



SKA DOCUMENT MANAGEMENT PLAN

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 Author TJ Stevenson
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Name	Designation	Affiliation	Date	Signature
Owned by:				
TJ Stevenson	System Engineer	SKA Office		
Authorised by:				
Jason Spyromilio	Head of Project	SKA Office		
Released by:				
Philip Diamond	Director-General	SKA Office		<i>Philip Diamond</i>

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Block diagrams			
Other			

ORGANISATION DETAILS

Name	SKA Organisation
Registered Address	Jodrell Bank Observatory Lower Withington Macclesfield Cheshire SK11 9DH United Kingdom Registered in England & Wales Company Number: 07881918
Website	www.skatelescope.org

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LIST OF ABBREVIATIONS

ALMA.....	Atacama Large Millimetre Array
CAD.....	Computer Aided Design
CDR.....	Critical Design Review
CM.....	Configuration Manager
DMS.....	Document/Data Management System
ICD.....	Interface Control Document
ISO.....	International Organisation for Standardisation
PAF.....	Phased Array Feed
PDF.....	Portable Document Format
PDR.....	Preliminary Design Review
WBS.....	Project Documentation Structure
MRI.....	Master Record Index
SEMP.....	System Engineering Management Plan
SKA.....	Square Kilometre Array

1 Purpose and Scope

1.1 Purpose of the document

The purpose of this document is to serve as a common standard for document numbering, formatting and handling for SKA Office documents and the deliverable documentation of the SKA project.

A secondary aim is to achieve a high level of documentation quality and as such improve the quality of the engineering process and reduce rework.

1.2 Scope of the document

This document describes the numbering and formatting standards of documentation that will be prepared during the SKA project. The handling and control of these documents are also described in more detail and guidance is provided on repositories, reviews and change management.

The SKA project will use an information technology based Document Management System (DMS). The DMS has yet to be specified and its utilisation elaborated, although these will be in broad conformity with the provisions of this Plan. This document will be updated once these steps have been taken.

2 REFERENCES

2.1 Applicable documents

The following documents are applicable to the extent stated herein. In the event of conflict between the contents of the applicable documents and this document, the applicable documents shall take precedence.

- [AD1] SKA Pre-Construction Project Office Management Plan
- [AD2] SKA Change Management Procedure, document number SKA-TEL.SE.CDM-SKO-PR-001
- [AD3] ISO 8601, Data elements and interchange formats — Information interchange — Representation of dates and times
- [AD4] ISO 32000-1:2008, Portable document format

2.2 Reference documents

The following documents are referenced in this document. In the event of conflict between the contents of the referenced documents and this document, this document shall take precedence:

- [RD1] 'PrepSKA Documentation Standards, Handling and Control', document number MGT-040.010.010-MP-001
- [RD2] SKA Work Breakdown Structure SKA.TEL.OFF.SOW-001
- [RD3] SKA Office Document, 'Document Type List', document number MGT-040.010.010-DTL-001
- [RD4] SKA Office Document 'SKA Interface Management Plan', document number SKA-TEL.SE.IFD-SKO-PR-001

3 Introduction

It is foreseen that during the development (the 'Pre-Construction Phase') of the SKA a large number of deliverable documents will be generated by various companies and institutions spread around the globe. It is therefore of primary importance that documentation standards and control processes be agreed to and be adhered to in order to ensure a coherent view and approach across the documents to be used by the SKA Office. This Plan may be used as a model for those documents not generated for delivery but used for internal purposes within the Consortia.

This document will provide guidance on:

- Templates
- Numbering
- Common formatting
- Submission
- Change management

for deliverable documents to be generated during this phase of the project.

This document also provides a description of the means to handle and control deliverable and other SKA Office documents.

It must be noted that the word 'document' refers to word processing files, spreadsheets, schedules, drawings, presentations, illustrations of any similar item that forms part of the deliverables.

This document is derived from [RD1].

4 Common elements

4.1 Templates

.

Templates, conforming to a standard for general document presentation, can be made available.

Templates will address word processing files only. For other documents such as spreadsheets, drawings, presentations and illustrations the minimum requirements to be included in the documents are addressed in paragraph 4.5.

4.2 Language

All deliverable documents shall be written in British English.

4.3 Date format

The date format to be utilised is in accordance with the ISO 8601 standard [AD3] and shall be written in order of year, month and day with hyphens separating the elements. The year will be expressed in four digits, the month in two digits and the day in two digits.

For example, 14th August 2007 shall be written as 2007-08-14

4.4 Electronic file formats

All documentation to be delivered shall as a minimum be converted to PDF files and shall be compliant to Adobe Acrobat PDF version 1.7 [AD4]. It shall be the responsibility of the author of the document to ensure accurate and readable conversion of documents to PDF format.

For drawings the PDF files will be of high enough quality to ensure clear reading and understanding of measurements and symbols.

For spreadsheets, presentations and word processing derived documents the standard is Microsoft Office 2007 or later.

4.5 Electronic file names

The electronic file name of the document shall reflect the full document number, as described in paragraph 5, of the relevant document.

Apart from the document number the electronic file name must also include a very short indication of the title/description of the document.

The utilisation of spaces and brackets in filenames is to be avoided.

4.5.1 Title/Description field

The title or description of the document to be added to the document electronic file name must be:

- As short as possible
- Separated from the rest of the name with underscores
- Preferably one continuous field without spaces. If spaces are necessary for clarity, underscores must be used.

Examples are:

- Requirement Specification for the feed: **FeedReqSpec**
- Software design document for the master controller: **Mstr_Ctrl_SW_Design**

No formal requirement and limit is placed on this field but the requirements as set out above must be taken into account when adding this field. The total length of the entire electronic filename shall not exceed 50 characters.

4.5.2 PDF files

As an example the PDF file of the Quality Assurance Plan described in paragraph 5.2.6 shall have the electronic file name of:

SKA-TEL.MGT.QA-SKO-QP-001-A_QualAssurPlan.pdf

The Microsoft Office 2007 equivalent of this document shall be:

SKA-TEL.MGT.QA-SKO-QP-001-A_QualAssurPlan.docx

4.5.3 CAD files

CAD files can remain in the original format of the CAD package being utilised but must be zipped for delivery. The drawing generated from these files shall be in PDF format and the files names shall adhere to the rules as set out above.

4.5.4 Interface Control Documents

Interface control document (ICD) file names shall adhere to the rules as set out above. For example the PDF version of the ICD utilised as an example in paragraph 5.3 shall have the electronic filename of:

SKA-TEL.MGR.TELMGT-TEL.DSH.LMC-ICD-001-A.pdf

Due to the already quite long file name no descriptive field will be added. This is only applicable to interface control documents.

4.5.5 Other

The electronic file names of other documents such as Microsoft Office files shall adhere to the rules as set out above with the exception of the type which will be either .docx, .pptx, .mdb or .xlsx.

Zipped files shall adhere to a standard compatible with generally available zip tools such as WinZIP®. No password protection will be applied.

4.5.6 Document Control Fields

Deliverable documents shall show:

- The Author of the document – the principal person responsible for editing the document into its publication form
- The Owner of the document – the person responsible for initial publication and implementing approved changes. A signature (electronic or graphic) is required.
- The Approver(s) of the document – those persons responsible for approving the publication of the document and implementing the contents. Signatures are required.
- The Releaser of the document – the person responsible for the consequences of implementing the contents of the document. A signature is required.

Owners, Approvers and Releasers of SKA Office documents are given in [AD1].

5 Document numbering

5.1 General

All SKA Office documents shall reflect the document numbering scheme as described in this document. Documents developed as part of other projects (example pathfinders) which are delivered as part of the Pre-Construction phase shall at least be supplied with a completed cover page (similar to the front page of this document) reflecting the SKA numbering scheme as described in this document. The document will be filed in the central repository under the SKA number.

All documents numbered utilising the numbering scheme as described in this document shall reflect the complete number as described in the next paragraph. In other words, all components of the number shall be present and be complete.

5.2 Format

The SKA Office documents shall be numbered using the following format:

SKA-PPP.PPP.PPP-RRR-TTT-SSS

Where:

- SKA is the project code,
- PPP.PPP.PPP is the work breakdown structure code, (WBS codes to the appropriate level)
- RRR is a code for the organisation responsible for the document (3 or 4 characters)
- TTT is the document type, (2, 3 or 4 characters)
- SSS is the sequence number (3 digits including leading zeros if necessary)

Capital letters shall be used for all components of the document number.

5.2.1 Work breakdown structure code

The Project Work Breakdown Structure (WBS) is a hierarchical tree structure based on the subdivision of the development work of the SKA into its components. The WBS consists of a number of levels with each of the sets of WBS codes representing a specific level within the structure. Detail on the WBS and the relevant codes are provided in [RD2].

The WBS codes as reflected in the document number format must always be provided as a full set of codes separated by periods.

5.2.2 Organisation Code

Organisations using this Plan may propose their own Organisation Codes, and if approved by the SKA Office, these will be entered into a central registry held by the SKA Office.

The SKA Office codes used so far are:

SKO
SKAO

5.2.3 Sequence number

The sequence number is a sequential number assigned to documents within the WBS. The main aim is to distinguish documents of the same type within the same level of the WBS. For example, there may be several Management Reports being generated at Project Management level, each report dealing with a different subject. However, the WBS code and document type of the documents may be the same and therefore the sequence number will differentiate between these documents.

The sequence number consists of three digits and will start at 001.

Every document number will contain a sequence number even though there may not be similar documents within the same WBS level.

5.2.4 Document type

The document type field provides an indication of the group of documents to which the particular documents belong to. For example, all Requirement Specifications will reflect RS as the document type.

The document type may vary between two and four alphabetical characters. A complete list of document types is presented in [RD3].

5.2.5 Revision number

The revision number of the document shall provide an indication of the status of the document. Therefore all draft documents shall be numbered alphabetically starting with A then B then C etc.

As soon as a document has been approved the revision shall be raised to a numerical number starting with 1.

Any updates to an already approved document shall be indicated by the addition of an alphabetical number following the approved revision number. For example, 1A will indicate a first update of revision 1 but will also indicate that that the update has not been approved yet. As soon as the update has been approved the revision of the document will be raised to 2.

5.2.6 Example

For illustration purposes consider the structure as presented in Table 1. According to this scheme, the first draft of the SKA Quality Assurance Plan would be numbered:

SKA-TEL.MGT.QA-SKO-QP-001-A

SKA-TEL.MGT - SKA Telescope Project Management	SKA-TEL.MGT.APP - Project Management Approach
	SKA-TEL.MGT.S1A - Stage Agreements
	SKA-TEL.MGT.STP – Strategy to Proceed
	SKA-TEL.MGT.S2P - Stage Preparation
	SKA-TEL.MGT.EMT - Enterprise Management and Tools
	SKA-TEL.MGT.MTG - Meetings
	SKA-TEL.MGT.TPS - Technical/Peer Reviews
	SKA-TEL.MGT.SCH - Project Scheduling
	SKA-TEL.MGT.RES - Resource Planning and Management
	SKA-TEL.MGT.CCM - Configuration/Change Management
	SKA-TEL.MGT.RMT - Risk Management
	SKA-TEL.MGT.DMT - Documentation Management
	SKA-TEL.MGT.QA - Quality Assurance
	SKA-TEL.MGT.GAP - Gap analysis
	SKA-TEL.MGT.CST - Costing
	SKA-TEL.MGT.COMM – Communications
	SKA-TEL.MGT.PPIA - Precursor and Pathfinder Interaction and Analysis
	SKA-TEL.MGT.DGS - Domain Groups
	SKA-TEL.MGT.ITT - Integrated Task Teams
	SKA-TEL.MGT.SDRA - Site Documentation Review and Analysis
	SKA-TEL.MGT.AUD - Site Audit
SKA-TEL.MGT.SMP - Site Management Plan	
SKA-TEL.MGT.INDL - Industry liaison	
SKA-TEL.MGT.TVL - Travel	

Table 1 : Example of WBS (general document numbering).
Note that this WBS is not that which is adopted by the SKA Office.

5.3 Interface control documents

All interface documents shall be numbered and may include word processed documents, drawings, tables, lists etc.

Because ICDs will refer to two entities within the WBS all ICD document numbers shall refer to both entities and shall be numbered as follows:

SKA-PPP.PPP.PPP-QQQ.QQQ.QQQ-ICD-SSS-RR

Where:

- SKA is the project code,
- PPP.PPP.PPP is the WBS code of the interface engineering work of the leading entity ('owner') involved in the interface,
- QQQ.QQQ.QQQ is the WBS code of the interface engineering work of the following entity involved in the interface with redundant codes omitted (generally 'TEL'),
- ICD is the document type (ICD),
- SSS is the sequence number, and
- RR is the revision number

For the definition of 'Leading' and 'Following' in the context of interfaces, please refer to [RD4].

Capital letters shall be used for all components of the document number.

The definition of the fields within the number is the same as described in paragraph 5.2.

For illustration purposes consider the structure as presented in Table 2. According to this scheme, the first draft of the ICD between the Dish Local Monitoring and Control and the Telescope Manager would be numbered:

SKA-TEL.MGR.TELMGT-TEL.DSH.LMC-ICD-001-A

SKA.TEL.DSH – Dishes	
	SKA.TEL.DSH.MGT - Dishes Project Management
	SKA.TEL.DSH.SE – Dishes System Engineering
	SKA.TEL.DSH.INFRA – Dishes Infrastructure Requirements
	SKA.TEL.DSH.PWR – Dishes Power Requirements
	SKA.TEL.DSH.OPTIC – Optical Design
	SKA.TEL.DSH.STRUC – Structure
	SKA.TEL.DSH.FEED – Feeds and LNAs
	SKA.TEL.DSH.RCVR – Receivers
	SKA.TEL.DSH.LMC – Local Monitor and Control
	SKA.TEL.DSH.LINFRA – Local Infrastructure
SKA.TEL.MGR - Telescope Manager	
	SKA.TEL.MGR.MGT - Telescope Manager Project Management
	SKA.TEL.MGR.SE – Telescope Manager System Engineering
	SKA.TEL.MGR.INFRA – MGR Infrastructure Requirements
	SKA.TEL.MGR.PWR – MGR Power Requirements
	SKA.TEL.MGR.TELMGT - Telescope management
	SKA.TEL.MGR.OBSMGT - Observation management
	SKA.TEL.MGR.CSF - Common Software Framework

Table 2 : Example WBS (ICD numbering).

Note that this WBS is not that which is adopted by the SKA Office.

In general it will be recommended that the leading party of the ICD is reflected in the first part of the number. In the example above this will imply that the leading party of the ICD is the Telescope Manager. For more on leading parties of ICDs refer to [RD3].

5.4 Minimum requirements for drawings

Each drawing shall contain a title block and shall at least include the following information:

- Units of measure
- Drawing number
- Drawing title
- Revision
- Scale
- Number of sheets

- Names, dates and signatures of drawing creator, checker and approval party.

6 Submission, handling and control of documents

6.1 Central repository

This section will describe the SKA Office Document Management System (DMS) once it has been specified. The term repository is interchangeable with DMS in this document.

A central repository for all SKA documents shall be developed, maintained and operated by the SKA Office. The repository shall make provision for both paper and electronic formats of documentation.

At this stage no tools have been identified for the handling and storage of documents and it will therefore be a manual process until further notice.

6.1.1 Documents to be submitted

All deliverable documents shall be submitted to the SKA Office Configuration Manager .

Other documents not specifically developed for SKA may also be submitted to the central repository.

6.2 Document handling and control

6.2.1 Document number request

The document submission process is initiated with a document number request to the central SKA Office Configuration Management. This should be done via e-mail to the Configuration Manager (CM) within the SKA Office. The information to be provided as part of the request must include at least:

- Project code – for this context, this is always SKA. Other contexts are not excluded
- Document title
- Document type
- Proposed WBS code

The CM will ensure that the correct sequence number and the correct document type code are allocated and will reply by e-mail to the requestor with the complete document number to be utilised for the specific document.

The CM will add the allocated number to the central Master Record Index (MRI – a function of the repository/DMS) and publish the MRI within the SKA Office.

Any request for a change to or a cancellation of document number must be forwarded to the CM who will provide an updated number or cancel the previous request. These changes will be reflected on the MRI.

6.2.2 Document submission

Once generated the document shall be submitted to the central SKA Office DMS. The electronic file naming, formatting and numbering as set out in paragraphs 4 and 5 shall be adhered to at each submission.

It is encouraged that documents be submitted as regularly as possible to enable an effective history trail of the document to be created and maintained. Such submissions shall be made subject to increments in document versions.

Documents shall, as a minimum, be submitted to the repository upon release for review events.

Once submitted to the repository and approved for release, the relevant revision of the document shall be viewed as a baseline. This will imply that for subsequent publications of the document the revision of the document will have to be updated. For example, in the event that Revision D of a particular document has been submitted to the repository the next revision of the document will be E. Note that the document will also not be raised to revision E before revision D has not been submitted to the repository.

Submission of electronic documents to the repository shall be by e-mail or ftp (for large documents). As soon as the document has been received by the CM a confirmation of receipt will be sent to the person that submitted the document. Depending on the nature of the document, the document will be entered into the database and will be made visible within the DMS.

Confidential documents will not be made visible within the DMS, please refer to paragraph 6.2.4 for a more detailed description of the handling of confidential documents.

It is recognised that certain documents may be available in paper format only. These documents must be submitted to the repository either by hand or postal delivery. Upon receipt of the paper copy of the document the document shall be scanned to a PDF format by the CM. The paper copy shall be filed in the repository and except for confidential documents, the scanned PDF versions of the paper documents shall be made available online.

Such documents will be subjected to Optical Character Recognition processing if of sufficient quality, so that full text searching and indexing is possible.

6.2.3 Document approvals

Documents to be approved by the SKA Office (or other parties) will be identified and be agreed to as early as possible within each of the work packages.

In general the approval of documents will be performed at the conclusion of formal design reviews such as the Preliminary Design Review (PDR) or Critical Design Review (CDR).

Approvals outside these events will be allowed and it will be the responsibility of the person or institution that generated the document to manage the approval process.

6.2.4 Confidential documents

Confidential documents shall be filed in a separate section within the central repository. Access to these documents will be limited and will be controlled by the CM. Electronic scanned copies of the documents will be made for backup purposes only.

Confidential documents must be clearly identified as such, in writing, upon delivery to ensure that handling of the document will be in accordance with procedures.

Copies of confidential documents will only be allowed once written (letter or e-mail) has been obtained from the document owner. A register detailing the number of copies and recipients of the copies shall be maintained by the SKA Office CM.

Due to the complexity in Confidential Document handling the classification must be well justified and motivated which will be filed with the document. In addition a proposed distribution list will be submitted to ensure correct handling and distribution of the document from the SKA Office CM.

6.2.5 Change requests and control

Change requests are only applicable to formally signed and approved documents such as specifications and interface control documents.

In the event that a document under change control needs to be updated or changed outside formal design reviews a change request will have to be raised by the person or institution requesting the change.

The change management process is described in detail in the SKA Change Management Procedure [AD1].

A template for change requests is included in the RfP DRD.

6.2.6 Document review process and procedures

The documentation review process and procedure are described in the RfP Statement of Work.

6.2.7 Master record index

A Master Record Index (MRI) shall be compiled and be maintained by the SKA Office CM. The information contained within the MRI shall include:

- a. Document Number
- b. Document Title
- c. Short document Description
- d. Document Revision
- e. Author
- f. Document Date
- g. Document under change control (Yes/No)
- h. Status:
 - i. Number allocated
 - ii. Revision (draft, approved, released)
 - iii. Approval
- i. Physical Location of Master document (if applicable)
- j. Distribution list (if applicable)

As indicated the MRI shall be available and shall serve as the main reference for documentation available on the project.