



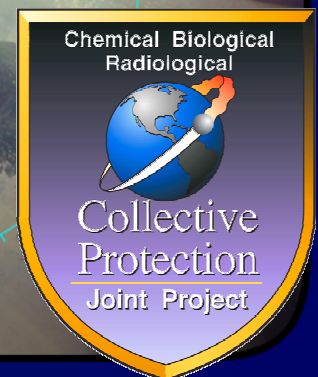
Allied Engineering Publication (AEP)– 54 Overview

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INTRODUCTION



- The AEP-54 is a **NATO CONFIDENTIAL** document developed as part of the activities of the Land Group 7 (LG/7) Working Group 2 (WG2) * on ColPro led by the United Kingdom.
- The document is out for ratification by NATO Nations and is being formulated as STANAG 4634.
- The objective of this document is to:
 - Define acceptable NATO ColPro design and performance specifications.
 - Detail the challenge levels for ColPro.
 - Describe the technical specification against which ColPro Systems are to be tested.



* *AEP-54 is currently under the jurisdiction of the NATO LG/7 Physical Protection Sub-Group (PPSG)*



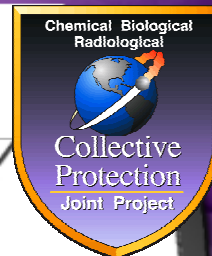
- **Chemical Agents**
 - Persistent and Non-Persistent
 - Modified or Thickened
- **Biological Agents (in aerosolized form)**
- **Nuclear (breathable airborne emitters)**
- **Radiological (aerosolized radioactive material)**
- **Toxic Industrial Hazards (TIH) ***
 - Toxic Industrial Chemical (TIC)
 - Toxic Industrial Biological (TIB)
 - Toxic Industrial Radiological (TIR)



* *Via Release Other Than Attack (ROTA)*



CHALLENGE LEVELS *



- Established (and ratified by LG/7) based on the recommendations and Threat Assessment completed by the LG/7 Challenge Sub-Group (CSG) for Chemical, Biological, and TIH challenges.
- Based on guidance from the LG/7 Nuclear Protection Sub-Group (NPSG) for Nuclear and Radiological Hazards.
- Derived from modeling of operational scenarios with current weapons delivery systems.
- Described as **Essential** (minimum acceptable standards of performance) or **Desirable** (ideal level of protection).



* *Challenge Levels are classified NATO Confidential and can not be furnished for public distribution.*



PROTECTION FACTOR (PF) DEFINITION



- There are four routes for contamination to penetrate into the Toxic Free Area (TFA):
 - a. Contamination Control Area (CCA)
 - b. Materials, seals, and connections
 - c. Air filtration Unit (AFU)
 - d. Protective Entrance (PE) - contamination via personnel/equipment entry/exit
- The PF of the ColPro System and/or components is hazard-specific and defined by the following equations:

$$PF = \frac{\text{Hazard Challenge Dose Ct (mg min/m}^3\text{)}}{\text{Hazard Exposure Limit Ct (mg min/m}^3\text{)}}$$



$$PF_{\text{Total}} = [(1/PF_a) + (1/PF_b) + (1/PF_c) + (1/PF_d)]^{-1}$$



- **The AEP-54 addresses the following areas:**
 - **Operational Requirements**
 - **Technical Specifications**
 - **Testing Methodologies**

- **The basic parameters covered are:**
 - **Technical**
 - **System Performance**
 - **Filtration**
 - **General Considerations**



- **System Integrity**
- **Chemical Agent Protection**
 - Vapor
 - Liquid
 - TICs (liquid and vapor)
- **Biological Agent Protection**
- **Nuclear Protection**
 - Radiological Particles
 - Thermal Radiation
 - Blast
 - TIR
 - Electromagnetic Pulse (EMP)



BASIC PARAMETERS SYSTEM PERFORMANCE



- Durability
- Erection and Strike
- Maintainability
- Operational Effectiveness
- Liquid Repellency
- Heat and Flame Resistance
- Environmental Climate
- TFA Habitability and Overpressure
- Entry and Exit
- Operational Decontamination
- Interoperability of Transportation *



* *NATO Agreement for Interoperability of Transportable, Unhardened ColPro Systems is included in separate Annex*



Filtration

- **HEPA Efficiency ***
- **Vapor Protection ***
 - **Single-Pass Filtration**
 - **Regenerable Filtration**
- ***In-Situ* Filter Performance (Air Filtration Unit integrity during filter change out)**
- **Air Filtration Unit Robustness**

General

- **Storage and Service Life**
- **Air Transportability**

* *Test Specification for HEPA and Vapor Filtration included in separate Annex.*



Examples of desirable features:

- **Modular construction.**
- **Field repairable.**
- **Decontaminable.**
- **Hardened against liquid and particulate ingress.**
- **Allow communication between CCA, TFA, and exterior.**
- **Incorporate appropriate lighting capabilities.**
- **Include hygiene facilities.**
- **Allow for rapid strike and erect.**
- **Have a method of testing and filter residual life.**
- **Allow for monitoring of vital system parameters.**
- **Capable of withstanding blast overpressure and shock.**



**Standardization Agreement (STANAG)
Allied Joint Publication (AJP)
Allied Tactical Publication (ATP)**

- **STANAG 2941: Guidelines for Air and Ground Personnel using fixed and transportable COLPRO facilities on land.**
- **STANAG 2515/ATP-70: Collective Protection in a Nuclear, Chemical and Biological Environment. (will be covered in the in the newest AJP 3.8.1. (ATP 3.8.1, Vol I –III)):**
 - **STANAG 2520: AJP 3.8.1. Vol I**
 - **STANAG 2521: AJP 3.8.1. Vol II**
 - **STANAG 2522: AJP 3.8.1. Vol III**



CONCLUSION



- The design and performance specifications presented in AEP-54 are based on currently available data and recommendations from the LG/7 CSG and NPSG.
- The guidance provided is generic in nature such that it is readily applicable to a changing threat and should be used in conjunction with the NATO ColPro Operational/Tactical documentation.
- The ultimate goal is to help NATO Nations achieve a required level of ColPro that is desirably equal to or greater than that afforded by Individual Protective Equipment (IPE).



POINTS OF CONTACTS



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