Environmental Monitoring in Support of Civil and Defense Applications

- Rapid data delivery - 4 times faster than legacy systems
  - quickly react to changing conditions
- 10 times the data
  - more accurate data for better forecasts
- International collaboration

Global Weather, Climate, Hazards Monitoring System

Program Status and Cal/Val Update

Presented by: Dr Karen St.Germain

November 24, 2008
NPOESS Payload Development Status

**Cross-track Infrared Sounder**
- Modules built and re-integrated
- Initial bench test completed Nov 07
- Electromagnetic Interference (EMI) testing completed Dec 07
- Vibration testing completed Feb 08
- EDU integrated onto NPP spacecraft for initial functional test
- Final CrIS Thermal Vacuum (TVAC) testing on-going, radiometric calibration underway
- Incremental sell off effort on-going
- Upcoming: Pre-Ship Review in late Dec

**Visible/Infrared Imager/Radiometer Suite**
- Ambient testing completed
- Electronics Module (EM) Thermal Cycle completed
- Cryoradiator vibration testing completed Jan 08
- Final Ambient Regression testing completed Feb 08
- Pre-Environmental Test Review (PER) completed Apr 08
- Cryoradiator integrated with rest of sensor
- Environmental Testing underway: position 1 completed, no unexpected outages

**Ozone Mapping & Profiler Suite**
- Integrated Sensor Risk Reduction testing completed
- Nadir, Limb and Main Electronic Box (MEB) testing completed
- Nadir/Limb/MEB integrated into final Integrated Sensor Suite configuration
- Incremental sell off effort on-going
- Final Acceptance Testing ongoing
- TVAC testing complete
- delta PSR successfully completed on 6 November
NPOESS Payload Development Status

Advanced Technology Microwave Sounder

- Flight Unit 1 delivered to NPP in 2005 for integration
- Delta Critical Design Review (CDR) for replacement of obsolete components - Sep 2008

Clouds and Earth’s Radiant Energy System

- Approved for flight by NASA for NPP
- Delta CDR complete
- Undergoing modifications for Oct 08 delivery to NPP
- Approved for flight by NOAA for NPOESS C1
NPP Schedule to Launch Static Critical Path

Key Program Milestones

System Engineering

Ground IDPS

Payloads

CERES

NPP Integration

O&S

ME Sep

NPOESS CDR

NPOESS Sensors Delivery

1/25/07

12/14/08

CrIS 1/27/08 OTH Need Date

OMPS 12/18/08 OTH Need Date

4/2/09 OTH Need Date

6/3/09

6/9/09

12/2/09

Ship

11/6/08

12/15/09

3/30/10**
NPP
Calibration/Validation

Karen St. Germain
Chief, NPOESS Data Products Division
&
NGST Cal/Val Team

NOVEMBER 2008
NPP Cal/Val Program is Driven by 2 Main Objectives

• Accomplish the NPOESS Mission of providing environmental data to meet civilian requirements and military missions.
  – Ensure Product Operational Viability.
    • Provide the NPOESS Customers with validated, useful data products for their applications.
    • Provide investigations into product defects and inconsistencies of specific impact to Customers.
  – Provide Independent Verification of NGST results.
    • Provide technical insight and oversight of NGST implementation of algorithm.
    • Provide scientific validation of products.
    • Coordinate issue resolution to meet Program priorities.

• Facilitate the fullest possible exploitation of the unique data provided from NPP/NPOESS by the science, commerce, climate, and academic communities.
  – Support Data Integration for Mission Systems.
    • Provide Cal/Val beyond basic contractual compliance required for initiation of use of data product by primary mission systems.
    • Act as liaison between NGST and operational community to coordinate product updates as required.
  – Support User Community.
    • Provide general Program information to all users about data products, sensors, and algorithms.
    • Provide technical support to broad research and development community in their assessment and exploitation of NPOESS data.
    • Support NASA and NOAA Climate initiatives by sharing data, software tools, and information as needed.
Guiding philosophy developed from Lessons Learned on Heritage Programs

1) Sensor Performance and Characterization are the cornerstone of all data products.

2) Experience and resources from Past Operational and Science Missions should be fully exploited and incorporated in the NPP and NPOESS Programs.

3) Customer and User Satisfaction is achieved through participation in the Cal/Val process.

4) Community Proficiency with Operational Algorithms is essential to efficient Cal/Val and Community buy-in.

5) Space-borne assets, Global models, Surface Networks and Data Assimilation provide a cost effective comprehensive view of sensor and algorithms performances.

6) Targeted Campaigns and Special Studies will be planned and executed as needed.

7) EDR Performance and corrective actions will be handled in accordance with established Program priorities.

IPO, NASA, and NGST share this philosophy and are working together to develop an executable NPP Cal/Val Program.
NPP Post-Launch Priorities established for efficient Cal/Val Program

• All Sensors: *Bullet-proof RDRs* and archiving every piece of sensor, telemetry, and housekeeping data from spacecraft

• All Sensors: Well tested, *robust SDRs.*
  – SDRs that reflect reality of as-built sensor, as discovered in pre-launch testing of sensor.

• All Sensors: *Off-line processing to support SDRs* (generate coefficients, etc.)

• *EDRs that characterize sensor on-orbit,* available by no other means:
  – Imagery (Band-to-Band Registration, Noise, Striping)
  – SST (Radiometric Performance of Infrared bands, at the warm end)
  – Cloud Top Temperature (Radiometric Performance of Infrared bands, at the cold end)
  – Cloud Mask (Band-to-Band Registration)
  – Ocean Color (Reflected VIS Performance)
Evolution of Expertise

<table>
<thead>
<tr>
<th>TIME</th>
<th>PRODUCT CHAIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Launch</td>
<td>RDR Development and Verification</td>
</tr>
<tr>
<td>Early Orbit Check-out</td>
<td>RDR On-Orbit Verification</td>
</tr>
<tr>
<td>ICV</td>
<td>Establish Sensor Stability</td>
</tr>
<tr>
<td>LTM</td>
<td>Sensor Long-Term Monitoring</td>
</tr>
</tbody>
</table>

Expertise shifts from Contractor Sensor Engineers to Government Customers and Users over time and product chain.

Evolution of Expertise
Cal/Val Discipline Leads provide Heritage Experience and Customer Knowledge

- NPP IPO Cal/Val Product Area Discipline Leads (selected March ‘08) and their NGST counterparts
  - SDR
    - VIIRS – Frank DeLuccia, Aerospace & Lushalan Liao, NGST
    - CrIS - Gail Bingham, USU/SDL & Denise Hagan, NGST
    - OMPS – Scott Janz, NASA/GSFC & James Done, NGST; (Limb-Glenn Jaross, NASA/GSFC)
    - CERES – Not included in the NPOESS Community Collaborative Plan because ground processing being performed by NASA for their community.
      - NASA Science Data Segment (SDS) has accepted the CERES Cal/Val requirements
  - EDR
    - VIIRS Atmosphere: David Starr, NASA/GSFC & Mike Plonski, NGST
    - VIIRS Land: Jeff Privette, NOAA/NESDIS/NCDC & Alain Sei, NGST
    - VIIRS Ocean: Bob Arnone, NRL & Patty Pratt, NGST
    - VIIRS Imagery/Cloud Mask: Tom Kopp, Aerospace at AFWA & Mike Plonski, NGST
    - CrIS/ATMS Sounding: Chris Barnet, NOAA/NESDIS/STAR & Denise Hagan, NGST
    - OMPS Ozone: Larry Flynn, NOAA/NESDIS/STAR & James Done, NGST; (Limb-Didier Rault, NASA/LaRC)

- Cal/Val Discipline Leads have built teams of SMEs to develop and execute cal/val tasks.
  - SMEs from each agency included within each discipline team.
  - Teams leveraging resources available from their communities
  - Team members identified in Discipline Cal/Val Plans
  - Teams hosting regular Discipline Cal/Val Workshops

- NDPD and NCDC have begun working on a strategy and implementation plan for NPOESS data stewardship in support of NCDC climate science

- NDPD working with JCSDA to develop role for NWP community in NPP Cal/Val

Cal/Val Discipline Team Members and their roles are detailed in the Discipline Sections of the Cal/Val Plan.
• NGST Leads Early Orbit Check-out (EOC) SDR Calibration Effort

• IPO Leads the NPOESS Intensive Cal/Val (ICV) Effort
  – IPO coordinates NPP Cal/Val Team and Operations Team.
  – IPO coordinates tasks outside of NGST with NGST.
  – IPO coordinates anomaly detection functions with Algorithms/xDRs between Customers, Users, IPO, and NGST.
  – IPO presents NGST with Algorithm/Product issues with recommended resolutions, when known.
  – IPO leads development of necessary new science.

• NGST (A&DP IPT) Leads Algorithm/Product issue resolution integration during the ICV Effort.
  – NGST responsible for making changes to xDRs to meet specifications.
  – NGST partners with IPO to find problems and solutions.

• NGST (O&S) Leads the Long-Term Monitoring (LTM) Effort.
NGST Cal/Val Team
Key Responsibilities

• All sensors: Provide Core Sensor Teams responsible for providing expertise during activation, characterization and anomaly resolution sensors post-launch.
  – Sensor vendor representatives, payload sensor POC, SDR error budget developer, SDR algorithm developer.

• All sensors: After ICV, NGST remains responsible for SDR performance through the life of the sensor.

• All algorithms: During ICV and LTM, NGST is responsible for integrating changes to algorithms into the operational processing system efficiently.

• All algorithms: During ICV and LTM, NGST is responsible for resolving problems with algorithms and sensors causing performance to degrade lower than specified values.
Data Products Mature through Cal/Val Phases independently for efficient implementation

- **Four Phases of Cal/Val:**
  1. Pre-Launch; all time prior to launch – Algorithm verification, sensor testing, and validation preparation
  2. Early Orbit Check-out (first 30-90 days) – System Calibration & Characterization
  3. Intensive Cal/Val (ICV); extending to approximately 18 months post-launch – xDR Validation
  4. Long-Term Monitoring (LTM); through life of sensors

- **For each phase:**
  - Exit Criteria established
  - Activities summarized
  - Products mature through phases independently
NPP Community has distinct Cal/Val Roles & Responsibilities

**Customers**
- Integrate SDRs and EDRs into mission systems and provide performance analyses.
- Evaluate EDRs for climate applicability

**Users**
- Provide analyses of data products to IPO Cal/Val Team.

**IPO**
- Coordinate all NPOESS Cal/Val efforts
- Ensure SDRs and EDRs meet Contractor specifications and are operationally viable
- Support Customer/User community

**NPOESS Contractor Team**
- Deliver SDRs and EDRs that meet Contractual specifications (NPOESS System Spec Appendix D)

**NPP Community** has distinct Cal/Val Roles & Responsibilities:

- **Customers**
  - AFWA, NESDIS, FNMOC, NAVO, NASA SDS

- **Users**
  - Academia, Research, Direct Readout

- **IPO**
  - Staff and SMEs

- **NPOESS Contractor Team**
  - NGST/Raytheon/Subs
Completed Spring-Summer 2008

- Populate “NPOESS Community Collaborative Calibration/Validation Plan” (NC3VP), which includes discipline-specific detailed post-launch plans.
  - Cal/Val Leads coordinate SME contributions and reviews.
  - Discipline-specific Workshops planned to collect SME technical contributions to and review of plans.
  - Evolve performance assessments and apply results to post-launch plans.
- Interact with Customers to identify needs for xDR/IP viability and prepare data integration strategies.
- Work to secure availability of Cal/Val data resources.
- Investigate inter-discipline collaborations, data requirements, and tool development.
- Continue monitoring of/participation in development of NGST Cal/Val plans and processes.
- Continue participation in pre-launch instrument testing and algorithm verification.
Current Activities Fall 2008

- Review Cal/Val Plans with Integrated Team and Customers.
    - Collect and integrate Customer (and user) reviews of detailed plans.
      - Feed Sensor Tasks into MOT procedure development as tasks are defined.
      - Continue work to secure resources for cal/val activities.
      - Continue tool development.
      - Continue monitoring of/participation in development of NGST Cal/Val activities.
      - Release initial draft of NC3VP.
        - Provides baseline input to IMT.
Planned Activities for 2009

- Conduct Community Roll-out of NC3VP for NPP (April 2009)
- Conduct Cal/Val Data Policy Workshop (February 2009)
- Continue to evolve discipline plans as Community activities are defined.
- Explore collaborative international relationships.
- Obtain Memorandums of Agreements (MOAs) with other Agencies to assure access to calibration/validation data.
- Continue tool development for cal/val activities.
- Continue monitoring of/participation in development of NGST Cal/Val activities.
“NC3VP” contains a section describing approach for each instrument.

**Overview section:**
- Establishes Program definition of mission success.
- Identifies IPO Cal/Val objectives.
- Defines Program EDR priorities.
- Defines Cal/Val Phases and general activities and entrance and exit criteria.
- Describes reporting methods.
- Describes information/data flow processes.
- Establishes evaluation scheme for consistent progress reporting across the program.

**Sensor sections:**
- Separate sections on the VIIRS, CrIS/ATMS, and OMPS sensors.
- SDRs and EDRs addressed independently.
SDR sections of the “NC3VP” will detail teams, activities, schedules, & resources.

• Calibration/Validation
  Overview and Objectives
  – Explain calibration over lifetime of sensor
  – OpsCon for sensor
    • Day in life
    • Maneuvers
    • Wiring Diagram of phases
  – Discuss risks of sensor/algorithm design and as-built sensor
  – Test Dates and milestones
  – Performance Criteria
  – Team Overview
  – Anomaly Resolution (work with Payloads)

• Pre-launch Activities (Each task from task network will be discussed)
  – Objectives of pre-launch activities
  – Exit criteria of Pre-launch
  – Description of tools developed/used
  – Individual Tasks
  – Organization of tasks

• Early Orbit Checkout (EOC) Activities
  – Objectives of EOC activities
  – Entrance/Exit criteria of EOC
  – Description of tools developed/used
  – Individual Tasks

• Intensive Cal/Val (ICV) Activities
  – Objectives of ICV activities
  – Entrance/Exit criteria of ICV
  – Description of tools developed/used
  – Individual Tasks

• Long-term Monitoring (LTM) Activities
  – Objectives of LTM activities
  – Entrance/Exit criteria of LTM
  – Description of tools developed/used
  – Individual Tasks

• Resources
  – Development of Ground Truth
  – Team Organization
  – Communication

• Appendix:
  – Tool Development
    • Identification of existing tools and tools that have to be developed
    • Schedule for obtaining/developing tools
    • Use of GRAVITE resources
EDR sections of the “NC3VP” will detail teams, activities, schedules, & resources.

• Objectives
  – What are the EDR requirements to meet Mission Success.
  – Provide table summarizing requirements, indicating current capabilities

• Approach (Summary)
  – What is overall extent and scope of effort required for each EDR/SDR within discipline?

• Schedule and Milestones within IPO-Defined Phases
  – What are specific EXIT CRITERIA for each SDR/EDR
  – What are specific ACTIVITIES needed to meet these exit criteria for each SDR/EDR.
  – What is the time required to perform these activities for each SDR/EDR.
  – Define Milestones, specific to discipline, to demonstrate progress toward satisfying EXIT CRITERIA.

• Resource Requirements
  – Personnel
  – Coordination
  – Validation Data
  – Sensor Data
  – Computing Resources/Technology

• Reporting
  – What is the plan for generating the IPO-Defined Reports?
  – Who is responsible for generating each type of report?

• Areas of Concern
  – What are the known risks for each SDR/EDR?
  – What are the known sensor issues for each SDR/EDR?
  – What are the watch items for each Algorithm?

• Appendix
  – Actual Detailed Plan for each EDR
    • Walk through each phase and describe each activity necessary assuming nominal sensor performance.
    • Discuss how heritage experience will be leveraged in plan and practice.
    • Detail validation data needed for each SDR/EDR.
    • Describe Plan B’s.
CrIS SDR
Cal/Val Strategy Highlights

- Prelaunch activities:
  - Analysis of TVAC data
  - Evolve TVAC findings into improved operational algorithm
  - Verification of RDRs and sensor vendor engineering parameters (LUTs)
  - Update TVAC analysis tools for on-orbit operational data
  - Exercise operational algorithm with TVAC gas cell dataset and day-in-the-life test sequence

- Postlaunch activities
  - Comparisons of SDRs against other sensor measurements (e.g. A-Train; MetOp)
  - Radiometric, Spectral and Geolocation evaluation and trending
  - Comparisons of SDRs with cloud-cleared radiance IPs, GFS models
  - Long-term stability SDR characterization
ATMS SDR
Cal/Val Strategy Highlights

• Pre-Launch Activities
  – Analysis of TVAC data

• Post-launch activities
  – Comparison of on-orbit vs. T/V data, possibly including maneuvers
  – Quantify scan biases from sidelobes & s/c structure
  – Scan uniformity/bias analysis
  – X-comparison w/other satellite sounders
    • Resampling & comparison w/AMSU
  – Underflights & pre-launch cal/val exercise possible
  – NWP radiance validation & comparison w/model Tb fields
  – Geolocation checking
  – RFI contamination checking
  – Ascending/descending Tb comparisons
  – Gross anomaly identification, parameter trending
  – ATMS-CrIS footprint matching
  – ATMS 57.29 GHz Center Frequency Stability & Drift between ATMS & CrIS
VIIRS SDR
Cal/Val Highlights

• Use heritage techniques
  – Geolocation – GCP training with Landsat (MODIS)

• Identify problems using EDRs
  – CM, AOT, and SST: emissive band radiometry
  – CM, AOT, and OC: reflective band radiometry
  – OC: polarization
  – Imagery: geolocation and mapping accuracy

• Comparisons with ground truth data sources
  – Lake Tahoe TOA radiance data
  – Railroad Playa TOA radiance data
  – ROLO or processed lunar data
  – Sensor data from EOS A-train during time of overlap
  – Landsat GCP database
OMPS SDR
Cal/Val Strategy Highlights

• Use heritage Calibration Techniques:
  – Dark Current Observations (Dark Current, Bad Pixels)
  – Lamp Measurements (Linearity)
  – Solar Calibrations (Diffuser Degradations and CCD characteristics)
  – Wavelength Monitoring
  – Yaw Maneuver (Diffuser Goniometry)
  – Trending of calibration parameters and results
  – Unbinned and terminator Earth SDRs (Stray Light, Geolocation, Gain)
  – Statistical analyses of calibrations and Earth SDR radiances
  – Comparisons of OMPS radiances (Cross-track calibration consistency & 300 to 310 nm)
  – Use of TC EDR and NP IP to identify problems with SDRs
  – EOF Spectral Covariance Analysis
  – Mg II Index (Core-to-Wing Ratio for Solar Activity)
  – Aerosol Index and R/lambda linearity dependence
  – Reflectivity monitoring – Ice radiances, equatorial Pacific minimum
  – Spectral Discrimination

• Use information from EDRs
  – Use to check stray light contamination
  – Analyze Ozone retrieval residuals
  – Check for degradation by examining reflectance spectra
  – Attitude check for consistency across swath

• Cross-Compare with Data:
  – VIIRS SDR M1 band radiances
  – Ground Instrument Data (CasaNosa) from pre-launch characterization
  – Radiances from OMI, GOME-2, SBUV/2
  – Solar Irradiances from SORCE, SSBUV, SBUV/2
EDR Cal/Val Strategy Highlights

– Build teams of SME’s from both customer and science communities to leverage heritage knowledge and tools as well as assure understanding of Customer Mission Success.
– Incorporate lessons learned from Heritage Data Product Validation
  • Concentrate on datasets proven valuable for global validation (e.g. ECMWF, NCEP/GFS, RAOB’s)
  • Work with experiments of opportunity for detailed characterization of products.
– Characterize performance of EDRs in various ensembles of cases.
– Leverage existing capabilities – (e.g. NESDIS operational real-time AIRS and IASI processing and validation systems and aircraft validation campaigns)
– Prioritize validation as follows:
  • Validation of “First Light” spectral with model analysis or forecasts.
  • Validation of key performance parameters using validated SDRs against other sensor products, operational and dedicated RAOBs, etc.
  • Inter-comparison of operational products (from IDPS) with research products generated by heritage algorithms.
  • Characterization of all EDR products and long-term demonstration of performance against operational and dedicated in situ observations
Overarching Post-Launch Algorithm Update Process

- Connects IPO and NGST Cal/Val efforts
- Allows for external requests via IPO control
- Allows more routine fixes to follow a more streamlined path
- Documented in IDPS Sustainment Plan
ICV External Algorithm Change Process Tracks Changes from Originator to Implementation

1. NPP SDR & EDR C/V Teams coordinate with the other external entities and submit Discrepancy Reports (DRs) and Change Recommendations into the Data Product Issues Tracker (DPIT) on GRAVITE. These are reviewed by the SDR/EDR C/V Team Leads and are either promoted to the DR Tracker or retained in the DPIT as a watch-item.

2. The NGST C/V Team is a part of the larger C/V Team, however, they have their own C/V process.

3. DR Tracker is a Database on GRAVITE where external parties can log, describe, and track DRs and Change Recommendations. The DR Tracker allows for DR collaboration and provides work-off plans and current status. - Description of DR - Proposed Impact - Status of work-off - Priority

4. DR Review Team, made up of IPO and NGST, and are responsible for reviewing the items in the DR Tracker and categorizing them by Type

5. Type I
   - IPO Directed and Funded
   - Beyond spec compliance
   - New algorithm
   - Different science
   - Functionality change
   - NGST Funded
   - Change to science
   - Anomaly fix

6. Type II
   - Necessary to meet spec
   - Necessary for anomaly resolution

7. Type III
   - Service Problems
   - Local Settings

The NGST C/V Team is a part of the larger NGST C/V Team, however, they have their own C/V process.
IDPS Sustainment Update cycles decrease in time with increase in urgency

<table>
<thead>
<tr>
<th>Method</th>
<th>Use</th>
<th>Time required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal</td>
<td>Routine updates</td>
<td>Four month release cycle</td>
</tr>
<tr>
<td>Compressed nominal</td>
<td>Higher priority changes</td>
<td>Four week release cycle</td>
</tr>
<tr>
<td>Urgent updates</td>
<td>IDPS producing unusable data</td>
<td>As soon as possible</td>
</tr>
<tr>
<td>Informal integration</td>
<td>Checkout ICV algorithm changes</td>
<td>One week to I&amp;T string, as little as four weeks to operations</td>
</tr>
<tr>
<td>release</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Time durations are activities performed by IDPS Sustainment only
  - Begin when change request is written and approved

As products are validated and Customers using and integrating into applications, frequency of changes decreases due to increase in Customer impact.
Tools for performing Cal/Val Activities will be detailed in the “NC3VP”

- Government Resource for Algorithm Verification, Integration, Test, and Evaluation (GRAVITE)
  - Dedicated support for IPO Cal/Val team
  - Focus is Operational Viability
  - Hosts NSIPS and SDS RIPServer
  - Components
    - Technical Library
    - Pre-Launch Data Archive
    - Processing and Analysis Software Repository
    - Data Storage and Distribution
    - Central Processing
    - Whole System Triage
    - NSIPS
    - SDS RIPServer

- NPOESS Science Investigator-led Processing System (NSIPS)
  - Dedicated support for NGST Cal/Val team
  - Focus is contractual spec

- NASA Science Data Segment (SDS)
  - Focus is evaluation of EDRs for Climate usage

- Status of Required ICDs:
  - NSIPS-to-IDPS: Complete (D41068 Rev.B)
  - GRAVITE-to-SDS: In review
GRAVITE facilitates Cal/Val Team Collaboration and is the interface for NPOESS data.
Cal/Val Peer Review Readout

• Cal/Val Peer Review held 22 May 2008 at the NOAA Science Center Auditorium in Silver Spring, MD.

• Panel of Cal/Val experts reviewed briefings by the IPO, including the selected Cal/Val Discipline Leads, and NGST detailing the organization of the NPP Cal/Val team and plans to develop the NPP cal/val program.
  – Panel included Paul Menzel (chair, UW/SSEC), Bojan Bojkov, (UMBC/GEST & NASA/GSFC), Jeff Morisette (NASA/GSFC), Tom Pagano (NASA/JPL), Gene Poe (NRL), and Jeff Reid (NRL).
  – Additional guests included interested NPOESS and Customer personnel.

• Requests for Action (RFAs) were submitted to the Panel for adjudication.

• Panel provided report on the peer review and RFAs 1 July 2008.
  – General feedback from the review was positive, supporting direction of NPP Cal/Val Program and development progress.
  – 27 RFAs assigned with high, medium, and low priority categorizations.
    • Most were suggestions for cal/val techniques and resources.
    • Several identify need to collaborate between disciplines and IPO/NGST, which is currently in progress.

• Presentations located on eRooms at:
  – NPP Mission eRoom > NPP MOR > NPP MOR > Peer Reviews > Cal/Val Peer Review
Review Panel Pleased with Cal/Val Planning Process

• Review Panel found “good preparations for”:
  (1) ensuring product operational viability
  (2) providing independent verification of NGST results,
  (3) supporting data integration for mission systems
  (4) supporting the NOAA and DoD user community.”

• Review panel cited:
  “several key actions that must be addressed through the Cal/Val planning process in order to assure that sensor characterization pre-launch can be combined with system performance post-launch to provide adequate measurements for spec-compliant data products.”

• “We believe that these can be addressed within the process that was outlined at the review”

• All RFAs closed or closure plans on schedule.
  – Resolution plans approved by submitters.
  – Completed actions reviewed by submitters for closure
Summary

• IPO Cal/Val Leads working with NGST Leads to develop and execute Community integrated Program.

• Program leverages subject matter and heritage expertise resident within each community.

• Processes and Interfaces between the cal/val and operations teams are being established to facilitate efficient communication during all phases.

• Tools are being developed to facilitate quick execution of calibration/validation activities and efficient integration of the necessary resolutions needed.

• Cal/Val Peer Review RFAs are resolved in the NPOESS Community Collaborative Calibration/Validation Plan for NPP.