



SPACE SHUTTLE PROGRAM
Flight Software Office
NASA Johnson Space Center, Houston, Texas



Flight Software Office (FSO) STS-124 In-Flight Anomaly Review SR 4230

Errol A. Jones/MS4
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Tracking #	Description	IFA?	IIFA?
STS-124-S-001	RPOP I-Load Data not updated on PGSC	Y	N



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STS-124-S-001

Rendezvous Proximity Operators Program (RPOP) I-Load Data Not Updated on PGSC

▪ PROBLEM DESCRIPTION

- **Training** versions of the RPOP I-Load files were not replaced with updated **Flight** versions on the Flight PGSC software load.
 - Note: I-Load data includes mass property and other configuration data for the RPOP program
- Problem discovered during standard Post-docking analysis of downlinked RPOP and Trajectory Control Sensor (TCS) data just after docking.
- Rendezvous and docking\undocking operations were not impacted:
 - RPOP only used for crew situational awareness (Rndz ops trained without RPOP)
 - Delta between training versions and flight version mass properties was minimal
 - Updated version of I-loads uplinked via OCA prior to undock
- **IFA?** – Yes, PRACA-reportable data error in PGSC software during flight.
- **IIFA?** – No. Does not impact integrated hazards or multiple elements (per NSTS 08126). Rendezvous operation not impacted (.4 inch cg error on X-axis, 1 ft. cg error on Y-axis) and the correct I-load file was uplinked for undock/flyaround.



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▪ ROOT CAUSE

- **Flight version** of I-loads delivered by RPOP engineer and appr'd by POCCB were not installed on final version of the Flight PGSC software Load. (i.e., training I-loads were not overwritten).
- **Peer Review** of PGSC Software (by PGSC Engineer) was not performed adequately and instructions not detailed specifically enough to uncover discrepancy between flight delivery and training delivery. (File date\time\size comparison not performed)
- **Verification** of PGSC Software load (by RPOP Engineer) only verified proper program execution (and not I-load data versions)

▪ CORRECTIVE ACTION

- Flight version of I-loads uplinked via OCA prior to undock
- Re-verification of all Essential PGSC applications performed in PGSC lab (with MS oversight)

▪ PREVENTATIVE ACTION PLANS (Immediate, Long Term)

- **Pre-flight Verification (Immediate)** – Preventative action in place for STS-125 and subs.

1. **Update Peer Review Checklist** to include complete build check of training and flight loads.
2. **Update Software Verification process** to “**require**” application owners to verify flight configuration data after final software load assembled.
(Note: Currently, only a “**courtesy**” verification is performed at the discretion of the PGSC engineer)
3. **Application Owners to submit sign-off page** to POCCB (in line to SRR Flt Certification) confirming verification of application version, application execution and configuration data.

- **Pre-flight Verification (Long Term considerations)** –

- **Automate data delivery** by application owner to PGSC Engineer
- **Automate Verification** process by Peer Reviewer and Application Owner