MANAGING RESOURCES IN A DOD SPACE-BASED AGILE/DEVSECOPS PROGRAM
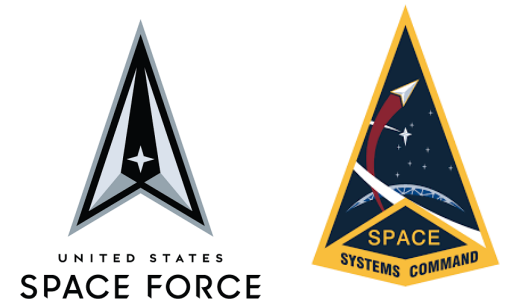
Michael D. Orosz[1], Lt Col Jacob Hempen[2], Lt Col John M. Turner[2], Brian Duffy[1] and Craig Charlton[1]
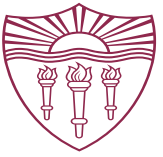
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Overall Project Objectives

- **Improve DoD competitiveness**: Specifically - improve existing DoD space-based *software* system acquisition processes

- **Goals**:

  —Determine the mission engineering methods, analysis, and metrics to transition from traditional DoD 5000 waterfall development environments to agile/DevSecOps processes

  —Includes integration of emerging technologies and related education for the future workforce.

 —**Improved understanding of resource management in a dynamic development environment**.
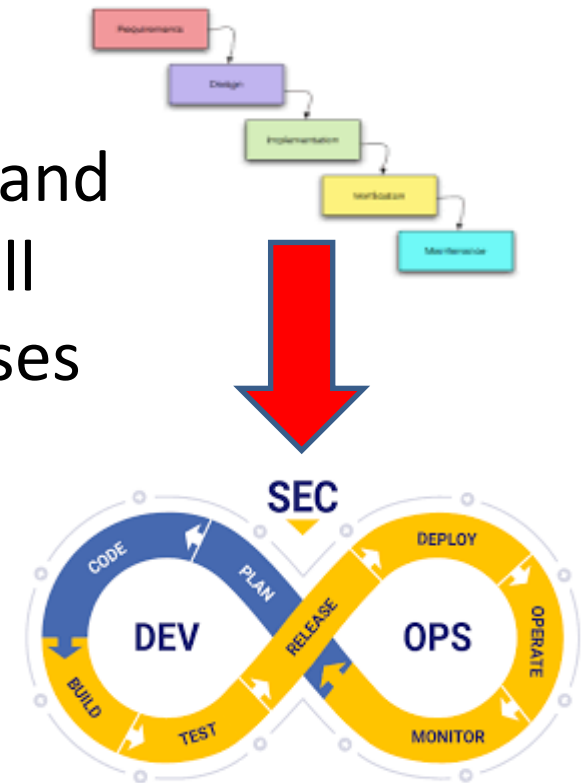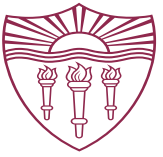
Four DoD Acquisition Projects
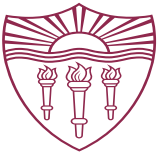
- **Project A:** Traditional waterfall method used (completed)
  - —Duration: 39 months (includes schedule extension)
  - —Software lines of code (SLOC): 178K

- **Project B**: Hybrid composed of both waterfall and agile/near continuous integration processes (completed)
  - —Duration: 25 months
  - —Software lines of code (SLOC): 113K

- **Project C**: Undertake technical explorations and stand up agile/DevSecOps environment in preparation for Project D (completed)
  - —Duration: 15 months
  - —Software lines of code (SLOC): None

- **Project D**: Agile/DevSecOps (**In Progress for 30 months**)
  - —Duration: Approximately 52 months
  - —Software lines of code (SLOC): TBD

Baseline

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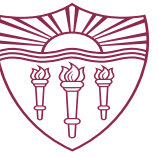
Recommendations/Observations

1. **Upfront engineering**: Perform some upfront engineering to help populate the project backlog, map features with compliance requirements, and to identify dependencies as early as possible in the program.

2. **Not all staff skillsets are equal**: The amount and diversity of talent needs to be constant, so they can be moved/re-arranged to react to the changing needs (be agile) of the program.

3. **Near operational test environments**: Establish (early in the program) a near operational environment and high-fidelity simulators (for horizontal I&T)

4. **Sprint Margins**: Plan margin into the sprints to handle unexpected events such as new technology insertion and/or unexpectedly complex stories (**Agile 101**).

5. **Licensing and other IP issues**: get licensing, IP, accreditation, certification and other programmatic issues resolved early.

6. **Training:** Need for on-board and continuous training to ensure team members (both the contractor and acquisition team) are on the same page

7. **Costing Challenges**: For projects that are costed using "T-shirt sizes, costing needs to be segmented into development, integration and testing, and bug (problem) work-off. Also need sufficient number of T-shirt sizes to cover smallest to largest work packages

8. **Custom tools**: Be prepared to customize performance tracking tools

   – Applies to all teams...government and development contractor

   – Issues:
   - Software incompatibilities
   - Foreign ownership of tools
   - Access challenges (e.g., VPN, security concerns, etc.)
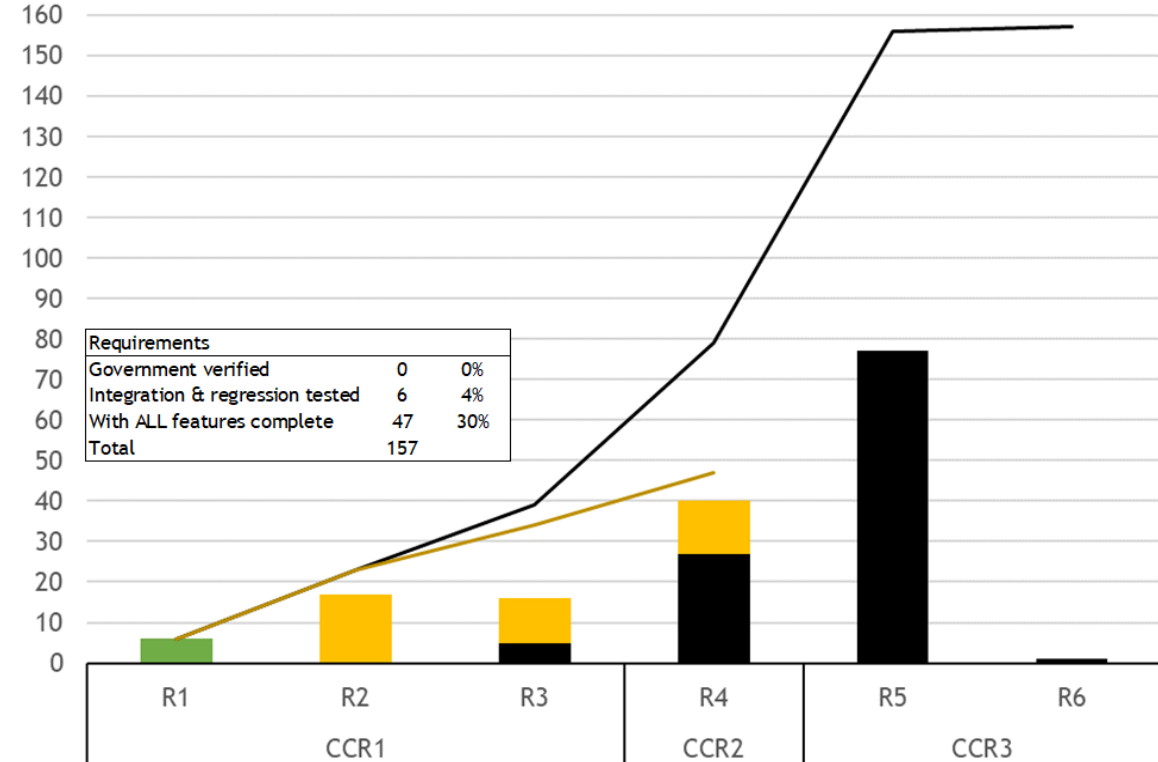   - EVM lags actuals – sometimes by months.
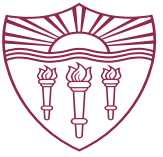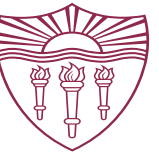
Customized Tools
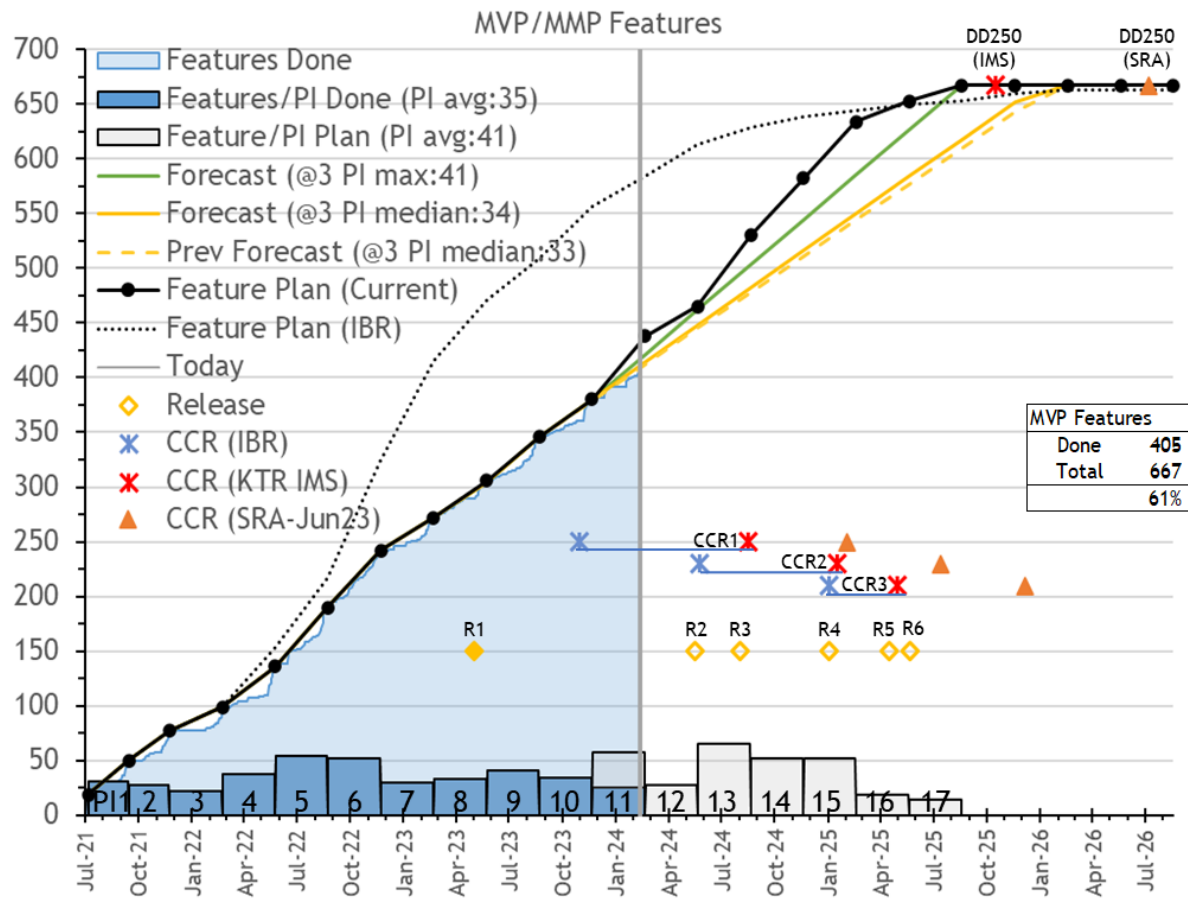
MVP/MMP Plan and Progress Chart


Requirements Completed Towards Critical Release Chart

Customized Tools

Feature Team	Key		Status	Δ Date	Points	%	MVP/MM	PI History	MVP History	Linked Rqmts (DNG)	PI	Issue Type	Updated
TMC	DEVC2-8843	F	In Progress	28-Nov-23	34 | 38	89	(6-b)	1-06),PI10(2023-03-26),PI11(2023-07-11)	(4-a) 2022-08-09,(6-b) 2023-10-19	RQ4342	11	Feature	02-Feb-24 13:23
SIM	DEVC2-477	F	In Progress	07-Sep-23	12 | 18	67	(3-b)	1-27),PI10(2023-04-11),PI11(2023-11-22)	08-29,(4-c) 2022-02-05,(3-b) 2022-02-11	RQ3279, RQ4439	11	Feature	02-Feb-24 13:23
SIM	DEVC2-8386	F	In Progress	26-Oct-23	23 | 31	74	(4-c)	1-27),PI10(2023-04-11),PI11(2023-05-04)	Non-M 2022-07-06,(4-c) 2023-01-18	RQ4386	11	Feature	02-Feb-24 13:23
SIM	DEVC2-8385	F	Done	15-Dec-23	9 | 9	100	(4-c)	2-13),PI10(2023-04-11),PI11(2023-07-11)	Non-M 2022-07-06,(4-c) 2023-01-18		11	Feature	02-Feb-24 13:23
SIM	DEVC2-813	F	Done	01-Feb-24	33 | 33	100	(3-b)	2-13),PI10(2023-08-23),PI11(2023-11-22)	(3-b) 2021-08-29	RQ4380, RQ4381, RQ4384, RQ4385, RQ4	11	Feature	01-Feb-24 18:48
SIM	DEVC2-1675	F	Done	01-Feb-24	28 | 28	100	(3-b)	5-22),PI10(2023-08-23),PI11(2023-11-22)	(3-b) 2021-08-29	RQ2750, RQ4398	11	Feature	01-Feb-24 18:43
TMC	DEVC2-554	F	In Progress	10-Apr-23	44 | 47	94	(5-a)	1-12),PI10(2023-04-10),PI11(2023-07-10)	(5-a) 2021-08-29	RQ1008, RQ1235, RQ370, RQ4050, RQ40	11	Feature	01-Feb-24 16:03
SFG	DEVC2-4430	F	In Review	01-Feb-24	0 | 1		(6-c)	3-11),PI12(2023-01-04),PI11(2023-07-07)	(3-d) 2021-10-04,(6-c) 2022-01-10		11	Feature	01-Feb-24 11:45
SFG	DEVC2-4429	F	In Review	01-Feb-24	0 | 1		(6-c)	0-06),PI10(2023-01-04),PI11(2023-07-10)	(3-d) 2021-10-08,(6-c) 2022-01-10		11	Feature	01-Feb-24 11:44
TMB	DEVC2-13770	F	In Progress	28-Nov-23	25 | 41	61	(6-b)	PI11(2023-10-10)	(4-a) 2023-10-10,(6-b) 2023-10-12		11	Feature	01-Feb-24 11:04
TMB	DEVC2-2268	F	In Review	01-Feb-24	16 | 16	100	(5-a)	7-10),PI12(2023-09-14),PI11(2023-10-09)	(5-a) 2021-08-29		11	Feature	01-Feb-24 11:01
TMA	DEVC2-1551	F	In Progress	20-Nov-23	56 | 72	78	(4-a)	1-18),PI10(2023-02-06),PI11(2023-07-12)	(4-a) 2021-10-29		11	Feature	01-Feb-24 10:13
MET	DEVC2-13005	F	In Progress	28-Nov-23	25 | 37	68	Non-M	PI11(2023-09-19)	Non-M 2023-09-19		11	Feature	01-Feb-24 10:13
MET	DEVC2-13086	F	In Progress	27-Nov-23	52 | 76	68	Non-M	PI11(2023-09-21)	Non-M 2023-09-21		11	Feature	01-Feb-24 10:13

Status Board of Features in current PI

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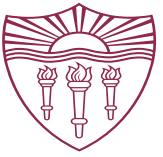
Next Steps

- Work with government team to continue to address observations and apply lessons learned from the study (Project C) and initial phases of Project D.

- Continue collection of performance metrics with a focus on velocity and related metrics.

- Explore strategies to mitigating the challenges of using EVM, I-short sizing and other cost and schedule performance tracking metrics within an Agile program.

- Continue developing/refining training materials and processes

- Join other projects to collect data and provide SME services