TRAINING PROGRAM FOR THE HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE (HMMWV) EGRESS ASSISTANCE TRAINER (HEAT)

JULY 2007

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HEADQUARTERS, DEPARTMENT OF THE ARMY

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TRAINING PROGRAM
FOR THE
HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE (HMMWV)
EGRESS ASSISTANCE TRAINER (HEAT)

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PREFACE

This training circular (TC) provides a standardized training program for the HMMWV Egress Assistance Trainer (HEAT). It outlines personnel responsibilities and provides implementation instructions, goals, and methods to ensure the overall success of the HEAT device and related programs. It provides basic knowledge and motivational training in the safe operation of the HEAT device. It is designed as an integral component of the larger vehicle operator selection, training, and testing process. It does not include any theater-unique requirements. The lesson content for this training program is included in Chapter 3. The lesson content consists of lesson outlines, transparencies, and handouts. This TC also includes the following appendixes:

- Appendix A (Sample Composite Risk Management Worksheet and Instructions).
- Appendix B (HEAT Preventive Maintenance Checks and Services (PMCS) Checklist).
- Appendix C (GTA 55-03-030 (HMMWV Unarmored Rollover Emergency Procedures Performance Measures)).
- Appendix D (Sample Training Scenarios).
- Appendix E (HEAT Pre-operational Use Inspection and Set-up Procedures).
- Appendix F (Lesson Slides).

This program may be used for initial and sustainment training. When used for sustainment training, commanders have the flexibility to choose and arrange training material based on the unit’s mission, driver behavior, and/or accident history.

This publication applies to the Active Army, the Army National Guard/Army National Guard of the United States, and the U.S. Army Reserve.

The proponent of this publication is Headquarters (HQ), United States Training and Doctrine Command (TRADOC). Submit changes for improving this publication on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forward it to:

Department of the Army
CASCOM Training Directorate
ATTN: ATCL-TDM (Move Division)
Building 1109, 401 First Street
Fort Lee, VA 23801-1511

18 July 2007
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CHAPTER 1

UPARMORED HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE (HMMWV)
ROLLOVER PREVENTION

The initial goal of the HEAT is to instill the training necessary to first avoid a rollover. However, when a rollover does occur, then training is required to learn how to survive the rollover and then successfully egress from an inverted vehicle by emphasizing teamwork and developing muscle memory through crew/battle drills. A better perspective may be in clarifying what the HEAT is not. It is not designed to show how easy it is to become disoriented. HEAT training is one of the final steps in an overall Vehicle Safety Training Program. The scenarios inherent to training in the device, presume that an accident has occurred or is in the process of occurring and the HMMWV crew must now respond accordingly.

Section I. Composite Risk Management (CRM)

1.1. CRM IS A DECISION-MAKING PROCESS. CRM is the Army’s primary decision making process for identifying hazards and controlling risks across the full spectrum of Army missions, functions, operations, and activities.

   a. A key element of risk decision making is determining what constitutes an acceptable level of risk. The primary premise of CRM is that it does not matter where or how the loss occurs, the result is the same — decreased combat power or mission effectiveness. However, risk or potential loss must be balanced against expectations or expected gains and risk decisions must always be made at the appropriate level of command or leadership and based on the level of risk involved.

   b. The following are the guiding principles of CRM:

   (1) Integrate CRM into all phases of missions or operational planning, preparation, execution, and recovery.

   (2) Make risk decisions at the appropriate level. As a decision-making tool, CRM is only effective when the information is passed to the appropriate level of command for decision.

   (3) Accept no unnecessary risk unless the potential gain or benefit outweighs the potential loss.

   (4) Apply the process cyclically and continuously. CRM is applied continuously across the full spectrum of Army training and operations, individual and collective day-to-day activities and events, and base operations functions.

1-2. THE COMMANDER, LEADER, AND/OR TRAINER MUST ENSURE THAT CRM PROCEDURES ARE IN PLACE AND USED. CRM is a five-step process. The steps are describes as follows.

   a. Step 1 (Identify Hazards). A hazard is an actual or potential condition, situation, or event that can result in injury, illness, or death of personnel, as well as damage, loss, or destruction of equipment and property. It is also a situation or event that can result in degradation of capabilities or mission failure. Hazards exist in combat operations, stability operations, base support operations, training, garrison activities, and off-duty activities. Hazards can be associated with enemy activity, accident potential, weather or environmental conditions, health, sanitation, behavior, and/or material or equipment.
b. **Step 2 (Assess Hazards to Determine Risk).** Hazards and associated risks are assessed during the mission analysis, course of action (COA) development, and COA analysis steps of the military decision making process (MDMP). This assessment must consider impact on mission and non-mission related aspects of the operation. The end result of this assessment is an initial estimate of risk for each identified hazard expressed in terms of extremely high, high, moderate, or low. The following are the three sub-steps in this step:

1. Assess the probability of the event or occurrence.
2. Estimate the expected result or severity of an event or occurrence.
3. Determine specified level of risk for a given probability and severity using the standard risk assessment matrix (see Figure 1-1).

<table>
<thead>
<tr>
<th>Risk Assessment Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Severity</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Catastrophic</td>
</tr>
<tr>
<td>Critical</td>
</tr>
<tr>
<td>Marginal</td>
</tr>
<tr>
<td>Negligible</td>
</tr>
</tbody>
</table>

**Figure 1-1. Risk Assessment Matrix**

c. **Step 3 (Develop Controls and Make Risk Decisions).** This step is accomplished during the COA development, COA analysis, COA comparison, and COA approval stages of the MDMP. Controls can take many forms, but normally fall into one of the three following basic categories:

1. **Educational (awareness) controls.** These controls are based on the knowledge and skills of organizations, units, or individuals. They include the awareness of the hazard and control. Effective educational control is implemented through individual and collective training that ensures performance to standard.

2. **Physical controls.** These controls are barriers, guards, or signs to warn individuals, organizations, or units that a hazard exists. Special controller or oversight personnel also fall into this category.
(3) **Avoidance/elimination controls.** These controls include positive action to prevent contact with an identified hazard or the total elimination of the hazard. Sources such as personal experience, accident data from the Risk Management Information System, after-action reviews, and lessons learned from similar past operations can identify possible control measures for specific events, operations, or missions.

NOTE: The key to effective control measures is that they reduce or eliminate the identified hazard. Effective control measures must specify who, what, where, when, why, and how).

d. **Step 4 (Implement Controls).** Leaders and staffs ensure controls are integrated into standing operating procedures, written and verbal orders, mission briefings, and staff estimates. The critical check for this step is to ensure controls are converted into clear and simple execution orders. Implementing controls includes coordination and communication with the following:

(1) Appropriate senior, adjacent, and subordinate units, organizations, and individuals.

(2) Logistics capability organizations and civilian agencies that are part of the force or may be impacted by the activity, hazard, or its control.

(3) The media, non-governmental organizations, and private volunteer organizations when their presence impacts or is impacted by the force. Leaders must explain how the controls will be implemented. Examples include the following:

- Overlays and graphics.
- Drills for vehicle and aircraft identification.
- Rehearsals and battle drills.
- Refresher training on threat and friendly vehicle identification for anti-armor and air defense weapons crews.
- Orientation for replacement personnel.
- Installation and maintenance of communications links for key civilian organizations.
- Operating convoys with a prescribed minimum number of vehicles.
- Provision to carry weapons and wear body armor and helmets when outside secure compounds.
- Accident awareness, safety briefings, and warnings.

e. **Step 5 (Supervise and Evaluate).** Leaders and staffs ensure risk controls are implemented and enforced to standard and provide the means of validating the adequacy of the selected control measures in supporting objectives and desired outcomes. Like other steps of the CRM process, supervision and evaluation must occur throughout all phases of any operation or activity. This continuous process provides the ability to identify weaknesses and to make changes or adjustments to controls based on performance, changing situations, conditions, or events.

NOTE: Figure A-1 shows a HEAT sample on DA Form 7566 (Composite Risk Management Worksheet).
Section II. Leader Actions

1-3. PROGRAMS AND INSPECTIONS. There are many good programs that leaders can establish to reduce rollovers. Designated-driver programs and unit on-the-spot safety inspections are good starting points.

a. Commanders should—

- Know their Soldiers.
- Require disciplined, legal behavior.
- Conduct individual Soldier risk assessments.
- Provide incentives for safe performance.
- Provide rollover avoidance and remedial driver training programs.
- Hold subordinate leaders accountable for leader intervention.

b. Squad leaders and platoon sergeants are the first line of defense. They should—

- Know their Soldiers driving habits.
- Ensure that deficiencies identified in vehicle inspections are corrected and then re-inspected.
- Recommend when driving privileges should be revoked.
- Counsel individuals on the repercussions of unsafe driving.
- Conduct periodic tailgate safety briefings to small groups.
- Encourage Soldiers to look out for each other.
- Give all the drivers sufficient driving practice with loaded vehicles. If they have not been driving for an extended period of time, use the “crawl, walk, run” method of training.
### CHAPTER 2

#### COURSE SUMMARY

<table>
<thead>
<tr>
<th>Recommended Sequence</th>
<th>Type of Instruction</th>
<th>Recommended Location</th>
<th>Recommended Training Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify preventive measures for vehicle rollover</td>
<td>Conference/Discussion</td>
<td>Classroom</td>
<td>0.4 hours</td>
</tr>
<tr>
<td>Identify actions to take when rollover is imminent</td>
<td>Conference/Discussion</td>
<td>Classroom</td>
<td>0.4 hours</td>
</tr>
<tr>
<td>Identify actions to take after a vehicle rollover (not in water)</td>
<td>Conference/Discussion</td>
<td>Classroom</td>
<td>0.2 hours</td>
</tr>
<tr>
<td>Identify actions to take after a vehicle rollover (in water)</td>
<td>Conference/Discussion</td>
<td>Classroom</td>
<td>0.2 hours</td>
</tr>
<tr>
<td>Review rollover and escape actions/ observe HEAT operation</td>
<td>Conference/Demonstration</td>
<td>HEAT facility</td>
<td>0.5 hours</td>
</tr>
<tr>
<td>HEAT Crew/ Battle Drills Practical Exercise</td>
<td>Practical Exercise/Performance</td>
<td>HEAT facility</td>
<td>1.0 hour</td>
</tr>
</tbody>
</table>

**Total recommended training time:** 2.7 hours

**NOTE:** The times shown above are considered the minimum for effective training.
CHAPTER 3

MODEL HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE (HMMWV) EGRESS ASSISTANCE TRAINER (HEAT) TRAINING PROGRAM

This chapter is a model HEAT training program. Most uparmored HMMWV rollovers are preventable and actions can be taken to prevent or reduce severity when they occur. The U.S. Army’s various commands and centers, as well as their sister service counterparts, have undertaken studies and identified steps to lower the number of HMMWV rollovers and to reduce the effect on combat readiness if rollover accidents do occur. This chapter is a guide to assist HMMWV users to prevent rollovers from occurring.

SAFETY NOTE: Unauthorized activation of the HEAT may endanger life.

Section I. General

3-1. PURPOSE. The purpose of the HEAT device (Figure 3-1) is to simulate an uparmored HMMWV rollover or roll to left or right, then train the vehicle occupants to successfully egress from the rolled HMMWV by emphasizing teamwork through crew/battle drills.

![Figure 3-1. HEAT Device](image)

a. HEAT tactics, techniques, and procedures train Soldiers on how to avert rollover injuries and preserve manpower and equipment.

b. The HEAT safety philosophy is to train, with an acceptable level of risk, personnel who travel in uparmored HMMWVs to automatically react to and survive a rollover, then expeditiously egress the inverted vehicle.

c. Unfortunately, the HEAT cannot precisely replicate the violence inside the vehicle during a rollover.

d. As new materiel is developed for the HMMWV, those who manage the HEAT should ensure parity between the HEAT and the HMMWV fleet.
3-2. DUTIES AND RESPONSIBILITIES. The following personnel perform the duties and responsibilities for the HEAT training program.

   a. Commander. The commander ensures adequate resources are allocated to support an effective HEAT training program. The operations officer has staff responsibility, coordinating, fielding, and supervising the HEAT training program, to include the following:

   (1) Maintaining the currency and relevance of the HEAT standing operating procedures (SOPs).

   (2) In concert with Command Safety Office and Directorate of Logistics (DOL), ensuring an inspection and maintenance program is conducted on the HEAT apparatus and facility.

   (3) Ensuring users conduct pre-operation, during operation, and post-operation preventative maintenance and safety checks to ensure the HEAT is functioning properly.

   (4) Coordinating procurement of additional training aids to support the HEAT training program with simulated realistic training.

   (5) Overseeing the associated risk management process.

   b. Safety Officer. The safety officer will—

   (1) Assist with establishing and implementing the command’s HEAT training, inspection, and safety programs.

   (2) Review and monitor the program and HEAT device for safe operations.

   (3) Review accident experience trends and provides an analysis to appropriate agencies/organizations as it pertains to the HMMWV and HEAT in order to assist in maintaining the HEAT training program’s currency and relevance.

   (4) Assist in any investigation where a Soldier is injured while conducting HEAT training in order to mitigate the risk for future use.

   c. Subordinate Commanders. Subordinate commanders will—

   (1) Develop training plans in order to prepare Soldiers to conduct effective driving and HEAT training.

   (2) Complete a risk assessment in accordance with Field Manual (FM) 5-19, prior to conducting HEAT training with their unit.
(3) Ensure personnel attending the HEAT training are medically fit to participate in this training. Commanders will screen Soldiers prior to HEAT training for any profiles or medical conditions that may preclude participation in the training. Conditions such as previous neck and back injuries or pregnancy will preclude Soldiers from training.

(4) Notify those in their charge of the hazards associated with HEAT training.

(5) Ensure personnel attending HEAT training are properly equipped, including protective eyewear.

(6) Encourage personnel selected to attend the HEAT training to accomplish any directed or recommended prerequisite training.

d. Commanders, HEAT Trainers, and Supervisors. Commanders, HEAT Trainers, and supervisors who attend HEAT training will—

(1) Read and be familiar with this TC.

(2) Review the HEAT Risk Management Worksheet (see Appendix A) and make any local expansions necessary for compatibility with the unit mission essential task list (METL).

(3) Ensure the HEAT preventive maintenance checks and services (PMCS) and prescribed maintenance is performed (see Appendix B).

(4) Ensure parity between the HEAT and the HMMWV operational fleet as new equipment for the HMMWV is fielded.

(5) Ensure communications are established in case of emergency.

(6) Ensure evidence of motion sickness is policed.

(7) Ensure training records are completed in accordance with local SOP.

e. Unit HEAT Trainer. The unit HEAT trainer will be the functional officer in charge (OIC)/noncommissioned officer in charge (NCOIC), working with technical input from the other uniformed members and/or contractors on site.
Section II. HEAT Training Requirements

This section delineates the required training equipment and aids and provides an overview of the training.

3-3. REQUIRED EQUIPMENT AND INSTRUCTIONAL AIDS.

a. Graphic training aid (GTA) 55-03-030, HMMWV Up armored Emergency Procedures Performance Measures (see Appendix C).

b. HEAT.

c. Whistle, air horn, or similar signal device.

d. Combat lifesaver (CLS) and lifesaver/first aid equipment.

e. Motion sickness supplies (medical/hazardous waste), such as:
   - Shop (wet/dry) vacuum.
   - Hose and water source.
   - At least two one-gallon pails.
   - Latex (or equivalent) gloves.
   - Shop rags/towels.
   - Motion sickness bags.
   - A self-closing trash can and plastic trash bags.

f. Recommended knee-pads and elbow-pads (flailing and egress injury abatement).

g. Safety glasses or goggles (mandatory for eye injury abatement).

h. Fire extinguisher (Class A, B, C - at least 10 pounds).

i. Hazardous material absorbent material to recover any oil and/or grease that may leak from the HEAT device and/or to clean up the effects of motion sickness.

3-4. TRAINING UNIFORM AND EQUIPMENT. HEAT trainees will report wearing boots, Army combat uniform/desert combat uniform, protective eye wear (mandatory), hearing protection, helmet, body armor, personal and any crew-served weapon(s), protective masks (as required by the unit) LBE/V, and any other equipment that would typically be worn while riding in an up armored HMMWV in a combat zone.

3-5. TRAINING REQUIREMENTS. Primary phase training and annual refresher training are mandatory for HMMWV crewmembers. Primary training will be scheduled at least once during each training year and include training outlined in this TC. To keep training current, personnel are required to complete annual academic refresher training that includes classroom objectives that are outlined in this TC.
Section III. HEAT Safety Considerations

This section defines and delineates the safety considerations inherent to operation of the HEAT and highlights key safety considerations in operation of a HMMWV.

SAFETY NOTE: It is never advisable to exceed the limitations specified in the operator’s manual for any vehicle.

3-6. MEDICAL PRE-SCREENING. While guidelines have not been developed for the medical pre-screening of crewmembers scheduled for HEAT training, commanders should prevent any Soldier or civilian under their control from undergoing HEAT training if the commander feels any pre-existing medical conditions could be exacerbated by participating.

3-7. SAFETY HAZARD AWARENESS NOTICE. A potential for a mishap during HEAT training is acknowledged. In order to ensure the safety of staff and HEAT training participant(s), the following considerations will be addressed. Be alert for those who appear to be experiencing difficulty. In the event of motion discomfort, the individual – or the unit to which the individual belongs – will be responsible for cleaning the physical evidence (such as the release of any bodily fluid or compound) of such discomfort before training will continue.

3-8. HAZARDOUS CONDITIONS AND CONTROL MEASURES. HEAT trainees must be informed of any known hazardous conditions and control measures that exist in the training environment. Trainees must remove all watches and rings, any jewelry worn around the neck, and empty all pockets of pens, pencils, and pocket knives. Earrings should be removed to prevent inadvertent tearing of the earlobe during rollover and egress from the HEAT. Trainees should not bring pagers or cell phones into the trainer. Trainees must be briefed of their responsibility to report any unsafe/ unhealthy condition they may discover. The instructor will identify the location of emergency equipment, fire exits, and procedures to be used in the event of a fire, injury, or other emergency. In the event of an in-HEAT emergency, singled by three blasts on the whistle or sounding of applicable alarm, trainees should exit the HEAT immediately and proceed to the pre-designated location. A single long blast means trainees should remain inside the HEAT and not open the doors.

3-9. ENVIRONMENTAL EXPOSURE. Aircrew members should not participate in flight duties for at least eight hours after completion of HEAT training to ensure stability in the otolith organs of the vestibular system (FM 3-04.301, Aeromedical Training for Flight Personnel, Chapter 9).

3-10. FIRST AID TREATMENT. First aid treatment includes oxygen administration; treatment for shock; cardiopulmonary resuscitation, when needed; and transport to the nearest medical treatment facility.

3-11. PRE-TRAINING REQUIREMENTS. Prior to engaging in HEAT training, personnel shall be proficient with the wear and operation of standard uniform and combat equipment worn in the theater and be familiar with survival, signaling, and rescue techniques appropriate to survival situations typical of disabled vehicles in the area of responsibility.
3-12. **EMERGENCY MEDICAL PERSONNEL.** There will be a minimum of one CLS on site during any operation of the HEAT. Ideally, CLS services will be provided by the unit undergoing the training. Emergency medical personnel with appropriate equipment and a suitable vehicle for transport will be readily available during all HEAT training. The absence of any criteria in this paragraph requires a reassessment of the risk and the approval of the appropriate authority.

3-13. **SAFETY REMINDER.** All personnel will be reminded that equipment damage, personal injury, and even death can result from carelessness, failure to comply with the approved procedure, or violations of warnings, cautions, and safety regulations.

3-14. **HEAT LOCATION SAFEGUARDS.** The HEAT device will be isolated from passers-by and accidental striking by the device when it is in motion.

3-15. **PERSONNEL PHYSICAL REQUIREMENTS.** Prior to their selection for HEAT training, prospective trainee records must be reviewed for any profiles or medical conditions that may preclude their participation. Trainers will ensure each HEAT training participant is free of symptoms of motion sickness and any injuries resulting from the training. All HEAT training participants will be required to remain in the immediate training area for at least ten minutes following training to be observed for presentation of acute motion sickness symptoms.

3-16. **LICENSING AND QUALIFICATION/DOCUMENTATION.** Commanders will ensure adequate records of initial training and annual revalidation are maintained for each trainee on the DA Form 348 (Equipment Operator’s Qualification Record (Except Aircraft)) or service equivalent.

   a. The HEAT will only be run by instructor trainers certified in accordance with this TC. Selection of operators will be based on Appendix E AR 600-55, The Army Driver and Operator Standardization Program (Selection, Training, Testing, and Licensing) and/or other applicable prescribing service directives.

   b. A statement of qualification to operate the HEAT will be made on the DD Form 1902 (Certificate of Qualification) to show “HEAT Instructor/Operator Qualified.”

3-17. **HEAT OPERATOR AND HEAT INSTRUCTORS.** Only instructor trainers certified in accordance with paragraph 3-16 may operate the HEAT. HEAT operators must be trained and certified by competent personnel. As such, commanders must determine who is qualified to train the HEAT operator(s). Commanders may assign other competent personnel (military, civilian technician, or contractors) as HEAT Instructor/Operators (I/Os). Ideally, someone who is already an instructor trainer or has experience as an instructor or safety officer/NCO may be designated by the commander as a HEAT Instructor/Operator. Instructor/Operators (I/Os) must be selected not only for their technical qualifications but also for their demonstrated performance, objectivity, and ability to observe and provide constructive comments. Qualification training for HEAT Instructor/Operators (I/Os) will be conducted using the following guidance:

   a. Individuals conducting HEAT training must be trained by other HEAT Instructor/Operators (I/Os).

   b. Initial qualification training will consist of, as a minimum, hands-on training of all tasks the operator is authorized to perform in accordance with the HEAT TC. Special emphasis will be placed on Academic and Performance Phase Learning Objectives and appropriate PMCS (see Appendix B). Annually, all HEAT Instructor/Operators (I/Os) must demonstrate a working knowledge and understanding of the appropriate subject areas in the HEAT training POI and the ability to administer the commander’s HEAT training program.
c. The initial/annual evaluation will determine the HEAT operator’s ability to train other personnel and perform essential tasks to the prescribed standards. HEAT Instructor/Operators (I/Os) may evaluate the HEAT operator(s) by observing the performance of the prescribed duties or by functioning as a crewmember undergoing HEAT training by the HEAT operator, in order to evaluate the effectiveness of the HEAT operator’s instruction.

d. HEAT Instructor/Operators (I/Os) will be certified in accordance with paragraph 3-12. HEAT Instructor/Operators (I/Os) will also be issued a DD Form 1902 as evidence of their qualification and designation (see Figure 3-2) and training/certification will be annotated on DA Form 348.

![Certificate of Qualification](image)

**Figure 3-2. DD Form 1902**

Section IV. Lesson Outline

**SHOW SLIDE 1:** An AMSAA study of HMMWV rollover accidents at the end of FY 05 revealed that “During the two years that has defined OIF/OEF there have been 34 Class A rollovers. During the entire 18.5 year span of the HMMWV data … there have only been thirty 30 class A rollovers.” The same study also found that OIF/OEF HMMWV accident rates are 12 to 42 times greater than non-OIF/OEF. A study reported by Helicopter World (now Defense Helicopter) magazine in September 2000 said a person who is "egress trained" stands a 250 percent greater chance of survival than an untrained occupant when faced with a rollover egress emergency.

Teaching Soldiers, under controlled training conditions, the proper procedures to egress from an inverted high mobility multipurpose wheeled vehicle (HMMWV) will allow them to achieve self-control and overcome the natural fear and panic following the vehicle rollover. It will also reduce casualties and fatalities resulting from such rollovers, even when the vehicle is under attack, underwater, or on fire.

*Show HEAT movie (type link into web browser to open website to view the movie).*
NOTE: Inform the students of the following TLO requirements.

At the completion of this lesson, you [the student] will—

<table>
<thead>
<tr>
<th>ACTION:</th>
<th>Perform clearing and egress procedures with the HEAT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONDITIONS:</td>
<td>In the HEAT, wearing required combat equipment, given instruction on actions to take to preclude and reactive measures during/after a HMMWV rollover as a HMMWV crewmember.</td>
</tr>
<tr>
<td>STANDARDS:</td>
<td>Properly evacuate the HEAT while adhering to applicable safety precautions and procedures outlined in this lesson and applicable references.</td>
</tr>
</tbody>
</table>

SAFETY REQUIREMENTS.

SAFETY NOTE: Of all the vehicle occupants, the likelihood of injury to the gunner is disproportionately higher than those of the others. Knowing the fundamental purpose of the HEAT, those occupying the gunner position must exercise particular diligence in securing occupant restraints, bracing for the rollover, and be particularly mindful of the increased potential for head and neck injuries - even in the device.

a. **Medical Pre-screening.** HEAT training undertaken while being treated by prescription medications, must be done so with the knowledge and approval of the treating physician.

b. **Safety Hazard Awareness Notice.** A potential for a mishap during HEAT training is acknowledged. In order to ensure the safety of staff and HEAT training participant(s), the following considerations will be addressed. Be alert for those who appear to be experiencing difficulty. In the event of motion discomfort, the individual – or the unit to which the individual belongs – will be responsible for cleaning the physical evidence (such as the release of *any* bodily fluid or compound) of such discomfort before training will continue.

c. **Hazardous Conditions and Control Measures.** Students must be informed of any known hazardous conditions and control measures that exist in the training environment. All watches, rings, and jewelry worn around the neck shall be removed; pagers or cell phones removed; and all pockets emptied of contents – particularly pens, pencils and pocket knives. Earrings should be removed to prevent inadvertent tearing of the earlobe during inversion and egress from the device. Crewmembers must be briefed of their responsibility to report any unsafe/unhealthful condition they may discover. The instructor will identify the location of emergency equipment, fire exits, and local procedures to be used in the event of a fire, injury, or other emergency. In the event of an in-HEAT emergency, (three blasts on the whistle or sounding of applicable alarm) exit the HEAT immediately and proceed to the pre-designated location. A **single long blast** is an indication to remain inside the device and do **not** open the doors.

d. **First Aid Treatment.** First aid treatment includes oxygen administration; treatment for shock, cardiopulmonary resuscitation, when needed; and transport to the nearest medical treatment facility.
e. **Pre-training Requirements.** Prior to engaging in HEAT training, personnel shall be proficient with the wear and operation of standard uniform and combat equipment worn in the theater, and be familiar with survival, signaling and rescue techniques appropriate to survival situations typical of disabled vehicles in the AOR.

f. **Emergency Medical Personnel.** There will be a minimum of one Combat Lifesaver (CLS) on site during any operation of the HEAT. Ideally, CLS services will be provided by the unit undergoing the training. Emergency medical personnel with appropriate equipment and a suitable vehicle for transport will be readily available during all HEAT training. The absence of any criteria in this paragraph requires an additional risk assessment, and the approval of the appropriate risk approval authority.

g. **Safety Reminder.** All personnel will be reminded that personal injury, death, or equipment damage can result from carelessness, failure to comply with the approved procedures, or violations of warnings, cautions, and safety regulations.

h. **HEAT Location Safeguards.** The HEAT device will be isolated from passers-by and accidental striking by the device when it is in motion.

i. **Risk Assessment Level.** Moderate - CRM is a decision-making process used by leaders to mitigate risks associated with all hazards that can injure or kill people, damage or destroy equipment, or otherwise impact mission effectiveness. CRM must be accomplished using appropriate composite risk management worksheet in Appendix A of this TC prior to the conduct of this training.

j. **Environmental Considerations.**

NOTE: It is the responsibility of all Soldiers and DA civilians to protect the environment from damage.

k. **Environmental Exposure.** Aircrew members should not participate in flight duties for at least eight hours after completion of HEAT training to ensure stability in the otolith organs (inner ear) of the vestibular system (reference Aviation/Flight Safety Program and Aviation Accident Prevention Plan [AAPP], paragraph 4-9d(1)) and FM 3-04.301 (Aeromedical Training for Flight Personnel, Chapter 9).

**SLIDE 3:** Knowing what actions to take immediately prior to a potential rollover and immediately following a rollover are vital to the safety of the vehicle’s crew. Rollover battle drills, based on unit standing operating procedures (SOP), routinely performed by the vehicle’s crew, create understanding of and how to react to the violent chaos that results when a rollover has occurred.

**ENABLING LEARNING OBJECTIVE (ELO)**

<table>
<thead>
<tr>
<th>ACTION</th>
<th>Understand preventive measures to preclude rollover.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONDITIONS:</td>
<td>In a classroom, provided instruction on preventive and reactive measures, crewman duties, and emergency steps to take in case of a vehicle rollover.</td>
</tr>
<tr>
<td>STANDARDS:</td>
<td>Identify precautionary measures to take to prevent a HMMWV vehicle rollover by answering the check-on-learning questions posed by instructor with a minimum of 80 percent.</td>
</tr>
</tbody>
</table>
SLIDE 4: The critical rollover angle for a Combat Patrol-loaded M1114 is less than 30°, while the critical rollover angle for an uparmored HMMWV is 25° (less with higher center of gravity (cg) loads). Driving an uparmored HMMWV is vastly different than driving a HMMWV without armor. At gross vehicle weight (GVW), which is an unloaded uparmored HMMWV with four crewmembers and their gear, rapid steering at speeds as low as 40 miles per hour (mph) increases the likelihood of a rollover. Stability is further reduced by road conditions, such as sand, debris, gravel, or rain; overloading the uparmored HMMWV; cargo placed high in the vehicle which raises the vehicle’s center of gravity; and driver inexperience or lack of training. At 60 mph on smooth dry pavement an overloaded uparmored HMMWV has a braking distance of 15 vehicle lengths, compared to 13 vehicle lengths at GVW.

SLIDE 5: Elaborate on the following

Rollovers are caused by speed, inadequate training, high centers of gravity, terrain and road conditions, driving habits, and local conditions. However, with proper driver training and actions, leader involvement, and composite risk management, the number of rollovers can be significantly reduced.

a. **Senior Vehicle Occupant.** The senior occupant is responsible for ensuring all personnel riding in or on a vehicle are wearing seatbelts/restraints and that all required equipment inside the vehicle is properly stored and secured. Other requirements are as follows:

   1. **Vehicle center of gravity.** The height of a vehicle’s center of gravity and the length of the wheelbase determine the vehicle’s stability. This is a major contributing factor to vehicle rollovers. If the crew overloads the vehicle or does not load the heavier items on bottom, the center-of-gravity will be raised higher. Every effort should be made to plan and load the vehicle to minimize this affect. If the load is off to one side of the vehicle handling will be adversely affected. This will not only prematurely wear on the vehicle components but will also tend to make the vehicle sluggish to control or drift from side to side.

   2. **Load security.** Improperly secured loads can change a vehicle’s center of gravity and its stability. Bulk liquid tank trucks are inherently less secure as liquids can surge when trucks brake or go around curves, thereby altering the center of gravity. Also, a vehicle loaded with containers will have a higher center of gravity. It is important that payloads are secured as closely as possible to the lateral centerline of the truck or trailer bed. If the payload is not centered properly, the vehicle stability will not be equivalent when turning to both the right and left.

   3. **Radius of curves and slope of roadways.** These calculations are important because they generate a centrifugal force that acts sideways on the vehicle, thereby the hazard of rollover.

   4. **Vehicle speed.** This factor probably contributes the most to vehicle instability because it magnifies problems presented by the other three factors. As the vehicle’s speed increases, the centrifugal force increases. Faster speeds also result in decreased driver response times. Of all the factors discussed above, the driver exercises control over speed. When maneuvering through curves or sudden traffic situations, a vehicle with a high center of gravity can easily turn over. Sudden vehicle maneuvers are especially risky because the combination of speed and load shift makes the vehicle unstable.

   5. **Trailer towing.** Vehicles towing trailers are much more prone to roll over, especially in curves and during sudden steering maneuvers, as a result of the exaggerated motion of the trailer.
b. **Vehicle Condition and Preparation.** It is critical the vehicle is in good operating condition before starting a mission. Pay particular attention to the condition of the tires and tire air pressure. Properly performed preventive maintenance checks and services (PMCS) is the best way to control this potential hazard.

**SLIDE 6:**

c. **Driver Risk Management Control Measures.** Every driver can take eight basic steps to prevent or reduce the potential for rollovers.

NOTE: Commanders should include safety tips in initial and sustainment tactical wheeled vehicle operator training.

1. Adjust the vehicle speed to allow a "speed cushion" for maneuvering (when approaching a curve, reduce your speed by at least 10 miles per hour below the posted speed limit).

2. Slow down.

3. Avoid panic – Do not jerk the steering wheel. Many rollovers occur when the driver panic and/or jerks the steering wheel during an emergency. At highway speed, jerking the steering wheel can cause loss of control and the vehicle may slide sideways and roll over.

4. Observe speed limit and check speedometer to ensure vehicle is below the posted speed.

5. Do not rely on a "seat of the pants" sense to judge speed and vehicle maneuverability. New suspensions and chassis set-ups give a false sense of control.

6. Slowly accelerate out of the curve.

7. Maintain a "space cushion" (distance between the vehicle and other traffic) so the driver has a safe maneuvering speed to compensate for errors in judgment, weather, road conditions, and poor driving by other motorists.

8. Avoid the temptation to brake hard if the rear of the vehicle or trailer "slides out." Instead, if there is clearance, attempt to apply steady throttle, allowing the vehicle to straighten itself. Braking will accelerate the skid, contributing to loss of control and rollover.

d. **Risk Management Procedures.** All personnel are required to use vehicle restraint systems. It is recommended when operating tactical military vehicles during field training, driver’s training, and tactical operations that the Kevlar/Advanced Combat Helmet (ACH) be worn at all times with chin strap properly secured.

**SLIDE 7:**

e. **Teamwork is Another Key to Successful Rollover Prevention:**

- Work as a team.
- Maintain crew integrity.
• Communicate with the driver. Tell the driver what is to the left, right, rear, and overhead. Your gunner is your eyes and ears! The gunner may be the only crew member capable of seeing around the entire vehicle. Use the vehicle intercom system to pass visual information to the driver, but rehearse shouted voice commands and hand signals in case the intercom fails. Avoid hazards by using a ground guide whenever possible.
• Identify terrain or conditions favorable for a rollover.
• Use a guide near bodies of water.
• Position team members within the vehicle.
• Combat locks help keep the doors closed in a crash, but are a hazard near water! Unlock combat door locks when near water (enemy situation permitting).
• Know how to get out. Rehearse vehicle evacuation as if only one exit is available.
  ▪ Combat door locks on the M1114 Up armored HMMWV are designed to keep the enemy out. When locked they also make it extremely difficult for rescuers to enter the vehicle!
  ▪ Accident damage may also jam the door locking devices, making them impossible to open.
  ▪ If the doors cannot be opened by occupants or rescue team members and the vehicle is inverted in water too deep to allow air in the vehicle, the likelihood of drowning is high.
  ▪ In this case, rescuers must immediately attempt to roll the vehicle on its side using all available means (tow straps, rope, winch cables, and so on) to gain access to the turret.
  ▪ Leaders must decide, based on the enemy situation, whether or not to keep the doors locked when operating near any body of water (bridges over/roads adjacent to any canal, river, lake, pond, and so on).

SLIDE 8:

HMMWVs are fitted with armor as a means of reducing casualties from improvised explosive devices (IEDs) and small arms fire. Currently trucks in Iraq are not even allowed on the main and alternate supply routes unless they have Level I factory-produced armor (armor integrated into nearly every aspect of construction) or Level II add-on armor (ballistic steel plates and bulletproof windows). In addition, welding shops are adding "T-cups," additional armor surrounding the ring mount to protect the gunners. The additional protection the armor provides U.S. Soldiers from IEDs and small arms fire has its price. Uparmored HMMWVs are extremely-top heavy and vehicle rollovers have become a common and deadly occurrence.

Knowing what actions to take immediately prior to a potential rollover and immediately following a rollover are vital to the survival of the vehicle’s crew.

SAFETY NOTE: Never attempt to leap from a rolling vehicle. Except for the gunner, ensure all vehicle occupants have their seat belts fastened. Ensure the gunner remains at the name tag defilade position with gunner’s restraint system on when in the gunner’s turret. Upon complete evacuation of all personnel, vehicle should be inspected for fire hazards such as leaking oil, fuel, ammunition and hydraulic fluid. Use the portable fire extinguisher when inspecting vehicle for leaks in case of fire, which could cause injury or death. If hazardous/explosive materials are involved, driver should take actions according to the DD Form 836 (Dangerous Goods Shipping Paper/Declaration and Emergency Response Information for Hazardous Materials Transported by
Government Vehicles) accompanying load. Notify rescue personnel and remain at evacuation distance while securing accident site.

SLIDE 9:

These steps should begin when the driver feels he/she has lost control of the vehicle and anticipates a rollover, but not into water.

a. **Driver:**
   
   (1) Releases the accelerator.
   
   (2) Shouts, "**Rollover, Rollover, Rollover!**"
   
   (3) Keeps hands on the steering wheel with arms extended but not locked.
   
   (4) Plants feet firmly on the floor.
   
   (5) Tucks head and chin into chest and braces for impact.

b. **Vehicle commander (VC):**
   
   (1) Shouts, "**Rollover, Rollover, Rollover!**"
   
   (2) Uses left hand to pull gunner into the vehicle.
   
   (3) Uses left hand and arm to hold the gunner in place.
   
   (4) Plants feet firmly on the floor while holding onto a stationary object.
   
   (5) Tucks head and chin into chest and braces for an impact.

SLIDE 10:

c. **Gunner:**
   
   (1) Shouts, "**Rollover, Rollover, Rollover!**"
   
   (2) Pushes/pulls self down into the vehicle.
   
   (3) Holds onto a stationary object.
   
   (4) Tucks head and chin into chest and braces for impact.
   
   (5) **Does not place hands or fingers on turret.** Turret’s movement can cause additional injuries.

d. **Other Crewmembers (if present):**
   
   (1) Shout, ‘**Rollover, Rollover, Rollover!**’
   
   (2) Assist VC in pulling the gunner into the vehicle and hold him/her.
(3) Tuck heads and chins into chests and brace for impact.
(4) Hold onto a stationary object.

SLIDE 11:

When in the vicinity of water and tactical conditions permit:

a. **VC:**
   (1) Informs vehicle crew that the vehicle is operating around water hazards.
   (2) Reminds the crew of the risk mitigating measures.
   (3) Unlocks the combat door locks.
   (4) Ensures all loose gear and cargo are secured.

When water entry is imminent, whether or not the potential for a rollover exists, these steps should be followed:

b. **Driver:**
   (1) Releases the accelerator and controls the entry by steering into the body of water.
   (2) Yells "Water!"
   (3) Keeps hands on the steering wheel with arms extended but not locked.
   (4) Plants feet firmly on the floor.
   (5) Tucks head and chin into chest and braces for impact.

SLIDE 12:

c. **VC:**
   (1) Shouts, "Water!"
   (2) Uses left hand to pull gunner into the vehicle.
   (3) Uses left hand and arm to hold the gunner in place.
   (4) Plants feet firmly on the floor while holding onto a stationary object.
   (5) Tucks head and chin into chest and braces for an impact.
d. Gunner:

(1) Yells, "Water!"

(2) Pushes/pulls self down into the vehicle.

(3) Slides feet in the direction of the vehicle’s movement.

(4) Plants feet firmly on the floor while holding onto a stationary object.

(5) Tucks head and chin into chest and braces for impact.

(6) **Does not place hands or fingers on turret.** Turret’s movement can cause additional injuries.

e. Other Crewmembers (if present):

(1) Shout, "Water!"

(2) Assist VC to pull gunner into the vehicle and hold him/her.

(3) Tuck head and chin into chest and brace for impact.

(4) Plant feet firmly on floor while holding onto a stationary object.

CHECK ON LEARNING: Conduct a check on learning and summarize the ELO.

ENABLING LEARNING OBJECTIVE (ELO)

SLIDE 13:

<table>
<thead>
<tr>
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<td>STANDARDS:</td>
<td>Identify precautionary and reactive measures to take in case of a HMMWV vehicle rollover by answering the check-on-learning questions posed by instructor with a minimum of 80 percent.</td>
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</tbody>
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SLIDE 14:

1. **After Rollover (Not in Water).**

   a. Each crewmember, whether driver, VC, or rear crew:

      (1) Braces one hand on the ceiling.

      (2) Unbuckles seatbelt with other hand and immediately puts both hands on ceiling.

      (3) Slides out of seat and sits up.

      (4) Disconnects headset.
(5) Turns off motor (driver).

(6) Orient self on the nearest door.

(7) Unlocks combat door locks.

(8) Opens door; if it does not open, try a different door.

(9) Exits with weapon.

(10) Assists remaining crew to exit.

(11) Establishes security.

(12) Checks for fires.

(13) Activates fire extinguisher, as needed.

(14) Recovers sensitive items.

(15) Provides first aid.

(16) Assists in vehicle recovery.

**SLIDE 15:**

**b. Gunner:**

(1) Disconnects headset.

(2) Releases Gunners Restraint System/Product Improved Gunner’s Restraint System.

(3) Orient self on the nearest door.

(4) Unlocks combat door locks.

(5) Opens door; if it does not open, tries a different door.

(6) Exits with weapon.

(7) Assists crew to exit.

(8) Establishes security.

(9) Checks for fires.

(10) Activates fire extinguisher, as needed.

(11) Recovers sensitive items.
(12) Provides first aid.

(13) Assists in vehicle recovery.

SLIDE 16:

2. **If Vehicle Rolls Onto Side.**
   a. Lower level Soldiers, if able:
      (1) Unbuckle seat belts.
      (2) Assist upper Soldiers to unfasten seat belts then carefully lower.
   b. Crew, if doors are jammed:
      (1) Exit through hatch or cargo area if possible.
      (2) Work as a team to open jammed doors.

NOTE: Conduct a check on learning and summarize the learning activity.

SLIDE 17:

1. **After Rollover (In Water)—**
   a. **All crewmembers**—
      (1) Turn off motor (driver).
      (2) Disconnect headsets.
      (3) Unbuckle seatbelt with other hand and immediately put both hands on ceiling.
      (4) Unlock combat door locks if not already unlocked.
      (5) Decide whether or not to remove personal equipment.
      (6) Exit the vehicle.
      (7) Assist each other to exit and secure weapons.
      (8) Assess injuries.
      (9) Get to safest shore.
      (10) Provide security.
      (11) Account for other crewmembers.
(12) Provide/seek first aid.
(13) Retrieve weapons, ammunition, and sensitive items.
(14) Assist with vehicle recovery.

b. **Vehicle Commander**

(1) Accounts for weapons, ammunition, and sensitive items.
(2) Requests medical support, if required.
(3) Reports accident.

**SLIDE 18:**

**2. Water Rescue Recovery Drill.** Do the following in the event one or more crewmembers do not personally egress from the overturned vehicle:

a. Rescuers secure the accident site.

b. Stay in contact with the vehicle, hold onto the vehicle, and kick/swim to a high point in buddy teams.

c. Rescuers tie a rope/cable to the vehicle to aid rescue.

d. Open doors and hatches, using the emergency rescue wrench if necessary.

e. If doors and hatches are not accessible, rescuers must immediately use all available means to turn vehicle on its side to gain access to the turret.

f. Seek out the highest point on the vehicle from which to rescue trapped occupants.

g. Ensure all survivors have air and are able to breathe.

h. Check for other injuries and apply first aid.

i. Remove personal equipment, including body armor.

j. Carefully move injured personnel to the highest point on the vehicle.

k. Evacuate from vehicle high point to safest location, depending on:

   (1) Enemy situation.
   (2) Water level and flow.
   (3) Water temperature.
(4) Distance to water’s edge.

(5) Anticipation of rescue.

CHECK ON LEARNING: Conduct a check on learning and summarize the lesson.

SHOW SLIDE 19: CHECK ON LEARNING

1. A combat patrol loaded M1114, with a normal center of gravity (cg) and normal load can operate on slopes of up to how many degrees?
   a. 20.
   b. 25.
   c. 30.
   d. 98.6.

2. The critical (rollover) angle for an in theater up-armored HMMWV is how many degrees?
   a. 20.
   b. 25.
   c. 30.
   d. 98.6.

3. What is the corrective action before reaching the critical rollover angle?
   a. Jerk the wheel back to the center of the road.
   b. All occupants yell, “Water!”
   c. Reduce speed and ease the vehicle back onto the roadway at a safe speed.
   d. Secure the coolers and secure voice radios.

4. What should you do, during egress, if you find the door you are attempting to exit will not open?
   a. Inflate your water wings, kick out the windshield, and swim away from the enemy.
   b. Do not panic - find a door that works.
   c. Stay put and call the Automobile Club.
   d. Stay put and call QRF on the secure voice radio.

SHOW SLIDE 20:

5. What are the egress actions for the Gunner following a rollover on dry land?
   a. Disconnect headset, release gunner’s restraint system, assess injuries, clear and check weapon, exit vehicle with weapon.
   b. Assist crew to exit, establish security, recover sensitive items, provide first aid and assist in vehicle recovery.
   c. a and b above.
   d. Leap from the vehicle before it rolls.
6. What are the immediate actions of the Driver should an entry into the water be imminent?
   a. Release the accelerator; yell “Water!” and keep hands on the steering wheel.
   b. Tuck head and chin into chest and brace for impact; and steer vehicle to control entry into the water to prevent rollover.
   c. a and b above.
   d. Leap from the vehicle before it hits the water.

7. What must you do prior to releasing your seatbelt for egress, and immediately afterward?
   a. Brace with one hand against what was the ceiling (consider which hand you should brace with) – your neck cannot support your body weight during a fall; unfasten your seatbelt with the other hand.
   b. Unfasten your seatbelt with one hand, pushing firmly until it pops loose. You may have to push against the floor with your bracing hand to allow the seatbelt to unfasten.
   c. a and b above.
   d. Take out your k-bar and cut the thing off.

SHOW SLIDE 21:

8. What is the purpose of the combat door lock?
   a. To prevent aggressors from entering the vehicle in a hostile area.
   b. It interfaces with the LoJack circuitry, and assists police in recovery of a stolen HMMWV.
   c. It jettisons the door if moisture is detected during a water entry.
   d. There is no difference between a combat door lock and a conventional door lock.

9. What should the HMMWV crew do when operating near bodies of water or crossing bridges?
   a. Inform crewmembers of the water hazard, loosen seatbelts, and slow down.
   b. Identify water hazards, unlock combat locks, remove seatbelts, and slow down.
   c. Slow down, inform crewmembers of possible water hazards, and unlock combat door locks (enemy situation permitting).
   d. Look for alternate routes.

10. What should HMMWV crews do to reduce the risk of being involved in a rollover?
    a. Check tires for proper inflation and serviceability, and slow down.
    b. Slow down, do not overload the vehicle, check condition and serviceability of tires, and secure loads.
    c. Ensure operators are properly licensed.
    d. Limit crews operating in the vehicle to four or less.
SHOW SLIDE 22:

11. What can gunners do to minimize their injuries when involved in a rollover?
   a. Try to jump away from the vehicle.
   b. Lower themselves and brace for impact.
   c. Yell “Rollover!” while lowering themselves into the vehicle, bracing for impact.
   d. Call the Automobile Club and complain about that last sharp curve in the road.

12. What preventive measures can be taken to minimize the chances of being involved in a rollover?
   a. Make a detailed Power Point presentation of any sharp curve in the road for emailing to your Congressman in a formal yet anonymous complaint.
   b. License and certify all crews on the HEAT, and train as a team.
   c. Slow down, avoid panic, know proper vehicle maneuvering, use caution in rural areas with soft shoulders, and identify water hazards.
   d. Only tracking your number of days left in country will help.

13. Other than the driver and gunner, what are the duties of the crew in the event of a rollover?
   a. Yell “Rollover!”
   b. Grab the gunner and pull him/her into the crew compartment.
   c. Brace for impact.
   d. All of the above.

SLIDE 23

<table>
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<tr>
<th>ACTION:</th>
<th>HEAT performance drills.</th>
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<tr>
<td>CONDITIONS:</td>
<td>In the HEAT trainer with required equipment and previous training.</td>
</tr>
<tr>
<td>STANDARDS:</td>
<td>Properly evacuate the HEAT while adhering to applicable safety precautions and procedures outlined in this lesson and applicable references.</td>
</tr>
</tbody>
</table>

SLIDE 24:

Show HEAT Gunner Restraint System movie to demonstrate/review restraint system (type link into web browser to open website to view the movie).

Observation:

1. Move group to the HEAT device room and observe the previous group undergoing training in the device. As the group of five in the HEAT completes their cycle, the observation group moves into the device to perform PE.

2. Group is in device with restraints fastened and doors locked. Conduct review/walk thru of below drill/actions to take during and immediately following rollover and escaping from the HMMWV.
3. Communicate with the driver. Tell the driver what is to the left, right, rear, and overhead. Your gunner is your eyes and ears. The gunner may be the only crewmember capable of seeing around the entire vehicle. Use the vehicle intercom system to pass visual information to the driver. However, rehearse shouted voice commands and hand signals in case the intercom is inoperative. Avoid hazards and use a ground guide whenever practicable. The gunner must remain in nametag defilade in accordance with FM 21-305 (Manual for the Wheeled Vehicle Driver), TC 21-305 (Training Program for Wheeled Vehicle Accident Avoidance), TC 21-305-4 (Training Program for the High Mobility Multipurpose Wheeled Vehicle), and TC 21-306 (Tracked Combat Vehicle Driver Training).

NOTE: Of all the vehicle occupants, the likelihood of injury to the gunner is disproportionately higher than those of the others. Knowing the fundamental purpose of the HEAT, those occupying the gunner position must exercise particular diligence in securing occupant restraints, bracing for the rollover, and be particularly mindful of the increased potential for head and neck injuries – even in the device. Further, those occupying the gunner position in the HEAT must verify prior to each rollover iteration that the gunner hatch locking mechanism remains secure, and to avoid inadvertent disengagement of the lock during each rollover.

4. Wear seatbelts. Survive the rollover!

5. During the roll:
   a. **The Driver Drives.** Continue to navigate the vehicle as long as the controls of the vehicle influence and direct its path and speed.
   b. **The Gunner Must Slip Out of the Gunner’s Seat.** Attempt to retract into the cab of the vehicle as quickly as possible. While this action does not eliminate the bouncing around inside the vehicle, it substantially reduces the likelihood of decapitation. It also puts the roll cage of the vehicle between the gunner and the accident site.
   c. **All Others in the Vehicle Must Make a Grab for the Gunner.** Assist them as abruptly as necessary to get into the cab of the vehicle as quickly as possible.

6. Use combat locks – safely. Combat locks help keep the doors closed in a crash, but are often a hazard near water. Unlock combat door locks when near water (enemy situation permitting).

7. Know how to get out. Rehearse vehicle evacuation as if only one exit is available. Actual egress entails:
   a. **BRACE** with one hand against the floor (what *was* the ceiling).
      
      (1) Consider which hand you should brace with (figure which hand can reach your seatbelt, and use the other one to brace).
      
      (2) Do not unlatch your seatbelt without bracing on the floor – your neck cannot support your body weight, let alone with all the *battle rattle* you have on.
b. UNFASTEN your seatbelt with your other hand.
   (1) Push against the floor with your bracing hand to release the tension on the seatbelt so it will unfasten.
   (2) Find the release button and press it firmly until it pops loose.
   (3) Be prepared to fall when the belt unlatches. Tuck your head and protect your neck at all costs.

c. SLIDE out of your seat, being sure to disconnect your headset.
   (1) Remember that you cannot open the door while inverted.
   (2) Be aware of your buddies and do not kick them in the face.
   (3) Muzzle awareness at all times.
   (4) Be aware your gear may get caught on something.

d. ORIENT yourself on the door.
   (1) Dropping out of your seat is more disorienting than expected.
   (2) Get yourself right side up before worrying about the door.
   (3) Look at the door – consider how it will open now that it is inverted.

e. UNLOCK AND OPEN the door. If it does not open, find a door that works. Recall whether your vehicle is one with two-stage combat locks or one-stage, and the differences it takes to open each.
   (1) Armored doors weigh 240 pounds each and are not meant to be inverted.
   (2) The door may be difficult or impossible to open.
   (3) Once the latch is open, you will have to really lean into the door to get it opened. However, if your door is not opening, try another door!
   (4) When you open a door, shout “Open door (and the location)!”

f. GET OUT, but do not let your buddy down.
   (1) Determine if all crewmembers are aware of the open door, and whether they are moving toward it.
   (2) Determine if all crewmembers are conscious.
Consider the risks of moving injured Soldiers – do not make the situation worse, but you cannot leave them hanging upside down, nor there to drown.

Look before you leap – do not rush out the first door, only to fall off a cliff, or thrust yourself into a burning fuel or oil slick.

The gunner’s egress entails some specific and additional steps:

a. Slide feet to the direction of roll, as the torso and legs are withdrawn to present the lowest possible profile.

b. Depending on how the rear seats are occupied:

(1) When both rear seats are occupied, both rear seat occupants will maintain a firm grasp on the gunner, pulling the gunner down inside the vehicle through the turret – assisting in restraining the gunner throughout the rollover until the vehicle has come to a stop.

(2) If only one rear seat is occupied, the back seat occupant will pull the Gunner toward them, much as described above.

c. Unlatch the gunner’s lanyard/harness and egress.

Section V. Practical Exercise

PRACTICAL EXERCISE
(Sample Scenarios included in Appendix D)

High Mobility Multipurpose Wheeled Vehicle (HMMWV) Egress Assistance Trainer (HEAT)

1. PURPOSE. The purpose of the HEAT PE is to simulate an up armored HMMWV rollover or roll to left or right, then train the vehicle occupants to successfully egress from the rolled HMMWV by emphasizing teamwork through crew/battle drills.

2. INSTRUCTOR GUIDANCE. The instructor should inform the students of the following TLO covered by this practical exercise. At the completion of this Practical Exercise, you will:

| ACTION: | Perform clearing and egress procedures with the HEAT. |
| CONDITIONS: | In the HEAT, wearing required combat equipment, given instruction on actions to take to preclude and reactive measures during/after a HMMWV rollover as a HMMWV crewmember. |
| STANDARDS: | Properly evacuate the HEAT while adhering to applicable safety precautions and procedures outlined in this lesson and applicable references. |

3. SAFETY REQUIREMENTS.

a. Medical Pre-screening. HEAT training undertaken while being treated by prescription medications, must be done so with the knowledge and approval of the treating physician.

b. Safety Hazard Awareness Notice. A potential for a mishap during HEAT training is acknowledged. In order to ensure the safety of staff and HEAT training participant(s), the following
considerations will be addressed. Be alert for those who appear to be experiencing difficulty. In the event of motion discomfort, the individual – or the unit to which the individual belongs – will be responsible for cleaning the physical evidence (such as the release of any bodily fluid or compound) of such discomfort before training will continue.

c. Hazardous Conditions and Control Measures. Students must be informed of any known hazardous conditions and control measures that exist in the training environment. All watches, rings, and jewelry worn around the neck shall be removed; pagers or cell phones removed; and all pockets emptied of contents – particularly pens, pencils and pocket knives. Earrings should be removed to prevent inadvertent tearing of the earlobe during inversion and egress from the device. Crewmembers must be briefed of their responsibility to report any unsafe/unhealthful condition they may discover. The instructor will identify the location of emergency equipment, fire exits, and local procedures to be used in the event of a fire, injury, or other emergency. In the event of an in-HEAT emergency, (three blasts on the whistle or sounding of applicable alarm) exit the HEAT immediately and proceed to the pre-designated location. A single long blast is an indication to remain inside the device and do not open the doors.

d. First Aid Treatment. First aid treatment includes oxygen administration; treatment for shock, cardiopulmonary resuscitation, when needed; and transport to the nearest medical treatment facility.

e. Pre-training Requirements. Prior to engaging in HEAT training, personnel shall be proficient with the wear and operation of standard uniform and combat equipment worn in the theater, and be familiar with survival, signaling and rescue techniques appropriate to survival situations typical of disabled vehicles in the AOR.

f. Emergency Medical Personnel. There will be a minimum of one Combat Lifesaver (CLS) on site during any operation of the HEAT. Ideally, CLS services will be provided by the unit undergoing the training. Emergency medical personnel with appropriate equipment and a suitable vehicle for transport will be readily available during all HEAT training. The absence of any criteria in this paragraph requires an additional risk assessment, and the approval of the appropriate risk approval authority.

g. Safety Reminder. All personnel will be reminded that personal injury, death, or equipment damage can result from carelessness, failure to comply with the approved procedures, or violations of warnings, cautions, and safety regulations.

h. HEAT Location Safeguards. The HEAT device will be isolated from passers-by and accidental striking by the device when it is in motion.

i. Risk Assessment Level. Moderate - CRM is a decision-making process used by leaders to mitigate risks associated with all hazards that can injure or kill people, damage or destroy equipment, or otherwise impact mission effectiveness. CRM must be accomplished using appropriate composite risk management worksheet in Appendix A of this TC prior to the conduct of this training.

j. Environmental Considerations.

NOTE: It is the responsibility of all Soldiers and DA civilians to protect the environment from damage.

k. Environmental Exposure. Aircrew members should not participate in flight duties for at least eight hours after completion of HEAT training to ensure stability in the otolith organs (inner ear)
of the vestibular system (reference Aviation/Flight Safety Program and Aviation Accident Prevention Plan [AAPP], paragraph 4-9d (1)) and FM 3-04.301 (Aeromedical Training for Flight Personnel, Chapter 9).

4. INSTRUCTIONAL LEAD-IN. Knowing what actions to take immediately prior to a potential rollover and immediately following a rollover are vital to the safety of the vehicle’s crew. Rollover battle drills, based on this TC and unit standing operating procedures (SOP), routinely performed by the vehicle’s crew, create understanding of and how to react to the violent chaos that results when a rollover has occurred.

5. SPECIAL INSTRUCTIONS. Conduct HEAT set-up procedures and pre-operational use inspection of the HEAT (Appendix E) prior to start of Practical Exercise.

   a. Demonstrate rollover of device while empty. Observe rollover rate and check for free-floating and unsecured obstacles within the device.

   b. Inspect the seatbelts and restraints for condition, security, and ease of operation at each position in the HEAT.

   c. Ensure that the motor controls and electrical connections of the HEAT to the building’s electrical outlets are secure and serviceable per theater safety standards.

   d. The senior HEAT instructor on duty will certify in the logbook that the daily and before-use checks for the device have been completed and that no weekly, monthly, quarterly, or annual inspections/services are overdue. Demonstrate rollover of device while empty. Observe rollover rate and check for free-floating and unsecured obstacles within the device.

Procedures

| 1. The first drill is for familiarization, pausing to highlight the 30- and 25-degree critical rollover angles and righting the device back. |
| 2. The second drill shall be a “dry run” (completely rollover over [inverted]) no actual release of the seatbelts or gunner’s harness will be made. |
| 3. The third will entail inverting the device and participants actually exiting the device, as though it had rolled on dry land. |
| 4. After righting the device, crew rotating seats and re-entering the device (the fourth drill will entail inverting the device simulating a water entry. |
INSTRUCTOR PROCEDURES

Conduct all 4 Crew/Battle Drills with each group rotating through the HEAT device.

Two HEAT instructors will be present at all times the device is in use. The front instructor (device operator) controls the electric motor for roll operations. Both operators will do a complete walk-around of the device prior to each roll to verify that doors are closed, gunner’s hatch mechanism is locked, and crewmembers are in their seats with their seat belts securely fastened. Prior to device operation, both instructors will position themselves on opposite ends of the device, diagonally across from each other, to allow a clear and unobstructed view of both sides of the device to ensure doors remain closed throughout die roll cycle.

1. The vehicle commander position will always be manned if there is more than one person in the device. The vehicle commander is responsible for ensuring all personnel within the HEAT are buckled in, the gunner is properly restrained, and the combat locks are engaged on all doors.

2. The device operator communicates using the intercom system with the HEAT occupants verifying all seatbelts are secured and ensures display screen indicates all doors are locked.

3. Once all positions report ready to the HEAT operator, they will use the intercom system to signal rotation is about to begin. They will then notify the assistant instructor and only then is the device ready for operation.

4. When the crewmembers are ready, the device operator rotates the simulator either to the left or to the right. Crewmembers should lower their chins to their chests, pull their arms across their chests, and brace their legs against the floor without locking their knees. Once the rolling has stopped and the device is in the desired position to complete the crew/battle drill, the HEAT operator uses the intercom system to signal to Crewmembers to begin the drill. Crewmembers should wait three to five seconds to orient themselves; brace against the ceiling with one hand, then release the restraint belts with their other hand. Next, they will pull down free of the seat and rotate to a horizontal face-down position while holding onto a reference point with both hands. The crew then proceeds with an egress per the scenario for the exercise.
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APPENDIX A

SAMPLE COMPOSITE RISK MANAGEMENT WORKSHEET AND INSTRUCTIONS

A-1. Instructions for completing DA Form 7566 are in Table A-1. A sample of DA Form 7566 is shown in Figure A-2.

A-2. Figure A-2 also provides a starting point to logically track the process of hazards and risks. It can be used to document risk management steps taken during planning, preparation, and execution of training and combat missions and tasks. It is a sample tactical road march scenario with a sample composite risk management (CRM) worksheet (not all inclusive of items that should be placed on a CRM worksheet).

Table A-1. Composite Risk Management Worksheet Instructions

<table>
<thead>
<tr>
<th>Item</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 through 4</td>
<td>Self Explanatory</td>
</tr>
<tr>
<td>5</td>
<td>Subtask relating to the mission or task in Block 1.</td>
</tr>
<tr>
<td>6</td>
<td>Hazards – Identify hazards by reviewing METT-TC factors for the mission or task. Additional factors include historical lessons learned, experience, judgment, equipment characteristics and warnings, and environmental considerations.</td>
</tr>
<tr>
<td>7</td>
<td>Initial Risk Level – Includes historical lessons learned, intuitive analyses, experience, judgment, equipment characteristics and warnings, and environmental considerations. Determine initial risk for each hazard by applying risk assessment matrix. Enter the risk level for each hazard.</td>
</tr>
<tr>
<td>8</td>
<td>Controls – Develop one or more controls for each hazard that will either eliminate the hazard or reduce the risk (probability and/or severity) of a hazardous incident. Specify who, what, where, why, when, and how for each control. Enter controls.</td>
</tr>
<tr>
<td>9</td>
<td>Residual Risk Level – Determine the residual risk for each hazard by applying the risk assessment matrix. Enter the residual risk level for each hazard.</td>
</tr>
<tr>
<td>10</td>
<td>How to Implement – Decide how each control will be put into effect or communicated to the personnel who will make it happen (written or verbal instruction; tactical, safety, garrison SOPs, rehearsals). Enter controls.</td>
</tr>
<tr>
<td>11</td>
<td>How to Supervise (Who) – Plan how each control will be monitored for implementation (continuous supervision, spot checks) and reassess hazards as the situation changes. Determine if the controls worked and if they can be improved. Pass on lessons learned.</td>
</tr>
<tr>
<td>12</td>
<td>Was Control Effective – Indicate “Yes” or “No”. Review during AAR.</td>
</tr>
<tr>
<td>13</td>
<td>Overall Risk Level – Select the highest residual risk level and circle it. This becomes the overall mission or task risk level. The commander decides whether the controls are sufficient to accept the level of residual risk. If the risk is too great to continue the mission or task, the commander directs development of additional controls or modifies, changes, or rejects the COA.</td>
</tr>
<tr>
<td>14</td>
<td>Risk Decision Authority – Signed by the appropriate level of command</td>
</tr>
</tbody>
</table>
Tactical Road March Scenario

Conduct a Tactical Road March

Mission: Detachment A 138 Finance Battalion conducts a tactical road march in order to relocate to a Forward Operating Base (FOB) ST19003500 NLT 0300Z 16 Jul XX to establish a finance support operation for Multinational Brigade North.

Situation: The battalion S2 produced an intelligence preparation of the battlefield overlay indicating the presence of many known (marked) and unknown (unmarked) minefields throughout the area with the minefields spanning portions of the route of march. Intelligence indicates armed terrorists are operating in three-to-five person teams with rocket propelled grenade (RPG) and improvised explosive device (IED) capabilities. It is not known if these teams will fight if contact is made.

Conditions: As the commander of Detachment A, you have just received a warning order, 1400 hrs 14 July, from your battalion commander alerting you of the upcoming mission. The terrain consists of moderately rolling hills. The road network consists of unimproved roads with sharp curves and steep embankments, with numerous potential ambush sites. The weather has been in the mid-50s to 60s during the day and mid-40s at night. It has been raining for the last four days and rain is predicted to continue through the rest of the week.

Facts:

- Detachment commander and sergeant have been assigned for the past 10 months.
- The detachment has been in theater the past four months, and is at 95 percent strength.
- The convoy will consist of seven uparmed high mobility multipurpose wheeled vehicles, all in good shape, to carry personnel, personal gear, and organizational equipment.
- Drivers and vehicle commanders are all experienced.
- Map recon indicates the FOB is thirty-five kilometers away.
- Aerial surveillance/coverage is not available.

Mission, Enemy, Terrain and Weather, Troops and Support Available, Time Available and Civil Considerations Analysis

Mission: Conduct a tactical road march.

Enemy: Armed terrorists are operating in three-to-five person teams with RPG and IED capabilities. It is not known if these teams will fight if contact is made.

Terrain: The terrain consists of moderately rolling hills. The road network consists of unimproved roads with sharp curves and steep embankments, with numerous potential ambush sites.

Troops: Experience level is high. Detachment personnel have trained and worked as a team for the past 10 months.

Time: 27 hours to start point.
Analysis:

a. Threat-based risk: Ambush and IED potential.

b. Hazard-based risk:
   
   (1) Rain/cold.

   (2) Limited visibility.

   (3) Surface traction.

   (4) Road width, sharp curves, steep embankments, and fatigue.
## COMPOSITE RISK MANAGEMENT WORKSHEET

For use of this form, see FM 5-19; the proponent agency is TRADOC

<table>
<thead>
<tr>
<th>1. MSN/TASK</th>
<th>Conduct HMMWV Egress Assistance Trainer (HEAT) Training</th>
<th>2a. DTG BEGIN</th>
<th>2b. DTG END</th>
<th>3. DATE PREPARED (YYYYMMDD)</th>
</tr>
</thead>
</table>

### 4. PREPARED BY

<table>
<thead>
<tr>
<th>a. LAST NAME</th>
<th>b. RANK</th>
<th>c. POSITION</th>
</tr>
</thead>
</table>

### 5. SUBTASK

<table>
<thead>
<tr>
<th>6. HAZARDS</th>
<th>7. INITIAL RISK LEVEL</th>
<th>8. CONTROLS</th>
<th>9. RESIDUAL RISK LEVEL</th>
<th>10. HOW TO IMPLEMENT</th>
<th>11. HOW TO SUPERVISE</th>
<th>12. WAS CONTROL EFFECTIVE?</th>
</tr>
</thead>
</table>

- **Mounting or Dismounting HEAT**  
  
  **Adverse weather (rain, lightning, cold, heat).**  
  M  
  Obtain weather forecast, bulb report; Ensure students have gear for season.  
  L  
  Conduct safety briefing prior to training.  
  Operator/instructor.  

- **Mounting or Dismounting HEAT**  
  
  **Trips, falls, and impact caused by swinging HEAT.**  
  H  
  HEAT must be secure from rotation or sway with a positive before Soldier operates HEAT.  
  L  
  Device has positive lock at multiple positions (0°, 90°, 180° degrees).  
  OIC, PL, or Safety pre-operational inspection daily.  

- **Mounting or Dismounting HEAT**  
  
  **Fall and impact from stepping/striking up to entrance area above ground.**  
  H  
  Use steps or ladder.  
  L  
  Provide secureable steps or ladder.  
  OIC, PL or Safety inspect for availability and serviceability.  

- **Mounting or Dismounting HEAT**  
  
  **Scrapes and cuts from sharp edges of HEAT body interior and exterior.**  
  M  
  File or sand all sharp edges on inside, passages, doors, and turret. Anywhere a Soldier may interface with the device.  
  L  
  OIC, PL or Safety inspect before use. Tags out edge and makes repairs before use.  
  OIC, PL or Safety inspect before and after operation and tags out sharp edge with sufficient protection.  

- **Rotating HEAT**  
  
  **Fell/abandoned from HEAT.**  
  H  
  Use and check seat belts and door locks and latches.  
  M  
  Inspect seat belts and retractable seat belts after each rotation.  
  OIC, PL or Safety inspects before and after each rotation.  

- **Rotation of HEAT**  
  
  **Injuries sustained from loss of motor control or braking.**  
  H  
  Inspect and service motor drive and brake system for potential failure.  
  M  
  Pre-operational inspection checklist.  
  OIC, PL or Safety conducts pre-operations inspections.  

---

**Additonal space for entries in Items 5 through 11 is provided on Page 2.**

### 13. OVERALL RISK LEVEL AFTER CONTROLS ARE IMPLEMENTED (Check one)

- LOW
- MODERATE
- HIGH
- EXTREMELY HIGH

### 14. RISK DECISION AUTHORITY

<table>
<thead>
<tr>
<th>a. LAST NAME</th>
<th>b. RANK</th>
<th>c. DUTY POSITION</th>
<th>c. SIGNATURE</th>
</tr>
</thead>
</table>

**DA FORM 7566, APR 2005**

Page 1 of 2
### HEAT Sample Composite Risk Management Worksheet (continued)

<table>
<thead>
<tr>
<th>5. SUBTASK</th>
<th>6. HAZARDS</th>
<th>7. INITIAL RISK LEVEL</th>
<th>8. CONTROLS</th>
<th>9. RESIDUAL RISK LEVEL</th>
<th>10. HOW TO IMPLEMENT</th>
<th>11. HOW TO SUPERVISE (WHO)</th>
<th>12. WAS CONTROL EFFECTIVE?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotating HEAT</td>
<td>Scraps, cuts, bruises, neck, back, finger injuries</td>
<td>H</td>
<td>First Aid personnel or Combat Lifesaver are present before and during rotation.</td>
<td>M</td>
<td>Arrange for proper level of medical response either by the installation or unit. Part of pre-ops checklist.</td>
<td>OIC, platoon sergeant, or safety personnel confirm presence of medical response.</td>
<td></td>
</tr>
<tr>
<td>Rotating HEAT</td>
<td>Scraps, cuts, bruises, neck, back, finger injuries</td>
<td>H</td>
<td>Ensure seat belts are serviceable, secure, and tight. Rotate HEAT slowly.</td>
<td>M</td>
<td>Make part of checklist for before-operations training.</td>
<td>OIC, platoon sergeant, or safety personnel conduct inspections before operations.</td>
<td></td>
</tr>
<tr>
<td>Dismounting HEAT</td>
<td>Injuries sustained from falling out onto hard floor</td>
<td>M</td>
<td>Use foam or rubber matting to reduce injuries from falls.</td>
<td>L</td>
<td>Pre-operational inspection of floor protection before operations.</td>
<td>OIC, platoon sergeant, or safety personnel conduct inspections before operations.</td>
<td></td>
</tr>
</tbody>
</table>

---

**Figure A.1.** HEAT Sample Composite Risk Management Worksheet (continued)
### COMPOSITE RISK MANAGEMENT WORKSHEET

For use of this form, see FM 5-19; the proponent agency is TRADOC

<table>
<thead>
<tr>
<th>1. MSN/TASK</th>
<th>2a. DTG BEGIN</th>
<th>2b. DTG END</th>
<th>3. DATE PREPARED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conduct Tactical Road March</td>
<td>141400Jul07</td>
<td>150300Jul07</td>
<td>YYYYMMDD 20070714</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. PREPARED BY</th>
<th>a. LAST NAME</th>
<th>5. SUBTASK</th>
<th>6. HAZARDS</th>
<th>7. INITIAL RISK LEVEL</th>
<th>8. CONTROLS</th>
<th>9. RESIDUAL RISK LEVEL</th>
<th>10. HOW TO IMPLEMENT</th>
<th>11. HOW TO SUPERVISE (WHO)</th>
<th>12. WAS CONTROL EFFECTIVE?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toller</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. HAZARDS</th>
<th>7. INITIAL RISK LEVEL</th>
<th>8. CONTROLS</th>
<th>9. RESIDUAL RISK LEVEL</th>
<th>10. HOW TO IMPLEMENT</th>
<th>11. HOW TO SUPERVISE (WHO)</th>
<th>12. WAS CONTROL EFFECTIVE?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambush/IED/Mines</td>
<td>E</td>
<td>Brief personnel on the threat. Request mine clearing teams and place at front of convoy.</td>
<td>H</td>
<td>SOP/Rehearsal</td>
<td>CDR/SFC</td>
<td></td>
</tr>
<tr>
<td>Rain/Cold</td>
<td>M</td>
<td>Ensure all personnel have weather gear, clean dry socks, and gloves.</td>
<td>L</td>
<td>SOP/Rehearsal</td>
<td>CDR/SFC</td>
<td></td>
</tr>
<tr>
<td>Operations under limited visibility (Night)</td>
<td>M</td>
<td>Reduce convoy speeds. Build in additional breaks to maintain convoy integrity.</td>
<td>L</td>
<td>SOP/Rehearsal</td>
<td>CDR</td>
<td></td>
</tr>
<tr>
<td>Surface Traction</td>
<td>H</td>
<td>Reduce convoy speeds. Build in additional breaks to maintain convoy integrity.</td>
<td>M</td>
<td>SOP/Rehearsal</td>
<td>CDR/SFC</td>
<td></td>
</tr>
<tr>
<td>Road width, sharp curves, and steep embankments</td>
<td>H</td>
<td>Reduce convoy speeds. Build in additional breaks to maintain convoy integrity.</td>
<td>M</td>
<td>SOP</td>
<td>CDR/SFC</td>
<td></td>
</tr>
<tr>
<td>Fatigue</td>
<td>M</td>
<td>Rotate drivers and gunners. Build in additional breaks to reduce the driver/gunner fatigue.</td>
<td>L</td>
<td>Battle Drill</td>
<td>CDR/SFC</td>
<td></td>
</tr>
</tbody>
</table>

Additional space for entries in Items 5 through 11 is provided on Page 2.

13. OVERALL RISK LEVEL AFTER CONTROLS ARE IMPLEMENTED (Check one)

- [ ] LOW
- [X] MODERATE
- [ ] HIGH
- [ ] EXTREMELY HIGH

14. RISK DECISION AUTHORITY

<table>
<thead>
<tr>
<th>a. LAST NAME</th>
<th>b. RANK</th>
<th>c. DUTY POSITION</th>
<th>c. SIGNATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulgham</td>
<td>COL</td>
<td>CDR</td>
<td></td>
</tr>
</tbody>
</table>

DA FORM 7566, APR 2005
# APPENDIX B

HEAT PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) CHECKLIST

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>INTERVAL</th>
<th>ITEM TO CHECK/SERVICE</th>
<th>PROCEDURE</th>
<th>NOT FULLY MISSION CAPABLE IF:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Before</td>
<td>Cab Assembly</td>
<td>Visibly check for cracks, dents, and sharp edges</td>
<td>Cracked or sharp edges are found</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. Cab Mounts and Retaining Bracket Hardware</td>
<td>Check for loose, missing, or damaged hardware</td>
<td>Loose, missing, or damaged hardware</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Seatbelts</td>
<td>Check for loose, missing, or damaged hardware</td>
<td>Loos, missing, or damaged hardware</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c. Cameras</td>
<td>Check for cracks, dirt, or damage. Check for missing rubber protection bumper pads</td>
<td>Cracked, dirty, or damaged. Missing rubber protection bumper pads.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d. BII Items</td>
<td>Check that all BII items are securely stowed</td>
<td>Un-stowed items</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e. Speakers and Microphones</td>
<td>NOTE: Requires two personnel. Check speakers and microphone for loose, missing, or damaged hardware and if functioning correctly</td>
<td>Loose, missing, or damaged hardware and not functioning properly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>f. Doors, Windows, and Gunner’s Hatch</td>
<td>Check operation of doors, windows, and gunner’s hatch</td>
<td>Not functioning properly</td>
</tr>
<tr>
<td>2.</td>
<td>Before</td>
<td>Base Weldment</td>
<td>Visibly check for cracks, dents, and sharp edges</td>
<td>Cracked or sharp edges are found</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. Gunner’s Cage Locking Pins</td>
<td>Check for loose, missing, or damaged hardware</td>
<td>Loose, missing, or damaged hardware and not functioning properly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Inspect Front AV Power Outlet</td>
<td>Check for loose, missing, or damaged hardware</td>
<td>Loose, missing, or damaged hardware and not functioning properly</td>
</tr>
</tbody>
</table>

18 July 2007
<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>INTERVAL</th>
<th>ITEM TO CHECK/SERVICE</th>
<th>PROCEDURE</th>
<th>NOT FULLY MISSION CAPABLE IF:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td></td>
<td>Stand Weldment</td>
<td>Visibly check for cracks, dents, and sharp edges</td>
<td>Cracked or sharp edges are found</td>
</tr>
<tr>
<td></td>
<td>Before</td>
<td>a. Inspect Adjustable Lifting Point, PIN, and Hardware</td>
<td>Check for loose, missing, or damaged hardware</td>
<td>Loose, missing, or damaged hardware and not functioning properly</td>
</tr>
<tr>
<td></td>
<td>Before</td>
<td>b. Side Platform Motion</td>
<td>Check for loose, missing, or damaged hardware</td>
<td>Loose, missing, or damaged hardware</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check binding and rolling out and in function</td>
<td>Not functioning properly</td>
</tr>
<tr>
<td></td>
<td>Before</td>
<td>c. Side Platform Steps and Leg Supports</td>
<td>Check for loose, missing, or damaged hardware</td>
<td>Loose, missing, or damaged hardware</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check binding and rolling out and in function</td>
<td>Not functioning properly</td>
</tr>
<tr>
<td></td>
<td>Before</td>
<td>d. Side Platform Roller Guilds and Supports Roller</td>
<td>Check for loose, missing, or damaged hardware</td>
<td>Loose, missing, or damaged hardware</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check for serviceable guilds and rollers</td>
<td>Un-serviceable</td>
</tr>
<tr>
<td></td>
<td>Before</td>
<td>e. Side Platform Locking Pins</td>
<td>Check for loose, missing, or damaged hardware</td>
<td>Loose, missing, or damaged hardware</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check Side Platform Locking Pin function</td>
<td>Not functioning properly</td>
</tr>
<tr>
<td>4.</td>
<td>Before</td>
<td>Upper and Lower Cab Support Weldment</td>
<td>Visibly check for cracks, dents, and sharp edges</td>
<td>Cracked or sharp edges are found</td>
</tr>
<tr>
<td></td>
<td>Before</td>
<td>Inspect screws, washers, and nuts</td>
<td>Check for loose, missing, or damaged hardware</td>
<td>Loose, missing, or damaged hardware</td>
</tr>
<tr>
<td>5.</td>
<td>Before</td>
<td>Gunner’s Cadge Escape Slider Door</td>
<td>Check for loose, missing, or damaged hardware</td>
<td>Loose, missing, or damaged hardware</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check Open and Close Slider Door</td>
<td>Not functioning properly</td>
</tr>
<tr>
<td>ITEM NO.</td>
<td>INTERVAL</td>
<td>ITEM TO CHECK/SERVICE</td>
<td>PROCEDURE</td>
<td>NOT FULLY MISSION CAPABLE IF:</td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
<td>--------------------------------</td>
<td>----------------------------------------------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td>6.</td>
<td>Before</td>
<td>Encoder</td>
<td>Check for loose, missing, or damaged hardware or worn belt</td>
<td>Missing or damaged belt</td>
</tr>
<tr>
<td>7.</td>
<td>Before</td>
<td>Front Operator’s Controls</td>
<td>Check for loose, missing, or damaged hardware</td>
<td>Loose, missing, or damaged hardware</td>
</tr>
<tr>
<td>8.</td>
<td>Before</td>
<td>Batteries and Components</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Before</td>
<td>a. Battery Hold Down Straps and Hardware</td>
<td>Check for loose, missing, or damaged battery hold down straps.</td>
<td>Loose, missing, or damaged hardware</td>
</tr>
<tr>
<td></td>
<td>Before</td>
<td>b. NATO Adapter and Battery Cables</td>
<td>Check for loose, missing, or damaged NATO adapter and battery cables</td>
<td>Loose, missing, or damaged hardware</td>
</tr>
<tr>
<td></td>
<td>Before</td>
<td>c. Battery Box</td>
<td>Check for loose, missing, or damaged battery box</td>
<td>Loose, missing, or damaged hardware</td>
</tr>
<tr>
<td></td>
<td>Before</td>
<td>Front Operator’s Controls</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. Function Test</td>
<td><strong>WARNING:</strong> This is done without crewmembers in cab assembly. Failure to comply may cause injury or death to crewmembers Attempt function test</td>
<td>Not functioning properly</td>
</tr>
<tr>
<td>9.</td>
<td>During</td>
<td>Crew Display Panel</td>
<td>Check for open doors, battle over ride, or e-stops display on panel</td>
<td>Not functioning properly</td>
</tr>
<tr>
<td>10.</td>
<td>During</td>
<td>Battery Bar Gauge</td>
<td>Check to ensure that battery bar gauge does not go below three bars</td>
<td>Notify field maintenance</td>
</tr>
<tr>
<td>ITEM NO.</td>
<td>INTERVAL</td>
<td>ITEM TO CHECK/SERVICE</td>
<td>PROCEDURE</td>
<td>NOT FULLY MISSION CAPABLE IF:</td>
</tr>
<tr>
<td>---------</td>
<td>------------</td>
<td>-----------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check HEAT assembly for any unusual noise or excessive vibration during rotation</td>
<td>Notify field maintenance</td>
</tr>
<tr>
<td>11.</td>
<td>During</td>
<td>Rotation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>After</td>
<td>HEAT Assembly</td>
<td>Clean entire HEAT assembly</td>
<td>Inner cab debris</td>
</tr>
<tr>
<td>13.</td>
<td>Monthly</td>
<td>Gearbox Lubrication</td>
<td>Check for proper fluid amount</td>
<td>Not full</td>
</tr>
<tr>
<td>14.</td>
<td>Monthly</td>
<td>HEAT Assembly: Paint, BII, and Rubber Protective Items</td>
<td>Check for loose, missing, or damaged paint, BII, and rubber protective items</td>
<td></td>
</tr>
</tbody>
</table>
GTA 55-03-030
For Official Use Only
HMMWV UPRARMORED ROLLOVER
Emergency Procedures
Performance Measures

WARNING
Never attempt to jump from a rollover vehicle. It may roll over you. Ensure that the vehicle has stopped rolling before exiting. Upon complete evacuation of the crew, vehicle should be inspected for any hazards such as leaking oil, coolant, ammunition, and hydraulic fluid. If hazardous/explosive materials are involved, driver must take actions according to the DD Form 836 accompanying list. Notify rescue personnel and remain at evacuation distance while securing accident site.

01 OCT 06

PREVENTIVE MEASURES:
Wear seatbelts. Survive the rollover.

SLOW DOWN. Watch for sharp curves and steep slopes. Curves and slopes generate centrifugal forces that act sideways on the vehicle, increasing the chance of rollover.

AVOID PANIC. Don’t jerk the steering wheel. Many rollovers occur when the driver panics and jerks the steering wheel during an emergency. Jerking the steering wheel can cause loss of control and the vehicle may slide sideways and rollover.

KNOW YOUR MANEUVERS. If you drive off the roadway, gradually reduce speed. Ease your vehicle back onto the roadway at a safe speed.

Use caution on rural roads / roads with soft or no shoulders. When a vehicle goes off a road, the vehicle can overturn when it strikes a ditch or embankment or is tripped by a soft soil.

PAY ATTENTION TO VEHICLE CONDITION, TIRE PRESSURE AND WEATHER:
- Pay particular attention to the tire condition and air pressure during PMCS to reduce potential hazards. Wear, improperly inflated tires increase your risk of rollover.
- Don’t over-inflate the tires. Example: the M1114 payload is 2300 lbs; this includes the passengers, winch, gunner’s protection kit, spare tire, weapons, and all cargo
- Keep the Vehicle Center of Gravity Low. Load heavier items low in the vehicle. Increasing the height of the vehicle’s center of gravity increases your risk of rollover.
- Secure the Load. Improperly secured loads can shift and become hazards within the vehicle and increase the chance of rollover.
- TRAILER TOWING. Vehicles towing trailers have a higher risk of rolling over, especially in curves and during sudden steering maneuvers, as a result of the exaggerated motion of the trailer. Adjust speed accordingly.

Work As a Team: Maintain Crew Integrity — Train as a team. Communicate with the driver. Tell the driver what is to the left, right, rear, and overhead. Your gunner is your eyes and ears! The gunner may be the only crew member capable of seeing around the entire vehicle. Use the vehicle intercom system to pass visual information to the driver, but rehearse shouted voice commands and hand signals in case the intercom fails. Avoid hazards, use a ground guide whenever possible.

Use combat boots safety. Combat boots help keep the doors closed in a crash, but are a hazard near water! Unlock combat door locks when near water (enemy situation permitting).

Knowing how to get out. Rehearse vehicle evacuation as if only one exit is available.

If vehicle rolls onto side:
- Soldier in lower position, if able:
  (1) Unbuckles seat belts.
  (2) Assists soldiers in higher positions to release seat belts and lower carefully.

- Crew, if doors are jammed:
  (1) Exits thru hatch or cargo area if possible.
  (2) Works as a team to open jammed doors.

ROLLOVER DRILL TASK STEPS
AND PERFORMANCE MEASURES:

NOTE: All personnel will use seat restraints!

1. Execute Rollover Drill (not in water):
   a. Driver
      (1) Releases the accelerator, plants feet flat on the floor and attempts to maintain control of steering.
      (2) Yells "Rollover, Rollover, Rollover!"
      (3) Keeps hands on the steering wheel, tucks chin into chest, and braces for impact.
   b. Vehicle Commander and Crew
      (1) Yells "Rollover, Rollover, Rollover!"
      (2) Pulls gunner into cab
      (3) Tucks chin into chest, plants feet firmly on the floor and braces for impact, while holding onto the gunner.
   c. Gunner
      (1) Yells, "Rollover, Rollover, Rollover!"
      (2) Drops down into vehicle
      (3) Tucks chin into chest, holds onto a stationary object, and braces for impact.
      (4) Assists crew to exit.
      (5) Establishes security.
      (6) Recovers sensitive items.
      (7) Provides first aid.
      (8) Assists in vehicle recovery.

2. After the rollover has stopped:
   a. Driver and Crew:
      (1) Driver turns off motor.
      (2) Braces one hand on ceiling.
      (3) Unbuckles seatbelt with other hand and immediately puts both hands on ceiling.
      (4) Slides out of seat.
      (5) Disconnects headsets.
      (6) Orientes self to nearest door.
      (7) Unlocks combat door locks.
      (8) Gets door open; if door does not open, tries a different door.
      (9) Exits with weapon.
   b. Gunner
      (1) Disconnects headsets.
      (2) Orientes self to nearest door.
      (3) Unlocks combat door locks.
      (4) Gets door open; if door does not open, tries a different door.
      (5) Exits with weapon.
      (6) Assists crew to exit.
      (7) Establishes security.
      (8) Recovers sensitive items.
      (9) Provides first aid.
      (10) Assists in vehicle recovery.
HMMWV
Water Egress
Task and Performance Measures

Note: Combat door locks on the M1114 Uparmored HMMWV are designed to keep the enemy out. When they are locked, it is extremely difficult for rescuers to enter the vehicle! This problem may be compounded if damage occurs to the door as a result of an accident. Commanders should determine when combat locks should be used while conducting operations near bodies of water.

M1114 Data:
Curb Weight: 9,800 Lbs / 4,447 kg
Payload: 2,300 Lbs / 1,043 kg
Gross Weight: 12,100 Lbs / 5,489 kg
Max Towed Load: 4,200 Lbs / 3,175 kg

Max safe speed depends on surface conditions, use your head!

PREVENTIVE MEASURES:

Always wear your seat belt to survive water entry and maintain orientation during a rollover.

When in the vicinity of water and tactical conditions permit:
1. Reduce speed and bring vehicle to a halt.
2. Inform vehicle crew that you are operating around water hazards.
3. Assess terrain and route for hazards and discuss risk mitigating measures with crew before proceeding.
4. Unlock combat door locks.

When water entry is imminent:

a. Driver
   (1) Release the accelerator, and controls the entry by steering into the body of water.
   (2) Yells “Water!”
   (3) Keeps hands on the steering wheel with extended but not locked arms, tucks head and chin into chest and braces for impact.

b. Gunner
   (1) Yells “Water!”
   (2) Pushes / pulls self down into vehicle.
   (3) Tucks head and chin into chest and holding onto a stationary object, braces for impact.

All other crew members
(1) Yells “Water!”
(2) Pulls the gunner into the cab.
(3) Tucks head and chin into chest and braces for impact.
(4) Plants feet firmly on the floor while holding onto a stationary object.

When the vehicle is stabilized

All crew
(1) Driver turns off motor.
(2) Disconnects headset.
(3) Releases seatbelts; uses caution if upside down.
(4) Exits the vehicle.
(5) Assesses injuries.
(6) Assists crew to exit and secure weapons.
(7) Decides to remove personal equipment.
(8) Gets to safest shore.
(9) Establishes security.
(10) Accounts for crew members.
(11) Provides first aid.
(12) Recovers weapons, ammunition and sensitive items.
(13) Assists in vehicle recovery.

WATER RESCUE / RECOVERY:

1. Secure the accident site.
2. Stay in contact with the vehicle, hold onto the vehicle and kick / swim to high point in buddy teams.
3. Rescuee fix a rope / cable to the vehicle to aid in rescue.
4. Open doors and hatches.
5. If doors and hatches are not accessible, rescuees must immediately use all available means to turn the vehicle on its side to gain access to the tunnel.
6. Seek out the highest point on / in the vehicle.
7. Ensure that all survivors have air and are able to breathe.
8. Check for other injuries and apply first aid.
9. Carefully move injured personnel to the highest point on the vehicle.
10. Remove excess equipment, to include body armor in deep water.
11. Evacuate from vehicle high point to safest location, depending on:
   - Enemy situation.
   - Water level and flow.
   - Water temperature.
   - Distance to waters edge.
   - Anticipation of rescue.

MEDDEVAC Request:

Line 1: 6-digit UTM grid location of pick-up site.
Line 2: Radio frequency, call sign and suffix of requesting personnel.
Line 3: Number of patients by precedence: Urgent, Priority, Routine.
Line 4: Urgent – loss of life or limb within 2 hours. Priority – loss of life or limb within 4 hours. Routine – evacuation within 24 hours.
Line 5: Special equipment required. As applicable, express either none, hoist, or stakes litter.
Line 6: Security of pick-up site
   (What possible/known threat is in the area?).
Line 7: Method of marking pick-up site
   (near / far recognition devices).
Line 8: Patient nationality and status
   (Coalition Military, US Contractor, non-US Contractor, EPW).
Line 9: NBC Contamination.

REPORT THE INCIDENT/ACCIDENT:

1. Who (Unit, Individual)?
2. What (Accident or Combat)?
3. Where (6-digit UTM grid)?
4. How (What caused the rollover, speed, visibility, cause of injuries or death)?
5. Follow up initial report ASAP with information regarding:
   a. Weather conditions.
   b. Seatbelts worn by each occupant.
   c. Fatigue / sleep prior to the accident.
   d. Was the driver able to see the hazard/other vehicle?
   e. Operator training / experience / license.
6. Complete Accident Report Form
   (DA Form 285-AGR) and forward to higher HQs.

Information provided by:
U.S. Army Transportation School
Army Driver Standardization Office (ADSO)
705 Reed Street
Fort Eustis, VA 23604
APPENDIX D

SAMPLE TRAINING SCENARIOS

NOTE: Prior to all scenarios, students shall conduct a pre-rotation check of their gear by using the “buddy system”. Any loose or hanging items should be fixed or removed at this time.

Scenario 1 - Orientation scenario

NOTE: This scenario should be used to identify any potential for students to experience motion sickness or claustrophobia. This scenario should be done at the beginning of every group training session.

1. Rotate the trainer and stop at the 25° position. Identify this as the critical rollover angle of the uparmored HMMWV.
2. Assess students for any illness or problems.
3. Rotate the trainer and stop at 90°.
4. Assess students for any illness or problems.
5. Rotate the trainer and stop at 180°.
6. Assess students for any illness or problems.
7. Rotate the trainer and stop at 360°.
8. Scenario complete.

Scenario 2 - HMMWV rollover to 180° BASIC

1. Rotate the trainer and stop at the 180° position.
2. *Unlock only one of the doors.
3. Signal students to egress the vehicle.
4. Observe and assist students as required.
5. After egressing, have students set up security and conduct accountability checks.
6. Conduct After Action Review.

*After the vehicle has come to a resting position, the lead instructor will only unlock one door. This is done to simulate jammed or damaged doors that cannot be opened.
Scenario 3 - IED explosion causes HMMWV rollover to 180° with one injured, but conscious Soldier

NOTE: Before the students load the vehicle, identify and instruct one of the students that they will be simulating an injured Soldier. Instruct the student to verbalize an injury when the vehicle comes to a rest. Instruct the “injured Soldier” that they are to offer absolutely no help to the other students. The other students will have to get him/her out of the seatbelt and vehicle.

1. Rotate the trainer and stop at the 180° position.
2. *Unlock only one of the doors.
3. Signal students to egress the vehicle.
4. Observe and assist students as required.
5. After egressing, have students set up security, treat/request MEDEVAC for casualties, and conduct accountability checks.
6. Conduct After Action Review.

*After the vehicle has come to a resting position, the lead instructor will only unlock one door. This is done to simulate jammed or damaged doors that cannot be opened.

Scenario 4 - IED explosion causes HMMWV rollover to 180° with two injured but conscious Soldiers

NOTE: Before the students load the vehicle, identify and instruct two of the students that the will be simulating injured Soldiers. Instruct the students to verbalize an injury when the vehicle comes to a rest. Instruct the “injured Soldiers” that they are to offer absolutely no help to the other students. The other students will have to get them out of the seatbelt and vehicle.

1. Rotate the trainer and stop at the 180° position.
2. *Unlock only one of the doors.
3. Signal students to egress the vehicle.
4. Observe and assist students as required.
5. After egressing, have students set up security, treat/request MEDEVAC for casualties, and conduct accountability checks.
6. Conduct After Action Review.

*After the vehicle has come to a resting position, the lead instructor will only unlock one door. This is done to simulate jammed or damaged doors that cannot be opened.
Scenario 5 - IED explosion causes HMMWV rollover to 180° with one injured and unconscious Soldier

NOTE: Before the students load the vehicle, identify and instruct one of the students that they will be simulating an unconscious Soldier. Instruct the student to do absolutely nothing when the trainer comes to a rest. Ensure the “unconscious Soldier” does not speak or offer any type of help to the other students. The other students will have to get him/her out of the seatbelt and vehicle.

1. Rotate the trainer and stop at the 180° position.
2. *Unlock the driver’s door.
3. Signal students to egress the vehicle.
4. Observe and assist students as required.
5. After egressing, have students set up security, treat/request MEDEVAC for casualties, and conduct accountability checks.
6. Conduct After Action Review.

*After the vehicle has come to a resting position, the lead instructor will only unlock the driver’s door. When students egress out of the vehicle, make sure they only use the vehicle’s frame to egress.

Scenario 6 - IED explosion causes HMMWV rollover to 180° with two injured and unconscious Soldier

NOTE: Before the students load the vehicle, identify and instruct two of the students that the will be simulating unconscious Soldiers. Instruct the students to do absolutely nothing when the trainer comes to a rest. Ensure the “unconscious Soldiers” do not speak or offer any type of help to the other students. The other students will have to get them out of the seatbelt and vehicle.

1. Rotate the trainer and stop at the 180° position.
2. *Unlock the driver’s door.
3. Signal students to egress.
4. Observe and assist students as required.
5. After egressing, have students set up security, treat/request MEDEVAC for casualties, and conduct accountability checks.
6. Conduct After Action Review.

*After the vehicle has come to a resting position, the lead instructor will only unlock the driver’s door. When students egress out of the vehicle, make sure they only use the vehicles frame to egress.

**WARNING:** A 90° egress is extremely dangerous and must only be conducted with the approval of the commander. An additional risk assessment must be done prior to the conduct of any 90° egress training being started. Egress will only be done through the Gunner’s Hatch.
Scenario 7- HMMWV rollover to 90° BASIC

1. Rotate the trainer and stop at the 90° position.
2. *Signal students to egress the vehicle.
3. Observe and assist students as required.
4. After egressing, have students set up security and conduct accountability checks.
5. Conduct After Action Review.

*When students egress out of the vehicle, make sure they only use the vehicles frame to egress.*

**WARNING:** A 90° egress is extremely dangerous and must only be conducted with the approval of the commander. An additional risk assessment must be done prior to the conduct of any 90° egress training being started. Egress will only be done through the Gunner’s Hatch.

Scenario 8- IED explosion causes HMMWV rollover to 90° with one injured but conscious Soldier

NOTE: Before the students load the vehicle, identify and instruct one of the students that he/she will be simulating an injured Soldier. Instruct the student to scream when the vehicle comes to a rest. Instruct the “injured Soldier” that he/she is to offer absolutely no help to the other students. The other students will have to get him/her out of the seatbelt and vehicle.

1. Rotate the trainer and stop at the 90° position.
2. *Signal students to egress the vehicle.
3. Observe and assist students as required.
4. After egressing, have students set up security, treat/request MEDEVAC for casualties, and conduct accountability checks.
5. Conduct After Action Review.

*When students egress out of the vehicle, make sure they only use the vehicles frame to egress.*

**WARNING:** A 90° egress is extremely dangerous and must only be conducted with the approval of the commander. An additional risk assessment must be done prior to the conduct of any 90° egress training being started. Egress will only be done through the Gunner’s Hatch.
Scenario 9 - IED explosion causes HMMWV rollover to 90° with two injured but conscious Soldiers

NOTE: Before the students load the vehicle, identify and instruct two of the students that the will be simulating injured Soldiers. Instruct the students to scream when the vehicle comes to a rest. Instruct the “injured Soldiers” that they are to offer absolutely no help to the other students. The other students will have to get them out of the seatbelt and vehicle.

1. Rotate the trainer and stop at the 90° position.
2. *Signal students to egress the vehicle.
3. Observe and assist students as required.
4. After egressing, have students set up security, treat/request MEDEVAC for casualties, and conduct accountability checks.
5. Conduct After Action Review.

*When students egress out of the vehicle, make sure they only use the vehicles frame to egress.

**WARNING:** A 90° egress is extremely dangerous and must only be conducted with the approval of the commander. An additional risk assessment must be done prior to the conduct of any 90° egress training being started. Egress will only be done through the Gunner’s Hatch.

Scenario 10- IED explosion causes HMMWV rollover to 90° with one injured and unconscious Soldier

NOTE: Before the students load the vehicle, identify and instruct one of the students that he/she will be simulating an unconscious Soldier. Instruct the student to do absolutely nothing when the trainer comes to a rest. Ensure the “unconscious Soldier” does not speak or offer any type of help to the other students. The other students will have to get him/her out of the seatbelt and vehicle.

1. Rotate the trainer and stop at the 90° position.
2. *Signal students to egress the vehicle.
3. Observe and assist students as required.
4. After egressing, have students set up security, treat/request MEDEVAC for casualties, and conduct accountability checks.
5. Conduct After Action Review.

*When students egress out of the vehicle, make sure they only use the vehicles frame to egress.

**WARNING:** A 90° egress is extremely dangerous and must only be conducted with the approval of the commander. An additional risk assessment must be done prior to the conduct of any 90° egress training being started. Egress will only be done through the Gunner’s Hatch.
Scenario 11 - IED explosion causes HMMWV rollover to 90° with two injured and unconscious Soldier

NOTE: Before the students load the vehicle, identify and instruct two of the students that they will be simulating unconscious Soldiers. Instruct the students to do absolutely nothing when the trainer comes to a rest. Ensure the “unconscious Soldiers” do not speak or offer any type of help to the other students. The other students will have to get them out of the seatbelt and vehicle.

1. Rotate the trainer and stop at the 90° position.
2. *Signal students to egress the vehicle.
3. Observe and assist students as required.
4. After egressing, have students set up security, treat/request MEDEVAC for casualties, and conduct accountability checks.
5. Conduct After Action Review.

*When students egress out of the vehicle, make sure they only use the vehicles frame to egress.
APPENDIX E

HEAT PRE-OPERATIONAL USE INSPECTION AND SET-UP PROCEDURES

NOTE

Only one platform is shown below. The side platforms are identical on both sides. This procedure covers the platforms setup. Only one platform locking pin location is shown below. The locking pins are both located to the left and right sides of the platform.

1. Remove two inner platform locking pins (1) from each side of platforms.

Figure E-1. Platform Locking Pin
2. Remove pins (3) from support legs (front and rear) (4).
3. Lower support leg (front and rear) (4) so upper hole on leg aligns with hole on side platform (3).

4. Install pin though side platform (3) and support leg (4).
NOTE

All support legs and steps are raised and lowered in the exactly same way. The support legs and steps are shown in the lowered position.

5. Using both personnel grasp each end of platform (5) and pull outward until fully extended to stop bracket (6).
6. Grasp steps (7) and rotate to ground.
Side Platforms Stowed/Platforms are in the outward position

1. Grasp steps (7) and rotate steps on to platform.

   **NOTE**

   Only one platform is shown below. The side platforms are identical on both sides. This procedure covers the platforms setup. Only one platform locking pin location is shown below. The locking pins are both located to the left and right sides of the platform.

2. Using both personnel grasp each end of platform (5) and push inward until the platform is fully under cab assembly (6).

   **NOTE**

   All support legs and steps are raised and lowered in the exactly same way. The support legs and steps are shown in the lowered position.

3. Remove pin inside platform (3) and support leg (4).
4. Raise support leg (front and rear) (4) so lower hole on leg aligns with hole on side platform (3).
5. Replace pins (3) into support legs (front and rear) (4).
6. Insert two inner locking pins (1) in each side of the platforms.

**Connect Power Cable Using 110v Wall Outlet**

**WARNING**

All control switches must be in the off position before connecting power cord to wall outlet. Failure to place control switches in the off position may result in injury or death to personnel.

1. Check that master power switch/key (4) is removed from operator’s control panel (2).
2. Check that E-stop (3) is pushed in.
3. Raise power inverter cover (6) and connect yellow power inverter cord (5) to inverter (1).

**WARNING**

Ensure that the power outlet being used for the HEAT is powered by a minimum of a 15 amp circuit breaker. Failure to comply may result in injury or death to personnel or damage to equipment.

4. Connect power extension cord (5) to 15 amp 110v wall outlet.
Figure E-6. Inverter Power Cables

Figure E-7. Operator's Control Panel
DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS

Operator’s Control Panel

1. **MASTER POWER SWITCH/KEY**— This is a two position key operated master power switch. Used or turning master power on and off. The off position is key turned all the way to the left and the on position is key turned all the way to the right.

2. **MASTER POWER LIGHT**— This light will illuminate amber when master power switch/key is turned the on position.

3. **HOUR METER**— The meter displays hour of HEAT operation. The hour meter starts adding whenever the master power switch/key is turned the on position.

4. **BATTERY LEVEL INDICATOR**— This displays current battery level charge once master power switch/key is turned the on position.

5. **OPERATOR CONTROL PANEL**— Contains instrument gauges, switches, and indicator lights used during HEAT operation.

6. **E-STOP**— This is a two position pushbutton operated button. Pushed in, this is used in any emergency situation to stop the rotation of the HEAT cab assembly, also used during procedure as a safety precaution. Pulled out allows HEAT to resume operations.

7. **SIDE-TO-SIDE JOYSTICK**— The joystick is spring loaded to return to center position when released. Moving the jot stick left rotates HEAT cab assembly counter clockwise (CCW). Moving the jot stick right rotates HEAT cab assembly clockwise (CW).

8. **COMBAT LOCKS OVERIDE**— The switch has a red safety cover that must be flipped up before use. This switch is spring loaded and is used joystick is spring loaded to return to center position when released. Moving the jot stick left rotates HEAT cab assembly counter clockwise (CCW). Moving the jot stick right rotates HEAT cab assembly clockwise (CW).

9. **MIC SWITCH**— This switch is spring loaded and is used in the up position to communicate to the crewmembers inside the M1114 cab assembly.

10. **MOTOR SWITCH**— This is a two position on / off switch. When turned to the right, on position the switch activates a relay to energize the motor and side to side joystick.
APPENDIX F

LESSON SLIDES

High Mobility Multipurpose Wheeled Vehicle (HMMWV)
Egress Assistance Trainer (HEAT)

The HEAT movie (TRADOC HEAT) for this VGT is available at:
VGT/HEAT_VG/551-HEAT/10.HTM

VGT 1

Terminal Learning Objective

<table>
<thead>
<tr>
<th>Action</th>
<th>Perform clearing and egress procedures with the HEAT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>In the HEAT wearing required combat equipment, given instruction on actions to take to preclude and reactive measures during/after a HMMW rollover as a HMMW crewmember.</td>
</tr>
<tr>
<td>Standards</td>
<td>Properly evacuate the HEAT while adhering to applicable safety precautions and procedures outlined in this lesson and applicable references.</td>
</tr>
</tbody>
</table>

VGT 2
Rollover battle drills create an understanding of and how to react to the violent chaos that results when a rollover has occurred.

**ENABLING LEARNING OBJECTIVE A:**

<table>
<thead>
<tr>
<th>ACTION:</th>
<th>Understand preventive measures to preclude rollover.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONDITIONS:</td>
<td>In a classroom, provided instruction on preventive and reactive measures, crewman duties, and emergency steps to take to preclude a vehicle rollover.</td>
</tr>
<tr>
<td>STANDARDS:</td>
<td>Identify precautionary measures to take to prevent a HMMWV vehicle rollover by answering the check-on-learning questions posed by instructor with a minimum of 80 percent.</td>
</tr>
</tbody>
</table>

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**Critical Rollover Angle**

- **Current Version of Up-armored HMMWV:** 25°
- **Combat Patrol-loaded M1114:** less than 30°

* less with higher-cg loads
Causes of Rollovers

Rollovers are caused by:

- Speed
- Inadequate training
- High centers of gravity
- Terrain
- Road conditions
- Driving habits
- Local conditions

Driver Risk Management Control Measures

- Adjust the vehicle speed
- Slow down
- Avoid panic
- Observe speed limits
- Do not rely on a "seat of the pants"
- Slowly accelerate
- Maintain a "space cushion"
- Avoid the temptation to brake hard
Teamwork is Key

- Work as a team
- Maintain crew integrity
- Communicate with the driver
- Identify terrain or conditions favorable for a rollover
- Use a guide near bodies of water
- Position team members within the vehicle
- Combat Looks
- Know how to get out

Price of Up armored HMMWVs

- Extremely-top heavy
- Vehicle rollovers common and deadly occurrence
Steps When Rollover Anticipated (Not Into Water)

Driver:
1. Releases the accelerator.
2. Shouts, "Rollover, Rollover, Rollover!"
3. Keeps hands on the steering wheel with arms extended but not locked.
4. Plants feet firmly on the floor.
5. Tucks head and chin into chest and braces for impact.

Vehicle Commander (VC):
1. Shouts, "Rollover, Rollover, Rollover!"
2. Uses left hand to pull gunner into the vehicle.
3. Uses left hand and arm to hold the gunner in place.
4. Plants feet firmly on the floor while holding onto a stationary object.
5. Tucks head and chin into chest and braces for an impact.

Steps When Rollover Anticipated (Not Into Water)

Gunner:
1. Shouts, "Rollover, Rollover, Rollover!"
2. Pushes/pulls self down into the vehicle.
3. Holds onto a stationary object.
4. Tucks head and chin into chest and braces for impact.
5. Does not place hands or fingers on turret.

Other crewmembers:
1. Shout, "Rollover, Rollover, Rollover!"
2. Assist VC to pull gunner into the vehicle and hold him.
3. Tuck head and chin into chest and brace for impact.
4. Hold onto a stationary object.
Water Entry Is Imminent
Whether Or Not The Potential For A Rollover Exists

NOTE: When in the vicinity of water and tactical conditions permit.

VC:
(1) Informs vehicle crew that the vehicle is operating around water hazards.
(2) Reminds the crew of the risk mitigating measures.
(3) Unlocks the combat door locks.
(4) Ensures all loose gear and cargo are secured.

Driver:
(1) Releases the accelerator, controls entry by steering into the body of water
(2) Yells “Water!”
(3) Keeps hands on the steering wheel with arms extended but not locked.
(4) Plants feet firmly on the floor.
(5) Tucks head and chin into chest and braces for impact.

Water Entry Is Imminent
Whether Or Not The Potential For A Rollover Exists

VC:
(1) Shouts, "Water!"
(2) Uses left hand to pull gunner into the vehicle.
(3) Uses left hand and arm to hold the gunner in place.
(4) Plants feet firmly on the floor while holding onto a stationary object.
(5) Tucks head and chin into chest and braces for an impact.

Gunner:
(1) Yells, "Water!"
(2) Pushes/pulls self down into the vehicle.
(3) Slides feet in the direction of the vehicle’s movement.
(4) Plants feet firmly on the floor while holding onto a stationary object.
(5) Tucks head and chin into chest and braces for impact.
(6) Does not place hands or fingers on turret.

Other crewmembers (if present)
(1) Shout "Water!"
(2) Assist VC to pull gunner into the vehicle and hold him.
(3) Tuck head and chin into chest and brace for impact.
(4) Plant feet firmly on floor while holding onto a stationary object.
ENABLING LEARNING OBJECTIVE B:

<table>
<thead>
<tr>
<th>ACTION:</th>
<th>Understand measures to take after rollover.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONDITIONS:</td>
<td>In a classroom, provided instruction on reactive measures, crewman duties, and emergency steps to take in case of a vehicle rollover.</td>
</tr>
<tr>
<td>STANDARDS:</td>
<td>Identify reactive measures to take in case of a HMMWV vehicle rollover by answering the check-on-learning questions posed by instructor with a minimum of 80 percent.</td>
</tr>
</tbody>
</table>

VGT 13

After Rollover (Not In Water)

Each crewmember, whether driver, VC, or rear crew:

1. Braces one hand on the ceiling.
2. Unbuckles seatbelt with other hand and immediately puts both hands on ceiling.
3. Slides out of seat and sits up.
4. Disconnects headset.
5. Turns off motor (driver).
6. Orient self on the nearest door.
7. Unlocks combat door locks.
8. Opens door, if it does not open, try a different door. (Shouts “door” to notify other soldiers of open door allowing egress.)
10. Assists remaining crew to exit.
11. Establishes security.
12. Checks for fires.
13. Activates fire extinguisher, as needed.
14. Recovers sensitive items.
15. Provides first aid.
16. Assists in vehicle recovery.

VGT 14
After Rollover (Not In Water)

Gunner:

1. Disconnects headset.
3. Orient self on nearest door.
4. Unlocks combat door locks.
5. Opens door; if it does not open, tries a different door.
6. Exits with weapon.
7. Assists crew to exit.
8. Establishes security.
9. Checks for fires.
10. Activates fire extinguisher, as needed.
11. Recovers sensitive items.
12. Provides first aid.
13. Assists in vehicle recovery.

If Vehicle Rolls Onto Side

Lower level Soldiers, if able:

1. Unbuckle seat belts.
2. Assist upper Soldiers to unfasten seat belts then carefully lower.

Crew, if doors are jammed:

1. Exit through hatch on cargo area if possible.
2. Work as a team to open jammed doors.
After Rollover (In Water)

All crewmembers:

(1) Turn off motor (driver).
(2) Disconnect headsets.
(3) Unbuckle seatbelt with other hand and immediately put both hands on ceiling.
(4) Unlock combat door locks if not already unlocked.
(5) Decide whether or not to remove personal equipment.
(6) Exit the vehicle.
(7) Assist each other to exit and secure weapons.
(8) Assess injuries.
(9) Get to safest shore.
(10) Provide security.
(11) Account for other crewmembers.
(12) Provide/seek first aid.
(13) Retrieve weapons, ammunition, and sensitive items.
(14) Assist with vehicle recovery.

VC:

(1) Accounts for weapons, ammunition, and sensitive items.
(2) Requests medical support, if required.
(3) Reports accident.

Water Rescue Recovery Drill

a. Rescuers secure the accident site.
b. Stay in contact with the vehicle.
c. Rescuers tie a rope/cable to the vehicle to aid rescue.
d. Open doors and hatches.
e. Turn vehicle if doors and hatches are not accessible.
f. Seek out the highest point on vehicle.
g. Ensure all survivors have air.
h. Check for other injuries and apply first aid.
i. Remove personal equipment.
j. Move injured personnel to the highest point on the vehicle.
k. Evacuate safest location, depending on:
   (1) Enemy situation
   (2) Water level and flow
   (3) Water temperature
   (4) Distance to water's edge
   (5) Anticipation of rescue
Check On Learning

1. A combat patrol loaded M1114, with a normal center of gravity (cg) and normal load can operate on slopes of up to how many degrees?
   a. 20.
   b. 25.
   c. 30.
   d. 98.6.

2. The critical (rollover) angle for current version in theater up-armed HMMWV is how many degrees?
   a. 20.
   b. 25.
   c. 30.
   d. 98.6.

3. What is the corrective action to take before reaching the critical rollover angle?
   a. Jerk the wheel back to the center of the road.
   b. All occupants yell, ‘Water!’
   c. Gradually reduce speed and ease the vehicle back onto the roadway at a safe speed.
   d. Secure the coolers and secure voice radios.

4. What should you do, during egress, if you find the door you are attempting to exit will not open?
   a. Inflate your water wings, kick out the windshield, and swim away from the enemy.
   b. Do not panic - find a door that works.
   c. Stay put and call the Automobile Club.
   d. Stay put and call QRF on the secure voice radio.

Check On Learning

5. What are the egress actions for the Gunner following a rollover on dry land?
   a. Disconnect headset, release gunner’s restraint system, assess injuries, clear and check weapon, exit vehicle with weapon.
   b. Assist crew to exit, establish security, recover sensitive items, provide first aid and assist in vehicle recovery.
   c. a and b above.
   d. Leap from the vehicle before it rolls.

6. What are the immediate actions of the Driver should an entry into the water be imminent?
   a. Release the accelerator; yell “Water!” and keep hands on the steering wheel.
   b. Tuck head and chin into chest and brace for impact; and steer vehicle to control entry into the water to prevent rollover.
   c. a and b above.
   d. Leap from the vehicle before it hits the water.

7. What must you do prior to releasing your seatbelt for egress and immediately afterwards?
   a. Brace with one hand against what was the ceiling (consider which hand you should brace with) – your neck cannot support your body weight during a fall; unfasten your seatbelt with the other hand.
   b. Unfasten your seatbelt with one hand, pushing firmly until it pops loose. You may have to push against the floor with your bracing hand to allow the seatbelt to unfasten.
   c. a and b above.
   d. Take out your k-bar and cut the thing off.

VGT 19

VGT 20
Check On Learning

8. What is the purpose of the combat door lock?
   a. To prevent aggressors from entering the vehicle in a hostile area.
   b. It interfaces with the Lojack circuitry, and assists police in recovery of a stolen HMMWV.
   c. It latches the door if moisture is detected during a water entry.
   d. There is no difference between a combat door lock and a conventional door lock.

9. What should the HMMWV crew do when operating near bodies of water or crossing bridges?
   a. Inform crew members of the water hazard, check seatbelts, slow down.
   b. Identify water hazards, unlock combat locks, remove seatbelts, slow down.
   c. Slow down, inform crew members of possible water hazards, unlock combat locks
   (enemy situation permitting).
   d. Look for alternate routes.

10. What should the HMMWV crews do to reduce the risk of being involved in a rollover?
    a. Check tires for proper inflation and serviceability, and slow down.
    b. Slow down, do not overload the vehicle, check condition and serviceability of tires, secure loads.
    c. Ensure operators are properly licensed.
    d. Limit crews operating in the vehicle to four or less.

Check On Learning

11. What can gunners do to minimize their injuries when involved in a rollover?
    a. Try to jump away from the vehicle.
    b. Lower yourself and brace for impact.
    c. Yell “Rollover!” while lowering yourself into the vehicle, brace for impact.
    d. Call the Automobile Club and complain about that last sharp curve on the road.

12. What preventive measures can be taken to minimize the chances of being involved in a rollover?
    a. Make a detailed Power Point presentation of any sharp curve in the road for emailing to your
       Congressman in a formal yet anonymous complaint.
    b. License and certify all crews on the HEAT, and train as a team.
    c. Slow down, avoid panic, know proper vehicle maneuvering, use caution in rural areas with soft
       shoulders, and identify water hazards.
    d. None of the above – only tracking your number of days left in country we help.

13. Other than the driver and gunner, what are the duties of the crew in the event of a rollover?
    a. Yell “Rollover!”
    b. Grab the gunner and pull them into the crew compartment.
    c. Brace for impact.
    d. All of the above.

18 July 2007
ENABLING LEARNING OBJECTIVE C: Practical Exercise

<table>
<thead>
<tr>
<th>ACTION:</th>
<th>HEAT operator performance drill familiarization</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONDITIONS:</td>
<td>In the HEAT trainer with required equipment and previous training.</td>
</tr>
<tr>
<td>STANDARDS:</td>
<td>Properly evacuate the HEAT while and adhering to applicable safety precautions and procedures outlined in this lesson and applicable references.</td>
</tr>
</tbody>
</table>

Crew/Battle Drill Descriptions

1. The first drill is for familiarization, pausing to highlight the 30- and 25-degree critical rollover angles and righting the device back.
2. The second drill shall be a “dry run” – completely rolling over (inverted) – no actual release of the seatbelts or gunner’s harness will be made.
3. The third will entail inverting the device and participants actually exiting the device, as though it had rolled on dry land.
4. After righting the device, crew rotating seats and re-entering the device – the fourth drill will entail inverting the device, simulating a water entry.

VGT 23

VGT 24
## Glossary

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAAAR</td>
<td>Abbreviated Aviation Accident Report</td>
</tr>
<tr>
<td>ACH</td>
<td>Advanced Combat Helmet</td>
</tr>
<tr>
<td>AGAR</td>
<td>Army Ground Accident Report</td>
</tr>
<tr>
<td>ARIMS</td>
<td>Army Records Information Management System</td>
</tr>
<tr>
<td>ATTN</td>
<td>attention</td>
</tr>
<tr>
<td>CASCOM</td>
<td>Combined Arms Support Command</td>
</tr>
<tr>
<td>CCW</td>
<td>counter clockwise</td>
</tr>
<tr>
<td>cg</td>
<td>center of gravity</td>
</tr>
<tr>
<td>CLS</td>
<td>combat lifesaver</td>
</tr>
<tr>
<td>COA</td>
<td>course of action</td>
</tr>
<tr>
<td>CPR</td>
<td>cardiopulmonary resuscitation</td>
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<tr>
<td>CRM</td>
<td>composite risk management</td>
</tr>
<tr>
<td>CW</td>
<td>clockwise</td>
</tr>
<tr>
<td>DC</td>
<td>District of Columbia</td>
</tr>
<tr>
<td>DA</td>
<td>Department of the Army</td>
</tr>
<tr>
<td>DOL</td>
<td>Directorate of Logistics</td>
</tr>
<tr>
<td>DOR</td>
<td>drop on request</td>
</tr>
<tr>
<td>DSN</td>
<td>Defense Switched Network</td>
</tr>
<tr>
<td>ELO</td>
<td>Enabling Learning Objective</td>
</tr>
<tr>
<td>FM</td>
<td>field manual</td>
</tr>
<tr>
<td>FOB</td>
<td>Forward Operating Base</td>
</tr>
<tr>
<td>GTA</td>
<td>graphic training aid</td>
</tr>
<tr>
<td>GVW</td>
<td>gross vehicle weight</td>
</tr>
<tr>
<td>HEAT</td>
<td>HMMWV Egress Assistance Trainer</td>
</tr>
<tr>
<td>HMMWV</td>
<td>High Mobility Multipurpose Wheeled Vehicle</td>
</tr>
<tr>
<td>HQ</td>
<td>Headquarters</td>
</tr>
<tr>
<td>IED</td>
<td>improvised explosive device</td>
</tr>
<tr>
<td>LOD</td>
<td>line of duty</td>
</tr>
<tr>
<td>MDMP</td>
<td>military decision making process</td>
</tr>
<tr>
<td>MEDEVAC</td>
<td>medical evacuation</td>
</tr>
<tr>
<td>METL</td>
<td>mission essential task list</td>
</tr>
<tr>
<td>METT-TC</td>
<td>mission, enemy, terrain and weather, troops and support available, time available, civil considerations</td>
</tr>
<tr>
<td>mph</td>
<td>miles per hour</td>
</tr>
<tr>
<td>NCOIC</td>
<td>noncommissioned officer in charge</td>
</tr>
<tr>
<td>O2</td>
<td>oxygen</td>
</tr>
<tr>
<td>OIC</td>
<td>officer in charge</td>
</tr>
<tr>
<td>PMCS</td>
<td>preventive maintenance checks and services</td>
</tr>
<tr>
<td>RPG</td>
<td>rocket propelled grenade</td>
</tr>
<tr>
<td>SF</td>
<td>standard form</td>
</tr>
<tr>
<td>SOP</td>
<td>standing operating procedure</td>
</tr>
<tr>
<td>SSN</td>
<td>social security number</td>
</tr>
<tr>
<td>TC</td>
<td>training circular</td>
</tr>
<tr>
<td>TLO</td>
<td>Terminal Learning Objective</td>
</tr>
<tr>
<td>TRADOC</td>
<td>Training and Doctrine Command</td>
</tr>
<tr>
<td>TTO</td>
<td>training time out</td>
</tr>
<tr>
<td>US</td>
<td>United States (of America)</td>
</tr>
</tbody>
</table>
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REFERENCES

Army Regulations

AR 600-55 The Army Driver and Operator Standardization Program
(Selection, Training, Testing, and Licensing), 18 June 2007

DA Forms are available on the Army Electronic Library (AEL) and the APD web site, www.apd.army.mil.

DA Form 348 Equipment Operator's Qualification Record (Except Aircraft)
DA Form 2028 Recommended Changes to Publications and Blank Forms
DA Form 2397-AB-R Abbreviated Aviation Accident Report (AAAR)
DA Form 7566 Composite Risk Management Worksheet

DA Pamphlet 385-40 Army Accident Investigation and Reporting, 1 November 1994


DD Form 1902 Certificate of Qualification

Field Manuals

FM 3-04.301 Aeromedical Training for Flight Personnel, 29 September 2000
FM 5-19 Composite Risk Management, 21 August 2006

Graphic Training Aids

GTA 55-03-030 HMMWV Uparmored Rollover Emergency Procedures

The following forms are available on the Army Electronic Library (AEL) and the APD web site, www.apd.army.mil.

SF 91 Motor Vehicle Accident Report

Training Circulars

TC 21-305 Training Program for Wheeled Vehicle Accident Avoidance, 19 August 1996

TC 21-305-4 Training Program for the High Mobility Multipurpose Wheeled Vehicle, 31 May 1991


18 July 2007 References-1
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By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
0717801

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