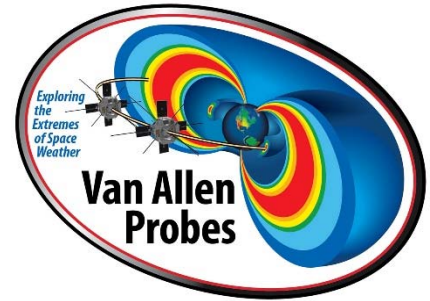


## Van Allen Probes Powered by GS Yuasa Cells Complete Primary and Extended Mission Operations

Roswell, Georgia, November 1, 2019 – NASA's twin Van Allen Probes, formerly known as the Radiation Belt Storm Probes, after 7 years in orbit have successfully completed their primary and extended missions. Having consumed the last of their propellant, both satellites have now received shut down commands from mission operators at the John Hopkins Applied Physics Laboratory (APL). APL designed and built the Van Allen Probes for NASA. GS Yuasa Lithium Power (GYLP) supplied the Lithium-ion cells which provided power through the eclipse phases of the vehicles' highly elliptical Mid-Earth Orbit. The conclusion of this mission marks the end of the first NASA program supported by GYLP.



Launched on August 30, 2012, the primary two-year mission tasked the satellites with gathering scientific data from a region around the earth avoided by most spacecraft and astronauts due to intense radiation harmful to some materials, electronics and people. The APL spacecraft engineers designed probes and instruments that are "hardened" to continue working even in the harshest conditions. The Probes provided critical insight to the workings of the Earth's radiation belts, with the resulting scientific data being analyzed to assist in spacecraft operations, spacecraft and spacecraft system design, mission planning, and astronaut safety.



Each satellite contained a battery consisting of GS Yuasa LSE50 Li-ion cells (50Ah, 3.7V). The low inclination highly elliptical Earth Orbit (HEO) resulted in varying eclipse periods which lead to discharge profiles ranging from deep discharges 45% Depth of Discharge (DOD) to full sun seasons, with a nominal DOD of 12%. When it became known that the mission was going to be extended, APL consulted GYLP and, using GS Yuasa's internally developed empirical Cell Life and Performance Model, the capability of the cells to support continuing operations was confirmed. Throughout the primary and extended mission, the cells operated flawlessly. Even though the battery management electronics included end of charge cell balancing, neither Van Allen Probes Batteries required cell balancing throughout their 7-year life in HEO orbit.

GS Yuasa has manufactured more of the Li-ion energy storage capacity deployed in space than any other company and has done so without anomaly or failure. GS Yuasa has provided Li-ion battery cells for more than 190 domestic and international satellite programs supporting missions ranging from scientific to human-rated LEO to large GEO communication spacecraft.

For more information about NASA's Van Allen Probes mission, visit:

<http://vanallenprobes.jhuapl.edu/index.php>

### **About GS Yuasa Lithium Power (GYLP)**

GS Yuasa Lithium Power, Inc. is the United States subsidiary of GS Yuasa focused on large format lithium ion battery system manufacturing for US customers. Primary products are lithium-ion battery systems for aerospace, defense, commercial, and industrial applications. <http://gsyuasa-lp.com/>

### **About John Hopkins Applied Physics Laboratory (APL)**

For more than 75 years, the Johns Hopkins University Applied Physics Laboratory (APL) has provided critical contributions to critical challenges with systems engineering and integration, technology research and development, and analysis. Our scientists, engineers, and analysts serve as trusted advisors and technical experts to the government, ensuring the reliability of complex technologies that safeguard our nation's security and advance the frontiers of space. We also maintain independent research and development programs that pioneer and explore emerging technologies and concepts to address future national priorities. <http://www.jhuapl.edu>

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