



TBD

Creating a Fully-Electronic GFE Work Authorization Document Process for JSC

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EXECUTIVE SUMMARY

- JSC's Electronic Document System (EDS) was published in 2013 by SMA to store and process Task Performance Sheets (TPS), Discrepancy Reports (DR), Hardware Movement Documents (EZT), etc. The 2013 transition turned a fully paper process into an electronic routing one with document level electronic approvals but **maintained an in-line paper process**.
- Today, all work and buy-offs continue to be captured on paper, walked between buildings, and is susceptible to approval errors, a rapidly slowing processing time, and led to projects requesting waivers to use alternate WAD systems, damaging JSC's QMS.
 - NT Data Systems team collaborated with multiple platform providers, test user groups, and stakeholders, to find a solution for this growing need in a way that exceeds JSC's current process, is adaptable to future innovation, and within our limited resource constraints**

INNOVATION

Moving from a paper-based process to a fully electronic one gives NT the potential to make improvement in every aspect of the TPS lifecycle.

Quick ROI Example (Kickback Data From August 2022-2023*)
7,929 TPS's Opened // 1,531 DR's Opened
681 QA Kickbacks (*Released 3/23) // 520 QARC Kickbacks
[1,201 Kickbacks] x [180 mins each] = 216,180 minutes or **3,603 hours of lost time from inefficiencies eliminated by an electronic system**

- Includes identifying the issue, using EDS to notify the responsible party, the party to see, respond to, and resolve the issue, and in some cases, walk the fixed paper across site

COLLABORATION

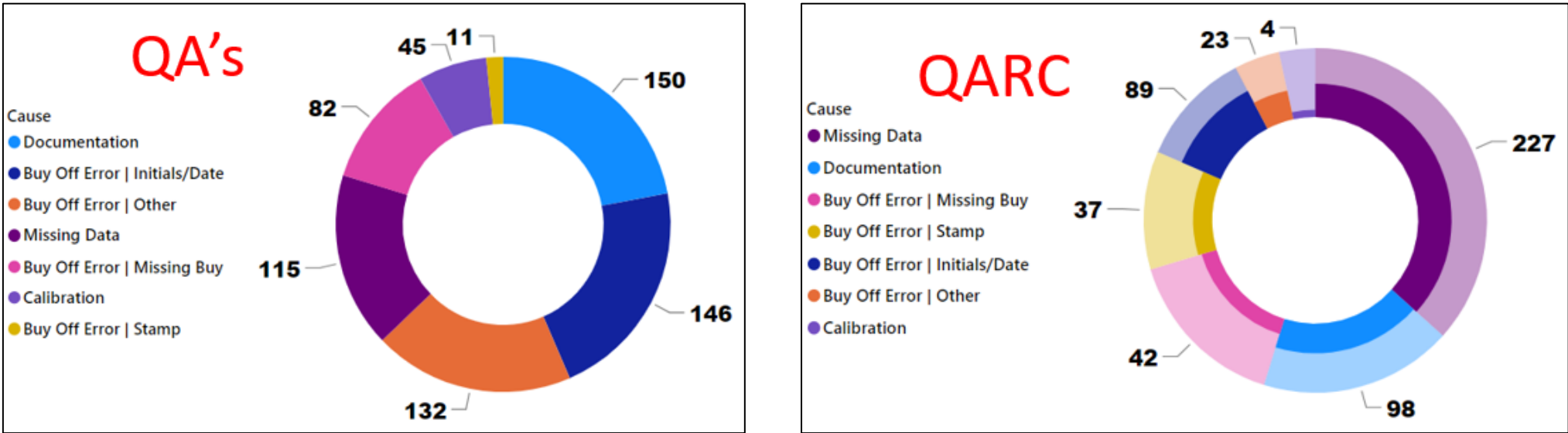
- COSMIC Docs: PM Tyson Tucker and Lead Developer Terri Geisler to create a WAD processing system that will meet JSC's future needs.
- Goddard SFC's Technical Data Management System (TDMS) team to establish a JSC project environment in their fully electronic platform.
- Crew & Thermal Systems Division (EC) Management.
- SA's HRP Research Operations & Integration (ROI) Hardware Team for working the Class 1-E Thigh-Cuff Project in TDMS for use on Crew 9+.
- TPS Creation & Approval Process KAIZEN Event Team for identifying improvement opportunities in the current process and defining a future state. Tiger team now working to develop action and implementation plan.

COSMIC

Documents

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COSMIC Docs. Potentially the NASA-JSC Owned, Fully-Electronic WAD System Solution



Quantifying the Need for a Fully Electronic System

OUTCOMES & INFUSION

- The NT Data Systems teams has continued to work these innovations while continuing to improve our current process in EDS via search parameter changes, small process improvements, and more.
- COSMIC Docs**
- Multi-directorate Kaizen event held on October 11th to evaluate the current process and realize an innovative future state with the COSMIC platform
 - Tiger team of SMA, EA, and SA stakeholders meets weekly to prioritize and execute a system implementation plan based on Kaizen event observations
- TDMS VTC User Group**
- Worked with TDMS Lead, Goddard SMA, and Project Management to stand-up a test environment and eventually JSC's own production instance
 - Over several months, worked with the TDMS developer team, VTC, and many others to customize the Goddard system to best fit JSC's needs, train the VTC team, and prepare the project for the first fabrication WAD
 - Team fully integrated in TDMS and fabricating and approving flight hardware

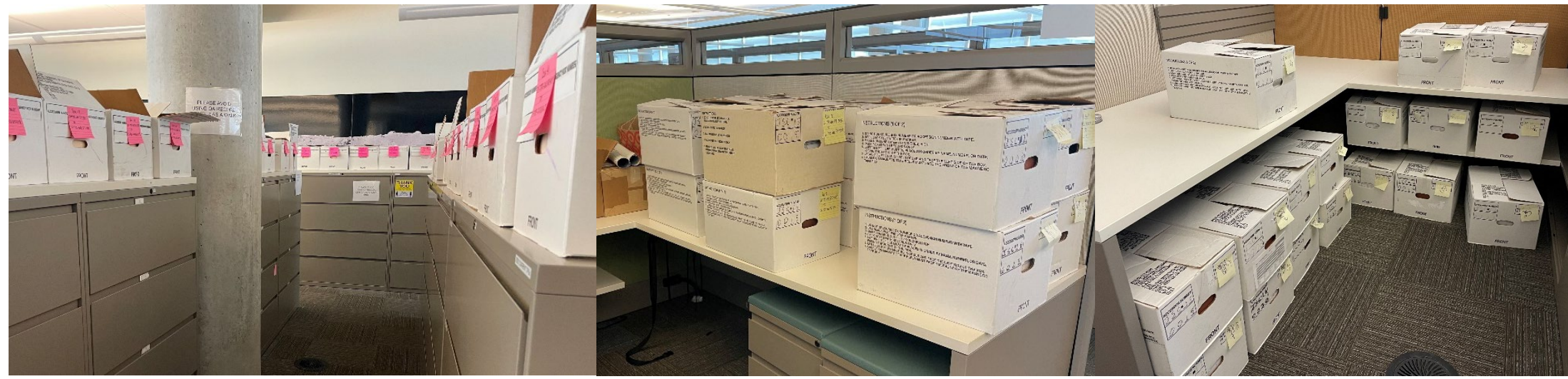
FUTURE WORK

- COSMIC Docs**
- SMA to continue partnership with EC; Need to provide Quality insight and requirements, system and process expertise. NT to ensure that all potential user's needs are integrated
 - First user groups will likely be the Orion Crew Survival Suit (OCSS) team and xEMU projects who are familiar with the COSMIC software, innovative, and eager for a new system
 - Foster conversations with EA's JEDII team, tie software to SMA's Calibration database, and more
- TDMS VTC User Group**
- Continue supporting the VTC user group through testing and completion of their Class 1-E Flight Hardware Project. Targeting Dec 2023 for Crew 8
 - Develop lessons learned to benefit our Goddard counterparts and our first COSMIC user groups transition more quickly to the new system

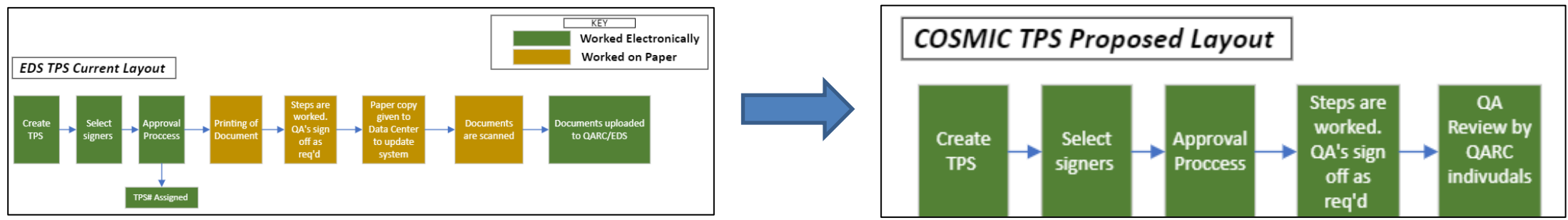
- Resource Limitations & Needs**
- All Data System team members are pursuing this effort as a self-assigned stretch project based on personal motivation and desire for continual process improvement at JSC
 - Need Cross-Directorate support to ensure EA buys into this effort which will act as a catalyst for growing this to a center-wide tool, including SA, JA, etc.

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NTR#(s) NA



Intrusive Storage of Paper WADs in Building 20



Above: TPS Process Improvement Between EDS and COSMIC; Below: New Platform Assessment

System	Owner	Ease of Transition	Pros	Cons	Rank
COSMIC Docs	NT & EC	Originally designed to mimic EDS for xEMU. Process flow is very similar to EDS. EC user groups familiar with COSMIC.	Best UI tested. SMA directly involved in creation of tool and new TPS/DR process.	Originally developed with no SMA insight or controls for Suits projects. Not tied to any other Engineering controlled databases.	1
TDMS	Goddard SFC	Successful first user group proved easy UI with limited group training needed.	System used by Goddard's team. Electronic signatures work well with unique capabilities.	Goddard owned software makes customization potential, limited. Lack of Part-based process. CM heavy.	2 1
EDS 2.0	NT	An overhaul of EDS would pose the easiest user transition.	Inherited love of EDS after 10+ years. SMA is the sole owner of the system and process.	Tied to on-site servers. Time and cost to overhaul EDS to meet needs would be extensive.	3 2
webPAPER	Ames RC	Used by White Sands for their test instructions. NT team has great relationship with development team.	Same nomenclature as JSC process. Electronic buy offs are already built into the system.	Limited customization. Has similar challenges as CP-PRACA and ISS-Part in terms of data visualization and user interface.	4 3
SharePoint eTPS	VIPER Project	Many project engineers and SMA personnel are familiar with the system.	Some JSC personnel have been using the system and are familiar with nomenclature and sign off process.	Data needs to be imported into QARC due to lack of part traceability database. Poor feedback from NT users.	5 4
Maximo or Solumina	Commercial Solutions (Leidos & Lockheed Martin)	Complete re-training of user base and unknown what integration is possible.	Solutions are industry tested with on-call support.	Extremely expensive. Requires a per user license. Minimal control of the look and feel.	6 5