



DVAC Risks and Their Mitigation

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July 15, 2011, Penticton

Outline



- 1. Technical Risk**
- 2. Schedule Control**
- 3. Transportation Risk**
- 4. Cost Risk**
- 5. Environment Protection**

1. Technical Risk



➤ Brief description

Potentially, there are technical risks, because no existing design can meet SKA requirements, any new design may bring the technical risk. Key technical problems:

- ✓ High accuracy main reflector manufacture
- ✓ Surface accuracy under operational conditions
- ✓ Pointing accuracy
- ✓ High dynamic range
- ✓ EMC and RFI environment

1. Technical Risk



➤ Impact

Any technical failure will lead not to meet the specifications.

- ✓ **Main reflector manufacture: hard to realise accuracy requirement**
- ✓ **Surface accuracy: low antenna efficiency**
- ✓ **Pointing accuracy: gain loss**

1. Technical Risk



➤ Proposed mitigation

JLRAT will take about one year of design, reviewing and discussing openly and internationally.

The special experiments shall be made to verify our design, including but not limited to whole piece reflector, subreflector, feed exchange device.

Two prototypes will also be developed to verify the new design.

1. Technical Risk



➤ Proposed mitigation

✓ Main reflector manufacture

Feasibility study will be done on manufacturing the reflector.
Cooperation will be made with international groups.

✓ Surface accuracy

Support structure design will be optimized.

✓ Pointing accuracy

Systematic errors will be corrected by the servo control system.
Dish subsystem optimization will reduce random errors.

2. Schedule Control



➤ Brief description

Most refer to design, manufacturing, transportation and installation schedule control.

➤ Impact

Dish schedule affects the whole project schedule and leads to cost risk.

2. Schedule Control



➤ Proposed mitigation

- ✓ Monitor the progress of the project
- ✓ Review the following information:
 - Status reports
 - Schedule updates
 - Financial analysis
 - Exception report addressing plan variations
- ✓ Key parts are manufactured by JLRAT.
- ✓ Subcontracting/external supply backup (A/B or A/B/C role)
- ✓ The principle of using different suppliers for backup will be applied, so manufacturing could be recovered rapidly.

3. Transportation Risk



➤ Brief description

Transportation is mainly affected by dish design, packing, ship company, and weather.

➤ Impact

Transportation affects the whole project schedule, product quality and leads to a cost risk.

➤ Proposed mitigation

- ✓ Most parts except for the main reflector panel are suitable for transportation in standard containers.
- ✓ Find an experienced local consultant for local transportation.
- ✓ The liner ship with standard container is considered as plan A, but the plan B for bulk is prepared.
- ✓ Insurance is needed.

4. Cost Risk



➤ Brief description

As a long- term project, conflicts between the budget and real expenses can easily happen. Especially for outsourced raw materials, price index variations are common. Any delay may also cause extra costs.

➤ Impact

Underestimating costs will lead to an increase in the budget, which will affect the whole project evolution.

➤ Proposed mitigation

- ✓ Cost estimation is as accurate as possible.
- ✓ Cooperate with a reliable and qualified supplier
- ✓ Ensure project on schedule

5. Environment Protection



➤ Brief description

Dishes are installed in remote area, to protect the local environment during installation period and waste disposal after the project lifetime.

➤ Impact

The lessons of failing to protect the environment are obvious. Any infringement of site environment regulations may delay or terminate the project.

➤ Proposed mitigation

Fully cooperate with the selected country, fully understand local regulations and culture.

Consider waste disposal (during installation/after dish life cycle) in design phase. Lessons learnt to SKA dish subsystem

5. Environment Protection



➤ Proposed mitigation

Construction phase:

All package of antenna will use recyclable material, such as metal or wood. Plastic or rubber is strictly controlled in package.

Telescope retiring phase:

Disassemble reflector surface into small pieces and make them re-utilized.



END