



# LESSONS LEARNED:

## *Midwest Flood of 1993*

By Vern Lowrey

The following Lessons Learned address military disaster relief operations during the massive flooding that occurred in the midwestern United States in 1993. Response to this crisis revealed important lessons in Army preparedness, leadership, organization, equipment and safety. For more information write to Commandant, U.S. Army Engineer School, ATTN: ATSE-ESA, Fort Leonard Wood, MO, 65473-6630. Or call (314) 563-4007, DSN 676-4007.



**INTRODUCTION.** A flood has been described as a "disaster in slow-motion." This was certainly true for the 1993 flood in the midwestern United States, which began in February and continues as this article is written (November 1993). Military campaigns were fought over 2000 miles of rivers in Illinois, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, and Wisconsin. Series of battles were fought along individual stretches of the Des Moines, Illinois, Mississippi, Missouri, and numerous other rivers, streams, and lakes.

Unlike the damage resulting from a hurricane, earthquake, or tornado, the flood damage was not localized or quickly assessed and then remedied by the rapid reaction of state and federal agencies. Instead, the military response was built gradually: It started at the local level, moved to state levels (including the National Guard), and finally moved through the federal level (including active and reserve forces and the U.S. Army Corps of Engineers) as capabilities to fight and recover from the flood were exhausted. Joint operations were conducted between Air and Army National Guard forces as well as with the Coast Guard. Based on this experience, the

current doctrine in FM 100-19, *Domestic Support Operations*, appears to be sound in guiding military flood-relief operations. The following topics were identified as key observations.

**TOPIC: The military command estimate process.**

**DISCUSSION:** The framework of the military command estimate process was used by all National Guard (NG) and U.S. Army Corps of Engineers (USACE) headquarters personnel. Intelligence information was continually gathered concerning the terrain, levees, flood levels, and weather. Current information concerning the employment of local, state, and federal resources was also gathered. Based on this information, military agency staffs and commanders developed courses of action for flood-fighting and flood-recovery operations. Decisions were reached and implemented as required.

**RECOMMENDATION:** Continue to use the military command estimate process during disaster-relief training and operations.

**TOPIC: Previous flood-relief operations and disaster-relief training exercises.**

**DISCUSSION:** Flood-relief operations early in 1993 provided valuable insights and helped foster coordination for responses to flooding that occurred later in the year. All operations prior to the major flooding events in July and August helped establish and improve liaison with local authorities. Army and Air National Guard, Active Army, and USACE

personnel had previously participated in joint disaster relief exercises with Federal Emergency Management Agency (FEMA) personnel and local authorities. Although these exercises revolved around various scenarios including earthquake, nuclear power plant evacuation, and civil disturbance responses, they helped establish lines of coordination between military response forces and civilian agencies.

**RECOMMENDATION:** National Guard, Active Army, and USACE personnel continue to participate in joint exercises as resources and time allow.

**TOPIC: Liaison teams.**

**DISCUSSION:** All agencies involved in the mid-west flood response effort were unanimous in the need for effective liaison personnel at emergency operations centers (EOC), from the local/county/city level to the FEMA level. Liaison personnel often were called upon to make immediate, on-the-spot decisions concerning military capabilities within the intent of the military response plan. They were considered subject matter experts (SME) but lacked training to be SME. Liaison personnel required dedicated communications and transportation capabilities.

**RECOMMENDATION:** Military response agencies provide trained, competent liaison personnel with equipment who can coordinate and represent their interests. Allow liaison personnel to make on-the-spot decisions based on the intent of the military response plan and the commander's guidance.

**TOPIC: Rules of engagement (ROE).**

**DISCUSSION:** The presence of National Guard forces in flooded areas normally provided a sense of secure calm to the local population, negating the need to demonstrate a show of force with weapons. Illinois, Iowa, and Missouri National Guard personnel were not issued weapons or ammunition based on this premise. Missouri authorized the issue of weapons for security missions when local authorities requested personnel to augment their police capabilities. Kansas National Guard personnel drew weapons for local security operations. All personnel were thoroughly briefed on the ROE and carried ROE cards. These ROE followed standard procedures identified for civil disturbance operations.

**RECOMMENDATION:** Continually assess the need for weapons and ammunition during disaster relief operations. When weapons and ammunition are required for security operations, use standard ROE, including rules of deadly force. Thoroughly brief personnel on the ROE and issue ROE cards.

**TOPIC: Release of National Guard forces from flood-fighting locations.**

**DISCUSSION:** National Guard forces initially were called to assist with immediate efforts to prevent loss of life, assist with evacuations, and provide security to evacuated areas. The goal was to have them stay only until local authorities could take over the flood recovery efforts. This goal allowed the NG units to be deactivated or quickly moved to other locations. Determination of when local authorities could relieve them was done by mutual agreement (consensus) between local officials and NG commanders. A common technique was to tie their release to a measurable event such as river depth, opening of a road or bridge, etc.

Sometimes it was difficult to get local authorities to realize that they had the capability to continue flood recovery efforts without NG assistance. Local people wanted the National Guard to continue to patrol evacuated areas because they perceived the areas would be "less safe" after these forces left. Release actions were not fully announced in some cases, which made it difficult for local authorities to quickly cover the lost capability.

**RECOMMENDATION:** Use measurable events to establish release criteria with local authorities as soon as possible. Continually communicate with local authorities concerning release actions.

**TOPIC: Communications equipment.**

**DISCUSSION:** Various kinds of communications equipment were required during the flood-relief operations. Cellular telephones were used extensively by USACE and National Guard personnel except in a few areas not covered by cellular telephone towers. While several types of cellular phones were procured or donated, those with higher wattage capability did the best because they had a larger coverage area. Personnel required training on how to use these phones, including how to periodically recharge and replace the batteries. Spot shortages of batteries occurred. Each military response agency controlled their own telephone frequencies. Fax machines were provided down to the task force level. They effectively provided up-to-date logistics and personnel status information. Both fax machines and E-MAIL were used extensively to transmit activation and deactivation orders. Radio coverage was provided by high frequency (HF), single-sideband type of equipment. Local FM radio coverage was provided primarily by AN/PRC-127 and AN/VRC-12 equipment.

**RECOMMENDATION:** Continually assess communications requirements, including existing cellular

telephone capability and impacts of potential damage to existing towers. Procure or plan to procure cellular telephones with additional batteries for contingencies. Provide each liaison officer with a cellular phone. Provide needed cellular phone training. Coordinate frequency requirements with local agencies. Provide fax machines and E-MAIL capability to the task force level. Continue to use FM and HF radios for back-up communications.

**TOPIC: Maps.**

**DISCUSSION:** Map coverage appeared adequate to support military response efforts in flooded areas. The USGS map scales used were primarily 1:100,000 and 1:24,000. Locally produced maps included city street maps, and county and state highway maps of varying scales. USACE Flood Plain maps were used primarily along the Mississippi River basin. Some local maps were outdated and did not show recent streets or roads. No difficulties in interpreting the maps were noted. The large-scale maps were used primarily in Emergency Operations Centers, while the small-scale maps were used by units and personnel on the ground.

**RECOMMENDATION:** Continually assess, acquire copies of, and train with updated map products for potential disaster relief operations areas.

**TOPIC: National Guard logistics support.**

**DISCUSSION:** National Guard units that deployed with all organic equipment, supplies, and repair parts were immediately capable of extended operations in the flood-relief effort. Other units that deployed without all organic equipment, supplies, and repair parts had to rely on local supply sources and local transportation. They were not fully capable to fight the floods. In states where individuals instead of units were called up, logistics support problems were compounded even further. States that provided forward direct support (DS) maintenance contact teams from organizational maintenance support (OMS) shops could repair most equipment on-site and had minimal down time. States that retained DS capability at their own OMS shops provided less timely repairs. Most units provided effective preventative maintenance (PM). Because vehicles were continually driving in and around water, PM was heightened, especially maintenance to keep fluids and seals from being contaminated. Additionally, portable latrines were needed in many areas for field sanitation purposes, and refrigerated vans were needed to store rations. Personnel required large quantities of sunscreen, bug repellent, flashlights and flashlight batteries.

**RECOMMENDATION:** Take all organic equipment, supplies, and repair parts when responding to disaster-relief missions. Provide forward DS maintenance capability and schedule PM operations throughout the operation. Provide portable latrines, refrigeration equipment, and adequate stocks of individual supplies, based on the situation.

**TOPIC: Safety.**

**DISCUSSION:** To keep personnel safe, commanders used the risk assessment process throughout the flood-relief effort. Safety concerns centered around prevention of heat injuries, night operations, use of life jackets, and protection against tetanus and insect bites. All personnel received training on how to spot and treat heat-related injuries. Although temperatures reached 100 degrees Fahrenheit in some areas with high humidities over 80 percent, very few heat related injuries were reported. Personnel were continually hydrated with water, used sun screens, and used the buddy system to watch each other.

Military personnel and equipment needed to be easily visible in the dark because operations continued around the clock. Floodlights provided by USACE and the Air National Guard were used extensively in critical flood-fighting areas. Several traffic accidents occurred when military vehicles with camouflage paint were not visible at night. This military equipment required additional reflective devices such as highway warning lights to prevent cars from driving into them. Personnel working at night were required to wear reflective clothing and use flashlights and the buddy system. Agencies required that all personnel operating on levees and in and around water wear life jackets. The life jackets provided by USACE to the National Guard and other agencies saved several persons who were swept away when levees broke. Additionally, all military personnel received inoculations against tetanus because of the unsanitary water. Adequate stocks of insect repellent were available to ward off mosquitos and flies around flooded areas.

**RECOMMENDATION:** Continually stress safety during disaster relief operations, including operating at night. Use the risk-assessment process. Plan for specific safety requirements such as the need for life jackets and highway warning equipment.

*Mr. Lowrey is Chief, Analysis Division, Directorate of Evaluation and Standardization, U.S. Army Engineer School. He served as the subject matter expert for the Center for Army Lessons Learned during the mid-west flood disaster-relief effort.*