

# Building the Nation's Next Generation Operational Polar-Orbiting Weather Satellite Scott C. Asbury, PMP



Poster #675

Ball Aerospace & Technologies Corp. – Boulder, Colorado

#### What is JPSS-1?

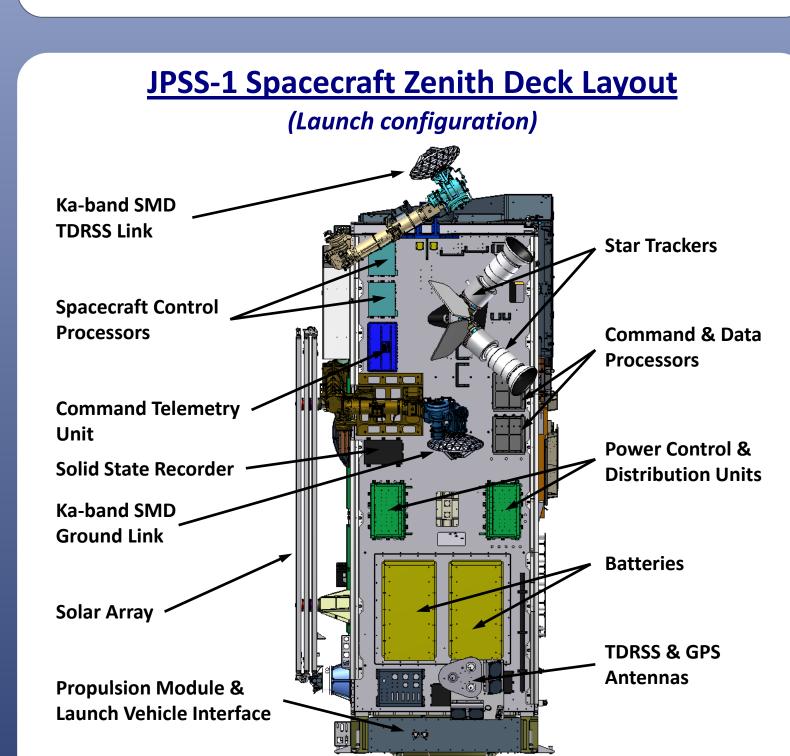
JPSS-1 is the Nation's next-generation, operational, polar-orbiting weather satellite being procured by NASA Goddard Space Flight Center on behalf of NOAA. The JPSS-1 spacecraft bus and its five instrument payloads are currently in full-scale production. Ball Aerospace is the provider of the JPSS-1 spacecraft bus, the Ozone Mapping and Profiler Suite (OMPS) payload and is the satellite integrator. JPSS-1 follows the successful Suomi National Polar-orbiting Partnership (S-NPP) satellite launched in October 2011. JPSS-1 will replace S-NPP after launch in the 2<sup>nd</sup> quarter of GFY 2017.

Keeping Americans safe from extreme weather events through storm tracking, enhanced weather prediction capabilities, and long-term climate monitoring is the cornerstone of the JPSS mission. The environmental monitoring which JPSS-1 will provide will advance weather forecasting and environmental prediction in many sectors, improving the ability of the public, Government, first responders, and businesses to plan for the future.

#### What is a Polar Orbit? Why Use a Polar Orbit?

❖ Polar orbits are ~90 degree inclination orbits, useful for spacecraft that carry out mapping or surveillance operations. Since the orbital plane is nominally fixed in inertial space, the planet rotates below a polar orbit, allowing the spacecraft low-altitude access to virtually every point on the surface.







# JPSS-1 is an **Enhancement** of the S-NPP Design

- ❖ Ball BCP-2000 spacecraft bus Planned launch 2Q GFY 2017
- 7-year mission life requirement
- Orbit: 824 km, sun-synch (98.7 deg), 1330L ascending node Observatory Mass (MEV): 1979 kg (dry)
- S/C Power (MEV): 1619 W (orbit average)
- 1553 & SpaceWire data networks Hydrazine propulsion system
- ADCS: 3-axis stabilized
- S-band Command & Telemetry Ka-band 300 Mbps Stored Mission Data link to ground network
- Ka-band 300 Mbps Stored Mission Data back-up link to TDRSS
- X-band High Rate Data direct broadcast @ 15 Mbps Same payload instrument complement as S-NPP

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#### **Advanced Payloads Provide Critical Operational** Weather Data & Long-Term Climate Observations

## ❖ Visible/Infrared Imager Radiometer Suite (VIIRS)

- o A scanning radiometer, collects visible and infrared imagery and radiometric measurements of the land, atmosphere, cryosphere, and oceans
- Cross-track Infrared Sounder (CrIS)
- A Fourier transform spectrometer with 1305 spectral channels will produce high-resolution, three-dimensional

#### temperature, pressure, and moisture profiles ❖ Advanced Technology Microwave Sounder (ATMS)

 A cross-track scanner with 22 channels, provides sounding observations needed to retrieve profiles of atmospheric temperature and moisture

## **❖** Ozone Mapping and Profiler Suite (OMPS)

- An advanced suite of hyperspectral instruments, extends the 25-plus year total-ozone and ozone-profile records Clouds and the Earth's Radiant Energy System (CERES)
- o A three-channel radiometer, measures both solarreflected and Earth-emitted radiation from the top of the atmosphere to the surface

# Joint Polar Satellite System Mission Architecture Ground Segment

