



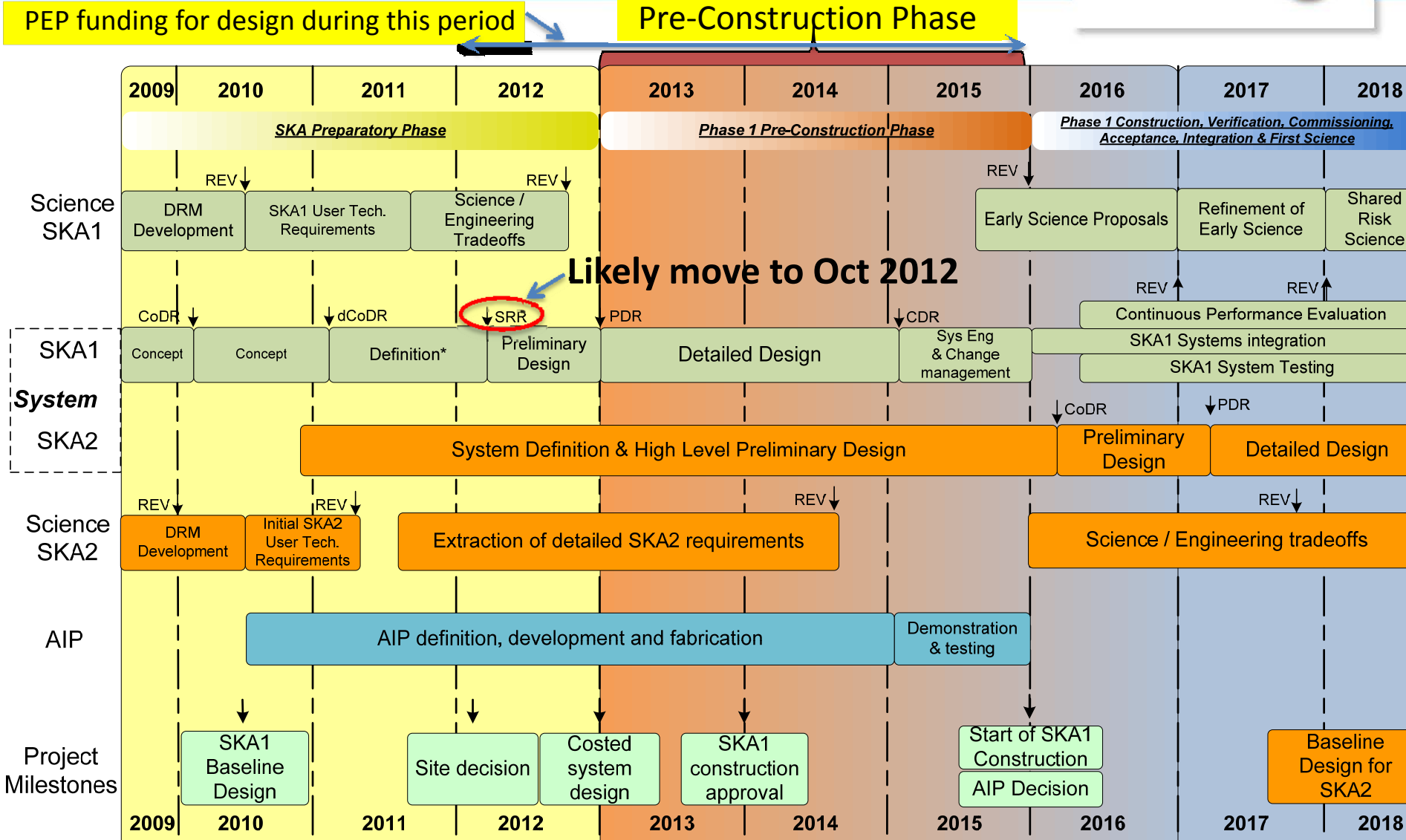
# East-Asia Consortium Meeting: Potential Contribution Mapping to SKA

Korea

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# Context for Pre-Construction Phase



# WPC **Element** Work in 2012-3



## Pre-Stage 1

Planning  
CoDR => SRR  
Work  
(See next slide)

## Stage 1

Allocated  
Requirements



Element  
Requirements,  
WBS

Analysis of  
CoDRs



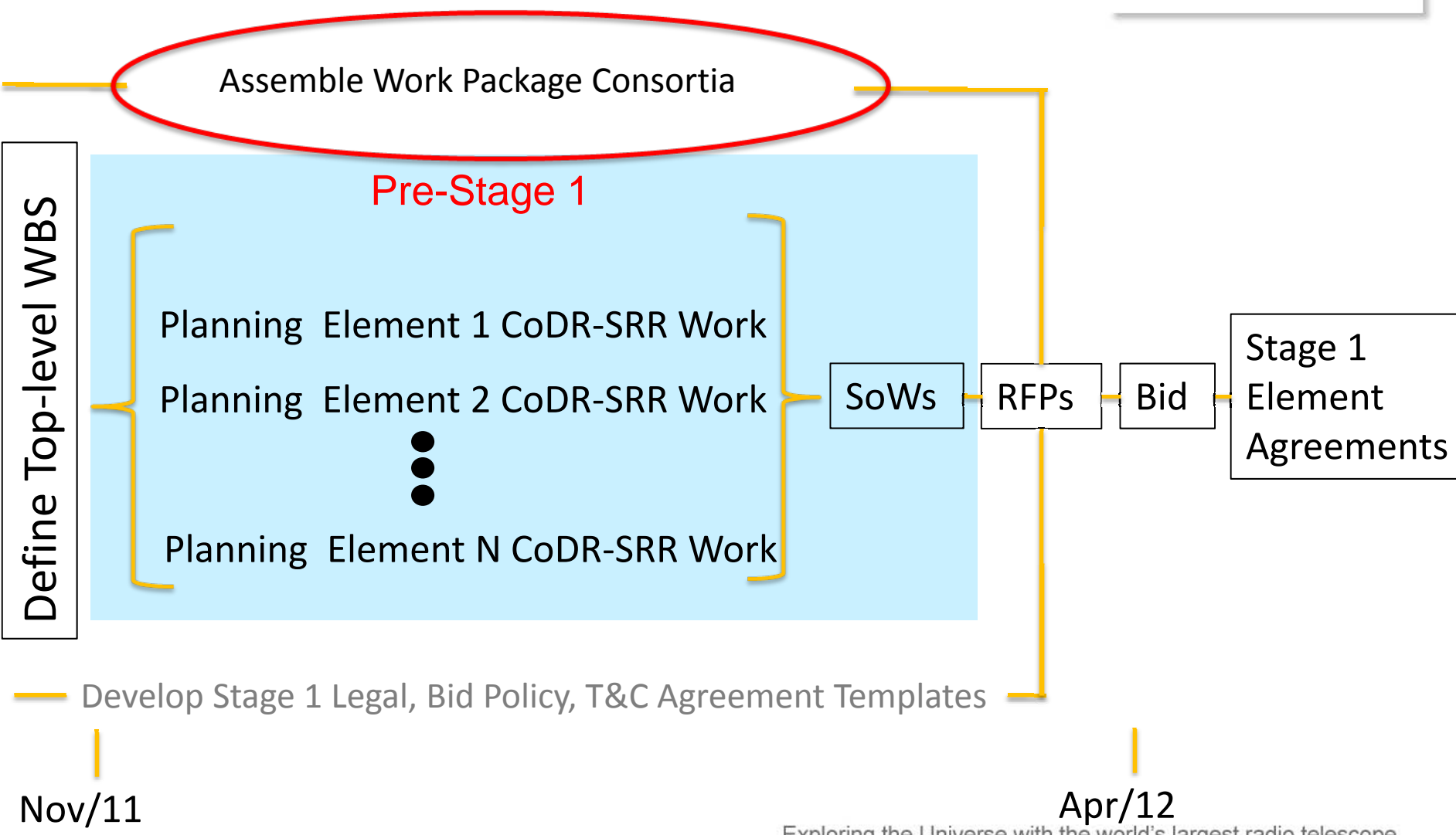
Development  
and Design  
studies

Verification  
Work

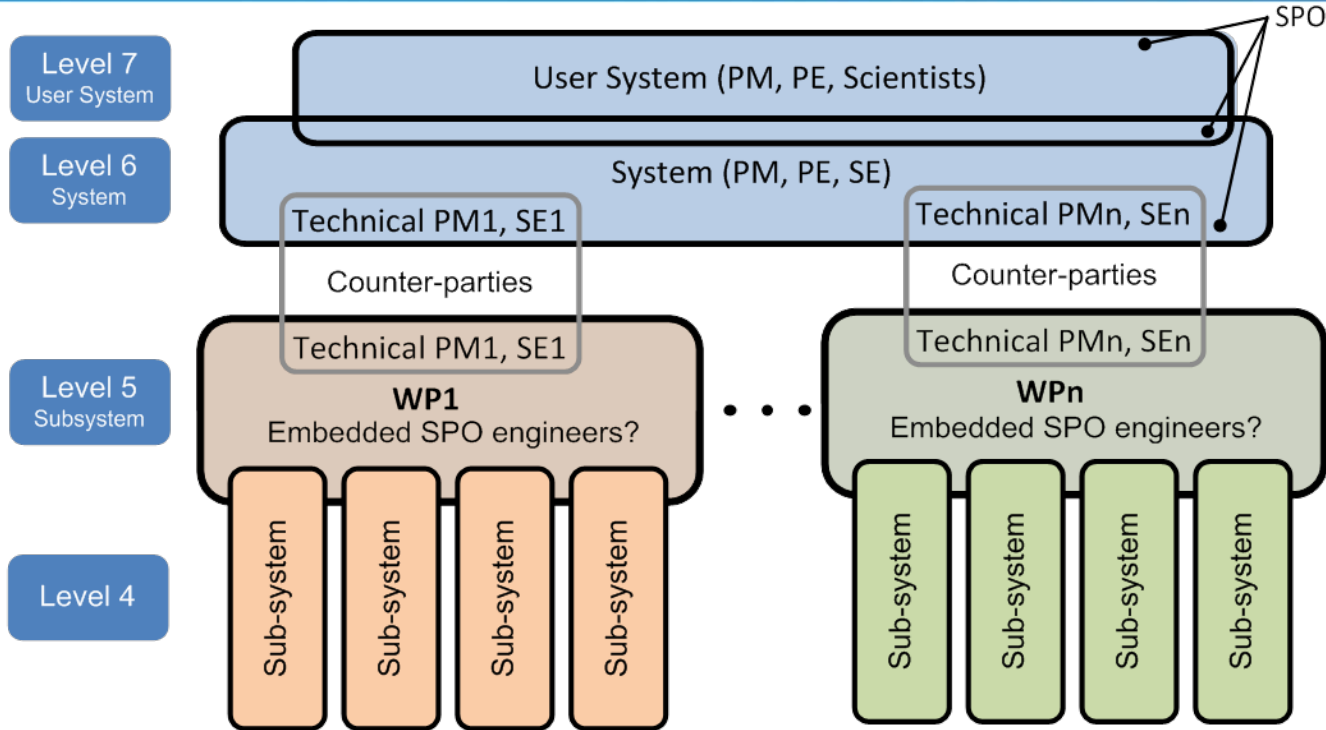


Element  
SRR

# Assembling Element Level RFPs for Stage 1 Work



# SPO-WPC Relationship



- SPO (as per PEP) contains a Technical Project Mgr and a System Engineer, devoted to each of five WPCs (likely also a scientist).
- Each WPC has a direct responsible counterparty (top WPC management and principal point of contact).
- In addition, to provide a separate communications path, “embedded” engineers reporting directly to the SPO, have also been suggested.
  - Paid by the WPCs.

# Assembling Work Package Consortia



- The mechanisms by which Work Package Consortia will be assembled is still under discussion.
  - “Self assembly” will certainly happen. ←
  - Qualification process to be put together.
- Selection process for individual WPs is TBD.
- Industrial participation in Work Package Consortia is crucial to rounding out capabilities.
  - Very unlikely that any of the (sponsoring) research organisations have the engineering depth to carry out more than a small fraction of the work.
- There are many models for industry involvement:
  - A constant factor: Industry is needed to contribute at many levels to the SKA PEP phase.

What will be the approach in EA? Operate together or collaborate widely and individually?

# Overall Work Breakdown Structure (WBS)



1 SKA – Square Kilometre Array – Total system
2 SKA.TEL - Telescope
3 SKA.TEL.DSHA - Dish Array
3 SKA.TEL.LFAA - Low Frequency Aperture Array
3 SKA.TEL.SADT - Signal and Data Transport
3 SKA.TEL.CSP - Central Signal Processor
3 SKA.TEL.DP - Science Data Processor
3 SKA.TEL.MGR - Telescope Manager
3 SKA.TEL.SAT - Sync and Timing
3 SKA.TEL.PWR - Power
3 SKA.TEL.INFRA - Site and Infrastructure
3 SKA.TEL.AI - Advanced Instrumentation
4 SKA.TEL.AI.MFAA - Mid Frequency Aperture Array
4 SKA.TEL.AI.PAF - Phased Array Feed
4 SKA.TEL.AI.WBSPF - Wide Band Single Pixel Feed
2 SKA.FAC - Facilities
2 SKA.PM - Project Management
3 SKA.PM.SPO – SKA Project Office
2 SKA.SCI - Science
3 SKA.PM.PS - Project Scientist(s)
4 SKA.PM.PS.SCA - Science Analysis
2 SKA.SE – SKA System Design and System Level System Engineering
3 SKA.SE.MGT - System Engineering Management
3 SKA.SE.REQ - Observatory Requirements
3 SKA.SE.OPS - Concept of Operations
3 SKA.SE.ARC – System Architecture
3 SKA.SE.PERF - System Level Trade Studies
3 SKA.SE.SYSD – System Design
3 SKA.SE.QA – Quality Assurance
3 SKA.SE.VER – System Verification Management
3 SKA.SE.INT – System Integration Management
3 SKA.SE.DOC - Document Control and Archiving

# WBS: Telescope only



## 1 SKA – Square Kilometre Array – Total system

### 2 SKA.TEL - Telescope

3 SKA.TEL.DSHA - Dish Array

3 SKA.TEL.LFAA - Low Frequency Aperture Array

3 SKA.TEL.SADT - Signal and Data Transport

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3 SKA.TEL.INFRA - Site and Infrastructure

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4 SKA.TEL.AI.MFAA - Mid Frequency Aperture Array

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4 SKA.TEL.AI.WBSPF - Wide Band Single Pixel Feed



# Talks that discuss East Asia SKA contributions



- **China**
  - Bo Peng
  - Yu Lu (dishes)
- **Japan**
  - Takahashi (Nakanishi - correlator Oxford)
  - Toshiki Kumazawa, Toyo Corp.
- **Korea**
  - Jongsoo Kim, KASI
  - Bong Won Song, KASI
  - Nam Cheol Yu, KEPCO Korea (Power)
- **Taiwan (ASIAA)**
  - Homin Jiang
  - Chau Ching Chiong

# Dish Array Top Level WBS



Dish Array					
	C	J	K	T	
3 SKA.TEL.DSHA - Dish Array					
4 SKA.TEL.DSHA.MGT - Management					
4 SKA.TEL.DSHA.SE - System Engineering					
5 SKA.TEL.DSHA.SE.MGT – DA Requirements					
5 SKA.TEL.DSHA.SE.DS - Design Studies	d				Structural Design
4 SKA.TEL.DSHA.DSH - Dish	f	f	f	f	Various parts
4 SKA.TEL.DSHA.SPF - Single Pixel Feeds	f	f	f	f	
5 SKA.TEL.DSHA.SPF.FPL - Feed payload					
6 SKA.TEL.DSHA.SPF.FPL.FEED - Feed					
6 SKA.TEL.DSHA.SPF.FPL.CRYO - Cryo	f	d	d,f	d,f	
6 SKA.TEL.DSHA.SPF.FPL.LNA - LNA		d		d,f	
6 SKA.TEL.DSHA.SPF.FPL.PCKG - Package					
5 SKA.TEL.DSHA.FDS.RX - Receiver		d,f	f	d,f	
4 SKA.TEL.DSHA.SIGT - Signal Transport		d,f			
4 SKA.TEL.DSHA.DVS – Dish Verification System					
5 SKA.TEL.DSHA.DVS.MGT - Management					
5 SKA.TEL.DSHA.DVS.SE - System Engineering					
5 SKA.TEL.DSHA.DVS.CON - Construction	d,f		d,f		1 <sup>st</sup> article, 2 <sup>nd</sup> ?
5 SKA.TEL.DSHA.DVS.VER - Verification	p	p	p	p	

d=design; f=fabricate; p=participate

# Central Signal Processor

## Top Level WBS



### Central Signal Processor

	C	J	K	T
3 SKA.TEL.CSP - Central Signal Processor				
4 SKA.TEL.CSP.MGT - Management				
4 SKA.TEL.CSP.SE - System Engineering				
4 SKA.TEL.CSP.COR - Correlator(s)				
5 SKA.TEL.CSP.COR.SW - Software Correlator			d,f	
5 SKA.TEL.CSP.COR.FPGA - FPGA Correlator		d,f	d,f	d,f
5 SKA.TEL.CSP.COR.ASIC - ASIC Correlator		d,f	d,f	d,f
4 SKA.TEL.CSP.BF - Beam Former(s)				
5 SKA.TEL.CSP.BF.CBF - Central Beam Former				
5 SKA.TEL.CSP.BF.DBF - Dish Station B.F.				
4 SKA.TEL.CSP.NIP - Non Imaging Processor(s)				
4 SKA.TEL.CSP.PWR - Power			d,f	
4 SKA.TEL.CSP.INFRA - Infrastructure			f	
4 SKA.TEL.CSP.LMC - Local Monitoring and Control				
4 SKA.TEL.CSP.VRF - Verification Unit(s)				

d=design; f=fabricate; p=participate

# Power Top Level WBS



Power					
	C	J	K	T	
3 SKA.TEL.PWR - Power			d,f		
4 SKA.TEL.PWR.MGT - Management			d,f		
4 SKA.TEL.PWR.SE - System Engineering			d,f		
4 SKA.TEL.PWR.GEN - Generation/supply			d,f		
4 SKA.TEL.PWR.CON - Conversion			d,f		
4 SKA.TEL.PWR.RET - Reticulation			d,f		
4 SKA.TEL.PWR.LMC - Local M&C Control			d,f		
4 SKA.TEL.PWR.FAC - Facility Interconnects			d,f		
5 SKA.TEL.PWR.FAC.CSP – Central Signal Proc.			d,f		
5 SKA.TEL.PWR.FAC.DP - Data Processor			d,f		
5 SKA.TEL.PWR.FAC.HQ - Headquarters			d,f		

d=design; f=fabricate; p=participate

# Format – Statement of Work (SoW)



<b>WBS element identification</b>	4 SKA.TEL.DSHA.MGT - Management
<b>WBS element description</b>	The WBS elements contain all the management activities to be performed for the Stage 1 of the SKA Pre-Construction Phase for the SKA Dish Array.
<b>Inputs</b>	
<ul style="list-style-type: none"> <li>• SKA Management Plans, Policies and Philosophies including:             <ul style="list-style-type: none"> <li>○ PEP</li> <li>○ Risk Management Plan</li> </ul> </li> <li>• Dish Array Concept Design review documentation set</li> <li>• Dish Array Concept Design review panel report</li> <li>• DVA1 Design review documentation sets (PDR and CDR)</li> <li>• SKA Management Plans, Policies and Philosophies</li> </ul>	
<b>Tasks</b>	
<ul style="list-style-type: none"> <li>• Roll out agreed to SKA Management Policies and Philosophies</li> <li>• Prepare and conduct kick-off meeting</li> <li>• Monitor and control project             <ul style="list-style-type: none"> <li>○ Develop and maintain project schedules</li> </ul> </li> <li>• Reporting             <ul style="list-style-type: none"> <li>○ Prepare and submit regular progress reports</li> </ul> </li> <li>• Conduct progress meetings (face to face and others) including:             <ul style="list-style-type: none"> <li>○ Internal progress meetings</li> <li>○ External progress meetings</li> </ul> </li> <li>• Perform risk management</li> <li>• Change management</li> <li>• Provide information and inputs towards the SPO for integration of project management information.</li> </ul>	
<b>Outputs/deliverables</b>	
<ul style="list-style-type: none"> <li>• Progress reports</li> <li>• Project schedules</li> <li>• Risks</li> <li>• Agreements</li> </ul>	

**End**