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SCaN Technology Management Plan Briefing to the SMD Planetary Science Division

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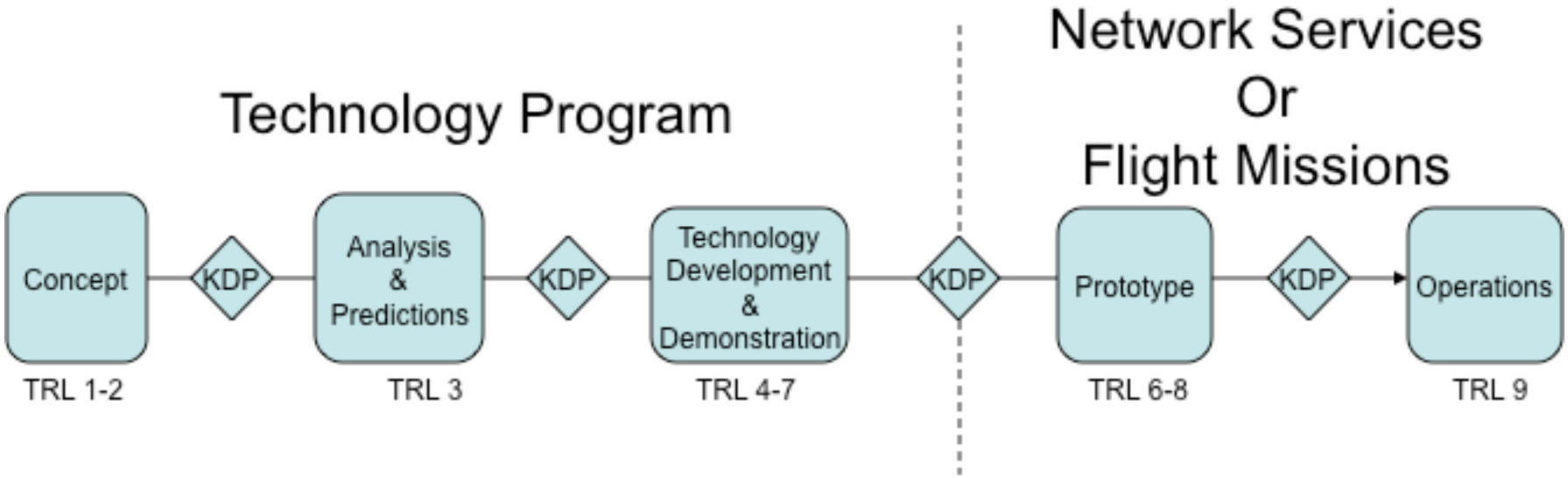
SCaN Technology Investments

Optical Communications: • Lunar Laser Comm Demo (LLCD) • Optical Core Technology • Deep Space Optical Terminal	**Game-Changing Technologies** •Cognitive Radios Concept Study •Silicon Nanowire Optical Detector Concept Study •Superconducting Quantum Interference Filter Concept Study •Additional GC technologies **
Advanced RF Technology: •X/Ka-band Transceiver •TDRSS Arraying Demo	**Position/Navigation/Timing:** •Space Clock
Advanced Networking: •Disruption Tolerant Network (DTN) •Space Internetworking Infusion Project	**SBIR Technology Coordination and Integration**
Software Defined Radios: •Communications, Navigation and Networking Reconfigurable Testbed (CoNNeCT) on ISS •CoNNeCT Experiments •Spacecraft Telecommunications Radio System Architecture •Universal Space Transponder	**Spectrum Efficient Technology:**** •Data Compression •Modulation •Coding **Tentative based on future budget
Advanced Studies: •RF Propagation Studies •Ionospheric Products	

SCaN Technology Development and Infusion Flow



SCaN Technology Process

There are three major components of the SCaN Technology Management process:

- **Planning** –
  - Seeking transformational technologies (technology "push")
  - Performing needs assessments and identifying associated required technologies (technology "pull")
  - Evaluating and selecting technologies, and updating the Integrated Technology Plan

- **Execution, Reporting, and Evaluation** –
  - Performing, reporting, reviewing, and managing ongoing technology development activities

- **Budgeting** –
  - Preparing the annual budget material
  - Advocating for technology activities funding

SCaN Technology Planning

Technology Development Identification

- Hold workshops if needed
- Assess current technology development
- Assess future capability needs
- Review SCaN priorities
- Receive/provide input regarding technology recommendations

Determination of Development Approach

- SBIR Program
- Other Mission Directorates
- OGA, Industry, Academia
- SCaN Centers

Concept Proposal Evaluation and Selection

- Technology Advisory Group selected
- Develop proposal evaluation criteria
- Assess proposals
- Rank proposals
- Submit recommendation to Director of Systems Planning for final selection to be included in the next PPBE budget cycle

Task/Project Plan Development

- Notify proposal awardees
- Develop contract/ MOU/MOAs if necessary
- Task/Project plans developed
- Negotiate final work plan
- Update Integrated Technology Plan

SCaN Technology Execution, Reporting and Evaluation

- The task/project manager or PI executing the task or project plan provides monthly status reports to the Technology Manager including accomplishments, planned activities, and any problems, issues or concerns needed to be raised to the Program level.

- The Technology Manager reports monthly status to the DSP and quarterly status to the SCaN Program Manager.

- Mid-year and annual reviews are held for Center technology development tasks to evaluate progress.

- Technology demonstration projects follow 7120.5 review process for evaluation.

- Key Decision Point Reviews may be held if needed to determine if and when a technology development activity will continue based on pre-defined criteria.

- The outcome of the evaluation reviews provide data needed to determine if the task or project will continue to be funded in the next budget cycle

SCaN Technology Budgeting

- The results of the Technology Planning Process and the Evaluation Process are used to formulate PPBE SCaN guidelines for the next budget cycle.

- The Program Requirement Guidelines for the Centers define the Center work that will be funded by the Technology program

- The Centers present the formal budget submittal for the work to SCaN

- The budget for the work is packaged and submitted to the SCaN Program Manager for approval

- Any over-guides that cannot be funded by the SCaN Program Manager is presented to SOMD Director

- Final budget is approved and marks are given to Centers for the beginning of the new fiscal year

SCaN Technology Infusion and Commercialization

- All participants in the SCaN Technology Program work to facilitate the infusion process by ensuring that the end users are engaged throughout the life of the development activity

- Stakeholders are involved by:
  - Participating in the technology development identification process
  - Participating in Technology Planning Workshops
  - Serving as members of TAGs that evaluate and recommend concept proposals
  - Attending and participating in all SCaN Technology Function reviews

- Technology developed within NASA at the Centers, JPL, and APL are encouraged to work with industry to begin the eventual handover process. This will endure that Stakeholders will have a capable vendor when needed.

Lessons Learned and Conclusion

- The Technology Management plan was developed with the Center Technology Managers, technology developers, rep from the Office of the Chief Engineer and internal SCaN personnel. This helped ensure participant buy-in.

- Processes were tested for a year before baselining plan

- We will continue to assess and improve the plan and processes as needed

- Engaging stakeholders and end users early in the technology development is critical to ensure infusion into operations

- Most, if not all, technology must be demonstrated in a relevant environment before being accepted by the end user. Funding for the demonstration must be planned well in advance.

- The SCaN Technology Management Plan was baselined March 2010 and is available upon request