



SOFTWARE AND COMPUTING

CONCEPT DESIGN REVIEW PLAN

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 Revision 1
 Author..... D. Hall
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Name	Designation	Affiliation	Date
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Approved for release as part of SKA Software and Computing CoDR:			
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DOCUMENT HISTORY

Revision	Date Of Issue	Engineering Change Number	Comments
A	2011-08-01	-	Initial draft document for comment
B	2011-08-30	-	Updated following feedback
C	2011-10-12	-	Minor amendments actioned by D. Hall
D	2011-10-26	-	Updated following 2011-10-12~14 CoDR preparatory meeting
E	2011-10-28	-	Minor text updates.
F	2011-11-10	-	Updated dates for review in section 2.3 and section 7.
G	2012-01-24	-	Updated dates, agenda, document lists, other minor amendments
H	2012-01-25	-	Corrections to title page
I	2012-01-27	-	Agenda item 2.7 presenters updated, references updated, Web links to documents provided

DOCUMENT SOFTWARE

	Package	Version	Filename
Word Processor	Microsoft Word	Word 2007	D1_WP2-050.020.010-PLA-001-I_CoDR_Plan

ORGANISATION DETAILS

Name	SKA Program Development Office
Physical Address	Jodrell Bank Centre for Astrophysics Alan Turing Building The University of Manchester Oxford Road Manchester, UK M13 9PL
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LIST OF ABBREVIATIONS

CoDR	Concept Design Review
PrepSKA	Preparatory phase of the SKA
SKA.....	Square Kilometre Array
SPDO	SKA Program Development Office
TBA.....	To Be Advised
WP2	PrepSKA Work Package 2

1 References

1.1 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.

[1] WP2-005.010.030-MP-001: System Engineering Management Plan

2 Introduction

2.1 Purpose of this document

This document describes the plan for the Software and Computing Concept Design Review (CoDR) for the Square Kilometre Array (SKA) project.

2.2 Scope of this document

This document describes matters related to the review itself, logistics of the review, and it includes a preliminary agenda for the review.

2.3 Date and Place of CoDR

The Software and Computing CoDR will be held on **15 and 16 February 2012** at the University of Manchester, Manchester, UK.

3 Purpose and Expected Outcome of the Software and Computing CoDR

The Software and Computing CoDR reviews work conducted during the PrepSKA concept phase. The concept phase and the design review requirements are described in more detail in [1].

The concept phase of the project was intended to conduct investigations into:

- SKA-related data processing software and hardware technologies currently being used
- Development trends for SKA-related data processing and underlying hardware technologies
- Technology options for SKA-related data processing and underlying hardware technologies
- Data processing software development work already done and being done by Precursors projects, Pathfinder projects, and Design Studies
- Results obtained from this work
- Scalability of data processing software development work done and hardware technologies towards levels required for the SKA
- Preliminary investigations into requirements for SKA data processing software and computing

- Preliminary definition of interfaces internal and external to SKA data processing software and computing
- Preliminary analyses of risks related to SKA data processing software and computing

3.1 CoDR Purpose

The CoDR will be conducted to evaluate:

- Progress in the software and computing domain
- Whether the software and computing work done within the concept phase is at a level sufficiently mature to allow transition into the next phase for software and computing – that is, the element definition phase
- Whether the key aspects of software and computing have been covered – and if gaps exist, whether adequate measures have been identified to address the gaps

The CoDR Panel is requested to consider the following questions, primarily focused on the context of SKA Phase1; and with consideration of extensibility to SKA Phase 2:

	Question
1.	Are the requirements for software and computing sufficiently defined for this stage of the project?
2.	Considering the stage of the project, have all the necessary aspects of software and computing requirements been considered and addressed during the review; or are there gaps or shortcomings?
3.	Considering the stage of the project, is the information presented in support of the evaluation of each concept option credible?
4.	Are there concept options for software and computing that have not been considered, but should be?
5.	Are the concept options proposed to be carried forward credible – e.g. scalable to SKA Phase 1 and then SKA Phase 2?
6.	Considering the stage of the project, have interfaces to other elements of the system been adequately identified and defined?
7.	Does the risk profile appear reasonably detailed – and assessed – for this stage of the project?
8.	Considering the stage of the project, do the proposed risk management plans appear reasonable and executable?
9.	Is the strategy to proceed to subsequent phases of the project credible, e.g.: <ul style="list-style-type: none"> • Identified tasks • Estimated effort and costs • Resources required • Estimated schedule • Risk management proposals

3.2 CoDR Expected Outcome

The expected outcome of the CoDR is conclusion of the PrepSKA concept design phase leading to establishment of a set of baselined concepts for the software and computing domain.

A successful CoDR will then result in initiation of the software and computing “element definition” phase.

4 Organisation of CoDR Meeting

4.1 Participants

The following groups of participants have been identified:

- Review Panel: The members of the review panel external to the PrepSKA project, plus the SKA International Project Engineer (Peter Dewdney)
- Presenters: Representatives from SKA participating institutions and the SPDO
- Observers: Other attendees, see below

The Review Panel is:

Name	Affiliation	E-mail
Brian Glendenning (Chair)	NRAO and ALMA	bglenden@nrao.edu
Peter Dewdney	SDPO	dewdney@skatelescope.org
Jeffrey Kantor	LSST	jkantor@lsst.org
Tom Liebsch	IBM	liebsch@us.ibm.com
Alberto Di Meglio	CERN	Alberto.Di.Meglio@cern.ch

As Presenters, the following people have been identified:

Name	E-mail
BS: Ben Stappers, UMAN	Ben.Stappers@manchester.ac.uk
CB: Chris Broekema, ASTRON	broekema@astron.nl
DH: Duncan Hall, SPDO	dhall@skatelescope.org
KC: Kobus Cloete, SPDO	cloete@skatelescope.org
MvH: Michiel van Haarlem, SPDO	haarlem@skatelescope.org
PA: Paul Alexander, UCAM	pa@mrao.cam.ac.uk
RS: Rob Simmonds, UCAL	simmonds@cpsc.ucalgary.ca
TC: Tim Cornwell, CSIRO	Tim.Cornwell@csiro.au
TS: Tim Stevenson, SPDO	stevenson@skatelescope.org

As Observers, the following people will be invited:

- Liaison engineers
- WP2 Management Team members
- Members of the SSEC
- Members of the International Engineering Advisory Committee (IEAC)
- SPDO staff members
- Staff members from relevant organisations participating – or potentially participating – in Pre-construction software and computing work

4.2 Review Process

The Review Panel is expected to review the documentation provided prior to the CoDR dates.

Any questions, comments or queries sent to the SPDO Software and Computing Domain Specialist in advance of the CoDR either will be recorded and responded to prior to the review, or will be recorded and be dealt with during the review.

Questions, comments or queries posed during the review will be recorded and will be attempted to be addressed during the review.

In the event that any question, comment or query cannot be dealt with during the review, it will be recorded as such. The SPDO Software and Computing Domain Specialist will arrange to have any outstanding issues addressed and responded to as soon as possible after the review.

4.3 Roles and Responsibilities

The SPDO Project Manager shall arrange for:

- Approval of nominees for the Review Panel
- Issuing invitations to nominees for the Review Panel
- Organisation and support of the review meeting, including required meeting facilities
- Response to agreed actions prior to the agreed dates due

The SPDO Software and Computing Domain Specialist shall arrange for:

- Distribution of all CoDR documentation to the Review Panel prior to 1 February 2012
- Recording of all questions, comments and queries raised before and during the review
- Response to questions, comments and queries before, during and after the review
- Recording of all responses to questions, comments and queries
- Compilation of a summary report to the PrepSKA Board and SSEC after the review.

The Review Panel Chair shall:

- Organise and lead the Review Panel
- Review the CoDR documentation
- Raise questions, comments and queries before and during the review
- Prepare and issue the written Review Panel Report, together with a list of actions agreed

The External Review Panel Members shall:

- Review the CoDR documentation
- Raise questions, comments and queries before and during the review
- Support the Review Panel Chair in the preparation of the Review Panel Report

Observers are invited to:

- Attend and observe the review
- Provide written feedback with regards to any aspect (including the documentation) of the CoDR after the review

5 Schedule Leading Up To and Following the CoDR

Time Period	Activities
Prior to 2012 January 27	Final versions of all documents to be available
2012 February 1	CoDR documents to be made available to Review Panel members
2012 February 1 - 14	Review Panel members read documents Review Panel members ask questions by email Review Panel members receive answers by email
2012 February 14	Review Panel members arrive in Manchester
2012 February 15 - 16	Conduct CoDR
2012 February 16	Review Panel provides initial verbal feedback
2012 February 17 – March 2	SPDO follows up initial action items from CoDR SPDO provides feedback on initial action items to Review Panel
2012 March 16	Review Panel provides final report on outcome of CoDR
2012 March 30	<p>SPDO will follow up all action items in CoDR final report.</p> <p>SPDO will provide written feedback to:</p> <ul style="list-style-type: none"> • CoDR Review Panel • WP2 Management Team • SSEC <p>The SPDO will also prepare and submit a report to the EC in fulfilment of PrepSKA contract delivery.</p>

6 CoDR Documents

The Software and Computing CoDR document set is split into three categories:

- CoDR documents to be reviewed by the Review Panel
- Support documents that have been generated for the SKA project, or for Pathfinders, Precursors or Design Studies. These documents support the CoDR documents, however the Review Panel is not required to review them.
- Other documents referenced in the CoDR documents under review. The Review Panel is not required to review these reference documents. They are provided for convenient access should Panel members seek to follow up on references in the CoDR documents under review.

6.1 CoDR Documents for Review

The Software and Computing CoDR documents to be reviewed by the Review Panel are:

Number	CoDR Documents For Review	
D1	WP2-050.020.010-PLA-001	SKA Software and Computing Concept Design Review Plan (this document)
D1A	WP2-050.020.010-PLA-002	Context of the Software and Computing CoDR
D2	WP2-050.020.010-SRS-001	Requirements Specification
D2A	WP2-050.020.010-RR-001	Analysis of requirements derived from the Design Reference Mission
D3	WP2-050.020.010-DD-001	Software and Computing System Overview
D3A	WP2-050.020.010-SR-001	Visibility Processing
D3B	WP2-050.020.010-SR-002	Processing for Pulsars and Transients
D3C	WP2-050.020.010-SR-003	The CyberSKA platform for data intensive radio astronomy
D3D	WP2-050.020.010-SR-004	HPC Technology Roadmap
D4	WP2-050.020.010-RE-001	Software and Computing Risk Register
D5	WP2-050.020.010-MP-001	Software Engineering
D6	WP2-050.020.010-MP-002	Strategy to Proceed

CoDR documents for Panel review are available at:

http://www.skatelescope.org/public/2012-02-15_Software_and_Computing_CoDR/Documents_for_Panel_Review/

6.2 Documents that Support the CoDR Documents

The following documents support the above Software and Computing CoDR documents.

They have been generated for the SKA project, or for Pathfinders, Precursors or Design Studies.

The Review Panel is not required to review these documents.

Number	Support Documents	
S01	125_Memo_Garrett	SKA Memo 125: A Concept Design for SKA Phase 1 (SKA ₁)
S02	130_Memo_Dewdney	SKA Memo 130: SKA Phase 1: Preliminary System Description
S03	132_Memo_Humphreys	SKA Memo 132: Analysis of Convolutional Resampling Algorithm Performance
S04	134_Memo_Newman	SKA Memo 134: Cloud Computing and the Square Kilometre Array
S05	SCI-020.010.020-DRM-002	Design Reference Mission: SKA Phase 1 (Revision 2.0)
S06	WP2-005.010.030-MP-001	System Engineering Management Plan (Revision F)
S07	WP2-005.030.000-SRS-002	SKA Phase 1 System Requirements Specification (Revision B)
S08	WP2-001.010.010-PLA-002	SKA Operational Concepts (Revision A)
S09	WP2-005.010.030-TR-001	Strategies and Philosophies (Revision F)
S10	WP2-005.030.010-TD-002	SKA1: High Level System Description (Revision A)
S11	ska-mandc-codr-panel-report-20111208-final	SKA Monitoring and Control Concept Design Review; Report of the Review Panel; Pune, India, Nov 8-10, 2011
S12	MGT-001.005.005-MP-001	Project Execution Plan - Pre-Construction Phase (Revision K)
S13	MGT-040.040.000-MP-001	Risk Management Plan (Revision 1)
S14	MGT-090.010.010-RE-003	Risk Register (Revision C)
S15	WP2-040.030.010-TD-001	High-Level SKA Signal Processing Description
S16	WP2-050.060.000-DD-004	2010-08-27 SKA1 Computational Costs Workshop Notes
S17	CyberSKA_HighLevelArchitecture	CyberSKA High Level Architecture
S18	DataManagementArchitecture	CyberSKA Data Management
S19	CyberSKA_DataProcessingArchitecture	CyberSKA Data Processing
S20	CyberSKA_Paper	CyberSKA: An On-line Collaborative Portal for Data-intensive Radio Astronomy
S21	CyberSKA_Presentation	CyberSKA: A Collaborative Portal for Data Intensive Radio Astronomy
S22	ASKAP-SW-0020	ASKAP Science Processing

Documents that support the CoDR documents are available at:

http://www.skatelescope.org/public/2012-02-15_Software_and_Computing_CoDR/Support_Documents/

6.3 Reference Documents

The following are other documents that are referenced in the CoDR documents under review.

The Review Panel is not required to review these documents.

Number	Reference Documents	
Z01	IESP-roadmap	International Journal of High Performance Computer Applications (2011): Volume 25, Number 1: The International Exascale Software Project Roadmap
Z02	TR-2008-13	ExaScale Computing Study: Technology Challenges in Achieving Exascale Systems
Z03	HBS_one	Astronomy & Astrophysics Supplement Series (1996) 117: 137-147: Understanding radio polarimetry. I. Mathematical foundations.
Z04	aa15013-10	Astronomy & Astrophysics (2010) 524 A61: The MeqTrees software system and its use for third-generation calibration of radio interferometers
Z05	2009ASPC__407__384P	The Low-Frequency Radio Universe, ASP Conference Series (2009) 407: 384-388: Calibrating LOFAR using the Black Board Selfcal System
Z06	2005ASPC__347__96B	Astronomical Data Analysis Software And Systems XIV, ASP Conference Series (2005) 347: 96-99: Mosaicing with Interferometers: An Efficient Algorithm for Imaging and Image Plane Corrections
Z07	20090800_CALIM	Proceedings of the IEEE (2009) Volume 97 Number 8: 1472-1481: Advances in Calibration and Imaging Techniques in Radio Interferometry
Z08	1992A+A__261__353C	Astronomy & Astrophysics (1992) 261: 353-364: Radio-interferometric imaging of very large fields: The problem of non-coplanar arrays
Z09	20080725_The_W-projection_algorithm	IEEE Journal of Selected Topics in Signal Processing (2008) Volume 2 Number 5: 647-657: The non-coplanar baselines effect in radio interferometry: The W-projection algorithm
Z10	1106.2745	A multi-scale multi-frequency deconvolution algorithm for synthesis imaging in radio interferometry
Z11	1102.5123	Scientific Visualization in Astronomy: Towards the Petascale Astronomy Era
Z12	Best_Practices_for_Cost_Estimating	GAO 09 3SP, March 2009: US Government Accounting Office Document, 'GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs'
Z13	CMU-SEI-2006-TN-039_Kendall_et_alia_HPC_Risks_Taxonomy	CMU-SEI-2006-TN-039: A proposed Taxonomy for Software Development Risks for High-Performance Computing (HPC) Scientific/Engineering Applications
Z14	20091120_sc09-exa-panel-kogge	Energy at Exaflops
Z15	EESI_Update-HPC_Initiatives_EPSRC_D2_2_R1.0	European Exascale Software Initiative - Deliverable D2.2 Update of Investigation Report on Existing HPC Initiatives

Number	Reference Documents	
Z16	Kogge_Dysart_Using_the_TO P500_to_Trace_and_Project _Trends	Proceedings of 2011 International Conference for High Performance Computing, Networking, Storage and Analysis, November 2011: 12-18: Using the TOP500 to Trace and Project Technology and Architecture Trends

Reference documents for the CoDR are available at:

<http://www.skatelescope.org/public/2012-02->

[15_Software_and_Computing_CoDR/Z_Reference_Documents/](http://www.skatelescope.org/public/2012-02-15_Software_and_Computing_CoDR/Z_Reference_Documents/)

7 Proposed CoDR Meeting Agenda

Session	Description	Presenter	Times (UT)	Duration (m)
1.0	DAY 1 - Wednesday 15 February 2012	University of Manchester, UK		
	Coffee/Tea		08:30 – 09:00	30
1.1	Review Panel closed meeting	Panel	09:00 – 09:30	30
1.2	Welcome and general overview of the SKA	MvH / KC	09:30 – 10:00	30
1.3	Purpose and context of the CoDR	TS	10:00 – 10:15	15
	Coffee/Tea		10:15 – 10:30	15
1.4	Flow of data from receptors to archive; orders of magnitude for data rates and volumes	PA	10:30 – 11:00	30
1.5	Requirements: derivation and analysis	PA	11:00 – 12:00	60
	Lunch All participants are invited		12:00 – 13:00	60
1.6	System overview and draft high level architecture	TC	13:00 – 14:30	90
1.7	Example of an access portal for science users to the science data: CyberSKA	RS	14:30 – 15:00	30
	Coffee/Tea		15:00 – 15:15	15
1.8	Review Panel closed meeting	Panel	15:15	TBA
	Dinner (Novotel)		18:30	
2.0	DAY 2 - Thursday - 16 February 2012	University of Manchester, UK		
	Coffee/Tea		08:30 – 09:00	30
2.1	Visibility processing	TC	09:00 – 10:00	60
2.2	Processing for pulsars and transients	BS	10:00 – 10:30	30
	Coffee/Tea		10:30 – 11:00	30
2.3	HPC roadmap	CB	11:00 – 11:30	30
2.4	Software engineering including relation to SEMP	TC	11:30 – 12:00	30
	Lunch All participants are invited		12:00 – 13:00	60
2.5	Risks and management of risks, including relationship with monitoring and control	DH / TC	13:00 – 13:30	30
2.6	Strategy to Proceed	PA	13:30 – 14:00	30
	Coffee/Tea		14:00 – 14:15	15
2.7	Summary, questions and dialogue		14:15 – 15:15	60
2.8	Review Panel closed meeting	Panel	15:15 – 16:30	75
2.9	Review Panel summary, initial feedback and closing of review	Panel Chair	16:30 – 17:00	30

8 CoDR Meeting Logistics

8.1 Location

The SPDO office is located at:

Jodrell Bank Centre for Astrophysics
Room 3.136
Third Floor, Alan Turing Building
Building 46 on the map in Section 9
University of Manchester
Manchester
M13 9PL
UK

The meeting room for the review is:

Lovell Seminar Room
Room 3.225
Third Floor, Alan Turing Building
Building 46 on the map in Section 9

8.2 Contact Details

For support please contact any of the following SPDO representatives:

Name Kobus Cloete (SPDO Project Manager)
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Phone +44 (0)161 275 4081

Name Duncan Hall (Software and Computing Domain Specialist)
Email dhall@skatelescope.org
Phone +44 (0)161 275 4140

Name Greta Collins (Office Manager)
Email collins@skatelescope.org
Phone +44 (0)161 306 6464

9 Campus Map and Walking from/to the Novotel Hotel

A map of the University of Manchester campus is presented on next page.

The Alan Turing Building is identified as number 46, approximately in the middle of this map.

For more maps of the campus please refer to:

<http://www.manchester.ac.uk/aboutus/travel/maps/>

A map of the ~15 minute walk (in red) between the Novotel Hotel and Alan Turing Building via Oxford Road is presented on the Google map (with north oriented upwards) on the page following the campus map. The alternative Google Maps walk (in blue) via Upper Brook Street requires walking around a traffic island.



