NENG SRR Review

Action Item (AI)

Originator: Philip Baldwin	**AI # 2**
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Ref. Slide:	**Date:** 07/08/2015

Short Summary:
Requirements on high-speed missions.

Problem/Comment:

Conduct a follow up discussion with Scott Schaire about driving requirements for the NENG Phase II system. Show rationale, goal, objectives, benefits to the NEN. Consider the following (submitted by Scott): The NENG shall provide auto failover capabilities - There has been zero data loss data loss and 0 operations failures since IRIS Launch (27June13). Why would we spend money to increase proficiency/availability? The NENG shall ingest spacecraft telemetry data at 1 Gbps - The requirement to date has been 13Mbps. The current capability is 600 Mbps. Why would we spend money to increase data rate unless it could serve as a Ka Band Gateway at 4 Gbps? The NENG shall run automatically based on an ingested NENSE (Near Earth Network Schedule Engine) schedule file (M&C is status only) - The benefit of this feature is unclear. Do we really need anything to keep working if the ACU and other boxes controlled by the M&C system are down?

Proposed Resolution:
Provide rationale for higher rates.

Assigned to: Salem El-Nimri Salem.F.El-Nimri@nasa.gov	**Assigned Date:** 07/13/2015

Resolution:

Since the SRR the NI-SAC/NISAR mission has been added to the NEN forecast. Based on the NEN mission forecast, NI-SAC data rate is 4Gsps which is the highest data rate that NEN Alaska Station (AS) Ka-band is required to support. NI-SAC is a joint mission between NASA JPL and Indian Government that the launch date is planned in the 2020 time frame. The signal scheme is SQPSK Rate 7/8 LDPC coding using dual polarization. The 4 Gsps rate will be achieved through two channels, each with 2 Gsps while one channel is RCP and the other is LCP. After decoding at the ground station removing the 7/8 LDPC coding overhead, the science data down link rate including CCSDS overhead will be 1.75 Gbit for each channel. The effective total data rate will be 3.5 Gbps. The AS station will require two high rate 2 Gsps receivers (RT Logic T1200) to support the NI-SAC mission. A coverage analysis has been conducted to determine the total daily volume based on number of passes for the AS station Passes/Day: 12.17

Average Duration: 5.3 min/pass Total Daily Coverage: 64.3 minutes = 3858 seconds Assume a 10 degrees antenna elevation For 3.5Gbps, the total daily volume will be 13503 Gbit or 13.186 Tbyes. Note: 1Tbyes = 1024 Gbit. Nen to discuss this with Scott Shaire.
Close Authorization:  **Closed Date:** 08/28/2016