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EC-GM/8/3/1907

20 July 06

IAB Sec

**UOR IO4165/AO1082 BUSINESS CASE FOR MEDIUM PROTECTED PATROL VEHICLES**

References:

- A. PJHQ USUR D/PJHQ/J5/CSD/205 dated 19 July 06.
- B. DCI(A) Paper GS/DCI(A)/7/4/1 dated 12 July 06.
- C. DEC GM Strawman Cardinal Points Specification EC/GM/DCC/SO1 dated 6 July 06.
- D. DEC SP VECTOR BC DEC(SP)/68/22 dated 3 March 06.
- E. DEC GM VECTOR RN EC-GM/8/3 dated 18 July 06.
- F. PJHQ/J5 – Op HERRICK Capability Shortfalls – note to DEP & DJtCap dated 15 Jul 05. (notal)

**ISSUE**

- 1. Initial procurement of 108 Medium Protected Patrol Vehicle (Med PPV) for both Operations TELIC and HERRICK.

**RECOMMENDATION**

- 2. You are invited to approve:
  - a. Procurement of 108 COUGAR Med PPV, for employment on Operations TELIC and HERRICK, at a cost not to exceed £73.1M (90% confidence figure, VAT included) consisting of:
    - £71.4M CDEL
    - £1.7M Direct RDEL
    - £0.0M Indirect RDEL
  - b. The latest acceptable IOC for the equipment is end November 06 (50% Confidence). The IOC is defined as the delivery of one company of Med PPV<sup>1</sup>. The FOC is to be achieved by end April 07<sup>50</sup>.
  - c. The commercial and acquisition strategies are summarised at Paragraphs 12 & 13.

<sup>1</sup> CM(BM) Loose Minute CM(BM)5/3/1/6/2 dated 20 July 06 approved by Min DP & SofS on 20 July 06.

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d. The support strategy is summarised at Paragraph 14.

And to note:

e. The formal requirement for Med PPV, as noted in Reference A, is 660 for Ops TELIC & HERRICK (510 & 150 respectively).

f. The cost estimates (out turn, VAT inc.) for the project of:

Project Phases	CDEL		
	10%	50%	90%
Procurement of 108 Med PPV base vehs from contractor	£32.1M	£35.6M	£41M
BOWMAN; procure, design & fitting of VIKs	£3.8M	£5.3M	£6.4M
PMR; procure, design & fitting	£0.3M	£0.4M	£0.5M
ECM (to inc MICAWBER); procure, design & fitting of '5 fit' VIKs	£1.6M	£1.8M	£2.2M
2 x Integration design & work (non-recurring)	£0.7M	£0.8M	£0.9M
Modifications	£0.5M	£0.5M	£0.6M
VAT (based on 18 vehs)	£0.9M	£1M	£1.3M
<b>Totals</b>	<b>£39.9M</b>	<b>£45.4M</b>	<b>£52.9M</b>
Appliqué Armour; procure & fitting	£6M	£6.7M	£7.7M
CVR(T) Bar Armour; procure & fitting	£8.6M	£9.7M	£10.8M
<b>Totals</b>	<b>£14.6M</b>	<b>£16.4M</b>	<b>£18.5M</b>
<b>Overall CDEL Totals</b>	<b>£54.5M</b>	<b>£61.8M</b>	<b>£71.4M</b>
	RDEL		
	10%	50%	90%
Technical Support	£0.5M	£0.5M	£0.6M
Manpower Substitution	£0.1M	£0.2M	£0.2M
Trials & Testing	£0.5M	£0.5M	£0.6M
Safety Case	£0.1M	£0.1M	£0.1M
Training package for Users & Maintainers	£0.1M	£0.1M	£0.1M
T&S	£0.1M	£0.1M	£0.1M
<b>RDEL Totals</b>	<b>£1.4M</b>	<b>£1.5M</b>	<b>£1.7M</b>
	CPF		
	10%	50%	90%
CLS (for 2 years)	£9.5M	£10.6M	£11.9M
Transportation	£1.1M	£1.3M	£1.5M
<b>CPF Totals</b>	<b>£10.6M</b>	<b>£11.9M</b>	<b>£13.4M</b>

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f. This UOR will be reviewed by the DEC (in consultation with the DLO and other stakeholders) at the end of the Operation; when the equipment is no longer required in support of the Operation; or one year after approval (whichever is sooner) to review whether to retain the equipment in service. If the Review concludes that the equipment is still required for the Operation, the support costs will continue to be claimed against the Reserve. If this review concludes that the equipment is no longer needed for the operation, then the equipment should be retained, re-deployed or disposed of. If the equipment is to be retained (i.e. taken into Core) funds to meet the unpaid VAT costs will have to be found and STP cost provisioned accordingly. If the equipment is to be re-deployed, the DEC will agree with the DLO (DLO Sec Scrutiny), and Customer 2 how the support costs will be met. If the equipment is to be disposed of immediately, this should be a fair charge to the Reserve.

#### TIMING

3. Immediate: Approval requested by 1600 hrs 21 July 06.

#### BACKGROUND

4. Urgent Statement of User Requirement. The USUR (Reference A) was raised by PJHQ on 19 July 2006.

5. Evolving Threat.

- a. Op TELIC. Since Jul 04, MND(SE) has lost 44 people to hostile action, of which 20 deaths occurred whilst operating in Snatch. A significant proportion of IEDs are EFPs, which have constantly changing initiation methods and are difficult to detect. Additionally, RPG and SAF threats are ever present. The increase in IED activity is assessed to be enduring and the insurgents' use of technology and continual adaptation of tactics are presenting a serious challenge to MND(SE) activity. CGS's recent visit report to Theatre stated that troop confidence in Snatch was low.

- b. Op HERRICK. The IED continues to be the most effective and wide spread means of attack for insurgents in Afghanistan. Current reporting indicates IED incidents are proliferating at an increasing rate, with activity intensifying across South and East Afghanistan in the first 6 months of 2006<sup>2</sup>. The most frequently employed devices being RCIEDs, VO(PP)IEDs and CWIEDs, which have had some improvements in design, employment and emplacement. However, they generally continue to attempt to overmatch the target through the use of blast. UXO remains

<sup>2</sup> CFC-A IED activity comparisons 2004-6: 2004 - 274 IED strikes, 2005-441 IED strikes, 2006 (predicted)-511 IED strikes. There have been 172 IED incidents in RC South between Jan and Jun 06.

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the preferred charge for these devices with AT-4 mines and a variety of artillery shells being the most frequently employed.

6. Current Capability Shortfall. At present there are a total of 380 Snatch deployed on Op TELIC against a Theatre PPV establishment of 420<sup>3,4</sup>. There are 166 Snatch 2A deployed on Op HERRICK. The Snatch PPV<sup>5</sup> provide the deployed force with a level of manoeuvrability and survivability in order to conduct operations, however, the rapidly evolving asymmetric threat faced on Ops TELIC and HERRICK have overmatched the capability envelope of the Snatch PPV. Moreover, the majority of Snatch deployed on Op TELIC are the 1.5 variant which is due to go out of service from January 2007. With a host of obsolescence issues<sup>6</sup>, Snatch is no longer capable of matching the high level threat faced in Iraq and Afghanistan.
7. Requirement. To provide UK forces deployed on Operations TELIC and HERRICK with appropriate levels of manoeuvrability and survivability afforded by a Med PPV in order to prosecute the missions successfully without unnecessary casualties.
8. Operational Analysis. The function of a protected patrol vehicle has been enduring throughout operations over the last four decades. There is no specific OA to support the requirement for a Med PPV, which is driven by the rapidly evolving threat. DCI(A) has initiated a study to define the longer term requirement to fulfil the future PPV capability<sup>7</sup>.
9. Options. Due to the timelines no investment appraisal has been conducted. A wide selection of available platforms that may meet the Med PPV capability requirements have been investigated. In order to meet the challenging timeline a platform must be in production now. It must also have the capability (available payload) of mounting an EFP protection solution. There are few platforms that meet these criteria, and it is accepted that the selected solution will not meet all of the stated requirements. The following options have been short listed:
  - a. Do Minimum. If no funding is made available the MOD would seek to reduce casualty levels by deploying additional and/or reallocating

<sup>3</sup> The holdings of 378 against establishment of 420 reflects the number of vehs lost through RTAs and insurgent action.

<sup>4</sup> Excluding the USUR to up-armour TUM/TUL for both Theatres, and the force uplift for Op HERRICK.

<sup>5</sup> A wheeled vehicle, which provides some ballistic protection to personnel inside, designed to carry 4, to enable primarily a combination of foot and vehicle-mounted patrols generally, but not exclusively, within PSO/COIN operations. In addition, PPV can also have utility to meet discrete combat support, combat service support and administrative tasks. It must enable at least one (ideally two) top cover sentries to be deployed when mobile, PPVs are expected to be able to operate on roads and tracks and need to be agile.

<sup>6</sup> In addition to the lack of physical protection, Snatch lacks the mobility, capacity and survivability required to sustain effective operations on TELIC and HERRICK. The details have been previously rehearsed in numerous fora and are not repeated for brevity.

<sup>7</sup> Information provided during Business Case Working Group 19 July 06.

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assets to the two Theatres. In the case of Op TELIC it is likely that more WR would be deployed, however, the current high usage rates of WR on this operation to date are having a long term detrimental impact on Defence's ability to sustain the WR fleet. On Op HERRICK, due to high level direction preventing the deployment of heavy armour, it is likely that the use of SH would be increased. However, similar to the situation faced by WR, the SH fleet is faced with increasing long term sustainability issues. **This option has been discounted.**

b. RG-31 'Protektor Mk 2'. South African (BAES LS OMC) mine protected vehicle in-service with a number of countries in different variants. Good mine protection with a proposal from the manufacturer on a development path to provide the payload to mount appliqué armour. The solution is immature; capacity is inadequate. Initial deliveries by the end of November. **This option has been discounted.**

c. COUGAR 6x6. US (Force Protection Inc.) mine protected section vehicle in-service with US forces on current operations. Proven mine protection (in-service US Army data) with sufficient payload available to mount appliqué armour; capacity affords stretch potential for wider employment. Initial deliveries by the end of November. **This option is the preferred solution.**

d. BUSHMASTER. Australian (ADI) APC with mine protection in-service with Australian forces on current operations. This option would meet, in limited numbers (up to 25 existing vehicles have been offered by the Australian Govt), the challenging timelines associated with this requirement. However, there is concern that BUSHMASTER does not offer sufficient payload to mount sufficient appliqué armour to meet the requirement. **This option requires further investigation.**

10. Preferred Solution. **Option C, COUGAR 6x6, is the recommended capability to meet this requirement, whilst seeking the early supply of a vehicle to enable timely EMC testing.** However, in an effort to meet the challenging timelines, it is recommended that the feasibility of BUSHMASTER (Option D) to meet part of the requirement be investigated further, with an option to acquire a number (within the overall approved totals and cost) for deployment to Op HERRICK.

11. Key User Requirements (KUR). KURs are at Annex A.

12. Potential Commercial Strategy.

a. Force Protection Inc - COUGAR. A Foreign Military Sales (FMS) case will be pursued to procure COUGAR vehicles for delivery of an IOC by end November 2006, and FOC end April 07. Commercial management

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will be in conjunction with the UK Defence Commercial Staff in BDS Washington acting on behalf of SUV IPTL for all contractual negotiations.

- b. Integration. A contract will be awarded to an established UK based contractor who has the requisite knowledge, experience and capacity to undertake the integration of Bowman, ECM, additional communications systems and possibly armour onto the selected vehicle. It is anticipated that initial work can be covered by existing PDS contracts. It is expected that the manufacture of VIKs will be subject to a separate contract.
13. Acquisition Strategy. SUV IPT will contract through the FMS process for the provision of vehicles and support in line with the Commercial Strategy outlined in Paragraph 12, above. Wherever possible, given the challenging timelines related to this UOR, SMART Acquisition principles will be applied. Under direction from Min DP and senior staff, it is proposed to adopt a single source acquisition strategy with FP Inc to meet this UOR capability. The single source strategy is based upon the identification of vehicle solutions, which was achieved by a world-wide market survey, paper technical assessment and industrial visits to ascertain the most suitable and cost effective solution.
14. Support Strategy. As this is a UOR there is insufficient time to prepare and provide a fully organic support solution. The COUGAR is already fielded by US forces in the respective theatres and there is an established support solution already in place. In addition, a variant of the COUGAR vehicle will be deployed by Iraqi forces in the near future, which would result in greater access to support. FP Inc are developing a CLS solution for the UK MOD<sup>8</sup>. SUV IPT will investigate the procurement of Manufacturers Spares Packs to support initial use of COUGAR by UK forces in both Theatres. It is proposed that a reference vehicle will be made available in UK to assist in the development of driver, maintenance and user familiarisation. COUGAR is supported by publications that meet US requirements (though not in AESP format). The UK based training fleet will act as an immediate maintenance reserve.
15. Key Risks and Mitigation. Risks are listed in a register at Annex B.
- a. Performance. The principal risk to performance centres on the integration of UK requirement capabilities (Bowman, ECM & various appliqué armours). Further risks surround the reduced trials programme and relative immaturity of DLoDs, which could have a detrimental impact on the delivery of capability when the platforms are delivered. MEDIUM.
- b. Cost. At this stage all costings quoted within the Business Case are ROMs based on best information provided by suppliers and

<sup>8</sup> FP Inc currently provide full contractor support for in excess of 150 COUGAR and BUFFALO vehs in IRAQ and AFGHANISTAN.

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experience on similar programmes. Approval is requested at 90% to mitigate against the risk of cost growth. MEDIUM.

c. Time. The programme is operating to challenging timelines. This may lead to developmental issues, normally covered in a traditional programme, being compromised. Additionally, due to the challenging nature of the programme, the approved IOC may not be met. Control of the acquisition of the vehicles will be limited under FMS processes; there are significant schedule and delivery risks. MEDIUM.

16. Defence Lines of Development (DLODs). Limited time has prevented work from being undertaken to solve the DLOD issues to date. However, work will be initiated, following endorsement, to address the issues outlined below:

a. Training.

(1) Meeting IOC. Units deploying on Op TELIC 9 (November 06) will have sufficient numbers of Cat C licence drivers. It is assessed that drivers and commanders will require approximately 10 days conversion prior to operating Med PPV. Current trade training for B Veh Mechs will act as a baseline with a 10 day familiarisation course required. Units receiving Med PPV at IOC will have to conduct a short training package in-Theatre before operating the capability. Contractor to instructor training will have to occur NLT end October to meet an IOC end November.

(2) Steady State. LAND has an existing process to train additional Cat C licence drivers<sup>9</sup> prior to units deploying to Theatre. The introduction of Med PPV will be accommodated in the current training package. SEME Borden will be tasked to deliver a 5-10 day familiarisation course. A Med PPV fleet will be held at OPTAG for full incorporation into units' PDT.

b. Equipment.

(1) Bowman, Comms & ECM. Integration of Bowman, comms (PMR) and ECM onto the selected platform will require ID&C to be carried out by the Systems Integrator (SI). It is essential that BATCIS IPT, SPSCM IPT & SI have early sight of the proposed platform in order to carry out these activities. The proposed design must use short lead items that are available from existing stock in order to ensure delivery to the exacting timelines. To ensure operational flexibility and redundancy all vehicles will be fitted for but not with Bowman HF & VHF<sup>10</sup>. PJHQ has directed that Bowman radios will be provided from current in-Theatre platforms (Snatch). To minimise problems with EMC the sequence of integration is

<sup>9</sup> Snatch 2 requires a Cat C driving licence.

<sup>10</sup> VHF is not compatible with the current ECM suite; this is being addressed.

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vital (EMC testing should occur once the exterior design of the vehicle is set).

- (2) Appliqué Armour. DSTL are currently advising the IPT on a range of suitable options to be considered. The ability to integrate appliqué armour onto the platform is a consideration when selecting a SI<sup>11</sup>. The IOC quantity of vehicles may not be fitted with the full appliqué solution on delivery.
  - (3) Bar Armour. Experience in mounting bar armour on in-service deployed platforms provides a high degree of confidence that this area will not prove a significant integration issue.
  - (4) Windscreen Protection. As part of the survivability solution measures will be considered to protect the windscreen and other viewing windows.
  - (5) Night Operating Capability. DEC GM will liaise with D Jt Cap to consider the provision of night vision goggles for drivers and commanders.
  - (6) Complementary Capabilities. The User community (PJHQ/Land CD) have already expressed a desire to integrate complementary capabilities once the platforms are delivered. These may include, pintle/ring mounted self-defence weapons, public address systems, TACSAT and public order capabilities. Consideration of these requirements will be made during the initial integration work and included where feasible<sup>12</sup>.
- c. Personnel. It is not anticipated that the introduction of the Med PPV capability will have an impact on areas such as promotion, career specialists or recruitment.
  - d. Information. The capability will be fitted with the relevant Bowman communications fit.
  - e. Doctrine. LWC (Msn Sp Gp) to be tasked with writing a TD note.
  - f. Organisation. LAND is considering the requirement to sustain the Med PPV capability, balancing the demands of a significantly larger platform with CLS.

<sup>11</sup> FP Inc may not have the capacity to deliver an integrated appliqué in time.

<sup>12</sup> Complementary capabilities will only be included within existing approval limits.

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g. Infrastructure.

(1) Facilities. LAND and PJHQ are advised to consider the facilities required to support a CLS solution in Theatre and the impact on infrastructure of a UK based training fleet.

(2) Power Requirements. COUGAR has an integral 'shore-power' facility to power the communications fit when the vehicle is switched off. It is anticipated that there will be a requirement to provide external power generation to the vehicle to ensure that Bowman radios remain on and initialised for QRF vehicles.

h. Logistics.

(1) The CLS package being developed the selected contractor, discussed in Paragraph 14, is designed to ensure the availability of the capability.

(2) The range of the selected platform will enable self deployment within theatre.

(3) The selected platform will not be supplied with a recovery variant. DEME(A) have offered a degree of assurance (based purely on a weight assessment) that the Foden(R) & HET, deployed in both theatres, will be capable of recovering the MED PPV, in the case of both breakdown and battle damaged.

17. Funding and Affordability. The Treasury has agreed, in principle, the costs of UOR's demonstrably needed for the campaigns in Iraq and Afghanistan will be reimbursed from the Reserve. If this does not occur the costs of this UOR will fall to the operational contingency fund. Where UOR action allows savings to be realised elsewhere in the defence programme, these will be identified and netted off against the cost of the UOR. SUV IPT will carefully record and report all spend to allow a claim to be made on the Reserve at the appropriate time.

18. Presentation.

a. External. DCRS will lead on production of an external presentation strategy in conjunction with DGMCC. A separate submission will be made to ministers on this subject.

b. Internal. The COUGAR 6x6 will provide a significant enhancement in survivability over that of Snatch and VECTOR (note the KURs at Annex A). However, the initial delivery of vehicles, while providing an enhancement on current survivability, may not have the complete

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survivability solution fitted (this would be conducted in-theatre as soon as available). Furthermore, the Chain of Command should acknowledge that the final solution (when fully fitted with appliqué/bar armour) will still be defeated by the most effective EFP & very large blast IEDs when encountered. Risk assessments and informed TTPs must be applied to mitigate the threat. COUGAR is a large platform with good cross country mobility<sup>13</sup> but less agility and terrain accessibility in the urban environment than Snatch and VECTOR. It is important that the Chain of Command understands and explains the strengths and limitations<sup>14</sup> of this capability to all potential users.

AD CC DEC GM

IPTL  
SUV IPT

Annexes:

- A. Key User Requirements for MED PPV.
- B. Risk Register for MED PPV.

<sup>13</sup> US user reports from Iraq state that both the US Army and USMC are satisfied with the cross country performance.

<sup>14</sup> COUGAR requires use of ear protection in the cab to comply with UK H&S standards when travelling at speeds in excess of 40 mph on hard surfaces.

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Annex A to  
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KEY USER REQUIREMENTS FOR MED PPV

Ser	Key User Requirements
1	The user requires ballistic protection in accordance with , for the complete capability.
2	The user requires under floor protection in accordance with STANAG 4569, Annex A, Levels 4A and 2b.
3	The user requires artillery fragment protection in accordance with for the complete capability.
4	The user requires an ability to enhance protection for the capability including the fitting of appliqué armour and spall liner.
5	The user requires an ability to carry 7 personnel (dvr/comd + 5).
6	The capability is to meet Medium Mobility criteria in accordance with DEF STAN 23-6.
7	The capability must be transportable by Strategic Lift (C17 & STUFT).
8	The capability must be able to operate in-service communications and ECM systems.
9	The capability must have a viable support solution for operations.
10	The capability must be able to operate in climatic conditions A1 – C1.

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Annex B to  
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**RISK REGISTER FOR MED PPV**

Ser (a)	Name (b)	Description (c)	Probability (d)	Impact (e)			Mitigation (f)
				P	C	T	
1	Time	The programme is operating to challenging timelines. This may lead to integration and manufacturing issues. This may result in IOC not being met.	MEDIUM	M	M	M	The selected solution is already in-service with an ally nation. An FMS case is being pursued and FP Inc has extensive experience of dealing with US DoD. It appears likely that the 1 Aug 06 date for ordering long lead items to meet 30 Nov 06 is attainable.
2	Integration of BOWMAN & ECM systems	BOWMAN & UK ECM systems have not been fitted to these vehicles before and present a significant challenge within the timescales of the programme.	MEDIUM	M	L	M	Early engagement of SMEs and the fact that the US Army/USMC has fitted similar systems to their variants. The early appointment of an experienced SI will mitigate this risk.
3	Cost Growth	At this stage all costings quoted within the Business Case are ROM based on best information provided by suppliers, and prices verified by US DoD. Potentially the cost of the programme could exceed the approved figure.	MEDIUM	M	M	L	Significant work has been applied to ensure that the costings articulated within the Business Case are taut and realistic based on similar programmes (US DoD has verified procurement cost for veh).
4	SUV IPT staff resources	Unprogrammed work is challenging the capacity of the IPT, which already has a substantial UOR burden and is under manpower control total reductions.	MEDIUM	M	L	H	Commercial Director BDS Washington has assured that every assistance will be given to the programme. Additional funding has been requested within the Business Case to cover the manpower substitution. Action by DLO & DPA to identify and supply additional resources to the IPT.
5	Integration of Appliqué	Appliqué Armour has not been fitted to these vehicles before and presents a	LOW	H	M	M	Early engagement of SMEs. IOC vehs may be deployed without the full appliqué capability

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	Armour	challenge within the timescales of the programme					
6	Commercial risk	The US contractor has not supplied these vehicles to UK MOD previously. The contractual arrangements may impose time delays on the programme which could threaten ISD.	LOW	L	L	H	FMS being pursued results in commercial engagement through BDS Washington (working with SUV IPT) direct to DoD. There is high level US military support for the planned acquisition.
7	Supportability	New vehicles into service have no UK ILS. Wider DLoDs are yet to be and have little time to be developed, which may lead to the capability not being optimised on delivery.	LOW	M	M	M	The selected contractor will offer a credible CLS package, including user and maintainer training, based on existing support provided to the US forces.
8	Process	Due to the abridged nature of the programme timelines the normal processes applied to a traditional programme will be reduced or not conducted.	MEDIUM	L	L	L	It is accepted that capability acquired under UOR compromises on the normal levels of scrutiny and assurance. The US DoD is being approached for any lessons learnt/identified.
9	Familiarity of vehicles	Lack of technical knowledge undermines assurance that vehicles will perform to meet the requirement. This may result in additional work to upgrade the vehicles, incurring a time and cost penalty, or accepting vehicles that fall short of the requirement.	LOW	M	M	M	Anecdotal assurance is available from the ally that operates the selected platform. The early provision of vehicles for integration work and training will provide a detailed knowledge of capabilities, enabling any shortcomings to be countered with minimal impact on the programme cost and time.

#### Definitions

Probability/likelihood of Occurrence	Low	Medium	High
	Low, but not impossible (0-20%)	Fairly likely to occur (20-50%)	More likely to occur than not (>50%)

Risk Impact		Low	Medium	High
Performance	Will fully meet the requirements	A few shortfalls in secondary parameters	Some short shortfalls in primary parameters	Shortfalls in achievement of key user requirements
Cost	No effect on cost	Small cost increase, <5% total cost	Significant cost increase, 5-10% total cost	Large cost increase, 10-20%
Time	No effect on schedule	Small slip, 0-1 month	Significant slip 1-2 months	Large slip 2-3 months

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