Operational Analysis in Support of HQ RC(S), Kandahar, Afghanistan, September 2007 to January 2008

T. J. Ramjeet

Defence Science and Technology Laboratory
Farnborough, Hampshire,
England, United Kingdom.
e-mail: tjramjeet@dstl.gov.uk

In 2006 Tom Ramjeet joined the Support to Operations Group of the Defence Science and Technology Laboratory (Dstl), an executive agency of the UK Ministry of Defence (MOD). As well as working with ISAF forces in Afghanistan, he has provided Operational Analysis (OA) support to the UK MOD Joint Service Command and Staff College in Shrivenham, Wiltshire. Tom holds a First Class honours degree in Mathematics and Physics from The University of Reading.

ABSTRACT

Hamid Karzai was elected President of Afghanistan in October 2004 following the fall of the Taliban but his country has faced sustained and determined resistance from a minority of individuals who are hampering the progress being made by NATO and the International Security Assistance Force (ISAF). The reconstruction and development of Afghanistan has been divided amongst five Regional Command Headquarters: North, East, South, West, and Capital.

A significant proportion of the insurgent activity in Afghanistan takes place in the Headquarters Regional Command (South), HQ RC(S)), area of responsibility which encompasses the Provinces of Day Kondi, Helmand, Kandahar, Nimruz, Uruzgan, and Zabul. Dstl has deployed civilian personnel to HQ RC(S) — on behalf of UK Ministry of Defence, under the name Operation HERRICK — to provide OA support since early 2007. The primary analytical support provided by the analysts during this time has been to support the HQs Campaign Effects Assessment (CEA) and the Intelligence branch; ongoing tasks conducted included polling analysis and statistical analysis of "significant acts" (SIGACTS).

The successful deployment of UK analysts in support of HQ RC(S) provides recent examples of analysis to support decision-makers on the front line and the context in which policy is being made, both in theatre and back in the UK.

BACKGROUND

Command of the ISAF mission in Afghanistan was initially rotated every six months to a different lead nation, but since 11th August 2003 NATO has taken indefinite command as it became increasingly difficult to sustain the six-monthly cycle. The ISAF expansion beyond Kabul consisted of four Stages. Stages 1 and 2 were the expansions to North and West

Afghanistan respectively; on 31ˢᵗ July 2006 Stage 3 (which involved taking control of the southern Provinces) was completed and in September 2006 authorisation was granted for the NATO-led ISAF forces to expand into the fourteen remaining Provinces in Eastern Afghanistan, which was successfully completed on 5ᵗʰ October 2006.

The divisional-level headquarters of HQ RC(S) is located at Kandahar Airfield (KAF) and is under the command of a two-star General; between May 2007 and January 2008 this duty fell to Major General Page of the British Army. At the time of writing a trilateral agreement exists whereby the command of HQ RC(S) rotates every nine months between British, Canadian and Dutch Forces.

Since April 2007 the Defence Science and Technology Laboratory (Dstl) has provided OA support to HQ RC(S) in the form of a two-man OA team split between the Intelligence (J2) and Operations (J3) branches but their analytical support has been used to support decision-making across the HQ.

Speed is paramount when delivering analysis to the military staff with deadlines ranging from 15 minutes to 24 hours. Simplicity is therefore key to ensuring work is delivered in a timely manner and yet can be understood by a multinational audience with a non-technical background. Much of the work conducted consists of *ad-hoc* tasks, meaning our methods have to be flexible to the range of demands. The OA used in-theatre differs greatly from the techniques seen in textbooks and academia but it is important to remember when reading this paper that time is a luxury the deployed OA teams seldom have. Given the sensitivity of the work, certain details have needed to be omitted from the Figures below.

THE WORK

A "contact" is defined as any engagement with the enemy, which could mean direct fire (DF), indirect fire (IDF) or an improvised explosive device (IED) strike. Contact analysis is one of the primary roles OA plays in the operational theatres of Iraq and Afghanistan and is the study of these enemy force (EF) engagements with the intention of identifying trend-setting and presenting findings to the relevant military staff so that these trends can be exploited.

THE SIGACTS DATABASE

The main data source used was the so-called "SIGACTS Database", held at HQ RC(S). The term "SIGACTS" (Significant Acts) covers a variety of events including instances of intimidation against local nationals, warnings of potential violence or (as was most common) a contact between the EF and ISAF Forces. All SIGACTS in the Region which are reported to HQ RC(S) are entered into this database. For each SIGACT particular information was recorded to allow the OA team to perform a range of analysis. Some essential items included:

- Time of the incident.
- Date of the incident.

- Location (District / Province / Grid reference, where possible).
- Type of Incident (Intimidation, Threat Warning, EF Attack, etc.).

The staff officers at HQ RC(S) within the intelligence branch were one of the great advocates of OA and would occasionally seek to use this capability to investigate more complex problems. While all work is done with the best data to hand, the analyst would inform the staff when more comprehensive analysis could have been conducted if certain additional data had been collected. This has led to a steady improvement in the quality of information reported by the troops on the ground to HQ RC(S). The following examples serve to provide the reader with an insight into the support that the Author provided to coalition forces in my role as the operational analyst in the J2 branch in HQ RC(S).

EXAMPLE ONE – ATTACKS ALONG THE ROAD NETWORK IN RC(S)

OA was asked to assess the threat posed by EF along a main supply route in RC(S) based on the last 4 months of information. The particular road in question cuts a path of 200 miles across the Region so submitting a comprehensive threat assessment within 24 hours was an impossible task. To deliver by the deadline a quick analysis of the route was conducted to identify clusters of points, which would indicate significant enemy activity. One such area was found on the route, highlighted with the ellipse in the figures below. The locations of the enemy-initiated attacks were plotted, with each month's activity represented on a separate slide.
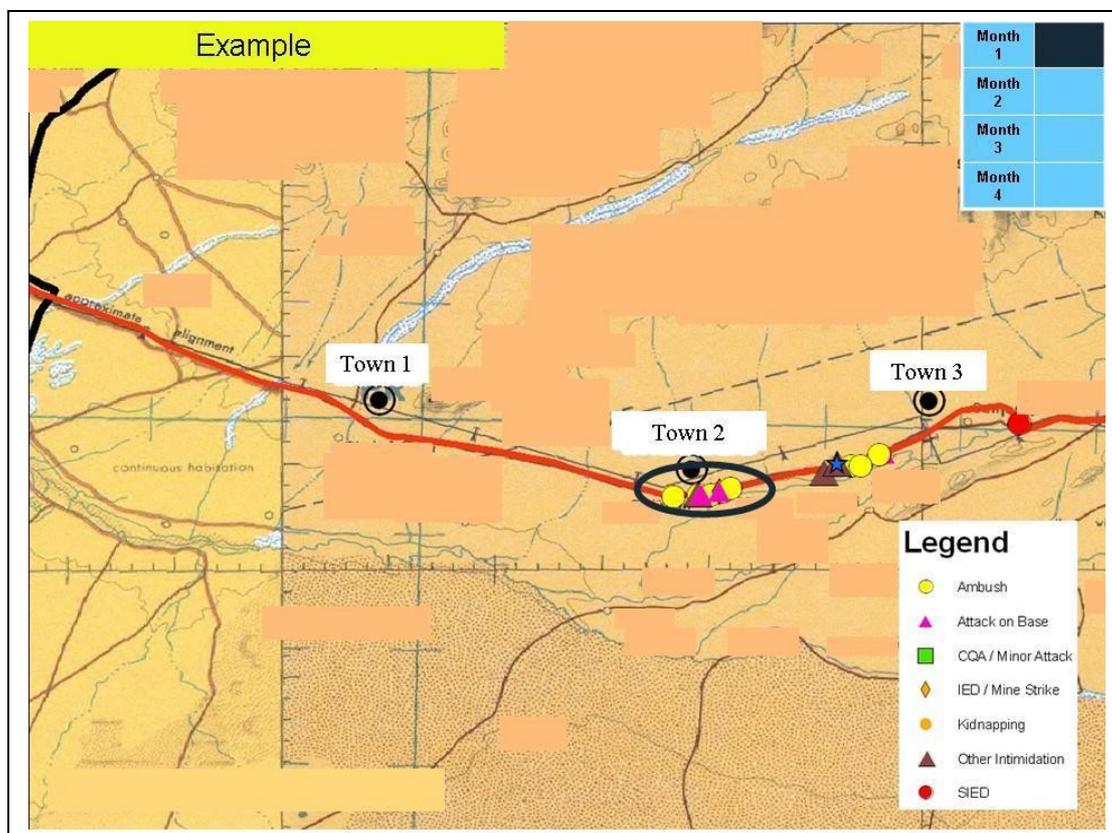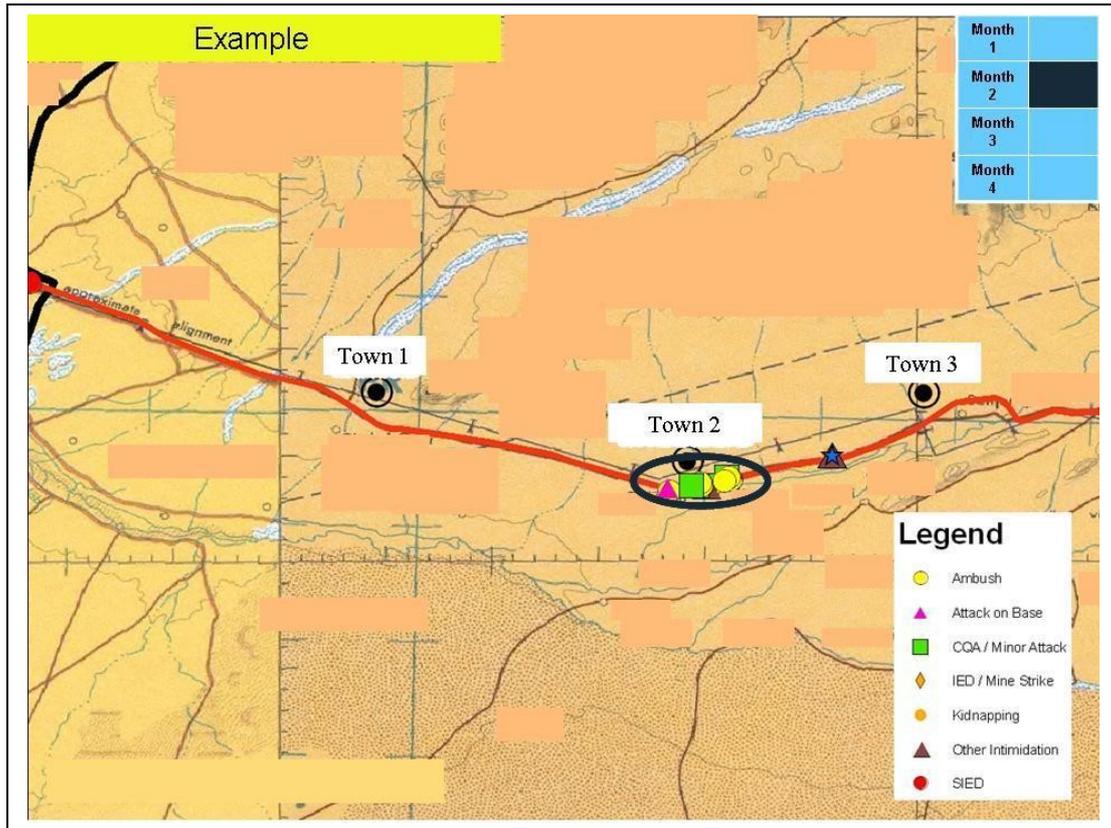

Figure 1: Example 1— Month 1.

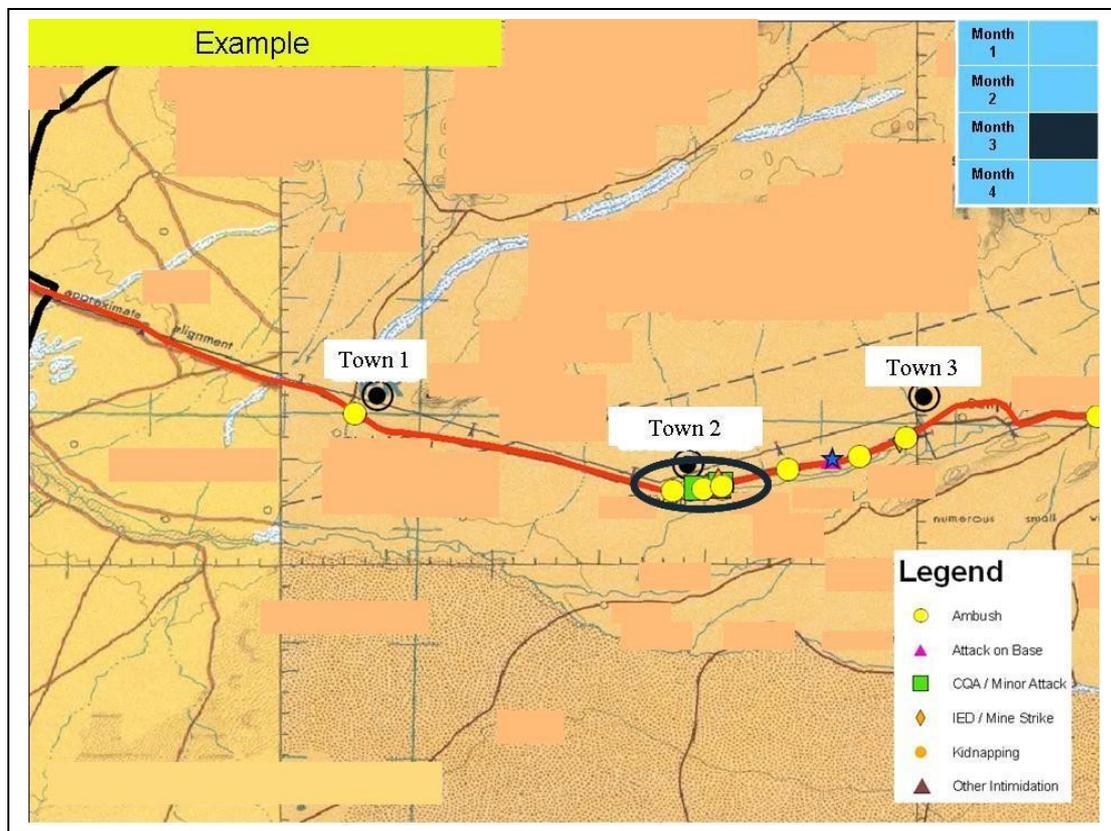*Figure 2:* Example 1— Month 2.

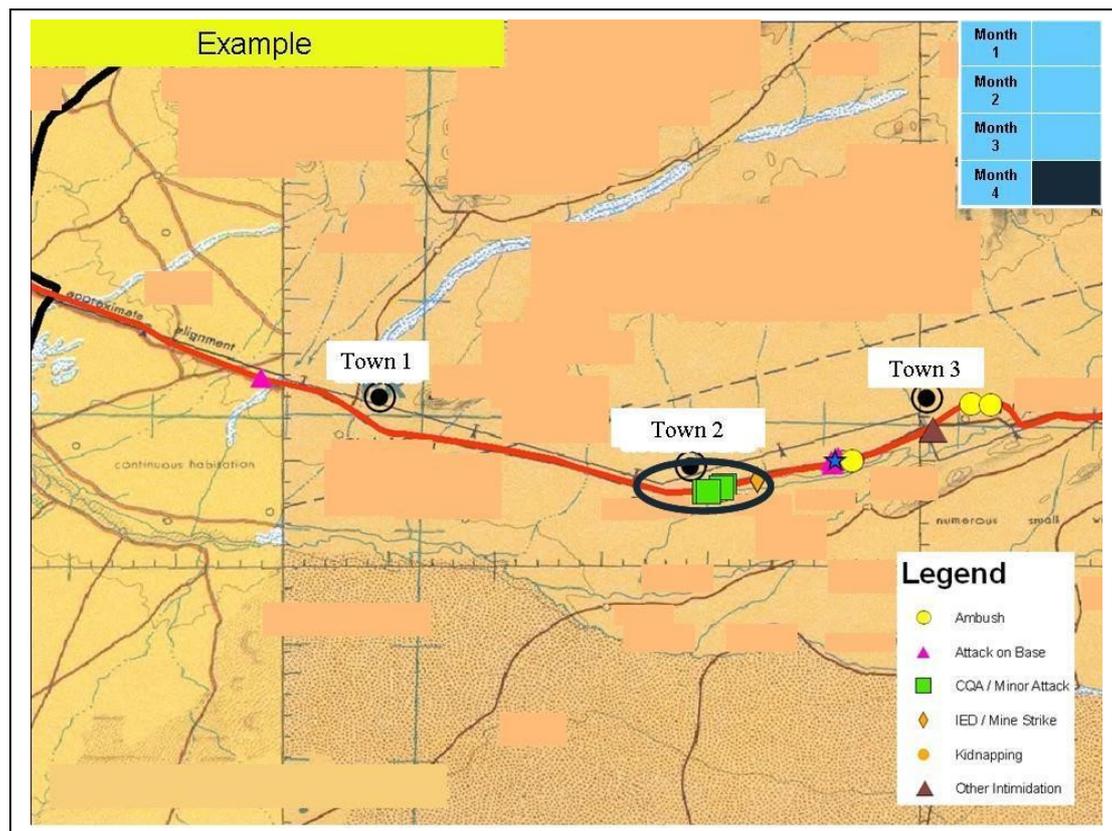*Figure 3:* Example 1— Month 3.

Figure 4: Example 1— Month 4.

The high concentration of enemy activity to the south of Town 2 in this example was not an isolated finding. Indeed, numerous analyses performed by OA on this section of the route consistently showed that the area posed a high threat to coalition personnel and as a result observation posts were erected in this location in an attempt to counter the threat. The Figures above were created with ArcGIS; it was a simple and yet effective means of presenting our analysis.

A similar approach was applied when the Royal Military Police (RMP) Special Investigation Branch requested analysis in support of the Coroner's inquest following the death of a British serviceman whilst travelling in a military convoy. The RMPs requested analysis of EF activity around the section of road where the soldier had been killed in the months leading up to his death but given the sensitive nature of this particular task, the RMP didn't disclose the impact of this work. However this wasn't the first time they had approached OA for assistance which would imply it is seen as a valued asset when conducting such investigations.

EXAMPLE 2 – IDF ATTACKS

IDF (i.e. rocket or mortar) attacks against KAF are a common occurrence and pose a constant threat to personnel on KAF. Consequently, any possible trend-setting OA can establish is highly-valued. A variety of work is done on the topic however of most interest to the HQ is the analysis on the following.

- •   Identifying the most likely time for an attack.
- •   Determining the favoured location to launch an IDF round.
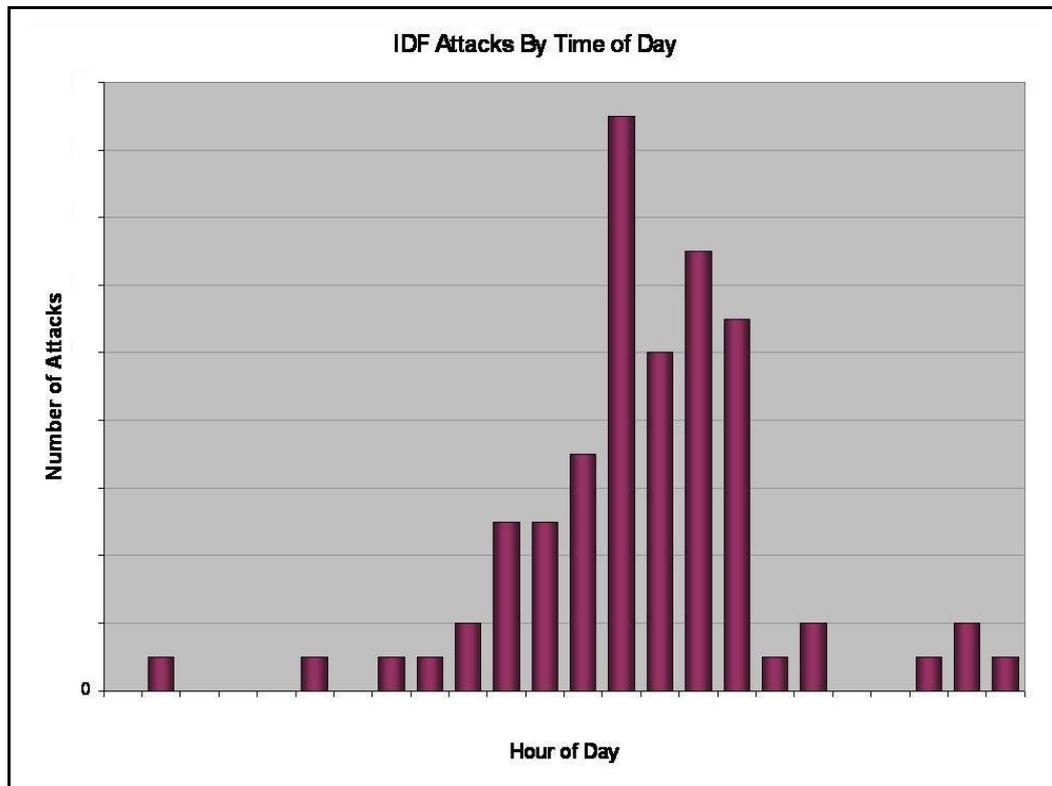

Figure 5: An example of where simple analysis can be used to identify enemy trend-setting.

Combining these two pieces of analysis proved a useful tool for Force Protection who would deploy sniper teams in suspected launch areas at the most high-risk times based on our assessments.

EXAMPLE 3 – ESTIMATING ENEMY AMMUNITION USAGE

The commander of RC(S) (COM RC(S)) wanted to understand the logistic requirement for EF to sustain its level of attack against his forces. The proposed solution was for OA to estimate the level of EF ammunition consumption which would inform COM RC(S) on the level of re-supply required by the enemy.

Initial planning on the task was conducted to determine what factors would affect ammunition expenditure during a contact and then OA set about collecting the relevant data. Unfortunately only part of the data requirement was recorded in the SIGACTS database:

- •   Contact type (Ambush, attack on base, friendly-force initiated attack, etc).
- •   Duration of contact.
- •   Number of positively-identified enemy fighters in the contact.

However to complete the task OA required information on the number of small-arms fire (SAF) rounds and rocket-propelled grenade (RPG) rounds each fighter expended during a contact. Given this task was time-critical, OA had to fill in these gaps of data with assumptions based on discussions with military staff.

For each contact type assumptions were made on following aspects of enemy fighter participation.

- Number of SAF and RPG rounds expended when the contact is initiated.
- The amount of time the enemy spends firing, as a proportion of the contact duration.
- Proportion of EF using small-arms fire (SAF), rocket-propelled grenades (RPG) and IDF.

Based on information in the database and the assumptions drawn up with the assistance of military staff, OA delivered an estimate of enemy ammunition consumption. Figure 6 illustrates one piece of the analysis presented to Major General Page, Commander of RC(S).
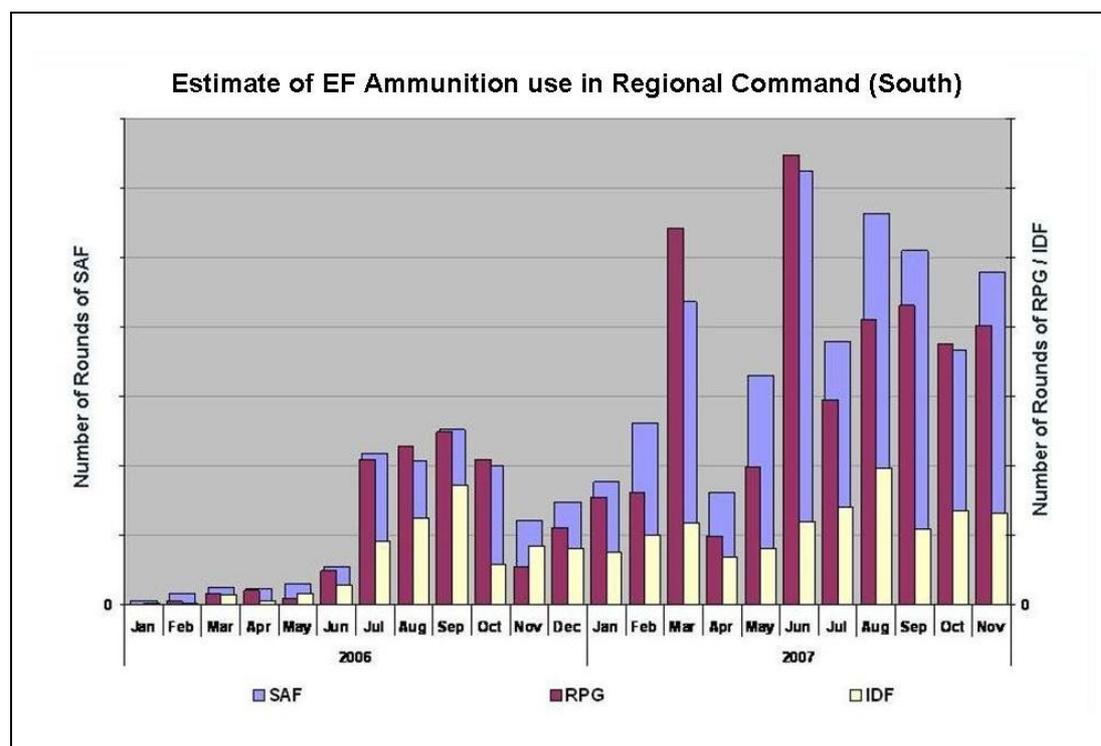

*Figure 6:* OA's answer to estimating the logistic demands on EF.

Given that this work was based largely on assumptions, these results were appropriately caveated. Indeed, it was important to advise the military staff that the graph in Figure 6 be used solely to observe the <u>trend</u> in EF ammunition consumption and focus less on the absolute figures in the graph.

COM RC(S) was very impressed with the quality of the work given the time pressure and requested regular updates of Figure 6 in the months that followed.

EXAMPLE 4 – IED TRENDS

ISAF forces transport their equipment and supplies around Afghanistan through two means: air and road. However the limited number of operational air frames means much of the movement is done using the latter which is constantly under threat from IEDs which are placed along supply and patrol routes with the aim of disrupting coalition activities. Our work on IED attacks attempted to identify trends in the following areas.

- Type of IED employed: Radio-controlled, RCIED / victim-operated, VOIED / vehicle-borne, VBIED / command wire, CWIED etc.
- Location.
- Seasonality. Preferences towards certain types of IEDs will (to an extent) be dictated by the amount of rainfall and by temperature.
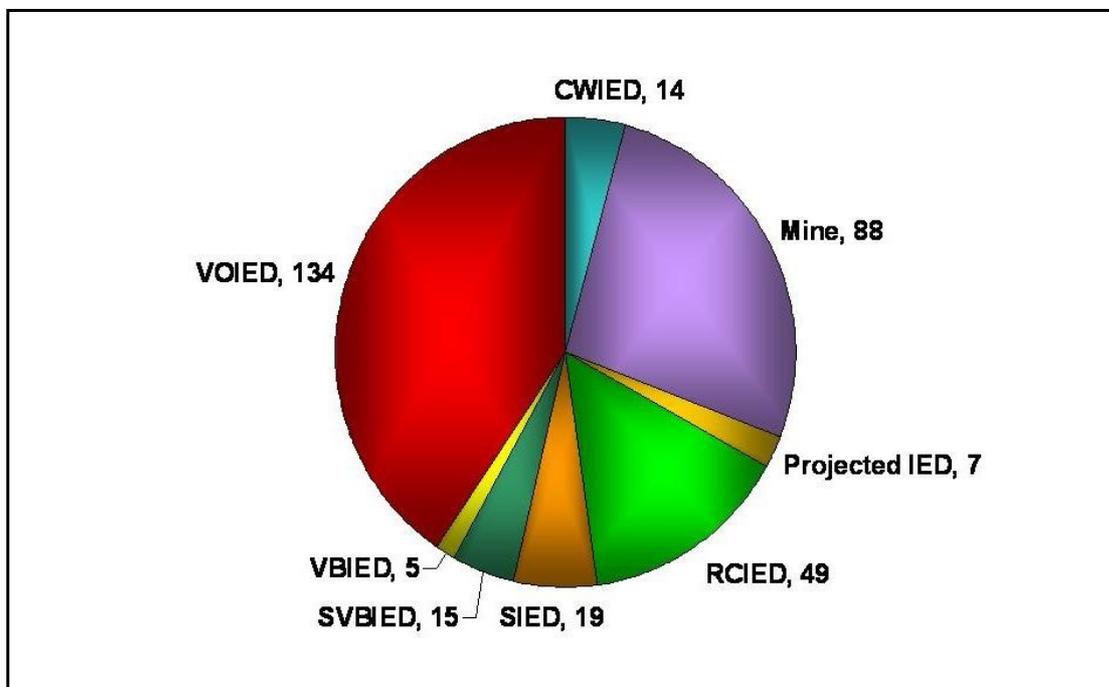
Figure 7: Illustrating IED usage in a single 6-month period. (CW = Command Wire, RC = Radio Controlled, S = Suicide, SVB = Suicide vehicle-borne, VB=Vehicle-borne and VO = Victim-operated).

It was regularly presented throughout the HQ including the UK Scientific Advisor (SCIAD) and representatives from counter-IED (C-IED); the latter used this work to validate their own assessments of IED activity in the Region and regularly sought OA expertise.

EXAMPLE 5 – DOES THE MOON PHASE INFLUENCE
THE FREQUENCY OF ATTACKS AT NIGHT?

This work was conducted as a background task as it was investigated purely due to the collective curiosity among personnel within the HQ, the Author included.

To complete the task the Author had to satisfy the basic metrological data requirement for any given day,

- What time was first light?
- What time did night begin?
- What was the phase of the moon?

The metrological office at HQ RC(S) kept a record of the moon phase each night expressed as a percentage (i.e. 0% = New Moon and 100% = Full Moon). It also listed the daily start and end of nautical twilight[1] which was used to define the beginning of day and night respectively.

The SIGACTS database recorded the start time and end time of an incident so contacts with the enemy which didn't begin at night could be filtered out with relative ease. Contacts occurring at night were then grouped by type (IED Strike, Ambush, Attack on Base, etc.) and then for each type they were grouped by the percentage moon illumination during the contact. (0% - 10%, 11% - 20%, 21% - 30%, etc). The findings are presented in Figure 8.
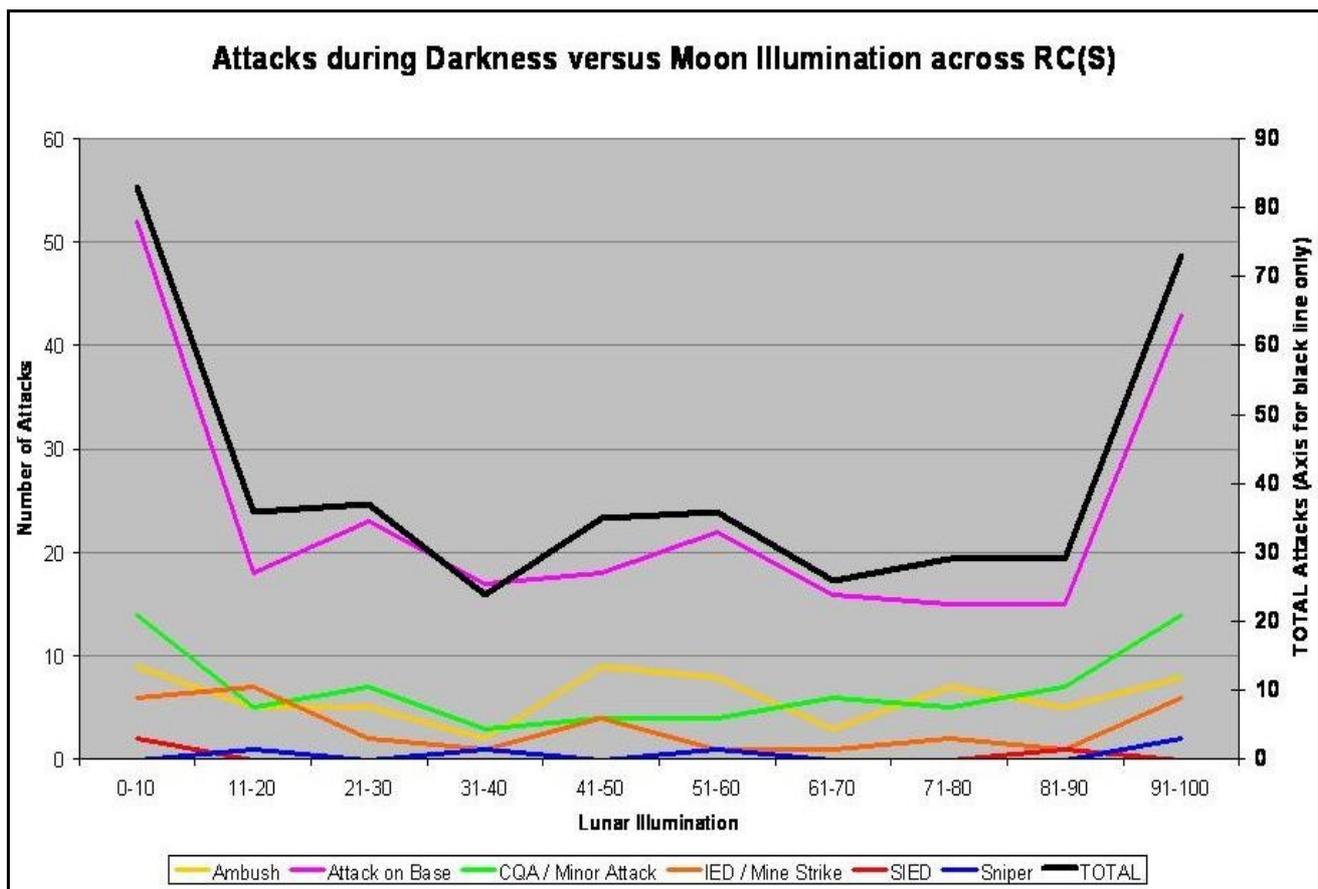

Figure 8: The moon's influence over EF activity, based on 9 months of data.

---

[1]   At the beginning and end of nautical twilight the Sun is 12° below the horizon but the general outlines of objects are still distinguishable. This is seen by military planners as more suitable than the traditional concept of bounding darkness times between sunset and sunrise.

The sharp rise in attacks when the lunar illumination is low wasn't much of a surprise to those to whom I presented the work because this allows the enemy to launch an attack under the maximum amount of cover giving them the best chance of survival. However the spike in attacks during the full moon was unexpected and no reasonable explanation could be determined at the time. As illustrated on the graph, two types of enemy attack exhibit peaks at both extremes of illumination: attacks on bases (Pink line) and Close-Quarter attacks (Green line).

The reader may be thinking there are additional factors which weren't taken into account when conducting the study. This is true; cloud cover is perhaps the first one which springs to many minds. The information almost certainly exists to conduct a more comprehensive study but when analysts deploy to support operations they learn to manage and prioritise their own work loads and at the time no further effort could be spent on this work.

LIVING CONDITIONS

In comparison to the conditions at the Forward Operating Bases (FOBs) and Patrol Bases (PBs) in Afghanistan, the standard of living at Kandahar Airfield was comfortable. HQ RC(S) staff shared a room with, at most, 3 other people and the wash facilities – which were more than adequate – provided a seemingly plentiful supply of running water.

The US-built gym was very well equipped and proved an essential escape for analysts wishing to spend some time out of the office which frankly is essential to preventing mental fatigue.

At the end of September temperatures were still reaching 35°C during the day but as the country entered winter, it became gradually cooler. Just before Christmas 2007 however temperatures dropped unexpectedly and seldom reached 6°C. In the weeks that followed, personnel at Kandahar Airfield were also subjected to heavy rain (the first rain for many months) and even snow!

Welfare facilities on base allowed UK personnel to contact friends and family by telephone. The weekly allowance was 30 minutes but more time could be bought if required. Internet access was also available but the number of computers providing this service was limited.

WORKING CONDITIONS

One of the first aspects analysts are informed of prior to deployment are the long hours. During the Author's tour the sheer volume of work meant 14-hour working days weren't uncommon and such a demanding routine was required from the analysts 7 days a week.

The HQ was air-conditioned which meant the OA team's productivity was seldom affected by the temperature outdoors and bottled water was in ample supply to prevent dehydration.

Secure email and voice communication with colleagues back in the UK was reasonably reliable and there were addition means of making contact if the matter was less sensitive.

CONCLUDING REMARKS

The OA team at HQ RC(S) was considered a highly-valued asset by those staff officers who were able to witness first-hand the work we do. A secondary task for every analyst Dstl deploys to theatre is to "sell" the concept and importance of OA to those military personnel who are unfamiliar with our role and who are unfamiliar with the concept of having civilians embedded in a military headquarters. The OA staff are after all representing Dstl and are selected to deploy to theatre for our interpersonal and communication skills just as much as their analytical ability. It is because Dstl select people on this basis that OA continues to succeed in supporting the military in operational theatres and on exercise.

ACKNOWLEDGEMENTS