

\*GTA 05-08-002

## Environmental-Related Risk Assessment

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Headquarters, Department of the Army  
March 2008

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\*This publication supersedes GTA 05-08-002, October 1999.



## **PURPOSE**

This graphic training aid (GTA) illustrates how the risk assessment process is used to assess and reduce environmental-related risks while conducting operations. Although all risk cannot be eliminated, leaders must identify hazards that may negatively impact the mission and/or the environment and implement controls to reduce the overall risk. Assessing environmental-related risk is only a part of the composite risk management (CRM) process.

## **OVERVIEW**

Risk decisions are a commander's business. Such decisions are normally based on the next higher commander's guidance on how much risk that commander is willing to accept and delegate for the mission. Risk decisions should be made at the lowest possible level, except in extreme circumstances.

Leaders and staff manage risks. Staff members continuously look for hazards associated with their areas of expertise. They then recommend controls to reduce risks. Hazards and the resulting risks may vary as circumstances change and experience is gained. Leaders and individual Soldiers become the assessors for ever-changing hazards such as those associated with the environment (weather; visibility; and contaminated air, water, and soil), equipment readiness, individual and unit experience, and fatigue. Leaders should advise the chain of command on risks and risk-reduction measures.

## **THE CRM PROCESS**

Environmental CRM is the process of identifying, assessing, and controlling risk across the full spectrum of Army missions, functions, operations, and activities and making decisions that balance the environmental risk with mission benefits. CRM integrates risk management into the military decision-making

process (MDMP). *FM 5-19* outlines the CRM process and provides the framework for making risk management a routine part of planning, preparing, and executing operational missions and everyday tasks. Assessing environmental-related risks is part of the total CRM process.

A knowledge of environmental factors is key to planning and decision making. With this knowledge, leaders quantify risks, detect problem areas, reduce the risk of injury or death, reduce property damage, and ensure compliance with environmental laws and regulations. Leaders should conduct CRMs using *DA Form 7566 (Composite Risk Management Worksheet)* before conducting any training, operations, or logistics activities.

*Figure 1*, page 9, is an example of a completed *DA Form 7566*. Blocks 1 through 4 contain general information, and Column 5 lists the subtasks associated with the mission or primary task.

The five steps in the environmental CRM process are as follows:

#### **STEP 1. IDENTIFY ENVIRONMENTAL HAZARDS**

Leaders identify environmental hazards during mission analysis. *FM 5-19* defines a hazard as any actual or potential condition that can cause injury, illness, or death of personnel; damage to or loss of equipment or property; or mission degradation. Environmental hazards include all activities that may pollute, create negative noise-related effects, degrade archeological/cultural resources, or negatively affect the habitats of threatened or endangered species. *Table 1*, page 10, lists common environmental hazards identified by environmental media areas.

The leader enters the identified hazards for each mission subtask in Column 6 of *DA Form 7566* (see *Figure 1*, page 9).

## **STEP 2. DETERMINE THE INITIAL RISK LEVEL FOR EACH ENVIRONMENTAL HAZARD**

Leaders use three substeps to determine the initial risk level for potential harm to the environment and the mission. In the first two substeps, leaders consider two factors—probability (see *Table 2*, page 12) and severity (see *Table 3*, page 14). In the third substep, leaders use a risk assessment matrix (see *Table 4*, page 15) that correlates the probability and severity to determine the initial risk level.

### **Substep 1. Determine the Probability of the Environmental Hazard**

Leaders assess the probability for each hazard identified (see *Figure 1*, page 9). Probability is how often an environmental hazard is likely to occur. Using their experience and best judgment, leaders select one of the five degrees of probability listed in *Table 2*, page 12.

In the example in *Figure 1*, the leader used experience, best judgment, and the definitions in *Table 2* to determine the probability for—

- Vehicle accidents or breakdowns causing a fuel or hazardous material (HM) spill. The probability is *seldom*.
- Spills during refueling stops. The probability is *occasional*.
- Maneuver damage from off-road movement. The probability is *frequently*.

### **Substep 2. Determining the Severity of the Environmental Hazard**

Leaders assess the severity for each hazard identified (see *Figure 1*). Severity is the effect that a hazard will have on the environment. Definitions for the degrees of severity are not absolutes—they are conditional and mission, enemy, terrain, troops

and support available, time available, and civil considerations (METT-TC) related. Leaders must use experience, judgment, lessons learned, and subject matter experts to help determine the degree of severity. *Table 3*, page 14, defines the four degrees of severity.

In the example in *Figure 1*, page 9, the leader used experience, best judgment, and the definitions in *Table 3*, to determine the severity for—

- Vehicle accidents or breakdowns causing a fuel or HM spill. These could be significant and cause major damage to the environment. The severity is *critical*.
- Spills during refueling stops. These could cause minor damage to the environment. The severity is *marginal*.
- Maneuver damage from off-road movement. This would cause little or no environmental damage. The severity is *negligible*.

### **Substep 3. Determine the Initial Risk Level of the Environmental Hazards**

Using the risk assessment matrix (see *Table 4*, page 15), leaders locate the column for the probability of an environmental hazard (determined in Substep 1) and the row for the severity of the same environmental hazard (determined in Substep 2). The risk level is indicated in the cell where the row and column intersect. The leader enters the initial risk level for each environmental hazard in Column 7 of *DA Form 7566* (see *Figure 1*).

In the example in *Figure 1*, the leader used the risk assessment matrix (see *Table 4*) to determine the initial risk level for—

- Vehicle accidents and breakdowns causing a fuel or HM spill. The risk level is *moderate* (the probability is *seldom* [Column D], and the severity is *critical* [Row II]; the intersection of the column and row in the matrix is *moderate* [IID]).

- Spills during refueling stops. The risk level is *moderate* (the probability is *occasional* [Column C], and the severity is *marginal* [Row III]; the intersection of the column and row in the matrix is *moderate* [IIIC]).
- Maneuver damage from vehicle off-road movement. The risk level is *moderate* (the probability is *frequently* [Column A], and the severity is *negligible* [Row IV]; the intersection of the column and row in the matrix is *moderate* [IVA]).

### **STEP 3. DEVELOP ENVIRONMENTAL CONTROLS AND MAKE RISK DECISIONS**

Controls eliminate or reduce the probability or severity of each hazard, thereby lowering the overall risk. Controls can consist of one of the categories listed in *Table 5*, page 16.

Many environmental-risk controls are simply extensions of good management, housekeeping, operations security, and leadership practices. Risk reduction controls can include conducting rehearsals, changing locations, establishing procedures, and increasing supervision. Using *Table 5*, page 16, leaders fill in Column 8 of *DA Form 7566* (see *Figure 1*, page 9).

Some risk will always exist, even after all practical risk control measures are in place. Based on the developed controls, leaders determine the residual risk for each of the hazards using the procedures from Step 2. Once leaders determine the residual risk for each hazard, the residual risk should be indicated in Column 9 of *DA Form 7566* (see *Figure 1*, page 9). Based on the highest residual risk determination in Column 9, this becomes the overall mission/task risk and is checked in Block 13. The residual risk requires the commander's attention. The commander determines whether or not to accept the risk. The commander may direct subordinates to consider additional controls or a change in the course of action.

#### **STEP 4. IMPLEMENT THE CONTROLS**

Implementing the controls requires informing all subordinates of the risk control measures. To do this, leaders define the controls by filling in Column 10 of *DA Form 7566* (see *Figure 1*, page 9). Leaders state how each control will be implemented and assigns responsibility for implementing the controls. For example, if the control measures for a fuel spill hazard are to ensure that operators are properly trained to dispense fuel and ensure that appropriate spill equipment is available, leaders must ensure that these controls are in place before an operation.

Leaders must anticipate environmental requirements and incorporate them as part of long-, short-, and near-term planning. The key to success is identifying the who, what, where, when, and how of each control and entering the information in *DA Form 7566*.

#### **STEP 5. SUPERVISE AND EVALUATE**

Leaders continuously monitor controls throughout an operation to ensure their effectiveness and to modify them as required. Leaders responsible for supervising each control should be identified in Column 11 of *DA Form 7566*. Leaders—

- Make on-the-spot corrections and evaluate individual and collective performances.
- Hold those in charge accountable.
- Require that all tasks be performed to applicable environmental standards.
- Ensure that the after-action review (AAR) process includes an evaluation of environmental-related hazards, controls, Soldier performance, and leader supervision.
- Ensure that environmental lessons learned are developed for use in future operations.

Each control identified and implemented must be evaluated (Column 12 of *DA Form 7566* [see *Figure 1*, page 9]) to determine if the control was adequate for the associated risk. This evaluation should include feedback provided to the Soldiers associated with the risk.

### **SUMMARY**

The ability of leaders to identify hazards is a key responsibility. One reality of today's missions is that the aspect of a hazard can change rapidly. Things of little risk initially can quickly become major threats due to unforeseen natural or man-made events. Leaders should be aware of this possibility. If they become complacent regarding such events, their lack of action should be viewed as a hazard.

Completing the risk assessment, but failing to identify effective controls usually results in a go/no-go decision based on the initial risk. If the risk assessment does not accurately identify the hazards and determine the level of residual risk, leaders are likely to make a risk decision based on incomplete or inaccurate information. If the risk assessment incorrectly places a mission in the routine, low-risk category, the commander may not be informed of a risk decision, resulting in an accepted risk level that could endanger the commander's intent or other organizations.

The CRM process is intended to provide reasonable controls to reduce negative environmental impacts and support mission accomplishment.

**COMPOSITE RISK MANAGEMENT WORKSHEET**  
For use of this form, see FM 5-10, the proponent agency is THRODGC.

1. MSNTASK: S6C Engineer Company Convoy  
 2. DTG BEGIN: 01 0600 R Jun XX  
 3. DATE PREPARED (YYYYMMDD): 20060520  
 4. PREPARED BY: Doe, John D.  
 5. DTG END: TBD  
 6. POSITION: Executive Officer

7. HAZARDS	8. CONTROLS	9. INITIAL RISK LEVEL	10. HOW TO IMPLEMENT	11. HOW TO SUPERVISE (WHO)	12. WAS CONTROL EFFECTIVE?
5. SUBTASK: Conduct convoy operations. Vehicle breakdowns and accidents causing spills of hazardous materials, fuel.	Train all operators and crew personnel to take appropriate action in case of spill, protect themselves; notify chain of command, confine spill.	M	Soldiers review SJP, command environmental program, train drivers before convoy, check spill equipment	Convoy commander, vehicle commander, platoon commander.	
Spills during fuel stops	Provide spill equipment.	M	Soldiers review SJP, command environmental program, platoon leader will check each spill kit.	Platoon leader.	
Maneuver damage from off-road movement.	Brief all drivers to stay on approved secondary roads; identify habitat along roads; provide personnel with map of route.	M	Soldiers review SJP, command environmental program, provide drivers slip map of route.	Platoon leader, vehicle commander.	

13. OVERALL RISK LEVEL AFTER CONTROLS ARE IMPLEMENTED (Check one)  
 LOW  
 MODERATE  
 HIGH  
 EXTREMELY HIGH

14. RISK DECISION AUTHORITY  
 a. LAST NAME: J. R. Risk  
 b. RANK: CPT  
 c. DUTY POSITION: Commander  
 d. SIGNATURE: SIGNED

DA FORM 7566, APR 2005

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AFD PE v2.00

Figure 1. Completed DA Form 7566 (Page 1)

**Table 1. Common Environmental Hazards**

Element	Hazard
Air	<ul style="list-style-type: none"> <li>• Equipment exhaust.</li> <li>• Convoy dust.</li> <li>• Range fires.</li> <li>• Open-air burning.</li> <li>• Pyrotechnics/smoke pots/smoke grenades.</li> <li>• Part-washer emissions.</li> <li>• Paint emissions.</li> <li>• Air-conditioner/refrigeration chlorofluorocarbons (CFCs).</li> <li>• HM/hazardous waste (HW) release.</li> </ul>
Archeological/cultural	<ul style="list-style-type: none"> <li>• Sensitive-area maneuvering.</li> <li>• Sensitive-area digging.</li> <li>• Artifact disturbance or removal.</li> <li>• Demolition/munitions effects.</li> <li>• HM/HW spills.</li> <li>• Sonic booms/prop wash.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>• Low-flying aircraft (helicopters).</li> <li>• Demolition/munitions effects.</li> <li>• Nighttime operations.</li> <li>• Operations near post/camp boundaries or civilian populace.</li> <li>• Vehicle convoys/maneuvers.</li> <li>• Large-scale exercises.</li> </ul>
Threatened/endangered species	<ul style="list-style-type: none"> <li>• Maneuvering in sensitive areas.</li> <li>• Demolition/munitions effects, especially during breeding seasons.</li> <li>• Disturbance individual species or their habitats.</li> <li>• HM/HW spills or releases.</li> <li>• Poor field sanitation.</li> <li>• Improper cutting of vegetation.</li> <li>• Damage to coral reefs.</li> </ul>

**Table 1. Common Environmental Hazards (continued)**

Element	Hazard
Soil (terrain)	<ul style="list-style-type: none"><li>• Overuse of maneuver areas.</li><li>• Demolition/munitions effects.</li><li>• Range fires.</li><li>• Poor field sanitation.</li><li>• Poor maneuver damage control.</li><li>• Erosion.</li><li>• Troop construction effects.</li><li>• Refueling operations.</li><li>• HM/HW spills.</li><li>• Maneuvering in ecologically sensitive areas such as wetlands and tundra.</li></ul>
Water	<ul style="list-style-type: none"><li>• Refueling operations near water sources.</li><li>• HM/HW spills.</li><li>• Erosion and unchecked drainage.</li><li>• Amphibious/water-crossing operations.</li><li>• Troop construction effects.</li><li>• Poor field sanitation.</li><li>• Washing of vehicles at unapproved sites.</li></ul>

**Table 2. Hazard Probability**

<b>Frequently (A) Occurs very often, continuously experienced.</b>	
Single item	<ul style="list-style-type: none"> <li>Occurs very often in service life.</li> <li>Expected to occur several times over the duration of a specific mission or operation.</li> <li>Always occurs.</li> </ul>
Fleet or inventory of items	<ul style="list-style-type: none"> <li>Occurs continuously during a specific mission or operation or over a service life.</li> </ul>
Individual Soldier	<ul style="list-style-type: none"> <li>Occurs very often in a career.</li> <li>Expected to occur several times during a mission or operation.</li> <li>Always occurs.</li> </ul>
All Soldiers exposed	<ul style="list-style-type: none"> <li>Occurs continuously during a specific mission or operation.</li> </ul>
<b>Likely (B) Occurs several times.</b>	
Single item	<ul style="list-style-type: none"> <li>Occurs several times in a service life.</li> <li>Expected to occur during a specific mission or operation.</li> </ul>
Fleet or inventory of items	<ul style="list-style-type: none"> <li>Occurs at a high rate, but experienced intermittently (regular intervals, generally often).</li> </ul>
Individual Soldier	<ul style="list-style-type: none"> <li>Occurs several times in a career</li> <li>Expected to occur during a specific mission or operation.</li> </ul>
All Soldiers exposed	<ul style="list-style-type: none"> <li>Occurs at a high rate, but experienced intermittently.</li> </ul>
<b>Occasional (C) Occurs sporadically.</b>	
Single item	<ul style="list-style-type: none"> <li>Occurs sometimes in a service life</li> <li>May occur about as often as not during a specific mission or operation.</li> </ul>
Fleet or inventory of items	<ul style="list-style-type: none"> <li>Occurs several times in a service life.</li> </ul>
Individual Soldier	<ul style="list-style-type: none"> <li>Occurs sometime in a career.</li> <li>May occur during a specific mission or operation, but not often.</li> </ul>
All Soldiers exposed	<ul style="list-style-type: none"> <li>Occurs sporadically (irregularly, sparsely, or sometimes).</li> </ul>

**Table 2. Hazard Probability (continued)**

<b>Seldom (D) Remotely possible; could occur at some time.</b>	
Single item	<ul style="list-style-type: none"> <li>Occurs in a service life, but only remotely possible.</li> <li>Not expected to occur during a specific mission or operation.</li> </ul>
Fleet or inventory of items	<ul style="list-style-type: none"> <li>Occurs as an isolated incident.</li> <li>Possible to occur sometime in a service life, but rarely.</li> <li>Usually does not occur.</li> </ul>
Individual Soldier	<ul style="list-style-type: none"> <li>Occurs as an isolated incident during a career or remotely possible.</li> <li>Remotely possible, but not expected to occur during a specific mission or operation.</li> </ul>
All Soldiers exposed	<ul style="list-style-type: none"> <li>Occurs rarely within the exposed population as isolated incidents.</li> </ul>
<b>Unlikely (E) Can assume will not occur, but not impossible.</b>	
Single item	<ul style="list-style-type: none"> <li>Occurrence not impossible.</li> <li>May assume will almost never occur in a service life or during a specific mission or operation.</li> </ul>
Fleet or inventory of items	<ul style="list-style-type: none"> <li>Occurs very rarely (almost never or improbable).</li> <li>Incidents may occur over a service life.</li> </ul>
Individual Soldier	<ul style="list-style-type: none"> <li>Occurs very rarely in a career or during a specific mission or operation. Occurrence not impossible, but may assume will not occur.</li> </ul>
All Soldiers exposed	<ul style="list-style-type: none"> <li>Occurs very rarely, but not impossible.</li> </ul>

**Table 3. Hazard Severities**

<b>Catastrophic (I)</b>	<ul style="list-style-type: none"> <li>• Loss of ability to accomplish the mission or mission failure.</li> <li>• Death or permanent total disability (accident risk).</li> <li>• Loss of major or mission-critical system or equipment.</li> <li>• Major property and/or facility damage.</li> <li>• Severe environmental damage.</li> <li>• Mission-critical security failure.</li> <li>• Unacceptable collateral damage.</li> </ul>
<b>Critical (II)</b>	<ul style="list-style-type: none"> <li>• Significantly (severely) degraded mission capability or unit readiness.</li> <li>• Permanent partial disability or temporary total disability exceeding 3 months (accident risk).</li> <li>• Extensive (major) damage to equipment or systems or significant damage to property or the environment.</li> <li>• Security failure.</li> <li>• Significant collateral damage.</li> </ul>
<b>Marginal (III)</b>	<ul style="list-style-type: none"> <li>• Degraded mission capability or unit readiness.</li> <li>• Minor damage to equipment or systems, property, or the environment.</li> <li>• Lost days due to injury or illness, not exceeding 3 months.</li> <li>• Minor damage to property or the environment.</li> </ul>
<b>Negligible (IV)</b>	<ul style="list-style-type: none"> <li>• Little or no adverse impact on mission capability.</li> <li>• First aid or minor medical treatment needed.</li> <li>• Slight equipment or system damage, but fully functional and serviceable.</li> <li>• Little or no property or environmental damage.</li> </ul>

**Table 4. Risk Assessment Matrix**

Severity	Probability				
	Frequently (A)	Likely (B)	Occasional (C)	Seldom (D)	Unlikely (E)
<b>Catastrophic (I)</b>	<b>E</b>	<b>E</b>	<b>H</b>	<b>H</b>	<b>M</b>
<b>Critical (II)</b>	<b>E</b>	<b>H</b>	<b>H</b>	<b>M</b>	<b>L</b>
<b>Marginal (III)</b>	<b>H</b>	<b>M</b>	<b>M</b>	<b>L</b>	<b>L</b>
<b>Negligible (IV)</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>

**Risk Categories are—**

- **Extremely High (E).** Mission failure if hazardous incidents occur during the mission or a frequent or likely probability of catastrophic loss (IA or IB) or frequent probability of critical loss (IIA) occurs.
- **High (H).** Significantly degraded mission capabilities in terms of the required mission standard. Not accomplishing all parts of the mission or not completing the mission to standard (if hazards occur during mission). Occasional to seldom probability of catastrophic loss (IC or ID) or likely to occasional probability of a critical loss (IIB or IIC) with materials and soldier system. Frequent probability of marginal (IIIA) losses.
- **Moderate (M).** Expected degraded mission capabilities in terms of required mission standard or has reduced mission capability (if hazards occur during mission). Unlikely probability of catastrophic loss (IE). Probability of a critical loss occurring is seldom (IID) or marginal losses occur with a probability of no more than likely (IIIB or IIC). Negligible (IVA) losses are a frequent probability.
- **Low (L).** Expected losses have little or no impact on accomplishing the mission. The probability of critical loss is unlikely (IIE) or marginal loss is no more than seldom (IIID through IIIE).

**Table 5. Environmental-Related Controls**

Control Type	Environmental-Related Examples
Educational	<ul style="list-style-type: none"> <li>• Conducting unit environmental-awareness training.</li> <li>• Conducting an environmental briefing before deployment.</li> <li>• Performing tasks to environmental standards.</li> <li>• Reviewing environmental considerations in AARs.</li> <li>• Reading units environmental standing operating procedures and policies.</li> <li>• Conducting spill prevention training.</li> <li>• Publishing an environmental annex/appendix to the operation order/operation plan.</li> </ul>
Physical	<ul style="list-style-type: none"> <li>• Providing spill prevention equipment.</li> <li>• Establishing a field trash collection point and procedures.</li> <li>• Establishing a field satellite accumulation site and procedures.</li> <li>• Policing field locations.</li> <li>• Practicing good field sanitation.</li> <li>• Filling in fighting positions.</li> <li>• Posting signs and warnings for off-limit areas.</li> </ul>
Avoidance	<ul style="list-style-type: none"> <li>• Maneuvering around historical/cultural sites.</li> <li>• Establishing refueling and maintenance areas away from wetlands and drainage areas.</li> <li>• Crossing streams at approved sites.</li> <li>• Preventing pollution of habitats.</li> <li>• Limiting noise in endangered and threatened species.</li> <li>• Avoiding refueling over water sources.</li> <li>• Curtailing live vegetation use for camouflage.</li> </ul>