

FRES: Replacement Vehicle or New Capability?

by *William F. Owen*

William F. Owen is a writer and broadcaster specialising in military thought and science. In this article he examines the competing requirements in the need for FRES and finds that the complexity may have been overstated.

The Future Rapid Effects System (FRES) is the most expensive programme in the British Army's procurement plan. Arguably, it is to the Army what Eurofighter Typhoon and Type 45 are to the Royal Air Force and Royal Navy: big, high profile, expensive projects, around which future capability might be based.

According to the Minister for Defence Procurement, Lord Bach:¹

'The SDR New Chapter, and our experience on recent overseas operations, have shown the need for lighter armoured vehicles that can be quickly sent by air to a trouble spot when a crisis breaks. MRV cannot meet this emerging requirement.'

There is little ambiguity in this statement, but there are wider requirements for FRES in addition to being able to deploy rapidly by air. The purpose of this article will be to examine these roles and discuss where they sit in the military science, thought and engineering reality of the early 21st century.

What is FRES?

Defining or explaining FRES is no easy task. The name itself adds to the confusion. What is an 'Effects System'? The name comes from the ill-defined and unhelpful concept of separating capability or effect from platform.

The thinking behind this is the procurement bias against being 'platform-centric'. As a product of military thought, this is clearly crude, simplistic and not useful as a conceptual tool. The concept of 'capability' and/or 'effect' can only be applied usefully in very specific circumstances.

In terms of land operations, sub-units, units and formations may well have capabilities that come from a range of platforms. This, after all, is the central premise of 'Combined Arms'. One of the components that will affect, or define the spectrum of, capability is the major equipment or platforms that the unit or formation deploys.

FRES is clearly a vehicle, or platform. On to it can be bolted communications, weapons and sensors, the integration of which will provide capability. Evidently the 'Effects System' is not the vehicle itself, yet the vehicle design is clearly critical.

The four basic requirements the FRES vehicle design has to meet are:

- Rapid deployment, to deal with or avert an overseas crisis.
- Replacement of existing vehicle types such as Saxon, CVR-T and FV430, to streamline and simplify logistic and training support.
- Provision of platforms for a 'Manoeuvre Support Brigade' for the Heavy Division.
- The technological and conceptual basis for the Warrior and Challenger replacement: 'delivering heavy effect from medium/light'.

Rapid Deployment

Stonewall Jackson once said that he who gets there first with the most troops wins. The rapid deployment criterion has perhaps been the defining focus of FRES. The engineering problem is that the internal air transport dimensions for the C-130J/K create a fairly small envelope. This limits vehicles to about the size of M-113, LAV-III or the Patria AMV. It could also be highly desirable, for a whole raft of reasons, to be able to fit FRES into a standard 20-foot ISO container.²

Current indications from industry³ are that it is not a technical challenge to produce a

vehicle with good cross-country performance, ballistic tolerance against 14.5mm armour piercing (AP), and the capability to dismount eight men, to fit within the envelope of a C-130. Worthy of additional note is the fact that a vehicle weighing under 11,300kg is transportable under-slung from a Chinook.⁴

It has been suggested that increasing the envelope to the A400M dimensions may allow a more capable vehicle design. This suggestion seems ill thought-out. The A400M, if built, will be able to transport vehicles of Warrior MICV weights and dimensions. But we know that the size, weight and logistic burden of these vehicles are not the best-suited to the type of operations for which we appear to be procuring the FRES vehicle. Adhering to the discipline of designing to the C-130 or ISO container envelopes, however, does not preclude the useful employment of A400M should it happen, and would ensure much greater operational and tactical flexibility.

Replacement Vehicle

If FRES is to replace a substantial portion of the current AFV fleet with a single, modular design, this would bring nothing but benefit to UK forces from a logistic and cost point of view. It would also present a significant stumbling block.

Almost by definition, a universal vehicle will involve substantial compromise for some users. Particular user requirements will almost certainly be addressed by fitting role-specific equipment, which in itself will create additional logistic challenges.

The history of friction inherent in the competing interests of particular Corps, Arms and Directorates does not engender confidence. Didactic, inflexible and often poorly reasoned opinion on the size of the infantry section, and/or on whether or not

vehicle-mounted 105mm guns should be capable of both direct and indirect fire support, does not provide a realistic basis for novel and useful solutions, however achievable they may be.

The real benefit to brigade and divisional planning staffs will be common fuel and lubricant requirements and the need to hold only one universal set of automotive components. Experience of FV-430, FV-600, and CVR-T has shown this to be simple and achievable. Procurement cost and training benefits are obvious.

Manoeuvre Support

The manoeuvre support brigade is an interesting concept. Conceptually and historically, the nearest equivalent are the BTR Regiments found in some Russian Motor Rifle Divisions. If correctly characterised at the sub-unit level, this is a very potent capability. Some have even called this 'the medium force' or 'medium force capability'. This appears to be a capability defined by providing infantry with useful, though not high, protected mobility and supporting them with rapid-fire cannon, guided weapons and perhaps some form of light indirect fire support. Should this Brigade be built around a CH-47 transportable vehicle, it will then also have a de-facto short-range airmobile capability, although limited support helicopter assets would probably mean that this would be not be practical at a level above combat team operations.

Warrior and Challenger replacement

The FRES requirement must also include consideration of the replacements for Warrior and Challenger. Unfortunately, this is where the walls come tumbling down. The implication is that 'capability or effect' will render heavy armour obsolete in that the 'effect' the heavy force creates will be deliverable from smaller, lighter platforms. At its most basic level, this is like asking someone to tell the future or to ignore history and physics. A quick consideration of possible FRES technologies is instructive.

Much has been talked and written about the need for FRES to have hybrid electric drive, electric armour and band tracks, as well as to benefit from digitisation, NEC and sensors synergy and fusion. Correctly and rationally applied, these technologies have substantial benefits, as well as some

significant limitations. The primary benefit is that they are efficient in weight, size and power terms when applied to light vehicles (< 20 tons). Hybrid electric drive frees up a significant area of volume within the envelope of a vehicle, as well as being more reliable and easier to maintain, with fewer spares being held. Arguably, these are fundamental to the future of light vehicle programmes.

Band track, in particular, is technology that seems limited to light-armoured vehicles, as does the current generation of hybrid electric drives, but this is not to say that these technologies will not mature for use in heavy armour. Narrow band tracks are very vulnerable to explosive and small shaped charges and, while lighter than conventional track, band tracks are still of considerable weight and are unitary items; so, unlike track links, the vehicle itself cannot carry a spare band track. This is a significant logistic challenge.

Electric armour is repeatedly cited as having the capability to protect FRES against current and near-future rocket-propelled grenade (RPG) threats. It does not, however, provide significant protection against kinetic attacks, as physics dictates that purely kinetic attacks demand a proportion of mass to defeat them. A 90-125mm APFSDS is still a substantial threat, though almost all data on national armies show the numbers of heavy armoured vehicles possessed by peer competitors or likely adversaries are becoming fewer day by day. The most likely threat seems to be from RPG and anti-tank guided missiles (ATGM). However, automatic cannons of calibres from 14.5mm to 30mm and thermobaric weapons also pose significant problems. Evidently we still require mass – in the shape of heavy armour systems. These may not be conventional main battle tanks (MBTs) as we currently understand them, but they may well come in excess of 40 tons.

The risk is that the British Army may have adopted a distinctly unreflective view of what future heavy armour might look like, partly because of the success ascribed to armour during operations in Iraq and partly because possible future roles fall outside the current cap-badge domains: perhaps a 'MBT' that dismounts infantry? Clearly it is possible to deliver heavy effect from a light platform. It is doubtful, however, if a light

platform could withstand heavy effect coming in the other direction.

Solutions

By dismissing the Warrior and Challenger replacements, it is possible to suggest that FRES is available right now, in the shape of vehicles such as FCLV, ATV-P or a combined new build and/or upgraded CVR-T 'type'. It would be relatively cost effective to field a brigade using these vehicles, as an interim capability, until new technology systems can be fielded in a usable form. Obviously these interim vehicles are not capable of replacing Warrior and Challenger, but is this a good enough reason not to seize the opportunity of acquiring such vehicles in the near future, particularly as it seems doubtful if heavy effect can really be delivered by light or medium platforms?

Both GD Land Systems and Haaglunds can field extremely capable hybrid drive vehicles in the near future, with good cross-country performance, payload and with ballistic tolerance of 14.5mm AP at 300m. These vehicles are available within the next year or so and some even exist as technology demonstrators with a significant degree of measurable capability.

It would be unfair to characterise FRES as a programme unwilling to take risk, but risk is inherent in the process. Evidently a replacement vehicle has the potential to give the British Army a new capability. What FRES could be, and perhaps should be, is definable, clearly evident and demonstrated in a number of programmes and technologies around the world. All FRES has to do is match what is out there against what is needed. The complexity of this task may have become overstated. As the Prussians would have warned us, 'In war, only that which is simple, will succeed.' Change the word 'war' for 'procurement' and we might be getting somewhere. ■

NOTES

1. MoD Press Release, 17 July 2003.
2. This enables the use of wide-spread cargo-handling capabilities as well as road and rail systems.
3. Author interview with General Dynamics Land Systems, 28 January 2004.
4. UK Staff Officers Handbook, Issue 1.1, Part 2, Serial 18.