Constellations Podcast

Episode 121 – Improving Space Mission Infrastructure, Leveraging Industry Innovation, and Commercial Opportunities with NASA

Speakers: Eli Naffah, CSP Formulation Manager, NASA Glenn Research Center – 14 minutes

John Gilroy: Welcome to Constellations the Podcast from Kratos. My name is John Gilroy, and I'll be your moderator. Today, we welcome Eli Naffah, he is the Communications Services Project Formulation Manager for the NASA Glenn Research Center. We are going to talk about the NASA Glenn Research Centers Communications Services Project or CSP. The CSP will demonstrate the feasibility of commercially provided SATCOM services for NASA missions with long term goals of acquiring future commercial SATCOM services and phasing out dependency on NASA owned and operated communication systems. Through CSP, NASA aims to bolster American Industry reduce the cost of communication services and maximize interoperability between government and commercial service providers while promoting a diverse and growing commercial market with us today.

John Gilroy: With us today again is, Eli Naffah, he is the Communications Services Project Formulation Manager. Eli has been with NASA for over 15 years and with its Communication Services Project for the past two. Eli, there's been a great deal of talk around NASA, preparing to return astronauts to the moon and travel deeper into the Solar System. As their focus travels further out, NASA seeks to enhance near earth operations through partnerships with commercial satellite communications providers or SATCOM. Can you tell us what is meant by near earth operations?

Eli Naffah: We're focused on operations below geostationary orbit. There are different definitions for near earth that could go as far as the moon and beyond but the focus for CSP is GEO and below. So the missions that would tend to be operating there would be our earth observation missions. I might have some astrophysics, potentially heliophysics, a commercial space station for example and launch vehicles as well. There could be some balloon activity as well as aircraft that could be serviced.

John Gilroy: So this is normally contrasted with what then? Near earth contrasted with what kind of services?

Eli Naffah: Typically it's the services that are being provided by our space network and near earth network. That's now called the Near Space Network. So we're really looking at those services right now. The deep space network is not really on our table right now because they are very much more unique and we're very much

focused on the fact that there's a lot of activity going on in that region of space commercially, and there's a lot of infrastructure that could support these types of services to NASA.

John Gilroy: Boy, all kinds of activity these days, both close to earth and far away from earth. So what is NASA's Communications Services Project or CSP? We mentioned it earlier. So why is it needed and what are the goals?

Eli Naffah: As you stated, the goal is to demonstrate the feasibility of commercial SATCOM. NASA's been going through an evolution since the early 2000s with commercial cargo; the Commercial Orbital Transportation System, commercial crew, most recently the Commercial LEO Destinations, and now the Communications Services Project. And so there's an evolution here to really get out of the business of operations and the infrastructure required and associated with maintaining those operations in low earth orbit. Allowing industry who is really positioned to do it well and to take advantage of the investments that industry has made as well as the innovation that you get with going with industry and eventually free up NASA to really focus on doing those things where industry is not as pre-dominant, such as exploration and focus on science.

John Gilroy: You're based in the Glenn Place, right near Cleveland, near the airport in Cleveland, they've been around for a long time, and this is nothing new for the Glenn or the Lewis Research Center to partner with commercial companies it's part of your heritage?

Eli Naffah: It is. It's Glenn's heritage to work with the industry, especially in SATCOM. Dating all the way back to the '60s when we opened up television broadcasting and most recently, in the late '90s and 2000s, we had the Advanced Communications Technology Satellite where we really opened up a lot of the industry capabilities that right now we want to leverage. So in particular with broadband, a lot of what they're trying to do with the internet now, routing in space, all of those things were enabled by Glenn working with industry. And really there was an explosion of investment and jobs that came out of that and so now that industry is poised to provide all these services to the terrestrial markets, land, sea, and air. We believe that that infrastructure can be leveraged to provide those services to NASA missions, mainly spacecraft in low earth orbit.

John Gilroy: I mentioned this heritage that you're sitting out there at Glenn, but this program we're talking about today, the CSP, this is relatively new. Only grown for a couple years, I think. And so more, better, different benefits? What's the special sauce that you can provide with CSP?

Eli Naffah: Well, CSP was created, we kicked it off in 2020. It leveraged a lot of studies that the space communications and navigation program did early on, looking at commercial architectures and commercial communications. So we really kicked

off an earnest with the Communications Services Project at that time and last year, we put an announcement for proposals out that we're in the middle of evaluating at this point to begin our Phase Two. So, our Phase One effort was basically understanding NASAs needs, mission needs and quantifying that, and then understanding what the industry capabilities are. We came to the conclusion that there was ample industry capability out there to serve NASAs needs and we put an announcement out for demonstration opportunities. We realized, right now there is no commercial service that we can go out and buy that will replace all of the services that we have now through CSP and the near earth network.

Eli Naffah: The idea was that we're going to need to close some gaps. It's all high TRL for the most part, high technology readiness levels, but the systems are geared for the terrestrial users. So seeing if those systems can be geared for space based users is really what we're trying to do. And really, to be honest with you, we need to demonstrate this as much to the NASA Missions as we do to industry. That reliable and robust space communications and navigation can be provided commercially, as opposed to through our traditional legacy networks.

John Gilroy: Eli, thousands of people from all over the world have listened to this podcast. Go to Google and type in “Constellations Podcast” to get to our show notes page. Here, you can get transcripts for all 100 plus interviews. Also, you can sign up for free email notifications for future episodes. Eli, you mentioned this CTS program, and I think that began in the '80s. And there's a timeline here. I mean, you're looking at a window here, I think the mid '20s, when you're going to have to make some kind of a change, is this one of the motivators for you looking at these different aspects?

Eli Naffah: Yes. In fact, we needed to take a look at being able to do this by around the 2027 timeframe. To be able to have some commercial services available. And it's not like we would flip a switch and then all NASA Missions would go to commercial services. What we're talking about here is new missions. And so new missions typically need to know what the comm. system and comm. architecture is going to be like, what kind of services can be provided, what the terminals are going to look like and how it'll interact with the spacecraft so they can design their mission with that in mind and so we're talking about having a capability available to missions that are in early lifecycle phases. So that by the 2030 timeframe, we can have an actual operation, commercial services operation, beginning with the NASA missions. If that makes sense.

John Gilroy: Eli, you're sitting in Cleveland at 16 degrees, you're kind of freezing your toes off there and let's look in the spring time, three or four months down the road. So what can people listening to this expect from the program around the next few months?

Eli Naffah: Well, in the next few months we'll be awarding the demonstration contracts or agreements, they'll be very much in the way that it was done with the Commercial Orbital Transportation System and commercial crew in the beginning where they did demos using Funded Space Act Agreements. So what we're building are public-private partnerships where NASA and industry are both investing in developing the capability and then demonstrating it. And so in the spring, we'll be making an announcement of the awards that we're making and what those demonstrations will be over the next few years.

John Gilroy: We kind of spoke in general about this public-private partnership here. Can you maybe give some examples of commercial SATCOM companies that you're partnering with today?

Eli Naffah: Well right now we're in a blackout period. And so, for me to talk in any detail about the types of companies would probably not be wise.

John Gilroy: Don't want you to get in any trouble here, Eli!

Eli Naffah: Yeah. I can say that we're looking for companies that are interested in providing communication and navigation services to NASA Missions. That's the key and I believe that there is a lot of interest out there and capability in doing that.

John Gilroy: So, the capabilities you're looking for in a company, is it this general communication thing? Is it cloud-based services, is it different types of services, or what kind of services are you looking at?

Eli Naffah: Yeah, so I'm sure the cloud plays into the delivery of the data on the ground. Obviously, there will be terrestrial networks involved. The specific services that we're looking for, we've defined them in a number of categories that are in our announcement for proposal. There's the terrestrial support, like the high-altitude balloons. There's launch and early operations phase, these are short duration missions, like commercial crew or cargo to ISS. There's launch support, there's low data rate routine missions, which are more long duration, lower data rate tracking, control, and telemetry. Then there's the high data rate routine mission, that's the return of the science data, and then there's the ability to do contingency services as needed. So, those are the kind of the categories they fall into and so those are all of the services that we currently get now out of the NASA legacy networks, which are operated out of the Goddard Space Flight Center.

John Gilroy: Boy, that's a pretty big laundry list of activities. There's some launch, terrestrial support, contingency plans. Seems like multiple industry partners, doesn't it?

Eli Naffah: It is anticipated that we will have multiple partners. We're not really looking, at least from the demo standpoint, we're not looking for any one particular

company to be able to do everything. And really, the way we put our announcement out, we were really looking to find out what industry was interested in doing, based on the capabilities that they had and their business interests. So what we're getting back in the proposals is really what industry would like to do and we're hoping that by working with multiple industry partners that we will be able to address all of the needs eventually.

John Gilroy: You know Eli, I've been doing this for a while, and it's always difficult to talk about public-private partnerships, but I think the start was understand NASA, then understand the different vendors that are out there and move from there. So, I think you've done a fantastic job of detailing commercially provided SATCOM capabilities for NASA missions and I am sure our listeners really appreciate it. I'd like to thank our guest Eli Naffah, Communication Services Project Formulation Manager for the NASA Glenn Research Center. Thank you, Eli.

Eli Naffah: Oh, thank you, John. It was a pleasure meeting you and talking with you and I'd just like to leave you with this message. I believe industry is capable, they're motivated, and NASA is committed. Look for our announcement to come out in the spring on the next step, which will be the capability development and demonstration phase.