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Conference Report

Waterways Conference 2022

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Waterways Conference 2022

THROUGHOUT HISTORY, THE ability to cross waterways has been fundamental to the successful application of land power. Rivers have often demarcated the frontiers between states precisely because they provide a natural barrier to incursion. They have also provided vital arteries for trade and logistics, so countries have fought for their control. On 27 April 2022, RUSI – in partnership with the Allied Rapid Reaction Corps, Institute of Royal Engineers and Royal Engineer Historical Society – hosted a conference examining how modern armies can exploit and overcome water obstacles in the face of precision fires and pervasive sensors.

The conference was opened by Andrew Lambert, Laughton Professor of Naval History at King's College London, who examined Wellington's crossing of the Adour during his campaign in southwest France in 1814 to illustrate enduring principles of gap crossing. Wellington successfully drew French forces away from his intended crossing point and collaborated with the Royal Navy to erect a bridge of boats that allowed for the rapid movement of infantry and guns to the far bank to secure a bridgehead. Lambert highlighted the importance of redundancy in bridging capabilities, noting the number of vessels lost during the operation. Rivers are inherently dangerous and so volume of materiel is important.

Major General (Ret'd) Mungo Melvin, Chairman of the Royal Engineers Historical Society, surveyed the experience of the British Army of the Rhine and noted that the approach to gap crossing throughout the Cold War involved reducing dependency on bridging by having a high prevalence of swimmable vehicles in the force, accelerating crossing by using multiple means to bridge and ferry troops simultaneously, and large-scale practice. Melvin argued that the British Army of today, by contrast, has become a force of 'non-swimmers', with limited options to emplace crossings, and little practice in doing so.

William Owen explained how the challenge in gap crossing was less the river and more the wider context and the implications of fixing the force to a single point for an extended period. Infantry mass on the far bank was critical to pushing the enemy from proximity to the river. Seeing the activity as a combined arms endeavour, however, meant that large-scale exercises crossing gaps were vital. The absence of such exercises ensures that things will go wrong in the fight.

Despite these hard-won lessons, it is also necessary to appreciate how the challenge has evolved. Major Pierre-Michel Arcade, Commander of the Franco-German River Gendarmerie Squadron, gave a presentation on the modern Rhine, highlighting the number of locks, power plants, ports and volume of shipping that moves along the river. The electronic monitoring of traffic was also highlighted as crucial to safety in peacetime, but a potential signature management issue in war.

What stood out was that control of the waterway now extends to control of the information infrastructure that manages it, and the need to interact with civilian agencies using the water, if military operations are to avoid risking human security.

A further shift in the operating environment is the pervasive surveillance of the battlefield by sensors that are not readily targetable. For some kinds of military activity, the latency of commercial space-based ISR is less problematic. The low resolution required to detect a crossing being emplaced, however, and the time it takes to conduct a crossing, means that crossing waterways is likely to be severely impacted by space-based assets. Florence Cross of Palantir explained how modern planning tools can obtain imagery from commercial satellites of any point on the globe within 20 minutes.

A further challenge to conventional concepts of gap crossing is the proliferation of long-range fires. Jack Watling highlighted how the proliferation of short-range ballistic and cruise missiles, as well as the ubiquitous availability of cheap yet precise loitering munitions, means that the concept of drawing forces away from a crossing and establishing a bridgehead does not prevent the bridge from being struck. Today, even non-state actors can viably bring weapons to bear at ranges out to 500 km. These strikes may not destroy a bridge, but will slow down crossings and force repairs, fixing the force in place. This reinforces the need for layered defence and a combined arms approach to gap crossing.

Major General (Ret'd) Pekka Toveri of the Finnish Army explained that Russian gap-crossing capabilities were limited at tactical echelons, but that the Russians maintained a considerable volume of pontoon bridging and that the BTR-80 on which most Russian reconnaissance functions depend is quick and reliable in water. BMP variants are slower to prepare for swimming and less manoeuvrable. Russian tanks – though snorkels are often shown in videos – are not able to perform this task tactically. Although Russian engineering expertise appeared to be variable in Ukraine, it was noted that Russia had not been significantly constrained by the large number of gaps on its chosen axes of advance. Although NATO forces are clearly better trained, Toveri emphasised that Russian forces remain equipped to conduct manoeuvre over gaps in a way that NATO units would currently struggle to replicate.

Overcoming these challenges likely requires the use of new capabilities and the regeneration of some old ones. Ross Terri of Esri highlighted the importance of stand-off geographic planning tools able to build detailed models of the environment to reduce the amount of physical reconnaissance necessary to select crossing points. Limiting time spent on the ground would accelerate the recce and emplacement of bridging and allow for a more integrated approach to planning the positioning of defensive systems around crossings.

Heiner Oehlen of KMW showcased the company's research and development into swimmable vehicles to highlight the levels of protection and mobility achievable today. Specifically, he noted that while swimmable vehicles were constrained by the need to increase floatable volume in proportion to weight, it was possible to have a full combat weight of 32 tonnes on a vehicle with STANAG 3 levels of protection. The use of water jets and automated control surfaces also

meant that modern vehicles could transition to swim in under a minute and did not need to sacrifice ground or swimming mobility. Nevertheless, delivering such a vehicle into service would take time.

Although new capabilities may create opportunity, Tom Winney of WFEL told the conference that demand for their older systems remained high and that increasing cost and complexity made changing these systems counterproductive. In many instances, the requirement was for redundancy and mass; something that has been ruthlessly removed from many Western armies since the end of the Cold War. Regenerating gap-crossing capabilities therefore meant having sufficient platforms to take risks and to recover from – rather than be paralysed by – losses. In this, he echoed arguments proposed by Owen that armies should embrace new capabilities that offered value but otherwise drive relentlessly for reducing complexity, cost and weight in its platforms.

Brigadier Chas Story, Chief Engineer of the Allied Rapid Reaction Corps, noted that rivers presented opportunities as well as obstacles. It was entirely feasible, for instance, to move by river from Germany to Romania quicker than it was to do so by rail into Poland for an equivalent sized force. He explained that the control and utilisation of waterways, and the exploitation of existing ferries and other infrastructure, were examples of how forces needed to think more creatively in their approach to the issue. He also emphasised how the need to blow bridges – especially on the defence – and impede movement would have human security implications for which militaries would need to plan more robustly. The use of flooding, and mitigating the effects of flooding on civilians, was critical to ensuring human security. Story also noted that although multinational gap-crossing capabilities were desirable to generate sufficient corps troops with high levels of interoperability between personnel, it was not a way of mitigating the need for national capabilities to have redundancy, especially given the military load classification necessary to support different national platforms.

An example of specific national requirements is highlighted by the French Army. Brigadier General Frédéric Richaud, Chief Engineer at NATO Joint Forces Command Naples, told the conference that bridging capability had been severely cut back in the French Army, leading to problems in the Sahel where operations required multiple crossings of the Niger River. This had often required commandeering civilian ferries, but the weight they could bear was limited. Furthermore, French vehicles were not swimmable; nor are future vehicles. The French military does have robust designs for tactical gap-crossing assets and these are being regenerated. This is having to be done alongside the restructuring of the force for major combat operations with the regeneration of the divisional echelon. Much engineering capability had been fixed to civilian resilience tasks, which now had to be force generated for wider commitments.

Major General Jeff Milhorn, Deputy Chief of Engineers at the US Army Corps of Engineers, emphasised the importance of both allied exercises and preparation in competition to enable success in conflict. Here, the pre-positioning of military stocks by the US in Poland ought to ensure that there was materiel on hand to support large-scale operations. However, this did not remove the need for allies to have organic capability. Milhorn also outlined the limitations

of civilian infrastructure in the European theatre able to accommodate the increasing weight of combat platforms. He argued that preparing the theatre entailed expanding military options by investing in infrastructure suitable for military vehicles. There was similarly a need – which the US was working to address – to increase the available training estate suitable for gap-crossing exercises.

In closing the conference, Major General Kev Copsey – Chief of Staff of the Allied Rapid Reaction Corps – made three key observations. First, the lack of integration between combined arms training and gap-crossing exercises is producing massive distortions in NATO's perception of its own abilities. That gaps are wished away – even in command post exercises – means that the real challenges of manoeuvring over the ground that NATO must defend is under-appreciated throughout the force. It is therefore necessary to train at scale and to have gap crossing as a component in major exercises. Second, Copsey argued that if gap crossing is viewed as an 'engineer sport' it was unlikely to be successful in practice. The activity requires mutual support and deconfliction with air defence, reconnaissance and manoeuvre elements, with the engineers, to properly plan and synchronise crossings. Third, Copsey noted that any actual operation in Europe at operational scale would involve successive gap crossings by formations, and that exercises almost always only included one, which was adjacent to the main effort. This did not test – and consequently did not provide the evidence for – a realistic mass of bridging capability, since once emplaced there was rarely a tempo-based requirement for recovery of bridging assets. Although Russian forces have performed poorly in Ukraine, Copsey noted that if NATO wished to avoid being surprised at the gap between its aspirations and capabilities it would need to address these deficiencies.

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