



SKA STAGE I: PROJECT EXECUTION PLAN, WORK BREAKDOWN STRUCTURE, & REQUEST FOR PROPOSALS

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TALK OUTLINE

- Available SKA Documentation
- The SKA Project Execution Plan
- SKA Working Packages: WBS & SoW
- Request for Proposals

AVAILABLE SKA DOCUMENTATION

- CoDR Documentation
- SKA Publications
 - SKA Design Reference Mission
 - SKA Project Execution Plan: the PEP
- SKA Stage I Work Breakdown Structure (WBS) & Statements of Work (SoW)
- SKA EoI Results
- SKA Industry Engagement Strategy

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Most important documents for you!

SKA PROJECT EXECUTION PLAN

Created as a result of CoDR work

The PEP Provides:

- High-level overview of WPs, and guidance on technology readiness, downselection.
- High-level SKA development timeline.
- Medium-grained cost estimation for SKA Preconstruction.
- Coarse-grained cost estimation for SKA I construction.

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SKA PROJECT EXECUTION PLAN

Table 2 : Rolled up resource plan for the 2012-2015

	2012		2013		2014		2015		Total		TOTAL Cost €	
	py	Material €	py	Material €	py	Material €	py	Material €	py	Personnel €		Material €
Rolled up Total	116	5,650,000	156	5,890,000	184	6,310,000	182	9,390,000	637	62,860,000	27,240,000	90,900,000
1 SPO Management, Admin, Outreach and Office Costs	11	2,050,000	22	2,710,000	26	1,770,000	27	1,670,000	86	8,600,000	8,200,000	16,800,000
2 Science	2	-	2	-	4	-	5	-	13	1,300,000	-	1,300,000
3 System	4	-	5	-	7	-	7	-	23	2,300,000	-	2,300,000
4 Maintenance & Support	0	-	1	-	1	-	1	-	3	300,000	-	300,000
5 Dish Array	18.5	2,275,000	22.7	1,475,000	20.7	2,375,000	17.2	1,225,000	79.1	8,010,000	7,350,000	15,260,000
6 Aperture Array	40.25	1,100,000	40.25	155,000	37.5	365,000	37.5	5,535,000	155.5	15,550,000	7,155,000	22,705,000
7 Signal Transport and Networks	6	-	8	-	10	-	10	310,000	34	3,400,000	310,000	3,710,000
8 Central Signal Processing	13	-	27	200,000	37	300,000	35	200,000	112	11,200,000	700,000	11,900,000
9 Software & Computing	16	225,000	18	1,350,000	22	1,500,000	22	450,000	78	7,800,000	3,525,000	11,325,000
10 Power	2	-	4	-	11	-	11	-	28	2,800,000	-	2,800,000
11 Site Engineering and Site Office	2	-	6	-	8	-	9	-	25	2,500,000	-	2,500,000

construction.

SKA WORKING PACKAGES

- Science
- Management
- System Engineering & Requirements
- Dish Arrays
- Aperture Arrays
- Signal & Data Transport
- Sync & Timing
- Central Signal Processor
- Science Data Processor
- Telescope Manager
- Power
- Site & Infrastructure

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*Led by the
SKA office*

SKA WORKING PACKAGES

*Worked in
their definition*

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SKA WORKING PACKAGES

PEP has slightly different definition of WPs

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BREAKING DOWN THE WORK, AND STATING IT: WBS & SOW

WBS & SoW

The tasks to be performed during Stage I (bringing CoDR designs into Preliminary Designs) need to be broken down into specific steps:

- Work Breakdown Structure (WBS) brings the granularity, and interactions; it might evolve in different phases.
- Statements of Work (SoW) define, for each WBS element, the actual work to be done; it must change in every phase.

WBS & SOW



The tasks to designs into into specific

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PRE-CONSTRUCTION PHASE, STAGE 1 WORK BREAKDOWN STRUCTURE AND STATEMENT OF WORK

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ELEMENTS OF WBS & SOW

- Structure of a WBS element:
 - Identification
 - Description
 - Inputs
 - Tasks (Statement of Work)
 - Outputs/Deliverables

ELEMENTS OF WBS & SOW

6.6.7 SKA.TEL.DSH.STRUC – Structure

WBS element identification	<p>4 SKA.TEL.DSH.STRUC – Structure</p> <p>5 SKA.TEL.DSH.STRUC.PED – Pedestal (Tower)</p> <p>5 SKA.TEL.DSH.STRUC.MNT – Mount/Positioner</p> <p>5 SKA.TEL.DSH.STRUC.REFL – Backing Structure and Reflector(s)</p> <p>5 SKA.TEL.DSH.STRUC. FDSP – Feed Support Structure</p> <p>6 SKA.TEL.DSH.STRUC. FDSP.INX – Feed Indexer</p> <p>6 SKA.TEL.DSH.STRUC. FDSP PDM – PAF Deployment Mechanism</p> <p>6 SKA.TEL.DSH.STRUC. FDSP.ROT – PAF Rotator (if present)</p>
WBS element description	<p>This WBS element provides for the development and analysis of the requirements and models for the structural components needed to support the optical components and all the other physical components of the dish contained above (but not including) the foundation.</p>
Inputs	
<ul style="list-style-type: none"> • Requirements from next level up. • Dish optics options. • Technology road map. • Applicable documents from the CoDR. • CoDR Review Panel reports and relevant replies to the reports. • CoDR Concept descriptions, as applicable. • Risk Register from the CoDR. • Costs document from the CoDR. • Major assumptions: <ul style="list-style-type: none"> ○ See Inputs for SKA.TEL.DSH. 	

ELEMENTS OF WBS & SOW

Tasks

- Analyse requirements allocated from the next level up (SKA.TEL.DSH.SE-SRR.REN - Requirements Engineering).
- Develop a Verification Plan (SKA.TEL.DSH.SE-SRR.VPL - Verification Planning).
- Develop an Architectural Design (SKA.TEL.DSH.SE-SRR.ARC - Architecture).
- Develop a set of Implementation Options. Each option will require a model (see below). The options to be considered are as follows:
 - Options: Structural options for supporting the reflectors and feed systems, depending on the optical design.
 - Principal options to be considered for symmetrical optics: Alt-Az mount, three-axis mount, equatorial mount; for offset designs: Alt-Az mount.
 - Other options as necessary for completeness.
- Models and Trade Studies. (SKA.TEL.DSH.SE-SRR.MOD - Modelling)
 - For each option, develop parameterised performance models. Analyse the options and models to provide support for a trade study at the Dish Array Level. (SKA.TEL.DSH.SE-SRR.MOD - Modelling).
 - Optics, dish structure, and environmental influences are coupled: support the development of a model of how the beam changes with changes in the structure of the dish and the local environment. Changes with time are most important.
 - Structure changes considered should encompass all sources of variation: environmentally induced (wind, solar), production variation, materials aging, wear and tear, and other sources.
 - Time scales of changes should be documented, especially those that occur on seconds to 10s of minutes.
 - For each option, develop parameterised cost models. Analyse the options and models to provide support for a trade study at the Dish Array Level. (SKA.TEL.DSH.SE-SRR.MOD - Modelling).
- Develop and maintain the Risk Register/Database (SKA.TEL.DSH.SE-SRR.RMT - Risk Management)
- For each Option, develop an Interface Control Document (SKA.TEL.DSH.SE-SRR.IFD - Interface Definition)
- Provide additions to the Dish Level Technology Road Map (see Glossary), as applicable. (SKA.TEL.DSH.SE-SRR.RMO).
- Carry out the following tasks, as described under SKA.TEL.DSH.SE-SRR.xxx, where xxx denotes: S2P, TDG, DES, ERA, SUS.

ELEMENTS OF WBS & SOW

Tasks

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ELEMENTS OF WBS & SOW

Outputs/deliverables

- Requirements Analysis Documents (as listed in SKA.TEL.DSH.SE-SRR.REN).
- Stage 2 Product Plan (S2P).
- Verification Plan Document (VPL - first draft).
- Architecture Design Document (ARC - first draft).
- Risk Register/Database (RMT).
- Parameterised Models, as needed to support trade studies at the Dish Array Level (MOD).
- Options and Models Analysis Documents for use at the Dish Array Level (MOD – first draft).
- Trade Study Support Document for the Dish Array Level (TDG - first draft).

REQUEST FOR PROPOSALS DOCUMENTS

The RfP will be issued in Q1 2013, to gather bids for the SKA WPs, to be lead by an international consortium. The documents to be made available will be:

- WBS/SoW
- Intellectual Property Policies
- Consortium Agreements
- Multilateral Agreements
- Additional documents
 - SKA High-Level System Description
 - CoDR Document Sets
 - Project Acronym Lists
- Others!

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QUESTIONS?