

## BREAKOUT SESSION 15.

### SPACE COMMUNICATIONS AND NAVIGATION

**Concern:** Does Simulink play a role in the development of your communications? One thing seen consistently, ask for cutting edge technology and think that some currently technologies probably can't be improved? Quality of the tools you use to develop your systems. No requests for making the tools we use right now to make them better.

**Response:** Charles mentioned we just did an industry study to see what architecture might look like in 15 years. Tools you're suggesting to model the current architecture is something we would do to see if that's a path we want to go down. Would really like more of a modeling tool on how to improve the system.

**Concern:** Any specific operating voltage for the high amplifier for subtopic 14?

**Response:** We did not specify as they have a wide variety.

**Concern:** What we would propose would complement and existing project, and maybe leverages a lot of things but requires a lot of changes to the plans, would it be better to submit or do a demo?

**Response:** They're judged individually and viewed on the technology basis. Depends on what system you'd like to integrate with.

**Concern:** What are the plans for the Scan test bed and follow-up? We heard Scan testbeds for 2018 but there are no further plans?

**Response:** We are phasing it out but the product itself is being phased into product comm. But the call doesn't call for that specific hardware. It's not the formal testbed that it was before.

**Concern:** There's talk about far future, what's NASA's vision and how does a small company fit into that?

**Response:** Researching it as a future distribution. It's on transformational stuff, but we're always interested in new tech.

**Concern:** Small sats and cubesats, is there any communication issues that arise from the smaller architecture?

**Response:** There has been some concern on whether they have a mother spacecraft that does all the comm. But we haven't specifically addressed how we navigate or communicate much. We need to talk about the communication needs before we fly. Could be in future solicitations.

**Concern:** If you have any applications for anything higher than K-band?

**Response:** We've underutilized it and we're not going towards it right now.

**Concern:** Interplanetary guidance, is there interest in autonomous spacecraft? Autonomous maneuvering? How is Scan organized right now? How does the portfolio of tech get developed?

**Response:** Yes, there is a call for autonomy in all regimes. Low space craft and more in the future. Yes for movement. Scan does not directly operate the space missions that use these things. We do have a few missions where we're trying to develop tech, but generally we don't do the end product tech. Sometimes they buy other tech and try to infuse our tech into it. We do have a technology development unit. Also everything has to be compatible with our network.

**Concern:** If you continue to use the 50/50 wavelength to other planets and deep space, is the transmission ever going to be required at such a high power, is that something that we will need to block?

**Response:** Have not done the calculation but we're talking about 10 watts. But we have to have a beacon at a high altitude and it's really the outbound beacon that is the problem.

**Concern:** Are there any plans on how telehealth and telemedicine communications would bridge into the current infrastructure?

**Response:** Whatever system is developed now just has to be able to support that. There are certain requirements on ISS that we would have to meet. Human spaceflight has a lot of requirements that we have to meet. We have to take the personal safety of the astronauts into account and we have to follow the laws for that.

**Concern:** Communication high temperature requirements?

**Response:** We don't have any right now, we were looking into it a bit, but it's a very limited case so we don't have any general requirements for it. We're trying to satisfy a lot of different programs, people, and agencies. If we didn't put it in the call, we may put out an extra example. We may have a call for specific types.

**Concern:** Are you looking for point to point communications?

**Response:** Many of our users don't want to do the pointing. Especially the users that do the low rate ones. We're looking to evolve those.

**Concern:** In terms of space surveillances are there different forms?

**Response:** Scan does radio metrics. Surveillance is more of a DoD thing.