NARRATIVE

OF

ACCIDENT

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1) History of Events.
   a) Pre-accident Phase. On 4 March DIVARTY and 1-33FA arrived at FOB Summerall, vicinity of Bayji, Iraq. 1-7th Field Artillery arrived two weeks later to relieve and assume 3-66th Armor area of responsibility. Two weeks prior, 18 February, eight personnel left on the advance party from DIVARTY and 1-33rd FA. They arrived at FOB Summerall to improve the living conditions by initiating local contracts with Iraqi citizens. The arrival of DIVARTY and 1-33FA established an unprecedented employment to the local economy in improving the quality of life for all U.S. soldiers in the FOB. The initial request for renovation of the bathroom/shower of Bravo battery was on 19 March. It went on a bid and Al Taqadum Contracting Company won, providing all the equipment to renovate the facility. The work for the facility began on 3 April and completed NLT 29 April. The work was actually completed on 2 May. The facility was open to all soldiers of Bravo battery on 3 May. On 11 May the battery R & U closed the facility for repairs because the right water heater was leaking. 1-33 FA contracted for repair after closure of the shower and the work began on 14 May. Repairs were not finished because of a missing part for the water heater, the water pressure release valve. Although the facility was closed, unknowingly another key was circulating without the consent of the R & U. On 16 May two soldiers used the facility to take showers. On 17 May eight soldiers used the facility, of which two soldiers experienced mild electrical shock while taking showers. The Platoon Leader informed the shocking experience the following day to the R & U. The R & U advised the Platoon Leader to unplug the left water heater since the right does not function already. A reason he concluded was the cause of the electrical shocks. Others had led to suspect that the left water heater was causing the shocks.
   b) Accident Phase. On 18 May 1720 hours CPL Marcos Nolasco completed afternoon PT with SGT Benjamin Perez. CPL Nolasco returned to his bay to get change of clothes and his shower kit. He then entered the shower facility and at around 1725 SGT Avant and SPC Lamar heard a scream, though it was perceived to be soldiers horse playing by the breezeway, so they did not bother to investigate where the sound came from. At 1745, SPC Lamar entered the shower room to take a shower, saw the water heater plugged-in, and unplugged it and proceeded to the second stall on the right side. He turned on the faucet but there was no water. As he was leaving the shower facility he saw personal effects hanging on the first shower door. The first shower door was locked and there wasn't a response from the individual inside the shower stall. SPC Lamar went his unit bay area to call for assistance from SGT Avant and SGT Smith who were present. He informed them that he had tried effortlessly to get the attention of a soldier in the shower. He felt that "something was wrong". They then also called the aid of their platoon leader 2LT Davis who resides adjacent to the shower facility. 2LT Davis climbed the shower wall to find CPL Nolasco without life signs. 2LT Davis and SPC Lamar performed CPR to revive CPL Nolasco with no

avail. SGT Smith at the same time had rushed to the Battery Operation Center (BOC) to request medical aid.

c) Post accident Phase. BOC notified the medics for emergency assistance. The medics continued with CPR to revive CPL Nolasco. The Battalion (BN) Surgeon moved CPL Nolasco to 1-7 Battalion Aid Station (BAS) awaiting air medical evacuation requested by DIVARTY Tactical Operation Center (TOC). The DIVARTY Surgeon met them at the landing zone (LZ) to offer any aid. Air medevac arrived twenty minutes later and the BN Surgeon and the Bravo Battery Commander accompanied CPL Nolasco to FOB Speicher in the helicopter. He was pronounced dead by the doctor after several minutes of arrival.

2) Human Factors Investigation.

a) Personnel Background Information. CPL Nolasco was born on April 18, 1970 in Mexico. He was raised in Southern California by his mother. Although he lived in Los Angeles and San Diego for several years, CPL Nolasco spent a lot of time in Mexico. He enlisted as a Marine in 1988 and was stationed at Okinawa, Japan. There he met and married his wife Mariko, and shortly after had their son, Angel. CPL Nolasco's enlistment in the Marines ended, but he continued to serve the military by managing the largest Moral Welfare Recreation (MWR) facility in Okinawa, Japan for the Marines. He earned numerous civilian service awards in this position. CPL Nolasco enlisted in the Army in 2002, to resume the responsibility of an American soldier. While with Bravo battery, he had gained the trust of many soldiers in his platoon and all have become close friends with him because of his charisma and motivation. CPL Nolasco's sense of duty is unwavering and was always the first to volunteer. But most of all, soldiers admired CPL Nolasco for his dedication to his family. He often talked about how much he loved his wife and how proud he was of his son Angel.

b) Personnel Management. CPL Nolasco was assigned to 1st Infantry Division 1st 33rd Field Artillery on August 2002, MOS 13P. While in Germany with Bravo Battery he was a fire direction specialist. His primary duties at FOB Summerall, for Operation Iraqi Freedom II were gate guard or man observation post with 2nd firing battery Bravo.

c) Vehicle suitability. Investigation revealed not a factor.

d) Communications. Four days prior to the incident, six soldiers had expressed their concerns to the battery R & U and the platoon leader; they were shocked while taking a shower. The issue was raised to the chain of command and arrived at the Bravo Battery Executive Officer. The battery commander was on leave and had only returned the day before the incident. The battery didn't disseminate the shower information to the battery or revise their current risk assessment because most of the FOB shower facilities were experiencing the same situation. The issue was not raised any further to the battalion command. R & U knew his responsibility to solve the problem, which was to turn in a work order for repairs. That was the only thing he could do. He asked the only electrician from Kellogg's Brown and Root (KBR) to inspect the facility, but with only an initial staff on the ground, the electrician had other requirements and was unavailable. According to the survey with the battery, half of the soldiers did not receive any

formal or informal risk assessment from their chain of command about the electrical hazard that was occurring. Thirty out of fifty-eight soldiers in both firing batteries were only aware of the situation through word of mouth from fellow soldiers. Three soldiers knew to unplug the power cord through process of elimination, a learned trick of how not to get shocked.

e) Meteorological information. Investigation revealed not a factor.

f) Support services. Investigation revealed not a factor.

g) Accident survivability. It was found there was no "Earth" ground to the panel box or to the water piping, according to CW2 Christopher Sembert, an electrician with 216th ENG BN, who investigated the wiring on the eve of the incident. All circuits and wiring were checked for obvious shorts and proper grounding. Mr. Sembert cites, an attempt had been made to ground the panel box out with a wire but was not connected to any type of ground in the soil. Wiring throughout the building was done with only a two wire conductor which has no capability of connecting the ground up on the outlets. He continues, "Power was restored to the building, with the two water heaters unplugged from the outlets. The water piping was checked for power, no voltage was present. Power was restored to the left side water heater. The water pipes were rechecked for voltage. With the water heater plugged in, and the checking power from a separated outlet (separate circuit) to the water piping 406v were present. This showed there was a direct short in the water heater causing the water line to become 'Hot' with voltage." Since the circuit panel, outlets and water piping had no grounds the breaker in the panel would not trip and shut power off to the water piping.

h) Rescue operations. Upon the arrival of SGT Smith to the BOC to inform the officer in charge (OIC) about the incident, the report for medical assistance was called immediately. Afterwards the procedure to report an air medevac was called from the battery to the battalion and then DIVARTY, which requested air medevac. The time elapsed from discovery of CPL Nolasco and initial medical response encompasses approximately fifteen minutes from the aid station to the Bravo battery shower area. The air medevac occurred approximately twenty minutes after arrival at 1-7 BAS.

i) Special investigation. 216th ENG BN electrician, CW2 Sembert conducted the initial investigation. He monitored the electrical current in the water pipes, suspecting that CPL Nolasco was electrocuted; he reported 406 volts were present in the water piping from the water heater to the shower stall. The water heater was brought to FOB Speicher for analysis by an expert electrician, suspected that it contributed to his death. The water heater's heating element was found split and burnt creating a short which electrically charged the water heater pipes leading to the shower stalls. The short in the water heater was the primary that caused an electrical charge that instigated the electrocution.

j) Witness interview. Statements were gathered from eight witnesses. Captain Brian P. Tierney has been a Field Artillery Officer for seven years, and has just taken command of Bravo 1-33rd FA on December 2003. 1LT Dmitry D. White is Bravo 1-33FA Executive Officer, he has been in the unit since his completion from Officer Basic Course February 2002. 2LT Thomas Davis is the 2nd Fire Platoon Leader, he has also been with 1-33rd FA upon completion of OBC August

2003. SFC James R. Smith is the Platoon Sergeant and has an additional duty as the battery's R & U NCO. SGT Brennan D. Avants is the Assistant Ammunition Section Sergeant. SGT John Smith is the battery's Recon Sergeant. SPC Frank F. Lamar, E-4 promotable, is the MLRS Gunner for the platoon. MSG William G. Putnam is the BN S2 NCOIC and also Force Protection NCO for FOB Summerall.

3) Materiel Factors Investigation.
   a) Vehicle/Equipment/Structure/Vessel worthiness. Investigation revealed not a factor.
   b) Systems. Investigation revealed not a factor.
   c) Engines. Investigation revealed not a factor.
   d) Transmission. Investigation revealed not a factor.
   e) Laboratory analysis. On 5 June 2004 CW2 Christopher J. Sembert and 1SG Robert E. Lefberg analyzed the heating element in the defective water heater. On arrival continuity was rechecked from the heating element to the metal casing. Continuity was present. The heating element was removed from the water heater. Upon removal the element was burnt and split open from overheating. (Most likely due to no water in the tank.) This split in the element shorted the metal casing of the water heater causing the heater and metal water piping to become "Hot" with voltage. CW2 Christopher J. Sembert is a qualified Utilities Operations and Maintenance Technician with the 216th ENG BN. 1SG Robert E. Lefberg is a Master Electrician in his civilian occupation.
   f) Accident site information. The latrine is approximately 28'4" long, 17'6" wide and the ceiling is 8'9". As you enter through the only entrance there are six sinks to the left three on the south wall and three sinks on the middle wall, which is 10.5" wide and separates the sink area from the shower area. The area of the sinks is approximately 10'8"x17'6". The shower area is approximately 16'8"x17'6. Each shower has a countersunk basin porcelain basin with a metal drain. The shower faucets are metal and the shower head is seated in a holder and can be removed to wash off with. Each shower is approximately 3'x5'4". The walls separating the showers are approximately 6'8" high and 10" thick.
   g) Fire. Investigation revealed not a factor.

4) Analysis.
   a) Accident Sequence. Accomplishing the task to renovate facilities and improve living conditions for FOB Summerall was contracted to local nationals. It provided incentives to bolster the local economy with employment and foster positive image of the US presence. The overwhelming need for workers encouraged the local citizens to seek employment on the FOB. Their ability to make repairs seemed a great solution to the problem. KBR, on the other hand, was unable to provide the support. They lacked personnel to do all tasks that the FOB demanded. KBR had arrived in February 2003 with a few personnel and little equipment, as an advanced party to establish KBR services to FOB Summerall and begin construction of a DFAC. Local contractors were hired for many tasks: hired hands, carpentry, electrician, plumbers, and building

renovations. Bravo battery's bathroom/shower facility contract began of 3 April 2004 and was completed on 2 May. Before its completion the battery's R & U NCO requested the assistance of KBR to inspect electrical work of the shower facility, but more significant matter were required of the only master electrician at the FOB to oversee. The contract was accepted by the BN S4 as complete without a knowledgeable expert to validate the quality of the work performed. On 3 May the facility was opened to the battery for use. By the 11 May the right water heater was leaking and it required repairs. During this time, personnel were experiencing significant decrease of water pressure from a powerful spray to a few droplets. The lack of water also affected the water heater, as the result of the lab analysis the left water heater was short-circuited due to the lack of water inside the water heater. After the incident, the investigation showed that the water heater's heating core had "split", causing a direct short which transferred an electrical charge to the water pipes leading to the shower stalls. On 14 May, local national repairmen came to fix the water heater and the electrical fuse panel of the building. The repairs were not completed because the plumber had broken the pressure release valve on the water heater. The battery's R & U NCO had closed the facility to wait for the necessary part. May 16, Sunday, two soldiers took morning showers but were not affected by the electrical shock. May 17, Monday approximately 0000-0100, two soldiers used the shower after their shift, and both states that they did not experience any electrical shock. At 1600, a soldier used the facility and was also unaffected. At 1800, another soldier used the shower and was the first to feel a mild shock. During 2000-2100, three soldiers took showers at separate times and were mildly shocked. Another soldier took a shower after 2400 hours but did not get shocked. All the soldiers whom experienced the electrical shock shared it with their comrades as well as their platoon leader. Tuesday, the platoon leader informed the R & U NCO that the showers were shocking soldiers. R & U NCO briefly shared with the platoon leader what might be causing it, and believed it was the water heater on the left and advised him to unplug it when he takes a shower. Only three others knew to unplug the water heater before taking a shower so as to not get shocked. The directive to close the showers was not communicated or supervised to ensure compliance. There were no signs marking the shower facility closed and a second key had been used to open the facility on Sunday. The reports ended at the battery XO, but since news of the mild shocks were happening at other locations on FOB Summerall, it was not perceived to be a hazard to mitigate. There were no formal or informal dissemination of information to the battery by the chain of command to inform the soldiers within the unit of the safety risk in any of the shower facilities. Only by their fellow soldiers who shared their testimony with others were other soldiers becoming aware of the incidents and how to avoid being shocked. This incident happened because there were no preventive measures mitigating the safety hazard identified by the soldiers. The unit failed to inform the battery by posting signs, or cutting the water heater plug. The units on FOB Summerall lack certified personnel to inspect the facility for safety or advice electrical requirements in scopes of work in contracts.

b) Command Factors. The battery commander was on leave prior to all reports of this particular shower facility shocking soldiers but was aware of other locations in the unit/FOB experiencing such incidents. He arrived the day before CPL Nolasco's death. There was risk management established in the battery, but the unit failed to update their risk assessment for the new hazard. The risk assessment was focused on operational and environmental factors. The unit executed risk assessment as they were trained. It is very unusual for a military organization to conduct a risk assessment of a building or facility. The battery XO was the safety officer but perceived that it was no threat because it was just a mild shock and happens only occasionally. Communication within the chain of the command was consistent, everyone was aware of missions and FRAGOs. Battery's morale was high, everyone was established in their living bays, the FOB was improving beyond expectation, and their mission was always constant to man OPs or gate guard. OPTEMPO was in sync with missions; everyone was set on a daily routine.

c) Environmental Factors. The board concludes that there were no present and contributing environmental factors at the time of the accident.

d) Materiel Factors.

   i) Major Components. The water heater was local equipment which the contractor provided for the facility. The analysis indicates that the heating element was burnt and split open from overheating. From the experts point of view due to the inadequate amount of water in the inside the water heater's tank. This split in the element in turn shorted the metal casing of the water heater causing the heater and metal water piping to become "Hot" with voltage. The lack of water was caused by the water pump failing to provide a continuous flow of water to the water heater. If the pump was inconsistent with its flow of water, then at times the tank inside of the water heater became empty. Another contributing component was the wiring throughout the building. The building was wired using two-wire conductor which has no capability of connecting the ground up to the outlets. It was found by the electrician that there was no "earth" ground to the electrical panel box or to the water piping. An attempt had been made to ground the panel box out with a wire but was not connected to any type of ground in the soil.

   ii) Major Systems. Investigation revealed not a factor.

e) Human Factors

   i) Support. The absence of an expert electrician to supervise proper electrical wiring of the building was a contributing factor. KBR had begun limited work order service for the FOB, as they were in the beginning phases of providing services to the FOB. The R&U NCO failed to file a work order request thru the Mayor's Cell in order to task KBR for the service. He asked the KBR electrician to check the shower facility, but the worker was unable to assist due to working other work order requests. At the time of the incident KBR had fewer than 20 personnel total and 1 master electrician.

   ii) Standards. The battery XO shortcoming was that he failed to warn the unit of the safety hazard associated with the shower facility. There were no signs posted or unit announcement the shower was off limits. The XO did direct the

R&U NCO to lock the shower room, but there was a second key that existed and was not under unit control.

iii) Training. The R & U NCO is not trained to conduct QA/QC for contracted labor involving plumbing, electrical, and carpentry of work. The Battalion S4 has limited training in contingency contracting. He is not trained to clearly articulate electrical requirements in a scope of work or trained to QA/QC electrical and plumbing work in order to accept a contractor's work.

iv) Leader. The unit leadership failed to inform the unit the facility was closed. There were no signs on the door or announcement in meetings or formations. Additionally, the unit failed to post closed signs or take measures to prevent the damaged water heater from being plugged into the wall outlet. Improper supervision from the direct supervisor of the facility (R & U NCO), the immediate supervisor (platoon leader), and the acting battery commander (battery XO) failed to keep the facility closed until the problem was resolved. The lack of closed signs posted on the bathroom door or communicating to the unit the bathroom was closed resulted in the unauthorized access to the facility. There were 2 keys to the shower facility, one in the possession of the R&U NCO at the time of the incident and a second key unaccounted for. The lack of accountability of the second key of the facility made it possible for soldiers to use the showers.

v) Individual. The board concludes that CPL Nolasco was unaware of the shower facility's hazards. Nonetheless, the board could not determine if CPL Nolasco used the shower before, if he had been shocked before, or if he knew to unplug the water heater before taking a shower. Therefore the board cannot determine his knowledge of the hazard.