

Assembly, Integration & Verification (AIV)

Engineering Meeting

October 2013

Richard Lord and Adam MacLeod



- AIV Consortium Key Personnel
- Work Package Description
- Boundaries of Responsibility
- Major Milestones
- External Interfaces
- Precursor Integration – MeerKAT
- Precursor Integration – ASKAP

AIV Consortium Key Personnel



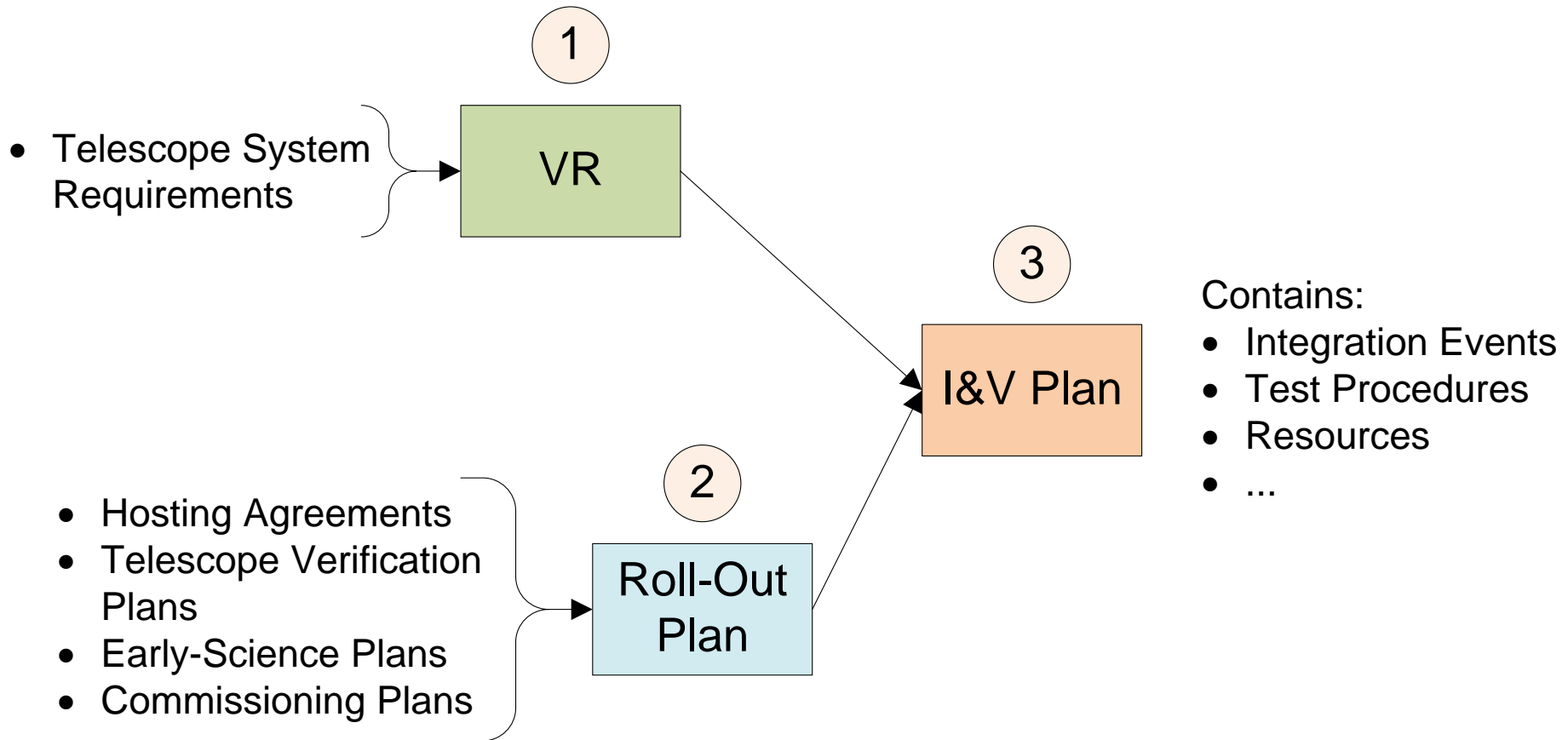
Organisation	Contact Person	Role
SKA SA	Richard Lord	Consortium Leader and SKA1_MID AIV Leader
	Thomas Kusel	Consortium System Engineer
CSIRO	Adam MacLeod	SKA1_SURVEY AIV Leader
	Antony Schinckel	Participant
ASTRON	Jan Geralt bij de Vaate	SKA1_LOW AIV Leader
	Mark Bentum	Participant
SKA Office	Peter Hekman	SKA Office Point of Contact

Further participants will join the AIV Consortium over time.

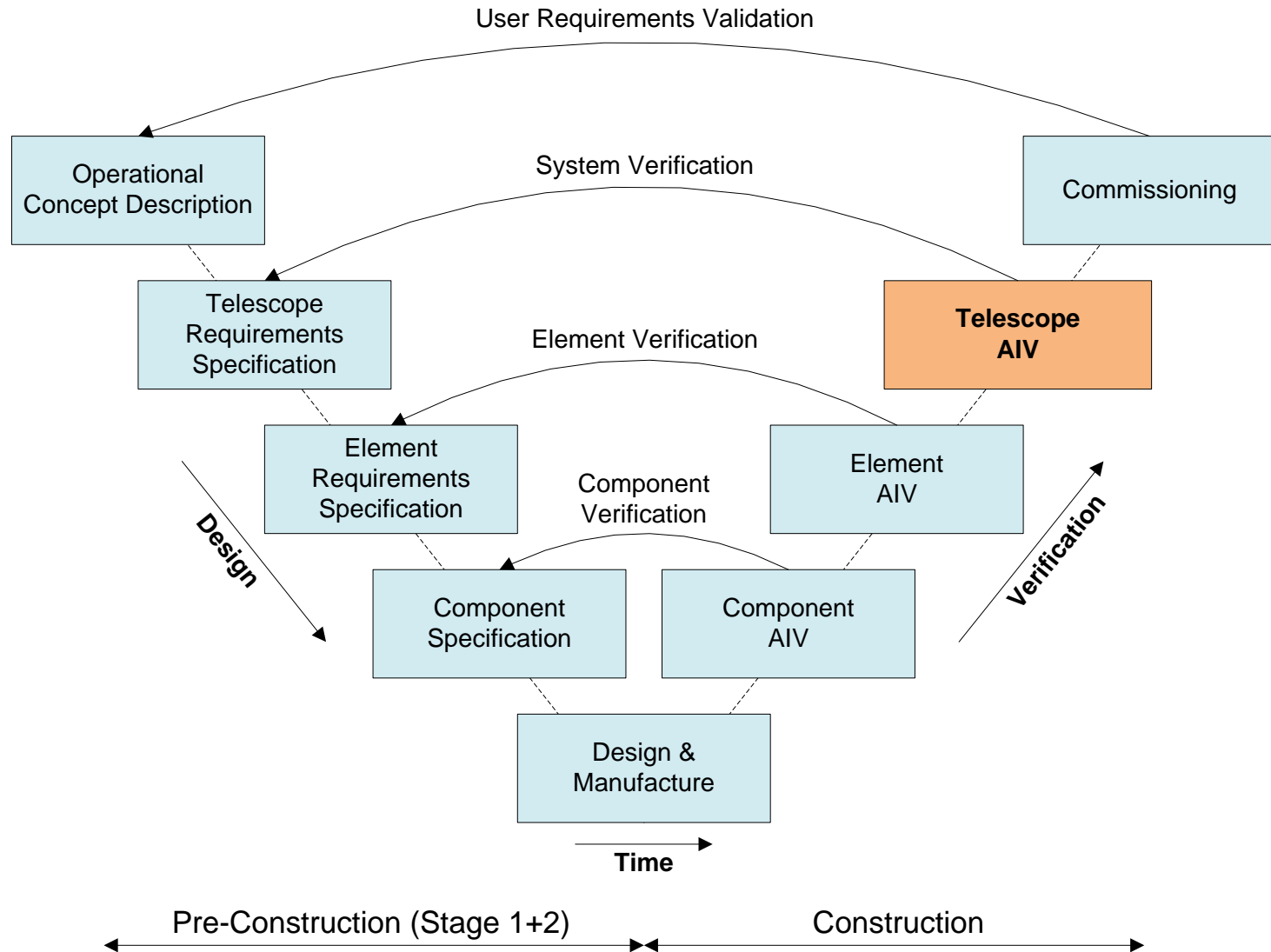
Planning for all activities at the remote sites that are necessary to:

- Incorporate SKA1 Elements into existing infrastructure.
- Integrate all SKA1 Elements into a Telescope System and verify compliance to engineering requirements.
- Integrate Precursors into SKA1:
 - MeerKAT Precursor into SKA1_MID
 - ASKAP Precursor into SKA1_SURVEY

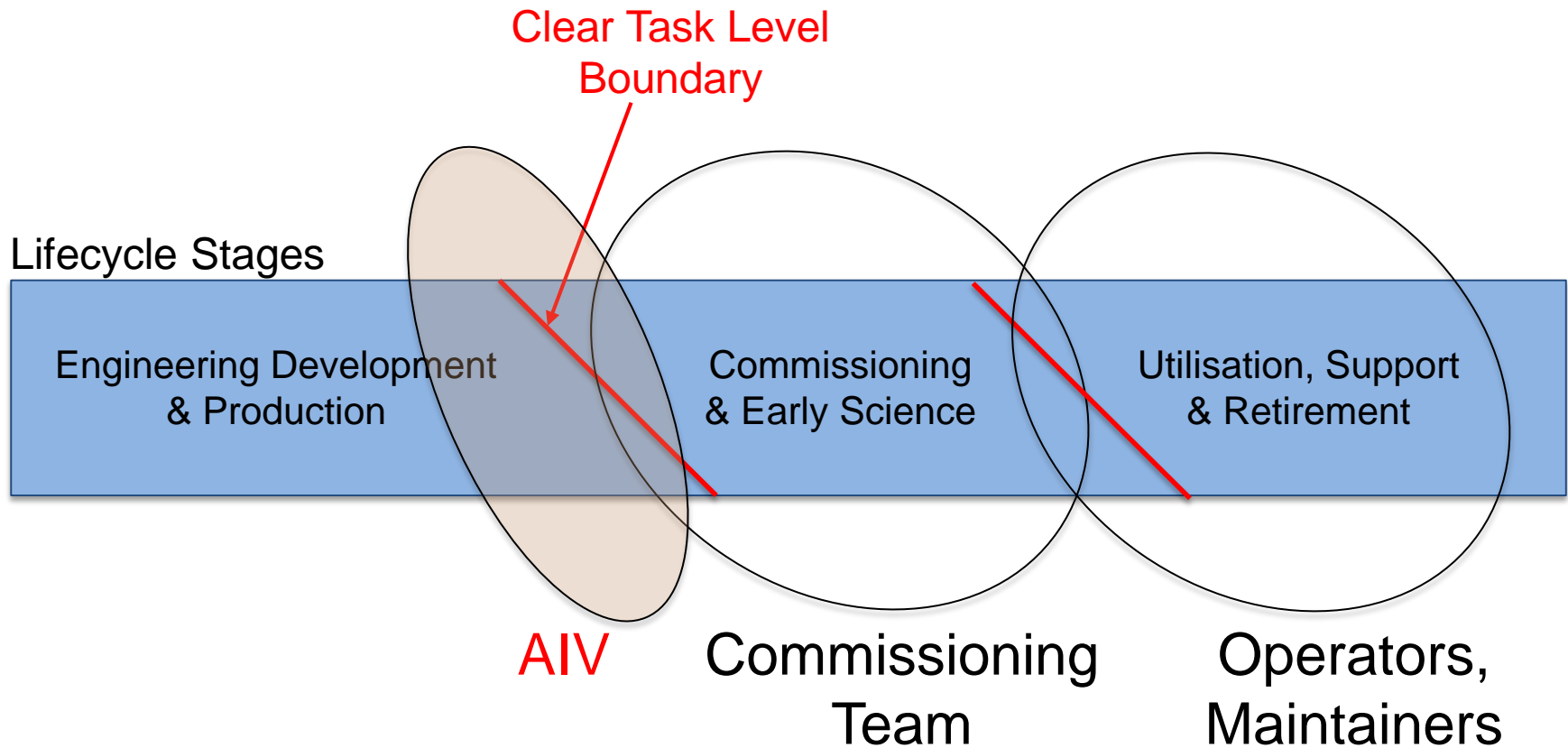
Work Package Description



Boundaries of Responsibility



Boundaries of Responsibility



Major Milestones - Stage 1



#	Stage 1: Milestone Description	Date
1	t0	Nov 2013
2	t0 + 12w	Jan 2014
3	Telescope Verification Requirements	Apr 2014
4	Telescope Roll-Out Plan (Draft)	Jun 2014
5	Input to Re-Baselining Exercise	Sep 2014
6	PDR Submission	Nov 2014
7	PDR Closure	Jan 2015

Major Milestones - Stage 2



#	Stage 2: Milestone Description	Date
1	Kick-off	Feb 2015
2	Telescope Preliminary I&V Plan	Mar 2015
3	Telescope Test Procedures (Draft)	Jun 2015
4	Telescope Roll-Out Plan (Final)	Sep 2015
5	Telescope Detailed I&V Plan	Dec 2015
6	Telescope AIV Resource Establishment	Mar 2016
7	Telescope Test Procedures (Final)	Jun 2016
8	CDR Submission	Jul 2016
9	CDR Closure	Sep 2016

Inputs:

- Telescope (Level 1) Requirements

Outputs:

- Methods for verification for all telescope-level requirements (Analysis, Demonstration, Test, Similarity, etc.)
- Traceability between Requirements and Verification Requirements

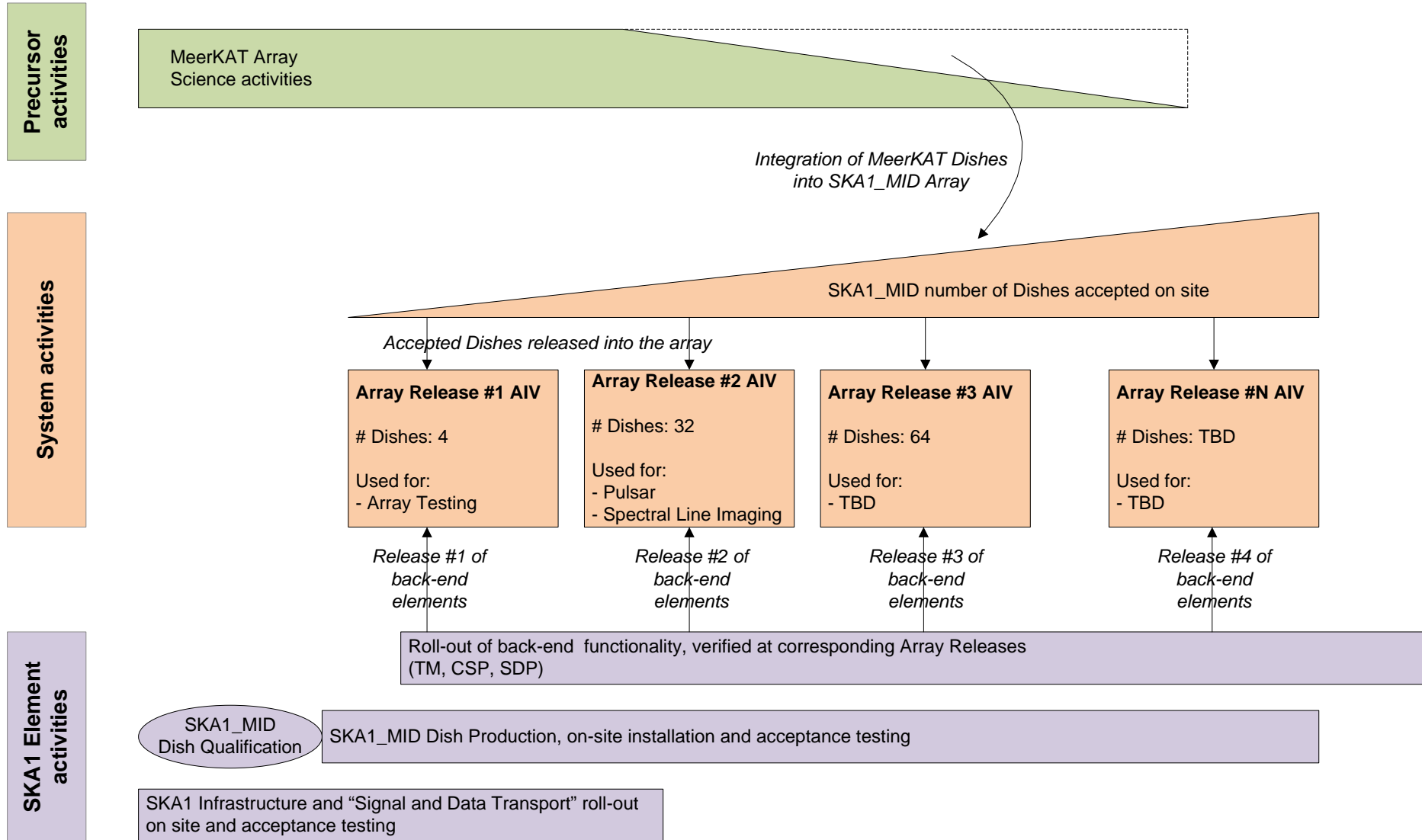
Inputs:

- Hosting Agreements
- Installation constraints
- Verification plan
- Science priorities

Outputs:

- A clear roll-out plan for all three telescopes,
 1. SKA1_LOW
 2. SKA1_MID
 3. SKA1_SURVEY
- that forms the basis for delivery of elements and integration activities.

Example: SKA1_MID Roll-Out Plan



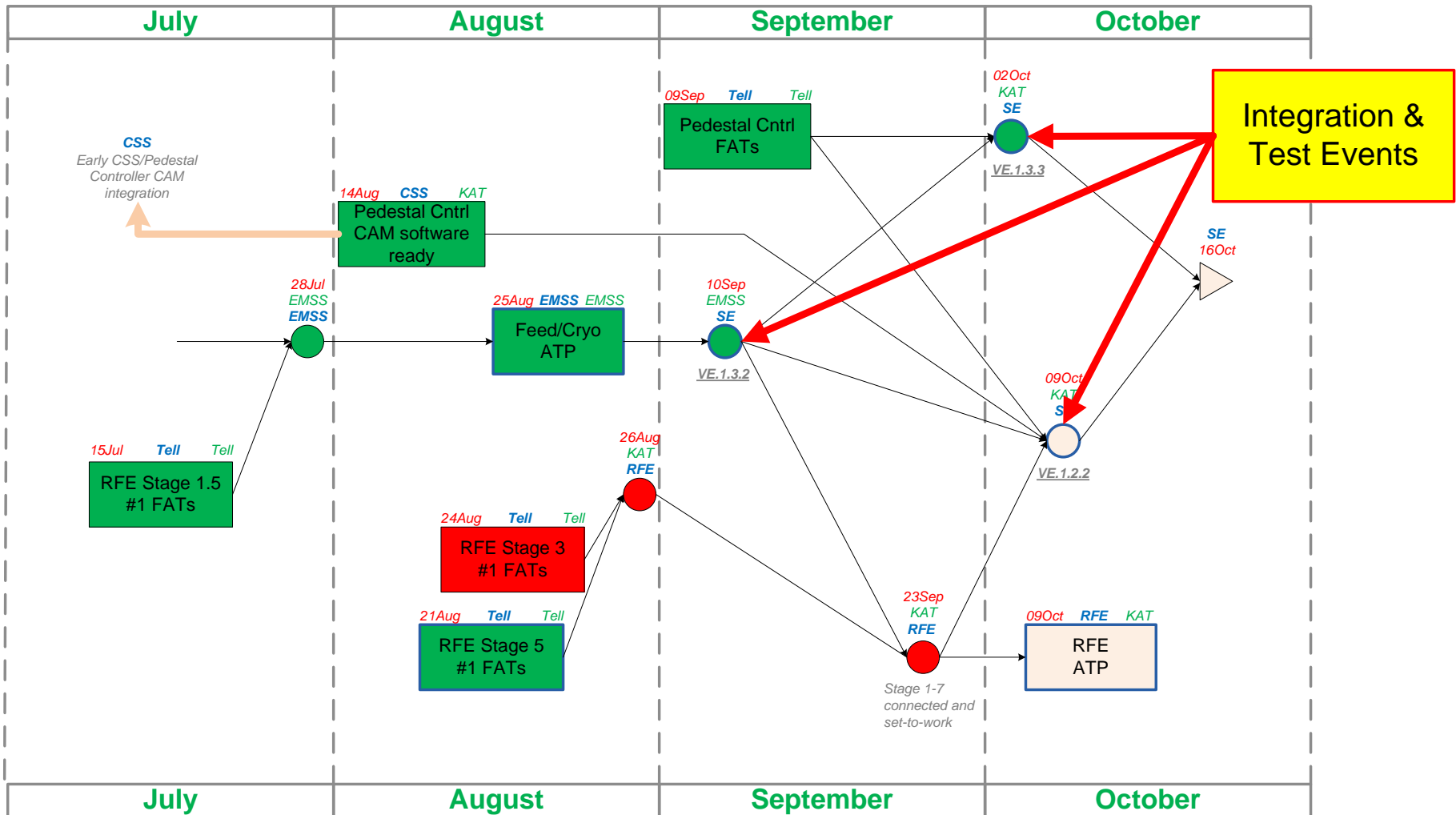
Inputs:

- Verification Requirements
- Roll-Out Plan

Outputs:

- Verification Events
- Integration Plan, incorporating the Verification Events
- Test Procedures and Configurations
- Requirements for specialised Test Equipment and Facilities

Example of an I&V Plan



Inputs:

- Hosting agreements
- Discussions with SKA Office and other Element Consortia

Outputs:

- Defined set of interfaces and constraints on SKA1_MID, which will be communicated to other SKA1 Elements by the SKA Office.

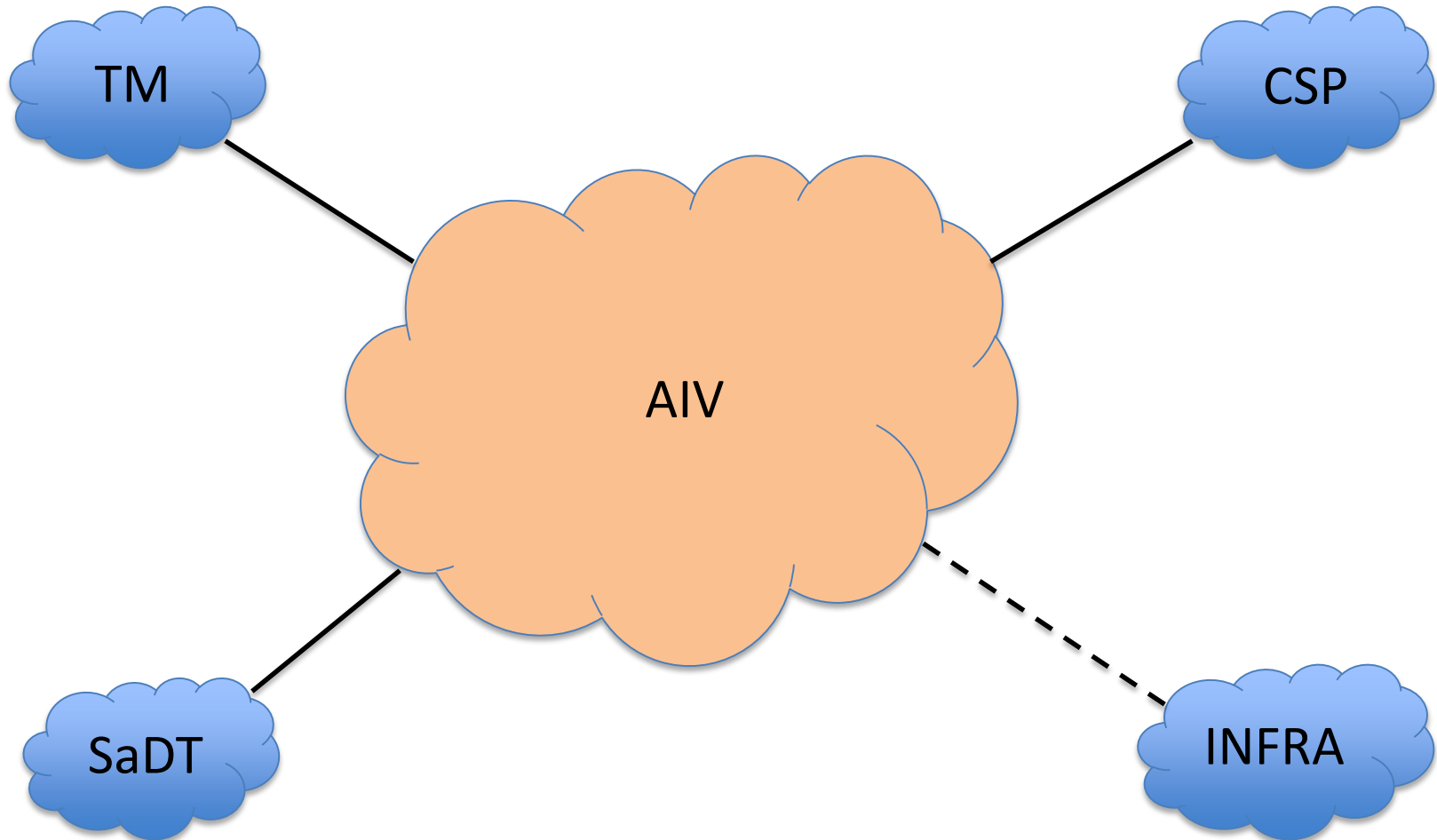
Inputs:

- Hosting agreements
- Discussions with SKA Office and other Element Consortia

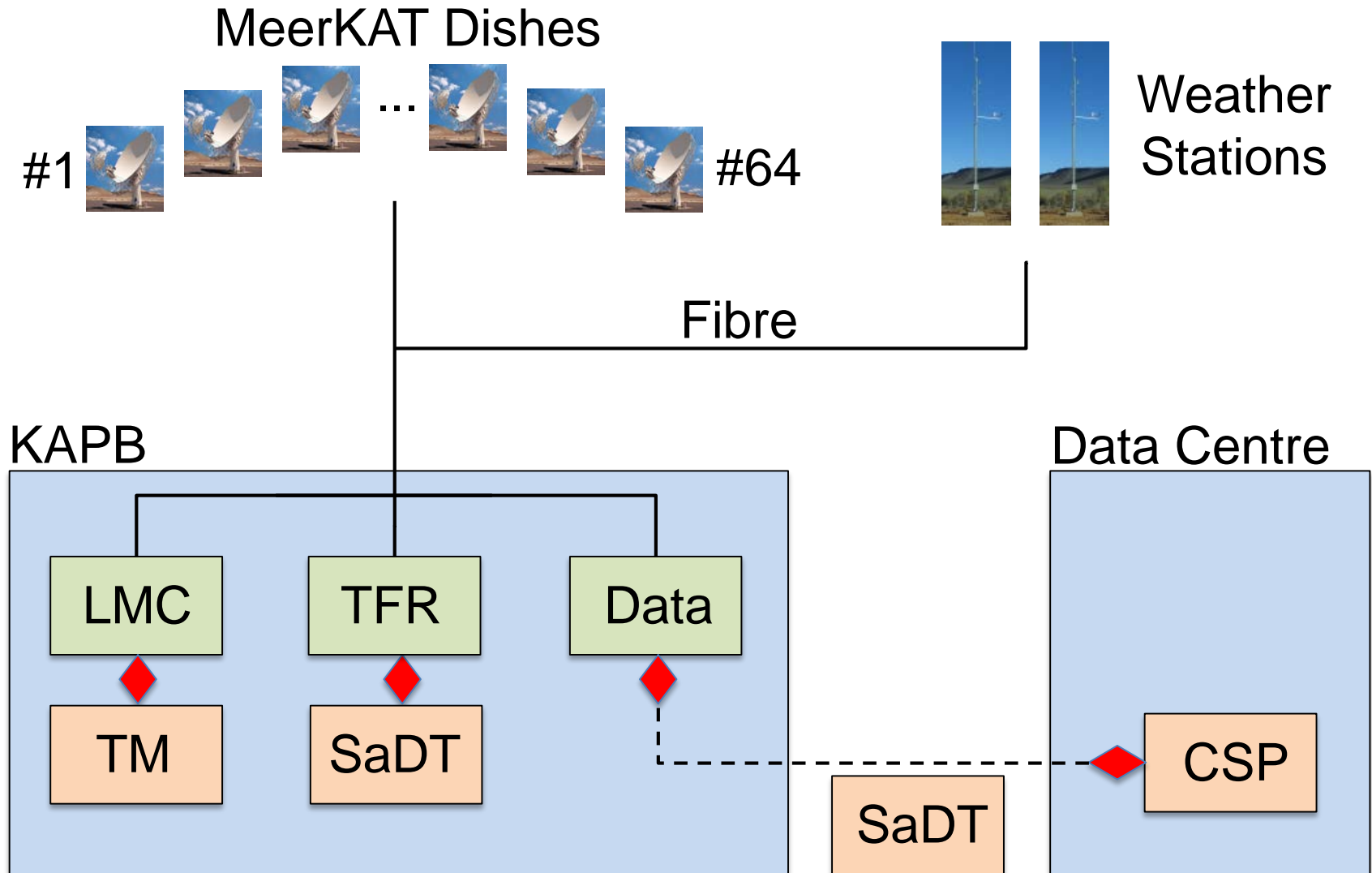
Outputs:

- Defined set of interfaces and constraints on SKA1_LOW and SKA1_SURVEY, which will be communicated to other SKA1 Elements by the SKA Office.

External Interfaces



Precursor Integration - MeerKAT



Precursor Integration - ASKAP



- 1) What is ASKAP**
- 2) How to integrate ASKAP**
- 3) Strategy for integrating ASKAP**



What is ASKAP?

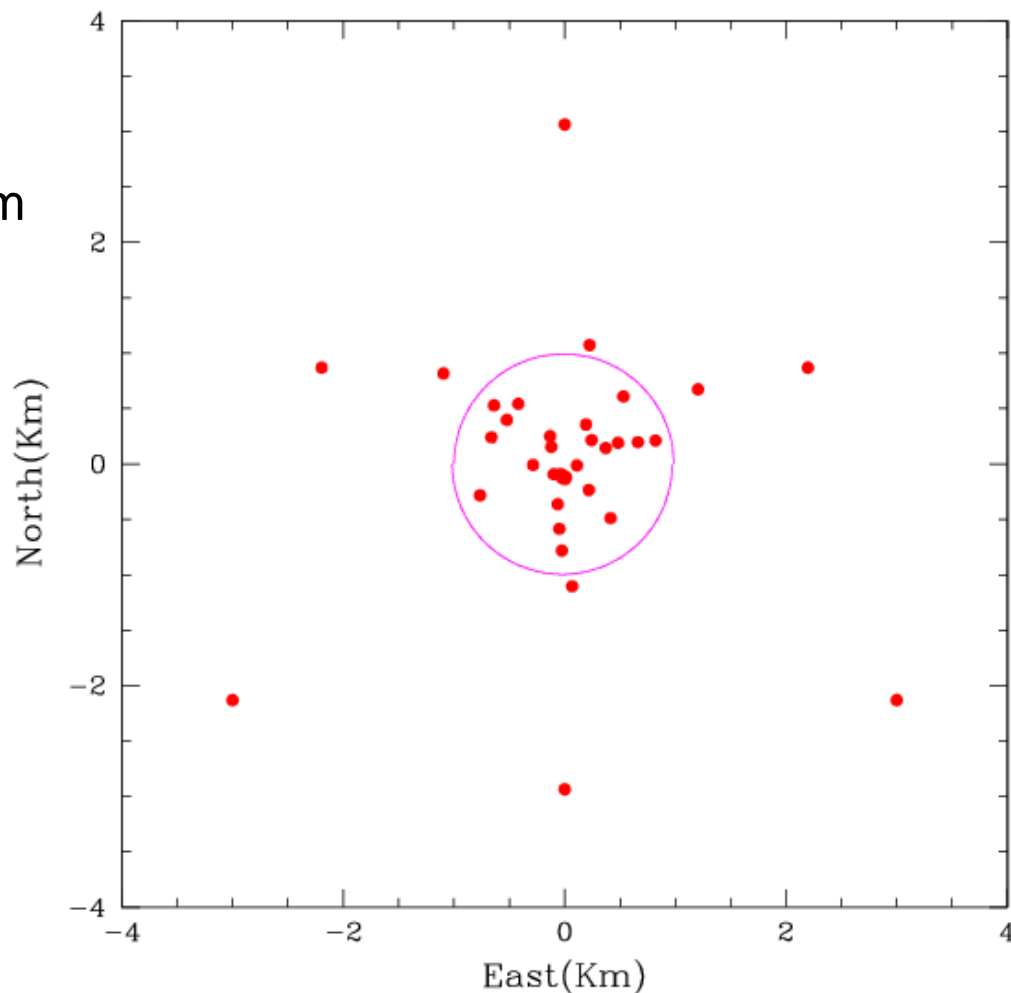


ASKAP is a 36 dish telescope

- Parabolic dish, 3 axis design
- 12m diameter
- Baselines ranging from 22m to 6km

ASKAP uses MRO Infrastructure

- The control building
- Roads
- Fibre within the MRO
- Trunk fibre to Geraldton
- Power reticulation
- Weather stations
- RFI monitoring



What is ASKAP?



Each dish comprises a Phased Array Feed (PAF) receiver system

- Analog receive chain at the dish focus
- Digital receive chain in the MRO control building

Combined, each dish + PAF system provides

- 36 Dual-polarisation beams supporting 30 deg² Field Of View
- Aperture efficiency of **TBC**

Beams from each dish combined at the Correlator

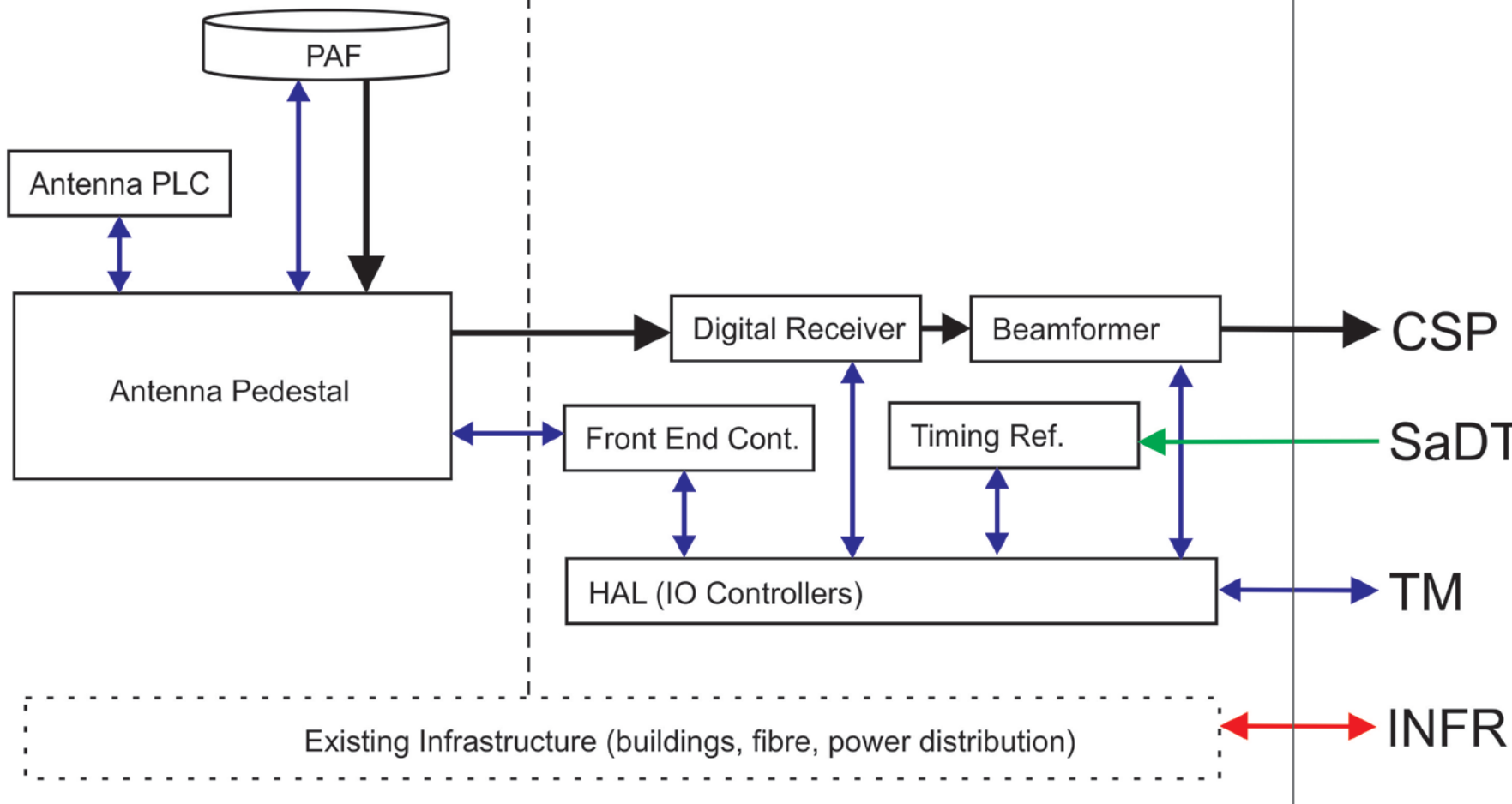
Science Processing & Archiving performed at the Pawsey Centre

How to Integrate ASKAP

1 of 36

@ the dish

@ the control building



- 1) Establish signed-off ICDs with other consortia
- 2) Support SKA1 Elements with interface development
- 3) Conduct Integration Readiness Review
- 4) Integrate first ASKAP antenna into SKA1_SURVEY
- 5) Verify interfaces with SKA1 Elements
- 6) Integrate remaining antennas



Thank You