**J1- Readiness**

The JPSS Algorithm Integration Team (AIT) brings technical expertise and support to product algorithms, specifically in testing and validating science algorithms in the Algorithm Development Library (ADL) environment.

What we do:
- Assist teams with code updates, testing, and deliveries
- Provide technical support and expertise to teams
- Provide avenues for effective configuration management
- Facilitate a structured test and review process for new algorithms

We have developed a variety of in-house software for organizing, managing, and transitioning product algorithms. Additionally, we are taking leadership in the process of enhancing algorithms to meet upgraded requirements for J1. Our involvement in the development and review process, in addition to our expertise in integrating the evolving algorithms into ADL, will make it possible to plug the new algorithms into the operational system with greater efficiency and ease.

**Integration Specialists**

AIT has five integration specialists each assigned to specific Sensor Data Record (SDR) and Environmental Data Record (EDR) teams based on expertise. Integration specialists:

- Interact directly with algorithm teams during development, testing, and integration
- Attend meetings with science teams to keep apprised of algorithm status
- Provide test results to algorithm team
- Provide change run test results to all affected teams
- Prepare and deliver algorithm packages
- Maintain support through review and integration process

**Quality Assurance**

STAR AIT in conjunction with JPSS STAR Management (J-STARS) has developed a Quality Assurance Plan that describes the QA procedures to be used for J1. The QA Lead is responsible for maintaining situational awareness of the J1 project as a whole and coordinating with management and oversight teams.

For QA purposes, AIT:
- Meets Clearance/Clearquest for algorithm configuration management
- Completes with the Algorithm Change Management procedures put forth by Data Products Engineering & Services (DPES)
- Assists algorithm teams in maintaining accurate and up-to-date documentation throughout the development process

**Algorithm Review Process**

New algorithms developed for J1 are subject to the STAR Enterprise Lifecycle Review Process (ELPR)

- Consistent with the Satellite Product and Services Review Board (SPSRB) review process
- Adds value to product development
- Generates standard documentation covering
  - Requirements and Risks
  - Algorithm Theoretical Basis
  - Implementation Plan
  - Software Architecture
  - Quality Assurance
- Process tailored based on implementation timeline and development progress
- Tailored reviews mitigate risk by eliminating overhead of preparing multiple reviews
- Technical risk is low because Level 1 and Level 2 requirements are handled by separate review boards and are already developed

**Requirements Tracking**

- STAR AIT complies Requirements Allocation Documents (RAD) for J1
- Algorithms undergoing a review process
- The RAD contains Level 3 and 4 requirements allocated to AIT
- The RAD operates in parallel with the NASA Software Requirement Specification documents
- Requirements in the RAD are traced to Level 1 and Level 2 requirements
- The RAD is standard deliverable and is made ready. Requirements and changes to requirements are discussed at each review.

**SASQUATCH**

Simplified And Streamlined Quality Assurance Through Coding Help

EPL Review documents include both Requirements Allocation Documents (RADs) and Requirements tables with identical content. Additionally, a spreadsheet is provided for reviewing requirements tracing to Level 1 and Level 2 requirements. SASQUATCH is a perl script that reads requirements from a spreadsheet and generates both the RAD and Review files, thus ensuring consistent content and formatting. EPL Review documents include a Review Item Disposition (RID) spreadsheet that tracks all risks and review items. For each review, the review items in the RID are presented. Building on the capability of SASQUATCH, Risk-QUATCH converts the RID spreadsheet into properly formatted presentation slides for the review.

**Algorithm Change Process**

The Algorithm Change Process is regulated to preserve the integrity and functionality of the operational system.

As we look toward J1 Readiness, many algorithm changes are not in response to discrepancies and errors in the code, but rather changes and updating the code to accommodate:
- New J1 Requirements
- The upgrade to the Block 2 operational system

Algorithm updates follow the established change review process documented in the Algorithm Change Management Plan. New algorithms (related to new J1 products) follow an additional review process prior to the submission of the change package to DPES.

**Recent DRs**

STAR ASSIST regularly assists science teams with algorithm changes resulting from new or changed requirements.

- We have generally worked on 30-40 DRs per FY.
- The current directive has emphasized KFPs. Most of our current work focuses on SDR algorithms and development and integration of J1 products. Past years have shown greater emphasis on Land, Aerosol, and Cryosphere EDRs.

Integration and testing involves creating baseline and modified runs of test data. In cases for Cloud Mask and Aerosol changes, we diligently test the effect on downstream products using the Chainrun script.

The flow chart below shows an abbreviated version of the algorithm change process. AIT provides assistance to the science team's development of the product algorithms in the offline system. We will help science teams develop and integrate changes into ADL. We then aid in the submission process to DPES. When the updated operational algorithm is delivered, we can assist with merging the developing code with the new operational system.

The table below shows a list of DRs we have worked on and/or submitted Algorithm Change Packages (ACP) for in the past fiscal year. ACP submission is an iterative process as we work with DPES to overcome the differences between the ADL and G-AD systems.

**Algorithm Change**

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