NWES Proposal

—undergoes Spring tests

Sometimes you don't want the "real thing."

Complications arise, for example, if you aim to test how soldiers should or would react to a real nuclear explosion.

So what do you do? You train with a variety of devices—simulators—to approximate actual conditions following a nuclear blast.

Now comes a proposed simulator which ties everything—flash, cloud, bang, electromagnetic energy effects, injury extent, and fallout and radiation levels together—in a neat package on wheels.

The package, called a Nuclear Weapons Effects Simulator (NWES), undergoes a Spring Proof of Concept Test at Fort McClellan, Alabama. The Training Devices and Simulation Branch of the Unit Training Division, and the Test and Coordination Division of the Directorate of Combat Developments at the US Army Chemical School, along with the Jet Propulsion Laboratory, Pasadena, California, will conduct the tests. If the concept proves feasible, further development will follow.

The tests will employ a pyrotechnical air display to provide flash, cloud, and bang cues. A radio frequency (RF) transmitter and a communications device attached to US Army communication radios will simulate the effects of electromagnetic pulse (EMP). The NWES cues trigger the transmitter, which simultaneously emits an RF signal.

The NWES device consists of several pyrotechnical shells, each fired from a mobile launch trailer (figure 1). The mortar tubes are made of the same material used to encase fireworks. The flash and cloud cues for the airburst device, which uses three identical containers to house the flash and pyrotechnical mixtures, are detonated at intervals of two- to three-tenths of a second apart to produce a large flash, followed by a cloud.

The bang cue, generated by a different projectile detonated shortly after the flash appears, simulates the illusion of distance. An observer, because of the time lag, perceives the detonation as originating from a distance greater than actually occurred.

A flash-to-bang delay of up to 40 seconds could be used for a simulated distance of 15 kilometers (9.32 miles) from ground zero. This would allow nuclear field training exercises to be performed in relatively space-restricted areas.

During the EMP simulation, the EMP receiver will emit radio noise which interferes with communications (the antennas are connected to Army radios), when the RF signal is transmitted.

The ground burst simulation would also be a pyrotechnical air display. The differences between it and the airburst simulation would be: the height of the burst would be less, and a stem cue would be formed by a smoke-emitting projectile fired from the ground into the base of the cloud.

The recommended approach for accomplishing nuclear contamination transfer training is to use the Persistent Chemical Agent Simulants (PCAS) and Chemical Agent Monitor (CAM) technology the same way it is used to accomplish chemical contamination transfer.

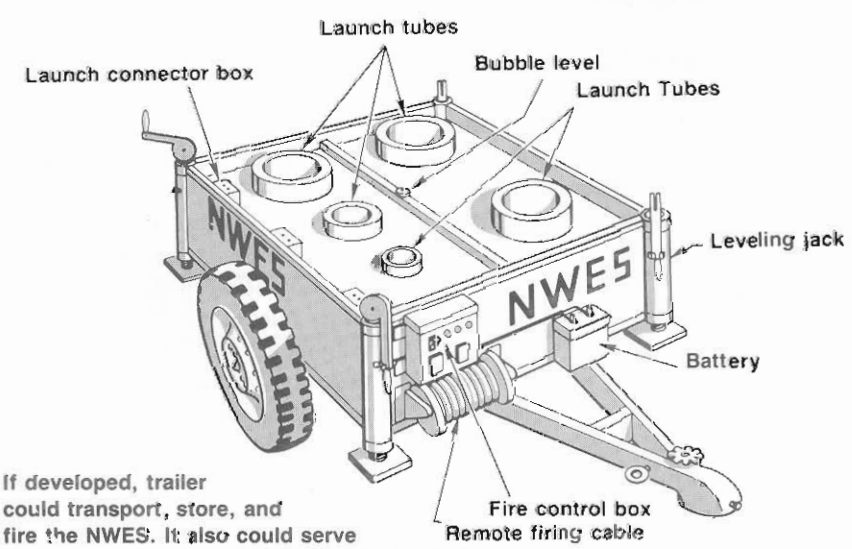
An RF data link would transmit simulated total dose/dose rates for the initial effects of radiation, blast, and heat. Soldiers would carry real-time casualty assessment (RTCA) devices, including an antenna, a decoder, an integrator (a device which contains a predetermined, built-in dose level), and a casualty indicator such as a buzzer or light.

When the predetermined level of dose, blast, or heat injury is reached, the integrator activates or turns on the indicator.

An RF data link would also simulate fallout and radiation hot spots by having transmitters—placed in desired spots—using a signal which would weaken and decay over time.

The field strength of the RF signals, dependent on distance, would allow the decoder to assess the extent of injuries.

Figure 1. Nuclear Weapons Effects Simulator



If developed, trailer could transport, store, and fire the NWES. It also could serve as a delivery system for a chemical simulant.