Standardized Payload Hosting



on

THALES Space Inspire

SESNext GEO Satellites

24th Annual Small Payload Ride Share Symposium 14 September 2022



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- 1. SES Corporation
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SES is World's Largest Satellite Owner/Operator

GOVERNMENT SOLUTIONS



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Hosted Payload

Launched

Launched

Launched

Launched

Utilization of available capacity on commercial satellites to accommodate additional transponders, sensors or other space bound items

Industry Leader: Three U.S. Government Hosted Payloads

- ▲ Wide Area Augmentation Systems (WAAS)
 - Award date: 25 March 2015
 - Customer: FAA
 - Launched on 18 May, 2017
 - Mission: Global Positioning Systems air navigation aid
- Global-Scale Observations of the Limb and Disk (GOLD)
 - Award date: April 2015
 - Customer: NASA
 - Launched: January 25, 2018
 - Mission: Sun-earth data collection
- Commercially Hosted Infrared Payload (CHIRP)
 - Award date: May 2008 (on orbit ~3 years from contract award)
 - Customer: U.S. Air Force
 - Mission: Experimental Infra-Red payload met all objectives at a fraction of the cost of a free-flyer satellite
 - Pathfinder effort to resolve policy & security issues
- European Geostationary Navigation Overlay Service (EGNOS) for the European Commission



- 1. Schedule (Launch Period)
 - Matching payload / sensor availability with program build schedule
 - Action plan in case of late hosted payload delivery
- 2. Suitable Longitude
 - Most NASA programs required CONUS field of regard
 - NASA may execute extensions to EOL of sensor or spacecraft
 - Spacecraft location reassignment with conditions
 - Teleport support (antenna and rack availability)
- 3. Spacecraft Bus Design (Technical)
 - SWaP, Data Rates, Thermal
- 4. Financial (Business Case)
 - Fair share versus delta costing very different outcomes
 - Charge for data downlink

SES Hosted Payload Accommodation Considerations



Requirements Accommodated	CHIRP	WAAS GSP6	NASA GOLD	WAAS GSP7	NASA TEMPO	NASA GeoCarb
<u>S</u> ize	\checkmark	✓	✓	\checkmark	\checkmark	\checkmark
<u>W</u> eight and	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Power	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Data Rates	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Thermal	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Longitude	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Launch Period	\checkmark	\checkmark	\checkmark	X	X	X
Business Case	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
HOSTED?	SES-2	SES-15	SES-14	No	No	No

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Thales SPACE INSPIRE* Standardized Hosted Payload Envelope **SES** on SESNext Satellites





INSPIRE = INstant SPace In-orbit Reconfiguration

First two SESNext Spacecraft: SES-25 at 19.2°E, SES-26 at 57°E co-launching 4Q2024 – room available for your payloads



- 1. Spacecraft Procurement Management / Launch option
 - Contracted support from NASA (commercial procurement model)
 - On-site procurement engineering (design, build, test, launch prep)
 - Launch and launch site support (launch readiness)
 - NASA Sensor integration and both ground and in-orbit test
- 2. Teleport & IOT support
 - Worldwide teleport / fiber network / orbit raising operations
 - IOT support (~test consultants working with spacecraft and instrument manufacturers)
- 3. Spacecraft and Hosted Payload Operations
 - Spacecraft Operations Center
 - Spacecraft housekeeping and sensor reconfigurations
- 4. Slot Provisioning
 - Co-located in slot where SES has spectrum filings
 - Data downlink in-band with SES licensing
 - FCC licensing of space terminal held by SES



- 5. Ensured Data Relay
 - Downlink capture at SES Teleport (antenna and data rack)
 - Terrestrial data relay (commercial fiber to NASA / PI data center)
- 6. Manufacturer Interface / Customer Support
 - Working relationship with satellite manufacturer for life of contract
 - Spacecraft health trending
 - Anomaly resolution
 - Identified point of contact for USG including escalation plan
- 7. Spacecraft Retirement
 - Safely retire / decommission spacecraft at EOL in accordance with FCC and ITU guidelines

Recent NASA solicitations have requested slot hosting services



- Value to SES
 - Capture of additional "hosting" revenue from non-SESNext payloads
 - ✓ Maintaining fully-funded program management factory presence
 - Acceptable margins for operations (delta cost very small)
 - Holding GEO orbital slots
- Next Steps
 - Find candidate payloads
 - Payloads compliant with Thales IRD can be integrated up to 4Q2023

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