General Atomics Journey with MPEO - SAP’s Next Gen Complex Manufacturing Solution
GENERAL ATOMICS & HISTORY

LOCATION: San Diego

FOUNDED: 1955 by General Dynamics

STATUS: Privately held corporation

BUSINESS: High-technology research, design, manufacturing and production for industry and government worldwide.
Missile Defense and Space Systems (MDSS)

- Land Based and Sea-Based IAMD Railgun System
- Missiles and Weapon Systems
- Surveillance and Sensor Systems
- Space Systems
- Loitering Projectile Weapon System (LPWS)
- High Power Radio Frequency (HPRF)
Current PLM/ERP/MES/Timekeeping Application Landscape

• Two primary business units with diverse and vertically integrated manufacturing footprint:
  – Aircraft and Missions Systems (GA-ASI)
    • End-to-end integrated solution between Windchill/SAP ECC/CAMS/Autotime since 2015
    • CAMS customer since 2013
  – Electromagnetics (GA-EMS)
    • PLM – Windchill
    • ERP, Production Execution, and Timekeeping – SAP ECC
    • No MES
    • Evaluated for initial MPEO roll-out
MPEO 1709 Greenfield Sandbox Proof-of-Concept

KEY BUSINESS DRIVER: Technical evaluation for GA-EMS’s next gen MES Solution

SCOPE:
• Configure, test, document, and learn S/4 HANA MPEO 1709 functionality
• Fit/gap analysis against EMS requirements
• Product maturity for EMS deployment
• Technical assessment and solution framework for a side-car deployment with ECC
• MPEO conversion strategy for side car
• Business Change Impact

ASSUMPTIONS:
• Greenfield
• No enhancements to existing functionality
• No interfaces to any systems (e.g. AutoTime, Windchill, ECC etc.)
Key Highlights and Gaps

- SAP Dev Angel Support (Julia, Deepak, and team) – Very knowledgeable and responsive
- FIORI user experience – MPEO developed entirely on FIORI platform
- Production Engineering
  - Version Managed BOMs and Routings
    - Cannot use classic BOMs and Routings in MPEO
  - Routing app with electronic work instructions
  - eBOM/mBOM handover via Visual Enterprise Manufacturing Planner (VEMP)
  - Use of production versions
  - Employee business partners
  - Change Impact Analysis
  - **Key Gaps:** Phantoms in BOMs, side-car integration
- Production Operations
  - Basic order execution functionality currently limited to just creation with no change management functionality
    - Available in 1909 release
  - Limited functionality around project manufacturing
  - Great Production Supervisor app
  - **Key Gaps:** Order Change, side-car integration
- **Key takeaways**
  - Able to run basic end-to-end MES business process. However functionality gaps to be addressed in order to be viable option for EMS business
  - Understood SAP’s design thinking on the product - best of ECC and CAMS plus more
  - Significant upgrade to the solution from 1709 to 1809 further maturing the product
  - Recognize potential early adoption risks and growing pains with a new application that continues to mature
Key Business Change Impacts

- FIORI based
- Change from Date Effectivity to Version control BOMS and Routings with no Drawing Revision association
- BOM/Routing Authoring
- Use of VEMP for BOM management
- Use of Business Partners
- Change Records
- Planning Scope by plant or part
- Paperless Manufacturing with electronic work instructions, buy-offs, and time entry
Conclusions & Recommendation

SAP S/4HANA Manufacturing for Production Engineering and Operations

- SAP S4 – MPEO is being developed as a powerful SAP S4 MES Solution that is part of the core
- CAMS will no longer be supported by SAP at some point (YR 2023)
  - No new innovations and does not align with the long terms strategy
- MPEO can be implemented with existing SAP ECC Version as well as be ready for eventual S4 Brownfield Implementation
- Based on review of MPEO 1709 (released) and 1809 (released) SAP is committed to very capable Manufacturing Production Module
  - 1909 roadmap addresses most gaps in the solution

The GA-EMS / GA ITS Team Recommends Implementation of SAP S4 MPEO initially as a side car with SAP ECC
EMS Roadmap for a Digitized Shop floor

- 2018
  - Jun
  - Jul
  - Aug
  - Sep
  - Oct
  - Nov
  - Dec

- 2019
  - Jun
  - Jul
  - Aug
  - Sep
  - Oct
  - Nov
  - Dec

- 2020
  - Jun
  - Jul
  - Aug
  - Sep
  - Oct
  - Nov
  - Dec

- 2021
  - Jun
  - Jul
  - Aug
  - Sep
  - Oct
  - Nov
  - Dec

- 2022
  - Jun
  - Jul
  - Aug
  - Sep
  - Oct
  - Nov
  - Dec

- 2023
  - Jun
  - Jul
  - Aug
  - Sep
  - Oct
  - Nov
  - Dec

Capacity Planning
- Phase 1
- Phase 2
- Phase 3

Digitized Shopfloor @ Tijuana with S/4 MPED
- JAN 2019
  - Max
  - Dec

Digitized Shopfloor @ Tijuana with S/4 MPED - Phase 2
- MAR 2020
  - MAX
  - DEC

Digitized Shopfloor @ Tijuana with S/4 MPED - Phase 3
- MAR 2021
  - MAX
  - DEC

Workflow Automation
- Phase 1
- Phase 2
- Phase 3

Reports & Dashboards
- Phase 1
- Phase 2
- Phase 3

S/4 1809
Brownfield/Small box POC

S/4 Brownfield Production Deployment

Digitized Shopfloor @ all EMS Sites with S/4 MPED - Multiple Phases
Questions?