



National Aeronautics and Space  
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# Test Plan

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TPC - 1



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# Test Plan

Delivery Validation  
WSDS Verification  
Ops Practice Schedule





# Delivery Validation



- Use Regression Test Baselines (RTB)
- When
  - As part of the formal delivery process
  - Starting between versions 2 and 3
- Goal: Confirm readiness to proceed with operations
  - Successful code delivery
  - All important functions
  - Resource (CPU, disk) usage still acceptable
- RTB contents
  - Input: A simulated mini-delivery (~4 scans = ~ 1000 framesets)
    - Initially with simulated data, then with real data during flight ops
    - Generate fake image telemetry from simulated images
    - Fake ancillary data for simulated images; arbitrary format
  - Output: Level-0,1b archive, frame meta-data





# Delivery Validation



- RTB test procedure
  - Select RTB data. Massage as required. Assign version. Archive.
  - Using a trusted ops delivery, process RTB data using parameters as close to normal as possible
  - Version and archive resulting data
  - Select key comparison metrics
    - Pipeline return codes as expected
    - Presence of all expected products
    - Key trend statistics, e.g. SFPReX corrections, catalog statistics, image statistics
    - Be sure products from scan/frame pipeline, multi-frame pipeline, quicklook, and QA are included
  - Write code to compare key metrics and display results
  - Time passes ...





# Delivery Validation



- RTB test procedure (cont.)
  - Using integration (“int”) delivery, run RTB data using same parameters as archived RTB run
  - Run comparison code
  - Manually examine comparison results as well as side-by-side image comparisons for a subset of images
  - Consult with subsystem engineers regarding differences
  - Present results to CCB
  - Repeat with ops delivery, except compare to int delivery: Results should be identical except for timestamps, release strings, etc.
  - If there is a failure at any point, back up to previous successful step, debug, fix problem, proceed





# WSDS Verification



- When
  - Begin test runs after version 2
  - Official run prior to ORR
  - As needed to re-verify
- Simulation Test Data Characteristics
  - Up to 30 continuous orbits (60 scans) = ~2 days' data = ~1% of mission = ~700 coadds
    - Now have 73 frames of test data on hand for prototype testing
  - Varying pixel response, dark current, hot/dead pixels
  - 2MASS sources with modeled fluxes
  - Galactic model
  - Extra-galactic model
  - Some solar system objects
  - Complex backgrounds (cirrus etc.)
  - Extended objects
  - Truth: supplied flats, darks, source list with positions/fluxes





# WSDS Verification



- Success criteria
  - Key performance requirements
    - Completeness, reliability, photometry, astrometry
    - Scan sync misalignment detection sensitivity
    - QA effectiveness
  - Key throughput requirements
    - Ingest, scan/frame, multi-frame run times
    - Data volumes





# WSDS Verification



- Procedure
  - Standardize measurement tools for evaluating success criteria
  - Test prep
    - Acquire simulated data
    - Generate level-0 test archive (including meta-data)
    - Document simulation characteristics, locate truth data
  - Confirm suitability of desired delivery
    - Consult subsystem cogE's and cogSci's
    - Confirm success of RTB
  - Run scan/frame pipeline
  - Run multi-frame pipeline
  - Confirm success of runs





# WSDS Verification



- Procedure (continued)
  - Collect and examine QA data
  - Run QA measurement tools
  - Internal+external science team support
  - Prepare report
  - In case of failure to meet one or more performance goals, consult with relevant cogE's, cogSci's, science team, project, and form a plan of action





# WSDS Verification



- Volume data flow testing
  - Prior to version 3 release
  - 2-days of sim data (30 consecutive orbits)
  - HRP to WSDC using flight network setup
  - Ingest → scan/frame pipeline, QA, multi-frame pipeline, dynamic calibration





# Ops Practice Schedule



- External
  - Mission Scenario Tests: late '08 to early '09
  - Load Volume HRP transfer tests: mid '09
  - Operational Readiness Tests: late '09
- Internal
  - Bulk frame pipeline runs: now to launch
  - Scan/frame through coadd with QA: late '08 to launch
  - Ingest through coadd with QA: spring '09 through launch

