



# SDP Memo: Organisation of the SDP 2016 PDR Architecture Documentation

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## ORGANISATION DETAILS

Name	Science Data Processor Consortium
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## SDP Memo 025

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## List of Abbreviations

<b>Abbreviation</b>	<b>Expansion</b>
ACE	Architecture-Centric Engineering
DSA	Documenting Software Architectures
PDR	Preliminary Design Review
SDP	Science Data Processor
SEI	Software Engineering Institute
SWEP	Software Engineering Plan
VAB	Views and Beyond

## Introduction

An important goal in the SDP consortium is to reduce risk associated with the architecture. One form of risk reduction can be achieved with documentation conforming to an established documentation procedure such as the “Views and Beyond” (VAB) documentation process of the Architecture Centric Engineering (ACE) process developed at the Software Engineering Institute (SEI) at Carnegie Mellon University. This established structure of architecture documentation aids in completeness and facilitates thorough inspections.

The SEI explains how this provides a framework that complies with the IEEE 1471-2000 methodology, see the reference work “Documenting Software Architectures: Views and Beyond” [RD01]. The “SDP Preliminary Software Engineering Plan” [RD02] contribution to this PDR, will cover this further.

In preparation for architecture work following the PDR, this document begins to structure our software architecture accordingly. This memo contains a description of the organisation of the documentation for the PDR, together with a mapping of the planned reports and memos to this structure.

This organisational summary is a default first part of any architecture documentation, and is hence submitted with the PDR documents as a memo “Organisation of the SDP 2016 PDR Architecture Documentation”

# References

## 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.

Reference Number	Reference

## 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.

Reference Number	Reference
RD01	Documenting Software Architectures - Views and Beyond, Paul Clements, Felix Bachmann, Len Bass, <a href="#">David Garlan</a> , <a href="#">James Ivers</a> , <a href="#">Reed Little</a> , <a href="#">Paulo Merson</a> , <a href="#">Robert Nord</a> , <a href="#">Judith Stafford</a> , SEI Series in Software Engineering, Addison-Wesley Professional
RD02	SDP Preliminary Software Engineering Plan, Braam and others.

# The 2016 SDP PDR Documentation Package

The PDR documentation package will contain a subset of the elements found in a full VAB architecture documentation. In preparation for the SDP CDR, the structure of full software documentation is outlined in the SDP Preliminary Software Engineering Plan [SDP:SWEP] document, together with architectural processes for its creation, use and evaluation.

The 2016 SDP documentation package will contain the following components:

1. **Overview of the documentation** - this document
2. **Architectural Summary** - several existing documents fulfill this need
3. **SDP Architectural Process** - This will be contributed in the Preliminary Software Engineering Plan 2016 SDP PDR contribution. This will provide context to PDR reviewers and the SKAO as to what process we are evolving towards.
4. **Architectural Views** - A few views will be delivered, where the word "few" applies to choosing more than one view type, but also to using view types for more than one subsystem where appropriate (views for subsystems are sometimes called "view packets"). There is no need to be comprehensive. We expect
  - a. Decomposition views - these will be constructed from the product tree, where the appropriate relationship is "uses".
  - b. Data Flow views - documenting the architecture of pipelines
  - c. Deployment views - documenting the systems and what software is installed on them
5. **Requirements Coverage**
6. **Glossary and acronyms**
7. **Background, design constraints and rationale**

*List 1: PDR Architecture Component List*

## Mapping of planned PDR documents to the SEI VAB structure

The following table maps the planned PDR contributions to the components of the architecture documentation outlined above.

<b>Planned PDR Document Component</b>	<b>Contributing Planned PDR Contributions</b>
Overview of the documentation	Organisation of the SDP 2016 PDR Architecture Documentation (this document) SDP Guide to Reviewers
Architectural Summary	SDP Element Architecture Design
SDP Architectural Process	SDP Preliminary Software Engineering Plan SDP Preliminary Qualification and Acceptance Plan SDP Development Plan

View: Decomposition	SDP Product Tree Diagram SDP Functional Decomposition Diagram SDP Product Tree Descriptive Spreadsheet
View: Data Flow (pipelines)	SDP Pipelines Design SDP Parametric Models and Analysis Report Imaging Pipeline Non-imaging Pipeline SDP Science Use Case Matrix Fast Fourier Transforms Time and channel averaging iPython performance model description Science Analysis Calibration Ingest pipeline Data challenge supplement Baseline dependent averaging
Deployment View	SDP Data Processor Design SDP Size Estimates Derived from the Parametric Model
Work Assignment Style (construction, support, cost)	SDP Cost Model SDP Costing Basis of Estimate SDP Preliminary ILS Plan
Development View	SDP Preliminary Construction Plan
View packet: Data Flow	SDP Execution Framework Design Industrial evaluation of Data Flow for SDP
View Packet: Preservation	SDP Preservation Design (** contains many views)
View Packet: LMC	SDP Local Monitoring and Control Design (** overlaps strongly with Data Flow)
View packet: Wide area distribution	SDP Delivery Design Regional Centres SDP Observatory Tools Design
Requirements Analysis & Coverage	SDP Interface Requirements SDP Requirements Analysis and Allocations SDP Compliance Matrix SDP Matrix of Requirements and Functions



Glossary and Acronyms	SDP Glossary
Background, Design Constraints and rationale	SDP Assumptions and non-conformance Analysis of System Scaling to SKA2 SDP High Level Risk Register Science use case analysis (?) SDP System Sizing Derived from the Parametric Model
Unknown component	PROT.ISP Report SDP Configuration Items List SDP Preliminary Concept of Operations

Table 1: Mapping of PDR contributions to PDR Documentation Components