Report from Surface Power Monthly Meeting
June 2020

Quantitative Info

79 total attendees. 70 attended via the Zoom app, 9 attended via dial-in.

Notes

From Discussion

Longform discussion notes on page 3

Recommendation for folks to view presentations from Kickoff if they weren't able to attend (available here: http://lsic.jhuapl.edu/)

Ray's Contributions:
- Wes and Ray are discussing how to integrate Ray's STMD activities with LSIC work
- Strategic technology plan in development at STMD that encompasses SMD and HEOMD, looking at identifying gaps and how to close them, which LSIC can work towards
- Potential goals outlined by Ray:
  - Will use LSIC as a conduit to wider lunar surface community (gov't, industry, nonprofits, academia)
  - Looking to leverage LSIC with an interagency advanced power group (all federal agencies funding power technology)
- Centennial power challenge is another great avenue for LSIC (stimulating new ideas for lunar surface power), LSIC can broadcast what NASA is trying to accomplish
- Creating interchanges to keep stakeholders informed about development
- Announcement for centennial challenge anticipated in the fall / September
- One key avenue for identifying challenges / gaps will be actual work on the lunar surface, getting data / feedback in situ

STMD Advanced Power Systems Strategic Technology Plan should be available around September

Lots of discussion about the need to specify existing needs, response is that the purpose of the Surface Power focus group is to begin by gathering information from all stakeholders, information from NASA, bringing these together to get a fuller picture of available technology, current needs, and rating level of urgency

Documents should be shared either by sending to Wes or by sending to the listserv while the approved tools are set up through LSIC

From Chat

Chat transcript on page 6

Suggested goals:
From Chat:
Goal: Development of scalable power systems - kilo power to megapowercapabilities. (Clive Neal)
Goal: Development of Hydrogen and Oxygen liquefaction technologies. (Jacob Chancery)

Discussion of wiki and collaboration tools

Need to follow up polls outside Zoom, NASA participants cannot vote via browser

Question re: power challenge details - see July LSIC newsletter for details

Longform Discussion Notes

Clive – I don't know how many folks were at the LSIC kickoff, but if you didn't have an opportunity to be there, I don't know if that info is already up on your website but for folks who didn't get there, it was a great opportunity put together by APL - I'd recommend that to everybody.

Ray – It's been my pleasure to work with Wes as this begins to spool up, and I understand that there's been a lot of activity on the APL side of things over the last few months as he's gotten on board. At the same time, Wes and I have continued a dialogue to understand how we can integrate his activities and the activities I'm supporting at STMD. I'm going to go through a few of thoughts but going to start with large amount of work that's ongoing in STMD to develop strategic technology plans for each of the areas. So there is one titled as advanced power systems, the whole idea behind that is for us to be able to link into the human exploration side of things, as well as the science mission directorate. So being able to tie into those architectures and identify gaps STMD needs to work on, and close those has been a big activity going on in parallel with this. Wes and I have been involved in getting them to be a part of the review of those gaps and help in terms of our roadmaps that we're putting together to show how we can close those gaps. We've talked about utilizing LSIC as a means of, once we get to the right point and get the go ahead from the wider community, reaching out through APL and the LSIC's effort to other government agencies, industry, nonprofits, and academia.

Ray – The other thing that I've been involved with for a long time that will also be of use to the LSIC is the interagency advanced power group. That involves all of the federal agencies involved in funding power technologies. Meets to interchange information relevant to technology, and it's there to help us explore how we collaborate together. There's a great opportunity here for the IAPG and LSIC effort at APL to work together.

Ray – Another that is potentially great is the centennial power challenge. NASA initiated that over the last year, and the idea is to stimulate new ideas for lunar surface power. I think there is a really good opportunity to kind of reach out and broadcast what NASA is trying to accomplish with that and find the right method of disclosure to both get willing participants as well as being able to link some of those products and spread the information as work continues on it.

Ray – The last item was a discussion that Wes and I have been having. It's going on in parallel internal to NASA as well. Includes a lot of STMD funded technology and the different mission centers. I'll give you an example with Marshall Spaceflight Center with their lander work. We've initiated a whole method of interchange to keep them abreast of the latest work being funded through STMD in each of the power related areas for components, as well as systems. Been talking about using APL as a means to broadcast beyond the NASA centers, but get this out to all the folks that would be involved and interested in understanding where NASA is with each of the technology gap closure areas.

Clive Neal – Where can we find the STMD Advanced Power Systems Strategic Technology Plan? Is it in the current NASA strategic plan?
Ray – There's a whole series of these technology plans being done in STMD and they're all still in the internal working stage, so we have a few more months to go before the info would be released, say through the LSIC. At least in the power area that's what I'm looking at being able to use to disseminate. But that will occur sometime in the September time frame.

Gary Barnhard – Power & Ancillary Services Beaming & Cislunar Utility Interfaces fall in the STMD portfolio?

Ray – Will be in the STP. Will be info where we see the gaps and where we see investments to be made to narrow those gaps and where we see those as appropriate in the different architectures. I'm assuming, Wes, that the chat thing is something that would get responded to later or while we go through this today.

Angeliki Kapo – When will the power challenge start and for how long and what will be the prize in USD?

Ray – I think perhaps Monci Roman from the Marshall spaceflight center might be on – could Monci say a few words if she's on? Perhaps she's not on. All those details are being developed now, so the current expectation is that the first announcement for the centennial challenge will be in September. They are working on the best way to do that. One time it would've been done as a meeting, but it may well be a virtual event. There will be info in that first meeting that will identify the prizes as well as the rules and other things, and those are all being worked actively to try and get it all done for the September timeframe.

Clive Neal – Ray talked about strategic knowledge gaps in power arena. Could he give a brief summary of what those gaps are to focus us into what we need in these next steps. I'm looking at this list and we need to provide input on the next topics. What does the client, i.e. STMD, actually want. It would be good to focus to take these steps.

Wes – To that end we have – we're about halfway through, and we have basically coming up on the next slide what will be our focus group goal, then we'll talk about existing in the context of other technologies, we're going to go in and get to that additional detail that a lot of people are hungry for. Identifying that target is very important. Following this first focus group meeting we'll have an opportunity to address some of those specific topics in the next session.

Ray – as well ok to the gaps we're trying to get to a level to understand what's needed to close that gap. In some cases that could be knowledge, in some places that can only be closed by getting more work done on the surface of the moon where we've got data that can feed back to close that appropriately. The thing that makes the whole strategic technology plan development difficult is to try and get this not only just for power technology but across the other areas as well. So we are going to get to a certain capability in the September timeframe. I don't want to say as everyone on the telecon knows, this is a continuing process as we go forward, so we're going to have a capability to get something out for folks to review, but there will be an opportunity for a lot of feedback especially as we begin to understand strategic investments that need to be made and how to prioritize those for near-, mid-, and far-term. We have different ways to capture that information, one of which is knowledge.

Clive – We're looking at next steps. I assume STMD has a couple of things that they have highlighted to say this is critical to get input on now. For example, if we're going to use the resources there from the lunar ISRU workshop last year, power is essential. Scalable power will be essential. I think this group getting the knowledge base that we have from the participant list – we've got a lot of knowledgeable people to give input to those immediate next steps. Getting at least those to this group would be very important for moving things forward in a timely manner.

Ray – I wouldn't disagree with anything that you're saying. Part of what Wes is trying to do is make sure that this gets focused in the right way to give people the opportunity to make those inputs. On my side, working with Wes it's how do we take that information and get it invested into what STMD is doing in the right timeframe. We've got a ways to go here.

Gary – Part of my concern is that having been tilting at the power area in earnest for the better part of a decade, there seems to be a schism between what STMD thinks matters, what HEOMD thinks matters, then both at HQ and at centers, as well as what seems to matter to our commercial partners. As well as with the Air Force. What I pasted into the chat are the three mission development areas that we currently have in integration, and we'd be happy to share with the group. We need to – get to a level of specificity where we're developing / understand what's going to make a different / what's going to matter. To being able to provide the necessary utilities.

Ray – So Gary, I think your criticism is accurate. There – we, prior to the strategic tech plan development what was put in place was an activity called STAR (Strategic Technology Architecture Roundtable) And the whole reason for that was to pull together SMD, HEO, and to some degree the aero world as well, there is working investments in the aero world that could be very – provide a good collaboration. That whole STAR activity was put in place to address that issue. To some degree that's internal to NASA, and the issues relevant to commercial are also really important. We understand we're in the 21st century and NASA is evolving both with LSIC and internally. There's a ton of discussion relevant to commercial, and how we work with the commercial industry to make the investments in the right ways and capitalize on…

Gary – There are power and ancillary services requirements that are going to be met to serve customers. How do we get there in the most reasonable manner orchestrating the available resources, insights, and knowledge base. All the different actors. This cannot be a sandbox. One of the things that was driven out by the folks speaking from senior management at the workshop was that NASA was prepared to do things differently this time.

Ray – Gary I'm sorry for interrupting. We would not be making the investments at APL if we didn't want to make this happen. This activity you're seeing happen exists because of that.

Gary – I was told that NASA is prepared to engage. We're putting our commercial money where our mouth is and our partners want to do it as well.

Wes – This is highlighting the need for next steps to get involved with each other. To this point, some of this is chicken and egg, we need to be informed by these other communities. If we want to get these requirements, we need to be informed by all of the users. That's part of what we have with focus group facilities on here right now. When you think about 'how do we drive requirements for ISRU',…how much and how far are we going to push this power. There's similar needs across these focus groups. There is some insight into how we can get to at least some of these things by reading this report – a 13 page doc here, I could even post it or you could google this (plan for sustained lunar exploration and development). They mention the LSII and state this line right here.

In the meetings in the future, this is where we can explore this further. Thank you all for joining.

Gary – How do you want us to share docs?
For now email is appropriate, but for the LSIC website there will be resources, you let us know what is most important to have available in a more visible site rather than just those.

Koorossh – With respect to sending an email to all the participants, it would be more efficient if folks want to send comments to you and you can screen those comments and you can summarize those in one email rather than trying to reduce the amount of emails we might get. It's going to overload our mailbox. Just – it would be good to send it to you and you can coordinate it. Maybe some of them are redundant, and you could send the one email, that will be more efficient.

Wes – happy to do a weekly email blast of summary of things that are going on in particular.

Complete Chat Record

Reeve Heinis : Hi Rob, nice to have you.

Reeve Heinis : *nice to have all of the Robs!

Clive Neal : Goal: Development of scalable power systems - kilo power to megapower capabilities.

Jacob Chancery : Goal: Development of Hydrogen and Oxygen liquefaction technologies.

Rachel Klima, APL/LSIC Director : This will not be visible to those connected through a web browser, so folks who cannot see it can answer here as well

johnsg : development

Paul Van Susante : can we do both?

Craig Peterson : Our power needs led us to develop a unique solution to meet those needs.

johnsg : 3 to 4

Wesley Fuhrman (APL facilitator) : Content from the kickoff is on the LSIC.jhuapl.edu website

Clive Neal : Where can we find the STMD Advanced Power Systems Strategic Technology Plan? Is it in the current NASA strategic plan?

Angeliki Kapoglou : When will the power challenge start and for how long and what will be the prize in USD?

Gary Barnhard : Power & Ancilliary Services Beaming & Cislunar Utility Interfaces fall in the STMD portfolio?

Gary Barnhard : Question for Ray Beach

Rachel Klima, APL/LSIC Director : for those on browser options are: Sloack; google chat; lattermost; microsoft teams; discord; nothing beyond email

Rachel Klima, APL/LSIC Director : Slack, rather

Rachel Klima, APL/LSIC Director : yikes, and Mattermost

Rachel Klima, APL/LSIC Director : trying to type without looking

Brad Thomson : Does the email listserv have an option to receive digest only? I find that a key method of keeping email volumes reasonable

Rob Button : Email and MS Teams

Rachel Klima, APL/LSIC Director : Wes: I recommend you follow up on this kind of poll afterwards, because NASA folks who are on via browser cannot vote and they have restrictions

Koorossh Araghi, NASA JSC : Wes, NASA folks who are on via browser cannot vote.

Gary Barnhard : These are areas that XISP-Inc are working with NASA HEOMD, Commercial Partners, and AFWERKs contacts on . . .
• Power and Ancillary Services Beaming (PASB)
• Interoperable Network Communication Architecture - Applications (INCA-A)
• Cislunar Utility Technologies, Integration & Interface Standards (CUTIIS)

Paul Van Susante : sorry, got to leave early, my truck with 14,000 lb of simulant is arriving a day early... gotta love logistics

Paolo Venneri : When can we expect to have access to the wiki and other collaboration tools?

Rachel Klima, APL/LSIC Director : For now I would say email

Jessy Kate Schingler : Thank you for hosting :)

Michael Mealling : digest mode does that well

Richard Howard - ORNL : Thanks Wes.

Karl Hibbitts : Nice Job Wes!

Paolo Venneri : Thanks!

Mike Smith (ORNL) : Thank you.

Rob Versteirt - ENGIE : Thanks