition of the functional entities in the Glossary will have 'functional' inserted prior to the word 'entity'.
RATIONALE:	This will improve consistency with the text in section 4.1. The capitalization of the functional entities serves to distinguish them from any confusion with other possible uses. Incorporating 'Functional Entity' into the name of the entity would significantly impact common usage of OAIS terms and complicate the diagrams.
DCC/DPC RESPONSE:	See response DCC/DPC-17.9 above

ID:	DCC/DPC-17.20
COMMENT CATEGORY:	Updates needed for clarification
COMMENT:	A new definition is required for the term: Data The moon rock example is unhelpful as it mixes together digital data and physical objects. The difference between these needs to be clear.
PROPOSED DISPOSITION :	No changes are planned
RATIONALE:	The example is useful in that it makes the point that physical objects can be valid data objects.
DCC/DPC RESPONSE:	See response in DCC/DPC-4 above.

ID:	DCC/DPC-17.23
COMMENT CATEGORY:	Updates needed for clarification
COMMENT:	A new definition is required for the term: Edition This definition is grammatically incorrect and out of step with the definition of "edition" in other standards - e.g. in FRBR (Functional requirements for bibliographic records) terms an Edition equates to an Expression; a Version or a Manifestation
PROPOSED DISPOSITION :	Change the term "Edition" to "AIP Edition" throughout, and change the Glossary definition to "An attribute of an AIP whose information content has been improved in comparison to the source AIP and is therefore a candidate to replace the source AIP"
RATIONALE:	This change makes the use of the term more precise and the definition clearer.
DCC/DPC RESPONSE:	The word 'improved' in the text is misleading. This should probably be "changed". (Because, in terms of information content it will not always be for the better!)

ID:	DCC/DPC-17.25
COMMENT CATEGORY:	Updates needed for clarification
COMMENT:	A new definition is required for the term: Independently understandable. This definition is problematic as information will not remain independently understandable forever in the way described here. Decoding it will eventually depend on special resources not widely available, such as dictionaries and grammars of 21st Century English. The definition should imply that an OAIS will perform the maintenance required to ensure that a digital object which is currently independently understandable will remain so.
PROPOSED DISPOSITION :	No changes are planned
RATIONALE:	It is inevitable that the archive must perform some activities in order to ensure continued independent understandability, nevertheless the definition should be taken as just that, and not a place to include details of such mechanism.
DCC/DPC RESPONSE:	In Section 1.7.2 (page 1-10) the term "Independently understandable" would be clearer as "Independently usable". This term makes it clear that the archive cannot be responsible for providing all the tools which may be required to interpret the material over time. This term also appears in Section 3.1 (page 1-11) and also Section 3.2.4 (page 3-4). A suggested new definition for the term "Independently Understandable" is: "A characteristic of information that has sufficient documentation to allow the information to be used, interpreted and understood by the Designated Community."

ID:	DCC/DPC-17.31
COMMENT CATEGORY:	Updates needed for clarification
COMMENT:	A new definition is required for the term: Physical Object The definition should clearly distinguish between a physical object and a digital object.
PROPOSED DISPOSITION :	No changes are planned
RATIONALE:	We believe that the distinction is normally rather obvious. However the issue is that the line between a physical object and a digital object may be blurred since a digital object must be embodied in some way in a physical object. For example one may look at a CD-ROM as containing digital objects, but also as a physical object with tracks with "pits" which in some complex way carry the "bits" i.e. it may depend on the level of detail with which one looks at the object.
DCC/DPC RESPONSE:	See response DCC/DPC-4

ID:	DCC/DPC-18
COMMENT CATEGORY:	Updates to add missing concepts or strengthen weak concepts
COMMENT:	Section 1.2 (page 1-2) paragraph beginning "This reference model does not specify a design or an implementation..." -This statement is contradicted by the sense of the document, which appears at a number of places to be quite specific about recommended implementation. The document should clearly separate the theory and the conceptual model from actual implementation.
PROPOSED DISPOSITION :	No changes are planned
RATIONALE:	Various pieces of functionality are specified and some are quite detailed. However this is to clarify the concepts and terms involved. As stated, this is a conceptual model that does not specify an implementation and this must be kept in mind when reading the document.
DCC/DPC RESPONSE:	As identified in DCC/DPC -1, the document would benefit from a fundamental reorganisation to separate the model from implementations and use-cases.

ID:	DCC/DPC-19
COMMENT CATEGORY:	Identification of any outdated material
COMMENT:	Section 1.5 (p 1-4) -The list in this section needs updating and should point to relevant sections of appendix B. It should give a list of standards which it recommends and should point to work which builds on OAIS such as the PREMIS Preservation Metadata: Implementation Strategies Working Group, PREMIS Data Dictionary version 1.0 (OCLC and RLG, 2005) and the RLG, An Audit Checklist for the Certification of Trusted Digital Repositories, 2005.
PROPOSED DISPOSITION :	Changes have been made: "Some areas for potential OAIS-related international and community standards are listed below with indications where progress has been made: – standard(s) for the interfaces between OAIS type archives; – standard(s) for the submission (ingest) methodology used by an archive – Producer-Archive Ingest Methodology Abstract Standard (ISO 20652:2006); – standard(s) for the submission (ingest) of digital data sources to the archive; – standard(s) for the delivery of digital sources from the archive; – standard(s) for the submission of digital metadata, about digital or physical data sources, to the archive; – PREMIS Preservation Metadata: Implementation Strategies Working Group, PREMIS Data Dictionary version 1.0 (OCLC and RLG, 2005) – standard(s) for the identification of digital sources within the archive; – protocol standard(s) to search and retrieve metadata information about digital and physical data sources; – standard(s) for media access allowing replacement of media management systems without having to rewrite the media; – standard(s) for specific physical media; – standard(s) for the migration of information across media and formats; – standard(s) for recommended archival practices; – standard(s) for accreditation of archives. – An Audit Checklist for the Certification of Trusted Digital Repositories, 2005"
RATIONALE:	Although this list could be extended it seems worth adding these details.

DCC/DPC RESPONSE:	The update of this list is welcomed. CCSDS should be aware that the last bullet now needs updating "An Audit Checklist for the Certification of Trusted Digital Repositories, 2005" has been superseded by "Trustworthy Repositories Audit & Certification: Criteria and Checklist (TRAC)", Version 1.0 (February 2007). Other existing standards which could usefully be added here are: ISO 15489: Information and documentation - Records management; and ISO 23081: Information and documentation - Records management processes - Metadata for records.

ID:	DCC/DPC-26
COMMENT CATEGORY:	Updates to add missing concepts or strengthen weak concepts
COMMENT:	Section 2 Introduction (p2-1) paragraph beginning "The explosion of computer processing power..." -The concept of an active archive in this paragraph needs further development. The definition of the term is not clear and this should be made explicit in chapter 1.7.2. If active archive refers to the process of digital curation then it needs to be understood, as digital curation processes will affect both the functions and workflows which are detailed later in the document. It is not clear whether active archive relates to the management of digital objects after ingest into the OAIS or whether the term also embraces the curation activities engaged in by the Producer and Management prior to ingest into the OAIS. A diagram explaining how the active archive relates to the OAIS would be helpful at this point.
PROPOSED DISPOSITION :	It is proposed that we do not add extra text or diagrams for definition.
RATIONALE:	The phrase "Active Archive" is defined sufficiently well in the previous sentence. i.e. one "where the Producer role and the archive role are the responsibility of the same entity". Furthermore the term is used just once.
DCC/DPC RESPONSE:	Section 2 (page 2-1) the sentence beginning 'These systems, which are sometimes known as Active Archives, should subscribe to ….' should be replaced with 'These systems should subscribe to… '. There is no need to introduce the term "Active archive".

ID:	DCC/DPC-30
COMMENT CATEGORY:	Updates to add missing concepts or strengthen weak concepts
COMMENT:	Section 2.2.3 (page 2-7) paragraph beginning "The Submission Information Package…" -A Submission Information Package (SIP) is not necessarily either structured or complete when it is received by the OAIS. It should be reflected in the text that a degree of work may be required to prepare a SIP for ingest. Indeed a SIP may be made up of made up of a number of SIPs which have been prepared by different producers. For instance, SIPs may arrive with limited or even no metadata and have to have this enhanced or added. This paragraph should introduce the idea of these more complex scenarios to let implementers know the sort of work which may be required and the planning processes involved in preparing a SIP and converting between a SIP and AIP. Some reference to Producer archive interface -- Methodology abstract standard (ISO 20652:2006) and Information and Documentation – Records management (ISO 15489(2001) would be helpful here to ensure implementers know that additional help is available.
PROPOSED DISPOSITION :	Replace the penultimate sentence in that paragraph by "The relationships between SIPs and AIPs can be complex; one AIP may be created from one SIP; one AIP may be created from several SIPs transferred at different times by the same producer: one AIP created from several SIPs from several producers. Even in the first case, the OAIS may have to perform a number of transformations on the SIP" and also add pointer to PAIMAS in the Roadmap section.
RATIONALE:	It is useful to clarify the possible complexities involved.
DCC/DPC RESPONSE:	The penultimate sentence in Section 2.2.3 (page 2-7) paragraph beginning "The Submission Information Package…" will be easier to understand and ensure contingencies for different situations if the following text is used "The relationships between SIPs and AIPs can be complex; as well as a simple one -to-one relationship in which one SIP produces one AIP, other possibilities include: one AIP being produced from multiple SIPs produced at different times by one producer or by many producers; one SIP resulting in a number of AIPs; and many SIPs from one or more sources being unbundled and recombined in different ways to produce many AIPs. Even in the first case.."

ID:	DCC/DPC-31
COMMENT CATEGORY:	Identification of any outdated material
COMMENT:	Section 2.2.2 (page 2-6) paragraph beginning "The Packaging Information is that information…" The example of Packaging Information given in this paragraph is out of date and misleading. It ties the concept of Packaging Information to something which wouldn't be part of a data object. There needs to be some separation between Content Information and Packaging Information. The definition would benefit from some better examples.
PROPOSED DISPOSITION :	No changes are planned
RATIONALE:	The example of the CD-ROM is not out of date and it seems clear enough. Additional packaging information and examples are discussed in Section 5.
DCC/DPC RESPONSE:	See response DCC/DPC 4 re CD-ROMS. It might also be useful to broaden the definition to packaging standards such as METS or MPEG-DIDL.

ID:	DCC/DPC-35
COMMENT CATEGORY:	Updates to add missing concepts or strengthen weak concepts
COMMENT:	Section 3.1 (page 3-1) bullet 1 -The requirement to negotiate for information should be dropped on the grounds that most OAISs are places of deposit in which clear decisions have to be made concerning what is actually accepted. The sentence should be changed from "The OAIS must: Negotiate for and accept appropriate information from information Producers" to "The OAIS must: Accept or reject appropriate information from information Producers"
PROPOSED DISPOSITION :	No changes are planned
RATIONALE:	The comment discusses a specific example but the bullet point covers the more general case and should stand.
DCC/DPC RESPONSE:	To allow the word 'Negotiate' to remain as an obligation, there needs to be some words to indicate that negotiating may sometimes be a null step; or a machine-machine negotiation. Suggested revision to the text could be 'Negotiations can embrace a range of possible actions, and may sometimes be a null step. It may be carried out for each SIP, for each producer, or for a class of producers. It may involve extensive human contact or machine-machine negotiations, such as that which takes place between a web crawler and a web server when deciding what, if any, content the server will permit the crawler to have.'

ID:	DCC/DPC-42
COMMENT CATEGORY:	Updates to add missing concepts or strengthen weak concepts
COMMENT:	Section 4.1.1.2 (page 4-5) -Some of the tasks described in this section would appear to be an activity covered by the Producer archive interface --Methodology abstract standard (ISO 20652:2006) and Information and documentation – Records management (ISO 15489:2001) It would help to have a section which summarises activities which are part of these standards, and directs users to them for further details. This would include negotiating for material (see comment on chapter 3 above); ensuring that submitted material conforms to a collecting policy and accepting or rejecting material as part of the Quality Assurance process (currently included in the Audit Submission function, page 4-11); and activities required to turn a SIP into an AIP. (See comment on Chapter 2.2.3 above). A diagram which explains activities in the early stages of ingest should be added.
PROPOSED DISPOSITION :	No changes are planned
RATIONALE:	Reference to PAIMAS is made under Administration, and also the Roadmap has been updated
DCC/DPC RESPONSE:	Information indicating that this is the point at which PAIMAS should be implemented would be useful in Section 4.1.1.2 (page 4-5). Users may not be aware of its existence and pointing them to it will increase the uptake of the standard and efficiency of an OAIS. We suggest that an indication is made in Figure 4-2 (page 4-5) of the functions which are covered by PAIMAS by bounding the following functions in a box labelled: "Pre-Ingest Activities – see PAIMAS (ISO 20652)": Producer, Receive Submission, and Quality Assurance We also suggest the addition of a paragraph after the diagram and before the paragraph "The Receive Submission Function …." which reads: Submission Information Packages are prepared by the Producer. This preparation phase may require the completion of one or more of a number of activities before the SIP is ready for receipt by an OAIS. The activities are specified in ISO 20652: 2006, *Producer-archive interface -- Methodology abstract standard (PAIMAS)*. Activities include 4 phases: Pre-ingest, formal definition, transfer and validation. Pre-ingest activities include: making initial contact; preparation of feasibility studies; definition of scope; preparation of a draft SIP definition; and

	preparation of a draft submission agreement. Formal definition activities are: final SIP design; agreement of conditions of transfer; specification of access restrictions and delivery methodology. Transfer activities include: the actual transfer and preliminary processing of the SIP. Validation activities are: the actual validation of the SIP and any follow-up action required by the producer.

ID:	DCC/DPC-43
COMMENT CATEGORY:	Updates to add missing concepts or strengthen weak concepts
COMMENT:	Section 4.1.1.2 (page 4-5) paragraph beginning "The Quality Assurance function…" -The idea of a 'staging area' as a place where SIPs are stored is an implementation issue. This level of detail is not needed at this point in the document.
PROPOSED DISPOSITION :	Change 'in staging storage' under 4.1.1.7 Access, pg 4-16, to 'in the staging area'. Also make the change in 4.3.2, 4.3.3, 4.3.4,
RATIONALE:	The QA function requires, at least conceptually, a pause for examination with associated storage of the object. Staging area is used in a general way to denote such storage; this is believed to be readily understandable. The change of 'staging storage' to 'staging area' is made for consistency.
DCC/DPC RESPONSE:	See response DCC/DPC-17.12

ID:	DCC/DPC-49
COMMENT CATEGORY:	Identification of any outdated material
COMMENT:	Section 4.1.1.1 (page 4-3 to 4-5) -Common services are easily trapped in time and it does not seem to be the function of this document to describe the computing environment. This whole section would be better: • left out altogether • replaced with a simple list with reference to relevant standards • described in Service-oriented architecture (SOA) terms If it remains then diagrams explaining the Common Services and how they integrate with the OAIS should be provided. Note: the IEEE POSIX Reference Model is withdrawn; it may (or may not) be replaced by ISO/IEC 9945-1 etc Information technology — Portable Operating System Interface (POSIX®).
PROPOSED DISPOSITION :	Change last sentence of first paragraph to "Examples of such services include;"
RATIONALE:	The General Services are not outdated so quickly
DCC/DPC RESPONSE:	This whole section should be updated in light of changing technology and use of technology, and the fact that the IEEE POSIX Reference Model, in the form this section is based on, is withdrawn.

ID:	DCC/DPC-50
COMMENT CATEGORY:	Identification of any outdated material
COMMENT:	Section 4.1.1.3 (page 4-6 to page 4-8) -This whole section should be withdrawn. This document cannot give the subject the level of treatment it requires and there are specific standards which deal with the issues. In addition parts of the chapter are now out of date as new technology and methodologies have been developed. It would be better to make a general statement and point towards other relevant standards as possible means of achieving an implementation. One possible relevant standard is Information technology -- Security techniques --Code of practice for information security management (ISO 17799:2005). A possible replacement for Section 4.1.1.3 is: "The OAIS assumes a highly reliable, highly available, scalable (as required) error-free storage layer, in which AIPs can be placed and from which they can later be retrieved in identical form. There are many ways to achieve this, depending on the scale and other requirements. A number of ISO (or other?) standards are applicable in achieving this, including X, Y, Information technology --Security techniques --Code of practice for information security management (ISO 17799:2005). Long term reliable bit storage is NOT the same as long term preservation as defined by OAIS, but is a necessary part of it. It is important to realise however that, although good practice in this area has been widespread in well-managed IT infrastructure services for many years, factors such as scale (total object size, individual object sizes, and total numbers of objects) and particularly stringent requirements for fixity and security will place special demands. The ways these demands are best met will vary rapidly with contemporary computing practice, and are beyond the scope of this document."
PROPOSED DISPOSITION :	Disagree, no changes to text required
RATIONALE:	This section does need some level of detail so that the standard can stand alone. We do not think that we need to refer to these ISO standards.
DCC/DPC RESPONSE:	We suggest that after the first sentence in Section 4.1.1.3 (page 4-6), the following sentence should be inserted, 'The figure implies relationships between functions that may be realised very differently than the figure suggests, as long as the intent of those functions is achieved'

ID:	DCC/DPC-54
COMMENT CATEGORY:	Updates needed for clarification
COMMENT:	Section 4.2.1.4 (page 4-23) Figure 4-12 -What do the dots to the far right of the tree imply? -This is unclear and needs either deleted or explained.
PROPOSED DISPOSITION :	No changes are planned
RATIONALE:	The dots indicate that the diagram does not show an exhaustive set of Information Objects.
DCC/DPC RESPONSE:	A key explaining what the ellipses represent in Figure 4-12 (page 4-24), and other related figures, should be added to Figure C-1, (page C-1), to clarify the diagrams.

ID:	DCC/DPC-55
COMMENT CATEGORY:	Updates needed for clarification
COMMENT:	Section 4.2.1.4.1 (page 4-27) paragraph beginning "As another example consider an electronic file…" – The final example about word processing document requires updating. Changes in that proprietary formats can also be open standards.
PROPOSED DISPOSITION :	Changed the last sentence of that paragraph to: "If the word processing format is proprietary, and if it can not be acquired even to the level of simply viewing the document, it may be necessary to migrate the document to a non- proprietary format to ensure its Long Term Preservation."
RATIONALE:	This is a useful addition to avoid confusion.
DCC/DPC RESPONSE:	The new sentence is difficult to understand. Suggested wording for this sentence is: "If adequate Representation Information cannot be acquired which will at the least allow simple viewing, to ensure its Long Term Preservation it may be necessary to migrate the document to another format for which Representation Information is openly available."

ID:	DCC/DPC-56
COMMENT CATEGORY:	Updates needed for clarification
COMMENT:	Section 4.2.1.4.2 (page 4-27) paragraph beginning "In addition to Content Information…" -The first sentence beginning "In addition to content information…" should be removed. It is unclear how these four categories map onto implementation and data structures. The text needs to be upfront in saying that these categories are simply for consideration to avoid people trying to shoehorn data into them. This is not a specification for data models. The word 'understanding' in the sentence beginning "In addition to Content Information…" should be expanded. Paragraph beginning "Provenance Information…" throughout the digital preservation process, changes will be made to the data object; the standard should mention the need for audit trails? Provenance is where changes should be documented and authentication stated. Examples would be useful, particularly of packaging information. The concept of packaging, wrappers etc is quite straightforward, but examples could demonstrate how; the CD-ROM example isn't helpful.
PROPOSED DISPOSITION :	In 4.2.1.4.2 add "support the trust in, the access to and context" instead of "allow the understanding" - Added "providing an audit trail for the Content Information" to definition of Provenance. - Added "These classifications provide a minimum set of PDI, and it should be recognised that this classification does not specify a data structure." at the end of this section. In 4.2.1.4.3, - Updated text to: "For example, if the Content Information and PDI are identified as being the content of specific files on a CD-ROM, then the Packaging Information may include the specification of the ISO 9660 volume/file structure on the CD-ROM because it describes the wrapper or container of the file content. On the other hand, if the Content Information and PDI are files within a TAR file, then the Packaging Information will include the specification of the TAR implementation because it describes the wrapper or container of the file content. It may also include the file name, or the file number on sequential media e.g. tape, but these are all local implementation decisions."
RATIONALE:	We believe these updates are useful improvements. However the PDI information categories are important concepts and such information should be included in all archives doing long-term preservation. The CD-ROM example is used throughout the document and is still relevant and a good use case. The related text in 4.2.1.4.3 is updated to be more concrete and a TAR

	example added for additional clarity.
DCC/DPC RESPONSE:	See response DCC/DPC-4.

ID:	DCC/DPC-60
COMMENT CATEGORY:	Identification of any outdated material
COMMENT:	Section 4.2.1.3.2 (page 4-23) paragraph beginning "Since Access software will incorporate…" – The sentence beginning "The practical use of emulation…" needs to be deleted. Such a recommendation is out of place and possibly out of date.
PROPOSED DISPOSITION :	Change end of sentence to "is an area of active research"
RATIONALE:	This is a fairer description of the state of the art.
DCC/DPC RESPONSE:	Section 4.2.1.3.2 (page 4-23) paragraph beginning "Since Access software will incorporate…", sentence beginning "The practical use of emulation…". It is felt that emulation is more than an area of active research and is being actively used by some preservation implementations. A suggested replacement for the sentence is "The practical use of emulation techniques for digital preservation has been shown to be both efficient and cost effective with certain data formats."

ID:	DCC/DPC-66
COMMENT CATEGORY:	Updates to add missing concepts or strengthen weak concepts
COMMENT:	Section 4.3.2 (page 4-50) Last bullet point – Previous definition of SIP was to create an AIP; this seems contradictory and the example is also confused. Does this refer to a situation where no new AIP is created? This section requires clarification.
PROPOSED DISPOSITION :	We have updated the SIP definition in the Glossary to: "An Information Package that is delivered by the Producer to the OAIS for use in the construction or update of one or more AIPs and/or the associated Descriptive Information". In addition, we have update the last bullet in section 4.3.2 to: "One SIP - Updated Descriptive Information Only: An investigator, or archive personnel, creates a new algorithm for detecting hurricanes in images. He runs this algorithm over all the images contained in an archive. This data is combined into either a new Associated Description or a set of Package Description updates for existing AIPs which is input as a SIP. This does not cause an update to existing AIPs because this information is associated Descriptive Information."
RATIONALE:	This comment has highlighted a deficiency in the Glossary SIP definition. However the last bullet in section 4.3.2 does provide a useful example - namely that a SIP may only be giving Descriptive Information and may not be involved in an AIP submission or update.
DCC/DPC RESPONSE:	The new definition of a SIP would read better if it were split into two separate segments: "An Information Package that is delivered by the Producer to the OAIS for use in the construction of one or more AIPs and/or the associated Descriptive Information, or for the update of one or more AIPs and/or the associated Descriptive Information".

ID:	DCC/DPC-69
COMMENT CATEGORY:	Updates needed for clarification
COMMENT:	Section 5.2 (page 5-10) -The heading "Access Service Preservation" is not clear enough and doesn't define the abstract concepts very well. Is it intended to be 'Functionality Preservation'?
PROPOSED DISPOSITION :	No changes are planned
RATIONALE:	There is a section on "Preservation of Access Software Look and Feel" which covers what is meant.
DCC/DPC RESPONSE:	The heading might be clearer if replaced with: "Preservation of Access Services".