

Advanced Integrated Collective Protection System

By Adolfo R. Negron

Wing Commanders and Senior Wing Staff of the US Air Force Europe have called collective protection (CP) "one of the greatest enhancements to...mission operating capability... Since the early seventies, CP has been a major asset to the command and control of major weapon systems. CP protects an enclosure against hazardous concentrations of toxic agents by providing clean, filtered air at above ambient pressure. Protection extends to the soldier and the equipment, and allows the soldier to function at maximum efficiency with complete freedom of movement and

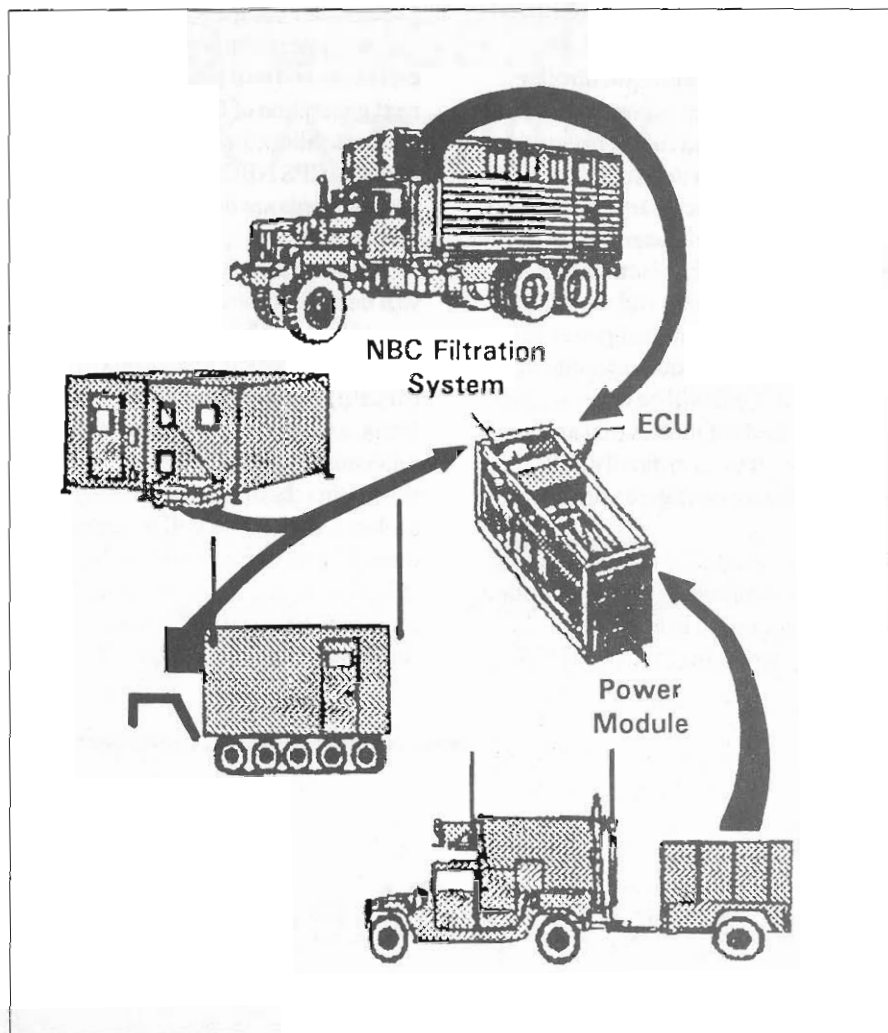
communication in a shirt-sleeve environment.

In a continuing effort to enhance the US armed forces' ability to carry out its mission in a nuclear, biological, and chemical environment, the US Army Edgewood Research, Development, and Engineering Center (ERDEC) is developing the Advanced Integrated Collective Protection System (AICPS). The AICPS mission will be to provide protection against chemical and biological agents and radioactive

particles to a variety of tactical and combat support/service vans and shelters.

The AICPS will consist of an NBC filtration system (FS) integrated with an environmental control unit (ECU), and an integral power unit (IPU). As shown in the figure above, AICPS will be either mounted on an exterior wall of the host van or shelter or, if necessary, be skid- or trailer-mounted.

The FS will employ a deep bed filter using chromium-free, ASZM-TEDA, carbon. The deep bed filter design will enhance effectiveness against current threat agent challenges and reduce filter change logistics by extending the filter life. The FS will provide cleaned, filtered air at above ambient pressure. The AICPS will incorporate a control



Parameters	XM31	XM32	XM33
Airflow (CFM)	400	200	200
Cooling/Heating (BTU)	60,000/46,000	36,000/ 29,900	18,000/ 13,150
Exportable Power (KW)	10	10	5

panel to provide pressure monitoring capability and low pressure warning inside the host system. A controller will monitor system power use, temperature, pressure, and fuel consumption, among other characteristics. The ECU will provide the necessary cooling and heating for the host system while the IPU will provide the electrical power required to run the FS and the ECU, and will export additional power to run the host system mission equipment. A family of AICPS will be developed to meet the needs of most Army and joint service systems. This family will consist of three configurations as shown on page 29.

The AICPS will also interface with the host system subsystems to provide efficient operation in NBC and non-NBC environments. It will be

functionally compatible with the current generation of protective entrances and will interface with the next generation of NBC detectors and alarms to allow for automatic activation of the AICPS NBC mode when NBC contaminants are detected or an alarm is received.

An integrated system like AICPS will be a first time capability for the US armed forces. The existing Modular Collective Protection Equipment (MCPE), Environmental Control Units, and power generation units are relatively large and heavy. By integrating these units into a single package, economies will be achieved through common assemblies, better efficiencies, and tighter mechanical designs. The result will be a much smaller and lighter package. The

AICPS will cost less than the existing hardware in like quantities because of the high degree of integration that reduces structure and support costs. Life Cycle costs are also expected to be reduced due to the reductions in manpower, personnel, and training costs required for the set up, operation, and repair of AICPS.

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US Army Chemical Corps 1994 Writing Competition

The theme for the 1994 Chemical Corps Writing Competition will be *The Chemical Corps: Preparing for the Twenty-First Century*.

This competition is open to military of all branches and services, including allied nations, and civilians of any nationality.

Entries should be 500 to 2,500 words in length, supported by appropriate footnotes, bibliography, and graphics. Manuscripts should be double-spaced and accompanied by a cover sheet with the author's name, title, organization, and a short biography.

Competitors need to submit their entries to the Office of the Chemical Corps Historian, US Army Chemical School, ATTN: ATZN-CM-MH, Fort McClellan, AL 36205-5020, no later than 15 August 1994.

Judging will be on a 100-point scale with up to 40 points for

writing clarity, 30 for relevance to *The Chemical Corps: Preparing for the Twenty-First Century*, 20 for general accuracy, and 10 for originality. A panel of judges appointed by the Assistant Commandant of the Chemical School will review the entries and recommend the top three articles to the Chief of Chemical. The decision of the Chief of Chemical will be final.

The Chemical Corps Regimental Association will present monetary awards to the top three entries. First place will receive \$300, second will get \$150, and \$50 will go to the third place entry.

The winning article will be published in the Chemical Corps Regimental Association Yellow Book and in the January 1995 issue of *CML*, *Army Chemical Review*. Other articles will be considered for publication as appropriate.