

Operation Desert Sweep The Restoration of Kuwait

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Abstract: This paper will provide the reader an insight into the magnitude of Ordnance and Explosive Waste (OEW) that is present in the US sector of Kuwait and how it is being detected, detonated or rendered safe, and disposed. Techniques and technologies that are being employed to ensure maximum safety and quality will be highlighted throughout this paper.

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Operation Desert Sweep The Restoration of Kuwait

In August 1990, Iraq invaded Kuwait. Then, as the United Nations coalition forces massed along the Saudi border in what was called Operation Desert Shield, Iraq dug in, laid mines and stockpiled huge caches of munitions. When efforts to negotiate a peaceful settlement failed, Desert Storm was unleashed. For days, the Iraqi positions were bombarded in the most prolific aerial campaign in history. Then the land battle was joined, and in 100 hours Kuwait was free. The war was over, but a lethal battleground remained.

The Gulf War freed left the Kuwait countryside with enormous environmental restoration problems. Caches of munitions, shells and other ordnance were left throughout the country. Oil wells were burning uncontrolled. Leaking oil created lakes of tar in the desert. The country's infrastructure was severely damaged - as road networks, utilities, housing, entire cities were destroyed. Damaged military hardware was scattered across the country, still filled with ordnance and POL (petroleum, oil and lubricants). Bunkers littered with all types of ordnance were dug throughout Kuwait. Hundreds of kilometers of minefields had been laid across the country, some covered by shifting sand and leaking oil.

When the Gulf conflict ended, the Kuwait Government divided the country (about the size of New Jersey) into six sectors and began negotiating Explosive Ordnance Disposal (EOD) contracts with six different countries, rewarding some of the coalition partners that helped oust Iraq. Later a seventh sector for Turkey was added.

The US designated sector is reportedly the heaviest contaminated area of the seven sectors, partly because it was subjected to the most intense aerial attacks of the war. American B-52s alone dropped over 800 tons of munitions during 527 interdiction missions against the Iraqi forces. Thousands of these munitions were cluster bombs which had a very high dud rate. In addition, unexploded ordnance (UXO) from more than a dozen countries is spread over the land.

The US sector also includes three major oil fields - Al Wafra, Um Gudair, and Al Burgan. In addition, there is a military airbase (Al Jaber) which was heavily targeted during the war, and over 150 km of minefields which were laid across the landscape. Finally, there are heavy contamination sites from unexploded ordnance in the central and southwestern areas.

In April 1991, CMS began negotiations with the Kuwait Ministry of Defense (KMOD). In October 1991, CMS was awarded a \$134 million contract. The contract was divided into two phases: A four month mobilization phase provided time for build up of equipment, personnel and housing. An eighteen month performance phase covers the execution of the work, which includes: 1. Locating and clearing unexploded ordnance, 2. Removing war damaged military vehicles, and 3. Demolishing bunkers and reclaiming the land.

During the mobilization phase, CMS undertook a massive international effort to rebuild an infrastructure for use in country - living quarters, medical services, transportation, telephone, FAXes, copy machines, computers, etc. Experienced, trained and certified personnel were positioned to staff the more than 500-man team. The movement of \$24 million worth of equipment from several countries, including Austria, US, and Germany, was a huge logistical challenge. Obtaining permits and other licensing requirements from the Kuwait MOD was complicated by the disarray of the country after the war. Despite all these road blocks, CMS successfully mobilized the personnel, equipment and materials within the required 4 month period.

One of the first tasks accomplished in Kuwait was the establishment of a support base of operations. CMS secured the Al Habdan Towers located along the coastline of Kuwait in the city of Fahaheel. This bombed-out multitower facility was completely renovated and refurbished. The facility houses all the American technicians working in Kuwait, and has office space for the CMS Program Office as well. The facility also has a large dining facility, recreation room, pool, tennis courts, and laundry facilities. Adjacent to the Towers is the CMS Motor Pool and maintenance facility.

The CMS EOD project, dubbed "Operation Desert Sweep", is staffed in Fahaheel, Kuwait and CMS headquarters in Tampa, Florida. The majority of CMS employees are former U.S. military personnel and are therefore comfortable with large scale EOD operations. As an example, the Deputy Director of Explosive Ordnance Disposal Operations is the former commandant of the EOD training school at Indian Head, Maryland.

After successful mobilization, CMS entered into the performance phase of the contract. The first step in the performance phase was to specify the requirements for the remediation operations. CMS divided the US sector into 36 smaller, more manageable subsectors. A thorough and detailed survey and reconnaissance was conducted on each subsector to identify the type, location and condition of UXO, mines, vehicles, trenches and bunkers.

During the survey and reconnaissance phase, EOD teams went into each subsector and gathered essential information on the contaminants found. The teams used Global Positioning Systems (GPS) to precisely record the position of ordnance and other contaminations. A CMS proprietary software system called Minefield and Ordnance Recovery System (MORS) was used to collate the data collected during the reconnaissance. Through the use of MORS, the data is archived and can be used to create very accurate maps showing the location of the items. The data in MORS, when combined with information such as vehicle and personnel availability, is used to plan, manage and conduct clearance operations. The MORS data is also essential in performing Quality Assurance for clearance operations.

Following proven military practices and procedures, CMS then disposes of ordnance, removes damaged equipment and restores the Kuwait desert to normalcy. Throughout the entire performance phase, CMS' own Quality Assurance Teams ensures the operations are being conducted safely and that clearance was accomplished to predetermined levels.

One of the major tasks facing the CMS EOD teams is the removal and disposal of approximately 150 kilometers of minefields containing over 750,000 anti-personnel and anti-tank mines from twenty different countries. The clearing of mines and ordnance is very dangerous; therefore, safety is foremost in all clearance operations. For example, the latest and most advanced Austrian Schiebel mine detector is in use. This device is capable of

detecting mines with very little metal content. New techniques are also evaluated, such as an ingenious mine cruncher. Where technology has not caught up to a particular requirement, innovative techniques are used to safely and successfully accomplish a clearance task.

One of the innovative techniques used in the disposal of anti-personnel mines is the use of a specially adapted excavator. The excavator has been armored and the bucket has been replaced with a specially designed rake which is used to detonate the smaller anti-personnel mines. After a tract is cleared, the CMS QA team certifies that the area is clean and safe.

In addition to the minefields, the Iraqis left seven immense underground ammo supply sites containing thousands of tons of Iraqi ordnance which must be removed. Furthermore, there were heavily fortified bunkers and trenches, which were used for ordnance storage, vehicle fighting positions and command posts. These bunkers must be reclaimed.

More than a dozen countries took part in the air and ground war. Therefore, it is difficult to imagine the variety of shells, rounds, grenades etc that litter the country side. For the most part, this ordnance is rendered safe and transported to a location in a remote area. The munitions are placed in a ditch; C4 blocks are placed around the UXO; covered with dirt and then imploded. Ordnance which can not be safely moved is destroyed in place. The munitions found in containers in the ASPs is turned over to the KMOD. The CMS QA team then inspects the area for cleared munitions.

The war damaged military equipment poses a difficult removal problem. The vehicle's ammunition stores and POL are still on board and must be removed first. Some of this equipment is buried in sand or standing in oil. After the vehicle is rendered safe, it is transported using heavy equipment and flatbed trucks to a holding area for later disposal by the KMOD. The CMS QA team and KMOD inspects the area for contaminates.

Professionalism and safety permeate the CMS operations. CMS personnel working on this project are all highly skilled professionals with emphasis on EOD disposal. All CMS EOD technicians are graduates of the US Naval EOD School in Indian Head, Maryland. They

have has extensive service in a US military EOD unit with hands-on experience and demonstrated leadership skills. Although already trained in EOD techniques, all EOD personnel are recertified through our training program. The CMS certification program is an eighty hour program combining classroom teaching with field exercises. No technicians are sent into the desert without adequate training and safety indoctrination.

CMS has established a Test and Evaluation group to continuously research new and innovative technologies, such as robotics, and remote sensing devices which can be applied to clearance operations. CMS also assists the Kuwait Government with public awareness programs. Finally, all CMS personnel are educated on Kuwait customs and culture before they enter the country.

To give the reader an idea of the enormous task that CMS has undertaken, the following program status, as of 26 JULY 1992 (5 months into the performance phase of the contract), is provided:

Tons of Ordnance Destroyed: 4,326

Tons of Ordnance Removed: 1,504

Mines Destroyed: 131,754

Vehicles Removed: 1,406

Sectors Cleared and QA'd: 12 (KMOD), 17 (CMS)

In summary, Operation Desert Sweep is an unprecedented EOD and site restoration program. CMS has successfully met the challenge and is not only meeting the requirements but is performing ahead of schedule. CMS is proud to participate with the government of Kuwait in this humanitarian operation.