

SCOPE OF WORK
FOR

NATIONAL POLAR-ORBITING OPERATIONAL ENVIRONMENTAL SATELLITE SYSTEM
PREPARATORY PROJECT AND JOINT POLAR SATELLITE SYSTEM CROSS-TRACK INFRARED
SOUNDER/ADVANCED TECHNOLOGY MICROWAVE SOUNDER SUPPORT ACTIVITIES

DRAFT of 7 November 2011

C.1 INTRODUCTION

The Joint Polar Satellite System (JPSS) will address the nation's requirements to provide global environmental data necessary to monitor the Earth, manage resources, support the Nation's economy, and protect lives and property. Developed by the National Aeronautics and Space Administration (NASA) for the National Oceanic and Atmospheric Administration (NOAA), the JPSS program will integrate future civilian and military polar-orbiting environmental satellite space and ground segments with a single Common Ground System (CGS). This new satellite and ground system represents a major upgrade to the existing Polar-orbiting Operational Environmental Satellites (POES), which have successfully served the operational weather forecasting community for nearly 50 years. The first of the new satellites is the National Polar Orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP) launched on October 28, 2011. The JPSS 1 is scheduled for launch in 2016.

C.2 ACRONYMS/DEFINITIONS

AIRS	Atmospheric Infrared Sounder
ATMS	Advanced Technology Microwave Sounder
Cal/Val	Calibration and Validation
CGS	Common Ground System
CrIMSS	Cross-track Infrared Microwave Sounder Suite (CrIS & ATMS)
CrIS	Cross-track Infrared Sounder
DRs	Discrepancy Records
EDR	Environmental Data Record
GOES	Geostationary Operational Environmental Satellites
GRAVITE	Government Resource for Algorithm Verification, Independent Testing and Evaluation
IASI	Infrared Atmospheric Sounding Interferometer
ITAR	International Traffic in Arms Regulations
NPOESS	National Polar orbiting Operational Environmental Satellite
JPSS	Joint Polar Satellite System
NASA	National Aeronautics and Space Administration
NESDIS	National Environmental Satellite, Data and Information Service
NOAA	National Oceanic and Atmospheric Administration
NPOESS	National Polar-orbiting Operational Environmental Satellite System
NPP	NPOESS Preparatory Project
POES	Polar-orbiting Operational Environmental Satellite
SDR	Sensor Data Record
SNOs	Simultaneous Nadir Overpasses
SRF	Spatial Response Function

C.3 STATEMENT OF WORK

The Statement of Work defines the effort required for technical support and new technology development studies. The Contractor shall furnish experienced personnel with the relevant background or experience and materials except as otherwise specified in accordance with the terms and conditions specified in the resulting contract.

C.3.1 CALIBRATION AND VALIDATION OF THE NPOESS PREPARATORY PROJECT (NPP) CROSS-TRACK INFRARED SOUNDER (CrIS) AND ADVANCED TECHNOLOGY MICROWAVE SOUNDER (ATMS) .

Science support and development to the CrIS and ATMS program for operational instrument calibration and monitoring, and inter-sensor calibration for weather and climate applications provides invaluable assistance to the government. Post-launch calibration/validation of SDR parameters is required throughout operation. This includes validation of code functionality, development of and training for SDR code ports, interface tools and datasets, and support of the investigation of CrIS-related discrepancy records (DRs). Tasks include support and training to the JPSS SDR application teams on the uses of SDR algorithms, test datasets, and tools of proxy generation and parameter extraction. Verification that the proper calibration coefficients are used in the SDR operations and Government Resource for Algorithm Verification, Independent Testing, and Evaluation (GRAVITE) codes. Provide updates and support the CrIS and ATMS instrument error analysis software package as needed.

C.3.2 INTERCOMPARISON BETWEEN SENSORS.

Each of the NPP sensors have been rigorously calibrated and characterized during ground and on-orbit operations. Some of the parameters from one sensor are comparable to another sensor. By deriving these comparisons, a more in-depth knowledge of the measurement can be determined. The contractor will compare the results from one sensor to another, taking into account the characteristics of each and provide updates to the CrIMSS calibration while on-orbit. The calibration updates have been planned to be implemented using aircraft campaigns and inter-comparisons between sensors using simultaneous nadir overpasses (SNOs). Contractor work efforts will include planning, data collection and analysis of NPP with other operational sensors such as AIRS, IASI, and GOES. Updates to these comparisons will be accomplished as improvements are made to the codes of these sensors.

C.3.3 JPSS PRE-LAUNCH INSTRUMENT CHARACTERIZATION.

The contractor will support the government SDR team lead to provide JPSS CrIS and ATMS sensor oversight to ensure that they will function properly when in operation; provide a coordinated, compressive review of the test planning execution and sensor performance evaluation; and implement instrument performance improvements. The contractor will assist the government by: 1) providing support to the design, build, and testing of follow on JPSS sensors and software, 2) provide lessons learned from the NPP sensor and discuss how these lessons impact future JPSS sensors, 3) coordinate data distribution and dissemination by reviewing overall progress and performance and their impact on the SDR algorithm, including suggesting improvements to the algorithm, 4) coordinate the analysis of the CrIS and ATMS sensor performance and work with the instrument and sensor science leads to suggest actions, set risks, and anticipate needs, 5) provide inputs to the sensor scientist for inclusion in updating progress and issues to the program office, 6) serve as the technical editor for the schedule for the JPSS Calibration/Validation (Cal/Val) plans developed by the CrIMSS Cal/Val Thread

team and the ATMS L1 (Level 1) Team, 7) work closely with sensor scientist to track and estimate error performance of the CrIS and ATMS sensors and processing software, 8) provide continuity between NPP and JPSS 1 sensors, 9) provide truth data development and sustainment for the JPSS sounding sensors and 10) characterize the spatial response function (SRF) of the JPSS ATMS frequencies.

C.3.4 CONFERENCE SUPPORT.

The contractor will assist the government by organizing an annual conference session that provides a unique venue for calibration specialists of space and aircraft sensors to gather and discuss results, new and old ideas, calibration approaches, and experiences. The session is closed to foreign nationals and provides an International Traffic in Arms Regulations (ITAR) safe venue for discussion of instrument designs and other ITAR-restricted issues. JPSS scientists and engineers can present recent findings to a technical audience that will share and receive feedback related to the Cal/Val of JPSS sensors.

C.3.5 DELIVERABLES.

The contractor will 1) deliver a detailed annual work plan three months before the start of the subsequent option period and 2) monthly status reports on work accomplished and issues identified.

C.3.6 TRAVEL.

The contractor will 1) perform work primarily at the contractor's location, 2) travel as needed to conduct testing and attend meetings in Fort Wayne, IN (2 trips), Washington, DC (2 trips), American Geophysical Union Conference, San Francisco, CA (1 trip), American Meteorological Society Conference, TBD (1 trip) and the IGARSS Conference, TBD (1 trip).

C.3.7 BASE & OPTION PERIODS.

Base	05/01/2012-04/30/2013
Option I	05/01/2013-04/30/2014
Option II	05/01/2014-04/30/2015
Option III	05/01/2015-04/30/2016
Option IV	05/01/2016-04/30/2017