



PROJECT MANAGER FORCE PROJECTION

Army Ground Robotics Update: NDIA Robotics Division Meeting 14 November, 2017

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PM Force Projection



Agenda

- Army Robotics Portfolio Update
- Common Robotic System, Heavy {CRS(H)}
- Enhanced Robotics Payloads (ERP)
- Squad Multipurpose Equipment Transport (SMET)



PEO CS&CSS Robotics Portfolio

<div></div>			<div>M160 Light Flail</div> <div></div>	<div>Route Clearance & Interrogation System</div> <div></div>	<div>Leader/Follower</div> <div></div>
<div>Robotic Enhancement Program</div> <div></div>	<div>Man-Transportable Robotics System Increment II</div> <div></div>	<div>Common Robotic System Individual</div> <div></div>	<div>Squad Multipurpose Equipment Transport*</div> <div></div>	<div>Robotic Combat Vehicle</div> <div></div>	
<div>Non-Standard Equipment</div> <div><div><p>MTRS MK II MOD I (Talon IV RESET)</p></div><div><p>MTRS MK II MOD II (Talon 5A)</p></div><div><p>TALON IV CBRNe</p></div><div><p>Dragon Runner</p></div><div><p>FirstLook</p></div><div><p>SUGV 310 Mini-EOD</p></div></div>			<div>Common Robotic System Heavy*</div> <div></div>	<div>Enhanced Robotics Payloads*</div> <div></div>	<div>Automated Convoy Operations</div> <div></div>

* Images are conceptual representations, not endorsements



Common Robotic System (Heavy) {CRS(H)} - Problem Statement

PROBLEM STATEMENT

- Explosive Ordnance Disposal (EOD) units lack the ability to perform tactical operations on explosive ordnance (to include IEDs) from a safe standoff distance during EOD operations in global operations.
- EOD units lack the capability to render IEDs safe for transport under decisive operations with an adequate success rate.

Current
(RONS)



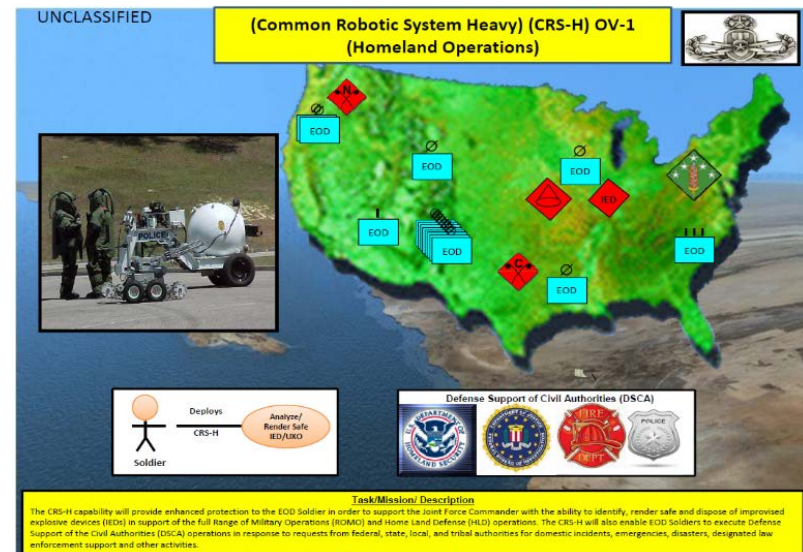
- CRS(H) will replace the Remote Ordnance Neutralization System (RONS) MK3 MOD1
 - To address recent evolution of lethality of explosive hazards & greater need for availability of systems
 - To provide open architecture to support a number of future/variant configuration options
 - To exploit higher levels of performance of newer systems in terms of visual capability, camera views, mobility, and manipulator dexterity, lift capacity & arm extension.



The CRS(H) is the Army's large sized, vehicle transportable, common robotic platform capable of accepting various mission payloads enhancing protection to the EOD Soldier by providing increased standoff capability to identify, render safe and dispose of explosive ordnance and improvised explosive devices in support of the Range of Military Operations and Homeland Defense operations.

- Weight < 700 lbs
- Wireless range of 1,000m LOS and 400m NLOS
- Manipulator arm capable of picking up 100 - 275 lbs and capable of extending 36" below the platform ground plane and 110" above the platform*
- Utilize the CRS(I) Universal Controller to operate the system

- **CPD: Projected January 2018**
- **RPP Released: Projected 1QFY19**
- **Contract Award: Projected 2QFY19**
- **AAO: Projected 225**
- **Target AUMC: TBD**
- **Users: EOD and CBRN**



*CPD recently relaxed requirement from 128" to 110" arm extension



CRS(H) Subsystems Overview

Robotic Platform



< 700 lbs platform weight

Controller

CRS(I)
Universal
Controller
required if
available



Enhanced Robotic Payloads (ERP) (separate draft CDD)



IOP
instantiation
will be used
to provide
modular
interfaces

Native Manipulator Arm

Capable of picking up &
carrying 275lbs objects;
100lbs at full extension

At least 6 DoF arm



Pan, Tilt, Zoom (PTZ) Cameras

Provide trained operator with ability
to visually ID 9 volt battery @ 20ft

Provide fused HD overlay of
Shortwave/Longwave IR &
visible light



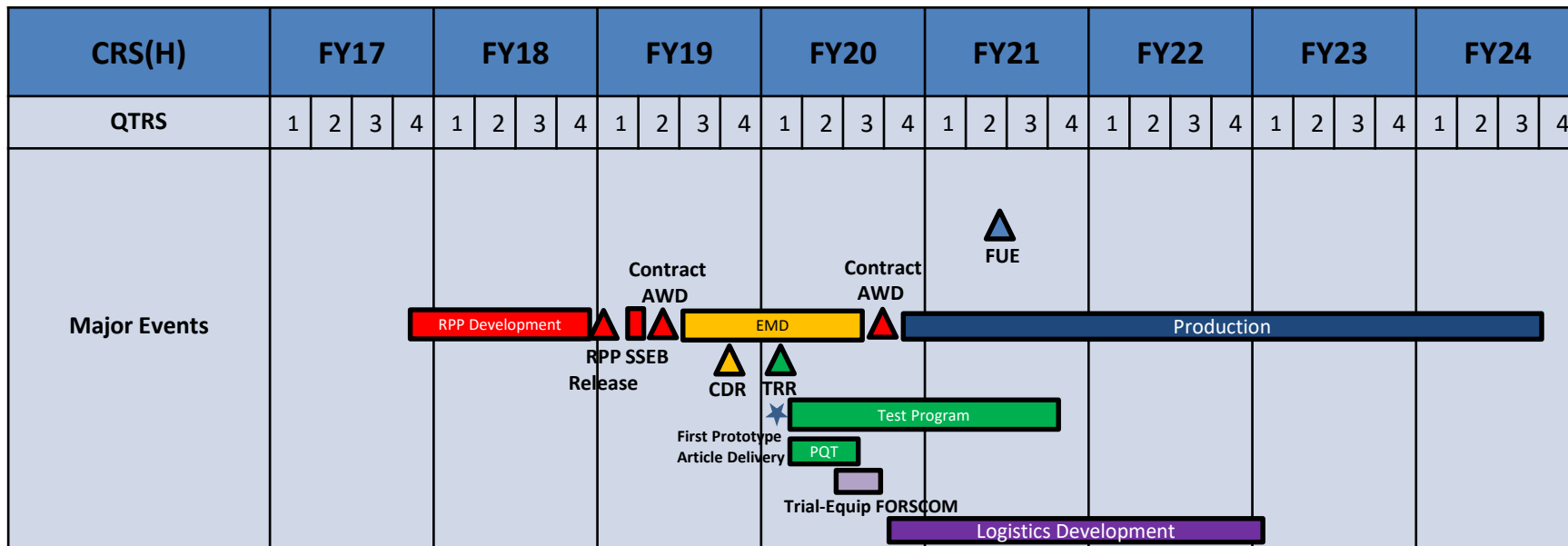
Radio Relay

Radios on both
platform &
controller and at
least 1 remotely
deployable comms
extension node for
NLOS operations
and to extend LOS
range by 2x





CRS(H) Preliminary Schedule



Discussion Points:

- Market Surveys and Follow-on discussions used to shape Other Transaction Authority (OTA) contract / Request Prototype Proposal (RPP)
- Schedule assumptions:
 - Critical Design Review (CDR)
 - Prototype delivery at Test Readiness Review (TRR)
 - Production start following Contract Award

Targeted industry engagement in FY18 to support RPP release in early FY19

- NAMC P-Spec Request for Information (RFI):
 - Provide industry with early visibility into the initial CRS(H) P-Spec
 - Enables collaboration between PdM UGV and industry
 - Provide Government with early industry insight as to technological suitability and feasibility of the initial, proposed CRS(H) P-Spec
- RFI Methodology
 - Government to provide P-Spec in a spreadsheet
 - Respondents asked to provide input for each proposed P-Spec requirement:
 - Clarifications
 - Technology Maturity/Availability
 - Other / Miscellaneous / General Comments

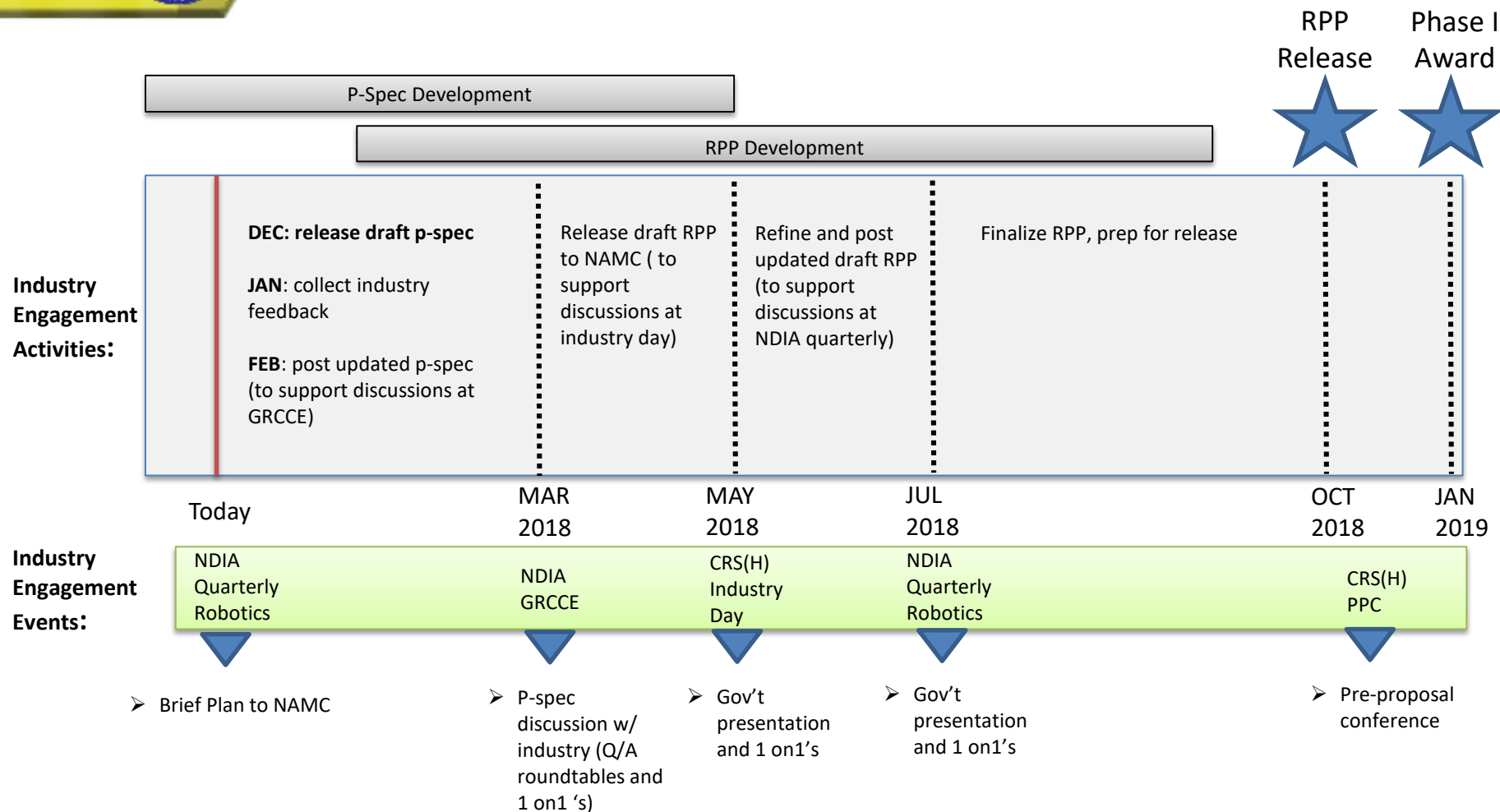
FY18 Market Survey Goals

- ☐ FY17 market research follow-up
- ☐ Identify trade space opportunities
- ☐ Industry informed P-Spec
- ☐ Socialize DRAFT Request Prototype Proposal (RPP)

Industry input helping to shape program requirements!



FY18-19 CRS(H) NAMC Timeline



Leverage Existing Events to Interact with Industry



Enhanced Robotic Payloads (ERP)

System Description: The ERP is a suite of modular capabilities designed with open architecture to provide and increased level of standoff, situational awareness, disruption capability and dexterity to respond to current and emergent Engineer, CBRN and EOD requirements. These multiple, modular robotic mission payloads will use open architecture to integrate with the MTRS Inc II and CRS(H) platforms to form the Army's next generation platform adaptable robotics systems.

Capabilities*:

- Dual Arm Dexterity
- Multi-Shot Disrupter
- Fine Precision Aiming Module
- Multispectral Overlay Camera
- Obstacle Avoidance & Digital Modeling
- Extended Range Radio & Mesh Networking
- Extended Range UAV & Surveillance



- CDD Approval: TBD
- RFP Release: TBD
- AAO: Projected 743
- Users: CBRN and EOD

* Only obstacle avoidance & Mapping and extended range/mesh networking will be fielded to CBRN units





ERP Payload Overview

Multi-Shot Disruptor / Precision Aim

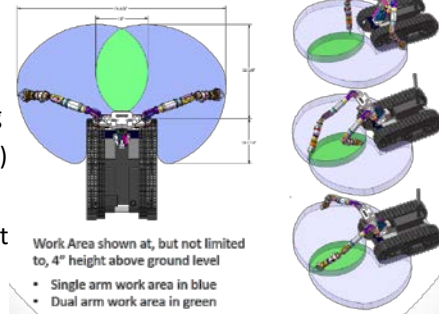


Provides six (T) to ten (O) disruption options including one water shot



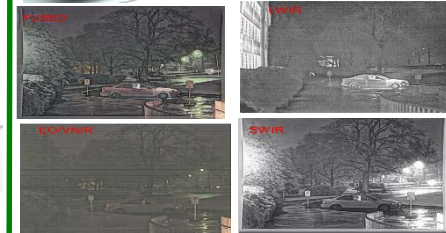
Dual Arm Dexterity

Capable of picking up 90 (T) – 300 (O) pounds and carrying the object for 100 meters on level ground



Multi-Spectral Overlay Camera

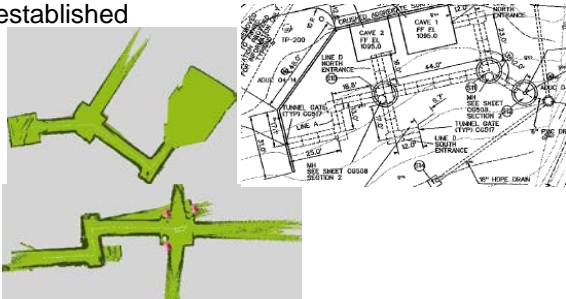
Provides fused spectrum video from LWIR, SWIR and visible light cameras



Obstacle Avoidance and Digital Modeling

Sufficient to digitally model the immediate area around the platform to a distance of 25-40 meters from a platform which enables walls and obstacles to be displayed on the OCU as visual data

Capable of automated return and obstacle avoidance until communications with the OCU is re-established



Extended Range / Mesh Networking



Provide three (T) – four (O) remotely deployable repeater nodes capable of extending LOS platform distance by its initial capability for NLOS subterranean operations



UAV Extended Range and Surveillance

Provide a tethered (T); untethered (O) UAV to assist with communication management and situational awareness



UAV shall incorporate the capability to extend communication range



- Market Research input currently solicited (October 2017) on FedBizOps
 - Six different Market Surveys were solicited
 - Response Due Dates between 10-17 November 17

<https://www.fbo.gov/index?s=agency&mode=form&tab=notices&id=1a047c0ecd7628b31585787e2156b588>
- Follow-on RFIs will be released throughout FY18
- “Industry Day” planning underway, targeting Spring of 2018



Squad Multipurpose Equipment Transport (SMET) Directed Requirement Technology Demonstration

Description: Directed Requirement, signed 14 April 2017, directed the selection of 4 SMET Variants, totaling 80 systems, issued to Soldiers in 2 Brigades for a 1 Year Technology Demonstration to develop the CPD, TTPs and CONOPs.

Two Configurations: Unmanned and Optionally Manned

Required Capabilities:

• Carry 1000 pounds	• Operate over 60 miles in 72 hrs	• Generate 3KW stationary and 1KW moving
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Stretch Goals:

<ul style="list-style-type: none"> • Follow Me • Battery Charging • Reliability 	<ul style="list-style-type: none"> • Silent Watch • Universal controller compatibility • Anti-Rollover 	<ul style="list-style-type: none"> • Transportability at convoy speed • Imbedded Video TMs and Manuals • Interoperability/Expandability
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Phase I: Vendor Solution Assessment (FY17)

- OTA contracts awarded to 9 companies for 10 platforms
- 1 month Phase I assessment @ Ft Benning: 11 Sept-14 Oct 2017
 - 2 vendors run each week at separate locations
- \$100K per system Program Of Record target cost

Phase II: Operational Technology Demonstration (FY18-FY19)

- Down select from Phase I to 4 platforms to produce 20 systems each
- Aberdeen Test Center limited testing and logistics development at PdM ALUGS, Selfridge Air National Guard Base
- Issuing to 2 IBCT locations with Field Service Representative support
- CPD developed and informed by developing TTPs and CONOPs
- OTA continued leverage
- Informed Program Decisions Determine Future



NIE16.1 OCT15 SMET Surrogates

- Acoustic Testing
- Power Offloading
- 60 Miles in 72 hours:
 - road march
 - unimproved road
 - trail
 - wooded



Unimproved Road

- Excursions:
 - Turn Radius
 - Sprint Speed
 - Ascend/Descend
 - Lateral Traversability
 - Water Fording
 - Gap Crossing
 - Tow Speed



Gap Crossing

Day 1	Day 2	Day 3	Day 4	Day 5
-Arrive -Prep -Load Payload -Government In brief -Vendor Demo -Acoustic Test (Late night/early morning)	-Begin 72 hours (First Light) -60 Mile Attempt <div> - Tough Courses - Extensive Data Collected - Great Industry Feedback </div>	-60 Mile Attempt	-60 Mile Attempt	-End 72 hours -Excursions -Depart

Testing Notes:

1. Night testing allowed the use of white light
2. All tests completed using remote control



Phase I - Selected Vendor Systems

- Paper OTA Proposals Evaluated for Assessment Selection
- 8 Other Transaction Authority (OTA) contracts awarded on 27 Jul 17
- 6 Unmanned and 2 Optionally Manned Solutions selected
- Fort Benning Assessment
11 Sept to 14 Oct 17

Companies

General Dynamics Land Systems
HDT Expeditionary Systems
AM General
Howe & Howe Technologies, Inc.
Roboteam NA, Inc.
QinetiQ North American
Applied Research Associates

Systems



Downselect from 8 to 4 Pending

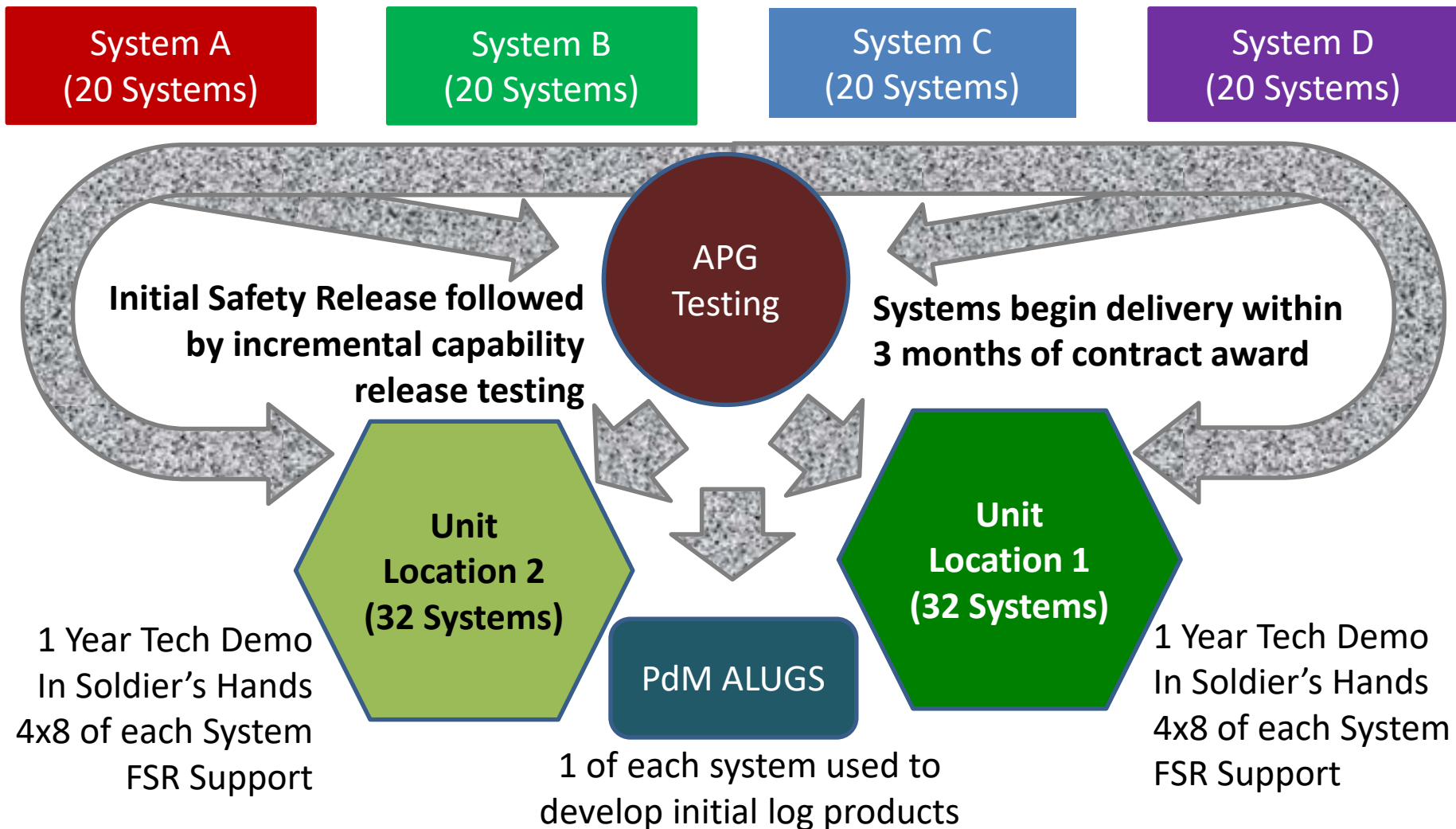
- Performance Data
- Logistics Support Proposal
- Technical Proposal
- Cost Proposal

4 Systems will Participate in 12 Month Technology Demo at
2 of 3 locations Fort Campbell, Fort Polk or Fort Bragg.



Phase II – Soldier Use Tech Demo

80 System Procurement Supports a 1 Year Technology Demonstration and CPD Development

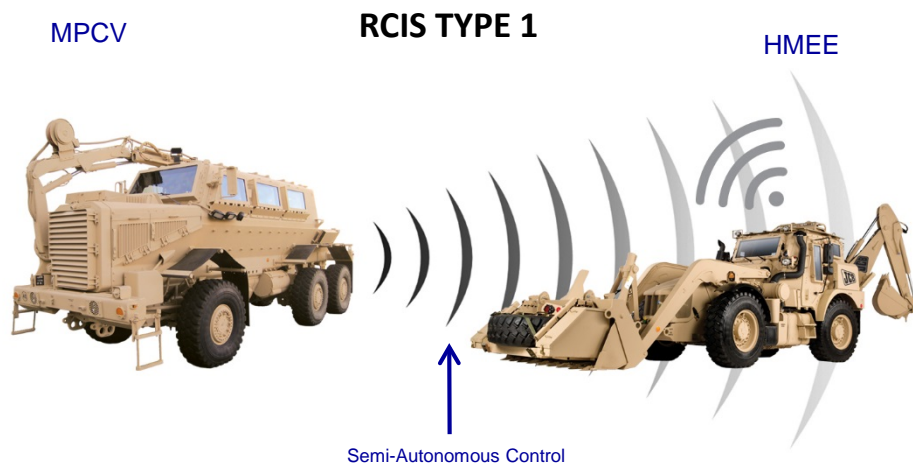




Discussion

Route Clearance & Interrogation Systems Type I

- **System Description**: RCIS Type I will be an excavator (High Mobility Engineer Excavator (HMEE) –Type I), with modular payloads, it will provide force protection and enable soldiers to remotely operate the HMEE from a Buffalo Mine-Protected Clearance Vehicle (MPCV).
- **Route Clearance and Interrogation System Type 1 Capabilities**:
 - ☐ Provides semi-autonomous excavation, interrogation, and classification of deep buried IEDs, explosive hazards and caches.
 - ☐ Allows the ability to neutralize explosive hazards.
 - ☐ Enables ability to operate in confined/urban areas, preventing threat forces from using concealed locations to re-seed routes with explosive hazards.



- **ACAT: ACAT III (Pre-EMD)**
- **AAO: 266**
- **MDD: 3QFY14**
- **Milestone B: 2QFY18**
- **EMD Contract Award: 3QFY18**
- **Milestone C: 1QFY21**
- **IOT&E: 3QFY22**



Route Clearance & Interrogation Systems Type II

- **System Description**: RCIS Type II will provide a capability to tele-operate and/or semi-autonomously control the functions of the RG-31 type vehicle and controlled from another Medium Mine Protected Vehicle (MMPV) or RG31 type of vehicle.
- **Emerging Program Events**:
 - ☐ RG31/MMPV digitization study
 - ☐ RFI to gauge industry interest and initiate communication of requirements.
 - ☐ FY20 is the first programmed funding for RCIS Type II
 - ☐ Extensive Performance Spec and RFP development started by FY19

RCIS TYPE II

MMPV



MMPV Type II



Semi-Autonomous Control

Preliminary Dates

- ACAT: ACAT III (Pre-EMD)
- AAO: TBD
- MDD: 3QFY20
- Milestone B: 2QFY21
- EMD Contract Award: 3QFY21



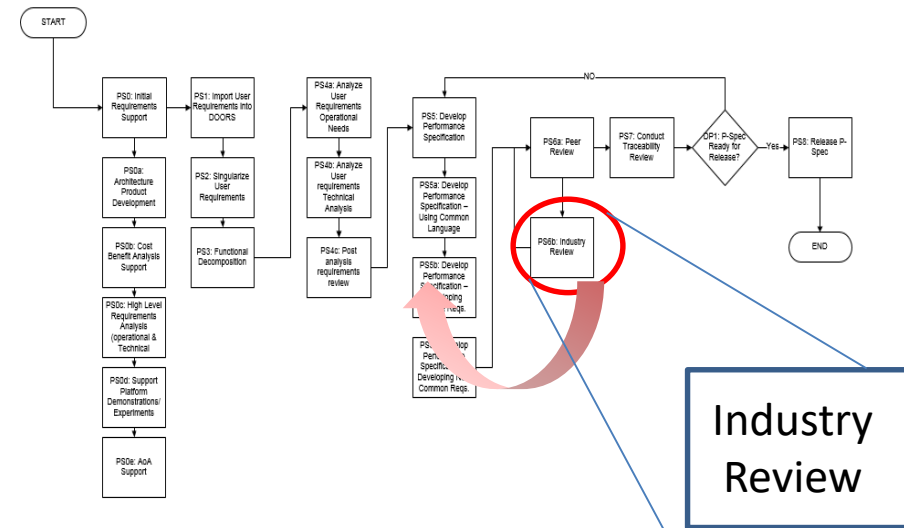
CRS(H) Industry Engagement

FY17 Market Survey

- ☒ Market Survey /RFI on COTS candidates for CRS(H) received

FY18 Market Survey Goals

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PM FP P-Spec Development Process

Industry input helping to shape program requirements!