



**Fleet Command**

Commander Operations  
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Northwood Headquarters  
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NORTHWOOD  
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FLEET/500/Personal

Colonel XXXXXXXXXXXXXXX OBE Royal Marines

Lieutenant Commander XXXXXXXXXXXXXXX Royal Navy

Major XXXXXXXXXXXXXXX Royal Marines

22 February 2007

**BOARD OF INQUIRY: CONVENING ORDER - DEATH OF MARINE J WIGLEY P060782P**

1. You are to assemble in West Battery Whale Island at 1500 on 22 February 2007, as a Board of Inquiry with Colonel XXXXXXXXXXXXXXX Royal Marines as President. You are to enquire into the circumstances surrounding the death in Afghanistan of Marine J Wigley P060782P of 45 Commando Royal Marines during Operation Herrick.

2. In particular, you might wish to cover the following areas:

- a. Establish the details of the incident (when, where and what happened) using the material available including the US CIB Report into the incident.
- b. Establish command and control procedures in place during that incident, and assess their suitability, implementation (concentrating on factual evidence rather than opinion) and effectiveness.
- c. Examine what orders, procedures and instructions were issued and whether they were correctly followed, whether they complied with current procedures and whether enhancements might have avoided this incident.
- d. Determine state of serviceability of equipment/craft if relevant etc.
- e. Determine what/whether Service kit may have been deficient or defective if relevant.
- f. Determine whether or not Marine Wigley was on duty; and

g. Make recommendations.

3. The Inquiry is to be conducted in accordance with the directions contained in QRRN Chapter 57. You are to call before you such witnesses as are necessary, including civilian, to enable you to form correct conclusions and are to call for expert advice on any matter, should this be considered appropriate.

4. The report of the Board is to be made to me once complete with an interim verbal report made two weeks from the Board's initial briefing. The report is to be in tri-fold format, to be accompanied by the minutes of evidence taken and is to contain the Board's conclusions on matters disclosed by the evidence, together with any assessment of the facts leading up to the incident.

XXXXXXXXXXXX

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~~XXXXXXXXXXXX~~

XXXXXXXXXXXX MBE  
Rear Admiral  
COM(OPS)

From Colonel ~~XXXXXXXXXXXX~~ OBE



Fleet Headquarters

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25 June 2007

Sir

**SUBMISSION OF FINDINGS OF THE BOARD OF INQUIRY INTO THE DEATH OF MARINE J WIGLEY P060782P**

We have the honour to submit the findings, conclusions and recommendations of the Board of Inquiry established to investigate the circumstances surrounding the death of the death of Marine J WIGLEY P060782P on 5 December 2006.

We have the honour to be,  
Sir,  
Your obedient Servants

~~XXXXXXXXXXXXXXXXXXXX~~  
~~XXXXXXXXXXXXXXXXXXXX~~

~~XXXXXXXXXXXXXXXXXXXX~~  
Major Royal Marines

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Lieutenant Commander Royal Navy

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Colonel Royal Marines

**BOARD OF INQUIRY INTO THE DEATH OF P060782P MNE JONATHAN WIGLEY**  
**EXECUTIVE SUMMARY**

1. Incident Summary. On 5 Dec 06, at 1216(L), a pair of US F/A-18C aircraft call signs XXX 01 and 02 of Strike Fighter Squadron 131 operating from the USS DWIGHT D EISENHOWER were conducting Combat Air Support (CAS) with Joint Terminal Attack Controller (JTAC) call sign xxxxxxxx)83 in support of 1 Tp, Zulu Coy, 45 Cdo Gp near Garmsir, Helmand Province, Afghanistan. During the mission the lead aircraft misidentified and strafed a friendly position, injuring one and fatally wounding another UK Royal Marine.
2. Events. The following 3 events were causal in this incident.
  - a. Event 1 - Target Misidentification. XXX 01 misidentified 1 Tp's location as the enemy location. This was causal in this incident in that XXX 01 strafed 1 Tp's position causing 1 fatality and 1 injury.
  - b. Causes. There is no certain cause for XXX 01's mis-identification. Based on their observations of various pieces of evidence including but not limited to the HUD video, aircraft trajectory and cockpit voice recordings, the US CIB came to an assumption as to why XXX 01 opened fire on the wrong position and formed their conclusions accordingly. XXX 01 has not commented on their assumptions or conclusions. Proposed reasons include over-reliance on visual cues, lack of a friendly position marker in the cockpit, failure to use his target designator diamond and the fact that the friendly force and the enemy positions looked very similar. The UK BOI agrees that each of these factors may have contributed to the mis-identification.
  - c. Event 2 - Non-SOP CAS Procedures. The JTAC could not maintain visual contact with XXX 01 and did not adhere to Type 1 CAS SOPs. That he did not transition to Type 2 CAS SOPs was causal in this incident in that the JTAC cleared XXX 01 hot without verifying safe attack geometry.
  - d. Causes. The JTAC employed non-standard control procedures for Type 1 CAS. This does not appear to have been the first time this had occurred nor does it appear uncommon in the Afghanistan theatre of operations. He was under considerable pressure on the ground, being under fire and in a position where he could not easily see the aircraft. Additionally he had developed confidence in XXX 01's ability as he had previously attacked the same target on 3 occasions. Given all the above he assumed that XXX 01 was able to identify the correct target again. The UK BOI considers that the procedures were non-standard and that a formal transition to Type 2 CAS may have prevented the incident occurring but that the behaviour of the JTAC was entirely reasonable under the circumstances.
  - e. Event 3 - Failure to Use Target Designator Diamond. XXX 01 transferred to visual references for Attack 6 without cross-checking his HUD weapon system information which highlighted the correct target location. That he did not use the

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Target Designator Diamond to differentiate between target and friendly locations was causal in this incident.

f. Causes. XXX 01 seems to have been certain that he had identified the correct target and once held visually decided that he did not need to use other means of target identification. It is SOP to switch off the Target Designator Diamond prior to engaging the target to de-clutter the HUD and allow a better picture of the target area but it appears that he did this without cross-checking the target location first. Having also attacked the target 3 times already, he may have been over-confident that he knew where the target was. The BOI considers that had XXX 01 cross-checked the visual and aircraft-system cues the incident may have been avoided.

3. Statement on US CIB Findings and Conclusions. The UK BOI endorses the US CIB report's findings and recommendations.

4. Conclusions. This BOI draws the following conclusions:

a. In relation to Event 1 (Target Misidentification):

(1) XXX 01 gave a running commentary to the US CIB on what he perceived had occurred on the day in question. Based on their observations of various pieces of evidence including but not limited to the HUD video, aircraft trajectory and cockpit voice recordings, the US CIB came to an assumption as to why XXX 01 opened fire on the wrong position and formed their conclusions accordingly. XXX 01 has not commented on their assumptions or conclusions.

(2) Similar terrain contributed to target misidentification.

(3) Channelised attention contributed to the misidentification.

(4) Had the friendly forces position been clearly marked, the probability of an attack on it would have been reduced.

b. In relation to Event 2 (Non-SOP CAS Procedures):

(1) The JTAC was not operating in accordance with Type 1 CAS SOPs in that he issued a 'Cleared Hot' call to XXX 01 having not assessed final attack geometry to ensure safe de-confliction from 1 Tp's location.

(2) Given the attack heading and relative positions of friendly and enemy positions, it is not clear that he could have accurately identified a correct attack heading to make a timely 'Cleared Hot' call in any event.

(3) The JTAC was prevented from seeing the aircraft by the weight of enemy fire and the obscuration caused by his position.

(4) The JTAC, being unaware of the geographic similarities between the enemy and friendly force positions, anticipated that having attacked the target successfully 3 times XXX 01 knew where it was and could identify it again.

(5) In this situation, the JTAC should have formally transitioned to Type 2 CAS. This would have made it clear to XXX 01 that the JTAC could not see the aircraft and was unable to conduct Type 1 CAS.

(6) The JTAC procedures commonly in use in the operational environment fall below formal peacetime requirements owing to the increased levels of danger and pressure induced by enemy fire on the battlefield. This is particularly apparent in that the procedures for transitioning between Type 1 and Type 2 CAS are not routinely practised during training.

c. In relation to Event 3 (Failure to Use the Target Designator Diamond):

(1) In the opinion of the Board, XXX 01 was sure he was looking at the correct target throughout his attack and hence considered the use of additional targeting information superfluous.

(2) XXX 01 under-utilised his weapon system information and used visual cues only for the attack. Had he used the Target Designator Diamond he would have correctly identified the target. However, given his conviction that he was looking at the correct target, it is doubtful that he would have acted upon visual HUD cues had they remained visible.

(3) The removal of the Target Designator Diamond is only relevant here because XXX 01 correctly identified the target location and cued his ~~xxxxxxxxxx~~ onto it prior to rolling out on his final attack heading. Had he misidentified the target in the first instance, he and the aircraft systems would have both been incorrect and fratricide would have been even more likely.

d. In relation to Event 4 (WIGLEY Hit by Unexploded 20mm PGU 28 A/B Ammunition):

(1) WIGLEY most likely died having been hit by a 20mm 'dud' round fired by XXX 01. There remains no conclusive evidence as to the exact damage mechanism for his injury, however it is unlikely that he received a direct hit otherwise his injuries would have been far greater. It is the opinion of the BOI that he sustained a glancing blow from a low-energy 20 mm 'dud' round which may have ricocheted off the ground prior to impact.

(2) It is highly probable that WIGLEY was dead prior to leaving the trench owing to the severity of the injuries he sustained. It is most likely that he would not have survived a wound of this nature regardless of the medical treatment available at the time.

(3) It is the opinion of the BOI that the quality and timeliness of the first aid WIGLEY received and the subsequent CASEVAC process were entirely adequate.

(4) It is not possible to say whether or not the carriage of a larger OSPREY plate in the rear of WIGLEY's body armour as opposed to the smaller protective plate that WIGLEY chose to fit for this operation would have provided sufficient protection to have saved him. It seems likely that, at best, the small rear plate only received a glancing blow on its edge and therefore did not make any real contribution to protecting WIGLEY. Had he worn the larger plate, it may have been hit more solidly and could have resulted in a different outcome but this can not be stated with any certainty.

(5) Given the mission, threats and conditions, it is the opinion of the BOI that WIGLEY was wearing appropriate protection for the task he was committed to on the day and that the medical and CASEVAC facilities and procedures were adequate for this operation.

## RECOMMENDATIONS

### 5. The BOI recommends:

- a. That a mechanism to mark friendly force positions either on the ground (when tactically feasible) or in the aircraft be developed. When not tactically feasible, enemy positions should be marked to differentiate them from friendly positions. A positive cross check of friendly and enemy positions should be made prior to each pass. (Source: Event 1.)
- b. That a lightweight electronic data transfer device is introduced to allow JTACs to pass 9-line briefs electronically. This should display both enemy and friendly force positions automatically on cockpit systems. (Source: Event 1.)
- c. That PJHQ with SME advice as appropriate conducts a review of in-theatre procedures. This should determine whether Type 1 CAS control is appropriate or whether procedures need to be amended based on operational experience and should also investigate the utility of the 9-line brief with regard to its applicability in current operational theatres with particular emphasis on the format by which friendly positions are passed to aircraft. Once the review is complete, appropriate training authorities in Air and Land Command should amend procedures if required and in any event, provide guidance to theatres to emphasise Type 1 control requirements. (Source: Event 1.)
- d. That Land and Air Commands reviews FAC/JTAC basic and combat ready, and PJHQ reviews in-theatre training with NATO to ensure more accurate replication of realistic battlefield conditions. Training should include TIC exercises where enemy and friendly forces are operating in similar terrain and in close proximity and the FAC/JTAC is operating forward in the contact battle. (Source: Event 1.)

- e. That Air Command and appropriate training authorities review JTAC training to include scenarios which require the JTAC to transition between Type 1 and Type 2 CAS and to practise Type 2 CAS procedures. (Source: Event 2.)
- f. That aircrew should reference in-cockpit indicators as well as external visual cues prior to weapons release. Specifically for those aircraft which have a Target Designator Diamond, aircrew should not un-designate the target without positively cross-checking the aircraft information with their own visual cues. (Source: Event 3.)
- g. That the Helmand UK Task Force should be informed that the in place Force Protection orders represent a pragmatic balance between protection and mobility and are supported. (Source: Event 4.)

6. BOI Opinion. It is the opinion of the BOI that the key players in this event XXX 01 and the JTAC acted in good faith throughout. Both acted with the best of intentions under very challenging conditions. The friendly fire incident was a tragic accident, which occurred in a highly charged environment where lives were at risk. Though implementation of all normal peacetime procedures should have prevented it, this was not peacetime. War is a very different environment, where risks must be taken to achieve one's aims. Perhaps the most telling statement is that of Z Coy Sgt Maj, who had wanted to send the aircrew of XXX Flight a message after the incident<sup>1</sup>. This was never actually sent but it was going to say that, it had not been a good day at the office for any of them, but had the F18s not been there, they would probably have lost far more men that day.

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<sup>1</sup> Telcon ~~XXXXXXXXXXXXXXX~~ of 22 Jun 07.



**BOARD OF INQUIRY INTO THE DEATH OF P060782P MNE JONATHAN WIGLEY**

Time Zone. All timings used in this report are Local (L), in contrast to the US CIB Report which uses Zulu (Z) throughout. (L) is 4.5 hours ahead of (Z).

**INTRODUCTION**

1. Purpose. This Board of Inquiry<sup>1</sup> (BOI) was convened to inquire into the circumstances surrounding the death of P060782P Mne Jonathan Wigley (WIGLEY) on 5 Dec 06 in Afghanistan. The Board was to report its findings and make recommendations to Commander Operations, Commander-in-Chief Fleet HQ.
2. Composition. The Board comprised:
  - a. Colonel ~~XXXXXXXXXXXX~~ OBE – President.
  - b. Major ~~XXXXXXXXXXXX~~ Royal Marines – Member.
  - c. Lieutenant Commander ~~XXXXXXXXXXXX~~ Royal Navy – Member.
3. Convention. The BOI convened in West Battery, Whale Island, Portsmouth on 22 Feb 07. Following initial consideration, the BOI was stood down until it could be briefed by the US Combined Investigation Board (CIB) convened under the authority of US Central Command Air Forces and receive a copy of their report. The brief was delivered by R Adm ~~XXXXX~~ USN, the CIB President, at PJHQ, Northwood on 12 Apr 07, the main report was received on 15 May 07 and the attachments on 11 Jun 07. The BOI was reconvened at West Battery on 21 May 07. It completed its deliberations and made its report on 25 Jun 07.
4. Report Format and Classification. The report is split into 3 parts: Part 1, the Main Body (classified Restricted), Part 2, which comprises the Supporting Documents (classified Restricted) and Part 3 which comprises a full copy of the US Combined Investigation Board (CIB) Report (classified Secret).
5. Supporting Reports. The UK BOI was not given access to US personnel and relied upon the US CIB report for its evidence. It did however have full access to the UK member of the US CIB, Wg Cdr ~~xxxxxxx~~RAF. The UK BOI is satisfied that there has been full release of US information and total transparency through this mechanism<sup>2</sup>. The Royal Military Police (RMP) in theatre produced a report<sup>3</sup> which gave witness statements

<sup>1</sup> FLEET/500/Personal dated 22 Feb 07. (COM Ops Convening Order for BOI) (Flag A).

<sup>2</sup> Statement made by Wg Cdr ~~xxxxxxx~~RAF dated 22 May 07 (Flag B).

<sup>3</sup> 62 Section SIB RMP Crime Ref Number: 83187/06 dated Jan 07. (OC 62 Section SIB RMP Report) (Flag C).

from those UK personnel involved in the incident and seized various physical exhibits<sup>4</sup>. This report forms a large part of the evidence used by the Board.

## INCIDENT SUMMARY

6. Incident. On 5 Dec 06, at 1216 hrs, near Garmsir, Helmand Province, Afghanistan, whilst providing Close Air Support (CAS) to 1 Troop Zulu Company, 45 Commando Group (1 Tp, Z Coy, 45 Cdo Gp), the lead aircraft of 2 US Navy F/A-18C aircraft from Strike Fighter Squadron 131 flying from the carrier USS DWIGHT. D. EISENHOWER, misidentified and strafed a friendly position injuring one and fatally wounding another Royal Marine.

7. Cause of Death. WIGLEY died as a result of severe injuries to his chest. These were a combination of blunt impact and penetrating trauma<sup>5</sup> most likely caused by being hit by a piece of unexploded ordnance<sup>6</sup> delivered by a US Navy F/A-18C. He was pronounced dead at 1320 hrs on 5 Dec 06<sup>7</sup>.

8. Duty Status. Mne Wigley was on duty at the time<sup>8</sup> being a Royal Marine serving in 1Tp, Z Coy, 45 Cdo Gp and died whilst serving on operations in the Helmand Province of Afghanistan during Op HERRICK 5.

## BACKGROUND

### 9. Operational Environment.

a. UK Forces Mission in Helmand Province. UK Forces in Helmand Province are tasked under the legal authority of UNSCR 1707 and by invitation of the standing Afghanistan National Government to provide a secure and stable environment within which reconstruction work can continue. Specifically UK Forces are there to assist the local government to build its capacity, authority and influence and to prioritise and synchronise reconstruction and development programmes along side fully integrated and joint security operations.

b. Terrain. The area of operations south of Garmsir District Centre (GDC) bounded by the Helmand River to the west and the irrigation canal to the east is primarily a flat expanse. It is a mixture of fields, hedgerows, treelines and irrigation ditches. Some areas are put to crops while others are over grown. Interspersed among these are single buildings and multiple building compounds. These are surrounded by high walls and are connected by roads and tracks. The area is badly scarred by the effects of many years of intense conflict which has resulted in terrain which offers short fields of view and fire at ground level. Additionally, vehicle mobility is restricted owing to the vegetation and the preponderance of drainage

<sup>4</sup> Physical exhibits are listed and held by those nominated at Annex AP to that report (OC 62 Section SIB RMP Report).

<sup>5</sup> Forensic Pathology Services, Post Mortem Report by Dr xxxxxxxxx BSc (Hons), MB BS, FRCPath, DipRCPATH (Forensic), dated 06 Jan 07 (Flag D – p8).

<sup>6</sup> US CIB Report (Flag E – p38).

<sup>7</sup> 62 Section SIB RMP Crime Ref Number: 83187/06 dated Jan 07. (OC 62 Section SIB RMP Report). Statement by Lt Col xxxxxxxx (Flag C (S-1))

<sup>8</sup> Zulu Company CSM Nominal for period (Flag F).

ditches where movement is best conducted by tracked vehicle or on foot. Vision and fields of fire improve dramatically from the roofs of buildings and from the few areas of high ground. From the air, it is challenging to pin point positions due to the homogenous nature of the area. An aerial photograph of the area is at Annex A.

c. Environment. The weather was clear and calm on 5 Dec 06. There was no precipitation and visibility was estimated to be greater than 7 nm at ground level. The operation was conducted in daylight hours.

d. Equipment. The operation was planned to be a rapid advance requiring speed and agility on the part of all. The men of Z Coy were carrying 'fighting order'. This comprised normal Combat Soldier 95 dress, webbing, weapon, radio, combat body armour and helmet plus ammunition, food and water. In total this 'light' order equated to approximately 60-70 lbs.

e. Enemy Action. From early in the operation, the enemy engaged Z Coy. During the planning, it was estimated by OC Z Coy that 1 Tp on the west flank would be most hard pressed. This turned out to be correct. From mid morning onwards the level and effect of the enemy action increased. It was generally found that when the AH-64<sup>9</sup> were on station the enemy could be suppressed relatively easily but when these left, no matter what other CAS was available, the weight of enemy fire increased<sup>10</sup>. From the time that the AH left the area at approximately 1230 hrs, 1 Tp and the JTAC were subjected to increasing levels of fire from small arms and Rocket Propelled Grenades (RPGs). The impact of this was that risk increased, movement within Z Coy was restricted, vision and situational awareness decreased and there was a general increase in pressure on decision-makers at all levels. The environment was far from 'ordinary'. It is against this backdrop that all actions occurred thereafter.

## 10. Participants

### a. Z Company 45 Commando Group Royal Marines.

(1) The Officer Commanding Zulu Company (OC Z Coy), 45 Cdo Gp, was Major xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx He had arrived in Afghanistan on Op HERRICK 5 on 7 Oct 06 and was experienced under fire, having been engaged by the enemy on several previous occasions<sup>11</sup>.

(2) Z Coy consisted of 3 troops of dismounted Royal Marines (1 Tp, 4 Tp and 5 Tp), was supported by a Regimental Aid Post (RAP) including a Surgeon Lieutenant and Leading Medical Assistant (LMA) of UK Medical Group, and a small number of Combat Medical Technician (CMT) Spartan Ambulances of the Light Dragoons. Also in direct support of Z Coy were a Joint Terminal Attack Controller (JTAC) and 4 Scimitar AFVs, fitted with 30mm cannon.

<sup>9</sup> UK Apache Attack Helicopter.

<sup>10</sup> JTAC interview with BOI, dated 30 May 07 (Flag G – p11).

<sup>11</sup> OC Zulu Coy interview with BOI, dated 30 May 07 (Flag H – p5).

(3) In the days immediately prior to the incident that took place on 5 Dec, Z Coy were involved in the following engagements and activities:

1 Dec 06. 1 Tp were engaged in a minor 'Troops in Contact' (TIC). 4 Tp conducted a standing patrol.

3 Dec 06. 5 Tp conducted recce of Garmsir DC with CO 45 Cdo Gp present. Minor TIC prompted a planned Disruption Op to take place in the following days.

4 Dec 06. Disruption Op planning. Orders were given at 1930 hrs.

5 Dec 06. Disruption Op commenced at 0630hrs.

(4) WIGLEY was a rifleman in 1 Tp which, on 5 Dec, was commanded by Capt (XXXXXXXXXX:XXXXXXXX)RM and included within its ranks a Troop Medic; Mne  
XXXXXXXXXXXXXXXXXXXXXXXXXXXX

b. Joint Terminal Attack Controller.

(1) The Joint Terminal Attack Controller<sup>12</sup> (JTAC) operating with Z Coy on 5 Dec 06 was Capt (XXXXXXXXXXXXXXXXXXXX) a member of 148 Bty RA. He was an experienced JTAC and, although he had worked with Z Coy for less than a week, he had worked in the Garmsir DC area for many months and was familiar with the terrain<sup>13</sup>.

(2) XXXXXXXXX had undergone extensive training to prepare him for this role. He had completed the UK FAC school (JFACTSU) on 10 Jun 05 where he had been a competent student throughout the course. He was declared Combat Ready on 8 Dec 05. He had taken part in extensive training prior to deploying on Op HERRICK 5, including multi-national and US exercises involving various aircraft types and all significant levels of command. By the time he deployed on Op HERRICK 5, he had conducted 190 day and night CAS controls and exceeded the NATO standard of training required to deploy to this theatre<sup>14</sup>.

(3) XXXXXXXXX joined 45 Cdo Gp on 4 Aug 06 as a Fire Support Team leader which included him, as JTAC, plus other fire support co-ordinators for artillery and mortars. He deployed with his unit to Afghanistan on 15 Sep 06 and had conducted 43 JTAC sorties of which 25 had been live controls. He carried a XXXXX Secure Radio (enabling secure ground-air communications) and a Tough-Book computer loaded with XXXXX imagery (to provide detailed (but not live) satellite imagery of the immediate area and to calculate grid references of designated points). He was also equipped with, but did not carry, a Laser Target Designator (used to mark enemy positions with a laser

<sup>12</sup> The JTAC is the forward ground forces commander's CAS expert. He provides the commander with advice on the employment of Air Assets in support of ground operations and subsequently directs the action of combat aircraft engaged in CAS.

<sup>13</sup> JTAC Interview with BOI, dated 30 May 07 (Flag G – p3).

<sup>14</sup> US CIB Log Book EVI.



NARRATIVE.

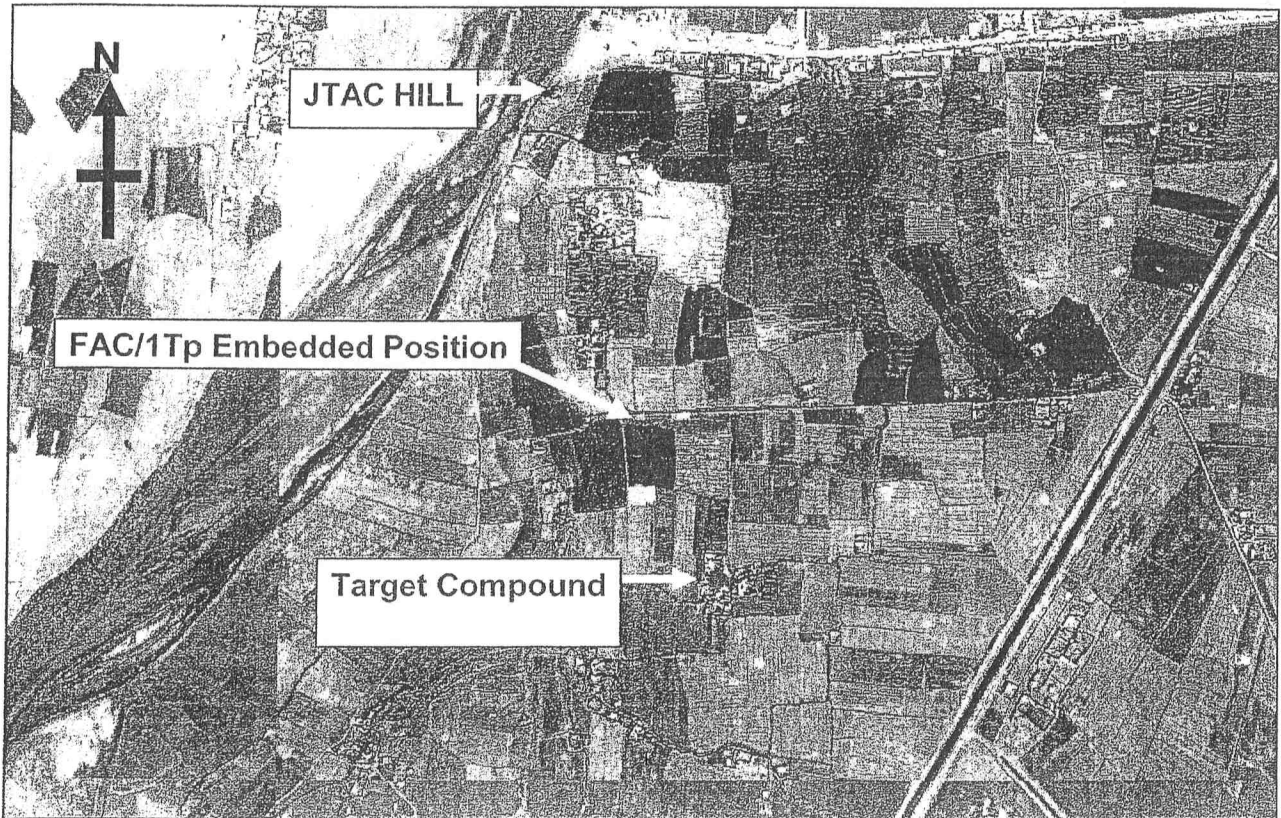
11. Ground Situation. On 5 Dec 06, Zulu Coy, 45 Cdo RM was tasked to conduct a deliberate clearance operation in the area south of Garmsir District Centre (GDC), 'to clear ground, buildings and cover that were being used by enemy forces to engage Coalition Forces, and to generally disrupt enemy forces in that area'<sup>18</sup>. 1, 4 and 5 Tps of Z Coy were each allocated specific clearance areas and objectives that ran along corridors from north to south. Their objectives were detailed as A1 to A4 for 1 Tp, B1 to B4 for 4 Tp and C1 to C4 for 5 Tp (See Map at Annex A). 1 Tp was to be the right-hand troop as Z Coy advanced in a southerly direction. It was bounded on the East by 4 Tp and on the West by the Helmand River. Each tp was to clear a single objective and then wait for the other tps to clear their respective areas before proceeding. The operation commenced at approx 0630 hrs when troops crossed the Report Line ARBROATH towards Report Line TAUNTON. The third and final Report Line, PLYMOUTH, was located approximately 1.5km south of Report Line ARBROATH and was the operation's Limit of Exploitation. The operation went ahead in accordance with OC Z Coy's plan. The Coy came under effective enemy fire shortly after commencing the operation and declared a 'Troop-in-Contact' situation, labelled TIC-IA. Report Line 'TAUNTON' was reached at approximately 1130 hrs, with all A and B objectives having been taken and 1 Tp waiting for suitable conditions before commencing its assault on A3. At this time 1 Tp was taking cover in an irrigation ditch on Report Line 'TAUNTON' as they were taking enemy small arms and RPG fire.

12. JTAC. The JTAC had initially deployed to JTAC Hill, a vantage point positioned in the vicinity of Report Line ARBROATH with views across the battle space towards the objective (see Map at fig 1). He made the decision to re-deploy and embed with 1 Tp as the action progressed further away from JTAC Hill towards the further objectives. This decision was assessed as sound doctrinally and tactically<sup>19</sup> as it allowed the JTAC to be close enough to the engagements to conduct safe and efficient controlling, something he could not do if he remained at JTAC Hill. At the time of his decision to re-deploy, 1, 4 and 5 Tps were sustaining moderate but effective enemy fire from various locations, but not to an extent which would restrict embedded JTAC operations<sup>20</sup>. However, by the time XXXXX Flight made contact with the JTAC for tasking, 1 Tp were taking cover in an irrigation ditch at Report Line TAUNTON. Adjacent to this irrigation ditch was a treeline which partially obscured the JTAC's view of aircraft operating to the north. Also at this time enemy fire consisting of small arms and RPGs had increased in volume and effectiveness on 1 Tp's position further restricting the JTAC's ability to see above the ditch. He found himself taking cover whilst continuing to control the aircraft and looking out when he could. Prior to the incident, successful CAS engagements had been prosecuted with 1 USAF B1 bomber, 1 UK GR 7 Harrier and 2 UK AH-64 Apache helicopters.

<sup>18</sup> 62 Section SIB RMP Crime Ref Number: 83187/06 dated Jan 07. (OC 62 Section SIB RMP Report). Statement by Maj xxxxxxxxxxxxRM, dated 12 Dec 06 (Flag C (B-1)).

<sup>19</sup> OC JFACTSU interview with BOI, dated 23 May 07 (Flag J - p11).

<sup>20</sup> JTAC interview with BOI dated 30 May 06 (Flag G - p22).



Map 1

13. Air Situation. XXXXX Flight came under control of the JTAC at 1201 hrs after an uneventful launch, transit and Air-to-Air Refuel. On achieving secure 2-way radio communications, the JTAC issued a verbal JTAC-to-Jet brief which provided the core elements of a 9-line brief<sup>21</sup> (but not in sequence nor in a single transmission) and declared Type 1 CAS in force. XXXXX 01 correctly read back and acknowledged all information, including the position of friendly forces. From initial radio contact, the JTAC spent 24 minutes in communication with XXXXX 01 confirming friendly, and in due course enemy, locations. XXXXX Section also conducted Non-Traditional Intelligence, Surveillance and Reconnaissance of a possible enemy position of interest to the JTAC during this period building their situational awareness as they did so. Prior to the first attack, XXXXX 01 confirmed over the radio that he was entirely happy with these positions<sup>22</sup>. In total, 6 attack passes were conducted by XXXXX Flight during the 45 minutes under JTAC control. These comprised 2 live bomb attacks, 2 gun strafe attacks and 2 dry passes (where no ordnance was released).

14. XXXXX Flight CAS Mission Flow.

a. Attack 1. All attacks were conducted on a small compound of isolated buildings approximately 460m southeast of 1 Tp's location (detailed on Map 1).

<sup>21</sup> The CAS 9-Line Brief is a JTAC-to-Aircraft brief detailing the elements required to conduct CAS including target position, location of friendly positions and attack direction.

<sup>22</sup> XXXXX 01 interview 15 Dec 06 (Flag E, Index A-IIIb, p15).



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Attack 1 was carried out by XXXXX 01 on a building within the compound with a GBU-12 laser guided bomb. The bomb was delivered from a standard profile and impacted within expected parameters on the correct target. Leading up to, and throughout the attack, Type 1 CAS procedures were followed although the 'Cleared Hot' call (mandatory final clearance to attack) was issued by the JTAC approximately 1 min prior to weapon release; at this point XXXXX 01 was still in the turn onto his final attack heading and not yet pointing at the target. Doctrinally, this is non-SOP JTAC procedure for Type 1 CAS and was a common theme throughout the period of control whereby the JTAC consistently cleared the attacking aircraft for a 'hot' attack before he had sighted and checked its final run-in heading. At this point 1 Tp (including the JTAC) was being engaged by enemy forces with small arms fire and RPGs.

b. Attack 2. This attack was a strafing run<sup>23</sup>, again conducted by XXXXX 01 using the aircraft's 20mm Vulcan Cannon, onto a building within the same compound as the previous attack. New target coordinates were passed to the pilot although the full 9-line brief was not given because target 2 was the same compound as that of the previous attack. This is considered acceptable procedure by JFACTSU<sup>24</sup> for CAS targets in close proximity. The strafe profile was successfully executed on the correct target although from a slightly shallower dive with the pilot opening fire at greater range than SOP<sup>25</sup>. During this attack the pilot received the 'Cleared Hot' call from the JTAC approximately 1.5 minutes prior to weapon release; again this occurred before the aircraft was on its final attack heading. Of note, at this time, the JTAC felt confident in XXXXX 01's ability to identify the correct target having already performed 1 good attack, and states that he felt that the JTAC and pilot had developed a "good bond"<sup>26</sup>.

c. Attacks 3 and 4. The JTAC passed coordinates for a further target within the same compound for a second GBU attack. XXXXX 02 had the only remaining GBU-12 suitable for the attack but his XXXXX<sup>27</sup> was inoperative. XXXXX 01 then directed that the flight join together and he employ his own XXXXX to illuminate<sup>28</sup> the target while XXXXX 02 released the GBU-12 when authorised ('buddy lasing'<sup>29</sup> SOP). The JTAC did not issue a mandatory 'Cleared Hot' call for this pass but had told the pilot to 'Target that position' 3 minutes prior after passing the target coordinates, he also requested a 'release call' from XXXXX 01 one minute prior to intended release. No ordnance was dropped on this run as XXXXX 01 was unable to acquire the target with his XXXXX. XXXXX Flight then set up for a re-attack using the same procedure and asked 'Confirm we are cleared hot on a 090 run-in heading'<sup>30</sup>. The FAC responded with a 'Cleared Hot' approximately 20 seconds prior to intended weapon release although no ordnance was dropped on this run due to switch error in XXXXX 02's cockpit. Throughout Attack 3 the SOP flow of communications between the JTAC and XXXXX Flight became disjointed,

<sup>23</sup> Strafing Run – an air-to-ground attack by guns.

<sup>24</sup> OC JFACTSU Interview with BOI, dated 23 May 07 (Flag J – p10).

<sup>25</sup> Friendly Fire Incident 5 Dec 06, Brief to DCJO (Ops) (Flag I – p37).

<sup>26</sup> JTAC interview with BOI, dated 30 May 07 (Flag G – p11).

<sup>27</sup> XXXX Forward Looking Infra-Red (XXXXX) is described in full at Annex B.

<sup>28</sup> XXXXX energy is directed at the target.

<sup>29</sup> The means by which one aircraft illuminates the target with XXXXX to guide ordnance released by a second aircraft. US CIB Report (Flag E – p12).

<sup>30</sup> Communications Transcript, XXXXX 01, dated 5 Dec 06 (Flag E, Index C-I, timing 8:08:25(Z)).



culminating in the JTAC not passing a 'Cleared Hot' call. In Attack 4 the communications flow recovered with the pilot requesting whether or not he was cleared hot and the JTAC responding correctly. At this point in the engagement the enemy fire targeting 1 Tp's position was steadily increasing in intensity and effectiveness further restricting the JTAC's ability to visually acquire the incoming aircraft.

d. Attack 5. XXXXX Flight set up for another west to east run in with XXXXX 01 talking XXXXX 02 through the correct switch settings. XXXXX 01 then acquired the correct target with his XXXXX and received a 'Cleared Hot' call from the JTAC approximately 30 seconds prior to weapon release. XXXXX 02 released his weapon as directed and the bomb impacted the target within expected parameters.

e. Attack 6 – Incident Attack. The JTAC then directed XXXXX Flight to strafe the tree line 50m south of the previous target location.

(1) No grid was passed owing to its close proximity to the previous target and the JTAC's confidence in the pilot's ability to continue attacking targets within the vicinity of the same compound. Again this is a standard procedure when a new target is near to the previous target<sup>31</sup>.

(2) XXXXX 01 was passed the target description and moved his Target Designator Diamond on to this position as he flew downwind opposite the target, using the XXXX<sup>32</sup>. At this point he had identified the correct position both visually and electronically. From this point onwards XXXXX 01 used visual cues outside the cockpit to prepare for the strafe attack and did not refer to the in-cockpit target location symbology<sup>33</sup>.

(3) The intensity of enemy fire on 1 Tp's position at this time was increasing and the JTAC was keen to progress the attack to suppress it. Prior to the pilot running in for his attack, the JTAC confirmed with the pilot that he was happy with the position of friendly troops. XXXXX 01 replied 'Affirmative' to this interrogations.

(4) As XXXXX 01 commenced his attack run, his HUD video<sup>34</sup> clearly marked the enemy position with a diamond symbol, the 'Target Designator Diamond'. The nose of the aircraft was flown through this position and continued to roll out pointing directly at 1 Tp's position instead. XXXXX 01 cancelled the HUD/XXXXX Target Designator Diamond, which was accurately positioned over the enemy location, as he rolled wings level for the attack (this is SOP for day strafe attacks to prevent the HUD markings from obscuring the target<sup>35</sup>).

(5) The JTAC called 'Cleared Hot' prior to the pilot rolling out on his attack heading but was unable to sight the aircraft on its attack run due to the high

<sup>31</sup> OC JFACTSU interview with BOI, dated 23 May 07 (Flag J – pp3-4).

<sup>32</sup> XXXXX (XXXXX) is described in full at Annex B.

<sup>33</sup> XXXXX 01 interview dated 15 Dec 06 (Flag E, Index A-IIIb, p34).

<sup>34</sup> Archived HUD (Head-Up-Display) video of XXXXX 01 dated 5 Dec 06 (Flag E, Index H).

<sup>35</sup> US CIB Report (Flag E – p27).





15 minutes and arrived at the RAP to collect the casualties a further ~~xxx~~ minutes later. However, despite being resourced to deliver a higher level of medical response than the RAP, there was little the team could do and Surg Cdr ~~xxxxx~~ confirmed WIGLEY dead at 1410 hrs<sup>47</sup>. The IRT landed back at Camp Bastion at 1432 hrs, 1 hour and 46 minutes after the incident had occurred with ~~xxxxxxxxxxxxx~~ and WIGLEY on board. A CASEVAC timeline is detailed at Annex D.

16. Withdrawal. On completion of the CASEVAC, OC Z Coy took the decision to extract all troops back to the Garmsir District Centre. By this time, 1 Tp were being engaged by effective enemy fire from the south, west and north-west and were in danger of becoming surrounded. 1 Tp were directed to move to 4 Tp's location and subsequently withdraw together to Report Line ARBROATH and then Garmsir District Centre which was reached at 1725 hrs<sup>48</sup>. Throughout the withdrawal, Z Coy regularly came under enemy fire although no further friendly casualties were sustained. The company was supported by A-10 and AH-64 Apache helicopter CAS throughout which was directed by the JTAC to good effect.

## EVENTS AND CAUSES

17. The factors which resulted in the death of WIGLEY were examined by the BOI and a number of causal events were subsequently identified. These are examined below as 2 distinct elements; those relating to the actions of ~~XXXXX~~ Flight and the JTAC which resulted in ~~XXXXX~~ 01 opening fire on 1 Tp's position (termed 'Friendly Fire Incident' below) and those relating to the death of WIGLEY including the Force Protection measures, medical treatment and CASEVAC process.

18. Friendly Fire Incident. 3 principal events have been identified that together resulted in the Friendly Fire incident. These are mirrored by the US CIB Report.

a. Event 1 -Target Misidentification. ~~XXXXX~~ 01 misidentified 1 Tp's location as the enemy location. This was causal to this incident in that ~~XXXXX~~ 01 strafed 1 Tp's position rather than that of the enemy causing 1 fatality and 1 injury.

(1) General Comment on Contributing Factors. ~~XXXXX~~ 01 gave a running commentary to the US CIB on what he perceived had occurred on the day in question. Based on the observations of various pieces of evidence including but not limited to the HUD video, aircraft trajectory and cockpit voice recordings, and having shown ~~XXXXX~~ 01 a map of the area asking him to talk through it<sup>49</sup>, the US CIB came to an assumption as to why ~~XXXXX~~ 01 opened fire on the wrong position.

(2) Contributing Factor 1 – Over-prioritisation of Visual Cues. ~~XXXXX~~ 01 had correctly identified the enemy position previously and had prosecuted it with a GBU-12 bomb on Attack 5. Furthermore, he had correctly identified the subsequent target on the downwind leg prior to Attack 6 and had cued his Target Designator Diamond onto it using his ~~XXXXX~~. Throughout the

<sup>47</sup> 62 Section SIB RMP Crime Ref Number: 83187/06 dated Jan 07. (OC 62 Section SIB RMP Report). Statement by Surg Comd ~~xxxxx~~ RN, dated 13 Mar 07 (Flag C-2, sheet 2).

<sup>48</sup> IX Gp Watchkeeper's Log 05 0001L – 2359L Dec 06 (Flag K, Ser 50).

<sup>49</sup> ~~xxxxxxxxxxxxx~~ Discussion.

remainder of the attack he over-prioritised visual cues, ignoring his weapon system information which correctly indicated target location, and attacked the wrong target<sup>50</sup>.

(3) Contributing Factor 2 – Lack of Friendly Force Position Identifier.

XXXXX 01 stated<sup>51</sup> that he had marked the friendly force position as a waypoint in his navigation equipment. This waypoint accurately marked 1 Tp's location, but it was not used for visual cross-reference in the HUD or XXXXX for the attack runs, as only the target position is displayed to provide visual cueing and weapon aiming data. It is the opinion of this BOI that had a friendly force position identifier been visible in either the HUD or XXXXX for Attack 6 the likelihood of an attack on friendly forces would have been significantly reduced.

(4) Contributing Factor 3 – Similar Terrain. The target and 1 Tp's locations shared similar geographic features, including a building compound, an east – west tree line and a bomb crater adjacent to the building compound. The similarity of terrain surrounding both enemy and friendly positions contributed to XXXXX 01's misidentification of the target location.

(5) Contributing Factor 4 – Human Factors. The US report considers a number of Human Factors related issues that may have contributed to the misidentification of the 2 positions<sup>52</sup>. An independent UK Human Factors expert was asked to review their findings. The subsequent report<sup>53</sup> states that there is compelling evidence to support the hypothesis that human factors played a role in the misidentification process but that it is difficult to assess to what extent these contributed to the outcome. In the opinion of the Board, key issues that most likely influenced XXXXX 01's decision making process include:

(a) Misperception caused by similar terrain features, the proximity of the 2 targets to each other and the narrow angular displacement between the friendly and enemy position as seen from the cockpit. Additionally the report states that Attacks 3-5 had been from the west but with a right hand turn in to the attack heading. Attack 6 was also from the west but with a left hand turn in to the attack heading which gave a different visual relationship between the two positions and could have contributed to the mis-identification.

(b) Channelised attention caused by extreme focus on the task in hand or high workload in the cockpit. Evidence given for this is the fact that XXXXX 01 ignored his low fuel warning 'Bingo' alarm for 2 minutes. This suggests to the BOI that he was working beyond his capacity to assess, evaluate and act correctly. Further justification for this assumption is that he had had to talk his wing man through the procedures for a 'buddy-laze' GBU-12 drop on the previous runs, the

<sup>50</sup> XXXXX 01 statement dated 15 Dec 06 (Flag E, Index A-IIIb, pp35-36).

<sup>51</sup> XXXXX 01 statement dated 15 Dec 06 (Flag E, Index A-IIIb, p15).

<sup>52</sup> US CIB Report (Flag E, p33).

<sup>53</sup> Human Factors Report dated 11 Jun 07 (Flag L).

men on the ground were being more heavily engaged and hence there was an urgency to prosecute the target, they were running low on fuel having discussed fuel states prior to the attack and he was executing a complex strafe mission making mental calculations in his head as he was flying the attack profile. Channelised attention is also suggested by XXXXX 01 focussing all his attention on the target visually after acquiring it with his XXXXX, failing to use other systems to verify the target information. Taking these elements together, channelised attention could have resulted and contributed to the mis-identification.

(6) Contributing Factor 4 – Failure to Use the Target Designator Diamond. (See Event 3.)

(7) Conclusions.

(a) This BOI cannot state with certainty why XXXXX 01 misidentified the friendly force position as the target because XXXXX 01 was not specifically asked this question. It is entirely possible that even if he had been asked, he would not have known the answer anyway. However, based on the available evidence and using military judgement and experience, a summary of likely contributing factors can be made.

(b) Similar terrain contributed to target misidentification.

(c) Channelised attention contributed to the misidentification.

(d) Had the friendly forces position been clearly marked, the probability of an attack on it would have been reduced.

b. Event 2 - Non-SOP CAS Procedures. The JTAC could not maintain visual contact with XXXXX 01 and did not adhere to Type 1 CAS SOPs. That he did not transition to Type 2 CAS SOPs was causal in this incident in that the JTAC cleared the aircraft 'hot' without verifying safe attack geometry.

(1) Contributing Factor 1 – Enemy Fire. The increasing effectiveness of enemy fire on 1 Tp's position forced the JTAC to remain in cover and prevented him from sighting the incoming aircraft on final attack heading prior to issuing the 'Cleared Hot' call. To have put himself into such a position would have been both dangerous and reckless in the opinion of the BOI. Under these conditions, however, he should have transitioned to Type 2 CAS providing a formal indication of the change to XXXXX 01.

(2) Contributing Factor 2 – Obscuration. The east-west tree line adjacent to 1 Tp's position of cover impeded the JTAC's ability to sight the incoming aircraft on final attack heading prior to issuing the 'Cleared Hot' call. Under these conditions he should have transitioned to Type 2 CAS.

(3) Contributing Factor 3 – Confidence in XXXXX 01. The JTAC states<sup>54</sup> that as XXXXX 01 had already attacked the same target 3 times, he was confident that the pilot knew where the target was and accordingly, in his mind, allocated XXXXX 01 greater responsibility for target identification than is expected under Type 1 CAS.

(4) Contributing Factor 4 – Theatre Norms. The JTAC states that he, and others, routinely cleared aircraft 'hot' without visual references due to the tactical situation (enemy fire, position etc) and the requirement to plan and prosecute other targets in rapid succession. He claimed to have used the term, 'Not Visual, Cleared Hot' on many occasions previously. This indicates a familiarity with the operational environment and air to ground operations and a confidence that the aircraft were able to operate under these conditions. It also suggests an informal transition to Type 2 CAS as the conditions for Type 1 were not being met. It is not clear whether this nuance was understood by either JTACs or pilots; this is considered unlikely.

(5) Contributing Factor 5 – Training. The JTAC stated that his training did not include practising the transition between Type 1 and Type 2 CAS or training for CAS controls while he was operating in close proximity to or engaging the enemy directly. This is partly because, generally, the ideal position for a JTAC would be at a distance giving the JTAC a clear "3D" overview of the area. However, in certain circumstances, such as these, it may be necessary for the JTAC to operate forward with a unit.

(6) Conclusions.

(a) The JTAC was not operating in accordance with Type 1 CAS SOPs in that he issued a 'Cleared Hot' call to XXXXX 01 having not assessed final attack geometry to ensure safe de-confliction from 1 Tp's location.

(b) Given the attack heading and relative positions of friendly and enemy positions, it is not clear that he could have accurately identified a correct attack heading to make a timely 'Cleared Hot' call in any event.

(c) The JTAC was prevented from seeing the aircraft by the weight of enemy fire and the obscuration caused by his position.

(d) The JTAC, being unaware of the geographic similarities between the enemy and friendly force positions, anticipated that having attacked the target successfully 3 times XXXXX 01 knew where it was and could identify it again.

(e) In this situation, the JTAC should have formally transitioned to Type 2 CAS. This would have made it clear to XXXXX 01 that the JTAC could not see the aircraft and was unable to conduct Type 1 CAS.

<sup>54</sup> JTAC interview with BOI, dated 30 May 07 (Flag G, pp25-26).

(f) The JTAC procedures commonly in use in the operational environment fall below formal peacetime requirements owing to the increased levels of danger and pressure induced by enemy fire on the battlefield. This is particularly apparent in that the procedures for transitioning between Type 1 and Type 2 CAS are not routinely practised during training.

c. Event 3 – Failure to Use the Target Designator Diamond. XXXXX 01 transferred to visual references for Attack 6 without cross-checking his XXXXX/HUD weapon system information which highlighted the correct target location. Further he un-designated the Target Designator Diamond prior to rolling wings level. This was causal in this incident in that XXXXX 01 did not use all relevant aircraft sensors to confirm the target location.

(1) Contributing Factor 1 – Certainty of Target Identification. Despite cueing his Target Designator Diamond on to the correct target downwind using his XXXXX, XXXXX 01 did not use it thereafter during the attack as he was certain that he had a visual on the enemy position. Had he done so, he would have seen that he was looking at the wrong position.

(2) Contributing Factor 2 – Procedures. It is SOP to un-designate the Target Designator Diamond to de-clutter the HUD picture<sup>55</sup>. It is the opinion of the Board that the action to un-designate the target may have been an automatic action more than a conscious decision.

(3) Contributing Factor 3 – Human Factors. The US CIB report states that human factors played a part in XXXXX 01 un-designating his Target Designator Diamond during the final strafe attack<sup>56</sup>. The main points made in the US report and agreed by this BOI were:

(a) XXXXX 01 had channelised attention, witnessed by him relying on visual target identification alone having cued his Target Designator Diamond on to the new target given by the JTAC. His over-prioritisation of visual cues, noting the target and friendly force similarity, and his failure to use on board weapons symbology to cross-check the target contributed to the outcome.

(b) Overconfidence due to the fact that XXXXX Flight had already attacked the target 3 times correctly. XXXXX 01 on his final strafe run was certain he was looking at the same target he had attacked previously and felt that he did not need to use additional target identification mechanisms. In this he demonstrated a misplaced overconfidence.

<sup>55</sup> US CIB Report (Flag E, p27)

<sup>56</sup> US CIB Report (Flag E, pp33-34).



(4) Conclusions.

(a) In the opinion of the Board, XXXXX 01 was sure he was looking at the correct target throughout his attack and hence considered the use of additional targeting information superfluous.

(b) XXXXX 01 under-utilised his weapon system information and used visual cues only for the attack. Had he used the Target Designator Diamond he would have correctly identified the target. However, given his conviction that he was looking at the correct target, it is doubtful that he would have acted upon visual HUD cues had they remained visible.

(c) The removal of the Target Designator Diamond is only relevant here because XXXXX 01 correctly identified the target location and cued his XXXXX onto it prior to rolling out on his final attack heading. Had he misidentified the target in the first instance, he and the aircraft systems would have both been incorrect and fratricide would have been even more likely.

19. Cause of Death of WIGLEY.

a. General. WIGLEY died of severe chest injuries<sup>57</sup> after being struck a glancing blow to the upper left/central part of his back most likely by a piece of unexploded ordnance delivered by XXXXX 01's aircraft.

b. Discussion on Impacting Object.

(1) As WIGLEY's body did not retain any of the matter from the object which caused his injuries, the Post Mortem was unable to state with confidence exactly whether they had been caused by ordnance from the F/A-18C or by something else<sup>58</sup>.

(2) Although 1 Tp had been targeted by RPG fire during the TIC, none of the witnesses report hearing an explosion at the time of this incident. It is therefore unlikely that WIGLEY was struck by fragments from a mortar, RPG or similar explosive device.

(3) Similarly, the possibility that WIGLEY was hit by a round of 20mm HEI from the supporting aircraft that detonated on impact can be discounted owing to the size and type of injury sustained. Witness statements taken from troops directly involved in the incident stated that they had observed the effects of detonating 20mm HEI ammunition on previous occasions, but do not recall having seen such effects here<sup>59</sup>.

<sup>57</sup> Forensic Pathology Services, Post Mortem Report by Dr xxxxxxxxx BSc (Hons), MB BS, FRCPath, DipRCPath (Forensic), dated 06 Jan 07 (Flag D, p8).

<sup>58</sup> Forensic Pathology Services, Post Mortem Report by Dr xxxxxxxxx BSc (Hons), MB BS, FRCPath, DipRCPath (Forensic), dated 06 Jan 07 (Flag D, p8).

<sup>59</sup> Capt xxxxxx RM interview with US CIB (Flag E, Index A-VIb, p15).

(4) Further, had WIGLEY been struck directly by a 20mm HEI projectile, whether or not it detonated, his injuries would have been far more severe. Hence a direct hit or 'high order' explosive event is unlikely.

(5) The profile of the wounds WIGLEY received indicate they were caused by ricocheting 'dud' rounds or by a glancing blow from such a round.

(6) Owing to the fact that WIGLEY's injuries were sustained at the same time that XXXXX 01 conducted his 2<sup>nd</sup> strafing run, it appears probable that 20mm HEI ammunition from this aircraft was responsible for his death. The US Technical Ballistic Investigation supports this conclusion.

(7) This explanation is consistent with the surrounding circumstantial evidence and spent ammunition recovered by witnesses from the scene of the incident.

(a) After the strafing run, many individuals recall noticing expended ordnance in the immediate area which was not observed beforehand. One such projectile was retained<sup>60</sup> and later forensically examined, revealing that it was unexploded PGU-28A/B Series 20mm ammunition of the type fired by XXXXX 01. This type of ammunition is unique to the USN F18A/C's M61A1 Vulcan Cannon and had not been expended in that location during the 6 months prior to Dec 06.

(b) The condition of the projectile when it was recovered (no corrosion was noted on the round indicating that it had been fired less than 48 hours beforehand) implies that it had originated from XXXXX 01's aircraft which had been fired directly at 1 Tp's location.

(c) Subsequent analysis of XXXXX 01's firing profile reveals that he was out of effective range of his target as he conducted his second strafing run<sup>61</sup> and it is quite likely that PGU-28A/B Series 20mm ammunition would not have detonated on impact but would have behaved in an identical fashion to traditional ball ammunition.

This evidence strongly supports the hypothesis that WIGLEY was killed by a non-exploding PGU-28A/B Series 20mm HEI round fired by XXXXX 01 which may have ricocheted after hitting the ground.

c. Discussion on Combat Body Armour.

(1) All members of 3 Cdo Bde RM had previously been issued with OSPREY Combat Body Armour, procured in order to counter the threat from ~~XX~~ XXXXXX which had been used against Friendly Forces throughout Afghanistan<sup>62</sup>.

<sup>60</sup> 62 Section SIB RMP Crime Ref Number: 83187/06 dated Jan 07. (OC 62 Section SIB RMP Report). Statement by LBdr XXXXXXXXXXXX dated 11 Dec 06 (Flag C (K-5)).

<sup>61</sup> Friendly Fire Incident 5 Dec 06, Brief to DCJO (Ops) (Flag I, p37).

<sup>62</sup> DLO Publication – A Commander's Guide to General Service Ballistic Protection (Flag M, para 13).

(2) OSPREY Combat Body Armour is a modular system of 2 integral parts: a Soft Armour vest, made from 3<sup>rd</sup> Generation Aramid material designed to protect against ~~XXXXXXXXXXXXXXXXXXXX~~ and 2 Hard Armour Plates (1 front, 1 rear) which are designed to protect against ~~XXXXXXXXXXXX~~. ~~XXXXXXXXXXXX~~ The dimensions of the plates are broadly ~~XXXXXX~~ wide ~~XXXXXX~~ high and ~~XXXXXX~~ thick, although they do not take into account the cut-outs at the top of both plates to aid movement of the wearer's head and arms. The hard armour is made from a ceramic face with a supporting composite backing and is designed to withstand ~~XXXXXXXXXXXXXXXXXX~~.

(3) The plate is designed to spread the force ~~XXXXXXXXXXXXXXXXXXXXXXXXXXXX~~ ~~XXXXXX~~ round across its whole area to prevent lethal amounts of energy being passed onto the wearer. This performance is uniform over the whole area of the plate therefore as long as the complete round strikes the plate the point of impact will not affect performance<sup>63</sup>. (Osprey Hard Armour plates have never been subjected to ballistics studies using 20mm projectiles and it is therefore impossible to say what level of protection would have been offered against such a threat).

(4) As a modular system, OSPREY can be adapted to increase or decrease protection levels, according to the role of the wearer, in particular, both the large front and rear plates can be replaced with a smaller and lighter (1.1kg) ceramic plate from the Enhanced Combat Body Armour (ECBA)<sup>64</sup>. This provides ~~XXXXXXXXXXXXXXXXXXXX~~ ~~XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX~~ ~~XXXXXXXXXXXXXXXXXXXX~~ whilst affording the wearer a much greater freedom of movement and a higher degree of mobility around the battlefield. The ECBA plate measures ~~XXXXXX~~ wide, ~~XXXXXX~~ high and ~~XXXXXX~~ thick and lies above and to the left of the centre of the upper body. When worn, its upper edge sits approximately ~~XXXXXXXXXXXX~~ than that of the larger rear plate.

(5) The IX Gp Op Order extant on 5 Dec 06 did not contain Force Protection Instructions relating specifically to the wearing of body armour on operations. Consequently, OC Z Coy consulted the 42 Cdo Baseline Op Order 001 which stated that 'Whilst patrolling, body armour (minimum of ECBA) is to be worn at all times...<sup>65</sup>.' After studying these higher formation orders, he analysed the level of risk that his company would face taking into consideration the threat-levels and rapid mobility that would be required by individuals throughout a high-tempo battle. He subsequently chose to advise his troops 'that OSPREY Combat Body Armour should be worn with the large protective plate worn at the front and a smaller plate [ECBA] at the rear<sup>66</sup> as a minimum. This guidance exceeded the minimum level of protection specified by both the IX Group and 42 Cdo Baseline Op Orders.

<sup>63</sup> Email Lt Col ~~XXXXXXXXXX~~ (SRM & PECOC RM) to Col ~~XXXXXXXXXX~~ OBE, dated 30 May 07 (Flag N).

<sup>64</sup> DLO Publication – A Commander's Guide to General Service Ballistic Protection (Flag M, para 15).

<sup>65</sup> 42 Cdo Baseline Op Order 001, dated 29 Oct 06 (incomplete) (Flag O, p8).

<sup>66</sup> 62 Section SIB RMP Crime Ref Number: 83187/06 dated Jan 07. (OC 62 Section SIB RMP Report). Statement by Maj ~~XXXXXXXXXX~~ RM, dated 12 Dec 06 (Flag C (B-2)).

d. Event 4 – WIGLEY Hit by Unexploded 20mm PGU 28 A/B Munition. It is the opinion of the BOI that in all likelihood, WIGLEY received a glancing blow to the top of his back by an un-exploded ('dud') 20mm PGU 28 A/B munition. This caused him fatal injuries and resulted in his death at the scene.

(1) Contributing Factor 1 – Combat Body Armour.

(a) WIGLEY had been issued with the full range of OSPREY Combat Body Armour allowing him to choose the level of protection he considered necessary. On 5 Dec 06, WIGLEY chose to wear OSPREY Combat Body Armour fitted with the large front plate and smaller rear ECBA plate<sup>67</sup>. This was a personal choice based upon the advice of OC Z Coy, the enemy threat he would face and his own assessment of the level of mobility he would require to move and fight effectively.

(b) The projectile that killed WIGLEY impacted across the top of his back slightly above the rear plate. It may have struck the upper limit of the plate and then enmeshed in the fabric of the Soft Armour vest<sup>68</sup> although, as the body armour was not retained for forensic examination (the extra weight and bulk would have slowed down 1 Tp as it withdrew, still under enemy fire), this cannot be confirmed. Examination of the body armour at the time revealed that the projectile had not obviously damaged the plate and that it appeared intact<sup>69</sup>. If WIGLEY had chosen to fit a larger rear plate to his OSPREY in order to afford himself a greater degree of protection (at the expense of mobility), it is more likely that the projectile would have struck the upper area of the plate. This would have reduced the energy transfer but owing to a lack of key information (the velocity of the projectile, the distance travelled, the energy dissipated by any ricochet or the angle of impact) it is impossible to estimate by how much<sup>70</sup>.

(c) It is the opinion of the BOI that Mne Wigley decided to wear appropriate protection for the situation. It exceeded the level of protection required by SOPs and orders and that it is impossible to hypothesise whether wearing the larger plate would have changed the outcome whether the impact was a direct hit or a ricochet.

(2) Non-Contributing Factor 1 – First Aid. Following their wounding WIGLEY and xxxxxxxxxxxx received increasing levels of medical care as they progressed through the CASEVAC chain. First aid was administered to both casualties without delay after the incident, by other marines that were in the immediate vicinity and also by xxxxxxxxxxxx a member of 1 UK Med Group who was attached to 1 Tp as the Troop Medic (Role 1). Treatment continued

<sup>67</sup> 62 Section SIB RMP Crime Ref Number: 83187/06 dated Jan 07. (OC 62 Section SIB RMP Report). Statement by Mne xxxxxxxxxxxx dated 9 Dec 06 (Flag C (M-2)).

<sup>68</sup> Forensic Pathology Services, Post Mortem Report by Dr xxxxxxxxxxxx BSc (Hons), MB BS, FRCPath, DipRCPPath (Forensic), dated 06 Jan 07 (Flag D).

<sup>69</sup> 62 Section SIB RMP Crime Ref Number: 83187/06 dated Jan 07. (OC 62 Section SIB RMP Report). Statement by Mne xxxxxxxxxxxx dated 10 Dec 06 (Flag C (H-2)).

<sup>70</sup> Email Lt Col xxxxxxxxxxxx (SRM & PECOC RM) to Col xxxxxxxxxxxx OBE, dated 30 May 07 (Flag N).

throughout their recovery to the RAP (Role 2 facility) where a greater level of medical care was given and again at the Field Hospital at Camp Bastion (Role 2 enhanced). It is of note that expert medical opinion suggests that the injuries sustained by WIGLEY were 'highly likely' to prove fatal regardless of the level of care he was to receive or the timeliness of its application<sup>71</sup>. This BOI finds that the level of care was appropriate to the battlefield situation and that this was not a contributory factor to WIGLEY's death.

(3) Non-Contributing Factor 2 – CASEVAC. Following immediate first aid, delivered in the trench, WIGLEY and kxxxxxxxxxx were evacuated in a timely manner from the POI to the unit RAP and thereafter to the Field Hospital at Camp Bastion. They both continued to receive treatment through out the evacuation process, even though it was believed that Wigley was already dead. Planning timelines were met at each stage and given the tactical situation on the ground it is considered a credit to those involved that the evacuation was conducted as quickly and as smoothly as it was. A timeline of the CASEVAC procedure is at Annex D. This BOI finds that the CASEVAC process was appropriate to the battlefield situation and that this was not a contributory factor to WIGLEY's death.

(4) Conclusions.

(a) WIGLEY most likely died having been hit by a 20mm 'dud' round fired by XXXXX 01. There remains no conclusive evidence as to the exact damage mechanism for his injury, however it is unlikely that he received a direct hit otherwise his injuries would have been far greater. It is the opinion of the BOI that he sustained a glancing blow from a low-energy 20 mm 'dud' round which may have ricocheted off the ground prior to impact.

(b) It is highly probable that WIGLEY was dead prior to leaving the trench owing to the severity of the injuries he sustained. It is most likely that he would not have survived a wound of this nature regardless of the medical treatment available at the time.

(c) It is the opinion of the BOI that the quality and timeliness of the first aid WIGLEY received and the subsequent CASEVAC process were entirely adequate.

(d) It is not possible to say whether or not the carriage of a larger OSPREY plate in the rear of WIGLEY's body armour as opposed to the smaller protective plate that WIGLEY chose to fit for this operation would have provided sufficient protection to have saved him. It seems likely that, at best, the small rear plate only received a glancing blow on its edge and therefore did not make any real contribution to protecting WIGLEY. Had he worn the larger plate, it may have been hit more solidly and could have resulted in a different outcome but this can not be stated with any certainty.

<sup>71</sup> TELCON kxxxxxxxxxx dated 30 May 05.

(e) Given the mission, threats and conditions, it is the opinion of the BOI that WIGLEY was wearing appropriate protection for the task he was committed to on the day and that the medical and CASEVAC facilities and procedures were adequate for this operation.

#### STATEMENT ON US CIB CONCLUSIONS AND RECOMMENDATIONS

20. The UK BOI, having carefully assessed the US CIB Report<sup>72</sup>, endorses the report's findings and recommendations with the following observations:

- a. The Statement of Findings on pages 38/39 and the Opinion Summary and Factors of Note on page 40 are supported.
- b. The Other Findings Worthy of Discussion on page 41 are not considered relevant to the UK BOI.
- c. The Corrective Measures on Page 42 are all supported (except Measure 8 which has been over taken by events) and have been incorporated into the UK BOI Recommendations where they are relevant to UK Forces.

#### SUMMARY OF UK BOI CONCLUSIONS

21. This BOI draws the following conclusions:

a. In relation to Event 1 (Target Misidentification):

(1) XXXXX 01 gave a running commentary to the US CIB on what he perceived had occurred on the day in question. Based on their observations of various pieces of evidence including but not limited to the HUD video, aircraft trajectory and cockpit voice recordings and 01, the US CIB came to an assumption as to why XXXXX 01 opened fire on the wrong position and formed their conclusions accordingly.

(2) Similar terrain contributed to target misidentification.

(3) Channelised attention contributed to the misidentification.

(4) Had the friendly forces position been clearly marked, the probability of an attack on it would have been reduced.

b. In relation to Event 2 (Non-SOP CAS Procedures):

(1) The JTAC was not operating in accordance with Type 1 CAS SOPs in that he issued a 'Cleared Hot' call to XXXXX 01 having not assessed final attack geometry to ensure safe de-confliction from 1 Tp's location.

<sup>72</sup> US CIB Report (Flag E, p38).

- (2) Given the attack heading and relative positions of friendly and enemy positions, it is not clear that he could have accurately identified a correct attack heading to make a timely 'Cleared Hot' call in any event.
- (3) The JTAC was prevented from seeing the aircraft by the weight of enemy fire and the obscuration caused by his position.
- (4) The JTAC, being unaware of the geographic similarities between the enemy and friendly force positions, anticipated that having attacked the target successfully 3 times XXXXX 01 knew where it was and could identify it again.
- (5) In this situation, the JTAC should have formally transitioned to Type 2 CAS. This would have made it clear to XXXXX 01 that the JTAC could not see the aircraft and was unable to conduct Type 1 CAS.
- (6) The JTAC procedures commonly in use in the operational environment fall below formal peacetime requirements owing to the increased levels of danger and pressure induced by enemy fire on the battlefield. This is particularly apparent in that the procedures for transitioning between Type 1 and Type 2 CAS are not routinely practised during training.

c. In relation to Event 3 (Failure to Use the Target Designator Diamond):

- (1) In the opinion of the Board, XXXXX 01 was sure he was looking at the correct target throughout his attack and hence considered the use of additional targeting information superfluous.
- (2) XXXXX 01 under-utilised his weapon system information and used visual cues only for the attack. Had he used the Target Designator Diamond he would have correctly identified the target. However, given his conviction that he was looking at the correct target, it is doubtful that he would have acted upon visual HUD cues had they remained visible.
- (3) The removal of the Target Designator Diamond is only relevant here because XXXXX 01 correctly identified the target location and cued his XXXXX onto it prior to rolling out on his final attack heading. Had he misidentified the target in the first instance, he and the aircraft systems would have both been incorrect and fratricide would have been even more likely.

d. In relation to Event 4 (WIGLEY Hit by Unexploded 20mm PGU 28 A/B Ammunition):

- (1) WIGLEY most likely died having been hit by a 20mm 'dud' round fired by XXXXX 01. There remains no conclusive evidence as to the exact damage mechanism for his injury, however it is unlikely that he received a direct hit otherwise his injuries would have been far greater. It is the opinion of the BOI that he sustained a glancing blow from a low-energy 20 mm 'dud' round which may have ricocheted off the ground prior to impact.

(2) It is highly probable that WIGLEY was dead prior to leaving the trench owing to the severity of the injuries he sustained. It is most likely that he would not have survived a wound of this nature regardless of the medical treatment available at the time.

(3) It is the opinion of the BOI that the quality and timeliness of the first aid WIGLEY received and the subsequent CASEVAC process were entirely adequate.

(4) It is not possible to say whether or not the carriage of a larger OSPREY plate in the rear of WIGLEY's body armour as opposed to the smaller protective plate that WIGLEY chose to fit for this operation would have provided sufficient protection to have saved him. It seems likely that, at best, the small rear plate only received a glancing blow on its edge and therefore did not make any real contribution to protecting WIGLEY. Had he worn the larger plate, it may have been hit more solidly and could have resulted in a different outcome but this can not be stated with any certainty.

(5) Given the mission, threats and conditions, it is the opinion of the BOI that WIGLEY was wearing appropriate protection for the task he was committed to on the day and that the medical and CASEVAC facilities and procedures were adequate for this operation.

## RECOMMENDATIONS

22. The BOI recommends:

- a. That a mechanism to mark friendly force positions either on the ground (when tactically feasible) or in the aircraft be developed. When not tactically feasible, enemy positions should be marked to differentiate them from friendly positions. A positive cross check of friendly and enemy positions should be made prior to each pass. (Source: Event 1.)
- b. That a lightweight electronic data transfer device is introduced to allow JTACs to pass 9-line briefs electronically. This should display both enemy and friendly force positions automatically on cockpit systems. (Source: Event 1.)
- c. That PJHQ with SME advice as appropriate conducts a review of in-theatre procedures. This should determine whether Type 1 CAS control is appropriate or whether procedures need to be amended based on operational experience and should also investigate the utility of the 9-line brief with regard to its applicability in current operational theatres with particular emphasis on the format by which friendly positions are passed to aircraft. Once the review is complete, appropriate training authorities in Air and Land Command should amend procedures if required and in any event, provide guidance to theatres to emphasise Type 1 control requirements. (Source: Event 1.)
- d. That Land and Air Commands reviews FAC/JTAC basic and combat ready, and PJHQ reviews in-theatre training with NATO to ensure more accurate



replication of realistic battlefield conditions. Training should include TIC exercises where enemy and friendly forces are operating in similar terrain and in close proximity and the FAC/JTAC is operating forward in the contact battle. (Source: Event 1.)

e. That Air Command and appropriate training authorities review JTAC training to include scenarios which require the JTAC to transition between Type 1 and Type 2 CAS and to practise Type 2 CAS procedures. (Source: Event 2.)

f. That aircrew should reference in-cockpit indicators as well as external visual cues prior to weapons release. Specifically for those aircraft which have a Target Designator Diamond, aircrew should not un-designate the target without positively cross-checking the aircraft information with their own visual cues. (Source: Event 3.)

g. That the Helmand UK Task Force should be informed that the in place Force Protection orders represent a pragmatic balance between protection and mobility and are supported. (Source: Event 4.)

23. BOI Opinion. It is the opinion of the BOI that the key players in this event XXXXX 01 and the JTAC acted in good faith throughout. Both acted with the best of intentions under very challenging conditions. The friendly fire incident was a tragic accident, which occurred in a highly charged environment where lives were at risk. Though implementation of all normal peacetime procedures should have prevented it, this was not peacetime. War is a very different environment, where risks must be taken to achieve one's aims. Perhaps the most telling statement is that of Z Coy Sgt Maj, who had wanted to send the aircrew of XXXXX Flight a message after the incident<sup>73</sup>. This was never actually sent but it was going to say that it had not been a good day at the office for any of them, but had the F18s not been there, they would probably have lost far more men that day.

<sup>73</sup> Telcon XXXXXXXXXXXXXXX of 22 Jun 07.

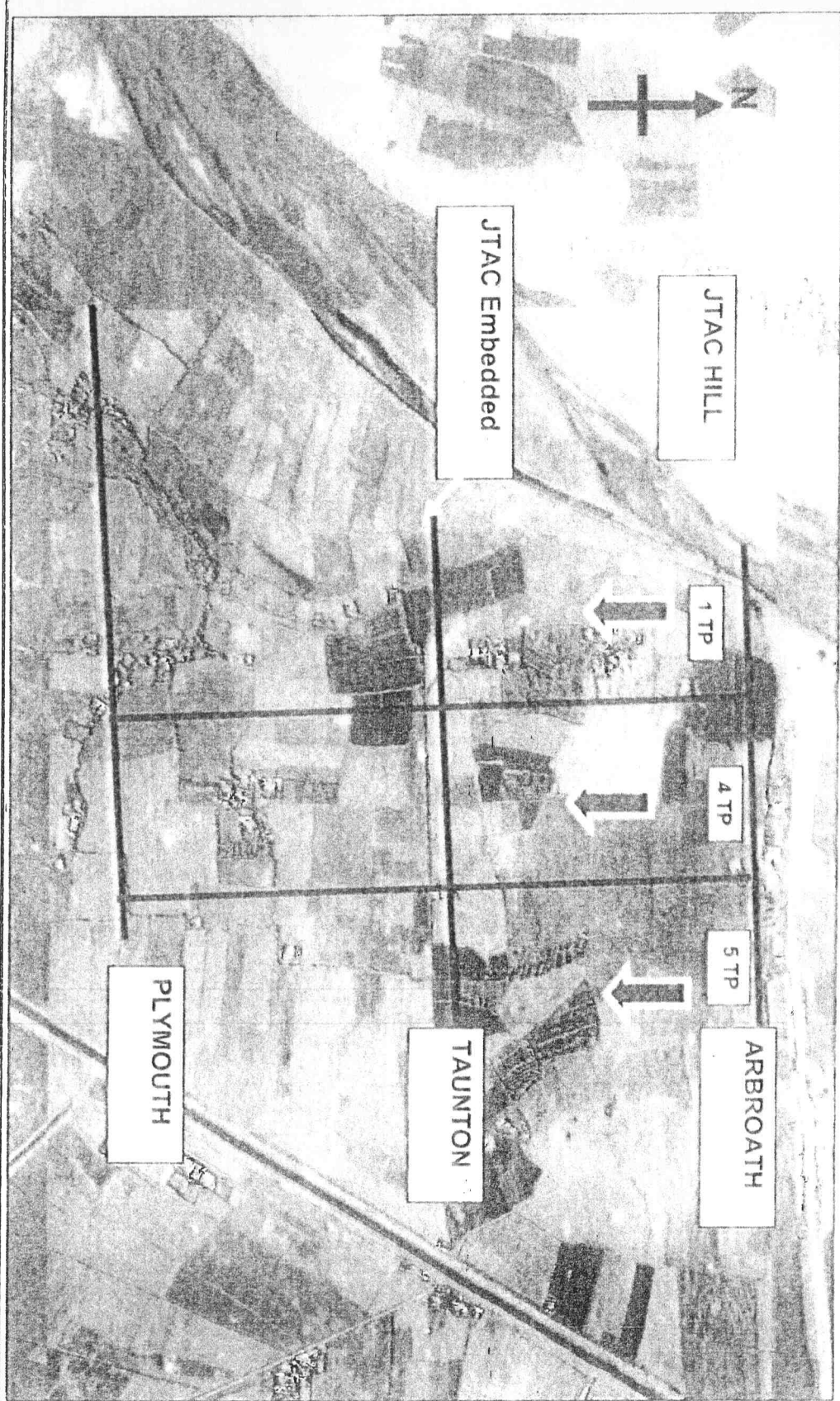
## Annexes:

- A. Aerial Photograph of Area of Operations.
- B. Aircraft and Equipment Descriptions.
- C. Timeline of Operations and Incident.
- D. Timeline of CASEVAC.
- E. Description of Aircraft Control.

## Enclosures:

- A. COMOPS Convening Order dated 22 Feb 07.
- B. Statement by Wg Cdr ~~xxxxxx~~RAF dated 22 May 07.
- C. 62 Section SIB RMP Crime Ref Number: 83187/06 dated Jan 07. (OC 62 Section SIB RMP Report)
- C-1. 62 Section SIB RMP Crime Ref Number: 83187/06 dated Jan 07. (OC 62 Section SIB RMP Report) (Witness Statement Mne ~~xxxxxxxxxxxx~~)
- C-2. 62 Section SIB RMP Crime Ref Number: 83187/06 dated Jan 07. (OC 62 Section SIB RMP Report) (Witness Statement Surg Cdr ~~xxxxxRN.~~)
- D. Forensic Pathology Services, Post Mortem Report by Dr ~~xxxxxxxxxx~~ BSc (Hons), MB BS, FRCPath, DipRCPPath (Forensic), dated 06 Jan 07.
- E. US CIB Report.
- F. Zulu Company CSM Nominal for period.
- G. JTAC Interview with BOI, dated 30 May 07.
- H. OC Zulu Coy interview with BOI, dated 30 May 07.
- I. Friendly Fire Incident 5 Dec 06, Brief to DCJO (Ops).
- J. OC JFACTSU interview with BOI, dated 23 May 07.
- K. IX Gp Watchkeeper's Log 05 0001L – 2359L Dec 06.
- L. Human Factors Report dated 11 Jun 07.
- M. DLO Publication – A Commander's Guide to General Service Ballistic Protection.
- N. Email Lt Col ~~xxxxxxxxxxxx~~ (SRM & PECOC RM) to Col ~~xxxxxxxxxxxx~~OBE, dated 30 May 07.
- O. 42 Cdo Baseline Op Order 001, dated 29 Oct 06 (incomplete).

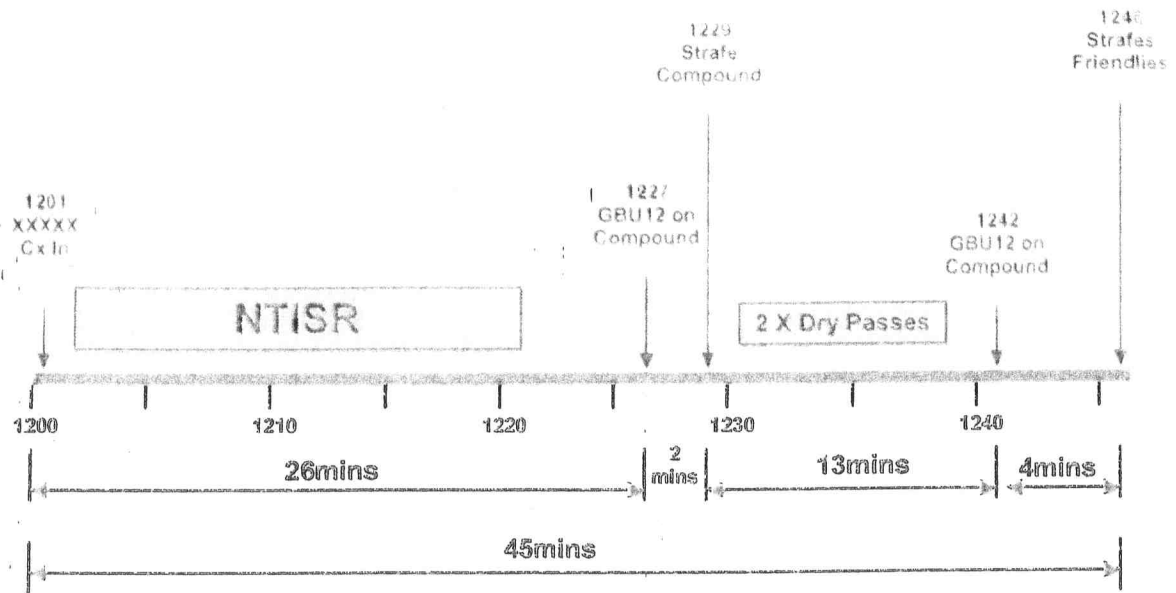
**AERIAL PHOTOGRAPH OF INCIDENT AREA**



ANNEX A TO  
FLEET/520/1/34  
DATED 25 JUN 07

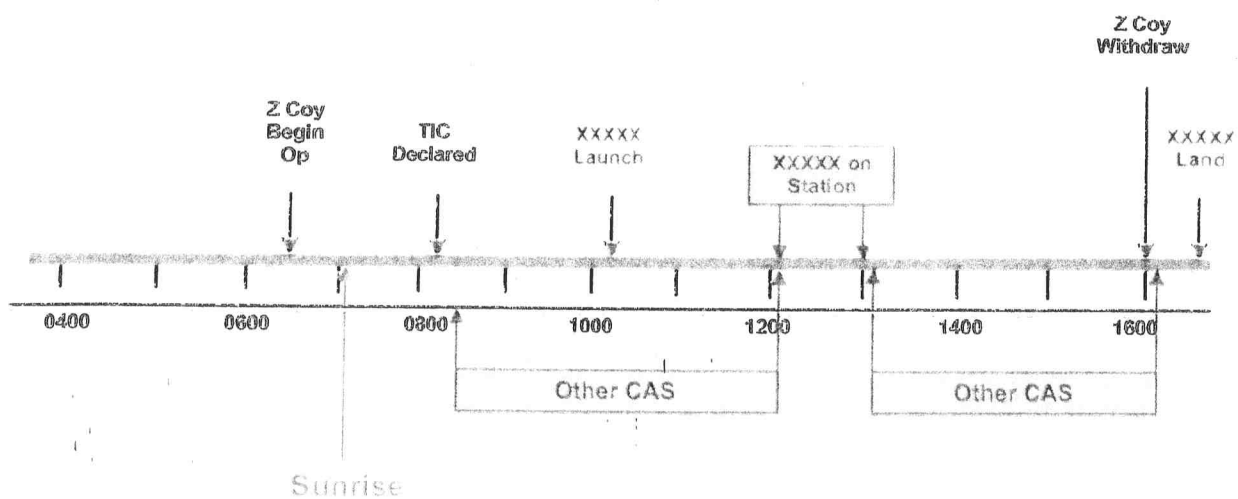
INCIDENT TIMELINES

*Small Scale*



All Times Local

# Large Scale

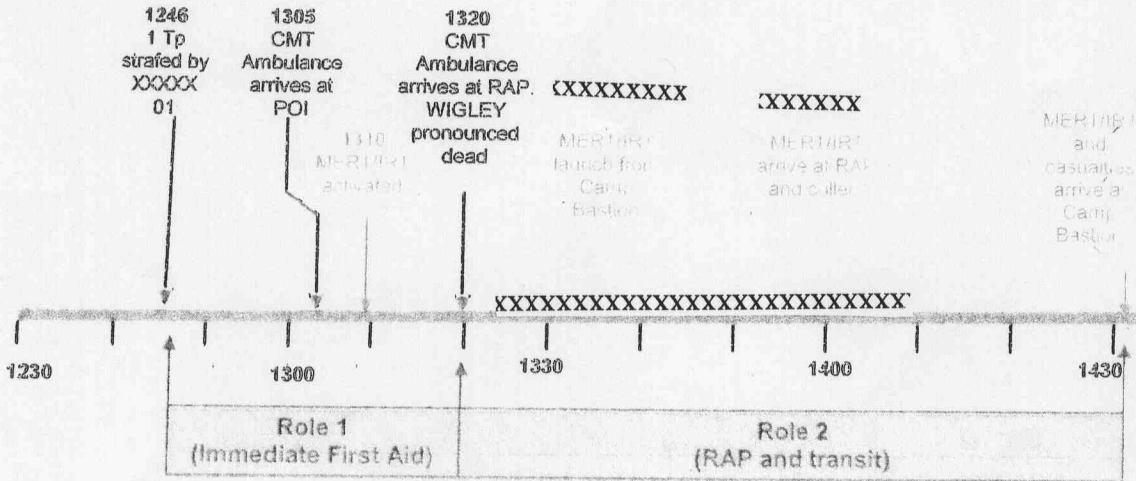


All Times Local

- **Type 1 control:**
  - JTAC visually acquires attacking aircraft and target for each attack
  - Analysis of attacking aircraft geometry required to reduce risk of fratricide
  
- **Type 2 control is used when the JTAC requires control of individual attacks:**
  - JTAC unable to visually acquire the attacking aircraft at weapons release and /or
  - JTAC unable to visually acquire the target and/or
  - Attacking aircraft unable to acquire the mark/target prior to weapons release

(Examples of when Type 2 control may be applicable are night, adverse weather, and high altitude or standoff weapons employment)
  
- **Type 3 control is used when the JTAC requires clearance for multiple attacks within a single engagement subject to specific attack restrictions.**
  - Only JTAC can provide Type 3 control
  - JTAC provides targeting restrictions then grants a "blanket" weapons release clearance ("CLEARED TO ENGAGE")
  - No requirement to visually acquire the aircraft or the target
  - All targeting data coordinated through supported commander's battle staff
  - JTAC monitors radio transmissions and other available digital information to maintain control of the engagement
  - JTAC maintains abort authority
  - Observers may be utilized to provide targeting data and target mark

**CASEVAC TIMELINE**



All Times Local

## EQUIPMENT AND ORDNANCE

1. F/A-18C Aircraft The F/A-18C is a single seat, twin engine, multi-mission fighter/attack aircraft that can operate from aircraft carriers or land bases. The F/A-18C conducts a variety of missions such as air superiority, fighter escort, suppression of enemy air defences, reconnaissance, forward air control, close and deep air support and day/night strike missions. The aircraft's fly by wire technology provides reliable and relative ease of control allowing the pilot to concentrate on employment of weapon systems. The F/A-18C employs a variety of air-to-air and air-to-ground general purpose and precision guided ordnance. The weapons system cuing information is integrated into cockpit displays such as head up display (HUD), digital display indicators and the helmet mounted cuing system through pilot selectable options.
2. M61a1 Vulcan Cannon. The F/A-18C gun system is the M61A1 20mm and carries up to 587 rounds of ammunition (i.e., PGU-27 [Target Practice], PGU-28 [Semi-Armour Piercing High Explosive Incendiary - SAPHEI]). The M61A1 gun system is capable of air-to-air and air-to-ground employment firing at a selectable rate of 4000 or 6000 rounds per minute.
3. Guided Bomb Unit-12 (GBU-12). The GBU-12 is a 500lb general purpose bomb with a laser guidance kit installed. After weapon release, the bomb guides on reflected laser energy. The target can be illuminated by the aircraft dropping the weapon, another airborne asset, or a ground based platform.
4. Guided Bomb Unit-38 (GBU-38). The GBU-38 is a 500lb general purpose bomb with a Joint Direct Attack Munition (JDAM) kit installed. The JDAM kit is a tail section containing an inertial navigation system and Global Positioning System (GPS) guidance control unit. The GBU-38 will guide to an entered coordinate upon release.
5. XXXX (XXXXX). The XXXXX duplicates much of the information available on the HUD. This allows the pilot to see aircraft performance, weaponry, target cuing and threat warning system information wherever the pilot is looking. In the air-to-ground mode, the XXXXX is used in conjunction with targeting sensors to accurately and precisely attack targets.
6. XXXX Forward Looking Infrared (XXXXX). The XXXXX was developed to acquire targets with improved recognition and at greater standoff ranges than existing systems. The multi-sensor, electro-optical targeting pod incorporates infrared, low-light television camera, laser rangefinder/target designator and laser spot tracker. Passive thermal imagery generates real-time television output with enhanced resolution that provides magnification of xXX versus previous FLIR capabilities at xX. These improvements produce a greatly increased standoff capability to detect and identify tactical targets day or night and in adverse weather conditions. The laser designator provides pinpoint illumination of the target for precision laser-guided weapons such as the GBU-12. The XXXXX is currently utilised only by the US Navy F/A-18C/D/E/F aircraft.