



MINISTRY OF DEFENCE

A REVIEW OF UK FORCES CHEMICAL WARFARE AGENT ALERTS
DURING THE 1990/1991 GULF CONFLICT

20 July 2000

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INVESTOR IN PEOPLE

BACKGROUND

1. On 14 July 1997, the Ministry of Defence (MOD)¹ published a policy statement setting out its strategy for addressing the health concerns that have been expressed by veterans of the 1990/1991 Gulf conflict.² As part of this strategy, the Government pledged to review incidents during Operation GRANBY where veterans have suggested that they were exposed to Iraqi chemical or biological warfare (CBW) agents. The first of these reviews concerned a tank of liquid found at the Kuwaiti Girls' School in Kuwait City in August 1991, and a draft case narrative was published jointly by the MOD and the Office of the Special Assistant for Gulf War Illnesses (OSAGWI) at the US Department of Defense (DoD) on 11 March 1998.³ Another paper published by the MOD on 6 April 1998 reviewed the circumstances in which UK forces reported groups of dead animals during the Gulf conflict.⁴
2. In December 1999, the MOD published a paper providing background information about the system that was put in place during the Gulf conflict to protect UK troops from the threat of CW agents.⁵ That paper provides background information as a basis for detailed reviews of incidents where veterans have suggested that they were exposed to Iraqi chemical weapons. The first of these detailed reviews was also published in December 1999, and considered the release of CW agents after demolition of the Khamisiyah ammunition dump on 10 March 1991.⁶
3. The second of these detailed reviews concerned suggestions that a chemical attack took place in Al Jubayl in the early morning of 19 January 1991, and was published on 20 January 2000⁷.
4. This third paper reviews evidence of CW alarms and alerts from August 1990 to March 1991. It examines the overall pattern and frequency of alarms for the whole period. In addition, as specific claims of CW exposure have been made in these cases, it addresses in detail events at Dhahran on 20 – 21 January 1991 and at Al Jubayl on 15 – 16 February 1991.⁸

¹ A glossary of terms used is at Annex A.

² "Gulf Veterans' Illnesses: A New Beginning", dated 14 July 1997.

³ OSAGWI and MOD Case Narrative: "Kuwaiti Girls' School", dated 11 March 1998.

⁴ "Dead Animals During the Gulf Conflict", dated 6 April 1998.

⁵ "British Chemical Warfare Defence During the Gulf Conflict (1990-91)", dated 7 December 1999.

⁶ "Review of Events Concerning 32 Field Hospital and the Release of Nerve Agent Arising from US Demolition of Iraqi Munitions at the Khamisiyah Depot in March 1991", dated 7 December 1999.

⁷ "A Review of the Suggested Exposure of UK Forces to Chemical Warfare Agents in Al Jubayl on 19 January 1991" dated 20 January 2000.

⁸ A map of the Gulf region is at Annex B.

Further Information

5. Further information about the Government's response to the health concerns of Gulf veterans, and all reports published by the MOD on this subject; can be obtained from the Gulf Veterans' Illnesses Unit's (GVIU) Website at <http://www.gulfwar.mod.uk>. Alternatively, information is available from GVIU, the Government's focal point on this issue. The unit can be contacted by calling the GVIU Helpline on 0800 169 4495 or by writing to:

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HISTORICAL METHOD

6. This review draws on two main sources of evidence: documentary records which survive from the time, and the present-day recollections of those who were involved in the events as they unfolded. In addition, it also draws on the investigations that have been carried out by OSAGWI at the US DoD.

Contemporary Documents

7. Standard military procedures for the Armed Forces require the recording of operational matters, usually at major headquarters (HQ), formation HQ and unit level. The format and content of these records vary to reflect the different organisational structures and requirements of the three Services. The Army Commander's Diary and the RAF Operations Record Book (ORB) (form 540/541) are not designed to include all of the information received or disseminated during an operation, but to focus on significant operational matters while certain other administrative and logistic issues are covered in less detail. An Army Commander's Diary should include details of all the major changes within the respective unit or formation; information received and given, including major orders and instructions; short summaries of the day's fighting (where applicable), including movements and details of casualties and prisoners; statements showing how the unit was employed; and annexes including as much other information as possible, with copies of documents issued and received.

8. Commanders' Diaries and RAF ORBs have limitations, particularly during the busiest operational periods, when units are not always able to undertake record keeping in accordance with MOD requirements. In addition, the nature of a unit's duties may mean that it is not always possible for them to maintain a structured diary, since their personnel may be split between a number of remote locations. On Operation GRANBY this was particularly the case with a number of Signals and Transport units. Although most units copy operational orders and instructions into their Diaries, very few retain copies of signals and messages received, unit nominal rolls and casualty returns, and their radio and watchkeepers' logs. There are often problems with the records of smaller sub-units and specialist cells within a larger organisation, whose detailed material may not be included in the larger Commanders' Diaries. It is frequently the case that details of routine occurrences, or occurrences initially deemed significant but subsequently considered to be no longer so, are often not recorded or kept. The reality of operations means that the coverage of particular events varies from unit to unit.

9. Commanders' Diaries and RAF ORBs should be returned to the MOD either at the end of an operation, or if the operation is long-lived, on a monthly basis. However, they are not always returned to the UK complete since Service security instructions tend towards the destruction of out-of-date paper. Administrative restrictions in-theatre favour the reduction of paper and other material to be shipped back to the UK. In the case of CBW records during the Gulf conflict, some Nuclear Biological and Chemical (NBC) officers have

noted that they destroyed many of their papers in theatre because they considered that nothing of significance had occurred.

10. Accordingly, the range and completeness of the records returned to the MOD after the Gulf conflict varied considerably. There are also some inconsistencies between those records that have survived. This is to be expected. Units involved would have been more concerned about defending against a possible chemical attack than about maintaining perfectly accurate war diaries. After an alert, and especially once it was clear that there were no casualties, attention would have been focused on their primary role.

11. GVIU have consulted over 175 pieces of contemporary written evidence held in the MOD archives in producing this review of UK CW alerts. This included every Commander's Diary and RAF ORB. In addition to these official records, other sources of documentary evidence still exist, such as private diaries and letters. Some have been used in this review.

Individual Recollections

12. The present day recollections of those present provide a useful additional source of information, especially where they had particular NBC responsibilities. The passing of years has a detrimental effect on personal memories, which fade and tend to become less objective. It is inevitable that those who have been contacted may not be able to recall the finer details of an event, and they may confuse their memories of different CW alerts. It is also inevitable that there will be inconsistencies between the recollections of different people, although where independent recollections corroborate one another, there can be greater certainty about their accuracy. Personal recollections are useful but are less authoritative than the information contained in contemporary records.

The Bounds of Possibility

13. Detailed reviews of historical incidents often uncover loose ends that cannot be satisfactorily tied up. Where only limited information about specific details is available, this is made clear, as is the point at which the more objective presentation of evidence gives way to the evaluation and interpretation of that evidence. The MOD's approach is to ensure that these differences are made absolutely plain in this and other reports, and that there can be no confusion between hard facts from authoritative contemporary records and more speculative information.

UNITED STATES DEPARTMENT OF DEFENSE WORK

14. In the US, OSAGWI has responsibility for investigating the possible exposures of US Gulf veterans. This has included investigating specific incidents during the Gulf conflict that are of concern to American Gulf veterans. OSAGWI have published a number of case narratives detailing what is known today about these incidents. Many of the case narratives published to date are interim reports, and may alter in the light of new information. A list of case narratives is at Annex C.

GENERAL PATTERN OF CW ALARMS AND ALERT STATES

Introduction

15. Most of the information regarding CW alerts during the Gulf is to be found in the Army Commanders' Diaries as the Army made up 70% of the Operation GRANBY force in the Gulf. However, information contained in RAF ORBs and Naval records also provides useful information about events surrounding CW alerts that may have caused troops some concern.

Before the Air Campaign

16. Prior to the start of the coalition air campaign on 17 January 1991 there was little in the way of either SCUD missile alerts or NBC alarms. It was not until the start of the coalition air campaign that Iraq began launching SCUDs at either Saudi Arabia or Israel. Earlier SCUD alerts were responses to test firings within Iraq. During the period before the air campaign intelligence assessments indicated that the NBC threat was 'LOW'⁹. In 'LOW' NBC threat state chemical agent monitoring equipment was generally not switched on, in accordance with standard doctrine. This is a significant point. It shows why there was only one contemporary report of an alarm from the beginning of the deployment up to 17 January. It also helps to explain why there were numerous alarms in the few days after 17 January, as the first prolonged and intensive use of the CW monitoring system during the period of higher threat sparked false alarms from interferences, equipment failure and operator error.

17. Monitoring and detection equipment was switched on during a SCUD alert on 2 December 1990. Between 0500¹⁰ and 0525 several units record receiving intelligence that there was likely to be SCUD activity between 0645 and 0900. At 0811 a number of units record that SCUDs had been launched (at Israel). As a result NBC Dress State 1 was ordered in some units and Dress State 2 in others¹¹. 7 Armoured Brigade (7 Armd Bde) HQ had deployed their Nerve Agent Immobilised enzyme Alarm and Detector (NAIAD) as a result of the increase in the NBC threat level. At 0910 this NAIAD alarmed and a number of units record that full Individual Protective Equipment (IPE) was donned. 3 Ordnance Battalion Royal Army Ordnance Corps (RAOC) record at 0925 receiving a message from the Brigade telling them that when units were happy with Chemical Agent Monitor (CAM) and Residual Vapour Detector (RVD)¹² checks they could carry out their unmasking drills. The all clear was called at 1040.

⁹ 'LOW' is defined as "The enemy has an offensive capability but there is no indication of its use in the immediate future".

¹⁰ All times quoted in this paper are Gulf local times, 3 hours ahead of UK local time. Where the paper quotes from sitreps or other documents where UK times are used these have been adjusted to Gulf local time.

¹¹ For full details of NBC dress and alert states see "British Chemical Warfare during the Gulf Conflict (1990-91)", dated 7 December 1999.

¹² Further information regarding NAIAD, CAM and RVD can be found in "British Chemical Warfare Defence During the Gulf Conflict (1990-91)", dated 7 December 1999.

18. A signal from 7 Armd Bde to Headquarters British Forces Middle East (HQ BFME) dated 3 December 1990 at 0500 says:

“In response to flash MSG [message] concerning the firing of 3 SCUD (cfm) missiles the Bde Gp executed a rapid and effective increase in alert (NBC threat state/dress state). The NAIADs were activated as the threat state was raised. An interesting observation resulted; NAIADs alarmed! Comment; The NAIADs are super sensitive and may have alarmed as a result of chemicals contained in the downwind burn off clouds from local oil refineries. This HQ is investigating further.”

19. Despite the final comment that ‘This HQ is investigating further’ no information was found about the outcome of any investigations and no further explanations are offered for the NAIAD alarming.

20. No SCUDs were actually launched either at Israel or Saudi Arabia that day, and there was no other possible CW delivery means (e.g. an aircraft) recorded. Therefore, the only reasonable explanation for the NAIAD alarming is that it was set off by something other than CW agents, equipment failure or operator error. See paragraphs 86-106 of “British Chemical Warfare Defence during the Gulf Conflict 1990/91” for details.

The First 5 Days of the Air Campaign

Day 1 – 17 January 1991

21. The start of the coalition air campaign on the 17 January 1991 caused an increase in alertness of all troops and many units record going to NBC Dress State 1 in the early hours of the morning as news came in of 100 coalition Tomahawk cruise missiles being launched at Iraq. Unit logs record that there was a certain amount of ‘general confusion’ as air alert states and dress states were raised and lowered throughout the morning of 17 January each time it was thought a SCUD had been launched. Some units went into Dress State 2, others went into Dress State 3R, full IPE. These alerts were false alarms; many higher-level unit records say that the satellite imagery mistook cruise missiles hitting SCUD sites for SCUD launches. There is however, one record in a HQ BFME log of a SCUD launch at 2300 that evening at Israel that is not subsequently discounted but is not backed up by other unit logs or US or UK Sitreps.

22. False NBC alarms on 17 January were prevalent, the first recorded being at 0430 when the 1 Royal Scots and 3 Royal Regiment of Fusiliers record going into Dress State 3R for 12 minutes due to a NAIAD alarm later described as a false alarm. In the 7 Armd Bde logs sheets it records that at 0550 the Royal Scots Dragoon Guards called a CW alert. Unmasking procedures were called at 0605 when it was realised that the alert had been caused by somebody incorrectly hearing a message over the radio. The Royal Scots Dragoon Guards record the reason for the alert as being that the US had been carrying out an NBC Exercise without telling them. However, all the other units (at least 11 other units record this incident) who had gone into

Dress State 3R as a result of this alert merely record it as a misheard message. At 0727, 14/20 King's Hussars (a 4 Brigade unit) called a CW alert when a sub unit callsign E30 informed them a NAIAD had alarmed. At 0750 the log sheets record that a sub unit callsign G42 had a negative RVD and that CAM was showing 1 bar in G mode (nerve agent) but nothing in V mode (blister agent). At 0803 callsign E30 stated that they had a negative CAM but that their RVD was showing mauve tinges. At 0834 the all clear was called. Meanwhile at 0815 a further alert is recorded by 7 Armd Bde as coming from 1 Staffordshire Regiment. 1 Staffordshire Regiment record this at 0810 as being a 'false NAIAD alert'. At 0959 the 14/20 King's Hussars log records that the callsign E30 NAIAD had alarmed and that it was the same NAIAD that had alarmed that morning. At 1019 the log sheet records that 1 person had a positive detector paper reading. At 1022 all sub units were ordered to 'change all detector paper to avoid confusion'. At 1027 the log records that the detector paper that gave a positive reading had been used in an NBC exercise (i.e. had been coloured by CW simulants and not discarded). At 1034 the log states that the NAIAD alarm was caused by a faulty NAIAD battery. At 1020 3 Royal Regiment Fusiliers (also a 4 Brigade unit) record going into 3R after seeing mist and hearing explosions. This lasted for 15 minutes until they were informed that it had been caused by a coalition Multiple Launch Rocket System (MLRS) firing. Both 4 and 7 Brigades were in the Devil Dog Dragoon Ranges area at this time, 60 kilometres Northwest of Al Jubayl.

23. The 7 Armd Bde and 3 Ordnance Battalion RAOC log sheets record that Dressing Station 1B went into full IPE at 1147 and 1220 respectively after hearing an explosion and seeing a plume of smoke. 4 Regiment Army Air Corps, at this time in the Al Jubayl area record a further false alarm with NAIAD at 1835 and 205 General Hospital (located in Riyadh) called a CW alert at 2300 after a guard heard "Gas Gas Gas" being called elsewhere. No explanations are recorded for these 3 incidents, which occurred in widely separated locations. It is possible that Dressing Station 1B may have reacted to MLRS firing or something similar, as 3 Royal Regiment Fusiliers had an hour earlier.

Day 2 – 18 January 1991

24. Units were woken early due to a SCUD alert. As information came into units it became clear that the SCUDs were aimed at Israel. The number of SCUDs thought to have been launched at Israel varies from log to log, but it appears that approximately 8 were fired between 0320 and 0340. A number of rumours circulated about the possible use of CW warheads in some of the SCUDs that hit Tel Aviv although these had been discounted by 0715. Meanwhile at 0545 HQ BFME gave the order for Nerve Agent Pre-Treatment Set, pyridostigmine bromide tablets (NAPS)¹³ to be taken at 0600 as the threat was considered to have risen. There were a number of log entries stating that a SCUD had been fired at Dhahran and had been intercepted by a PATRIOT missile. This was discounted by 1530 as a false alarm - PATRIOTS

¹³ For further information about NAPS tablets see "Background to the use of Medical Countermeasures to protect British Forces during the Gulf War (Operation Granby)", dated 27 October 1997.

had been fired from Dhahran and had self-destructed. However, this is not recorded in many logs, which may mean that personnel in some units believed that a SCUD had been fired and possibly destroyed by PATRIOT.

25. There were a number of NBC alerts on 18 January for a variety of reasons. At 0400 24 Airmobile Field Ambulance (located south of the TAPLine Road) went into Dress State 3R after 'reacting to a nearby horn'. CAM and RVD checks were negative and the all clear was given at 0412. A wider alert was caused at approximately 0630 when the 7 Brigade Rendezvous¹⁴ NAIAD alarmed. At least 6 units went into Dress State 3R as a result of this and the all clear was given at approximately 0705. Little explanation is given for this alert other than 'false alarm' although the 1 Armoured Division Transport Regiment log records receiving a message from its 2 Squadron at 0713 stating that the NAIAD had been checked and found to be faulty and that RVD checks had been carried out and found to be clear. There was a further alert at 0700 and 0740 when 39 Heavy Regiment Royal Artillery (RA) record that the 40 Field Regiment RA NAIAD had alarmed but that both readings were in error. 12 Air Defence Regiment RA also record that a NAIAD alarmed at this time (0755) but that it was a false alarm. The log sheet records state that as there had been no explosions, helicopters, or aircraft (i.e. no delivery means) the NAIAD was being checked.

26. 6 Armoured Workshop went into Dress State 3R at 0912 when a driver returned from the Force Maintenance Area (FMA) in Dress State 3R due to a NAIAD alarm at the FMA (6 Armoured Workshop and the FMA were located in Al Jubayl at this time). 11 Ordnance Company RAOC report that a NAIAD went off at 0951 and at 0954 report that it was a NAIAD malfunction. The 11 Ordnance Company Commander's Narrative for that day states:

"There have been many alarms with NAIAD in the BAA [Brigade Administration Area]. I have ordered all units to check for faults more thoroughly before issuing a general alarm"

27. 32 Armoured Engineer Regiment record that at 1100 their NAIAD had alarmed and that they had gone to NBC black. 15 minutes later they record that it may have been due to 'chemical burning 1km to the East' (this may refer to burn off from one of the various petrochemical factories in Al Jubayl) and that CAM had no reading and RVD tests were in progress. They report carrying out unmasking drills at 1125 followed by a further NAIAD alarm at 1149 when the NAIAD was being set up. This was suspected to be a false alarm and an RVD test was carried out. The all clear was finally called at 1200.

28. At 1641 the 40 Field Regiment RA (located near the Devil Dog Dragoon Ranges) NAIAD went off again and was declared a false alarm 3 minutes later. At 1945, 4 Armoured Division Transport Regiment (located outside Al Jubayl) record that they informed the FMA NBC Cell that they could

¹⁴ A central point through which stores had to pass for checking and identifying before proceeding to units.

hear a NAIAD going off nearby. They asked the FMA if this had been reported to them to which the answer was no.

Day 3 – 19 January 1991

29. The events of the morning of 19 January at Al Jubayl are documented in a separate paper¹⁵ published by the MOD in January 2000. There was a further alert later on the same day when a number of units record going into Dress State 3R. A number of units that were based up to approximately 100km North or Northwest of Al Jubayl report a Landrover driving round telling personnel to mask up. At 1209 the 14/20 King's Hussars record a CW alert and at 1214 stated that this had been initiated by a vehicle horn. At 1221 they record they had no reading on CAM and at 1225 the all clear was called. Almost immediately after, there was another alert called and a second all clear was then called at 1227. At 1232 they record the alert as being due to the Landrover. 12 Air Defence Regiment RA record at 1230 questioning whether it was an exercise and at 1235 record the incident as a 'practical joke' involving the Landrover. Units were asked to look out for this Landrover and to apprehend the driver if possible. It is not recorded whether the driver was ever apprehended.

30. At the same time as this 7 Armd Bde record at 1145 that the 2 Sqn Royal Corps of Transport (RCT) NAIAD had alarmed. At 1215 they confirm that the NAIAD had tripped whilst being moved. At 1200 1 Armoured Field Ambulance (based in the Al Qaysumah area) record that their CAM had activated and at 1210 that this had occurred due to the smell from an old sandbag. The log also notes that they informed 14 Signals and Forward Repair Group 7 of the alert and the reason for it. 1 Armoured Division HQ record a message from 14 Signals at 1205 stating 'DS in OP Keyes [area north of Al Qaysumah] at 3R due to NAIAD alarm', DS may refer to Dressing Station (a sub unit of a Field Ambulance) but this is not stated. At 1207 this is recorded as a false alarm. Further to this 1 Armoured Division Transport Regiment record that at 1230 they were in NBC black but this was a false alarm due to an Exercise by Dressing Station 5A (also based in the Al Qaysumah area).

Day 4 – 20 January 1991

31. The events of the night of 20 January in Dhahran are covered separately (see paragraphs 71-91). Earlier in the day 205 General Hospital at Riyadh had two false alerts; the first at 0423 when an alert was called with an all clear 7 minutes later and the second at 1750 when an alert was heard from elsewhere with Dress 0 called 7 minutes later. No further information is given about these two incidents and there is no record of chemical warfare agent detection and monitoring equipment alarming.

32. 6 Ordnance Battalion were initially based at Al Jubayl and on 20 January whilst some elements of the Battalion would have begun moving up to the Forward Force Maintenance Area (FFMA) some elements remained in Al Jubayl. They record on the night of the 20 January that the FMA NBC cell

¹⁵ "A Review of the Suggested Exposure of UK Forces to Chemical Warfare Agents in Al Jubayl on 19 January 1991", dated 20 January 2000.

called Dress State 3R at 2154 although no reason was given. At 2213 the order to carry out unmasking drills was given. 62 Company and 53 Company of 6 Ordnance Battalion carried out RVD and sniff tests and at 2244 53 Company called sniff test clear. Also at 2244 62 Company reported that they were nerve and liquid clear but they had two RVDs with mauve tinges and so would carry out a further RVD test. At 2300 the 2I/C recommended to the Watchkeeper that a check be carried out with CAM to see if it was a 'bad RVD'. At 2304 6 Ordnance Battalion informed the FMA NBC cell that they were liquid and vapour clear and asked for permission to unmask.

33. Also on the night of the 20 January, 7 Armd Bde record at 2330 that a CW alert had been heard in the area of 1 Staffordshire Regiment (who were moving from Devil Dog Dragoon Ranges to Al Qaysumah on the 20 January) but that no explosions had been heard in that area and no report had come in from the initiating unit. At 2335 the log sheet records that Dressing Station 1A were the likely initiators and that it was suspected to be a false alarm. Whilst there is no record of this event in the 1 Staffordshire Regiment Commander's Diary, it is recorded by 1 Armoured Field Ambulance of which Dressing Station 1A was a sub unit. Their log sheets record that at some time between 2240 and 2351 they were asked by 21 Engineer Regiment if they had originated the alarm. Dressing Station 1A responded 'no' but they had '2 negative CAM and 1 positive at present'. 21 Engineer Regiment thought that possibly Forward Repair Group 7 (part of 7 Armoured Workshop) had originated the alarm. HQ BAA sent a further message at 2351 stating that FRG7 had not originated the alarm. However, Forward Repair Group 7 did react to the alarm as the Commander's Narrative records that a false NBC alarm put them into Dress State 3R.

Day 5 – 21 January

34. At 0556 Main Repair Group 7A (part of 7 Armd Workshop, moved from the Al Jubayl area to the Tactical Assembly Area Keyes area North of Al Qaysumah from 19-21 January.) had a false positive for nerve agent on CAM which they thought had been caused by the thunder and lightning. 6 Ordnance Battalion (at Al Jubayl) record that at 0703 their NAIAD went off and at 0755 that this had been caused by the reagent pack in the NAIAD running out. 205 General Hospital (at Riyadh) called an alert at 0925 and 0935 but gave no explanation of the cause and the all clear was given at 0956. At 1610, 32 Field Hospital record that a NAIAD alarmed and that the all clear was given five minutes later. These were isolated incidents that are not recorded in other diaries.

17-21 January –Summary

35. Our review of the records suggest that there were at least 32 separate NBC alerts over the first five days of the air campaign; 9 on 17 January; 10 on 18 January; 4 on 19 January; 4 on 20 January and 5 on 21 January. At least 16 involved NAIAD false alarms. There is no geographical pattern linking these alarms. They ranged from Dhahran and Al Jubayl, the 1 Armoured Division and Brigade HQ areas 60-100km West and Northwest of Al Jubayl, to Al Qaysumah 300km to the Northwest, and Riyadh, over 300km to the Southwest.

Common Problems

36. As can be seen the first five days of the air war were characterised by false alarms. Clearly troops needed to work on the basis of responding to all threats both real and perceived. When NAIADs alarmed personnel would do full IPE and then investigate using CAM and RVD to check the reading from the NAIAD.

37. However, problems arose when units that had suited up to NAIAD alarms from other units were not given the reason for the false alarm. Similarly when "Gas Gas Gas" was called and then troops were subsequently stood down there was often no explanation given. This sometimes left troops with the impression that the occasions when they were not given a full explanation can only have been a real alert. However, it is important to remember that in the first three days of the air campaign Iraq did not launch any SCUDs at Saudi Arabia, nor were there other offensive Iraqi actions involving British Forces, eliminating the possibility that any chemical weapons had been delivered via this means.

38. Particularly in the early days of the air campaign problems were caused by a difference of approach to SCUD and NBC alerts by different units. For example some units raised their Dress State to 2 as the result of a SCUD alert whereas others went into full IPE, Dress State 3R. The Commanding Officer (CO) of 71 Aircraft Workshop noted in his Commander's Narrative for 17 January:

"The Dress State changed many times during the day with slight confusion as 4 Regt [Army Air Corps] has received it's dress states from HQ FMA and ours came from Maint at 1 Armd Div".

39. 4 Regiment Army Air Corps and 71 Aircraft Workshop were co-located at Al Jubayl.

40. A similar problem was one of nearby US troops being told to stand down from alerts after UK troops had already been told to stand down or alternatively being stood to when UK troops had not been given the order. This sometimes meant that UK troops were unmasking or unmasked but were seeing US troops in IPE. For example on 21 January 24 Airmobile Field Ambulance record going into Dress State 3 at 0225 for 1 hour and standing down to Dress State 1 by 0345. At 0531 they record that (US) 217 Transportation Company advised them they were in MOPP4 (equivalent of Dress State 3R). RVD CAM and NAIAD checks were carried out and 217 Transportation Company called the all clear at 0632.

41. There was evidence that those at higher-level perceived there was a problem with overreaction to SCUDs, alarms, noises and explosions. Both 32 Heavy Regiment RA and 40 Field Regiment RA Commander's Narratives for 17 January record the following:

"GOC [General Officer Commanding] is concerned about over reaction to air raid and NBC warnings, particularly in Al Jubayl"

42. The log sheets of 4 Armoured Brigade show that on the morning of the 17 January 14/20 King's Hussars and surrounding units were told on a number of occasions to 'calm down' when a NAIAD went off. Firstly they were told there had been no attack, secondly that efforts were being made to ascertain why people were in Dress State 3R and thirdly that there had been no delivery means.

43. An entry in the Commander's Diary from 11 Armoured Workshop of 18 January illustrates this problem.

"FMA is very jumpy moving to 3 Romeo everytime [sic] an alert sounds."

44. The Commander's Narrative from Main Repair Group 7A of 18 January says:

"We will respond only to direct air threats, there appears to have been a tendency to overreact to all levels of threat."

45. Problems were further caused by the fact that one of the ways of alerting other personnel to an NBC alert was the use of vehicle horns. One example is recorded in the 1 Armoured Division Transport Regiment Commander's Narrative where he notes that:

"Car sounding horn at camels resulted in RHQ to moving up to 3R"

46. Other problems came when US Forces failed to inform UK Forces that they were exercising or that they were firing weapons, causing UK troops to go into IPE.

47. Commanders were often frustrated by false NBC alarms, as this entry from the 1 Armoured Field Ambulance Post Operational Report (dated 10 June 1991) shows:

"NAIAD caused a frustratingly high number of false alarms, fortunately no true positives were experienced"

48. The RAF 540 of 18 January from Muharraq records a similar experience:

"A high amount of false alarms have been generated on NAIADs"

49. Those at sea also record having similar problems with CAM and NAIAD, with complaints that NAIAD was unreliable and that CAM had a high false alarm rate. However, HMS BRAVE records that:

"Whilst NAIAD was on the main reliable with only occasional spurious alarms, CAM enjoyed mixed fortunes"

Late January

50. The problems of the first few days of the air campaign did not disappear but did diminish throughout the rest of January. There were a number of reasons for this; a general improvement in communication between units and between the UK and US forces; an improvement in the way in which warnings were disseminated; and possibly most importantly a general feeling of being more comfortable with both the equipment and the situation.

51. On 22 January several units donned Dress State 3R at 1335 following an explosion that turned out to be US demolitions. On 23 January the Commander's diary for 4 Armoured Division Transport Regiment records a false NAIAD alarm with the all clear coming 20 minutes after the alarm, but gives no reason for the alarm and it does not appear to have been recorded in any other unit logs.

52. On 24 January the FMA NBC Cell issued a message that air threat 'YELLOW' (air attack probable) would be called every night at approximately 1830 and air threat 'WHITE' (air attack not immediately probable) would be called each morning at approximately 0630. This was due to the fact that the most likely time for SCUD attack was during these hours. Formalising the raising and lowering of alert states seemed to help calm units that had previously been continually raising and lowering the air alert states independently. On the same day 53 Field Squadron (Construction) Royal Engineers (RE) record that they were now not being alerted to SCUDs unless they were headed in their direction. Despite this there is evidence that there was a certain amount of confusion in some units following a series of false NBC alerts. Early in the morning several units in the Al Qaysumah area went into 3R following shouts of "Gas Gas Gas" and horns being used. Units were asking each other if they had started the alert. No-one had reported any explosions or NBC equipment alarms and so the order was eventually given to unmask. 7 Armd Bde and the Royal Scots Dragoon Guards record this alert as having originated with the 16/5 Queen's Royal Lancers. The 32 Field Hospital log sheet records at 2245 that they had a false NAIAD alarm. The 16/5 Queen's Royal Lancers Commander's Narrative for 24 January notes:

"The day was beset by false NBC alarms, all pers [sic] are very conscious of the threat and as a result people have overreacted when an alarm or noise resembling one, is heard."

53. The rest of January followed a similar pattern of general calm with some sort of alert, usually an isolated incident once each day. Incidents over the period 25-31 January were as follows. On 25 January at 1250, 205 General Hospital record a NAIAD alarming. The log sheets state that this was being referred to the RAF NBC Cell for them to deal with. There is no further entry relating to this NAIAD alarm in the 205 General Hospital log sheets and there is no mention of this incident in the RAF 540 for Riyadh. On 26 January the 32 Field Hospital Commander's diary records a false NAIAD alarm at 0145. An entry in the log sheets at 0140 states that the blood bank alarm had been set off by a power failure and that this alarm sounded identical to a NAIAD alarm. On 27 January at 0010 the 6 Ordnance Battalion log sheet records a NAIAD false alarm caused by the low battery alarm. On 28 January

7 Armd Bde record receiving a message at 2221 that the Queen's Royal Irish Hussars' NAIAD had alarmed but that this was due to a low battery. Units received intelligence on 28 January that chemical weapons had been seen being loaded onto aircraft the reaction was calm and measured. Units were told to deploy NAIADs alongside CAMs in H mode (blister agent) and to switch the CAM to G mode (nerve agent), as a check should the NAIAD alarm. On 29 January the Queen's Royal Irish Hussars (located in the Al Qaysumah area) record that at 0710 a NAIAD had alarmed and that they were investigating. They confirm at 0711 that there had been no explosions or low flying aircraft. At 0720 they record that it was a false alarm due to the reagent module running out. Also on the 29 January 205 General Hospital (located in Riyadh) report a 'NAIAD faulting' at 0900. On 30 January 3 Ordnance Battalion record receiving a message at 0140 from 43 Ordnance Company stating that their NAIAD had alarmed at 0104 but that it was a false alarm. On 31 January at 1805, 7 Armd Bde records a NAIAD alarm affecting 4 Field Squadron (part of 21 Engineer Regiment). At 1816 this was confirmed as a false alarm. 11 Ordnance Company records a 'NAIAD false alarm' at 1815 affecting 1 Squadron RE (also part of 21 Engineer Regiment). As both log sheets give the same grid reference (in the Al Qaysumah area) for the NAIAD alarm it can be assumed that both logs are referring to the same incident.

French/Czech Detections

54. OSAGWI have looked at a series of reports of possible chemical agent detections by Czech and French troops between 19 and 24 January 1991. OSAGWI have stated that there have been some difficulties in obtaining evidence from the Czech and French Governments. For this reason the report published in August 1998 is an interim report, coming to conclusions based upon what was known at the time. It is expected that an updated report will be published later this year.

Summary

55. The OSAGWI summary of the incident published in their 1998 case narrative was as follows:

“During the first several days of the Air Campaign, Czech and French units reported as many as seven detections of nerve and blister agents in portions of the Operation Desert Storm Theater. These reported detections took place between January 19 and January 24, 1991, in the vicinities of Hafar Al Batin and King Khalid Military City (KKMC), Saudi Arabia. Both the Czech and the French reports noted concentrations of chemical agents far below levels determined to be life threatening or able to cause immediate injury to troops in the area. The majority of those incidents were reported to each nation's respective chain of command as well as to the Coalition headquarters at CENTCOM.

Czech units in the Gulf War reported four chemical detections. The Czech government, however, indicates that their troops had two chemicals detections. A nerve agent detection that occurred

near Hafar Al Batin on January, 19 1991, and a report of discoloured sand near KKMC on January 24, 1991. The United States cannot independently verify the Czechs reports, however, the Department of Defense (DoD) is confident in the Czechs' ability to detect the presence of chemical agents. In November 1993, the DoD assessed these two detections as valid during testimony to the Presidential Advisory Committee in 1996, the Central Intelligence Agency (CIA) publicly stated that these detections were credible. This determination was based on an in-depth analysis by US technical experts of the Czechs' technical competence and the reliability of the Czech equipment. Investigators have not found any additional evidence that would change the DoD's and CIA's original assessment of detections.

The Czech government has not provided information about the remaining two reported detections. Investigators have relied on Gulf War-era logs and statements provided by personnel involved to gather information about these reported detections. The first of these reports involved a detection of Mustard vapor by a Czech unit near KKMC in January 19th. Although personnel involved reported the detection of Mustard agent by the CHP-71, a Czech chemical agent detector, they were unable to independently confirm the presence of Mustard using other detection protocols. Additionally, other confirmatory details, such as a more precise location of the detection, have not been discovered. Based on the lack of confirmatory tests and no obvious source for the chemical agents detected, as well as the fact the Czech government has never indicated these detections occurred nor provided information about them, this detection has been assessed as "Indeterminate".¹⁶

The second of the Czech detections, which was recorded in Gulf War logs but has not been acknowledged by the Czech government, occurred on January 20th. It involved a Czech unit, in direct support of the French, which detected the presence of Tabun and Sarin. An Intelligence Spot Report contained an entry reporting that on January 21st the French reported detecting Tabun, Sarin and Blister agents in their area. Although this report of the French detection does not specifically mention the presence of the Czechs, because the Czechs were reportedly in support of the French at the time of their detection, both of these reports are considered one incident. Other confirmatory details, such as a more precise location of the detection, were not provided in either log entry. Based on the lack of confirmatory tests and no obvious source for the chemical agents detected, as well as that fact that neither the French nor the Czech governments have ever indicated these detections occurred nor

¹⁶ The American assessment scale ranges from 'Definitely not' to 'Definitely' with Intermediate assessments of 'Unlikely', 'Indeterminate' and 'Likely', a tentative assessment based on the facts available at the time of reporting.

provided additional information about them, these detections have been assessed as 'Indeterminate'.

The government of France has not provided information about any of the four reported chemical detections attributed to the French forces during the Gulf War. In addition, the French have never provided specifics about their chemical detection equipment. Without this information, it is difficult to assess the chemical detection capabilities and the technical competence of the French forces. Using Gulf War-era logs, interviews with US personnel involved, and defense periodicals, investigators have pieced together what little is known about these incidents.

The first incident involving French forces occurred on January 19, 1991. This report involved a very low-level nerve agent detection in the vicinity of KKMC. The reports indicated that the French were called in and confirmed the presence of chemical agents. The second French incident also occurred on January 19th, and involved a report in the 18 Corps net (XVIII Airborne) in which the French reported "gas/gas/gas". The third incident is described above in conjunction with the detection of Sarin and Tabun on January 20th. As discussed in the narrative, investigators believe all three of these French incidents as well as the Czech Sarin and Tabun detection on January 20th are reports of the same detections recorded through different channels. Due to the fact that the government of France has not acknowledged these detections and the Czech Republic has never mentioned confirming any French detections; as well as the lack of confirmatory information about these detections and the absence of a possible source, these detections are assessed as 'Indeterminate'.

The fourth French incident occurred between January 24-25, 1991. A US Senator who inquired into the possible causes of Gulf War illnesses was told that a low-level detection of nerve and blister agent occurred at a logistics facility outside of KKMC and was reported by a member of the French military. Despite an extensive effort, this investigation has not discovered any possible source for the chemical agents reportedly detected. Due to the overall lack of information about this reported detection, this incident is assessed as 'Indeterminate'."

UK View on the French/Czech Detections

56. The MOD holds no contemporary records relating to these incidents between 19 January and 24 January as there were no British units based in the vicinity that the suggested detections took place.

57. These suggested detections are not supported by other detections from subsequent investigations by Coalition forces, or by any other evidence to identify the cause of these detections. Since publication of the US case

narrative in 1998, OSAGWI has received information from the French Government that all detections were false.

58. We have reviewed these detections against UK alerts and alarms over the same period, to evaluate whether any pattern might link them. All UK alerts and alarms on 19, 20 and 24/25 January are explained by the usual problems of interferences or reliability problems and there are no unusual clusters. There is a reference in the Commander's diary of 32 Field Hospital that the unit was in Dress State 3R at some point on 19 January. There is no explanation and no reference to NBC alarms or CW alerts. It is not possible to link this reference to the possible Czech/French detections North of Hafar Al Batin and near King Khalid Military City that day. 32 Field Hospital was about 30km from the nearest of these detections and 60km from the furthest. It is just as possible that 32 Field Hospital was at Dress State 3R in response to the alarms described in paragraph 30. UK evidence does not lend any support to the suggestion that some of the French and Czech alarms might have been detections of Iraqi CW released by coalition air attacks.

February 1991

59. February was in general quieter than January. 14/20 King's Hussars (north of Al Qaysumah) had a NAIAD alarm on 1 February due to a NAIAD fault which was followed up with CAM and RVD tests that proved negative. On 2 February the 1 Armoured Division Transport Regiment (also north of Al Qaysumah) NAIAD alarmed, this was called as a false alarm only 2 minutes after the alarm went off but no explanation is given as to why. There were further NAIAD alarms on the 10 and 12 February at 32 Field Hospital that were followed up with RVD. There was also a NAIAD alarm recorded in the RAF 540 Puma Detachment in Al Jubayl on 13 February. No explanation is given other than the all clear was given 15 minutes after the alarm. On 17 February the Main Repair Group 6 Guard Room reported 'alarms in the 10 Regiment RCT area'. The all clear was called at 1108. On all these occasions there is only one or two records of the alert and it is likely that on most occasions one of these is the originating unit. In addition to this on 23 February 1 Royal Highland Fusiliers log sheet records that at 0140 there was an explosion and at 0150 asked the NBC cell if there was an alert. Unmasking drills were started at 0220 and the all clear given at 0245. 32 Field Hospital record that at 0200 the Prisoner of War Guard Force (of which 1 Royal Highland Fusiliers were a part) told them to go to Dress State 3R. They were subsequently told by the FFMA NBC Cell that this was a false alarm raised by an NBC sentry.

60. Further NAIAD alarms are recorded 21, 24, 25 and 27 February. On 21 February the 32 Field Hospital Commander's Narrative records NBC Dress State 3R caused by a NAIAD false alarm. On 24 February the 6 Ordnance Battalion log sheet records that at 1955 they moved to Dress State 3R because of a NAIAD alarm but that CAM and RVD tests had proved negative. On 25 February 14/20 King's Hussars record that at 0021 they went into Dress State 3R following hearing an alarm from nearby. At 0033 this was confirmed as a false alarm due to a NAIAD operator error. On 27 February

the 22 Field Hospital log sheet records that at 1345 an alarm sounded and that this was a false alarm due to a NAIAD battery alarm.

61. There were also alarms at sea; on the evening of the 19 February an alarm went off on RFA Fort Grange. Full IPE was donned and checks were carried out that proved positive. The contamination appeared to be coming from the galley area and an 8 bar CAM reading came from the crew mess area. The cause of the alarm was found to be the detergent that had been used to clean the deck.

62. Units became much better at communicating to each other what was happening, for example if there was an exercise, if US troops were carrying out demolitions, or if MLRS was firing. There was on occasions still a tendency to misinterpret loud bangs. There was some concern, as late as the 22 February that troops were overreacting to sonic booms. Sentries were told to note any low flying aircraft, troops were told to listen out for the 'double tap' that characterised sonic booms and to react accordingly to the threat. As late as 24 February NBC officers were told to 'monitor alarms and false alarms' and to pass details of false alarms back to the FMA NBC cell for records. This does not appear to have been requested at any point prior to this, meaning that full explanations of false alarms, where they had been ascertained, probably were not passed back to the NBC cell prior to this. The logs show that during this period troops were busy preparing for the ground war and often moving position, when NAIAD would not have been routinely deployed.

63. Troops going through the breach into Iraq on 25 February were ordered to don Dress State 1 and in some cases Dress states 2 or 3 as intelligence suggested that CW weapons may be used at this stage. On 25 February the 1 Royal Scots log sheet records a false NAIAD alarm at 0001. 1RS did not go through the breach until the evening of 25 February, although other troops had started going through by 0001. However, there is no evidence that chemical weapons were used at this (or at any other stage of the war). The following entry from the 4 Armoured Division Transport Regiment Commander's Narrative dated 25 February illustrates this point.

"The NBC state was high with everything being worn except respirators and they were very close at hand. There was definite apprehension as we waited to go through [the breach]. It was felt that Saddam would almost certainly put chemical weapons down on the breach either before we got there or while we were going through it. At 1030 we crossed PL [Phase Line] IOWA which was the breach and it was an anti climax. The expected 60 metre mound of sand with mines never materialised, there was nothing to go through and many of the soldiers did not believe it when we told them they had been through the breach."

March 1991

64. At 0800 on 28 February the temporary ceasefire was declared and on 1 March 1991 the order was given to cease taking NAPS as the CW threat was now considered to be low. On 3 March several UK units report a chemical casualty at grid reference PU 995047 (southern Iraq, some 50km Northwest of 4 Armoured Brigade); this actually refers to a US Soldier thought to have been exposed to blister agent. In August 1997, OSAGWI published an interim case narrative on this incident. An update of this investigation is expected by the end of this year. The summary of the 1997 interim case narrative was as follows:

“On March 1, 1991, PFC David A. Fisher was exposed to a chemical agent while exploring enemy bunker complexes. PFC Fisher developed blister symptoms roughly eight hours following exposure. Medical evaluation and treatment diagnosed the exposure as liquid mustard chemical warfare agent. Fox reconnaissance vehicle readings of the bunker and PFC Fisher’s clothing alarmed for mustard agents, and testing of a urine sample gave positive results for mustard breakdown product. Although later analysis of physical evidence did not confirm the exposure, experts concluded that PFC Fisher’s skin injuries were most likely caused by exposure to mustard agent. PFC Fisher received a Purple Heart for his injuries. The assessment for this incident is that chemical warfare agent exposure is ‘Likely’. No other reports of similar blisters were made by PFC Fisher’s unit or any other units in the area. Likewise, no other symptoms of exposure to liquid mustard chemical warfare agent were reported.”

65. As stated in the US case narrative this was an entirely isolated incident and there were no reports of similar cases in that unit or in other units. UK units were not involved in this incident and would have been some 50km south of this area.

SCUD Missiles

66. SCUDs were launched at both Israel and Saudi Arabia during January and February of 1991. The widely held belief was that the launching of SCUDs at Israel was designed to provoke Israel into launching a counter attack thus drawing them into the conflict. On the night of 18 and 19 January it is thought some 10 SCUDs were launched at Israel. It was not until the 20 January that SCUDs were launched at Saudi Arabia with missiles being launched at Dhahran and Riyadh.

67. It is difficult to state definitively the exact number of SCUD launches, the intended targets, where they actually landed and whether or not they were destroyed by a PATRIOT missile. UK sitreps record a total of 88 SCUD launches throughout January and February of 91. However, the HQ BFME diaries record some 102 launches with a further 36 false alarms and 2 misfires. Whilst the figure of 88 SCUDs may be the more accurate, it is the information from HQ BFME that is of interest as it is this information that

would have been passed down to units at the time. Certainly the figure of 36 false alarms and 2 misfires is significant in that troops may well have donned various states of IPE for each false alarm depending upon where it was thought the SCUD was heading.

68. In the HQ BFME record of SCUD launches 72 were in January whereas 30 were in February. The HQ BFME diaries record that the total number of SCUDs launched at Saudi Arabia in January was 46 compared to 17 in February. This higher level of SCUD activity in January may well have contributed to the higher tension and number of false NBC alarms that occurred in January.

Conclusions

69. The general pattern of CW alerts during Operation GRANBY was therefore one of some confusion and nervousness during the early days of the air campaign with chemical monitors alarming frequently and personnel misinterpreting various external stimuli such as explosions from demolition exercises. There was also a greater number of SCUD alerts during January including false alarms. This situation steadily improved after the first few days with personnel becoming more acclimatised to the situation.

70. There is no evidence to suggest that any of the alarms described above were credibly linked to Iraqi attacks, nor any evidence of different detectors and monitors providing collateral for each others alarms. The vast majority of recorded alarms were explained by equipment failure, operator error, interferences or procedural failures. However, the explanations were often not communicated to the troops.

DHAHRAN 20 – 21 JANUARY 1991

Statement by Gulf Veteran

71. A UK Gulf Veteran has reported that on the night of 19 or 20 January, he was on duty at Dhahran Air Base when a SCUD missile was intercepted overhead by a PATRIOT Missile. He reported that the PATRIOT missile destroyed the engine of the SCUD, but that the warhead fell to earth and exploded approximately 400 yards from his section's position. He reported that, within seconds of the explosion, in excess of 20 NAIADs alarmed. Having donned IPE, those present went to monitor the site with three CAMs, all of which gave positive readings [mode unspecified]. Three RVD tests were then carried out, again all confirming the presence of chemical weapons [mode unspecified]. He states that this was reported to the NBC Cell and the station adopted NBC Alert State Black. Twenty minutes later the all clear was declared. However, after another twenty minutes, and after no further attack, they were told to adopt NBC Alert State Black once more, this time for eight hours. On querying why the alert state had been lowered they were informed that the alert had been caused by unburnt fuel when aircraft took off. He also reported that, the next morning, he took one each of the NAIADs and CAMs that had alarmed into COLPRO¹⁷ (Collective Protection) where he was unable to get CAM or NAIAD to react to aviation fuel.

RAF Detachment Dhahran

Introduction

72. The RAF Detachment in Dhahran had an NBC Cell, which was continuously manned throughout January with a 12 hour shift roster established on 14 January. The Cell notified the Detachment of changes to the Air Attack Warnings, NBC Levels and NBC Dress Category in response to receipt of SCUD missile launch warnings, as directed by the Detachment Commander or his deputy. NBC training was also carried out within the Detachment up to the start of the coalition air campaign on 17 January. This included specialist training for Chemical Sentries and individual training covering COLPRO drills and survive to fight drills/skills.¹⁸

Documentary Evidence

73. The Operations Record Book for January from the RAF Detachment at Dhahran notes that the first SCUD missile was fired at Dhahran at 0510 hours on 18 January and was destroyed by a PATRIOT missile. It notes that, over the following 10 days, a further 10 SCUD missiles were launched towards Dhahran. Of these, only one landed on the base. PATRIOT did not engage this one as the projected impact point had been computed to be in an area where no damage or casualties would result. The remaining nine SCUDs were either destroyed by PATRIOTs or missed the target area. On a few occasions, the intercepts took place over the airfield causing some minor

¹⁷ Further information on COLPRO can be found in "British Chemical Warfare during the Gulf Conflict (1990-91)", dated 7 December 1999.

¹⁸ For further information see "British Chemical Warfare Defence During the Gulf Conflict (1990-91)", dated 7 December 1999.

damage due to falling debris, and on one occasion two US Servicemen were slightly injured.

74. There is no documentary evidence of SCUD attacks or evidence of alarms at Dhahran on the night of the 19 January.

75. On 20 January the NBC Cell initiated Air Attack Red (attack imminent), NBC threat level high, NBC Dress Category Three Romeo at 2143 hours with an all clear at 2216 hours; and at 2224 hours with an all clear at 2235 hours. On 21 January the same state was announced at 0045 hours with an all clear at 0145 hours and at 2226 hours with an all clear at 2243 hours. On 22 January similar alerts took place at 0345 hours with an all clear at 0410 hours; 0715 hours with an all clear at 0740 hours; at 0745 with an all clear at 0758 hours; at 0808 hours with Dress Category 1, reduced to Dress Category 0B at 0843 hours, and at 1745 hours with an all clear at 1816 hours.

76. An Air Staff Management Aid (ASMA) After Action Report tote for Dhahran for the period between 2230 on 21 January and 2050 on 22 January has been located. It records that at 2230 on 21 January two or three SCUDs passed overhead of Dhahran with one reportedly landing in the sea. The next entry at 0715 on 22 January records a SCUD alert with one SCUD being destroyed by PATRIOT over the airfield scattering debris over the airfield. At 2050 the same day the entry states that 9 PATRIOTs were fired but that it was unknown what their target was. Further to this the entry states that all chemical checks were negative except for 1 RVD¹⁹ that gave a positive blister test. It was assumed that the age of the reagents was suspect as there were no CAM readings in the area. This ASMA tote is the only reference to CW monitoring and detections in Dhahran for the period of 20-22 January that has been located.

Headquarters British Forces Middle East (HQ BFME)

77. Entries in the HQ BFME J3²⁰ co-ord log sheets for the night of the 20 January 91 record very little other than at 2145 two SCUDs were launched followed by a further SCUD at 2153. It was confirmed at 2157 that 2 of the SCUDs had been destroyed by PATRIOT, followed by confirmation at 2240 that a third SCUD had also been hit by PATRIOT. A further entry at 0005 the following morning stated that the NBC reconnaissance showed no CW agents from the SCUD attack.

¹⁹ For further details on RVD see "British Chemical Warfare Defence During the Gulf Conflict (1990-91)", dated 7 December 1999.

²⁰ J3 is the operations division of the HQ.

1 King's Own Scottish Borderers (1KOSB)

78. The Advance Party of the 1 King's Own Scottish Borderers travelled by air for Dhahran from Brize Norton. Their Commander's diary noted that:

Just prior to arrival at Dhahran info that SCUD attack had closed airspace and diversion possible. In the event landed at Dhahran 0300 hours local [21 January] to be told don NBC Dress State 3. Remained at the state until 0600 hours. Remained outside ATLOs [Air Transport Liaison Officer] office until 0800 hours. Eventually HNS [Host Nation Support] coaches moved party [party] to Jubail [Al Jubayl].

No 51 Squadron RAF Regt

79. No 51 Sqn RAF Regt was based in Dhahran during this time. Their Operations Records for January and February have been examined. However, whilst a number of SCUD missile alerts are mentioned, there is no suggestion that any NBC monitors gave positive readings.

80. The first entry for this period is for the evening of 20 January 1991.

20th January At 2147 the unit received "Air Raid Warning Red"...There were 4 Scud missiles, basically on target, which were engaged by 5 Patriot missiles, 3 Scuds were totally destroyed in mid-air, whilst the fourth was a mission kill only. The fifth Patriot missile would appear to have been a mis-fire. Some debris was scattered within the confines of the base... After the attack the RAF detachment returned to "Air Attack Yellow, NBC Medium, Dress State 2".

81. A further two entries for the following day are along similar lines.

21st January At 0045 the RAF Det Dhahran issued "Air Attack Red". It was confirmed that 2 Scud missiles were targeted against Dhahran. Three Patriot missiles were fired in defence and destroyed both incoming Scud's. The third Patriot is believed to have been a mis-fire and impacted off the unit towards Al Khobar. A further 5 Scud missile attack warnings were received during early hours of the morning, all of which were false alarms.

21st January At 2221, the unit received a "GRANBY Red Sector East" warning...A single Scud had been launched at Dhahran, but was reported to have fallen into the sea between the Dhahran Peninsula and Bahrain. The "All Clear" was sounded at 2237 and the dress category returned to 0B at 0115.

29(F) Squadron RAF

82. The RAF 540 for January 1991 from 29(F) Squadron, also based at Dhahran, notes that the first genuine SCUD attack occurred at 0400 on 18 January. It was the first of many attacks over the next two weeks. They noted that one 'crippled' SCUD fell into the 'bondu' approximately half a mile from the Squadron site. The Sqn Commander notes later that there were SCUD attacks on 18, 19, 20, 21, 22, 23 and 25 January.

31 Squadron RAF

83. The RAF 540 for January 1991 from 31 Sqn, who were also based in Dhahran, notes that they were subjected to 'numerous' SCUD attacks after the outbreak of hostilities, and says that all of these were successfully intercepted by PATRIOT. It goes on to say that all personnel took shelter and donned NBC clothing when the air raid warnings were sounded, although it makes no mention of chemical alarms going off during these raids.

UK Sitreps

84. The MOD Situation Report (sitrep) of 20 January 1991 that was provided for the Secretary of State for Defence notes the following:

Pentagon reports 2 SCUD fired at Dhahran, but destroyed by PATRIOT at approx 202200. BFME reports a 3rd SCUD also destroyed by PATRIOT just before impact west of Dhahran. No reports yet of warhead.

85. A similar sitrep for 21 January 1991 noted the following:

US CENTCOM reports that following earlier attack by 3 SCUDs on Dhahran, further 7 SCUDs attacked Dhahran and Riyadh at approx 210045 and 0100; 4 at Riyadh (destroyed by PATRIOT) and 3 at Dhahran (2 destroyed by PATRIOT, 1 fell in sea);...No evidence of CW/BW warheads.

US Sitreps

86. Since the US controlled and co-ordinated the Coalition Air Defence System in the Gulf, their CINCENT and ARCENT sitreps should be regarded as the authoritative source on SCUD launches.

87. Unfortunately, it is not possible accurately to cross-reference these alerts with what we know of SCUD launches. Information taken from available US CINCENT and ARCENT sitreps gives no details of enemy SCUD activity on 18 January, but notes that F-15E aircraft were launched in response to SCUD launches at 0300-0330. There is no information for 19 January. No significant SCUD activity was noted for 20 January. On 21 January, four SCUDs were launched at Dhahran (and five at Riyadh). Fourteen PATRIOTs reported hits on targets. On 22 January there were further SCUD attacks on Dhahran, the majority of which were destroyed by Air Defence. Two SCUDs were successfully destroyed at Dhahran on 23 January. On 24 January, two SCUDs launched at Dhahran were destroyed by Air Defence. There were no recorded attacks on 25 January. On 26

January one SCUD was successfully destroyed at Dhahran at 0029 hours. There were no recorded attacks on Dhahran on with 27 or 28 January.

Recollections

88. The NBC adviser to the RAF Detachment Commander at Dhahran has been contacted. He notes that as far as the NBC Cell was concerned NBC Black should only be declared when chemical detection equipment actually alarmed. The practice of jointly declaring NBC Black and Air Raid/Air Attack RED had developed on exercises, particularly in RAF Germany, in the 1980s, mainly because many exercise air raids were accompanied by simulated chemical attacks. In 1986 RAF Strike Command reiterated the original policy that NBC Black should only be declared when actual contamination was detected, after the STO (Survive To Operate) forces had developed greater efficiency in reconnoitring a base after an air attack, and after it had been demonstrated that wearing IPE severely reduced performance. The Gulf Conflict was run on these procedures, but since individuals were drawn in from all elements of the RAF, not just RAF Strike Command, individual application of the procedures differed. The NBC adviser recalled disagreements with other RAF personnel over this issue. He recalled no reports of chemical detections as a result of SCUD impacts at Dhahran. He also notes that for 'a number of NAIADs' to alarm, a significant area would have needed to be contaminated. In his recollection, this never happened. He recalls that the NBC defence arrangements for the RAF detachment included a total of 7 NAIADs, one at each significant concentration of RAF personnel.

Conclusions

89. Whilst one Gulf veteran has recalled that a number of NAIADs alarmed following a SCUD impact in Dhahran on the night of the 19 or 20 January 91, another veteran (the NBC adviser to the RAF Detachment) has no recollection of chemical detections as a result of SCUD impacts at Dhahran.

90. The documentary evidence shows no indication that the SCUDs fired at Dhahran had anything other than a conventional warhead. There is no record of chemical agent monitors alarming in Dhahran on the night of the 19 or 20 January. Further to this, the HQ BFME log records that an NBC recce team found no CW agents from the SCUD attack.

91. It is therefore concluded that UK troops were not exposed to CW agents on the night of 19 or 20 January 1991 following a SCUD attack at Dhahran.

AL JUBAYL 15 –16 FEBRUARY 1991

92. Details of the CW defence arrangements at Al Jubayl were published in a previous paper about the events of the morning of 19 January in Al Jubayl²¹. This section brings together information contained in Commander's Diaries and other contemporary written records, supplemented by the present day recollections of those in Al Jubayl at the time, to piece together the events of the 15/16 February 1991. A map of Al Jubayl is at Annex D.

Headquarters British Forces Middle East (HQ BFME)

Documentary Evidence

93. The HQ BFME log sheets record a SCUD alert at 0204 on 16 February and the following entry at 0205 notes:

'SCUD launched Riyadh...projected impact 10 miles SW of Al Jubayl. No PATRIOT fired. Parts landed on land and sea... No chem, no report of cas'.

7 Armoured Brigade

Documentary Evidence

94. The 7 Armoured Brigade (7 Armd Bde) Main Log Sheet contains a single entry for 16 February 1991 that refers to the incident.

0630, Info from Div 1xSCUD fired at Al Jubail last night at 12:30pm – It landed 10km short, in the desert. (Conventional).

HQ FMA NBC Cell

Documentary Evidence

95. The FMA NBC Cell log sheets are still in existence for 15/16 February. In addition to this the HQ FMA NBC Cell produced a sequence of events document detailing the events of that morning. The following account is drawn from both these sources and a distinction is made where information has been drawn solely from the document entitled 'Sequence of Events'.

96. At 0202 hours on 16 February, the HQ FMA NBC Cell were informed that there was a SCUD missile alert at 0200. At 0205 hours, the NBC Cell noted that a SCUD missile alert had appeared on ASMA and that Riyadh was the target. The US sirens had been turned on. At 0206 hours the NBC Cell informed the FFMA of the red alert. At 0207 hours, the NBC Cell was informed by RAF Strike Command that the SCUD missile was in fact in bound for Al Jubayl. They operated the UK's sirens²². At 0209 hours, a message from RAF Strike Command noted that the missile was headed for Sector East

²¹ "A Review Of The Suggested Exposure Of UK Forces To Chemical Warfare Agents In Al Jubayl On 19 January 1991", dated 20 January 2000.

²² Documented in a later document 'Sequence of Events', produced by the HQ FMA NBC Cell.

(meaning Eastern Saudi Arabia). A message on ASMA gave its possible impact at 26+84N and 049-68E²³. The FMA noted that the missile impact was likely to be 0208 local time. At the same time, the first explosion was heard and Dress State 3 Romeo was announced over the tannoy²⁴. At 0213 hours, in a conference call, the FMA announced Air Red, NBC High, Dress State 3 Romeo. At 0217 hours, a recce party under the NBC Cell was deployed. At 0221 hours, Main Repair Group 6 (part of 6 Armoured Workshop) were instructed to conduct a chemical reconnaissance. At 0221 hours, a member of the Guard, was recorded as having thought he witnessed the strike. The 'Sequence of Events' document records this member of the Guard as having seen vapour trails and flame leaving the PATRIOT missile launcher site. It was later suggested that this might have been a flare²⁵. The log sheets note that, at 0224 hours a member of the Mobile Civilian transport Group (MCTG) confirmed that he witnessed a PATRIOT flying in a southwesterly direction. At 0235 hours, the NBC Cell was informed that Camp 4 were in Dress State 0, as they had been using the US warning system. They were immediately instructed to adopt Dress State 3 Romeo. At 0240 hours, callsign B5 told callsign B7 to stay in Dress State 3 Romeo. At 0245 hours, Camp 4 contacted the NBC Cell and told them that they were awaiting the tannoy call to go to Dress State 3R. They were instructed to do so immediately. At 0250 hours, the NBC Cell was informed that Main Repair Group 6 and 91 Ordnance Company²⁶ were doing CAM detector tests. At 0253 hours, 1MEF contacted the NBC Cell to tell them that there was a possible impact on the US system at 26.50N, 49.41E, although this was not confirmed. At 0255 hours, Main Repair Group 6 informed the NBC Cell that all their tests had proved clear. At 0259 hours, the NBC Cell contacted 91 Ordnance Company and told them that they urgently required test results from their location. At 0305 hours, 91 Ordnance Company contacted the NBC Cell and informed them that 53 Ordnance Company, north of the airport had reported a NAIAD going off and that they were investigating this. The NBC Cell noted on their 'Sequence of Events' that this detection was caused by Aviation fuel. At 0306 hours, 91 Ordnance Company informed the NBC Cell that they were still awaiting RVD results but that the CAM tests were clear.

97. At 0309 hours, 1st Marine Expeditionary Force (1 MEF), as US formation in the area informed the NBC Cell that one of their patrol boats had reported a 14ft cylindrical object smoking and sinking in the water. At 0310 hours, 91 Ordnance Company reported that their CAM and RVD tests were all clear²⁷. At 0316 hours, the HQ FMA Ops Complex²⁸ [i.e. HQ FMA, Old Port Barracks] unmasked. At 0317 hours, the NBC Cell noted the all clear in its

²³ Ibid.

²⁴ Ibid.

²⁵ The 'Sequence of Events', produced by the HQ FMA NBC Cell notes that the MCTG saw a flare in the sky.

²⁶ 91 Ord Coy are not mentioned in this entry in the FMA NBC Cell log sheets although they are asked for their results in a later entry. The 'Sequence of Events' document states that 'MRG6/91 Ord to test CAM/RVD'.

²⁷ This entry was taken from HQ FMA NBC Cell Log Sheets and 'Sequence of Events' document produced after the incident by the HQ FMA NBC Cell.

²⁸ Ibid.

sequence of events and announced this²⁹, presumably over the tannoy. At 0335 hours, the SO2 NBC at HQ FFMA contacted the NBC Cell. He was informed about the current situation and was promised that he would be given more information as it became available. At 0345, reports were received from G5 (plans division) of debris landing in the harbour water 100m off berths 5 and 6. At 0405 hours, G5 informed the NBC Cell that one man had observed the SCUD missile and its impact. The flash to bang time was two to three seconds. A cryptic message at 0410 recorded that 'Dropping off pax MRG now Scud intercepted and and [sic] debris fell into sea'. At 0415 hours, after being chased, 53 Ordnance Company confirmed that their NAIAD response was a false alarm³⁰.

98. At 0442 hours, the UK Liaison Officer (LO) with the US Marine Expeditionary Force (MEF) informed the NBC Cell that he did not yet have any information on the interception from the airport. At 0444 hours, he noted that the SCUD missile had not been engaged and that no units holding PATRIOT had reported firing. At 0500 hours, the NBC Cell contacted BFME and provided them with a sitrep on the SCUD missile. At 0505 hours, the NBC Cell contacted the Petrol Oils and Lubricants (POL) Point (manned by elements of 6 Ordnance Battalion) asking them to confirm what they had seen earlier that night. At 0545 a driver reported from the POL Point that he saw two red flames crossing the sky, one catching the other and resulting in an explosion behind Shed 5. At 0550 the Air Transport Liaison Officer (ATLO) at Al Jubayl airport reported having seen a flare trail from the port area. At 0623 a member of 52 Port Operating Company sent an eyewitness account of the SCUD.³¹ The NBC Cell assessed that maroons may have caused these sightings. At 0820 hours, 10 Regiment RCT noted that the RAF accommodation (also at Rezayat Camp) had set off the all clear tannoy siren. At 0828 33 Field Hospital informed the NBC Cell that they had received the all clear from the Americans. At 0949 hours local time the ATLO at Al Jubayl airport informed the NBC Cell what he had seen:

"White light, towards port, white flash and after piece of debris in flames seen heading towards port, 5-6 second later couple (2) of explosions."

6 Ordnance Battalion Group RAOC

Introduction

99. 6 Ordnance Battalion (6 Ord Bn) operated in the FMA and were responsible for holding and supplying combat stores to UK forces, and also for managing the transit of bulk stores through the port of entry at Al Jubayl. The battalion deployed to the Gulf with the following companies: 51 Ordnance Company (Petroleum), 52 Ordnance Company (Ammunition), 53 Company (Ammunition), 62 Ordnance Company (Materiel/Stores), 91 Ordnance

²⁹ Ibid.

³⁰ Ibid.

³¹ Unfortunately this has not, apparently, been preserved.

Company (Rations), 623 and 624 Stores Platoons, 63 Vehicle Platoon, a Bakery, and a Laundry.

100. In the FMA, the HQ and all of the Companies in 6 Ord Bn Group were based at Al Berri in Al Jubayl,³² with the exception of 52 Ordnance Company, who were based at the airport.³³ The first elements of 6 Ord Bn moved from Al Jubayl up to the FFMA on 2 January 1991,³⁴ and were followed by the bulk of the group between 20 and 23 January.³⁵

Documentary Evidence

101. The log sheets for 16 February state that at 0343 91 Ordnance Company reported that one SCUD had landed in South Al Jubayl and the radio had reported the landing has having been at approximately 0230 and that troops had returned to Dress State Zero, threat medium. At 0405 they reported that it was thought the SCUD had landed without going off and the radio was reporting that a PATRIOT had pushed the missile into the sea.

102. Later entries for the same day read as follows

Time	To	From	Event	Action
2007	#	Wkpr	Loud Bangs were heard everyone masked up. Carrying RVD tests. Also CSM.	RVD – No Nerve (negative) No Blister
2015			JSHU also gone into masks	
2020	NBC Cell		RVD Tests clear. Initiate unmasking drills	
2023			Carry out Individual Unmasking drills	

103. This indicates that there was some further disturbance later that day. This lasted less than twenty minutes between the loud bangs being heard and individuals unmasking. There are no other references to this in the surviving records from other units. It appears unconnected with the SCUD landing 17 hours earlier.

33 General Hospital RAMC

Introduction

104. 33 Field Hospital was a Royal Army Medical Corps unit which was based in Al Jubayl for the duration of the Gulf conflict. The War Diary from 33 General Hospital shows that this unit was based in Al Jubayl, at Grid

³² The Commander's Narrative for 6 Ord Bn does not give any grid references in the period immediately prior to 16 February 1991. However, the Narrative for 1 November 1990 gives a grid reference of 639837 for this Al Berri location of 6 Ord Bn, and it can be assumed that this was the location of those elements of the Battalion still in Al Jubayl on 16 February. The Bn HQ was located at 643844 on 8 November 1990, which is also in the Al Berri location.

³³ 52 Ordnance Company arrived in Al Jubayl on 16 December 1990, and the War Diary records their location on that date and for subsequent dates as grid reference 368963. But 52 Ord Coy had moved up to the FFMA before 16 February 1991.

³⁴ Major S.N. Addy, *A Logistian's War: A History of RAOC Operations on "Op GRANBY"*, undated, p. 25.

³⁵ *Ibid*, p. 26.

Reference 565960 (the Goodyear Tyre Retailers). This is confirmed by an article in the October 1991 edition of *The Army Medical Services Magazine*,³⁶ and by 33 Field Hospital's Commanding Officer who also record that the staff had living accommodation in Camp 4.

Documentary Evidence

105. The Commander's Diary from 16 February 1991 notes that at 0210 FMA NBC Cell had announced an air raid warning red with 3 Romeo Dress State. At 0215 hours, further information was received of an attack south of Al Jubayl. This was relayed over the hospital tannoy. At 0225 hours, 33 General Hospital noted that the HQ FMA NBC Cell gave an all-clear signal.³⁷ At 0230 hours, 33 General Hospital overheard a 3 Romeo message and consequently contacted the HQ FMA NBC Cell who confirmed that the Dress State was still 3 Romeo. They passed this information on to Camp 4 and 16. At 0313 hours, 33 General Hospital again noted an all-clear signal had been issued and ordered individual sniff tests to be undertaken. At 0630 the Air Raid Status was further reduced to White.

106. In addition to this the Commander's Diary is also still in existence with the following entries for the 15/16 February.

15th February SCUD attack on Jubayl at around 0200hrs (16).
The missile fell harmlessly in the sea. No patriot
was launched. Much confusion about dress states.

16th February 1800. The first SCUD on Al Jubayl arrived last
night but missed.

174 Provost Coy RMP

107. According to their Commander's Diary, 174 Provost Company was located at Grid Reference 682875, which was in the area of Pearl Beach, Al Jubayl. The Commander's Diary contains the following account:

"Scud attack on Al Jubayl. At 0200 hours local Air Raid sirens are sounded and within 5 minutes a large bang is heard in the direction of the port. Unit put in 3R and stays in that state until 0345 when the all clear is given. Chemical sentries deploy as usual. It would appear that a Scud missile landed in the water adjacent to Shed 5 in the Port area. Local Patriot missiles did not fire because they were down for maintenance. A lucky and close call for all. Navy divers will attempt to recover the missile for analysis."

³⁶ "33 General Surgical Hospital in the Gulf", in *The Army Medical Services Magazine* (Vol 45, October 1991), p. 131.

³⁷ This may have been a mistaken US signal.

221 Explosive Ordnance Disposal (EOD) Squadron Royal Army Ordnance Corps

Recollections

108. An Ammunition Technician Class One (Warrant Officer 1) from 221 EOD Sqn has been contacted. He recalls that he was asleep in his room in the Old Port Barracks, but was awakened by the local Saudi civil defence sirens that sounded on every air raid warning throughout the country. About thirty seconds later, the UK air raid warning siren sounded and they immediately started to adopt IPE. About one minute later, a very loud explosion was heard overhead which shook the windows. Once the WO1 and the WO2 with whom he shared a room had donned IPE and completed buddy-buddy checks, they switched on two CAMs, one in each mode, and emerged into the now crowded central corridor of the accommodation block. The atmosphere was one of 'disbelief and anxiety' as this was the first time that a SCUD missile had struck Al Jubayl. Immediately after the explosion, the NBC Cell had broadcast an NBC Warning prefixed by 'Attack, Attack, Attack.' As they moved down the corridor they monitored all doors and windows using CAMs.

109. After approximately 40 minutes, the WO1 recalls being stood down. The following morning, he made inquiries and was informed that a suspected SCUD missile variant had passed over Al Jubayl, had broken up and impacted in the desert 15-20 km away. The explosion was assessed to have been a sonic boom.

110. Later that day, the WO1 was with a US Navy EOD team which was located under canvas and camouflage nets at the water's edge at the far southwestern end of the Commercial Pier. The commander of the US Navy EOD team was a Chief Warrant Officer Class 2 (CWO2). They discussed the events of the previous evening. When asked if they had seen anything of the missile, the Americans appeared to steer the conversation away from this topic and instead discussed the design of SCUD missile variants and the implications for render-safe procedures were discussed and also the need for precautions when dealing with hypergolic missile propellants. At this point the CWO2 took the WO1 to a more private location and asked if he would treat the following information in the utmost confidence. The WO1 was briefed that the missile had been seen overhead and impacted in the sea, in the harbour very close to the pier and location. The appearance and progress of the impact, the subsequent re-surfacing and the final sinking of the main missile assemblage was described. The British WO1 was then shown a video of an underwater reconnaissance of the missile on the seabed. The missile could be clearly seen, lying on its side in remarkably good condition. It appeared to be in three sections: the warhead; the main missile assemblage and the rocket engine.

111. The WO1 was then questioned further about render-safe procedures since, whilst this was clearly a Navy EOD task (the missile being on the seabed), they were not trained on the missile. The WO1 agreed to assist by contacting the Head of Technical Intelligence (Army) (Hd Tech Int (Army)) to

request the render safe procedures for a SCUD 1B, since these would be relevant to the forthcoming disposal operation.

112. It became apparent that the SCUD missile had impacted within yards of an extremely large US logistics vessel carrying ammunition. On the quay side there were further stores of ammunition. The disposal operation, therefore, had to be very carefully conducted. The WO1 requested, and was given, US permission to brief the FMA Commander and the Hd Tech Int (Army). He also understood that the other version of events (the SCUD missile breaking up and impacting in the desert 15-20 km away) was a cover story.

113. Having obtained the render safe procedures from the Defence Intelligence Services (DIS) he delivered them to the CWO2. The WO1 was then deployed out of Al Jubayl. When he returned to Al Jubayl on 11 March he had the opportunity to inspect the main missile assemblage (MMA). The warhead had already been removed.

49 Explosive Ordnance Disposal Squadron RE

114. 49 (EOD) Sqn RE were based in Al Jubayl, and it was their personnel who visited the units within the FMA that had reported chemical incidents. The OC of 49 EOD Sqn RE recalls a SCUD missile landing in the sea next to Al Jubayl. He recalled that there was no chemical contamination but rather fuel residues. He noted that 221 EOD Sqn led on the operation using 49 EOD's equipment. However there is no evidence to suggest that either 49 EOD Sqn RE or 221 EOD Coy RAOC were involved in the event with the exception of the WO1 referred to above.

OTHER EVIDENCE

Introduction

115. Apart from the UK units in the Al Jubayl area on the 15/16 February 1991, there were also US units in the area. There are two further units that were not in the Al Jubayl area that refer to the SCUD launch. One final source of documentary evidence are the UK Situation reports (Sitreps) given to the Secretary of State for Defence on 16 February 1991.

1 Royal Highland Fusiliers

116. The 1 Royal Highland Fusiliers (1RHF) were based at Maryhill Camp, Al Qaysumah, some 380km Northeast of Al Jubayl. The Commander's diary for 16 February has the following entry:

“A SCUD missile attack was launched at Al Jubayl. An air raid warning was sounded on the sirens and 5 minutes later a loud explosion was heard. This was the sound of the PATRIOT missile being launched; this successfully engaged the SCUD, the remains of which landed in the Gulf. After the explosion, full IPE was worn until the ‘All Clear’ was sounded at 0310.”

117. Although not in the area, 1 RHF recorded this SCUD attack as a significant event.

1 Coldstream Guards

118. 1 Coldstream Guards were also based at Maryhill Camp, Al Qaysumah, some 380km Northeast of Al Jubayl. An entry in the 1st Battalion Coldstream Guards 'Digest of Service' for 16 February 1991, reads as follows:

"Thoughts of peace were dampened at about 0200 on 16 February when a SCUD missile landed not far from the Battalion's Camp. Everyone masked up but chemicals were not thought to have been used. The SCUD got through the PATRIOT defences and caused some damage in the Force Maintenance area."

119. This entry is less straightforward than the 1 RHF entry as it states that the SCUD fell not far from the Battalion's Camp, which given the location of the unit seems unlikely. As the entry clearly relates to the SCUD missile launch on Al Jubayl, it is possible that this may relate to a Rear Party or Echelon of 1 Coldstream Guards, located in Al Jubayl at the time.

UK Sitreps

120. The first MOD Sitrep of 16 February 1991 noted the following.

"Iraq launched a SCUD attack aimed at Al Jubayl in Saudi Arabia last night.³⁸ Full details not available, but preliminary reports are that it landed harmlessly south the town. ITN erroneously reported that Patriot missile intercepted SCUD and deflected it into the Gulf."

121. Later the same day a further Sitrep noted the following.

"Iraq launched a SCUD attack aimed at Al Jubayl in Saudi Arabia last night. Missile broke up in flight and it landed harmlessly in the sea."

122. The reference to the ITN reporting of the incident in the first sitrep may account for references to the SCUD being destroyed by a PATRIOT in some of the unit diaries.

³⁸ SCUD launch occurred at 0200 Gulf Time 16 February, and was therefore 2300 UK time on 15 February.

US Case Narrative

123. OSAGWI produced an interim case narrative containing information on the SCUD missile that landed in Al Jubayl harbour on 16 February. It is expected that an update to this narrative will be published this year. Their summary of events in the interim case narrative is as follows:³⁹

“On February 16, 1991, the 66th SCUD missile launched during the war was against Al Jubayl. The missile was an Al Hussein variant of the SCUD missile. It impacted in the waters of Al Jubayl harbor and broke up at approximately 0200 hours on February 16, 1991. There was no damage or injury to coalition personnel or equipment. Eyewitnesses to the event report seeing an explosion that looked as if the SCUD was intercepted by a Patriot missile. There was a Patriot Missile Battery located near the harbor. However, during this time period, the battery was not operational and could not have engaged and shot down the SCUD missile. Salvage operations of the missile began on February 22, 1991. During the operation, EOD personnel used an M18 chemical detection kit to check for the presence of chemical warfare agents. The operation ended on the March 2nd with the recovery of the warhead. During the recovery and render safe operations, EOD members found no evidence of chemical or biological agents. Based on the information that is available to date, our assessment is that the SCUD was ‘Definitely Not’⁴⁰ armed with a chemical or biological warfare agent.”

Conclusions

124. A good deal of documentary evidence remains covering the SCUD attack on Al Jubayl on the morning of the 16 February 1991. There is only one reference to any chemical agent monitors responding; the 91 Ordnance Company report to the FMA NBC Cell that the 53 Ordnance Company NAIAD had alarmed. However, it is later stated that this was caused by aviation fuel and that all other CAM and RVD checks were clear.

125. In addition to this, the warhead was recovered by US Forces and no evidence was found of the presence of chemical and biological agents, the US therefore assessed the likelihood of the presence of chemical warfare agents as being ‘Definitely Not’. This being the case it seems certain that the single isolated NAIAD alarm was false and not caused by the SCUD missile or chemical warfare agents.

³⁹ OSAGWI Case Narrative: “Al Jubayl, Saudi Arabia” dated 13 August 1997.

⁴⁰ The American assessment scale ranges from ‘Definitely not’ to ‘Definitely’ with intermediate assessments of ‘Unlikely’, ‘Indeterminate’ and ‘Likely’, a tentative assessment based on the facts available at the time of reporting.

OVERALL CONCLUSIONS

126. The early days of the air campaign (17-21 January) saw numerous false NBC and SCUD alerts. It is not difficult to understand how with heightened tension and a very real perceived threat of attack with chemical warfare agents by Iraq that those in theatre believed they may have been subject to CW attack. The system of warning and dissemination of SCUD attack information (particularly in the early days of the air campaign) erred on the side of caution, resulting in SCUD warnings being given when SCUDs had not been launched and being given to certain areas when a SCUD was not headed in their direction. This resulted in troops being stood up into various NBC dress states and being quickly stood down again with little explanation other than a 'false NBC alert'. This can only have served to heighten awareness of the situation.

127. In addition to this there were a number of false NBC alarms. When CW detection and monitoring equipment alarmed troops responded in correct fashion by suiting up and calling an alert. However, our trawl of the evidence suggests that the alarms were responding to other substances or because of equipment failure or operator error⁴¹. On a number of occasions troops suited up in response to an NBC alarm, but logs do not record a full explanation as to the cause of the alarm. In addition to this troops were generally unaware that their monitoring equipment could respond to anything other than 'the real thing', leading to a belief amongst some troops that they had been subject to attack by chemical warfare agents, when in fact they had not. However, numerous incidents showed that monitors could alarm when there was no delivery means (i.e. a SCUD or aircraft) and indeed when there was no intelligence or indication that Iraq would launch a CBW attack.

128. Whilst there may not be full explanations for every NBC alert that occurred during the conflict for nearly all incidents there is a straightforward explanation; one that was either given at the time (but not necessarily to everyone) or one that is a logical conclusion in hindsight with the facts available. One key factor is that at no stage after any of these incidents were there any personnel that exhibited symptoms that would be consistent with chemical warfare agent poisoning. There are no such records of casualties or illness in unit diaries, from the casualty evacuation chain, or in the Operation GRANBY Master Casualty List. It is therefore reasonable to re-state the earlier MOD position that there is no evidence of Iraqi use of CW agents against UK forces during Operation GRANBY.

⁴¹ For further information see "British Chemical Warfare Defence During the Gulf Conflict (1990-91)", dated 7 December 1999.

GLOSSARY

2I/C	Second in Command
AAC	Army Air Corps
AC	Aircraft
ADTR	Armoured Division Transport Regiment
Amb	Ambulance
Armd	Armoured
ASMA	Air Staff Management Aid
ATLO	Air Transport Liaison Officer
AWACS	Airborne Warning and Control System
BAA	Brigade Administration Area
Bde	Brigade
BFME	British Forces Middle East
Bn	Battalion
BW	Biological Warfare
CAM	Chemical Agent Monitor
Cas	Casualties
CBW	Chemical and Biological Warfare
CDE	Chemical Defence Establishment
CENTCOM	[US] Central Command
CIA	Central Intelligence Agency
CO	Commanding Officer
Coy	Company
CW	Chemical Warfare

CWO	[US] Chief Warrant Officer
Det	Detachment
DIS	Defence Intelligence Staff
DoD	[US] Department of Defense
DS	Dressing Station
DTG	Date Time Group
Engr	Engineer
EOD	Explosive Ordnance Disposal
Fd	Field
FFMA	Forward Force Maintenance Area
FMA	Force Maintenance Area
FRG	Forward Repair Group
Gen	General
GVI	Gulf Veterans' Illnesses
GVIU	Gulf Veterans' Illnesses Unit
Hd Tech Int	Head of Technical Intelligence
HMS	Her Majesty's Ship
HNS	Host Nation Support
Hosp	Hospital
HQ	Headquarters
IPE	Individual Protective Equipment
JHQ	Joint Headquarters
JOC	Joint Operations Centre
KKMC	King Khalid Military City
LO	Liason Officer

MARCENT	[US] Marine Central Command
MCTG	Mobile Civilian Transport Group
MEF	Marines Expeditionary Force
MLRS	Multiple Launch Rocket System
MMA	Main Missile Assembly
MOD	Ministry of Defence
MOPP	[US] Mission Orientated Protective Posture
MRG	Main Repair Group
NAIAD	Nerve Agent Immobilised enzyme Alarm and Detector
NAPS	Nerve Agent Pre-Treatment Set
NBC	Nuclear Biological and Chemical
OC	Officer Commanding
ORB	Operations Record Book
Ord	Ordnance
OSAGWI	[US] Office of the Special Assistant for Gulf War Illness
Pax	Passengers
PFC	[US] Private First Class
POL	Petrol, Oil and Lubricants
PWGF	Prisoner of War Guard Force
RA	Royal Artillery
RAF	Royal Air Force
RAOC	Royal Army Ordnance Corps
RCT	Royal Corps of Transport
RE	Royal Engineers
Recce	Reconnaissance

Regt	Regiment
REME	Royal Electrical and Mechanical Engineers
RFA	Royal Fleet Auxiliary
RHF	Royal Highland Fusiliers
RHQ	Regimental Headquarters
RMP	Royal Military Police
RN	Royal Navy
RPC	Royal Pioneer Corps
RRF	Royal Regiment of Fusiliers
RV	Rendezvous
RVD	Residual Vapour Detector
Sqn	Squadron
STO	Survive to Operate
TAPLine	Trans-Arabian Pipe Line
UK	United Kingdom
UK SHF(ME)	UK Support Helicopter Force (Middle East)
US	United States
USMC	United States Marines Corps
Wksp	Workshop
WO	Warrant Officer

US Work

OSAGWI Case Narratives and Information papers can be found on the Internet at <http://www.gulflink.osd.mil/>.

Case Narratives

- 11th Marines
- Al Jaber Air Base
- Al Jubayl, Saudi Arabia
- An Nasiriyah
- Camp Monterey
- Cement Factory
- Czech-French Detections
- Fox Alerts in the 24th Infantry Division
- Fox Detections in an ASP/Orchard
- Khamisiyah
- Kuwaiti Girls School
- Possible Chemical Agent on SCUD Missile Sample
- Reported Mustards Agent Exposure Operation Desert Storm
- Tallil Air Base, Iraq
- US Marine Corps Minefield Breaching

Information Papers

- Air Campaign: Modelling and Simulation in the Planning of Attacks on Iraqi Chemical and Biological Warfare Targets
- Inhibited Red Fuming Nitric Acid (IRFNA)
- M256 Series Chemical Agent Detector
- M8A1 Automatic Chemical Agent Alarm
- Military Medical Recordkeeping During and After the Gulf War
- Medical Surveillance During Operations Desert Shield/Storm
- Mission Oriented Protective Posture (MOPP) and Chemical Protection
- The Fox NBC Reconnaissance Vehicle