The NPOESS Mission: Instruments and Environmental Measurements

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The NPOESS Mission:Instruments and Environmental MeasurementsDavid L. Glackin, The Aerospace Corporation, Los Angeles, CA, USA 90009John D. Cunningham, NOAA/Integrated Program Office, Silver Spring, MD 20910Craig S. Nelson, General Dynamics Advanced Information Systems, Chantilly VA 20151 The NPOESS (National Polar-orbiting Operational Environmental Satellite System) program represents the merger of the NOAA POES (Polar-orbiting Operational Environmental Satellite) and the DoD DMSP (Defense Meteorological Satellite Program) systems. Established by presidential directive in 1994, a tri-agency Integrated Program Office (IPO) in Silver Spring, Maryland, has been managing NPOESS development, and is staffed by representatives of NOAA, DoD, and NASA. NPOESS is being designed to provide 55 atmospheric, oceanographic, terrestrial, and solar-geophysical data products, and will disseminate them to civilian and military users worldwide. The first NPOESS satellite is scheduled to be launched in 2009, with the other two satellites of the three-satellite constellation due to be launched over the ensuing four years. NPOESS will remain operational for at least ten years. The 55 Environmental Data Records (EDRs) will be provided by a number of instruments. The instruments will be hosted in various combinations on three NPOESS platforms in three distinct polar sun-synchronous orbits. The instrument complement represents the combined requirements of the weather, climate, and environmental remote sensing communities. The three critical instruments are VIIRS (Visible/Infrared Imager-Radiometer Suite), CMIS (Conical Microwave Imager/Sounder), and CrIS (Cross-track Infrared Sounder). Other instruments include OMPS (Ozone Mapper/Profiler Suite), APS (Aerosol Polarimeter Sensor), ATMS (Advanced Technology Microwave Sounder), SESS (Space Environment Sensor Suite), TSIS (Total Solar Irradiance Sensor), ERBS (Earth Radiation Budget Sensor), and ALT (Radar Altimeter). The data from these and the other instruments will enable more accurate short-term weather forecasts and severe storm warnings, as well as serving the data continuity requirements for improved global climate change assessment and prediction, providing a follow-on to NASA's Earth Observing System. The improved accuracy in atmospheric temperature and humidity soundings from these instruments, in combination with other observations expected to become available over the next ten years, will enable the current 3- to 5-day short-term weather forecasts to be improved from 70 to 80 percent to better than 90 percent and to be extended to 5 to 7 days with 80-percent accuracy.