



## Systems Engineering

### Highlights

### Science Data, Systems and Applications

GST possesses extensive experience in satellite space and ground systems engineering, serving both the US Federal government and international weather organizations. GST System Engineers adhere to the two primary industry-standard process baselines: the NASA Systems Engineering Handbook and the INCOSE Systems Engineering Handbook. These handbooks provide essential guidelines on core competencies, structured processes, and the enabling infrastructure necessary to successfully build, integrate and operate complex systems of systems.

GST is an active and trusted partner in the project definition phase of satellite missions. GST is developing the test methodology for the next generation Geostationary satellite GeoXO scheduled to launch in 2032. GST will create spectral calibration algorithms for the GXS instrument using simulated lunar data and synthetic observations to rigorously test the lunar calibration algorithm, ensuring robust methods for future project phases.



GST developed an event-based streaming workflow processor specifically designed for generating weather small-satellite imagery in near real time. This system is engineered to handle an arbitrary number of asynchronous data streams, ensuring flexibility and adaptability. GST provided the Technical Processes to support the system definition and implementation phases of Weather Image Processing System (WIGS) for the US Air Force. The technical process of Configuration, Risk and Requirements management were established to manage the software baseline and cloud architecture. We established a verification process to provide objective evidence that the system's Initial Operating Capability (IOC) met 90% of all pre-launch verifiable requirements. The system features a black box design with three key interfaces and an event-based structure for flexible data handling. Prioritizing minimal operator intervention, it includes monitoring and auto-restart capabilities, hosted on AWS GovCloud for security and reliability.



GST employees perform electrical, computer, systems, and software engineering in support of the NASA ICE-Sat spacecraft instrument development and spacecraft operation, as well as programming for Earth-orbiting imager data operations, product processing, calibration, image geo-location, data product archiving, and data product delivery.

GST was an architect of the NOAA Comprehensive Large Array-data Stewardship System (CLASS) design and oversaw the expansion of CLASS's archive capacity to meet the demands of the ever-increasing information holdings while consistently maintaining high system availability. GST worked closely with both NOAA and NASA to support new mission requirements, including analysis of the data types and necessary system changes to archive the campaign information upon identification of new data streams. The project achieved CMMI-DEV Level 3 which included the implementation of a process baseline that included 18 items. We led the security engineering and operations for the CLASS moderate impact system with over 200 FISMA controls implemented and managed over 500 systems.