Survivable Vehicles for the Warfighters

Mine Resistant Ambush Protected (MRAP) Requirements Management Process

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Agenda

1. MRAP Overview
2. Process Overview
3. Gates
    1. Requirements Prioritization Process (Gate 1)
    2. Design Solution Analysis (Gate 2)
    3. Prioritized Execution Analysis (Gate 3)
    4. Management Decision Review (Gate 4)
4. MRAP Requirements Management System (MRMS)
5. Logistics Impact

1. MRAP Overview

Joint Program Manager

SOCOM Liaison

USN Liaison

USAF Liaison

DPM - USMC

DPM - Army / Deputy

Director Business & Finance / Deputy

Director Acquisition Program Integration / Deputy

Public Affairs Officer

Strategic IPT

Joint Principal for Safety

Director Contracts

Director International Programs

PM Vehicle Systems / Deputy

PM M-ATV / Deputy

PM Assured Mobility Systems (AMS)

APM Caiman

APM MaxxPro

APM RG-31

APM RG-33

APM Buffalo

APM Cougar

Director Test and Evaluation

Director GFE Integration & PM Detection Systems

Forward

PM Logistics and Sustainment

DPM - Army

DPM - USMC

Chief Engineer / Deputy

Director Quality/ Production

MRAP Team

SPAWAR

DoD

USMC

DCMA

DLA

LOGCOM

DoA

Joint Program Office
Warfighters We Will Protect
MRAP
SURVIVABLE
Mine Resistant Ambush Protected Vehicles

DoAF

SAF AC

ATEC

ASN RDA

DoN

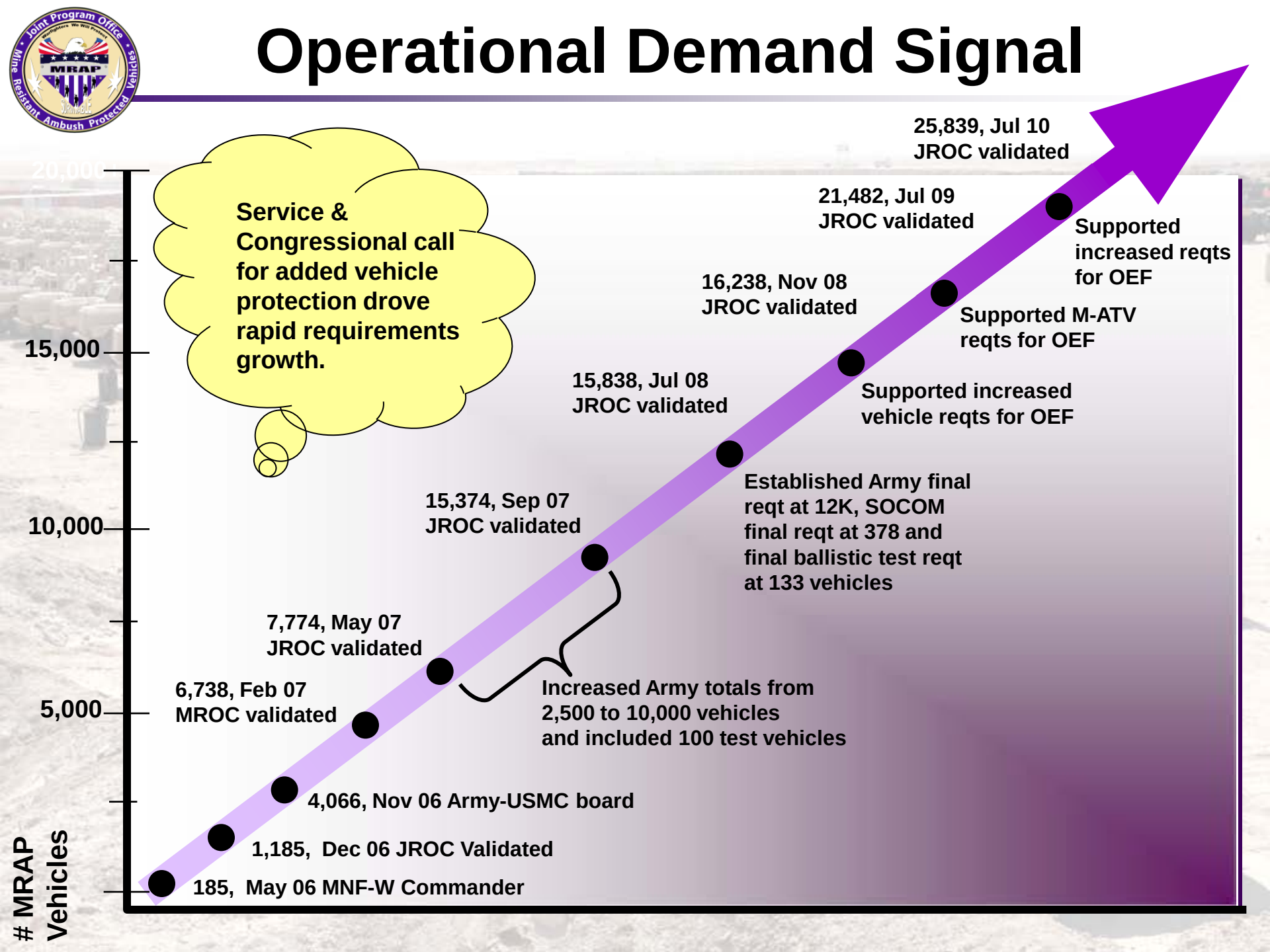
SOCOM

Aberdeen Test Center

PEO CS&CSS

NAVFAC

Operational Demand Signal



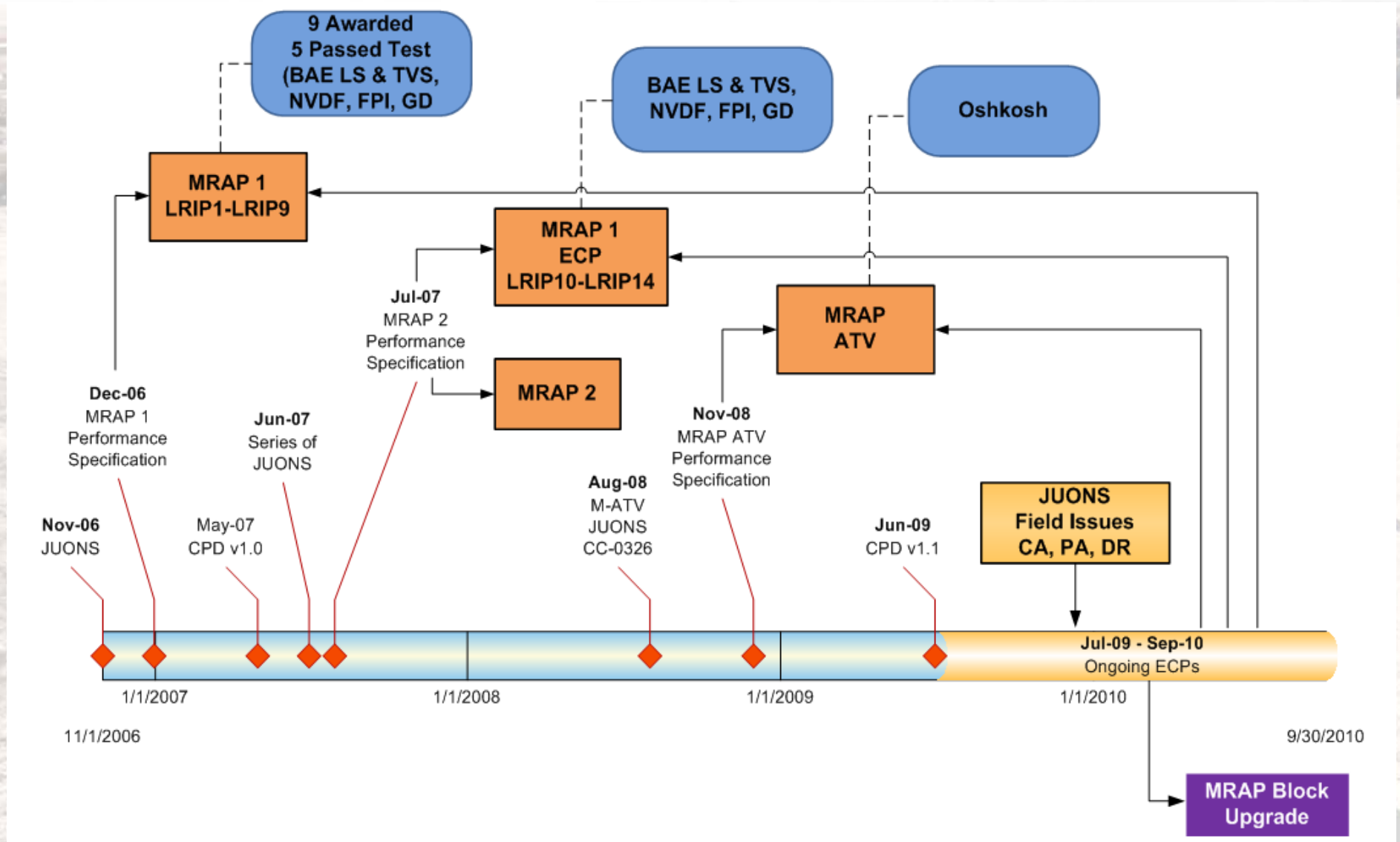
Trade-Offs

- Speed to field
- Multiple variants
- Urgent Fielding
- COTS
- Multiple LRIPS
- Variations along the way

VS

- Complete Testing
- One variant
- Fully supported
- Designed for Services
- Configuration controlled

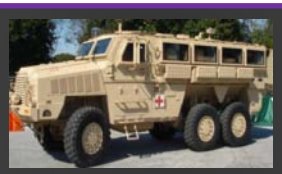
MRAP Requirements Timeline



MRAP Family of Vehicles

BAE





CAT I (379), CAT II (1,905), CAT II AUV (70), ARV (2)

FPI





CAT I (1,999), CAT II (1,061), CAT III (79)

BAE-TVS


CAT I (2,848), CAT II (16)

GDLS-C


CAT I (1,661)

Navistar Defense





CAT I (7,474), CAT II (16)

Oshkosh

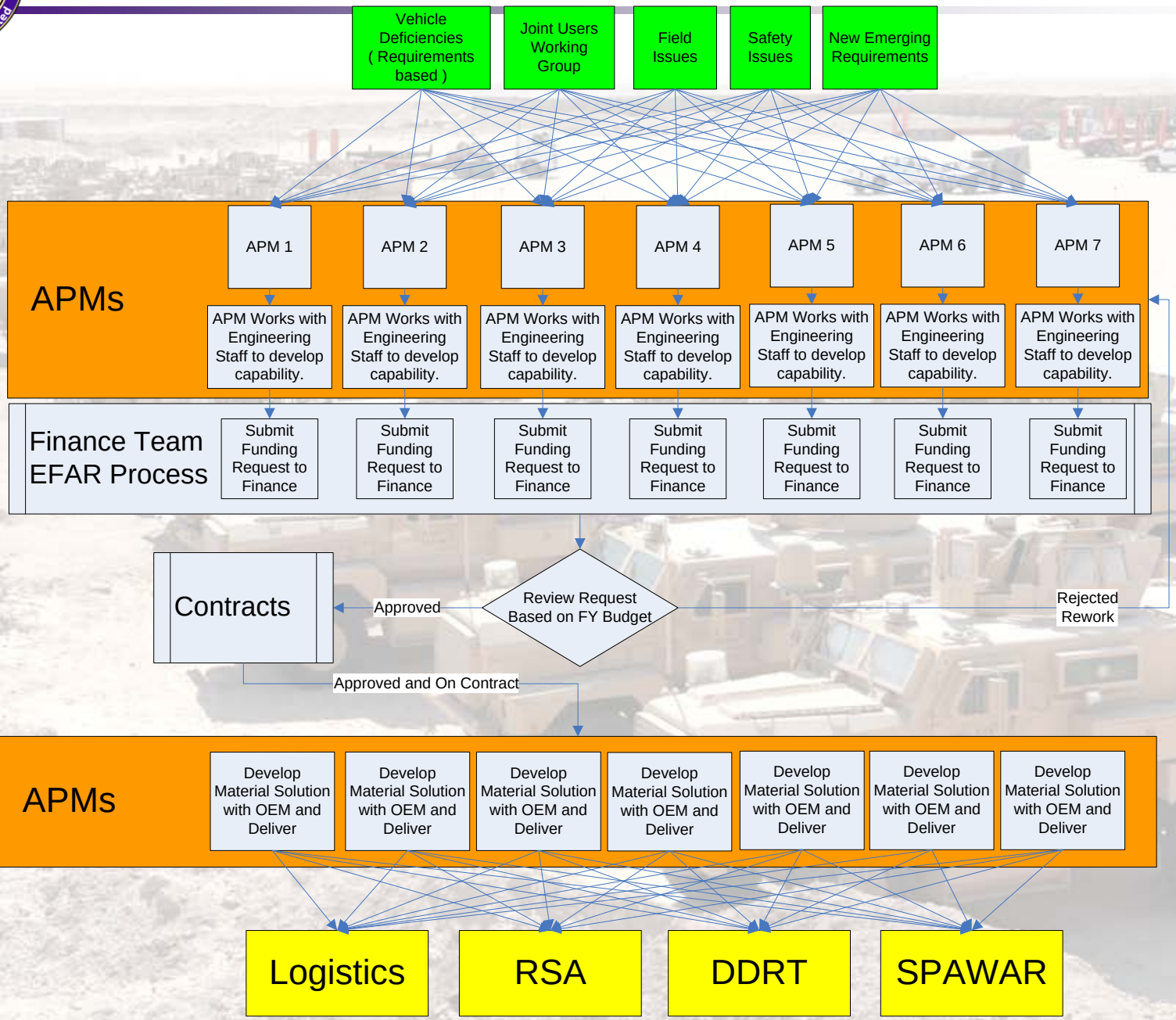
M-ATV (8,088)

International Programs


831

2. Process Overview

“Current State” Process



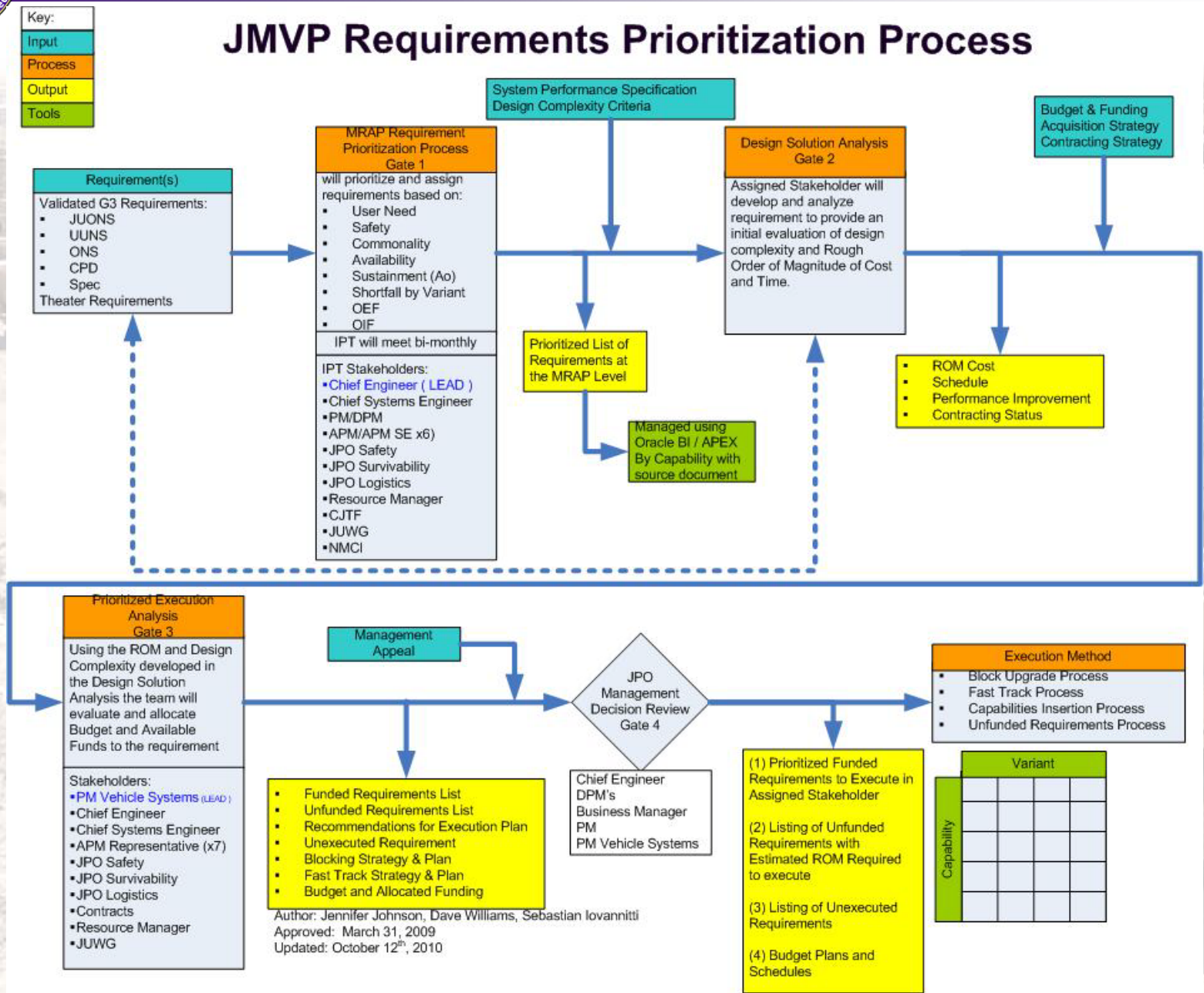
Purpose

To consolidate, prioritize and develop a funding plan for executing MRAP requirements.

This Process:

- **Embraces the Complexity that is MRAP**
  - **Cost, Schedule and Performance**
  - **Down to the sub-variant**
- **Focuses on capability across the fleet**
- **Supports centralized, holistic, informed decision making**
- **Is flexible, repeatable, maintainable and executable**

Requirements Prioritization Process



Roles and Responsibilities

- **Chief Engineer**
  - Lead of the MRAP Requirement Prioritization Process (Gate 1)
- **PM Vehicle Systems**
  - Lead of the Prioritized Execution Analysis (Gate 3)
- **Requirements IPT**
  - Complete Gate 1
  - Complete Gate 3
- **APM SE/JPO Engineering (modification owner)**
  - Complete Gate 2
  - Execute approved Execution plan for modification

3. Requirements Prioritization Process

(Gate 1)

Gate 1: Ground Rules

- The prioritization will be at the MRAP capability level as opposed to the specific platform level.
  - I.E. RPG Defeat vs. Bar Armor on the MaxxPro Dash

- Criteria developed will be used consistently for all MRAP Capabilities

Output – GATE 1

- Approved MRAP Requirements Prioritization Process
- Approved the list of MRAP Capabilities
- Approved ranking criteria for the MRAP capabilities
- A prioritized list of MRAP Capabilities to support the Execution analysis
- Categorization of each APM modification under the appropriate MRAP Capability

Ranking Criteria

Scoring Impact	Weight	Criteria	Scoring Method	Score
28.21%	11	Safety/Survivability	Catastrophic / Defeat (First Order)	9
	11	Safety/Survivability	Critical / Disruption (Partial First Order)	7
	11	Safety/Survivability	Marginal / Detection (Third Order)	5
	11	Safety/Survivability	Negligible	1
23.08%	9	User Need	JUONS/ONS	9
	9	User Need	KPP	8
	9	User Need	JUWG TOP 10	7
	9	User Need	CPD/P-SPEC shortfall	5
	9	User Need	Field Issue	1
17.95%	7	Operational Availability	Non-Mission Capable	9
	7	Operational Availability	Theater Specific (NMC)	5
	7	Operational Availability	Mission Capable	0
12.82%	5	Ease of Installation	Soldier Level - No Special Tools	9
	5	Ease of Installation	FSR Level - No Special Tools	7
	5	Ease of Installation	Sustainment Level	3
10.26%	4	Theater	OEF	9
	4	Theater	OIF	3
7.69%	3	Commonality	Logistics Footprint: Common A/B Kits	9
	3	Commonality	Logistics Footprint: Common B Kits	5
	3	Commonality	None	0

Gate 1 Formulation

❖ Formula for Weighted Score:

Safety/Survivability (Weighting x Score) +

User Need (Weighting x Score) +

Availability (Weighting x Score) +

Ease of Design Integration (Weighting x Score) +

Commonality (Weighting x Score) +

Theater (Weighting x Score) = **Weighted Score**

❖ Formula for Normalized Weighted Score:

Weighted Score / Maximum (Weighted Score) = **Normalized Weighted Score**

MRAP Prioritized Capabilities Round 5

	Capabilities	Source	Safety/Surv	User Need	Oper. Avail.	Ease of Install	Theater	Commonality	Weighted Score - Rd 5	Normalized WtdScore-Rd 5	Round 5
1	Gunner Restraint	Safety - Catastrophic (CPD v1.1, KPP 6.1.1)	9	9	9	9	9	9	351	1	1
2	AFES	JUONS-CC-0029 (CPD v1.1, KSA 6.2.7)	9	9	9	3	9	5	315	0.8974359	2
3	Seatbelts	JUWG Top 10/PSPEC GAP (CPD v1.1 KPP 6.1.1, SA 6.3.1.2)	9	7	9	7	9	5	313	0.89173789	3
4	Safety - Catastrophic	PSPEC 4.2.12 (CPDv1.1, KPP 6.1.1)	9	5	9	7	9	5	295	0.84045584	4
5	PIR Defeat (Rhino)	JUONS - CC-0266/JUONS CC-0222	7	9	5	7	9	5	289	0.82336182	5
6	Emergency Egress	Safety - Catastrophic (CPD v1.1, SA 6.3.1.4)	9	9	0	7	9	5	286	0.81481481	6
7	Rollover	JUONS CC-0373 (CPD v1.1, KPP 6.1.1, SA 6.3.1.3)	9	9	0	7	9	5	286	0.814814815	6
8	IED site interrogation	CPD v1.1, KSA 6.2.8	7	9	9	3	9	0	278	0.79202279	8
9	Underbody Threat Mitigation	Force Protection (CPD v1.1, KPP 6.1.1, KPP 6.1.2)	9	8	0	7	9	5	277	0.78917379	9
10	Side IED Mitigation	Force Protection (CPD v1.1, KPP 6.1.1, KPP 6.1.2)	9	8	0	7	9	5	277	0.78917379	9
11	Overhead Ballistics Protection	ONS-08-4485 (CPD v1.1, KPP 6.1.1)	7	9	0	7	9	9	276	0.78632479	11
12	HVAC	CPD Gap Interior Climate Control/Ventilation (CPD v1.1, SA 6.3.6.2)	7	7	9	3	9	5	275	0.78347578	12
13	Egress	CPD 6.3.12	7	5	9	7	9	5	273	0.77777778	13
14	Ability to Accept Sparks Rollers	ONS - 08-5463	7	9	0	9	9	5	272	0.77492877	14
15	RPG Protection	JUONS-CC-0327	9	9	0	7	9	0	271	0.77207977	15
16	Improved OGPK	Draft ONS 10-10441	7	8	0	7	9	9	267	0.76068376	16
17	EFP Protection	JUONS-CC-0173	9	9	0	3	9	0	255	0.72649573	17
18	Storage	PSPEC 3.1.7.9.2 / JUWG Top 10 (CPD v1.1, SA 6.3.4.3)	7	8	0	7	9	5	255	0.72649573	17
19	Radio Remote Control Unit	ONS-08-6466	5	9	0	9	9	5	250	0.71225071	19
20	RWS	ONS-08-6152 (CPD v1.1, KSA 6.2.3)	7	9	0	3	9	5	248	0.70655271	20
21	Seats (usability/comfort)	CPD v1.1, SA 6.3.1.2	7	7	0	7	9	5	246	0.7008547	21

Capability Gap Analysis

Current and Future Status

- Current shows status by platform and sub-variant “as is”
- Future shows potential state if all currently working actions are implemented
- Still does not get us to fulfilling the 100% solution on all platforms

Capability Gap Analysis - Top 9

Capabilities		Current Performance of Variants												
Technology	Normalized WtdScore	Variant A	Variant B	Variant C	Variant D	Variant E	Variant F	Variant G	Variant H	Variant I	Variant J	Variant K	Variant L	Variant M
Gunner Restraint	1.000													
Seatbelts	0.886													
AFES	0.880													
Safety - Catastrophic	0.834													
PIR Defeat (Rhino)	0.794													
Egress	0.772													
HVAC	0.766													
Emergency Egress	0.757													
Ability to Accept Sparks Rollers	0.723													

Capabilities		Future Performance of Variants												
Technology	Normalized WtdScore	Variant A	Variant B	Variant C	Variant D	Variant E	Variant F	Variant G	Variant H	Variant I	Variant J	Variant K	Variant L	Variant M
Gunner Restraint	1.000													
Seatbelts	0.886													
AFES	0.880													
Safety - Catastrophic	0.834													
PIR Defeat (Rhino)	0.794													
Egress	0.772													
HVAC	0.766													
Emergency Egress	0.757													
Ability to Accept Sparks Rollers	0.723													

Meets/ will meet after upgrade

= Does not meet after upgrade, but has reached cost/ performance

= Does not meet requirement and no upgrade planned

= not applicable

=data not provided

Design Solution Analysis

(Gate 2)

Gate 2 - Purpose

- Platform owners analyze each variant for compliance to the capability list generated in Gate 1.
- Identify and develop design solutions for platform shortfalls and capture cost, schedule, performance and acquisition data in the MRAP Requirements Management System (MRMS)

Gate 2 - Data Obtained

- **Specific Vehicle**
  - Variant (i.e MaxxPro, MaxxPro Plus, MaxxPro Dash)
  - # of vehicles per variant impacted
- **Cost per variant**
  - Unit cost of modification
  - NRE
- **Performance**
  - Current Performance (identify level of current performance i.e No AFES, 50 mph)
  - Proposed Performance with Modification (identify level of proposed performance i.e AFES engine and crew, 65 mph)
- **Schedule**
  - First Unit Equipped (months from Contract Award (CA) to deliver to DDRT/Albany)
  - Completed (months from CA to delivery of last unit to DDRT/Albany)
- **Acquisition Information**
  - Contract vehicle and Status

Output – GATE 2

- **Completed Design Solution Analysis for each platform modification**

- **Consolidated Database for each platform modification to include**
  - Unit Cost
  - NRE
  - Other Cost
  - CY10/CY11/CY12/CY13 (Number of vehicles that can be updated)
  - Variant Affected
  - Number of months to FUE & Number of months to complete
  - Current Performance & Proposed Performance
  - Acquisition method and status

Prioritized Execution Analysis

(Gate 3)

Gate 3 Expectations/Output

- Review of each modification for tractability to requirement
- List of funded requirements
  - By Capability
  - By vehicle variant
  - By Fiscal Year budget
- List of unfunded requirements
- Acquisition Plan for each modification.

Gate 3 Criteria

Cost:

- $0 = Perfect Score of 1
- $15,000+ = Worst Score of 0

Linear

Schedule

- Schedule to FUE
  - 0 month = Perfect Score of 1
  - 9+ Months = Worst Score of 0
- Monthly Production Rate
  - 1200+/month = Perfect Score of 1
  - 0/month = Worst Score of 0

Linear

Performance (% of performance increase)

- 100% increase = Perfect Score of 1
- 0% increase = Why are we doing this?
- Guidelines used for safety Issues
  - Negligible Safety Issue = 25 % increase
  - Marginal Safety Issue = 50% increase
  - Critical Safety Issue = 75% increase
  - Catastrophic Safety Issue = 100% increase

Linear

Prioritization

- Based on the Gate 1 Capability Priority (normalized score)

Gate 3 Weighted Criteria

- Cost – 30 %
- Schedule – 30 %
  - Schedule to FUE – 15%
  - Monthly Production Rate (MPR)– 15%
- Performance – 40%

- EQUATION:

Priority * (.3(Cost) + .15(FUE)+.15(MPR) + .4(Perf.))

Example GRS:

1.00 * (.3(.83) + .15(.56) + .15(1) + .4(1)) = .883

Normalized Score #1 Priority	$2500	4 Months	3600 per month	No GRS to GRS or Catastrophic Safety Issue

JPO Management Decision Review

(Gate 4)

Gate 4

- Purpose is to provide MRAP PM an executive summary of each of the capabilities and the status by each APM
- PM Vehicle Systems presents quad charts of each Capability to obtain funding decision and prioritization by MRAP PM.
  - Supported by APM and APM Lead SE's
- Approval by JPO MRAP to execute.

Gate 4 - Decision Format

WORK PACKAGE DESCRIPTION

- **ID:** 2043
- **Status:** New
- **Variant:** Cougar Cat 2
- **Description:** ISS Kits for CAT IIs

PERFORMANCE IMPROVEMENTS

- **Current Performance:**
  17K-3G front/23K-3G rear
- **Proposed Performance:**
  Increase mobility and strength

ACQUISITION STRATEGY

- **Procurement Type:** IDIQ
- **MIPR Location:**
- **Current Acquisition Phase:** EFAR Not Yet Submitted
- **Installation Man Hours:** 96
- **Installation Location:** MSF / OEF
- **Production Rate:**

	USA#	USAF#	USMC#	SOCOM#	USN#	TOTAL#
Baseline	0	0	0	0	0	0
New	172	0	15	0	83	270
Sum Total	172	0	15	0	83	270

Notes:

CURRENT QUARTER COST/QUANTITY

Baseline / Approved

- **FY10 Qty.:** 0
- **Unit Cost:** $0
- **NRE:** $0
- **Other:** $0
- **Total Cost:** $0

New / Under Consideration

- **FY10 Qty.:** 270
- **Unit Cost:** $134,017
- **NRE:** $0
- **Other:** $0
- **Total Cost:** $36,184,590

- **Funding Comments:** ISS kits for remaining USA, USN and USMC CAT II requirements

	FY10	FY11	FY12	FY13	FY14	TOTAL
Quantity	270	0	0	0	0	270
Unit Costs	$134,017	$0	$0	$0	$0	
NRE Costs	$0	$0	$0	$0	$0	$0
Other Costs	$0	$0	$0	$0	$0	$0
Total Funding	$36,184,590	$0	$0	$0	$0	$36,184,590

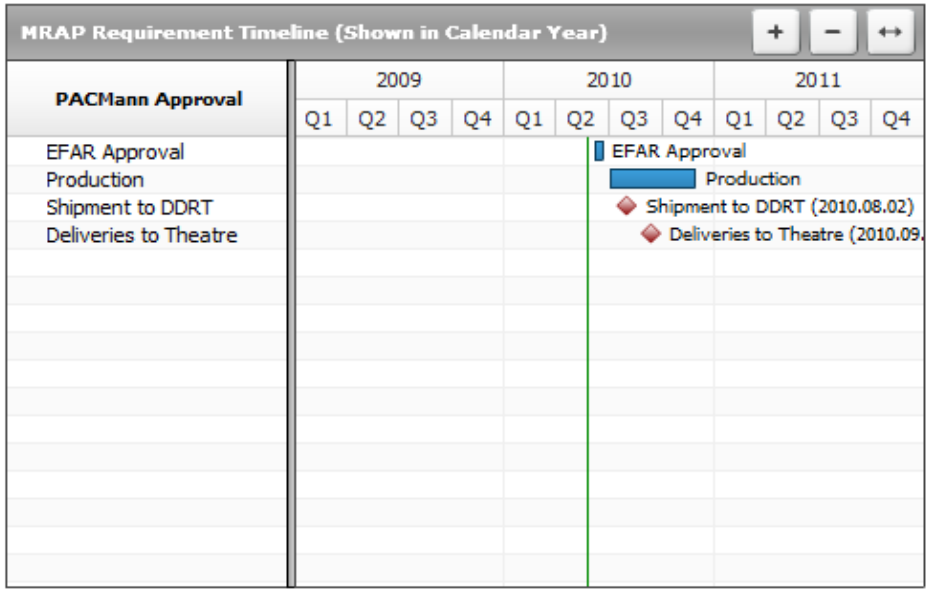
Funded

- **Quantity Funded:**
- **Amount Funded:**
- **Notes:** 0

Obligated

- **Amount Obligated:**

SCHEDULE



4. MRAP Requirements Management System (MRMS)

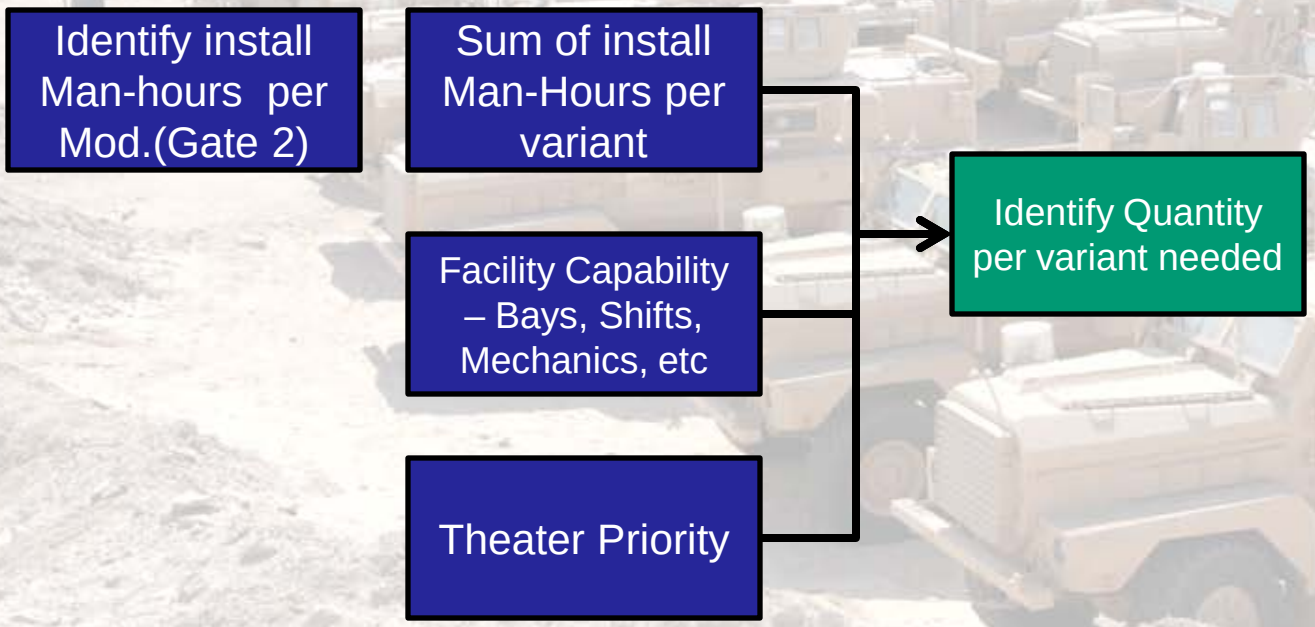
MRAP Requirements Management System (MRMS)

- Online database to track and manage the Req Mgmt Process
- Developed in response to needs identified after first round
- Developed in coordination with PEO CS&CSS CIO and PM AcqBus with potential for wider use across other PEOs/PMs.
- Incorporated requirements from Logistics, Finance, Acquisition, and Engineering
- Principle enhancements:
  - Controlling the data (who *can do* what when)
  - Tracking the data (who *did* what when)
  - Standardized format and content
  - Database systems vs. spreadsheets
  - Breaks the verify-change-reverify-change cycle

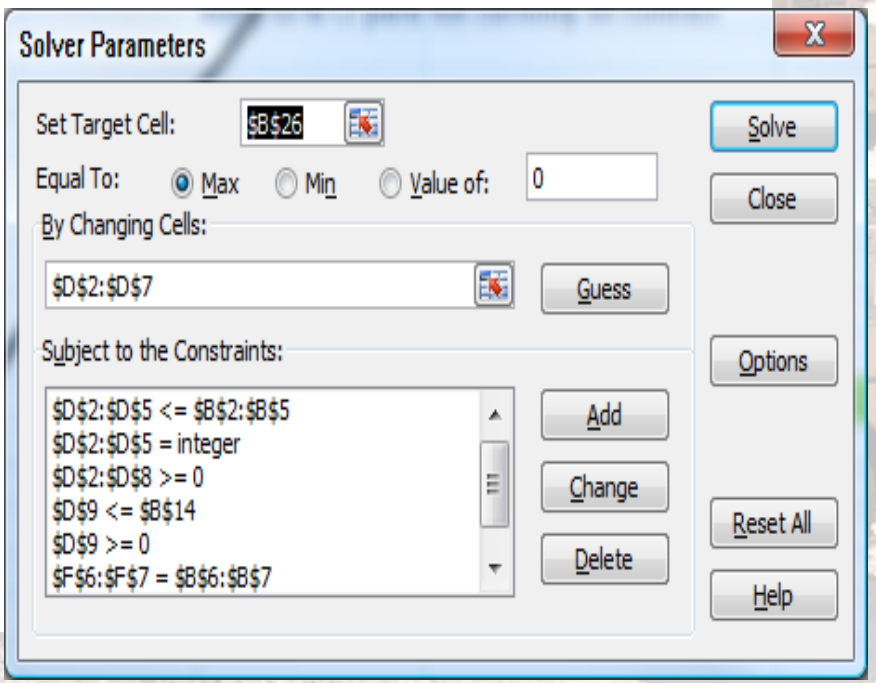
5. Logistics Impact

Limitations for Installation

- **Assuming the vehicles will be available the throughput in the MRAP Sustainment Facility (MSF) and the RSA's in OEF and OND are constraints on the ability to install capabilities.**



MSF Through Put



Cost Avoidance

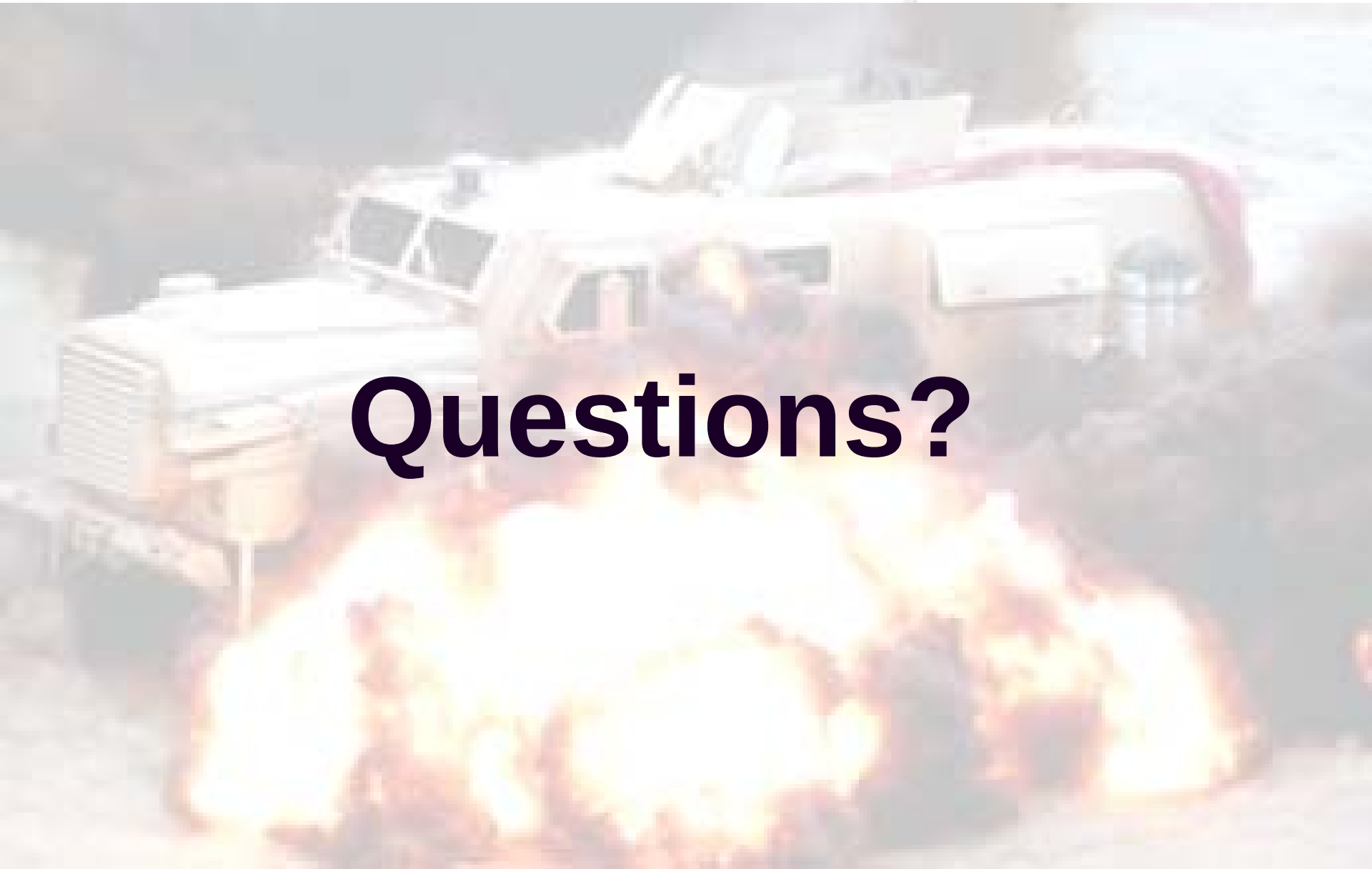
- **MSF Throughput analysis (Round 1)**
  - Limited upgrade fleet to most capable vehicles due to constraints of installation capability.
  - Identified the optimum mix of vehicle variants for installation of upgrades through the MSF
- **Generated a cost avoidance of $2.0B over FY11-17.**
- **MSF, OEF and OND analysis is currently underpinning the expected modification procurement quantity for all variants.**

Summary

- **Execute the process on a Quarterly basis**
  - Completed 5 rounds currently executing round 6
- **Work Packages**
  - Approved Work Packages: 275
  - Done: 419
  - Under Consideration / New: 49
- **Total dollars**

	Approved	Funded	Obligated
FY10	$1,662,046,082	$1,524,806,327	$700,478,840

- **Recipient of the Department of the Army, Lean Six Sigma Excellence Award Program (LEAP)**



Questions?