SUOMI NPP ATMS INSTRUMENT STATUS REPORT

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NOAAA/STAR

SESSION 4, AUGUST 9TH, 2016
Outline

• ATMS Instrument Status
• ATMS Data Quality
• ATMS Scan Drive Motor Current Anomaly
• Summary and Path Forward
Suomi NPP ATMS Instrument Status

Suomi NPP instrument event log is now available in STAR ICVS website provided by Cole Rossiter.

### ICVS Instrument Anomalies

- **Suomi NPP ATMS Instrument Status**
  - Suomi NPP instrument event log is now available in STAR ICVS website provided by Cole Rossiter.

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**Suomi NPP ATMS Instrument Status**

**ICVS Instrument Anomalies**

Click column headings to sort; Type in the "Search" box to query table contents.

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Time (UTC)</th>
<th>End (UTC)</th>
<th>Instrument(s)</th>
<th>Retrieved from:</th>
<th>CCR</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATMS Table and RAM Dumps</td>
<td>08/02/16</td>
<td>13:59</td>
<td>17:02</td>
<td>A</td>
<td>ESPC Ops Report</td>
<td>---</td>
<td>During SVL Contact 24691, SNPP engineers placed the ATMS instrument in safe mode to perform required ATMS table dumps. While in safe mode, no science data was generated resulting in a 2 minute, 40 second ATMS outage.</td>
</tr>
<tr>
<td>ATMS Once-per-Orbit Scan Reversals Implemented</td>
<td>07/25/16</td>
<td>--</td>
<td>--</td>
<td>A</td>
<td>Go-CAM Report, C/N Leads Archive</td>
<td>---</td>
<td>Svalbard Contact 24577, Ground commanded CEM-sequence until 08/04/16, then DAS-commanded at 70N, 75N, 80N, repeat; Expect 14 reversals/day.</td>
</tr>
<tr>
<td>ATMS TMon 131 and 132 Activated</td>
<td>07/18/16</td>
<td>--</td>
<td>--</td>
<td>A</td>
<td>C/N Leads Archive</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>ATMS TMon 131 and 132 Load</td>
<td>07/15/16</td>
<td>19:21</td>
<td>--</td>
<td>A</td>
<td>Go-CAM Report, C/N Leads Archive</td>
<td>---</td>
<td>On Friday, 15 July 2016, during contact 24437 at 19:21 UTC, OSPO loaded two new TMons (131 &amp; 132) and one new ACM sequence (100) to ATMS to monitor ATMS Main Motor temperature and DTU-measured ATMS Scan Drive Mechanism temperature. If either temperature exceeds 60°C for 24 seconds or 10 seconds, respectively, ATMS will automatically be commanded to safe mode.</td>
</tr>
</tbody>
</table>

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**Cumulative Zip file of all MX Releases**, (ZIP, 1.57 MB, New: 6/30/2016)

**Updated: 8/8/2016**
### Suomi NPP ATMS Instrument Status

<table>
<thead>
<tr>
<th>Event</th>
<th>Day</th>
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</tr>
</thead>
<tbody>
<tr>
<td>ATMS Table and RAM dump</td>
<td>08/02/2016</td>
<td>ATMS Once-per-Orbit Scan Reversals Implemented</td>
<td>07/25/2016</td>
</tr>
<tr>
<td>ATMS TMon 131 and 132 Activated</td>
<td>07/18/2016</td>
<td>ATMS TMon 131 and 132 Loaded</td>
<td>07/15/2016</td>
</tr>
<tr>
<td>ATMS Manual Command Scan Drive Reversal</td>
<td>05/09/2016~05/13/2016</td>
<td>ATMS Manual Command Scan Drive Reversal</td>
<td>05/05/2016~05/06/2016</td>
</tr>
<tr>
<td>ATMS Daily Scan Drive Reversals Stopped</td>
<td>04/15/2016</td>
<td>ATMS 1553 Packet Error Counter Alarm</td>
<td>02/01/2016</td>
</tr>
<tr>
<td>Commencement of the daily ATMS Scan Reversal</td>
<td>08/24/2015</td>
<td>ATMS Scan Reversal DAS Test Out</td>
<td>08/13/2015</td>
</tr>
<tr>
<td>ATMS Scan Reversal Upload Test</td>
<td>07/14/2015</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Suomi NPP ATMS all channel noise meets the requirement with margins
Suomi NPP ATMS channel calibration gain is stable
Suomi NPP ATMS On-orbit Status

Suomi NPP ATMS warm load PRT temperature is stable
Suomi NPP ATMS On-orbit Status

The number of SD Main Loop Integral Error QF scans keeps high orbital percentage since May 30, 2016.
Suomi NPP ATMS On-orbit Performance

S-NPP ATMS On-orbit O-B Bias (ECMWF) for Selected V-Band Channels

Suomi NPP ATMS on-orbit absolute bias (OBS-RTM) meet the requirement
Suomi NPP ATMS On-orbit Status

ATMS scan drive main motor current major spikes detected
- Instrument temperature increased
- Scan angle shift observed after SD motor current spikes but still well below requirements
- Once per day scan reversal implemented from August 24, 2015
- Once per orbit scan reversal implemented from July 25, 2016 (staggering configuration among consecutive orbits)
- ATMS put in safe mode due to 1553 issue during once per day reversal
- Twice per orbit reversal (staggering configuration near north and south pole) to be implemented soon
Suomi NPP ATMS On-orbit Status

Suomi NPP ATMS Dwell - Scan Drive Main Motor Current
(Main MOTOR CUR)
Daily Status on 08/08/2016

Suomi NPP ATMS Scan Drive Mechanism Temperature
2-Wire PRT (SD_MECH_TEMP)
Daily Status on 08/07/2016

NOAA NESDIS/STAR

STAR JPSS Annual Science Team Meeting, 8-12 August 2016
Suomi NPP ATMS On-orbit Status

Suomi NPP ATMS Main Motor Position (Angle) at Warm Target #1
Daily Status on 08/08/2016

Warm Target #1 Scan Angle (15 Orbits)

Warm Target #1 Orbital Mean Scan Angle (30 Days)

Warm Target #1 Orbital Mean Scan Angle (1 Year)

Warm Target #1 Orbital Mean Scan Angle (All Time)

Suomi NPP ATMS Main Motor Position (Angle) at Space View #1
Daily Status on 08/07/2016

Space View #1 Scan Angle (15 Orbits)

Space View #1 Orbital Mean Scan Angle (30 Days)

Space View #1 Orbital Mean Scan Angle (1 Year)

Space View #1 Orbital Mean Scan Angle (All Time)
Summary & Path Forward

- Summary
  - S-NPP ATMS on-orbit channel performance meets the requirement with margins
  - S-NPP ATMS scan drive motor current increased during the last year. More frequent scan reversal activities can help to reduce motor current. SD motor current anomaly didn’t show apparent impact on channel sensitivity
  - S-NPP ATMS TDR SD loop integral error quality flag was triggered on May 30, 2016 and the affected scans have been reduced since the implementation of once-per-orbit scan reversal
  - S-NPP ATMS reverse scan data are available for additional study from STAR ICVS website
  - ATMS ICVS-LTM packages have been tested successfully and ready for JPSS-1 operations
Summary & Path Forward

• Path Forward
  – Keep watching S-NPP ATMS on-orbit health status, performance, and data quality
  – Enhance ICVS anomaly notification function
  – Implement near real time JPSS-1 ATMS post-launch monitoring to support ATMS SDR team cal/val activities
  – Work with ATMS SDR team to improve current monitoring capability
Colocation of GRUAN

Provide radiosonde based ATMS TDR bias characterization results to support NWP applications