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# UBIQUE

# the Gulf War

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UBIQUE is the journal of the Canadian Military Engineers. An authorized publication of the Canadian Forces, it is distributed twice a year by the Director General of Military Engineering Operations. It is published to provide information of professional importance to Military Engineers, as a forum for the exchange of ideas and opinions, and as a common unifying influence for a branch of diverse backgrounds and interests.

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**Rédacteur** Capt D.J. Gould, SO/DGMEO
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## Table of Contents

# BRANCH ADVISER'S COMMENTS

Col Charles Keple, CD DGMEO

The theme of most of this edition of UBIQUE is the Canadian Military Engineer contribution of the Gulf War. There were several good reasons for this selecting this theme. Some of the CME's most interesting stories in 1991 came from the Gulf deployments. Most CME members want to learn as much as possible from that operation. And the participants themselves would like the recognition of their peers for their accomplishments.

I would like to use the theme for some other reasons. Many aspects of the Gulf operations are perfect examples of the CME as a whole, such that by studying the CME in the Gulf, we can all understand ourselves better. For example, the absence of contingency plans for that specific scenario, plus several major equipment deficiencies or rusty capabilities, could well apply to many potential CME missions. The fact that we responded so well is evidence of our real strength, our people. People brought together personal resourcefulness, a diversity of skill and experience, and innovative leadership to surmount the unforeseen challenges. Whether we like it or not, we will always have materiel shortfalls or voids in our plans, and we will always risk being *"blind-sided"* by crises. Our CME ability to respond in a timely effective manner will depend on our ability to maintain high standards of training, and to mobilize and exploit the breadth of experience in all our members. Given the current CF reductions and budget constraints, we must become even better at developing and maintaining individual skills and knowledge. Personally, I've always had reservations about *"performance oriented training"* which imposed minimum standard which could be taken to extremes. I feel that the Gulf success demonstrates the need for more *"should know, could know"* training, which gave the member optional and theoretical knowledge reminiscent of the *'good old days'*.

The Gulf operation, like Op DECIMAL in Pakistan, and like hundreds of other engineer successes had that special unrecognized quality that is too often another *"invisible hallmark"* of CME activity. Military Engineers spend so much time producing, and so little time grandstanding, that it's no wonder that nobody knows what we've done and thus, what we can do. It has taken the UBIQUE editor the better part of a year to collect the CME Gulf story, because the authors were already busy at their

# REMARQUES DU CONSEILLER DE LA BRANCHE

La plus grande partie du présent numéro de la revue UBIQUE est consacrée à un thème, soit la contribution des ingénieurs militaires canadiens à la guerre du Golfe. Nous avons choisi ce thème pour plusieurs raisons. Signalons que certains des plus intéressants articles rédigés par des membres de la Branche en 1991 portaient sur les opérations menées dans la région du golfe Persique. La plupart des membres de la Branche veulent tirer le plus de leçons possible de ces opérations. En outre, les participants voudraient bien que leur contribution soit reconnue par leurs pairs.

Ce thème convient pour d'autres raisons encore. De nombreux aspects des opérations menées par les ingénieurs militaires canadiens dans le Golfe reflètent parfaitement les fonctions remplies par la Branche de façon générale; en se penchant sur ces opérations, nous pouvons donc mieux connaître notre propre rôle. Il se peut en effet que les ingénieurs militaires soient appelés à remplir d'autres missions où ils ne disposeront pas des plans nécessaires et de tout le matériel adéquat. Si nous avons été aussi efficaces pendant la crise du Golfe, c'est grâce à notre personnel, qui constitue notre véritable force. Les ingénieurs militaires ont fait preuve d'initiative et de leadership, et ils ont su tirer parti de leurs compétences et expériences de travail diverses lorsqu'ils ont été confrontés à des événements imprévus. Quoi que nous fassions, nous ne posséderons jamais suffisamment de matériel, nous aurons invariablement à combler les lacunes de nos plans et nous risquerons toujours *d'être dépassés* par les événements en temps de crise. La capacité de la Branche d'intervenir de façon efficace et opportune dépendra de sa capacité de maintenir des normes d'instruction très élevées, ainsi que de mobiliser tous ses membres et de tirer profit de leur expérience très diversifiée. Dans le contexte des restrictions budgétaires et des réductions effectuées au sein des FC, nous devons trouver le moyen de mieux assurer l'acquisition et le maintien des compétences et des connaissances individuelles. Pour ma part, j'ai toujours douté de la valeur de la méthode de *«l'instruction axée sur le rendement»*, qui est fondée sur le respect de normes minimales et qui peut parfois être poussée à l'extrême. Je suis d'avis que le succès des activités exercées lors de la crise du Golfe fait ressortir la nécessité d'axer

next assignments. At some point, I believe that we must do a little better at apportioning our time, and deliberately make time to publicize our achievements and to share our collective experience.

The size of the CME Gulf deployment was also typical, in that it was absolutely vital to the overall mission, yet it was relatively small, small enough to be overlooked by most writers. Much of the CME capacity there was never fully tapped, for example, there is no doubt that for Op SCIMITAR and Op SCALPEL, the CME force could easily have provided or augmented area security. There's also another aspect to being *"first in — last out"* which again relates to lack of recognition. The horrendous "post-war" EOD challenge and restoration operations are too easily dismissed as somehow *"non-combat"*. Not only are such post-war operations an absolutely inseparable part of any conflict, but in many cases (including the Gulf War) they can be even more dangerous. There have been almost 300 disabling accidents to allied EOD teams since the war, including 67 deaths to date. The fact that not one CME member has been lost, even though Op MAGNOLIA and Op RECORD handled record volumes of munitions, is a tribute to the exceptional calibre and superb performance of CME members there.

I invite all members of the CME family to hoist in such lessons, and to take pride in our CME comrades, who by their excellence have brought great honour to the CME and to all of us. *Chimo!*

davantage l'instruction sur les connaissances supplémentaires et théoriques, comme c'était le cas dans le «*bon vieux temps*».

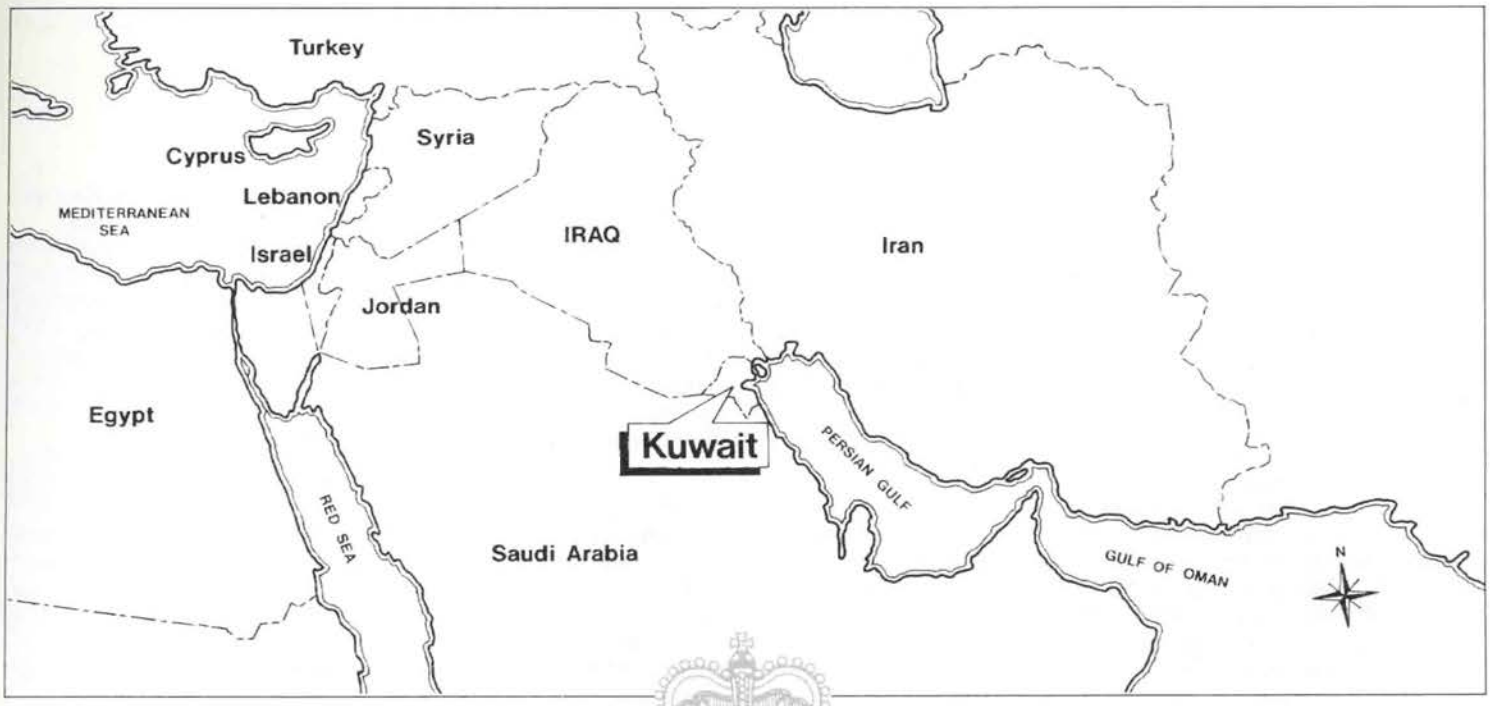
Tout comme l'opération DECIMAL, menée au Pakistan, et des centaines d'autres activités exercées par la Branche, la mission du golfe Persique est caractérisée par un degré de qualité très élevé, mais non reconnu; c'est là l'une des caractéristiques des travaux des ingénieurs militaires canadiens, qui passent *souvent inaperçus*. Ces militaires travaillent tellement et se vantent si peu que personne ne sait au juste ce qu'ils font et ce qu'ils peuvent faire. Le rédacteur d'UBIQUE a dû attendre plusieurs mois avant de recevoir tous les articles sur la contribution des ingénieurs militaires lors de la guerre du Golfe, puisque les auteurs des articles en question avaient déjà été affectés à d'autres missions. À un moment donné, je crois que nous devrons faire un effort pour consacrer un peu plus de temps à la rédaction d'articles, afin de faire connaître nos réalisations à nos confrères et de partager avec eux notre expérience.

La présence de l'équipe d'ingénieurs militaires était absolument essentielle au succès de la mission remplie dans la région du golfe Persique. Toutefois, cette équipe était relativement peu nombreuse; il s'ensuit que la plupart des articles publiés n'en faisaient pas mention. Une grande partie des ressources du génie militaire canadien qui étaient sur place n'ont pas été pleinement utilisées; il ne fait aucun doute que, dans le cadre des opérations SCIMITAR et SCALPEL, par exemple, l'équipe du génie militaire CANADIEN aurait très bien pu assurer ou accroître la sécurité dans le secteur. Par ailleurs, il arrive souvent que le travail d'une équipe ne soit pas reconnu à sa juste valeur lorsqu'elle est la «PREMIÈRE ARRIVÉE — DERNIÈRE À PARTIR». On réduit trop souvent l'importance des opérations de neutralisation des explosifs et munitions et les opérations de restauration en affirmant qu'il ne s'agit pas d'activités *de combat*. Cependant, les opérations menées après la fin de la guerre constituent non seulement une partie intrinsèque du conflit, mais, dans bien des cas, elles comportent encore plus de risques que les activités exercées en pleine crise. Depuis la fin de la guerre, près de 300 accidents ont occasionné de graves blessures chez des membres des équipes de neutralisation des explosifs et munitions des alliés; à ce jour, 67 personnes sont décédées dans le cadre de ces opérations. Le fait qu'aucun ingénieur militaire canadien n'ait encore perdu la vie dans l'exercice de ses fonctions au Moyen-Orient, en dépit du nombre incroyable de munitions qui ont été manipulées au cours des opérations MAGNOLIA et RECORD, témoigne du calibre exceptionnel et du rendement hors pair des ingénieurs militaires qui se sont rendus sur place.

Nous devrions tous tirer profit de l'expérience acquise par les autres ingénieurs militaires canadiens et être fiers d'eux, puisqu'ils font honneur à chacun d'entre nous. *Chimo!*

# LETTER FROM THE EDITOR

# LETTRE DU RÉDACTEUR




This special edition UBIQUE is a collection of experiences from all the different areas the Canadian Military Engineers were involved. From the initial planning and recce of a desert home for Canadian Air Contingent through direct support of allied engineers (British), to clean up of ordnance after the war, the Canadian Engineers displayed their flexibility, versatility and professionalism throughout the operation. Known as the "Doosers" (those who do) by the Comd of CATGME, the Engineers proved to be invaluable assets in not only supporting air operations but as members of the Ops team.

The spring '92 edition of UBIQUE will have a new look. The CME Newsletter will be combined with the UBIQUE and will not only include articles of a technical nature but will incorporate announcements, awards presentations. A history corner where interesting articles on the history of the Military Engineers will also be featured.

**Capt Darwin Gould**
Editor

Cette édition spéciale de l'UBIQUE est une collection d'expériences de tous les différents endroits où le Génie Militaire Canadien a été impliqué. À partir de la planification initiale et la reconnaissance d'une demeure pour le contingent aérien jusqu'au support direct des ingénieurs alliés (Britannique) pour ramasser et désamorcer le matériel de guerre laissé par l'Iraq, les Ingénieurs canadiens ont démontré leur flexibilité, versatilité et professionalisme d'un bout à l'autre de l'opération. Connus sous le nom de «Doosers» (Faiseurs) par le commandant de CATGME, les Ingénieurs ont prouvé qu'ils ont fourni une contribution importante lors des opérations aériennes dans le golfe Persique en temps que partie intégrale de l'équipe.

L'UBIQUE aura une nouvelle allure au printemps '92. Le CME Newsletter sera combiné avec L'UBIQUE et contiendra non seulement des articles d'une nature technique mais incorporera des annonces et des présentations. Un coin sera aussi réservé pour des articles intéressants sur l'histoire du Génie Militaire Canadien.

**Le capt Darwin Gould**
Rédacteur

# OPERATION FRICTION
## AIRFIELD ENGINEER TRAINING

**by Captain A.C. Lovett, CME**

In December 1990 Air Command was given the task of providing Rotation Two of the Airfield Engineer Detachment (AE Det) as part of the Canadian Air Task Group Middle East (CATGME) at the Doha, Qatar airbase.

With the experienced Air Command Readiness Challenge Team in existence, it was decided to use it as the nucleus of the AE Det rotation, with augmentees as required to fulfil the mission. The 23 person rotation was comprised of one MILE Captain, one MS tech, two str techs, one PG ftr, two electns, two RM techs, two EGS techs, three WSP techs, one CEP tech, five fire-fighters, one field engineer, and two heavy equipment operators.

Rotation Two was scheduled for March 1991, giving the team two months to prepare for its mission to support air operations under hostile conditions.

As part of the team's training, arrangements were made with the United States Air Force to allow the Air Command team to undergo base recovery after attack (BRATT) training at the Air Force Engineering and Services Centre training site at Eglin AFB, Florida. This training is a week long exercise where 200-person USAF Prime Base Engineer Emergency Force (Prime BEEF) team takes over host nation's facilities, prepares the airbase for attack, defends the base, and then recovers it after an attack.

The training site at Eglin AFB is comprised of two concrete runways and a group of permanent training and administrative buildings. The site is equipped with everything required to support an airbase including: crash rescue vehicles; aircraft arrestor gear; airfield damage repair equipment; reverse osmosis water purification units (ROWPUs); and portable airfield lighting systems.

The Canadian team of 30 personnel (23 rotation two personnel plus seven spares), deployed from 27 January to 2 February 1991. The team combined with an Air National Guard 150-person Prime BEEF team from the 189th Civil Engineering Squadron (CES), Little Rock AFB, Arkansas. The Canadians were each given positions within the 189th CES's organization corresponding to their trade. These included positions on the rapid runway repair team, power production team, fire fighter crews, water production teams and in other groups.

During the first few days of the exercise, as the scenario was building up for the attack, the training cadre provided instruction in areas such as: the use of specialized equipment (eg. aircraft arrestor gear and ROWPU); rapid runway repair techniques; NBC attack warning signals and personal drills; and unexploded bomb identification. Rapid runway repair methods taught were the concrete slab, folded fibreglass mat and AM-2 mat.

The latter part of the exercise was spent recovering the airbase, while under changing levels of chemical threat. The majority of resources were spent establishing a minimum operating strip. This included repairing three craters that were explosively blown in the runway.

On completion of the BRAAT training, the Canadian team travelled to CFB Trenton to undergo a week of NBC and small arms training. CFB Trenton provided two NBC instructors who gave detailed training in personal drills and NBC tasks the team might be expected to carry out in Qatar. During the training the instructors contacted the NBC unit in Qatar to ensure the training satisfied the requirement.

During the second last day of training, firm dates were received for the rotation in Qatar. The dates had been moved up a few weeks with the rotation scheduled over a six week period starting 14 February. The first five personnel scheduled to go into theatre had six days to return to their home-unit and get to CFB Lahr for staging into Qatar.

With the abrupt end to the war at the end of February, Rotation Two was stopped after the first three chalks. Of the 23 Air Command personnel scheduled for the AE Det, nine made it into the theatre of operations.

# Prelude to **OP Magnolia**

**by Major M.G. Fraser**

My boss had interrupted the final meeting between myself and the Command element of the AIRCOM Engineer rotation into Qatar so I knew it had to be important. It was finally happening! After five months of on again off again, my deployment to the Persian Gulf was assured.

In my position as Staff Officer Construction Engineering Operations in AIRCOM HQ, I had been involved from the start with AIRCOM's role as a support Command to Op Friction. In October 1990, I had been chosen as the J3 Engr to the Commander of Canadian Forces Middle East (CANFORME). I was to report to Kingston for one week of training prior to deployment. Before that could happen, the recce party signalled back that an Engr was not necessary and for the next seven weeks I remained on 24 hours notice to move. In December, I was tasked within AIRCOM, to develop and coordinate the training of two rotations of AIRCOM Engineers into Qatar (Roto 2 and Roto 3). However, months later, I found myself racing to the Middle East before them.

On 24 Feb 91, I reported to CFB Kingston for pre-deployment trg as part of the now well-greased CANFORME HQ SOPs. This was the second day of the air war. All was a go until the afternoon of 27 Feb when we were placed on hold due to President Bush's call to cease hostilities. Another period of waiting came and went until I was told to report to NDHQ for a J3 Ops meeting on Friday 1 Mar.

At this meeting, I was directed to immediately go to CANFORME HQ in Bahrain with the objective of providing Military Engineer support to Kuwait, if appropriate. As I packed my kit and flew out to Ottawa on 3 Mar, I mentally reviewed what the CME could do. The spectrum of support we could provide ranged from EOD to construction, fire fighting to geographical support, 1 CEU specialties to combat diving. I could only imagine the possibilities of *"selling"* these services in a country ravaged by seven months of brutal occupation.

My bubble was soon burst when my reception in Bahrain was summed up by *"Hello, we're getting ready to go home and you're too late!"*. With respect to timings, they could not have been more wrong. Yes, a J3 engineer throughout the war would have undoubtedly aided the cause, but Maj Dan Kelly may have actively fulfilled those duties albeit from a subordinate unit to the HQ. The fact is that the expression *"First in — Last out"* can denote a burst of activity at the start and end of an operation, particularly an operation with naval vessels and an airfield "Beyond conventional threat".

In any event, I was *"Last in"* as all rotations were now frozen. If there was military engineer work to do, I had to find it and then convince the Commander and the DCDS that we should continue Op Friction despite the end of the war. From 5 to 10 Mar, I contacted all Coalition military engineer organizations. The result was that additional assistance in Kuwait would be greatly appreciated, but little detail was known other than by those who were in Kuwait. Time spent on recce was definitely needed! With information from DMEO 2, LCol Sweeney, I made contact with the Middle East and African Project Office (MEAPO) of the US Army Corps of Engineers. They had dispatched the Kuwait Emergency Restoration Operation (KERO) into Kuwait City immediately after the liberation, but direct communications with KERO was not yet possible. MEAPO suggested we formally offer damage assessment skills to the Pentagon to augment KERO. In fine concurrent engineer activity, 1 CEU was placed on standby to provide three-man damage assessment teams within a maximum grouping of 25 personnel. The needles were given and personnel assembled, but a response from the Pentagon was not received before NDHQ J3 Ops and Commander CANFORME authorized a recce to Kuwait City. Finally, in the early hours of 12 Mar, I found myself in a Herc, flying into Kuwait city with my boss, LCol Daniel Pepin of R 22e R and currently J3 Land CANFORME, MWO Dale Melville, Camp Sgt Major in Qatar, my former field troop recce Sgt, Cmdr Kavanaugh, J4 Med CANFORME, and two RCR Company staff from A1 Jubayl.

Our mandate was to determine the necessity and feasibility of deploying up to 300 Military Engineers and/or the 1 Cdn Field Hospital to assist Kuwait. Within a day, we had determined the hospital was unnecessary as only 25% of the pre-war population remained in Kuwait City (almost 100% of the Kuwaiti population normally resides in Kuwait City) and the already returned medical staff could handle the load.

Engineering support was a very different matter! Although I was still in search of KERO (finding anyone in this empty and devastated city was a challenge), we were steered by Embassy staff (who has arrived 2 days previously) to BGen Mooney, Commander of the 352nd Civil Assistance Brigade of the US Army Corps of Engineers. He was exactly the right man as KERO and most Coalition restoration forces fell under his Op Con. The bigger picture was that MGen Frix, US Army, was Commander of TASK FORCE FREEDOM and as such, the Coalition Commander responsible for essential services restoration and essential explosive ordnance disposal (EOD) within Kuwait City. Later that day, we attended BGen Mooney's daily status briefing (2 hours in length!) and essentially were *"task shopping"* as all military activities in Kuwait City were presented to the BGen. Unfortunately, it became painfully obvious that KERO consisted of multiple 3-man damage assessment teams, which included a civilian contractor! The approach KERO was using was for the two military personnel to determine the scope of work and the contractor to offer an

immediate fix. In a country were tendering is unknown, we were emphatically advised that there was no room for our generous offer of assistance. I was not looking forward to going back to Winnipeg with 25 guys in 1 CEU who were given gamagobulin shots for no reason!

The one task that shone through as requiring assistance that the CME could enter into as an equal was EOD. A joint EOD centre was being formed to maximize the use of combined engr intelligence and MEDEVAC and to coordinate EOD efforts throughout the city. Ten hours after arriving in Kuwait City, I found myself tentatively accepting a 20-square kilometer sector of the city for a Canadian area clearance operation. The task would involve clearance of abandoned ordnance and coalition dropped cluster bombs. It was very encouraging to note that CME EOD expertise was immediately accepted by the US Army, US Air Force, British Army, RAF and French Army personnel. Although Commander CANFORME recommendation and DCDS approval would be another 48 hours away, preparations began to house, feed and brief a CME contingent of 23 personnel.

The briefing to Commander CANFORME on 13 March (he flew to Kuwait City and met us in the Canadian Embassy) outlined the three EOD tasks that TASK FORCE FREEDOM had identified as follows:

**a.** Minefield clearance on beaches around the city;

**b.** Area clearance of especially *"dirty"* sectors containing abandoned ordnance and air dropped munitions; and

**c.** City wide response to requests for EOD outside the sectors covered in **(b)** above.

Commander CANFORME accepted the recommendation to complete area clearance as per **(b)** above in the *"Canadian"* sector and provide a duty EOD team as per **(c)** on a rotational basis with the other coalition members. The Commander and the recce party immediately returned to Bahrain by the CANFORME Challenger and submitted the recommendation to the DCDS by msg at 2300 hrs local time. Approval, complete with operation orders, were received exactly 24 hours later and OPERATION MAGNOLIA was a go.

The operation was to be manned by in-theatre pers with the objective of fielding 5 three-man EOD teams with a minimum of one HC qualified team leader and an HA qualified *"number 2"*. The third team member did not have to have EOD trg as he was the safety man, but all team members were military engineers. One of the three-man teams included MCpl Emil St-Coeur, a former artilleryman and now a fire-fighter from Summerside/Qatar. Supervising the teams were a Troop Commander, a senior Fd Engr Sgt, HC qualified, a MCpl Ammo Tech, a Rad Op, an Adm Clk and Fd Engr drivers. The pers were drawn from 2 CER pers deployed to Al Jubayl, Saudi Arabia to run ROWPUs, EOD qualified Fd Engr from CFE Airfield Engineer Squadrons and 4 CER to support Qatar Airfield Ops and augmentees from CANFORME HQ. I was the operation controller on behalf of Commander CANFORME. The initial mandate was to perform area EOD clearance for 30 days with a view to a second period of 30 days. Lt (now Capt) Keith Mills led this operation with excellent leadership and results.

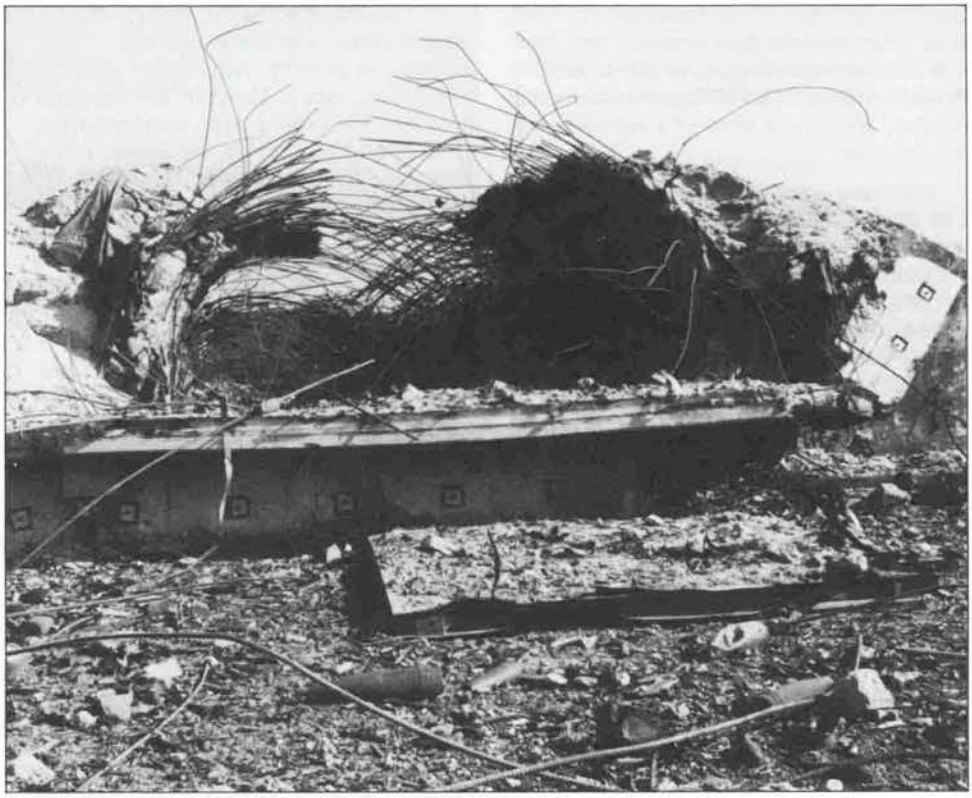
The story of OP MAGNOLIA is recorded elsewhere in this issue, but I must leave you with the back drop of events around this hazardous, but well-practised type of task. Kuwait City at this time had no power, water or governmental organization. One of the four oilfields burning was approximately 2 miles from the Canadian sector, causing a completely ominous blackening every 4 or 5 days for 24 to 48 hours. Members of OP MAGNOLIA were shot at numerous times. Unloading of ordnance declared safe was hazardously done by a Kuwaiti organized work force. Recovered ordnance was being stolen in the night by unknown elements despite Kuwaiti assurances of safekeeping and most dishearteningly, Palestinians were being sought out and executed by Kuwaitis. Throughout this operation, the members of OP MAGNOLIA were highly professional and able to maintain a level of morale and esprit de corps well above their Coalition comrades.

I now pick up the thread of this story at the end of OP MAGNOLIA. Commander CANFORME had visited the troop on 27 Mar to determine if the op should be extended past 16 Apr to 16 May (the second 30 day period). As part of his deliberations, the Commander met with MGen Frix who was personally eager to remove his Task Force. This was due to the high possibility of a civil war and/or establishment of a Kuwaiti dependence on TASK FORCE FREEDOM services. The Commander subsequently received permission to end OP MAGNOLIA *"as soon as our task to clear the Canadian sector is complete"*. On 8 Apr 91, OP MAGNOLIA ended and the CANFORME EOD Troop returned to Bahrain for a very well deserved rest with minimal duties until the airlift to Germany and Ottawa on 17 Apr. The Troop was met in Ottawa by senior branch members and proudly returned to their home units.

MCpl Boutilier places charges next to unexploded cluster bombs. Oil fire in the background

# OP MAGNOLIA

**by Capt K.J. Mills,**
**Doctrine Troop, CFSME**



The remains of a Kuwaiti munition bunker destroyed by allied bombing

*"First in, last out"*, the motto of the Engineers. The first to deploy to the Persian Gulf the sappers were also the last to leave. While the rest of the Canadian Forces in the Gulf were preparing to head home, a troop of Field Engineers were heading north to Kuwait City. Waiting for the sappers was the gruelling task of cleaning up the munitions left behind by the fleeing Iraqi army. The twenty three man troop was to become Canada's contribution to the multinational team's explosive ordnance disposal (EOD) clean up of Kuwait. The troop became part of Task Force Freedom, the American led effort to restore essential services and a sense of normality to the war torn country.

The troop wasted no time in getting to know their area of operations. The first two days were spent conducting extensive recces of Sector 10, the Canadian sector. Sector 10 was a 25 square kilometre area in the southern part of Kuwait City. Sgt Charlie Ralph (of 4 CER) quickly determined that there was enough work for at least a couple of weeks. The sector was an industrial park, but also included a horse racetrack, a stable complex, a hospital, a Kuwaiti military barracks and an ammunition depot. The area was also littered with Iraqi defensive positions and anti-aircraft artillery emplacements. Many buildings contained vast quantities of still unopened ammunition, but loose munitions such as grenades and RPG rounds were littered everywhere.

The work was not easy. The soldiers were often crawling through dark filthy trenches feeling for booby traps, knowing full well that any mistake could be fatal. These trenches had also become home to stray dogs and cats which Spr Rob Douglas (of 2 CER) found out to his great surprise. There is some question as to which of the two, Spr Douglas or the cat, was more frightened as both fled the dark trench after stumbling upon each other. The other team members were too busy laughing to tell for sure. These trenches usually contained loose, unused munitions that were collected and destroyed. Although no booby traps were found in the Canadian sector, several were discovered by American troops in other parts of the city, so the soldiers knew the threat was real.

The sheer magnitude of this task soon became evident. Within the first week the troop had collected approximately 10,000 cases of unused munitions ranging in size from 5.56 mm to 152 mm artillery rounds. The engineers then discovered another threat, several open areas littered with unexploded cluster bombs from the coalition bombing of Kuwait. Tiptoeing through these fields was nerve racking to say the least. Combat stress was a real factor. The nature of EOD work is stressful in any situation but, working in war torn Kuwait under the black smoke-filled skies made stress a constant factor that team leaders had to watch for.

Task Force Freedom was a collection of the EOD efforts of six countries. The United States, United Kingdom, Canada, France, Saudi Arabia and Kuwait all contributed to the EOD cleanup. The city was divided into sectors, each given to a different nation. The French and Saudis undertook the dangerous task of removing the minefields from the beaches around the city. The American, British, French and Australian navies combined forces to clear the waters, around the various Kuwaiti ports, of sea mines.

The Canadians lived with the Americans in Camp Freedom, a warehouse complex just south of Kuwait City. The basement of a warehouse full of school supplies quickly became the new home for the troop. After hours activities were limited, a deck of cards, the American's VGR and telephone calls to home were usually how the evenings were spent. Eight telephones were set up downtown and the Kuwait government paid all the costs as soldiers from all nations stood in line for hours to call home for 10 free minutes. The lack of evening activities encouraged the Canadians to get to know the soldiers from other countries, conversation became the best way to pass the hours. The usual trading of momentos and articles of uniforms reached a feverish pace during the last few days.

Kuwait City was black. During the night, only those areas with their own generators had light and the skies during the day were often blacker than night due to the smoke from the

burning oilfields. This darkness at night was often pierced as tracer rounds for .50 cal and other machine guns (MG) filled the skies. The Kuwaitis considered random MG fire a form of harmless celebration.

There were signs of what life was like during the Iraqi occupation, and it was not pleasant. All around the racetrack area were the corpses of horses, some which had clearly been senselessly tortured. The buildings which the Iraqis occupied were littered with half rotten food and human waste.

On 27 March 1991 the troop was visited by Commodore Summers, the Commander Canadian Forces Middle East (CANFORME). The Comd came to look at the work being done and to decide on a recommendation as to how long the troop would stay in the country. After meeting with the senior American and British EOD personnel the commodore visited Sector 10 to watch the troop in action. He was suitably impressed by the job being done and proceeded to award two promotions. Newly promoted MCpl Bedard of AES Baden and Cpl Warner of FMCHQ can tell their grandchildren they were promoted in a war zone.

As the end of the tour approached, the troop realized it had saved the best for last. In the southeast corner of Sector 10 were the remains of five Kuwaiti ammunition bunkers that had been bombed by the allies during the war. What had once been five reinforced concrete hardened shelters were now little more than rubble. The munitions that had been stored inside were now broken, burned, buried and generally scattered in all directions and mixed in with the debris from the structures. The entire troop spent its last three days sweeping through the remains inch by inch and disposing of the last of the munitions in Sector 10.

Besides the cleanup of Kuwait City, the EOD troop provided assistance to the Canadian Embassy and its staff while in Kuwait. Most of this assistance came from MCpl Downey (CFB Cold Lake) and his Mobile Repair Team crew who spent most of their days repairing embassy vehicles and maintaining generators while remaining on call for the troop's vehicle maintenance requirements. Amazingly, for the entire time in Kuwait none of the four Iltis'or 5/4 ton trucks required repair nor recovery.

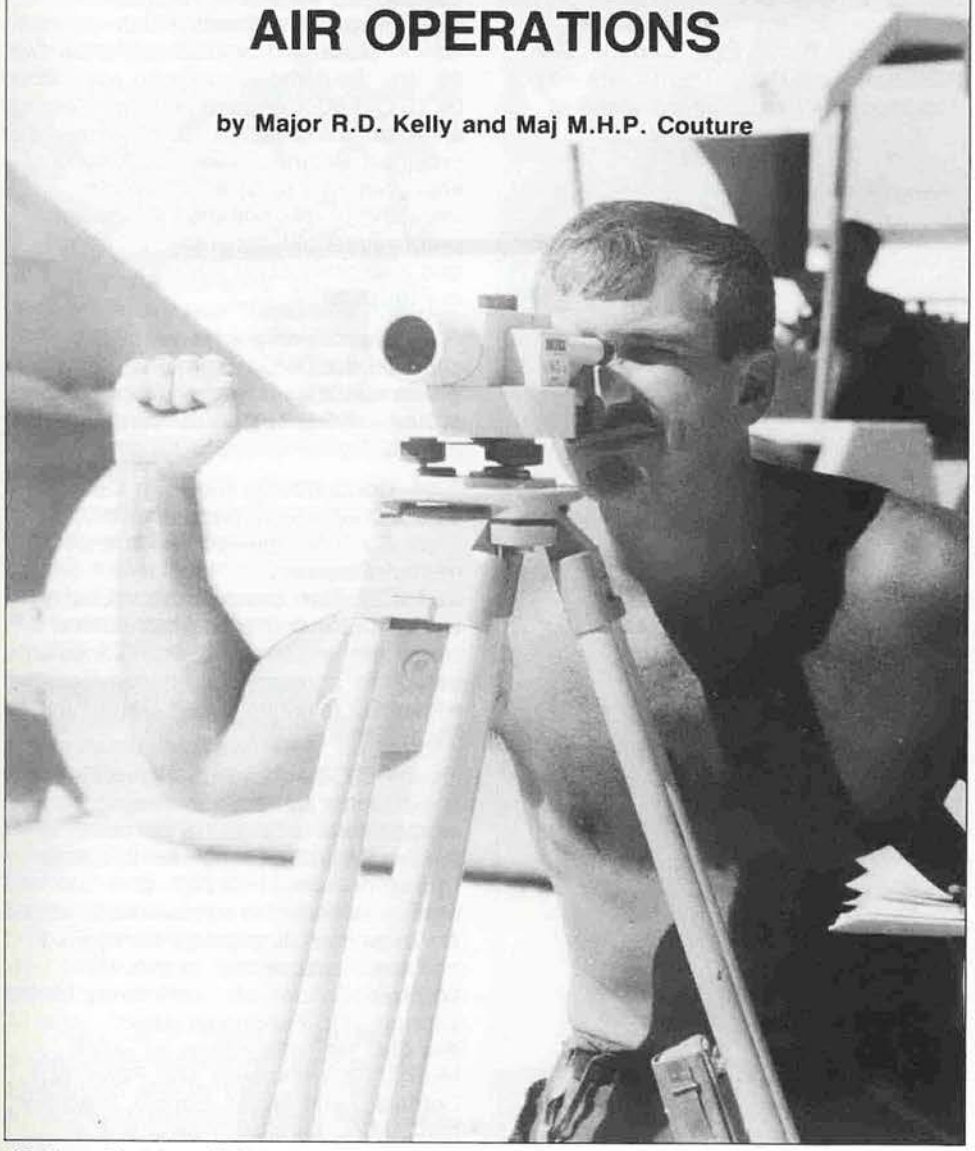
The task now complete, the sappers took a day to clean the vehicles (trying to remove the oil caked on everything), pack up their kit and to say their goodbyes. The next morning saw the final upload of the weapons and munitions being returned to Canada, the removing of the Canadian flag from the front of the camp and the departure for Bahrain. The troop would spend five days in Bahrain taking the opportunity to relax, shop and have a beer before returning to Germany and Canada on 17 April. For all involved it was an experience they will never forget.

MCpl Bedard inspects munitions

Sgt Patterson clearing a dug in AMMO bunker

# ENGINEER SUPPORT TO **AIR OPERATIONS**

**by Major R.D. Kelly and Maj M.H.P. Couture**



WO Marty Coté from CFB Lahr surveyed and produced the only drawings of CD1 and CD2 with great detail.

## Background

Shortly after the beginning of the crisis between Iraq and Kuwait in August 1990, Canada committed itself to participate in a multi-national air defence effort to ensure compliance with United Nations sanctions, and exercise pressure on Iraq in an attempt to see them withdraw from Kuwait. The results are history, however little has been documented on the efforts of the Engineers in Qatar supporting the Canadian Air Task Group Middle East (CATGME) in providing them with facilities, works, and utilities to live and operate in theatre. This article will highlight the major engineering challenges and lessons learned during the deployment phase of Operation SCIMITAR/FRICTION.

## Planning

CFE was tasked in late August 1990 to develop a contingency operation plan for deployment of up to 18 CF-18s for a period of 30 days to the Middle East. The Command Engineer Staff, BCEO Lahr, AEO Baden and SO AE for 1 Air Div HQ started contingency planning for a variety of possible situations with the worst case scenario being an austere tented accommodation and work area complex beside an airfield somewhere in the desert. Envisioned taskings included water supply, power generation, sewage disposal, refrigeration, air conditioning, lighting, field defences, camouflage and concealment, and camp complex set up. Concurrently, the stores and equipment to accomplish these tasks were sourced and personnel were selected for the Engineer Detachment and given refresher training in all aspects of Essential Services Repair, weapons and NBCW.

Doha was finally selected as CATGME's desert home and a recce party deployed to Qatar on 27 Sept 90. This recce confirmed and redefined the scope of work required for operations to be carried out. It also provided the necessary information for the engineers at Lahr and Baden to establish priorities for stores and equipment to be loaded in the initial chalks for the engineer work necessary to set up facilities.

## Establishment

An Airfield Engineer Detachment (AE Det) covering the spectrum of Engineer MOCs, made up of personnel from AE Baden and Lahr, was formed to support CATGME.

The designing of the AE Det for this operation was influenced by the foreseeable taskings, manning restrictions and the assumption that airfield engineer support for recovery operations would be provided by in place host nation or USAF resources. **Figure 1,** showing the sustainment engineer establishment, was adjusted during the deployment phase for front end work and during the sustainment phase as Essential Services Repair, EOD and fire, crash and rescue responsibility changes within the Multi-National Force at Doha. The major lesson learned in striking the right balance, within manning restrictions, was to design an organization for the planned establishment and to have a trained shadow or replacement establishment ready for deployment. While engineers are always busy, the essential work for this operation was front-end loaded. Both the established and the majority of the shadow organization, confirmed by recce, were then deployed on 04/05 October 1990. After the set up of facilities and utilities an AE Det tailored for the taskings stayed in location and the remaining personnel, in the shadow group, were returned to Lahr and Baden.

## Construction

Once deployed, the initial challenge for the AE Det was the establishment of accommodations and working facilities for the Air Task Group. To make this challenge more demanding the AE Det could not send an advance party and

no host nation support was provided for accommodations and working areas, except a shared hangar with the USAF Squadron. Three main sights and a number of miscellaneous structures were developed.

The first priority of construction was for a Command Complex to provide work areas for the Task Force HQ, AOC, SOC, Group Ops, Comms, Sec, NBC and Adm Dets. This facility was designed to fit an allocated piece of desert and constructed out of prefab air conditioned trailers. A contract was let on 30 Sept 90 and half of this complex was in place and operational by 08 Oct 90, with the complete complex established by 16 Oct 90. Commercial power through an automatic switched 100 KVA generator provided electrical services. Additional improvements involved complete encasing of this complex in splinter proof reinforced concrete *"L"* shapes and interconnecting bunkers, as shown at **Figure 2**.

The *"open centre concept"* satisfied the DND no smoking policy within buildings and the Qatari custom of no smoking outside buildings on this airfield.

Concurrently, the Engr Det established accommodations for the Task Gp at two camps which were aptly named Canada Dry No. 1 and 2 or CD1 and CD2. Two camps were necessary as the Qatar authorities had placed a constraint on the number of Canadian personnel allowed to be accommodated within the confines of the Qatar Emir Air Force Base.

CD1, as shown at **Figure 3**, was an old labour camp and plant maintenance/ storage yard located 1.5 km south of the Air Base. The lease for this camp was signed on 01 Oct 90. Over the next week the labourers were moved out and the camp was fumigated, disinfected and super chlorinated to provide accommodations and work areas for the support unit. Functional detachments of this unit requiring space included: MLBU, CE workshops and ROWPU, Comms, Land Maint, Supply, Transport, NBC, MPs, Medical, Postal and a collection of administrative offices. This camp was surrounded by a two metre wall and was completely self-contained. Power was supplied by three 250 KVA generators and potable water was gravity fed to all buildings from four 5000 gallon water tanks. Sewage was collected in holding tanks which were pumped out daily. The Engineer Det provided much of the expertise for the clean up and did all of the construction necessary to make this a functional military camp allowing the Support Unit to move in over the period 08-10 Oct 90. Throughout the deployment, the Engr Det also provided the necessary first line and preventive maintenance for this camp. Although many lessons were learned from the leasing, repairing and maintaining of this camp, the major lesson is that the size of the camp provided an excellent facility for all the functions of the Support Unit. Camps of a similar nature are owned by every

Figure 1

**SUSTAINMENT AIRFIELD ENGINEER DETACHMENT**

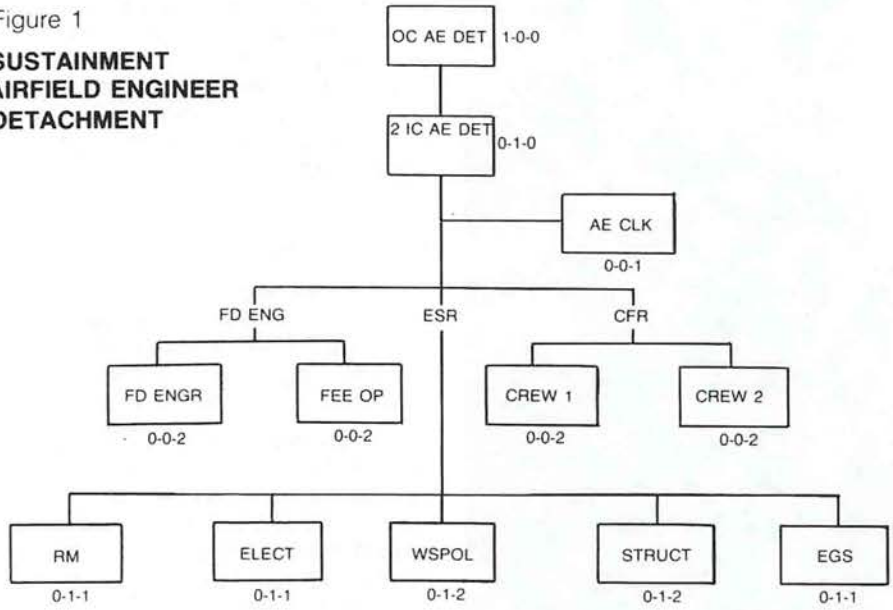
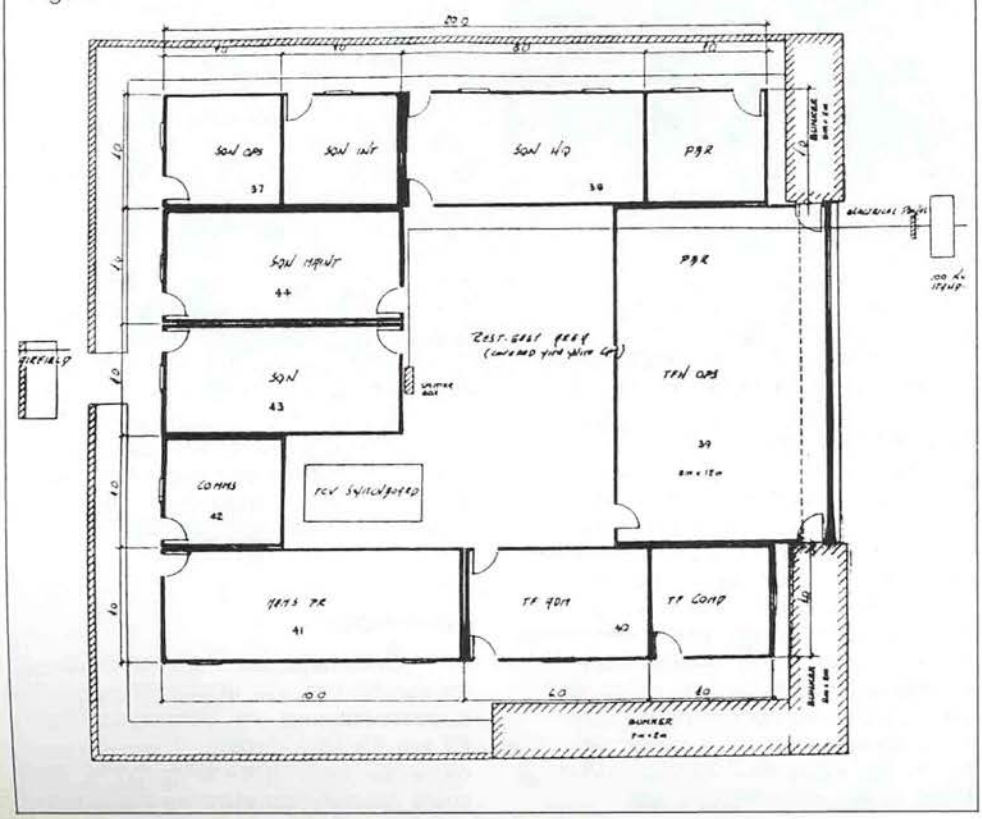



Figure 2



major trading company throughout the Middle East, and should be considered versus new construction for future short term deployments.

CD2 was built from the desert up on the South East side of the airfield to provide accommodations for the Task Force HQ, the Fighter Squadron and Security Coy. A contract was let on 30 Sept 90 for the construction of the accommodation and ablution trailers. Roads were constructed and utilities were designed, purchased and put in place over the next two and one half weeks by the Engr Det concurrent to the building and delivery of the prefab trailers. On 22 Oct 90, CD2 became the desert home for approximately 250 Canadians.

Potable water was supplied to this camp from three 5000 gal tanks under a pressurized system. Sewage was collected in underground holding tanks and power was provided to CD2 from two 250 KVA generators.

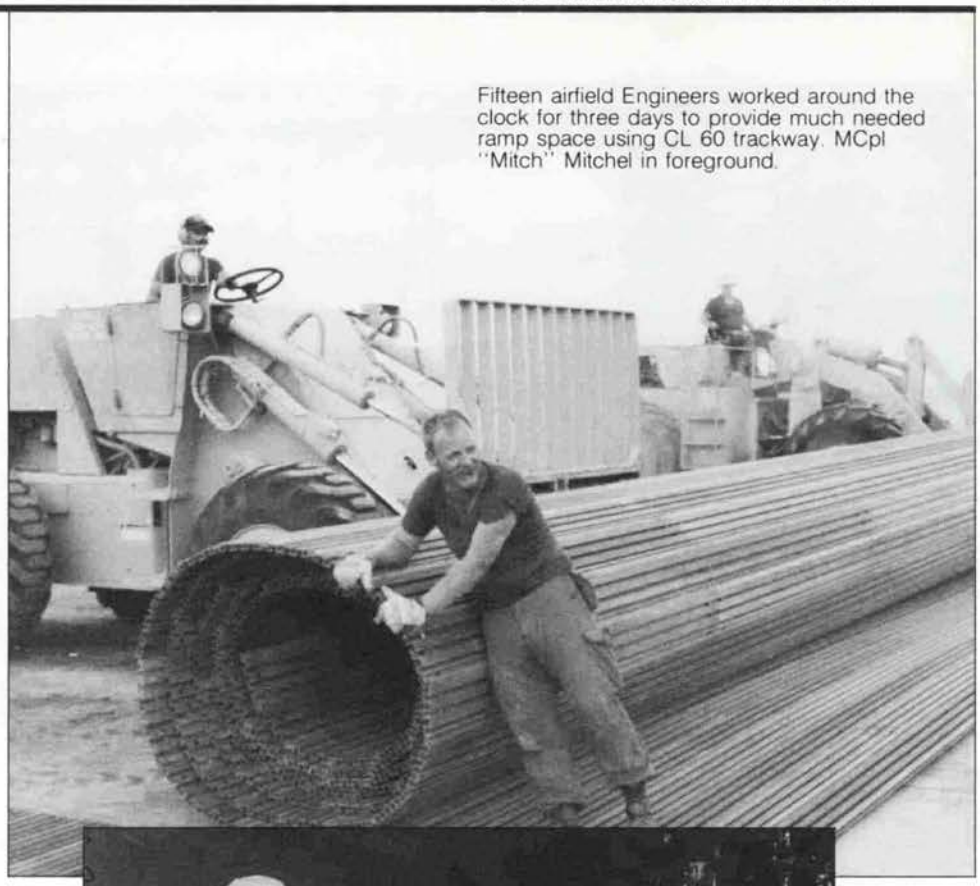
All utility lines, including water, sewage and power, were buried underground. Approximately 1.5 km of roads were constructed for CD2. Heavy equipment requirements for the above tasks were mainly filled by borrowing equipment from US or Qatari CE Sections. Although the Canadian engineers became quite proficient at bartering, leasing of equipment from local companies was also done for specific projects.

CD2, as depicted at **Figure 4**, continued to expand throughout the deployment and by Feb 91 could accommodate approximately 400 personnel.

The obvious lesson learned from the construction of CD2 was that the majority of building and utilities materials were available in theatre. From a cost comparison point of view, it was more economical to purchase these materials in theatre than transport them by C130 from CFE.

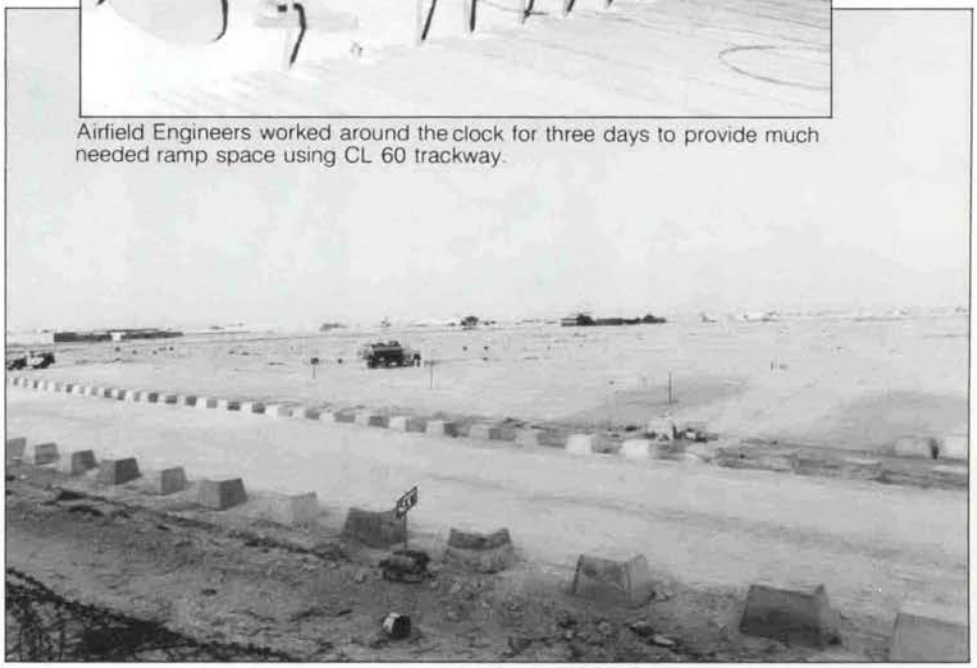
### Operations

The successful integration of Canadian and US fire-fighters for Crash Fire and Rescue and the problems associated with the installation of the mobile arrestor gear were lessons of extreme operational importance and are covered under separate articles. Other aspects of operational interest were provision of ramp space and survival to operate shelters.



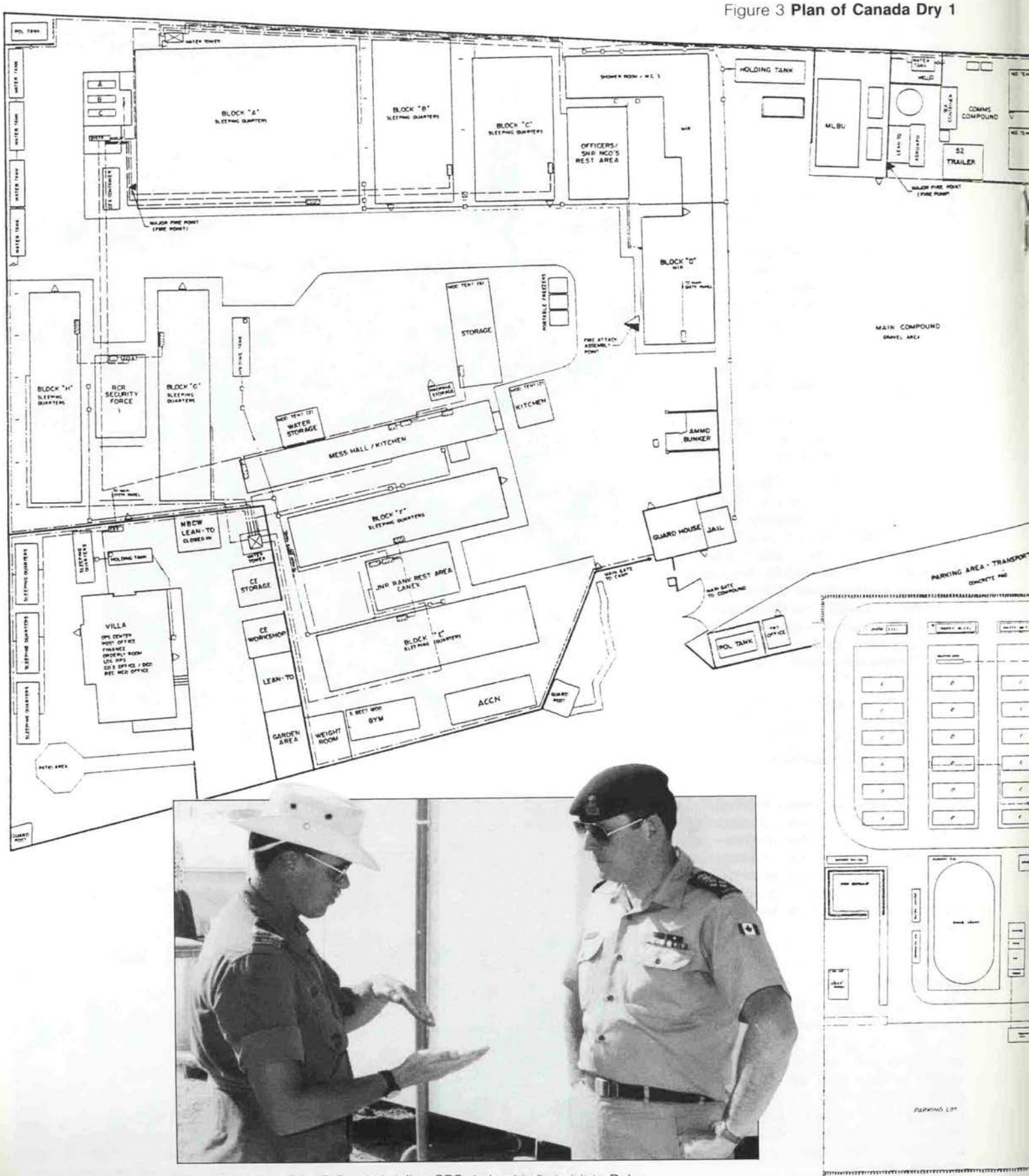
Fifteen airfield Engineers worked around the clock for three days to provide much needed ramp space using CL 60 trackway. MCpl "Mitch" Mitchel in foreground.

Airfield Engineers worked around the clock for three days to provide much needed ramp space using CL 60 trackway.



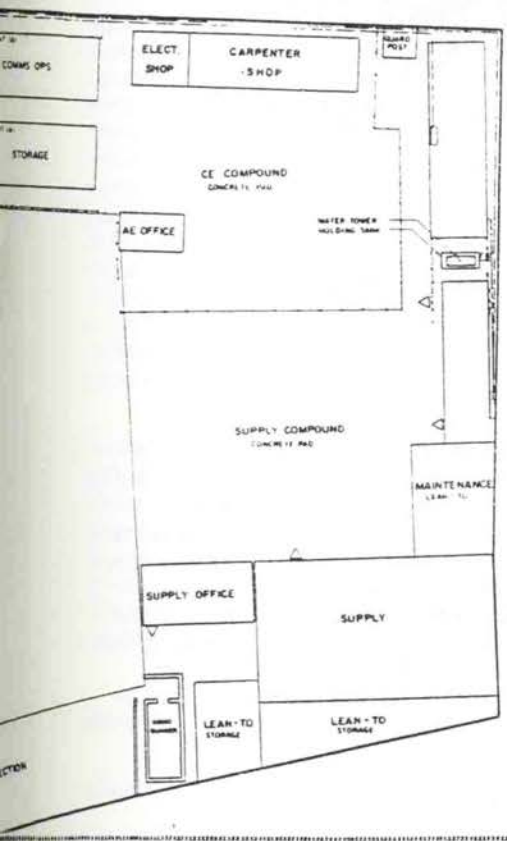
A tribute to the quality of workmanship provided by the FEE OP heavy equipment operators in Qatar. MCpl "Browny" Brown of AE Baden was IC FEEOP in charge of road construction and maintenance.

Figure 3 **Plan of Canada Dry 1**




Major Dan Kelly, OC AE Det, is briefing CDS during his first visit to Doha. Maj Kelly designed and layed out CD1 and CD2 facilities.

Local contractors installing one of many air conditioned barrack block trailers at CD2.



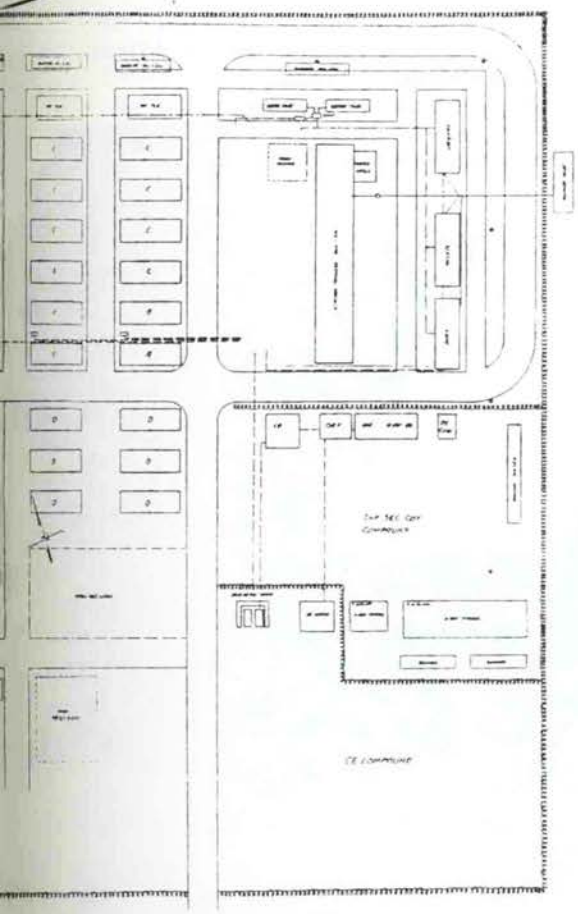
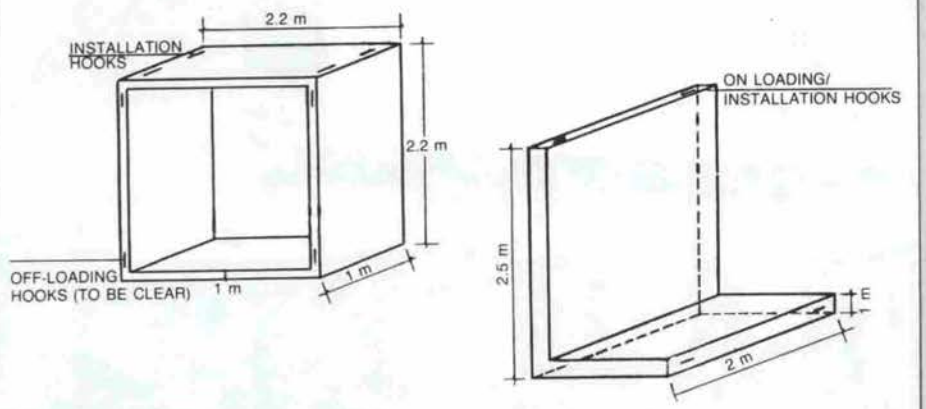



Figure 4 **Plan of CD2**

Sgt Bourassa, an electrician from CFB Lahr, is shown installing one of many electrical installations necessary to provide power to all of CD2. Note the size of the cable used due to excessive heat build up in desert environments.

Figure 5 **Splinters Proof Personnel Shelters and "L" Shape Walls**




# MOBILE ARRESTOR GEAR
## DEPLOYMENT IN THE GULF

**by: Capt D.J. Gould,**
OC AE Det Officer Commanding
Airfield Engineer Detachment, CATGME

Although most of the tasks assigned to the airfield engineers in support of the Canadian Air Task Group Middle East (CATGME) were of a domestic nature (i.e. accommodations, basic services and utilities), some very important operational taskings were undertaken. The trials and tribulations that went into the task of deploying the Mobile Arrestor Gear (MAG) at the Qatari Emir Air Force Base (QEAF) in Doha, Qatar will be described.

**Summary**

This article highlighted the experiences of the AE Det in providing support to air operations during the initial phase of OP SCIMITAR/FRICTION. This deployment confirmed that the training, experience, and versatility of each and every Engineer deployed enabled him to come up with many imaginative and workable solutions to difficult and unusual desert construction of operational and domestic facilities. The extent and diversity of the Engineers' accomplishments earned them the highest reputation which was unsurpassed in supporting this operation.

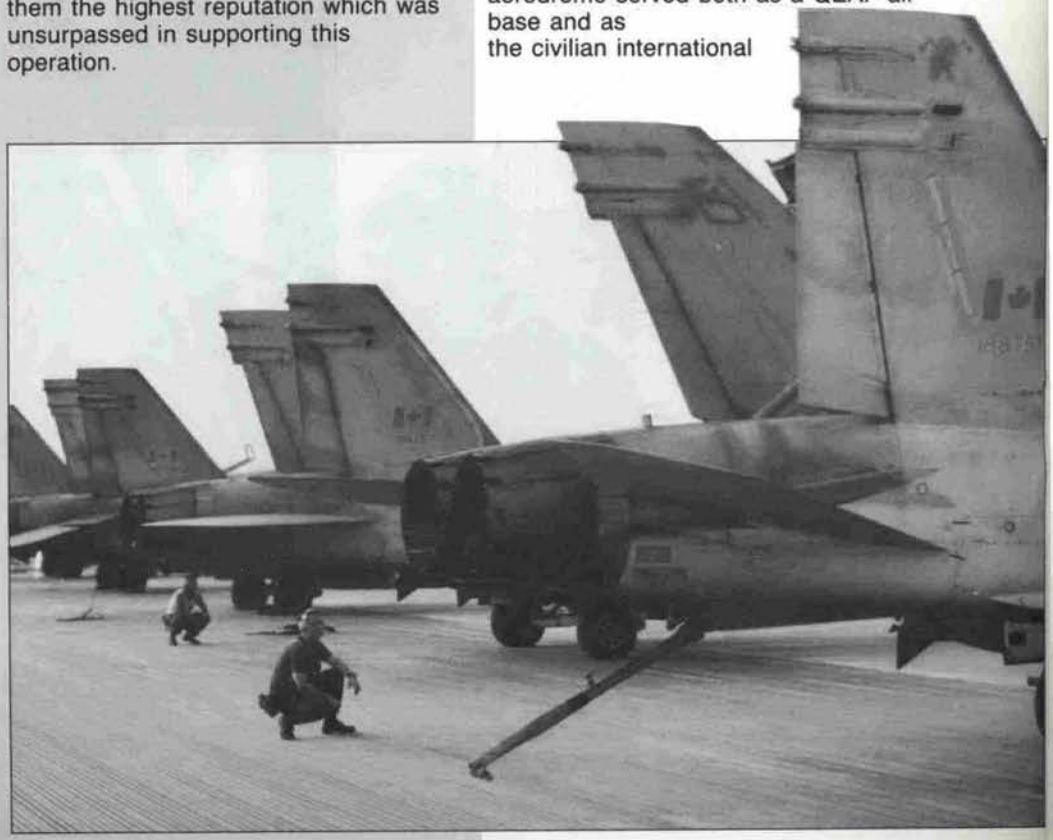
**Situation**

During the Gulf crisis CF-18, F-16 and F-1 Mirage aircraft flew out of Doha Qatar's 15,000 ft runway. The aerodrome served both as a QEAF air base and as the civilian international

One of the major problems in finding a desert home for CATGME in the initial planning stages was finding an airbase with available ramp space for the fighter squadron. Doha had the ramp space; however, a dangerous situation existed for 10 of the CF-18s which were parked on a taxiway used by the Qatari Quick Reaction Force. To provide simultaneous, non-hazardous movement of aircraft, the AE Det designed and built a 160 m x 21 m apron utilizing CL60 trackway from Base Lahr, Base Baden and 4 CER, and programmed the delivery into Doha using 12 C130 chalks. Once the site was prepared and the panels assembled into mats, 15 personnel from the AE Det worked around the clock installing and anchoring the trackway. This apron space was utilized throughout the deployment and daily inspections by the Engineers ensured that the trackway and anchoring system accomplished its aim.

Bomb shelters made out of splinter-proof reinforced concrete *"squares"* were designed by the Engr Det and constructed by contract. These squares, shown at **Figure 5**, were fitted together to provide shelters varying in length from 5 to 12 m.

The Engr Det constructed these shelters at the Comd Complex, at CD2 and at various work areas throughout the flight line. Each shelter end was closed off with a double blast wall entrance of sand bags.



A 160 m x 21 m apron was constructed using all available CL 60 trackway in CFE. Constructed adjacent to the Qatari Quick Reaction Force taxiway it was use to park 10 CF-18 aircraft.

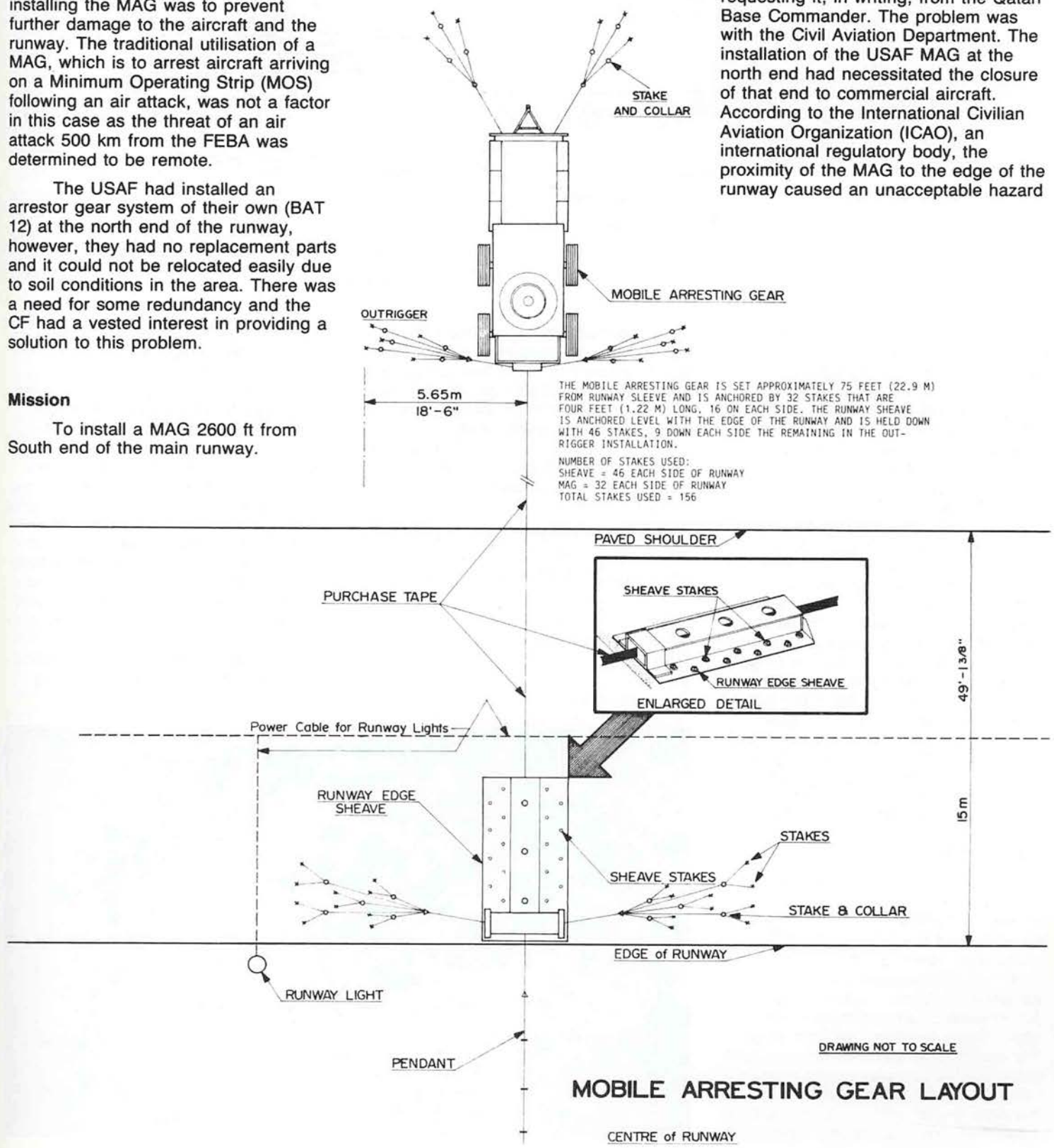
airport whose facilities were located on the other side of the runway from the military facilities. The runway was not equipped with a fixed arrestor gear system and there were definite operational concerns that battle damaged aircraft would return with limited control. The idea behind installing the MAG was to prevent further damage to the aircraft and the runway. The traditional utilisation of a MAG, which is to arrest aircraft arriving on a Minimum Operating Strip (MOS) following an air attack, was not a factor in this case as the threat of an air attack 500 km from the FEBA was determined to be remote.

The USAF had installed an arrestor gear system of their own (BAT 12) at the north end of the runway, however, they had no replacement parts and it could not be relocated easily due to soil conditions in the area. There was a need for some redundancy and the CF had a vested interest in providing a solution to this problem.

**Mission**

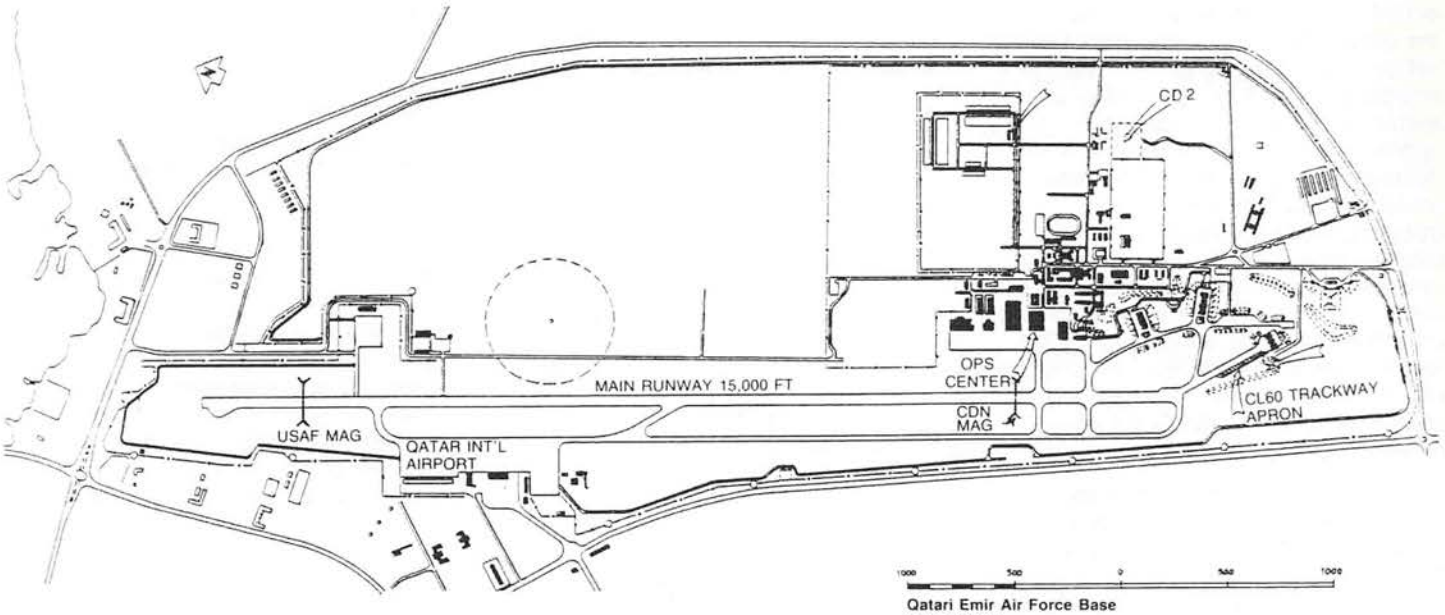
To install a MAG 2600 ft from South end of the main runway.

**MOBILE ARRESTING GEAR LAYOUT**




**Execution**

The first and most time consuming task in the mission was in obtaining permission from the QEAF and the Civil Aviation Department to deploy the MAG. Permission from the QEAF was obtained simply by requesting it, in writing, from the Qatari Base Commander. The problem was with the Civil Aviation Department. The installation of the USAF MAG at the north end had necessitated the closure of that end to commercial aircraft. According to the International Civilian Aviation Organization (ICAO), an international regulatory body, the proximity of the MAG to the edge of the runway caused an unacceptable hazard




Qatari Emir Air Force Base
Doha, Qatar

to commercial aircraft. Therefore, when we approached the department for permission to install our MAG at the south end, they initially refused as, it would have resulted in the closure of the whole runway to commercial traffic. In addition, our assessment of the threat and our concern over the need for arrestor gear redundancy was not shared by the Civil Aviation Department management. They felt that the US MAG was sufficient. It was necessary to convince them otherwise. This was done by presenting them with a scenario where the US MAG became *"inoperational"*, whether it be as a result of mechanical failure, sabotage, or an air attack, and a battle damage aircraft was returning to base. It was impressed upon them that if the aircraft was not arrested immediately after touchdown, it could cause a significant amount of damage to the runway which could result in what they initially feared: runway closure. It was therefore agreed that the CF may install their MAG only in the event that the US MAG became inoperational.

This compromise would have been very acceptable in a location where soil conditions permitted the installation of the MAG within a reasonable period of time (i.e. one to three hours). However, the soil conditions in Doha is such that a pavement breaker and/or rock drill would be required to install the over 100 four foot pickets necessary to hold down the MAG. It was estimated that this task would require approximately two days to complete, an unacceptable amount of time in a wartime scenario.

Ingenuity prevailed and a solution was found. The picket holes would be pre-drilled so that in an emergency, the MAG could be put into position and the pickets dropped into place. This method required that the MAG be deployed in order to mark the location of the picket holes and any redeployment would require it to be positioned in exactly the same location.

With the proper authorization, the next step was to recce the site and to determine the most expedient way to prepare the picket holes. The first method investigated was to use a pavement breaker with a four inch diameter, four foot long pick. Since the picks could be obtained in three foot lengths, a four foot section had to be fabricated by welding two picks together. A number of test holes were punched into the ground, in and around the proposed site, approximately 50 meters beside the edge of the runway. The result was that unpenetrable bedrock was encountered at approximately three feet in depth. The soil consisted of two to three feet of almost powder-like dust with rocks and boulders intermixed, and with granite-like bedrock at greater depths. This left only one other method: to drill the holes using a rock drilling rig.

Qatari military personnel in military uniform and in civilian dress examining a piece of the SCUD missile which landed 18 km North of the Qatari Air Base where the Canadian Air Contingent was located.

An additional limitation placed on the task was that damage to the aircraft operating surfaces had to be minimized. This had to be done to maintain the integrity of the southern approach. This limitation caused additional problems. In order to avoid removing any runway lights and to allow for the MAG cable runout, the MAG trailer would have to be located directly in line with the row of runway lights. However, this would have placed the MAG trailer pickets over the power cable feeding the lights. The solution was to place the MAG trailer approximately 25 meters away from the edge of the runway and place a runway edge sheave in between two sets of lights. The sheave, being much smaller than the MAG trailer, was located well away from the power cable and the cable runout would only require the removal of one set of lights. This met with Qatari approval (see sketch).

The plan was set and all that remained were the timings which were also an important factor. In order to carry out the work, we needed extended clearance on the runway. With the civilian and heightened military aircraft activity this was difficult to achieve. We eventually found the best window was from 2200 hours to 0600 hours.

With a portable lighting trailer, MAG trailer and forklift with sheave in tow, we proceeded to the edge of the runway, laid out the MAG and the hold downs, and marked the appropriate picket holes in the first night. The next night, we commenced with the drilling. A total of 156 holes four-ft deep were drilled in two nights. On the third night, at approximately 0330 hrs, a SCUD missile struck Qatar 18 km north of Doha. This information was only made known to us at the Commander's briefing the next day.

The mission was accomplished on 22 February 1991. It was then decided to test the system by deploying the MAG, engaging it with a CF-18 and taking it back down in one evening. This unfortunately was not to be. The ground war had begun, air superiority was guaranteed and the DComd of CATGME was planning for our victory celebrations. Our new orders were to prepare the MAG to be sent home.

Although a disappointing conclusion, the task was a real one which demonstrated the flexibility and ingenuity of the Airfield Engineers at war. *CHIMO!*

# FIRE PROTECTION
## CANADIAN AIR TASK GROUP MIDDLE EAST

Left to right: Cpl O'Rouke, MCpl Coish, and MCpl Pleau in front of 5/4 Ton home-made fire vehicle.

**by MCpl D. Pleau**

The existing on site crash rescue capability required to support CF 18 aircraft operations at the Doha airbase was virtually non-existent. It was critical that Canadian fire-fighters who were familiar with all aspects of CF 18 aircraft be sent to Doha. Moreover, Canada Dry One and Canada Dry Two had absolutely no structural fire protection. Hence, the mission of the Canadian fire-fighting element in Qatar was twofold. Firstly, it was to instruct American and Qatari fire-fighters to perform CF 18 crash and fire rescue operations, and secondly, it was to ensure that the proposed Canadian camps had adequate fire protection.

To summarize the areas of concern there was no water distribution system, no fire extinguishers, the nearest fire departments were six to eight minutes away, and security measures were restricted for the civilian fire department. The four Canadian fire-fighters had a difficult task ahead of them. The following are some of the highlights that were developed and established at Canadian Air Task Group Middle East (CATGME).

### Fire Protection Services
*Canada Dry One*

Structural fire-fighting protection at CD1 was a real challenge. The camp was located off the airbase and the camp was divided in two by a stone wall. One side was the domestic area consisting of the living quarters, hospital, kitchen and villa. The other side was the commercial area which consisted of the CE workshop, supply storage area, communications, land maintenance workshop and PAL section.

The first objective was to establish fire points throughout the camp for immediate quick response. These fire points consisted of camp fire orders, water pump tanks, and dry chemical extinguishers. Two major fire points were established, consisting of two Fire Fox pumps and four 3000 litre bladders, hoses and nozzles.

The first line attack team was accomplished by training ten personnel. A central location for a five man attack team was set up near the hospital, and it consisted of five sets of bunker gear, three Chemox breathing apparatus sets, extra canisters and fire hoses.

In the event of a fire, the initial response would be from the camp attack team along with one fire-fighter who would respond from the airfield with the 'homemade' fire truck. The civilian Doha Fire Department would respond to CD1 to augment our initial response team in approximately eight to ten minutes.

### Fire Protection Equipment and Services
*Canada Dry Two*

To provide fire protection at CD2 was an easier task because the camp was built by the Airfield Engineer Detachment. This camp consisted of approximately 40 mobile trailers used for accommodations, and washroom facilities, also a tented area used to house the kitchen, dining, rest area and supply services.

Fire points were between each row of trailers; however, the main concern was the tented area of the kitchen/dining section. This was resolved by CE tradesmen tapping into the water line from the two 5000 gallon water tanks and attaching a 30 meter length of hose, complete with pumps, to provide fire protection for the complex. Kitchen personnel were trained on the use of this equipment. Fire-fighting agreements were made with the Qatari and American Fire Departments to provide fire assistance to Canadian facilities on the airbase in the event of fire, and this led to the formation of a US/Canadian Fire Department. In the event of fire, the camp security force would provide the first response, followed by the US/Canadian fire truck and a P-19B crash vehicle, which had a structural fire-fighting package.

**Aircraft Crash Rescue Equipment and Services**
*at Doha Airport*

Military crash rescue services came under the command and control of the Qatari Fire Chief. The four Canadian fire-fighters were attached to the American Fire Department and were allowed to control incidents involving Canadian CF-18s, with backup from the American fire-fighters and vice versa for the American aircraft.

The fire-fighting equipment located at Doha airbase consisted of:

**a.** American Air Force —

- two 19Bs;
- one P13 with dry chemical and halon tanks;
- rescue equipment; and
- two pick-up trucks.

**b.** Qatari Air Force —

- a fleet of old foam trucks;
- some water tankers; and
- two ambulances.

**c.** Civilian International Airport —

- four Carmichael major foam vehicles;
- two rescue vehicles; and
- two ambulances.

**d.** Canadian Military —

- two BMW Fire Fox pumpers, and
- self-made fire vehicle made from a 5/4 ton truck fitted with a 2150 gallon water tank and 5 hp 105 PSI fire-fighting pump with hose and rescue equipment.

**Fire Inspection Program**

**Canadian Air Task Group Middle East**

The fire inspection program consisted of monthly inspections on all buildings, fire extinguishers in CD1 and CD2 and inspections on all general service equipment, Bowsers and Pod vehicles. Charts were also drawn up for all buildings and equipment to monitor fire inspections.

**Fire Training Program CATGME**

The training program consisted of structural and crash rescue procedures. For structural fires, the attack teams at CD1 were trained on the Chemox breathing apparatus, operation of the Fire Fox pumps, FAFFE, hose laying and building search and rescue procedures. Fire exercises were carried out on a regular basis at CDI and structural exercises were practised at CD2 and at the American military fire-fighters.

Crash rescue fire training was carried out regularly at the airport by the Canadian fire-fighters in conjunction with the American, Qatari air forces, and the civilian fire-fighters. Training concentrated on fire-fighting procedures for CF-18, Challenger, CC130, F-16 French Mirages, Alfa Jets, Sea King, and Gazelle Helicopters.

**Fire-fighting Establishment**

There was an establishment of sixteen fire-fighters in Doha — twelve Americans, and four Canadians. The US/Canadian fire department headquarters was commanded by a Tech Sgt Fire Chief and a Staff Sgt Deputy Fire Chief. There were two "six man watch" platoons each consisting of four Americans and two Canadians. The tour of duty was 24 hours on and 24 hours off. Additionally, the Canadian fire-fighters carried out their training and inspection programs during the 24 hours off duty. During high threat levels, the shifts changed to 12 hours on and 12 hours off, with all the fire-fighters remaining at the fire hall. The camps at CD1 and CD2 had a complete fire-fighting capability approximately one month after the first Canadian fire-fighters arrived. fire-fighting agreements were made with both the American and the Qataris which ensured CF-18 incidents would be handled immediately and professionally. With creative initiatives and hard work the Canadian fire-fighters implemented a superb fire-fighting program.

# FIREFIGHTERS in the Gulf

**By Cpl Randy Bennett**
**Cpl Roger Berry**
**Cpl Terry Cade**
**Cpl Richard Leblanc**

On 10 August 1990, preparation of the three Canadian Ships bound for the Persian Gulf commenced at the Naval Dockyard in CFB Halifax. As the sailing date of 24 August rapidly approached, the Dockyard was buzzing with activity around the clock. Extensive repairs and welding were required to install new weapons systems and to prepare the ships for additional personnel and equipment. This additional activity hampered the, otherwise, routine process of storing supplies and ammunitions.

Firefighters were busy ordering, stocking, and standing-by, while welding and ammunitioning were conducted. Additional firefighting equipment was required and acquired to cool ammunition lockers, as well as for future Firefighting requirements. The additional workload, coupled with the added pressure of having been given eight days' notice, was extremely stressful. Many Firefighters, recently posted, had the additional burden of learning their ship.

As the Halifax Harbour disappeared on 24 August, following a tremendous farewell from families; friends; and the people of Nova Scotia, the hectic work schedule continued. Nine consecutive days of extensive wartime operational training followed. Various types of battle drills and emergency stations were conducted to ensure the ships' companies were prepared for the, yet, undetermined mission.

One-third of the personnel en-route to the Gulf were sailing for the first time. Firefighters were responsible to ensure that all personnel were given tours of the firefighting equipment and fire systems located throughout the ships. Instruction of firefighting procedures were conducted on an ongoing basis.

After a well deserved 48 hours of rest in Gibraltar, the operational exercises increased, until the Sea Trainers were confident that the ships were combat ready for their deployment in the Gulf of Oman. Then, they transferred to HMCS FRASER before arrival in Sicily.

While sailing across the Suez Canal on 15 and 16 of September, the operational area of deployment changed from the Gulf of Oman to the northern portion of the Persian Gulf. Firefighters settled into a 8-or-12-hours-on and 8-or-12-hours-off routine. One of the Firefighter's secondary duties while en-route through the Suez Canal was manning the 50 Calibre Machine Guns.

En-route to the Gulf, there were extensive flying and refuelling operations along with battle exercises. Flying went on 24 hours a day and refuelling of the PROTECTEUR lasted up to 36 hours. During all of these evolutions, Firefighters were fully dressed in their protective clothing. Due to 50°C plus temperatures, medical personnel mercifully recommended that Firefighters stand-by in firefighting pants and boots with jackets close at hand, during normal flying and fuelling operations.

After leaving Djibouti, Africa; the ships sailed into Manama, Bahrain; on 27 September. While awaiting orders, they resupplied and left Bahrain on 5 October to begin patrols in the northern position of the Persian Gulf. During the period 5 October — 1 January 1991, the ships conducted extensive patrols hailing and boarding 25% of the thousands of ships monitored by the Multinational Forces. The TERRA NOVA boarded a record nine ships in one day.

While on patrol on Christmas Day, the crews enjoyed a nice turkey dinner which was served by the Officers, Senior NCOs, and select Canadian dignitaries. Santa was also there; he brought presents and thousands of letters from across Canada. After only a few short hours, it was back to reality and the vigorous routine.

On New Year's Day, HMCS PRESERVER ship's company departed from Canada to replace the PROTECTEUR'S crew on deployment in the Gulf. After flying for approximately 24 hours, they arrived on the PROTECTEUR the morning of 2 January 1991. The extensive process of changing over and getting settled in commenced. During the next eight days, the extensive tours and lectures of all the fire systems and equipment to the ship's company of 326 continued. This was necessary since, as before, approximately one-third of ship's company was either at sea for the first time or new to the class of ship.

On 10 January 1991, the PROTECTEUR, with its new crew, slipped Dubai in the United Arab Emirates to conduct its extensive CRI (Combat Readiness Inspection) in the Gulf of Ohman. Unlike the previous crew, the new PROTECTEUR's crew didn't have the luxury of time on their side. They had only nine days to be combat ready before entering the operational theatre.

As the 15 January deadline approached, war seemed imminent. The potential threat of enemy ships, mines, aircraft, and missiles intensified. There was a noticeable increase in anxiety, tension, and thoughts of loved ones amongst the crews.

**OP FRICTION I**

**CREW FROM HMCS PROTECTEUR**

Sgt. J. Barker
MCpl J. Evans
Cpl R. Bennett
Cpl R. Berry
Cpl L. Besner
Cpl D. Mathews
Cpl S. Roberge
Cpl J. Smith

**CREW FROM HMCS ATHABASKAN**

Sgt. W. Murray
MCpl C. Thibeault
Cpl F. Babineau
Cpl C. Cunningham
Cpl I. Johnson
Cpl M. Lavoie
Cpl R. LeBlanc

**OP FRICTION II**

**CREW FROM HMCS PRESERVER**

PO2 D. Nunn
MS W. Bewsher
Cpl T. Cade
Cpl Y. Dion
Cpl L. Francoeur
Cpl T. Garvin
Cpl L. Herbert
Cpl D. Meitz

**CREW FROM HMCS HURON**

Sgt G. Walker
MCpl D. Cyr
Cpl P. Casselman
Cpl M. Mitchell
Cpl R. Scott
Cpl L. Walters

**Notes:**
1. MWO D. MacNeil (CFF STS);
2. HMCS ATHABASKAN's crew were in the Gulf for both OP Friction I and II;
3. We would like to thank all of the above Firefighters for their help which enabled us to write this story.

On 28 January 1991, HMCS PROTECTEUR proceeded to the Combined Logistics Force Operational Sector in the southern area of the Gulf. Since she was the only supply ship with her own protection, she was able to proceed farther north to provide replenishment to various multinational ships in the battle group. Meanwhile, the ATHABASKAN and the TERRA NOVA were on escort duties in the northern Gulf area.

With the Gulf war commencing 17 January 1991, Gulf time, the ships were working at a very high degree of readiness. The ships were closed up at either a modified condition Yankee-Bravo, Zulu-Bravo, or at Zulu-Alpha. (These are water-tight and gas-tight conditions with Zulu-Alpha being the highest.) When they knew of a confirmed Scud launch, the ship automatically went to condition Zulu-Alpha. The wearing of war bags while working, eating, or walking throughout the ship became second nature.

During her 49 days at sea, the ATHABASKAN provided escort duties to a tug for the recovery of the USS PRINCETON (US Navy Missile Cruiser), which had become stricken after she hit a mine. While travelling through mine infested waters, the presence of oil slicks coupled with dense black smoke which pratically blocked out the sun led to a higher level of concern and increased awareness of the job at hand. When one had a quiet moment to ponder the situation, it seemed overwhelming, but once back to work, these thoughts were kept in the back of your mind as you concentrated on the job at hand.

With the news of the war ending, there were feelings of relief and exhilaration. Knowing we would soon be home with loved ones was reassuring. The realization that we excelled as professional Firefighter during a crisis is gratifying. It was an experience we will never forget.

The preceeding is a list of Firefighters who served in the Persian Gulf Crisis during Op Friction I and/or OP Friction II:

# THE BAOR
## IN THE GULF WAR

**BY MAJ A.F. MARKEWICZ,**
**OPS/TRG MAJ**
25 Engineer Regiment
British Army on the Rhine

### Introduction

As the operations and training major with 25 Engineer Regiment, based in Osnabruck Germany, I was assigned as liaison officer for 1 (UK) Armoured Division at the G3 desk of VII (US) Corps Headquarters. This article proposes to describe the British participation in the Gulf War and more specifically the Engineer effort.

### British Participation

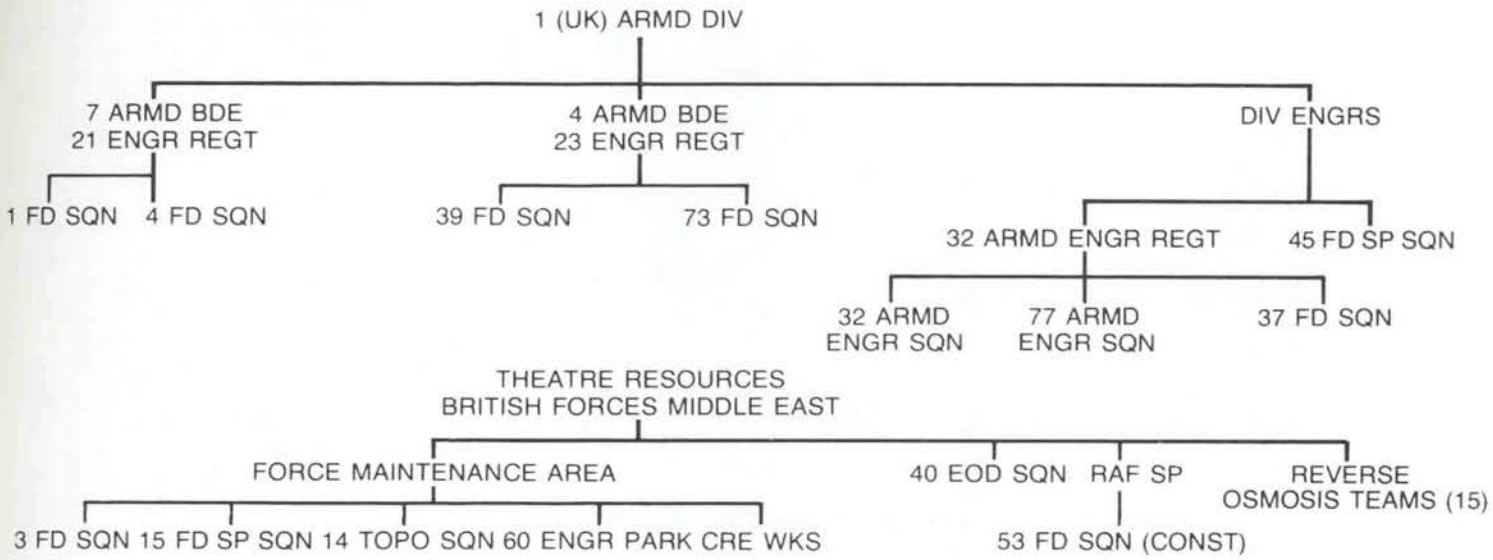
When the invasion of Kuwait took place, the British government responded by sending aircraft to Saudi Arabia, and ships to the Gulf. Early in September '90, the government announced that 7 Armoured Brigade would be sent to Saudi Arabia. The unit was equipped with Challenger main battle tanks and Warrior armoured infantry fighting vehicles. In effect a brigade group was formed and sent from the BAOR, including 21 Engineer Regiment. The brigade arrived in Saudi Arabia in October '90, and was attached to the Marine Expeditionary Force along the coast of the Persian Gulf.

In December '90, a two-brigade division was formed by sending out 4 Armoured Brigade, 1 (UK) Division Headquarters, 23 Engineer Regiment, 32 Armoured Engineer Regiment and a very large slice of logistics and support units. The division consisted of 25,000 soldiers with about 15,000 others supporting it. This was the division that was attached to VII (US) corps forming one of the largest corps in our history, over 150,000 strong. The UK division had three engineer regiments attached to it, one in support of each brigade, and the third as the divisional reserve. There were other British engineer units along, but mostly as third line resources, such as mapping and engineer works. Part of this force, sent from BAOR, were all five of the Canadian Military Engineer exchange officers. In fact, there were about 25 Canadian Forces officers and NCMs in the Saudi Arabia theatre of war, who ranged from exchange pilots flying Tornados, Chinooks and Lynx helicopters, to Naval, Armoured, Artillery, Signals, EME and Logistics officers, and at least one mapping WO.

### Planning and Preparations

Despite all of the units and people sent to the Gulf, 25 Engineer Regiment was not planned to go. It was tasked to provide individual augmentation of soldiers and officers, with about half of the unit ending up in the Gulf. With the planned deployment of the division came a flurry of Urgent Operational Requirements (UOR), with some of them on the engineer side. These UORs were new pieces or modifications to equipment that were rushed through the procurement process to field them in time for war. Some had already been in the procurement pipeline, while others were originated at the start of the crisis. Two of the particular concern for 25 Engineer Regiment were the light flail, or the AARDVARK Joint Services Flail Unit, and the Vehicle Launched Scatterable Mine System (VLSMS). We were tasked to mount two flail troops and a VLSMS troop. Our task was to create the organizations, find the soldiers and vehicles, and then train and deploy them. All this took place in about a month, including a few days of Christmas leave before departing for the Gulf. The VLSMS Troop was commanded by the other CME officer, with 25 Engineer Regiment, Lt Henry Berghuis. As the Ops and Trg major, my task was to set up this mounting, and very quickly become the resident *"expert"* for these new systems, including a *"hardship"* visit to the VLSMS producer in Bourges, France.

DIAGRAM 1 **BRITISH ENGINEER ORBAT — OP GRANBY**




Once these troops were deployed, I was tasked to go to the Gulf on four days notice, to help with the introduction of the troops into theatre. This was near the end of January '90, when the air campaign had started and the SCUDs were being thrown around. This broad brush tasking saw me heading off to the Gulf for *"four weeks maximum"*. Fortunately, I packed for the duration, as the day before I was to leave, headquarters Royal Engineers at divisional headquarters called me to send me up to VII (US) Corps headquarters to be the Engineer G2 liaison officer for the UK division. Shortly after I arrived at Corps HQ, it was decided to deploy a Corps tactical HQ in preparation for the anticipated attack on G Day. The US Division G3 LO would deploy with the tactical HQ, and I took his place as the UK Division's G3 LO, which confused the Americans almost as much as the British. I remained in this position while at Corps HQ, which was also the rest of my tour in the Gulf. The *"four weeks maximum"* turned into eight weeks.

DIAGRAM 2

**VII (US) CORPS — DIV ENGR RESOURCES**

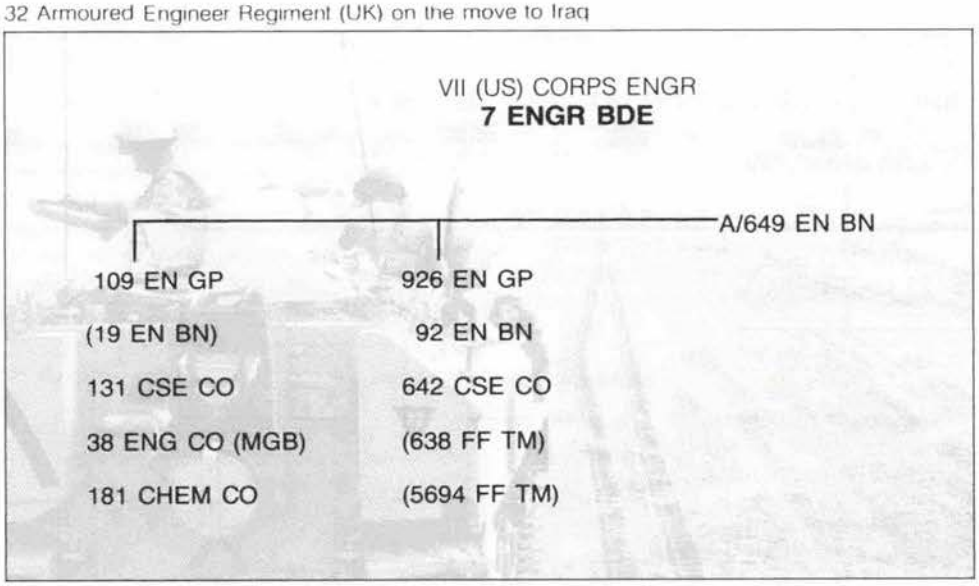
| 1 ID(M) | 1 AD | 3 AD | 2 ACR |
|---|---|---|---|
| 1 EN BN | 16 EN BN | 23 EN BN | 84 EN CO |
| D/17 EN BN | (54 EN BN) | (12 EN BN) | |
| 9 EN BN(OPCON) | (527 EN BN) | | |
| 176 EN GP | | | |
| 249 EN BN | | | |
| 317 EN BN | | | |
| 588 EN BN(–) | | | |
| 264 FF TM | | | |
| 376 FF TM | | | |

| 1 CAV (TACON) | 1(UK) AD(TACON) |
|---|---|
| 8 EN BN(–) | 32 AR EN REGT |
| | 21 AR EN REGT |
| | 23 AR EN REGT |

### Engineer Tasks

**Diagrams 1** and **2**, show the numbers of engineers that were part of the UK division and VII Corps at a point when commanders realized that they were really going to war. For ease of discussion the engineer effort will be discussed in three parts: Pre G-Day; the

32 Armoured Engineer Regiment (UK) on the move to Iraq




War; and post-ceasefire activities. It is to be noted that some activities carried on throughout the war such as the provision of water.

***Pre-G Day*** — The pre G-Day periode saw a great deal of engineer effort devoted to planning mobility. US and UK engineers studied and practiced ways to break through the expected border defences which were supposed to contain high berms, deep ditches, wide minefields and extensive wire defences. Even though the operational plan had been set to go around the border defences, at least in the VII Corps area, this plan was not disseminated down until the week prior to G Day.

In the VII Corps area, the US Engineers, as part of 1 Infantry Division, made the breach. Because of the area chosen, there were very few, if any, obstacles that had to be crossed. The infamous fire trenches were only lit in the Egyptian sector, and they caused no major problems. In most areas where there were obstacles, the coalition forces crossed them at will. This was almost entirely due to the lack of effective covering fire by the Iraqi defending forces who were deserting in droves and the lack of preparatory artillery fire.

Other Pre-G Day activities included general engineering support tasks, which included: setting up tented transit camps; constructing C-130 airstrips; and constructing a fuel pipeline across the desert. The heavy equipment operators were kept very busy improving roads and harbour areas and doing survivability tasks. Water supply was a key issue which the British solved by quickly fielding Reverse Osmosis Purification Units (ROWPU), to supplement the bottled water provided by the host nation. Mapping resources were stretched as maps had to be made and updated. Printing and distribution was also a major problem. In desert terrain, the 1:50,000 scale was useless as there was no ground detail to use. The 1:100,000 scale was usable for tactical operations, while the 1:250,000 was workable for getting around.

***G Day*** — A major concern at the breach area was marking lanes and traffic control. In the approach to the lanes, columns of vehicles had to be funneled into their correct lane, in accordance with the detailed movement plan. Main supply routes (MSRs) were constructed up to and away from the breach to keep people from getting lost. The MSRs were relatively simple, as the cross-country going in the area was very good with very few soft spots. The MSRs were constructed by graders moving in echelon, creating a small berm on each side, and then signing the berm. Unfortunately, this meant that roads quickly became canals when the rains came on G + 1, closing routes and slowing down traffic. MSR construction and maintenance was a major activity during the war, at least for general support engineers, as they struggled to keep up with the speed of the advance.

***Post Ceasefire*** — This period saw the US engineers faced with the enormous task of battlefield cleanup and destruction of Iraqi equipment. Their intention was to destroy any equipment that could be easily repaired, within Iraqi territory occupied by the Americans, and parts of Kuwait. The battlefield cleanup of minefields and unexploded ordnance was not even attempted unless it interfered with an important installation.

During the post ceasefire the HQ staff were devoted to collecting facts and figures from the war, including numbers of enemy vehicles captured and confirmed numbers of friendly casualties. Safety became a problem as souvenir hunters picked up unexploded ordnance and cluster bomb units (CBUs) which seemed to be the big favourite. Unfortunately, they killed and maimed themselves and others doing this.

In the end, I left the Corps HQ about three weeks after the ceasefire, when the UK Division was released from operational control of the Corps, and rapidly left the theatre.

The personal experience of being in a Corps HQ at war was, professionally, very rewarding. In some ways, I may have seen even more than if I had been an integrated part of the HQ. As with any organizaton, it is important to know people, and what they do, to get things done efficiently. Exchanges and permanent LOs help to establish that type of relationship.

I believe the NATO experience was invaluable to the smooth integration of the US and UK forces. Not only was much of the doctrine and concept of operations similar, but procedures generally followed the same patterns.

The short duration of the war could lead to false lessons if the observer is not careful. Questions of sustainment and reaction of HQs and logistic units under fire or enemy harassment, did not get answered. Air supremacy made life much easier for the good guys, and thankfully so.

Finally, engineers were heavily used and appreciated. Although they did not have to perform during the advance they were busy before and after. The UK division had a brigade of engineers to support it, and VII Corps had much more.


Conducting tests with the "Berm Buster" A means of breaching sand berms

**by Lieutenant Chris Stec, CME**
6 Troop Commander
32 Armoured Engineer Regiment

There are currently five Canadian military engineers on secondment with the British Army on the Rhine. All five were committed to serving in the Gulf War with the British forces. Two of the engineers, Capt Andy Paulus and Lt Chris Stec, served with 32 Armoured Engineer Regiment. Capt Paulus was 77 Sqn 2 i/c and I commanded 6 Tp, 31 Sqn.

It is with difficulty that I recount my experiences. This certainly is not due to the lack of experiences but in editing them concisely and sharing what may be of interest to the Branch. The lessons learned were numerous because the theatre of operations was different from anything previously experienced and all actions had real consequences.

In a span of three months I went from conjugating french verbs in St. Jean to commanding an armoured engineering troop of 28 men and eight vehicles in the deserts of south west Asia. In that time, it not only became important to familiarize myself with British methods of armoured engineering, but to gain the confidence of my new troop.

I had been with the troop for a month and a half when the Regiment received its warning order for deployment to the Gulf. For the next four weeks there was a massive Regimental effort to prepare vehicles and men for the ensuing operation.

In early January, after arriving in theatre, it was imperative to train for the probable task of breaching Iraqi obstacle belts that were becoming progressively enhanced. The Iraqi obstacles were formidable and somewhat similar to those tackled on exercise in Germany. There were special innovations such as flaming trenches and four meter high berms.

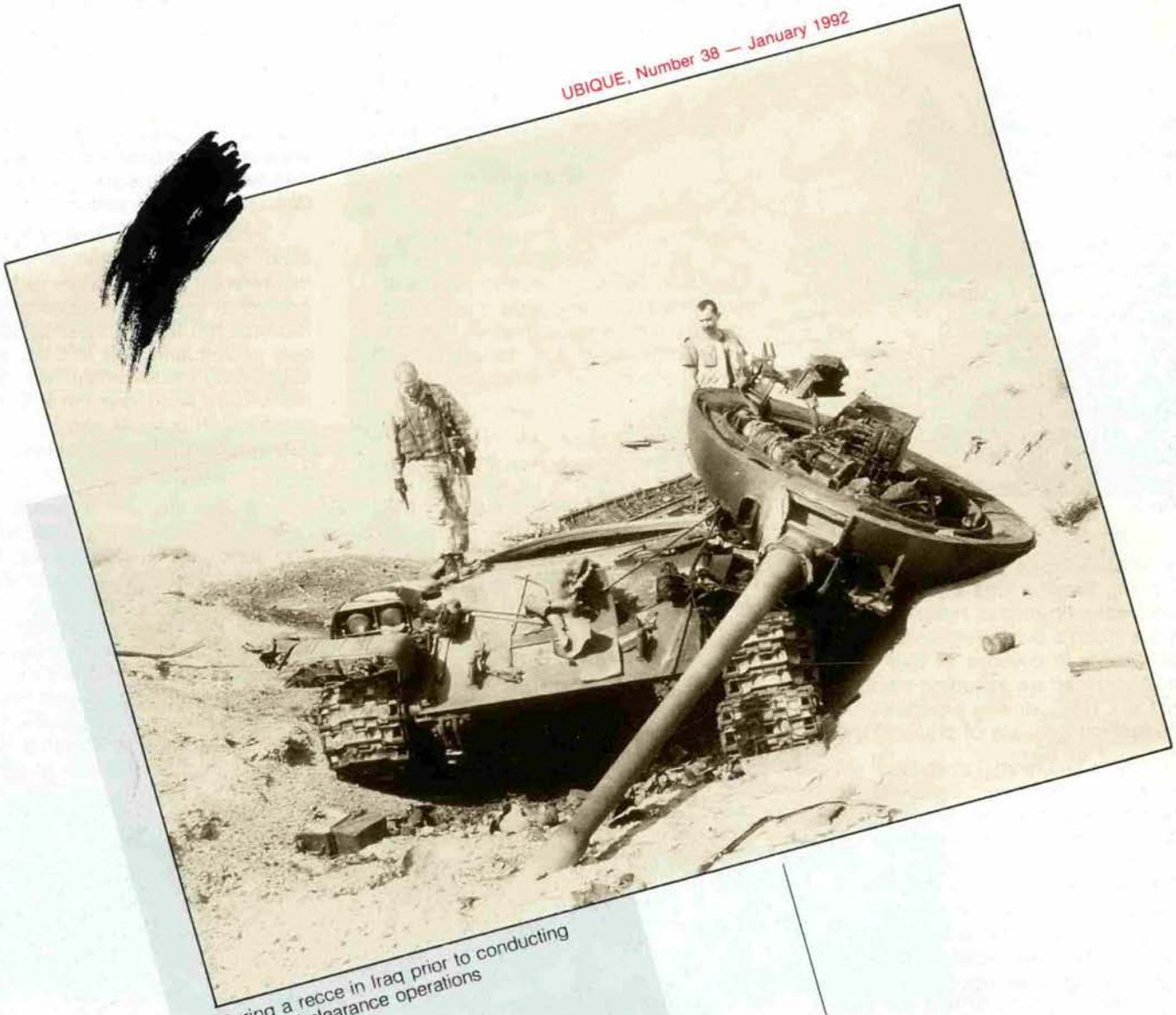
It was necessary to train hard to ensure a slick and smooth operation and to minimize the cost in lives and hardware, which was expected to be high. The training was a realistic as possible with peace time safety restrictions no longer dictating the conduct of exercises. Breaching the expected worst case obstacle scenario was our model.

Following this intense training, came a phase of movement, low level training and vehicle maintenance. This coincided with the air phase of Operation Desert Storm. Our turn would come next, but the wait seemed to last forever. During the wait, it became clear that the thrust of the 1 (UK) Armd Div would no longer be down the throat of the Iraqi defences, but would involve a wide flanking manoeuvre as part of VII (US) Corps effort.

Soon it was G-Day minus one, spirits were high, and we were ready to go. This was the moment that we, as professional soldiers, had trained for. We all ask ourselves what it would be like and wondered if our training would fail us. The next four days answered these and other questions that could only be answered in times of war.

The tactics employed and the unwillingness of the Iraqi soldier to stand and fight resulted in a situation where the engineers of 1 (UK) Armd Div did not perform any decisive tasks. The engineers moved with the brigades, reevaluating the situation constantly, as updated warning orders came in.

As a regiment, we fired no shots, nor were we fired upon. We collected



During a recce in Iraq prior to conducting battlefield clearance operations