



	<p>REGULATION 28 REPORT TO PREVENT FUTURE DEATHS</p> <p>THIS REPORT IS BEING SENT TO:</p> <ol style="list-style-type: none">1. MOD2. BAE Systems Ltd
1	<p>CORONER</p> <p>I am Louise Hunt Senior Coroner for Birmingham and Solihull</p>
2	<p>CORONER'S LEGAL POWERS</p> <p>I make this report under paragraph 7, Schedule 5, of the Coroners and Justice Act 2009 and regulations 28 and 29 of the Coroners (Investigations) Regulations 2013.</p>
3	<p>INVESTIGATION and INQUEST</p> <p>On 30/06/2017 I commenced an investigation into the deaths of Matthew Karl Hatfield and Darren Paul Neilson. The investigation concluded at the end of an inquest on 17th July 2018. The conclusion of the inquest was:</p> <p>The main cause of this incident was the tank being able to fire without the BVA assembly being present. During production and manufacture of the gun this hazard was not adequately considered or investigated and therefore the ability of the gun to fire without the BVA assembly present when the FNA with attached TVE is manually fitted in accordance with the TVEDU red drill went undetected. There were other issues which contributed to the incident. At the time of the incident there was no written process in place to check for the presence of the BVA assembly or any written process to confirm when it should be removed and where it should be stored. The prove the gun drill was misunderstood and there was a grey area around when it should be done. The decision to undertake an experience shoot was opportunistic and not communicated adequately. There was no written handover procedure in place and no handover occurred between the crews. Failure to correctly stow charges caused a secondary explosion following failure of the breech block due to the absent BVA assembly. The practice of unstowed charges was routine in the regiment and had not been identified or addressed by senior officers.</p>
4	<p>CIRCUMSTANCES OF THE DEATH</p> <p>The tank involved in this incident was a Challenger 2 call sign DS39AA which has a L30A1 120mm gun. The gun was designed and manufactured in the 1980s coming into use in Challenger 2 in 1994. The gun fires a projectile by a Tube Vent Electrical (TVE), which sits in the Bolt Vent Axial (BVA) assembly, igniting a propelling bag charge which then leads to the build-up of hot pressured gases which force the projectile out the barrel. The BVA assembly is a mushroom shape assembly. When the electrical circuit is made the stalk of the BVA assembly safely retains the TVE during firing of the gun system and allows the flame to be directed onto the charge through the flash panel to ignite the charge. The head of the BVA assembly creates a rearward seal when the gun fires to stop the high pressured hot gases which form from the lit bag charge coming back into the turret thus facilitating the gun to fire the projectile. During the manufacture and production of the gun it was not identified that the gun could fire without the BVA assembly being present in combination with the Tube Vent Electrical Display Unit (TVEDU) red drill. Cpls Hatfield and Neilson were Regimental Instructors Gunnery (RIGS) in Badger Squadron of the Royal Tank Regiment. They were at Castlemartin firing range as part of a planned live firing exercise culminating in a routine Annual Crew Test (ACT). The person in charge of the exercise was the Range Conducting Officer (RCO). On 14/06/17 the final ACTs were concluded just before lunchtime. The BVA assembly in tank DS39AA was removed, cleaned and replaced in the brew bin (a compartment in the tank). It was wrapped in a rag and covered by a prestle and red mine tape. The outgoing crew from the</p>

morning ACT were not aware that the tank would be used again that day. The white board showing the day's activities only detailed the morning ACT for the tank. There was no formal written process in place at the time to say when the BVA assembly should be stripped and where it should be stored before being checked by the armorer. A practice had developed for the BVA assembly to be taken out of the tank and stored in the range tower at the end of the day to be inspected by the armourer that evening or the following morning before being refitted to the tank by the first oncoming crew the next day. The RCO was not aware that the tank had been stripped down and the BVA assembly removed. The RCO did not adequately communicate that an experience shoot was taking place that afternoon as it was opportunistic. An experience shoot involves a non-qualified person being in the tank in the gunner's position to fire the gun. The required permissions were not obtained for the experience shoot however any risk was mitigated by the two RIGS (Cpl Hatfield as loader and Cpl Neilson as commander) being part of the tank crew. The other tank crew consisted of [REDACTED] as driver. 4 Shell 120mm TK practice SH L36A6 projectiles with bag charges and 4 shot 120mm TK DS practice L29A1 projectiles with charges were loaded into the tank with some additional rounds for the chain gun.

When the experience shoot crew entered the tank at around 15.00 hrs the tank was running. It was not recognised that the BVA assembly was absent and they would not have expected it to be missing. The loader placed his mobile phone in the brew bin and did not see the partially covered BVA assembly. At some point the loaders tray was put in place and the firing needle assembly (FNA) inserted. The Prove The Gun drill (PTG) ensures there is no ammunition within the gun and at step 6.13 requires the BVA to be checked for any TVE. It is not clear if this drill was done however it is possible to do the drill without noticing if the BVA assembly is present. The crew prepared to fire a shell 120mm TK practice SH L36A6 projectile using a bag charge and got a TVEDU red light warning. The most likely explanation for the TVEDU red light warning would be a failed vent tube insertion (the mechanism to ignite the charge bags used to propel projectiles). The loader would have run the accepted TVEDU red drill which includes manually fitting another vent tube on an FNA. It is possible to do this without noticing the BVA assembly is absent. This would have achieved a green light on the electrical circuit as the BVA assembly is not part of the electrical circuit. The tank would then have gone ahead to fire. As the BVA assembly was missing no adequate rearward obturation would be achieved in the gun which resulted in extremely hot pressurised gases from the ignited bag charge in the barrel coming back into the tank turret. This was the hissing noise heard by witnesses and [REDACTED]. The pressure then reached a point where the breech block exploded causing the upper breech block to be severed off landing in the back of the turret. After hearing the hissing Cpl Neilson was seen to attempt to leave the tank through the commander's hatch, as the breech exploded he was propelled out of the hatch landing on his head/face several meters away. Flames were then seen to come from the commander's and loader's hatches and the barrel. These were from the ignited unstowed propelling bag charges in the turret. One DST charge bag was on the charge storage locker in front of and to the left of the loader and 3 HESH bag charges were in the projectile racks to the right and slightly behind the loader. The DST bag charge likely ignited first followed by the other bag charges causing an immensely hot fire ball in the turret. The fire from the ignited charges was similar to a jet engine fire and was extremely intense. Cpl Hatfield was found wedged against the loading guard and was seriously burnt with his coveralls and shoes melted. The gunner was found with serious burns in the gunner's seat. The driver (who is sitting in a different compartment of the tank) was injured but his injuries were more minor. Army medics attended the scene within minutes and other emergency services were called and arrived quickly. Cpl Neilson required CPR and intensive treatment before being taken by air ambulance to University Hospital in Cardiff where despite further attempts to treat him he died on 15/06/17. Cpl Hatfield was extracted from the tank and given first aid and taken by air ambulance to Morriston hospital where despite further treatment he died on 15/06/17.

Following a post mortem, the medical cause of death was determined to be:

Cpl Hatfield: 1a BLAST RELATED BURNS

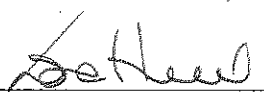
Cpl Neilson: 1a HYPOXIC ISCHAEMIC ENCEPHALOPATHY FOLLOWING CARDIAC ARREST

1b BLAST RELATED INJURIES

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CORONER'S CONCERNS

During the course of the inquest the evidence revealed matters giving rise to concern. In my opinion there is a risk that future deaths will occur unless action is taken. In the circumstances it is my statutory duty to report to you.

	<p>The MATTERS OF CONCERN are as follows. –</p> <ol style="list-style-type: none"> 1. I remain concerned that soldiers are not clear about when to use the Prove The Gun drill and the meaning of the word “work” in the drill. This was supported by the evidence of [REDACTED] who stated there was still a lack of clarity. The MOD should ensure that soldiers are clear about the meaning of the word work in the drill and when the drill should be undertaken. 2. One of the contributing factors to this tragedy was that the RCO, the person in charge of the live firing exercise, did not know the state of the tanks on the range and therefore allocated a stripped down tank for a live firing exercise. I remain concerned that it is vital that the person in charge of such exercises has up to date knowledge about the status of the tanks on the range. The MOD should look at what communication can be put in place to ensure the RCO is in fact in charge and has all the correct information to make decisions during the exercise. 3. [REDACTED] from the HSE confirmed that had applied advanced or developed risk assessment techniques been undertaken then it would have been identified in the design and manufacture of the gun that it could fire without the BVA assembly present when undertaking the TVEDU red drill. BAE and the MOD should look at their process to ensure that their risk assessments are suitable and importantly that drills are actively considered when assessing risk and identifying hazards during manufacture.
6	<p>ACTION SHOULD BE TAKEN</p> <p>In my opinion action should be taken to prevent future deaths and I believe you have the power to take such action.</p>
7	<p>YOUR RESPONSE</p> <p>You are under a duty to respond to this report within 56 days of the date of this report, namely by 12 September 2018. I, the coroner, may extend the period.</p> <p>Your response must contain details of action taken or proposed to be taken, setting out the timetable for action. Otherwise you must explain why no action is proposed.</p>
8	<p>COPIES and PUBLICATION</p> <p>I have sent a copy of my report to the Chief Coroner and to the following Interested Persons: Family of Matthew Hatfield Family of Darren Neilson [REDACTED] Dyfed-Powys Police HSE</p> <p>I have also sent it to the Minister for Defence who may find it useful or of interest.</p> <p>I am also under a duty to send the Chief Coroner a copy of your response.</p> <p>The Chief Coroner may publish either or both in a complete or redacted or summary form. He may send a copy of this report to any person who he believes may find it useful or of interest. You may make representations to me, the coroner, at the time of your response, about the release or the publication of your response by the Chief Coroner.</p>
9	<p>18/07/2018</p> <p>Signature  Mrs Louise Hunt HM Senior Coroner Birmingham and Solihull</p>