



Evolve to Open(EVO) Industry Day

20 July 2017

Celtic Manor

Purpose of the day

General Dynamics UK welcomes the industry, suppliers and Small/Medium Enterprises

This is the second of a series of General Dynamics supply chain engagements for the EvO Transition Partner (TP) contract. Its purpose is:

- Introduce the General Dynamics UK EvO team
- Engage with the supply chain
- Outline opportunities from within the General Dynamics UK EvO work scope
- Provide visibility and access routes to future General Dynamics-led competitions
- This is not part of the broader MORPHEUS Supply Chain Industry engagement coordinated by MoD

Welcome and outcomes for the day

Craig Jansen - EvO Transition Partner Programme Director

Welcome and outcomes for the day

As the MoD's Evolve to Open (EvO) Transition Partner, General Dynamics is:

- Delivering the next generation of Tactical Communication and Information Systems (TacCIS) capability after BCIP 5.6.
- Delivering a DaaP compliant MORPHEUS and EvO architecture that is Open, Interoperable, Vendor Independent and Evergreen
- Helping to transition the MOD to be a Quasi-Prime and Coordinating Design Authority

Our EvO Development and Procurement strategy

- Capability and Outcome driven Acceptance with continual Assurance
- Committed to EvO Team Values including our extended Industry team members
- Agile at Scale
 - Strong Agile governance and adherence to Agile principles
 - Nothing beats an Agile Team
- EvO and MORPHEUS will be stronger by engaging partner Agile development teams with best of breed domain and product expertise
- Transparent competition for hardware and software items

Industry engagement on EvO

Richard Thomas - Head of Supply Chain

Industry engagement on EvO

The approach taken by General Dynamics to ensure best value for money in the EvO programme

- **Our approach:**

- Embedding external experts into General Dynamics technical teams
- Outsourcing of specific work packages
- Implementing Scaled Agile Framework® (SAFe® 4.0)
- Procurement of best in class manufacturing capability, technology and materials
- Continuous collaboration with industry ensuring an efficient information flow supporting the programme
- Promote innovation within the Supply Chain throughout the programme lifecycle
- Utilise dual / multi sourcing to enable security of supply where appropriate
- Establish and maintain competitive and sustainable relationships with the Supply Chain throughout the programme lifecycle
- Ensure all mandatory legislation and compliance requirements are understood

EvO Supply Chain Approach

The approach taken by General Dynamics to ensure best value for money in the EvO project

- Reasons for this approach:
 - Continue to sustain and grow the TacCIS capability within the UK
 - Further develop the understanding and the potential of the supply chain
 - Ensure innovation is promoted throughout the process
 - Open the competition to enable Small to Medium Enterprise (SME) companies to compete for opportunities
 - Utilise best in class subject matter experts and cross-sector expertise
 - Ensure that Value for Money is delivered through competition

EvO Potential Supplier Opportunities

Work Packages which will be offered to the market through competition

- Below is a non exhaustive list of work packages which will be considered for competition in the market

Category	Examples	Expected Competition dates
Contract Manufacturing	Circuit Card assemblies, Cable Harnesses, metal enclosures, metalwork fabrication	Q4 2016- Q1 2018
Technical Services	Safety & security engineering support, Systems engineering, Architecture and Design support	Q3 2017
Software development	Delivery of coding work packages, Bespoke development of specialist & COTS software components	Q3 2017
Support services	Integrated Logistics Support design, Training package delivery	Q4 2017
Training development	Training Package Development, Train the trainer, CBT	Q1 2018

Channels of engagement

Process of establishing channels of engagement with General Dynamics

- Supplier registration portal to collect basic capabilities and details of potential Suppliers.
- General Dynamics conduct analysis of registrations and carryout segmentation/ categorisation process.
- Communication bulletins will be issued regularly on both a generic and specific level containing programme updates and upcoming competition alerts.
- Suppliers will be invited to participate in competitions relevant to their capabilities through PQQ...RFI...RFQ...
- Identified General Dynamics POCs will be available to manage open communications (Q&A forum) throughout the tender process.

Next Steps

What happens next – today, tomorrow and in the future

- Engagement opportunities today
 - Subject matter experts, per table configuration on following slide, will be available for brief one to one sessions to clarify any questions
 - Supply Chain representatives will be available to respond to any questions regarding becoming a supplier and doing business with General Dynamics
- Engagement going forward within EvO
 - All registered companies will begin to receive regular updates of General Dynamics progression in industry engagement, competition and programme progress.
 - Specific communications will be targeted towards companies who are registered and have displayed capabilities in relevant areas
 - General Dynamics will inform also of up coming events relating to topic specific innovation forums and further industry days with defined technical subject matter.

Conflict of Interest

**Peter Davies – Director Commercial & Export
Compliance**

Conflict of Interest

Background

- As the Transition Partner for EvO, General Dynamics will have access to information which could provide an unfair advantage in pursuing competitive MORPHEUS opportunities.
- General Dynamics has committed to MoD that it will behave ethically and ensure privileged information gained through sole source work on EvO is not available directly to the General Dynamics team that is pursuing competitive business.
- Under the Terms of the EvO Contract we have had to provide a Conflict of Interest (Conflict of Interest) Regime detailing the constraints and regulations to be applied.

Conflict of Interest

Implementation - General Dynamics

- The EvO team, irrespective of location, is not to share or discuss EvO privileged information with those pursuing any competitive opportunity.
- The MORPHEUS team pursuing the competitive opportunity is not to seek EvO privileged information or seek to influence the EvO design.
- Data storage, both Printed and Electronic Form is to be separated and access controlled between the EvO team and those pursuing the competitive opportunity.
- Teams are to physically separated.
- Individuals working on the EvO Contract may be precluded from working on a MORPHEUS competitive opportunity as determined by MoD.
- Wider industry players who wish to work on any aspect of the EvO Contract, will be required to adhere to the terms of the Conflict of Interest Regime.

Conflict of Interest

Implementation - Industry

- Dependent on Scope of Supply
 - COTS/Standard Catalogue products – no Conflict of Interest constraints
 - Development of bespoke products, under direct contract to General Dynamics as part of the EvO contract - Conflict of Interest constraints similar to those described for General Dynamics will form part of the Sub-contract terms and conditions
 - Provision of Labour for EvO, either on a manpower substitution or on a work package basis, under direct contract to General Dynamics – Conflict of Interest constraints similar to those described for General Dynamics will form part of the Sub-contract terms and conditions.
 - Development of products, or provision of labour under direct contract to MoD, Conflict of Interest constraints will be as required by MoD, dependent on the nature of the goods/services to be supplied.

EvO Overview

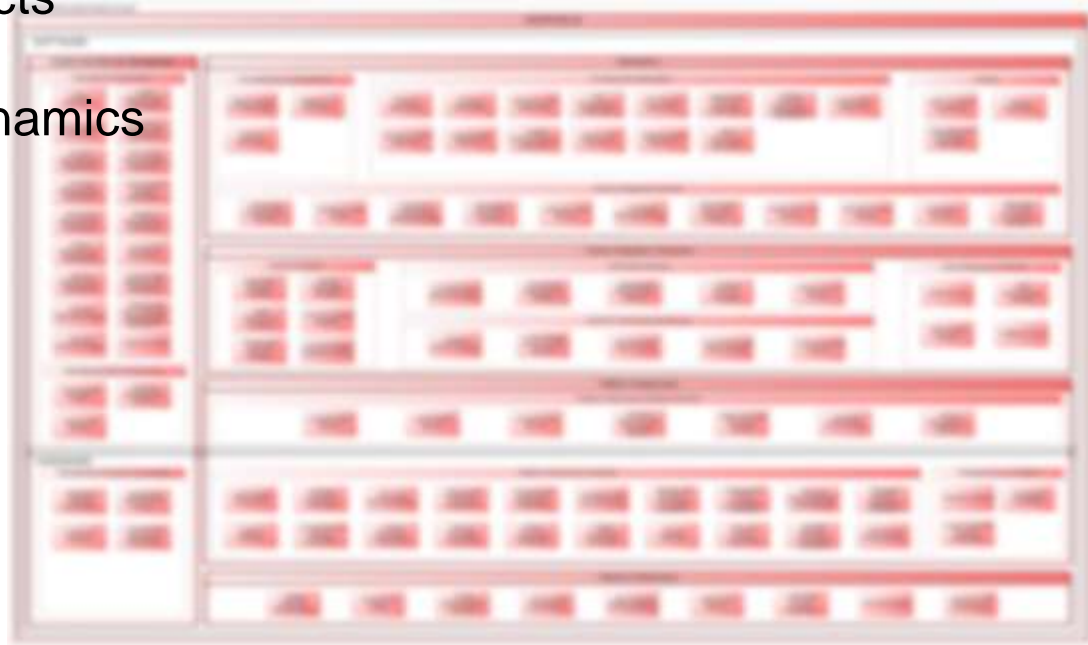
Andy Oliver – EvO Deputy Chief Engineer

MORPHEUS Evolve to Open (EvO)

- MORPHEUS is the UK MoD's next generation Land Environment Tactical Communication & Info System (LETacCIS)
- EvO will be the initial baseline of MORPHEUS:
 - Evolution of the legacy Bowman system
 - Builds on the Bowman 'Brownfield site' to provide an open system
 - Architecture based on General Dynamics 'Vertex' open TacCIS architecture
 - Architecture will be delivered and owned by MoD over the course of EvO execution
- Evo enables:
 - Early fielding of initial MORPHEUS capability
 - Maximum re-use of legacy equipment & COTS / MOTS

MORPHEUS Architecture

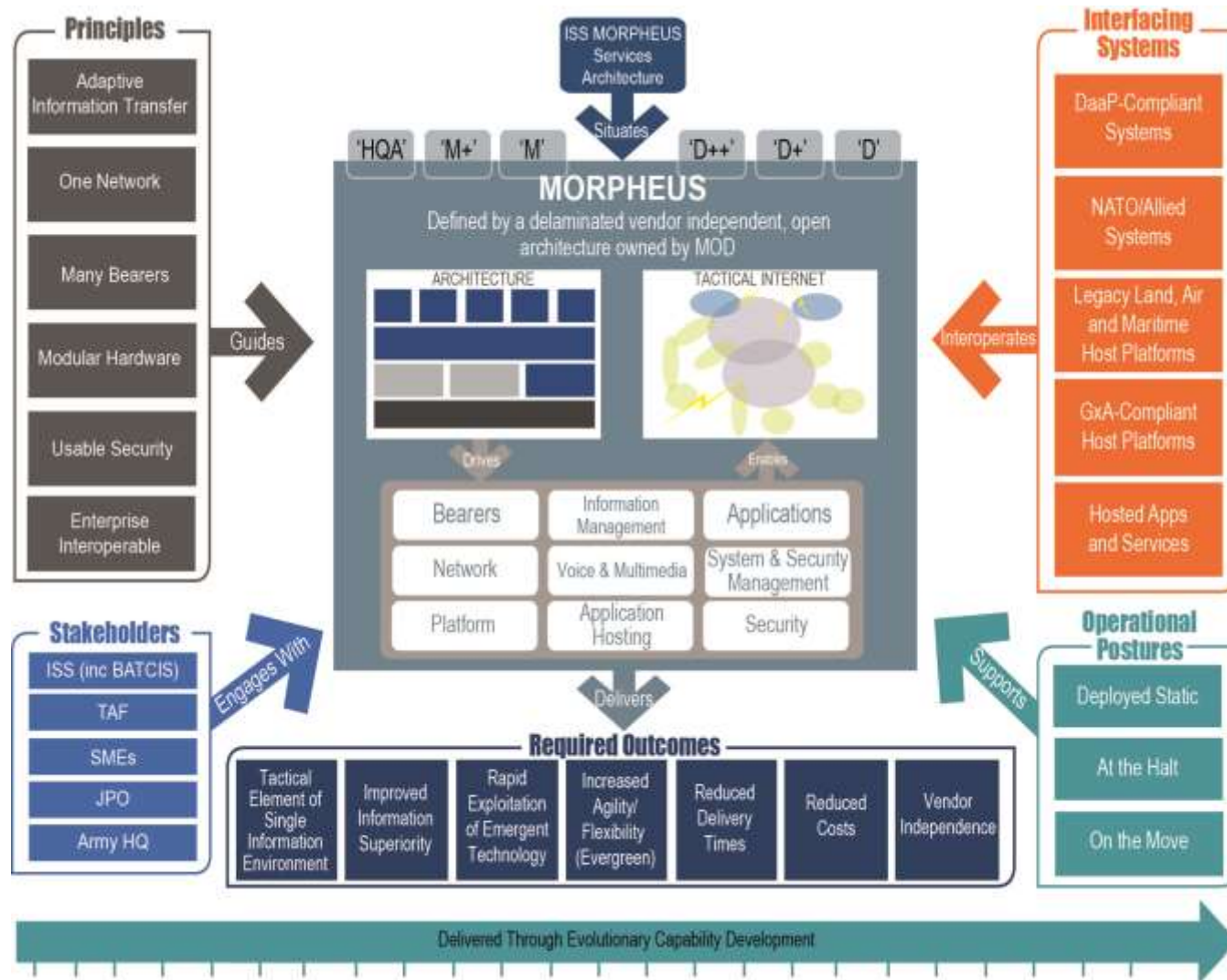
- Logical architecture under development for MoD under EvO
- Includes elements of
 - MORPHEUS target architecture
 - EvO System (realisation)
 - Legacy BCIP components (Evolving the current system)
 - GFE
 - General Dynamics Core products
 - Procured items by MoD
 - Procured items by General Dynamics



TAF Contact:

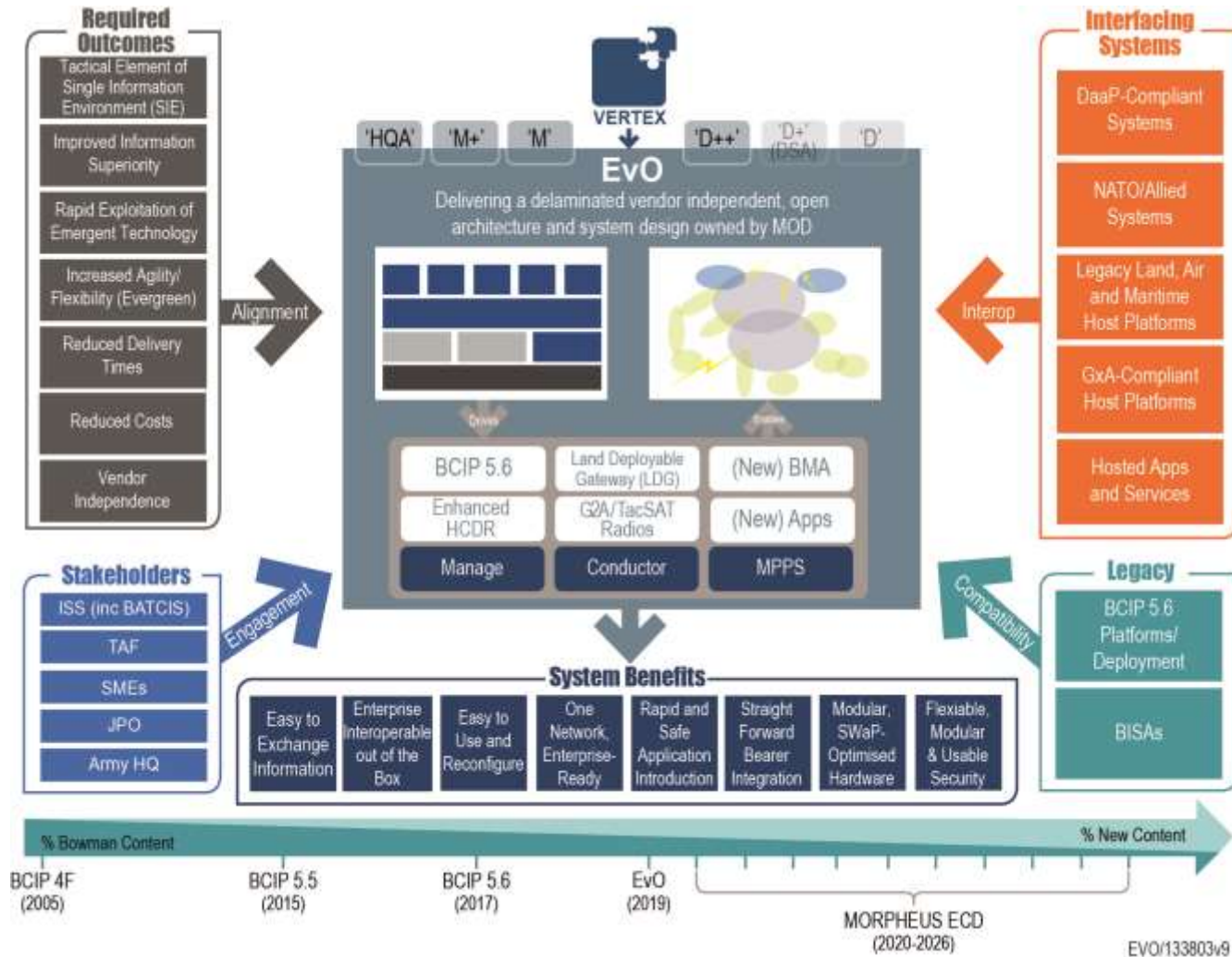
Chris Sabourin | TAF Lead
MORPHEUS | BATCIS | Mail Point #3008
Ash Level 0 | MOD Abbey Wood | Bristol | BS34 8JH
[07729882679](tel:07729882679) | christopher.sabourin109@mod.uk

MORPHEUS on a page

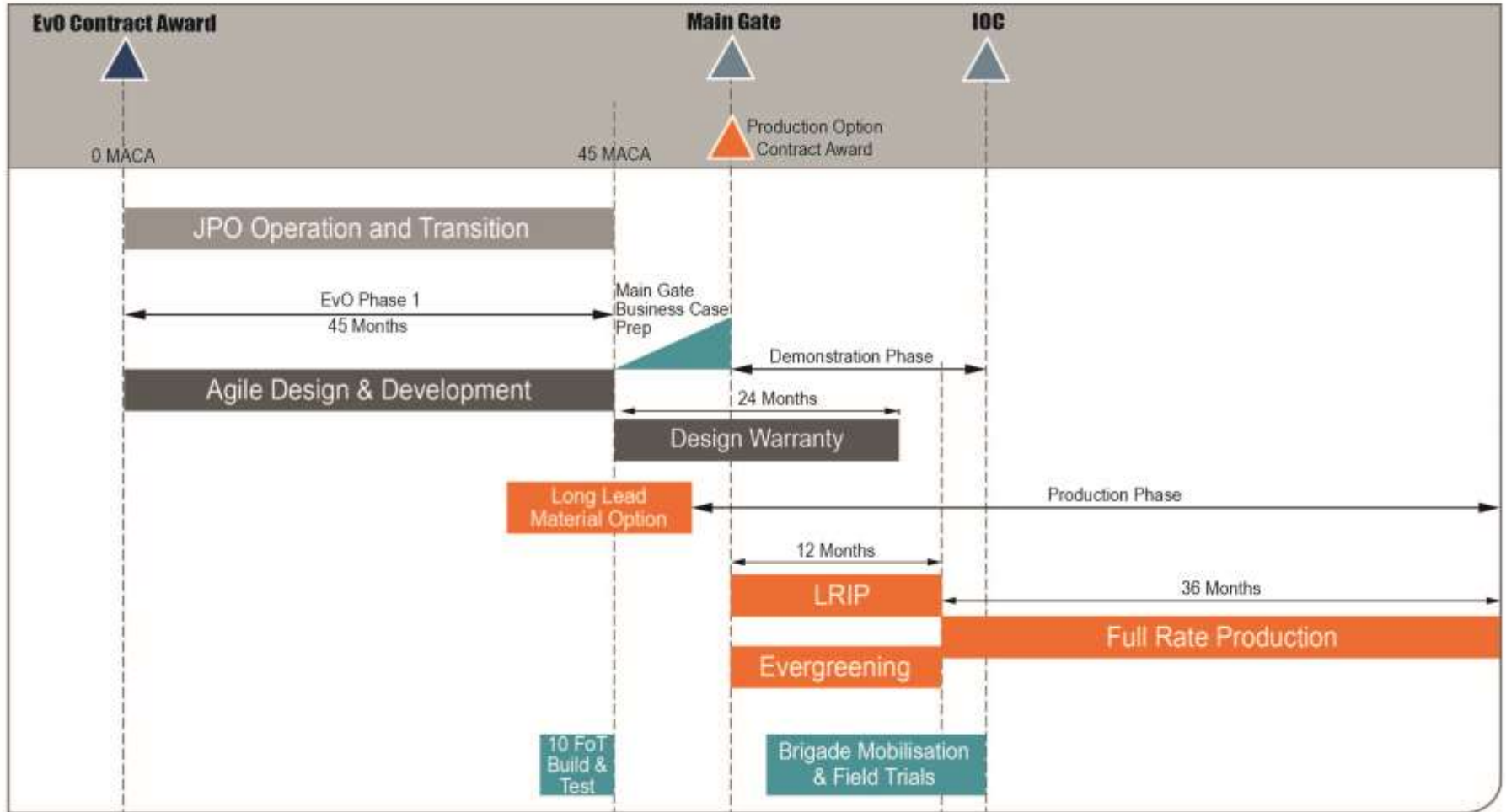


EvO solution overview

Evolving BCIP to provide an open basis for MoD to achieve Evolutionary Capability Delivery (ECD)



EVO Schedule

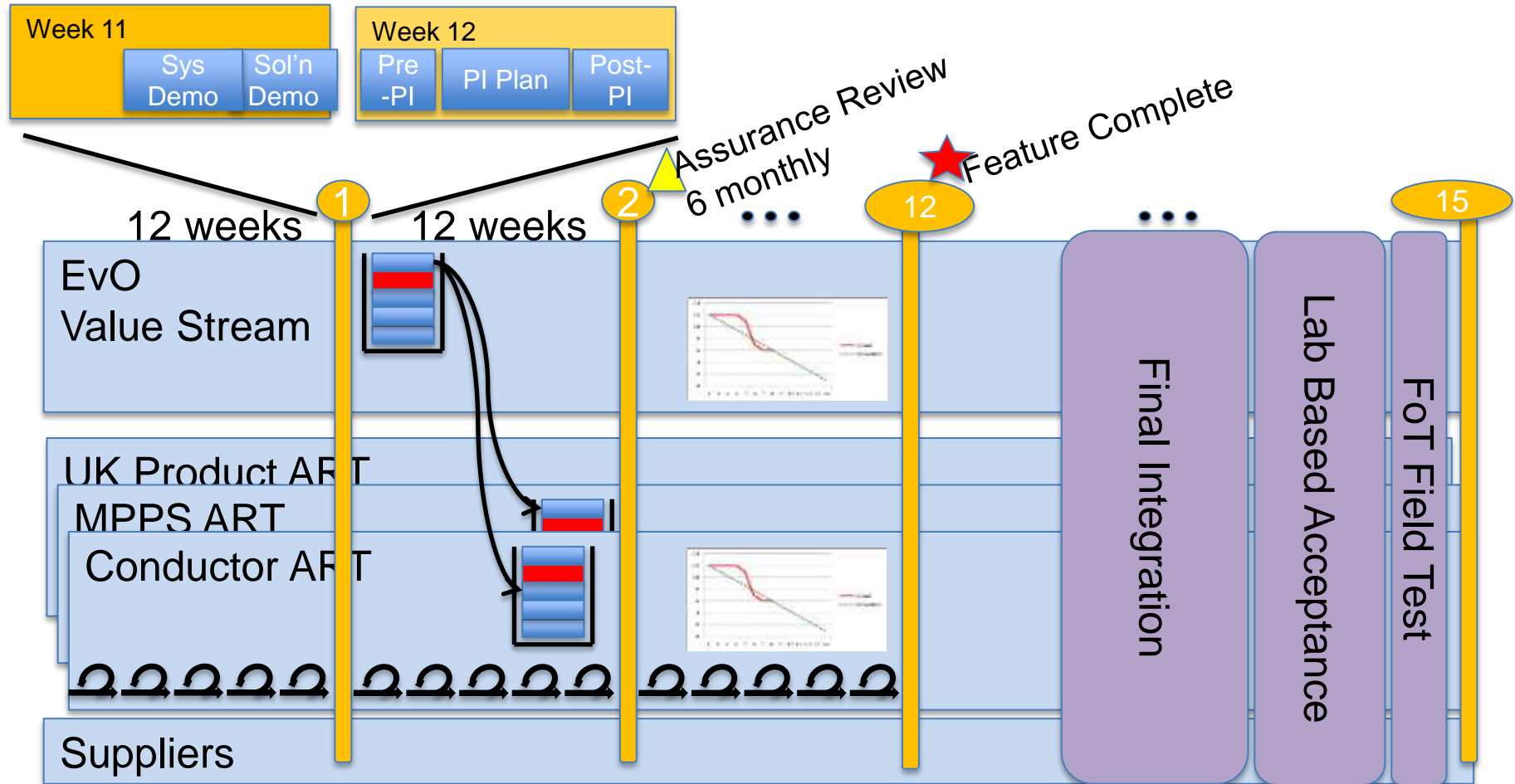


GD-MS 075 v1

Agile Design & Development

Manufacture & Fielding

EvO Agile Development



- Feature complete plan by 36 Months – 12 programme increments
- Integration roadmap of features into the Solution drives development and procurement

Contract Manufacturing

Julian Gould – Project Manager MPPS

Contract Manufacturing

Areas of Interest

- What is being Manufactured?
 - The Modular Platform Processing System (MPPS) is made up of the following Units:



Tactical Mobile Router (TMR-304)



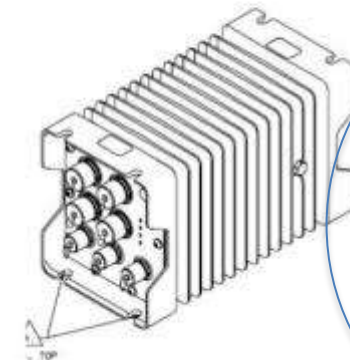
Tactical Mobile Router (TMR-314)



Tactical Crew Station (TCS-300)



Tactical LAS Adaptor (TLA)



Vehicle Processor Unit (VPU)



Simple Audio Ancillary Device (SAAD)

Contract Manufacturing

Areas of Interest

- Manufacturing Plan
 - Final assembly and unit level testing to be conducted in General Dynamics Hastings facility
 - Sourcing of PWB from contract manufacturers and key sub-assemblies
 - CM to supply tested PWB and sub-assemblies
 - PWB to be of IPC-A-610 class 2, build workmanship to be IPC-A-610 class 3
 - ROHS compliant (Lead Free) and typical PWB material is FR4 and up to 18 layers
 - All external surfaces to be NBC wash resistant
 - TP contract requires lab grade cables & MoD engaging supply of final cables

Unit	Design Phase Qtys	Production Qtys *	Areas of Opportunity
TCS-300	490	22,611	CCAs – Already under contract FPA – covered on next slides Casting / Metalwork
TMR-304	278	6,775	CCAs – Already under contract Casting / Metalwork
TMR-314	137	528	CCAs – Already under contract Casting / Metalwork
VPU	40	808	CCAs - Unknown content at this time. Casting / Metalwork
TLA	210	5,967	CCAs – Already under contract expect x1 (TREC) Casting / Metalwork
SAAD	228	4,288	Covered on later slides - planned procured item

Contract Manufacturing

Areas of Interest

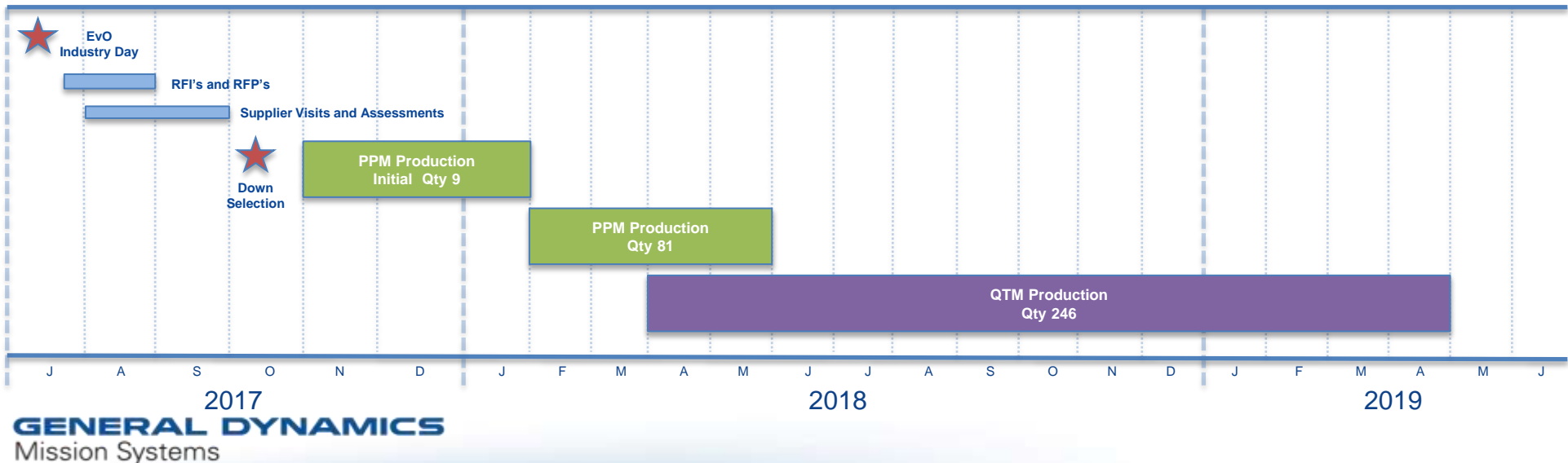
- What are we looking for right now?
 - Front Panel Assemblies for the TCS-300 Unit.
 - Quantity = 336 during Design & Development Phase.
 - Potential follow on Production order of 22,611 Units.



Contract Manufacturing

Areas of Interest

- When is it required by?
 - Initial Pre-Production Models (PPMs) are due end of January 2018 (Qty 9).
 - Remaining PPMs delivered between February and May 2018 (Qty 81).
 - Qualification Test Models (QTM) are to be delivered between April 2018 and April 2019 (Qty 246)
- What are the (next) steps we will be taking to do the procurement?
 - We will shortly be sending out RFI's to all interested parties then following with RFQ's.
 - During August and September 2017 we will carry out Supplier visits and assessments.
 - Final down selection will be carried out in October 2017.



Architectural Studies

Keith Brown – EvO Solution Engineering

Architectural Studies

- As part of EvO, General Dynamics is contracted to develop the MORPHEUS Architecture
 - Trade study white papers are required to compare alternative solutions to incorporate future (post EvO) capability into the architecture
- General Dynamics is seeking Supplier support in conducting some of these Studies
 - Potential partners should have previous experience/track record/knowledge in relation to a specific Study area
 - Offers an opportunity to shape the MORPHEUS vision
- Outline of Expected Process
 - General Dynamics provide the scope and context of the Study including all relevant MORPHEUS Architecture considerations
 - Supplier drafts an initial assessment of options, working in close liaison with the General Dynamics Architecture Team
 - Regular (min: Weekly) review assumed to maintain coherence with the architecture
 - Supplier incorporates General Dynamics feedback into final revision
 - Final draft reviewed and influences the final MADS and Model

Architectural Trade Studies

Currently Identified Studies Required

Study Area	Study
Networking	Wireless LAN
	SatCom Terminal integration
	TRINITY integration
Security	Information-centric multi-domain security
	Secure tunnelling and reverse tunnelling
	Tactical cross-domain voice and data guard (including crypto interoperability gateway)
	Integration with Enterprise Key Management
NSOIT (D) Integration	Shared IDAM
	G-Cloud integration
Apps and Hosting	ISS app-deployment model
DSA integration	DSA architecture
Other Integration	R-GNSS integration architecture
	ECM integration architecture
	Modular RF Design study

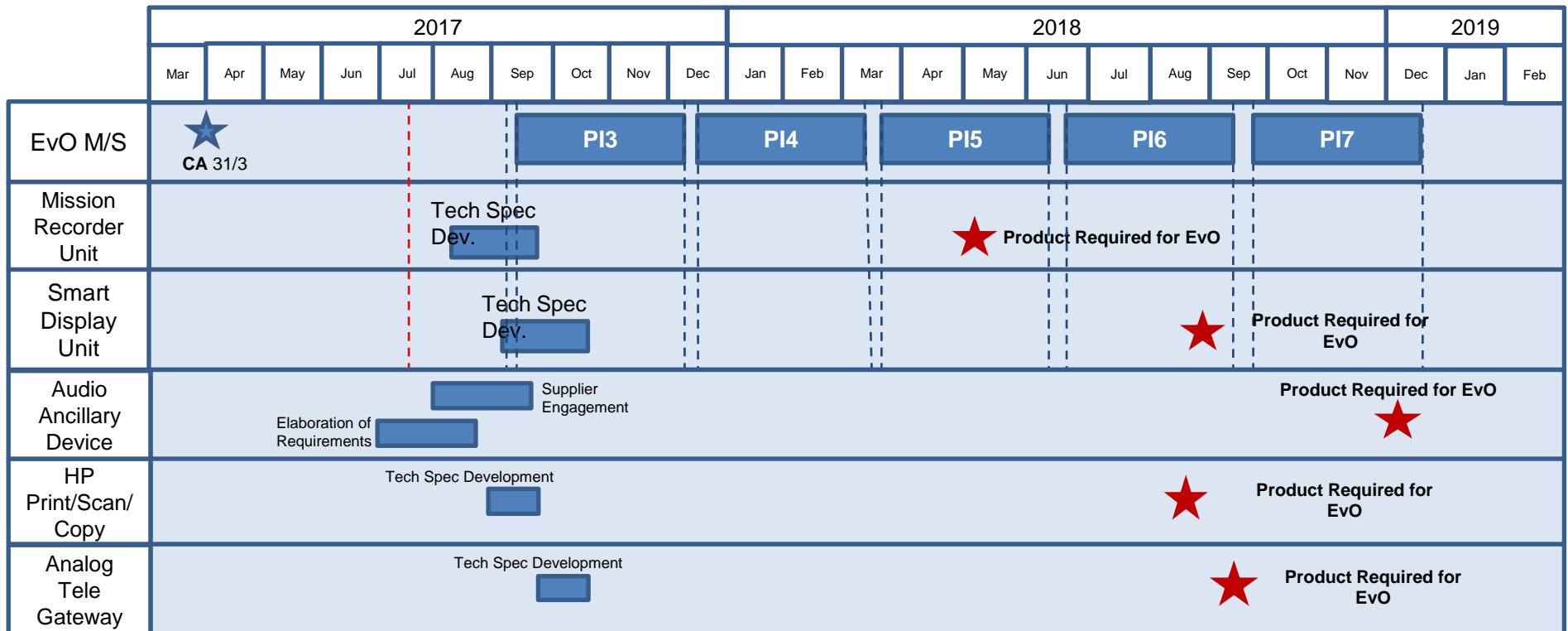
Procured Items

Procured Items

Procured Items	Notes
Mission Recorder Unit	See following slides
Simple Audio Ancillary Device	See following slides
Smart Display Unit	See following slides
Calendar Application	Procure
Email Application	Procure
Optical Character Recognition Application	Procure
File Compression	Procure
Unified Communications Application	Procure
Multimedia Authoring Application	Procure
Voice to Text App	Procure
Authentication Service	Procure
Operating Environment	Procure
Enterprise Collaboration Working Service	Procure
Malicious Code Protection	Procure
Intrusion Detection Service	Procure
Multimedia Application Server/Multimedia Management Service	Procure
Virtual Environment - MSDN	Procure
Session Border Controller	Procure
Print/Scan/Copy	Requires specification
Analogue Telephone Gateway	Requires specification

Procured Hardware Roadmap

1. Mission Recorder Unit
2. Simple Audio Ancillary Device
3. Smart Display Unit
4. HP Printer/Scanner
5. Analog Telephone Gateway



Mission Recorder Unit

High Level Requirements

- Ruggedised Network-Attached Storage (NAS) solution suitable for installation within both wheeled and tracked vehicles
- Will need to include UK accredited Data-at-Rest encryption solution
- Modular memory to allow for expansion
- Typical back-up storage capacity from 150GB/user to upwards of 1TB/user
- Support to record and replay multiple DEF-STAN 00-82 video streams with associated metadata
- Computer Processing and storage
- Voice processing, recording and replay, from user voice service devices on the platform
- Store log records of all voice services
- Record and store all chat messages

Procured Ancillary

Simple Audio Ancillary Device (SAAD)

- EvO voice services (Intercom, Radio access, Telephony/Conferencing)
 - provided by legacy devices and the Tactical Crew Station (TCS):
- General Dynamics evaluating software based voice clients as part of EvO
 - Some voice services delivered as part of a Software based application running on a vehicle mounted computer/display
 - An audio ancillary will be required
 - General Dynamics seeking inputs from Industry on how this ancillary could be provided



Smart Display Unit

High Level Requirements

- Vehicle Mounted Computing Hardware to host the EvO Common Operating Environment and User Applications, including video control and management
- Support GVA requirements on Dual GigEth connectivity for LAN and VoE inputs to receive video messages or streaming videos from vehicle sensors/sources
- DEF STAN 23-09 GVA compliant bezel layout
- Video display and decoding of DEF-STAN 00-82 complaint video VoE streams
- USB interface for access control devices
- GVA compliant power interface

Information Management

Nicola Hodgson Information Management and
Common Operating Environment Lead

Information Management Overview

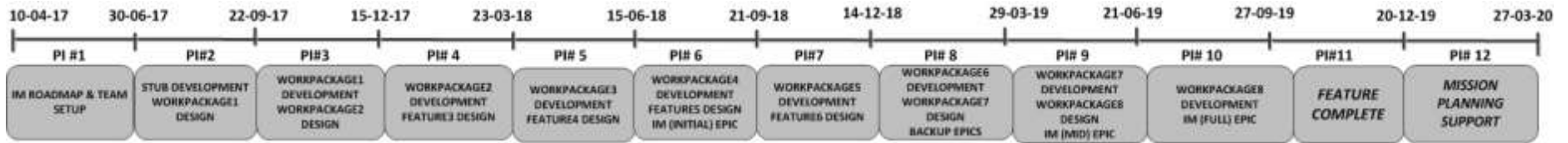
- Information Management enables the sharing of data between applications, storage of data such that it can be consistently searched and retrieved, and effective data management and administration.
- Information Management forms a core part of the EvO solution, key functionality includes:
 - Storage and retrieval of structured information - format defined by the Land Data Model (LDM)
 - Data distribution across the tactical internet
 - Publish / Subscribe Messaging
 - Data Replication & Synchronisation
 - Information Administration
 - Information and Data Protection
 - Metadata handling and synchronisation between nodes
 - Operational Records handling, information archiving
 - Information Interoperability

Information Management – Key Requirements

The core aspects that need to be considered for a distributed information management framework in the tactical environment are the following:

- Work with unpredictable connectivity and partitioning of the Tactical Internet
- Access to information when and where the user needs it, even when the TI is degraded
- Users can share information not just with other named users, but users in an area of interest, Conflict of Interest, or with those that have subscribed to a topic of interest
- Many users in the same appointed-role can access and share information
- Users can work standalone, apart from the network, but when re-connected can work collaboratively.
- Users should not have to re-enter information to be able to use it in another application
- Users can move from data terminal to data terminal or they can take the data terminal with them and connect it elsewhere on the network whilst still expecting the same data availability and services
- Users can access local information locally. A centralised service is not required to do the task at hand, when it requires only local information. As the distance in the network (i.e., logical scope) increases so will the timescale for the retrieval and distribution of information.

Information Management – Partnership Requirements



- General Dynamics UK has identified a breakdown of the Information Management Pan System Function into a roadmap that aligns with other elements of the system.
- The roadmap has been mapped to an initial set of work packages that are expected to be required as part of the system design and development of the IM PSF.
- General Dynamics UK is seeking supplier(s) with IM experience and capability to work with General Dynamics UK in an Agile manner on the provision of the IM PSF.
- The work packages will evolve as the programme evolves and as the IM requirements are clarified and further elaborated during each Programme Increment
- Timescales:
 - RFQ issued July 2017
 - Down-select August 2017
 - Partnership to commence September 2017
 - Design & Development – September 2017 to September 2019

Frequency Management

Michael George – Project Manager, Manage

Frequency/Spectrum Management Software

Overview

- The Frequency Management Application is required to perform manual and/or algorithmic formulas to determine an appropriate Frequency Allotment for radio nets whilst minimising RF interference.
- In addition, it provides the user with the ability to visualise the viability of RF links and radio net coverage, and identify / de-conflict co-site interference
- Where available, frequency de-confliction will utilise information from other systems including coalition systems, ECM systems, etc.
- The Frequency Management Application will be expected to integrate with the rest of the System Management software
 - Preferred option is for General Dynamics to procure an integrated Frequency/Spectrum management solution that is architecturally compliant to the MORPHEUS architecture
 - General Dynamics would provide the key software interfaces to make the software architecturally compliant

Frequency/Spectrum Management Software

Detailed Brief

The Frequency Management Application provides the user with the necessary tools to manage the deployment's RF spectrum, including:

- Planning the locations of radios and/or net service areas
- Modelling the RF characteristics of radios and their ancillaries, as installed on platforms, the deployment laydown and terrain data and, taking account of both the temporal and geographic aspects of frequency use, determining the minimal spectral footprint required
- Using the minimal spectral footprint to send a Frequency Allotment Request to and receive a Frequency Allotment from the Joint Spectrum Agency
- Constrained by the received Frequency Allotment and any location restrictions, and taking into account other systems including ECM systems in order to optimise both co-site and far-site deconfliction:
- Supporting the manual assignment of frequencies to radio nets
- Automatically assigning frequencies to radio nets
- Specifying the EPM techniques, waveforms and frequencies to be employed by specific nets
- Performing co-site deconfliction for vehicle and man platforms, plus static/mobile HQ's
- Sharing Friendly Forces Information Requirement data with other systems
- Identifying and reporting spectrum anomalies and inconsistencies in the System Plan
- Providing visualisations of the Deployment RF environment including Probability of Successful Operation and Rapid Path Profile Analysis

Frequency/Spectrum Management Software

Timescales

- July – Sept 2017: Assessment of potential suppliers including RFI responses
- Oct – Dec 2017: Down select to preferred suppliers

EvO Supplier Contacts

Who to speak to in General Dynamics UK regarding EvO Supply

General Dynamics UK

Richard Thomas – Head of Supply Chain

richard.thomas@gd-ms.uk

Supply Queries Mailbox

SupplyChainCommunications@gd-ms.uk

Supplier Portal

<https://www.gdsupplier.uk/>

GENERAL DYNAMICS
Mission Systems

GENERAL DYNAMICS
United Kingdom Limited

Partnering with General Dynamics



The screenshot shows the top section of the General Dynamics UK Supplier Registration Portal. It features a navigation bar with links for Home, Where to start, Supplier diversity, Become a supplier, and Supplier registration portal. The main content area includes a header stating that customer satisfaction is a fundamental objective, followed by text describing the company's search for suppliers and partners. A 'Six step process' is outlined with icons, and a 'What we look for' section describes the types of materials and services acquired. A large blue abstract graphic is visible on the right side of the page.

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