MINE ACTION CO-ORDINATION CENTRE

SOUTH LEBANON

SUMMARY OF DEMINING ACCIDENTS
DURING THE
OPERATION EMIRATES SOLIDARITY PROJECT

Serial	Date and Time of Accident	Cause of the accident	Injuries sustained	Main Conclusions from the Accident	Main Recommendations
1	10 May 2002 1200 hrs	Whilst prodding and excavating to uncover a No4 Anti-Personnel Mine previously located and partially uncovered by a deminer the Team Leader detonated the mine whilst prodding underneath it.	Traumatic amputation of the left hand thumb Minor fragmentation injuries to both hands and arms	The base of the Israeli No4 AP mine was moved in an upward direction by the demining probe. This would have caused the release of the slotted striker retaining plate through counter-lever action, therefore allowing the spring-loaded striker to move forward and detonate the mine. The accident was considered preventable.	No amendments were necessary to National TSG's. Amendment covering the wetting of hard ground areas was required to Clearance Organisation SOP's. All mines that prove difficult to excavate are to be destroyed in place.

Serial	Date and Time of Accident	Cause of the Accident	Injuries sustained	Main Conclusions	Main Recommendations
2	13 May 2002 1555 hrs	Whilst handling a live No 9 fuze/Igniter from a No4 Anti-personnel mine the deminer inadvertently released the slotted retaining plate which allowed the igniter to detonate in his hand	Deep fragmentation lacerations to the insides and tip of the left hand, middle, ring and index fingers, a minor closed fracture of left hand middle two fingers and a deep laceration on the inside of left hand thumb. There was also a small minor fragmentation laceration to the right hand palm.	The investigation concluded that the deminer had squeezed the No 9 Igniter releasing the slotted retaining plate and thereby allowing the striker to fire. The safety collar and safety pin was not in place on the No 9 Igniter. This accident was considered preventable.	An amendment is made to National TSG's regarding the "Actions on locating a mine". All No 9 Igniters removed for demolitions are to be destroyed with the safety collar and safety pin in place. All explosives are only to be handled by trained and experienced personnel. A period of refresher training is to be conducted required.

Serial	Date and Time of Accident	Cause of the Accident	Injuries sustained	Main Conclusions	Main Recommendations
3	20 May 2002 1258 hrs	After a deminer had partially excavated a No 4 APM the Team Leader started to complete excavation around the mine to allow access to the mine fuze, after prodding around and under the mine checking for booby traps, he chose to move a small rock away from the side of the mine. He then attempted to physically move the rock, whereupon the AP mine detonated.	The Team Leader suffered traumatic amputations of both hands above the wrists, multiple facial cuts and abrasions to his face, a large fragmentation wound to his inner right thigh, primary and secondary fragmentation injuries to his groin, left thigh and left foot.	The investigation concluded that there was an uncontrolled surface detonation of a No 4 AP Mine following the attempted removal of a rock next to the mine by the Team Leader. The mine was not laying flat as normally laid and was in the ground at a steep angle with the fuze downwards. The fuze was not visible to the Team Leader. The mine was fitted with the No 9 Igniter, which is very sensitive. The Team Leader was conducting this procedure during the heat of the day just prior to lunch. This accident was considered preventable.	An amendment is made to National TSG's regarding the "Actions on locating a mine". The No 9 Igniter used in the No 4A APM is very sensitive and may be more sensitized by accumulative ground pressure. All mines that incorporate a cocked striker such as the No 9 igniter are to be destroyed in-situ. Only sufficient earth is to be excavated to identify the mine prior to demolitions. Clearance lanes are to be orientated so as to approach the mines from the opposite end of the Igniter/fuze end. Igniters/fuzes are not to be excavated around. It appears that fatigue may have played a part in this accident. Medics are to ensure that all operational personnel drink sufficient quantities of liquids and take regular breaks.

Serial	Date and Time of Accident	Cause of the Accident	Injuries sustained	Main Conclusions	Main Recommendations
4	13 June 2002 1400 hrs	A Team Leader inadvertently stepped on a live No 9 Igniter whilst conducting his post demolition checks of detonation holes from mines destroyed following clearance that morning.	The Team Leader suffered bruising and minor abrasions to both buttocks	Detonation of a No 4 AP Mine fuze (No 9 Igniter) that was thrown into his access lane by the demolition serial just conducted. This accident was considered preventable.	No amendments were necessary to National TSG's. SOP amendment covering explosive charge preparation / placement and the systematic check procedure of each demolition seat of detonation. Caution is to be exercised and a proper visual search is to be made of access lanes and clearance lanes when moving back into an area after conducting controlled demolitions.

Serial	Date and Time of Accident	Cause of the Accident	Injuries sustained	Main Conclusions	Main Recommendations
5	26 June 2002 0938 hrs	The Deminer whilst excavating to a signal previously located by detector detonated a No 4 APM in a previously mechanically flailed area.	The deminer suffered closed fractures to his second and fourth fingers to his right hand, lacerations and flash burns to his right hand and right arm and a laceration to his forehead.	The area had been previously flailed by Bozena 3 flail. The No 4 APM fuze had been sensitized by the mechanical flailing. The deminer had carried out incorrect excavation drills This accident was considered preventable.	An amendment is made to National TSG's regarding the use of mechanical flail assets. Mechanical flails are <u>not</u> to be used inside known minefields containing No4 APM's and should only be used in the ground preparation role. <u>Not</u> as a <u>primary</u> clearance tool. Consideration is given by the Clearance Organisation in using the detector again following the removal of a certain percentage of soil, especially when excavating faint signals. Consideration is given by the Clearance Organisation to re-introduce the use of demining probes (only an excavation tool was SOP at this time).

Serial	Date and Time of Accident	Cause of the Accident	Injuries sustained	Main Conclusions	Main Recommendations
6	10 July 2002 0754 hrs	The Deminer whilst excavating to a signal previously located by detector detonated a No 4 APM in a previously mechanically flailed area.	The casualty suffered part traumatic amputation of his right hand thumb, closed fractures to his right hand first and second fingers, lacerations and bruising to his right hand and right arm, fracturing to the bridge of his nose, flash burns to his head and face and the loss of his right eye	The area had been previously flailed by Bozena 3 flail. The No 4 APM fuze had been sensitized by the mechanical flailing. The deminer was carrying out correct excavation drills This accident was considered preventable.	No amendments were necessary to National TSG's. Mechanical flails are <u>not</u> to be used inside known minefields containing No4 APM's and should only be used in the ground preparation role. <u>Not</u> as a <u>primary</u> clearance tool. Consideration is given by the Clearance Organisation in adopting the prone position when excavating signals.

Serial	Date and Time of Accident	Cause of the Accident	Injuries sustained	Main Conclusions	Main Recommendations
7	20 July 2002 1210 hrs	The EOD/Survey Supervisor inadvertently stood on a No 4 APM that had not been destroyed whilst conducting post demolition checks.	The Supervisor suffered traumatic amputation of his left foot and blast/fragmentation injuries to his right leg.	The Supervisor had stood on a No 4 APM that had not been destroyed by the demolitions serial but had been covered by soil from surrounding demolitions. The Supervisor failed to properly check the detonation holes with a metal detector after conducting demolitions. A lack of adherence to the Clearance Organisation SOP's. A lack of tasking authority from the MACC SL. This accident was considered preventable.	No amendments were necessary to National TSG's. The withdrawal of the operational license for this EOD/Survey Team and Level 1 Survey Assets. Clearance Organisations are to adhere to their Accredited SOP's. A letter of censure is raised against the Clearance Organisation Operations Manager for disregarding proper procedures. All future tasking must be co-ordinated by the MACC SL. Weekly Internal and External QA is to be conducted on each accredited asset on a weekly basis.

Serial	Date and Time of Accident	Cause of the Accident	Injuries sustained	Main Conclusions	Main Recommendations
8	27 July 2002 0855 hrs	The deminer whilst uncovering a No 4 APM, which was located inside a previously flailed cut lane as part of an area reduction task detonated the mine whilst excavating.	The casualty suffered compound fracture to his right index finger, deep lacerations to his upper lip and superficial multiple abrasions to his upper right arm.	The mine may have been sensitized by the flailing action. The deminer was conducting the correct excavation procedures. The deminer rolled into an uncleared area below where he was working. This accident was considered preventable.	No amendments were necessary to National TSG's. An amendment is made to the Clearance Organisations SOP's regarding the procedures for clearing mines on a slope. Revision is conducted on the drills and procedures of "actions on a detonation", during mechanical flailing when conducting "area reduction".

Serial	Date and Time of Accident	Cause of the Accident	Injuries sustained	Main Conclusions	Main Recommendations
9	21 Sept 2002 0736 hrs	The deminer was excavating using his non-master hand to investigate a signal.	He suffered closed fractures to his left 4th and 5th Metacarpal bones, closed fractures to his left 4th and 5th Proximal Phalanges, closed fracture to his right 1st Proximal Phalange, a small laceration to his left leg (mid-shaft of the Tibia) and small lacerations to his left upper arm	The deminer was using his non-master hand to excavate around a large rock and due to a lack of control detonated the buried No 4 AP mine. Excavation was being conducted onto the fuze end of the mine. Excavation was being conducted from a kneeling position as per Company SOP's The type of excavation tool contributed to the extent of the injuries. This accident was considered preventable.	An amendment is made in National TSG's detailing additional information regarding the drill to be followed when clearing around rocks. When the terrain permits and detailed information is known on the minefield lay out, clearance lanes should be located on the side of the mine row where the rear part of the mine will be the first portion of the mine located during excavation. Serious consideration is given by the Clearance Organisation to re-introduce the use of a demining probe and a using a lightweight probe. Serious consideration is given by the Clearance Organisation in adopting the prone position when excavating signals as part of their SOP's.

Serial	Date and Time of Accident	Cause of the Accident	Injuries sustained	Main Conclusions	Main Recommendations
10	21 Oct 2002 0845 hrs	Deminer was marking the boundaries of a clearance lane previously cleared but not marked by his Team Leader. Whilst driving in a wooden marking picket on the edge of the lane he detonated a buried AP mine.	Near total amputation of the left thumb. Multiple shrapnel entries/burns over the palm of left hand, volar fingers and the forearm. Loss of the distal phalanx of the third digit of the left hand with preserved but macerated skin and soft tissues. Multiple burns/shrapnel entries over the dorsum of the distal fingers and palm of the right hand. Compound segment fractures of the Ulna and Radius in the left hand.	The mine was a No4A APM fitted with a metal fragmentation plate on the lid (enhanced No4A APM fitted with a No 9 Igniter). The Team Leader should not have been conducting clearance. The Team Leader failed to mark his clearance in accordance with SOP's. The MACC SL issued clearance plan was not on site and was not being followed. The accident was considered preventable.	The clearance team is suspended for a period of 7 x working days for refresher training. Marking pickets should only be inserted in areas that have been previously cleared. All demining lanes should be marked in accordance with current SOP's. Team Leaders are not to clear mines but concentrate on Leading Teams. Clearance plans should be issued to Site Supervisors as soon as practically possible and followed verbatim. Disciplinary action is taken against the Team Leader.

Serial	Date and Time of Accident	Cause of the Accident	Injuries sustained	Main Conclusions	Main Recommendations
11	18 Feb 2003 1130 hrs	Deminer detonated a buried AP mine whilst prodding to investigate a signal	The deminer suffered compound closed fractures to his left first and second metacarpal bones, closed compound fracture to his right second metacarpal bone. Deep lacerations to the left hand palm. Deep lacerations to the right forearm. Small cut to the upper lip and slight swelling on the forehead.	The deminer had prodded directly onto the upper lid of a No 4 AP Mine. The deminer should have been conducting excavation drills instead of prodding due to the hard ground conditions. The deminer failed to adhere to the Team Leaders commands after the signal to “stop work” was given. The accident was considered preventable.	Team Leaders and Demining No 2’s are to more closely supervise manual clearance drills and procedures whilst demining is being carried out. All personnel within an operational task sites are to adhere to all signals and instructions given by Supervisory Staff.

Serial	Date and Time of Accident	Cause of the Accident	Injuries sustained	Main Conclusions	Main Recommendations
12	1st May 2003 1520 hrs	Caused by the unsafe handling of a live No 9 fuse/Igniter from a No4A AP Mine	Extensive primary fragmentation lacerations to his left hand thumb, first, second, and third fingers and primary fragmentation lacerations to his palm. Tendon damage to his thumb also. Primary fragmentation lacerations to his face and minor abrasions to his stomach.	The accident occurred when attempting to screw a live igniter detonator back into the igniter body. The Casualty was not aware that the detonator was live. A Site Supervisor who stated that it was inert handed over the detonator and igniter to the casualty. The accident was considered preventable.	Amendments are made to all clearance organisations SOP's detailing that under no circumstances is any items of ordnance (live or inert), to be removed from demining work sites without the prior permission of the MACC SL. An amendment detailing the above are made to National TSG's and presented to the National Demining Office for approval. All operational personnel working in Southern Lebanon receive specific and detailed training (from their respective Training Officers), on the safety arrangements and method of operation of the No 9 fuse/Igniter.

Serial	Date and Time of Accident	Cause of the Accident	Injuries sustained	Main Conclusions	Main Recommendations
13	08 Aug 2003 0707 hrs	The deminer whilst excavating towards a signal detonated a No4 Anti-Personnel Mine	The deminer suffered blast and fragmentation injuries to his face, right hand, front of right thigh and left forearm. In particular the right eye was bruised and grazed and the right hand received a deep cut from the base of the thumb into to the palm. The right hand middle finger was also fractured	The mine may have become unstable due to migration coupled with accumulated pressure from previous demolitions close to this mine. The deminer may have prodded onto the mine lid or fuze. The deminer was wearing leather gloves at the time of the accident and may have lost dexterity and “feel” through his prodder, therefore excessive force was applied during prodding. The accident was considered non preventable.	The Clearance Organisation is to disseminate to all demining personnel the danger of accumulated pressure on the MUV fuze as fitted to the No 4 AP mine. Team Leaders are to closely supervise manual clearance drills in areas where mines are known or suspected to have migrated. If a Team Leader cannot achieve this then the two man drill should be adopted on a site / lane specific basis. Leather gauntlets should not to be worn on top of protective working gloves when conducting excavation and prodding drills. The Clearance Organisation is to state in their Company SOPs the criteria for wearing leather gauntlets. The Clearance Organisation should consider replacing their current excavation trowel with one that will cause less injury to a deminer’s hand.