



# **A Rationale for Establishing Survivability Requirements for Objective Force Unmanned Army Platforms and Systems**

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# Outline

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- Introduction
- The Army NWE survivability requirement
- The new susceptibility chart
- Example
- Conclusions



# Introduction

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- Legacy Force/Interim Force transition
- Objective Force – new systems and doctrine
- International NWE survivability interest
  - Quadripartite Standardization Agreement (QSTAG)
  - NATO Standardization Agreement (STANAG)



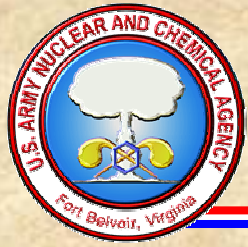
# The Army NWE Survivability Requirement

- Only equipment supporting critical missions has a NWE survivability requirement
- Training and Doctrine Command establishes the requirement for Army ground equipment (typically mobile ground-based (MGB))
- Space and Missile Defense Command establishes the requirement for its equipment (typically missiles)
- Generally states the type of criteria (all or HEMP only) and the time frame (operate through or back on line after a specified time period)

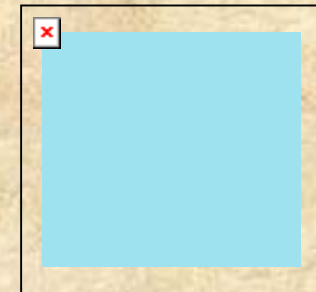
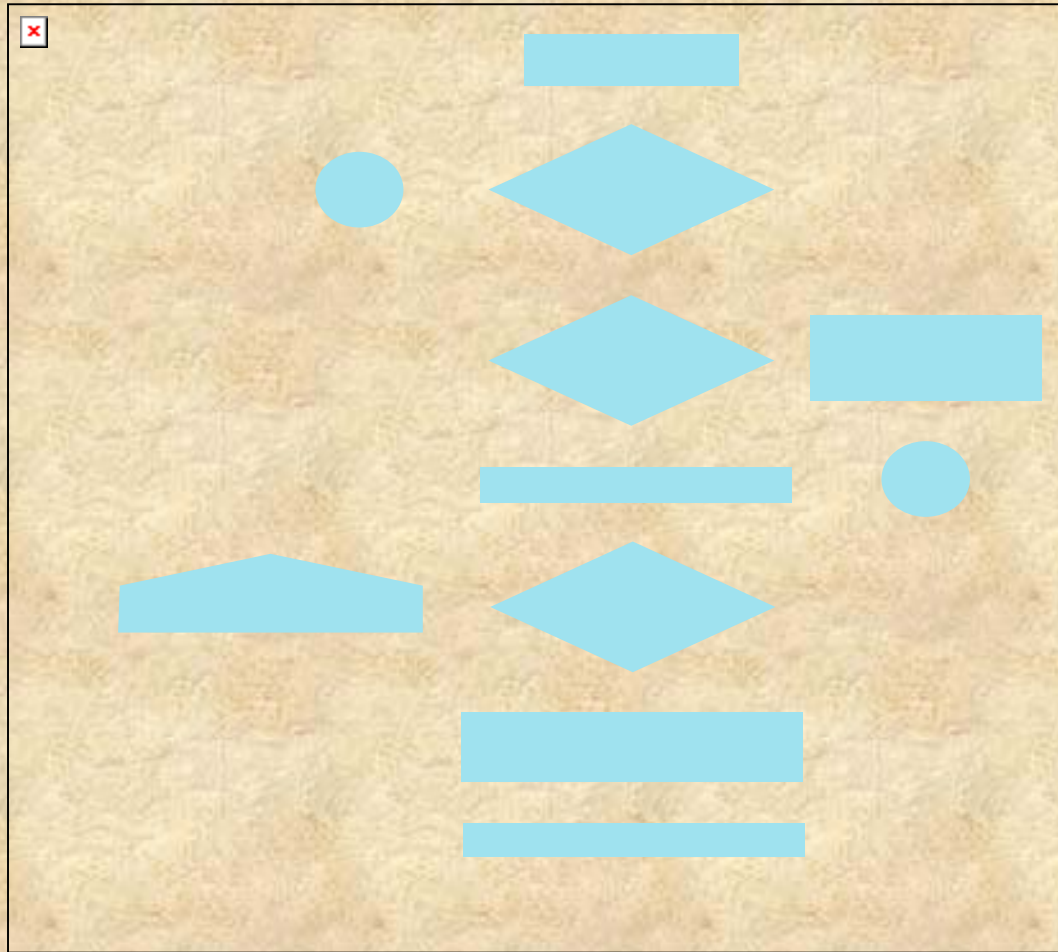


# The New Susceptibility Chart

- Approach follows QSTAG 1031
  - Five equipment classes
  - Criteria based upon the weakest link
- Rationale specified in QSTAG 2041
  - Allows for evolution of unmanned equipment design and usage
  - Weakest link is equipment, not man



# The Army NWE Survivability Requirement

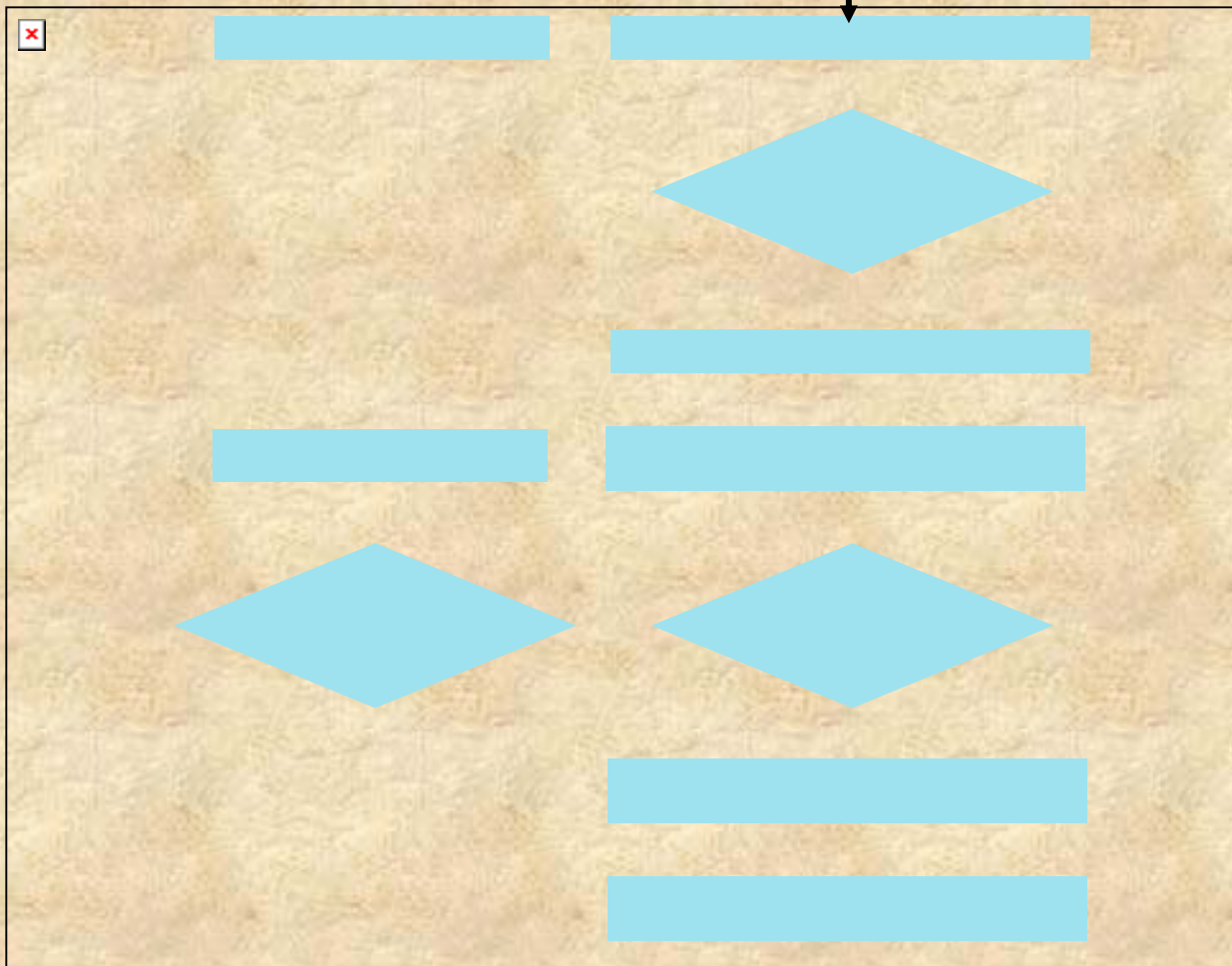


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# The Army NWE Survivability Requirement

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# The New Susceptibility Chart

## Predominant \* Susceptibility Chart for Five Unmanned, Legacy-Like Equipment Classes

	<b>CLASS I</b> Unmanned Equipment Exposed	<b>CLASS II</b> Unmanned Equipment in Shelters	<b>CLASS III</b> Unmanned Equipment in MBTs	<b>CLASS IV</b> Unmanned Equipment in LAFVs	<b>CLASS V</b> Unmanned Equipment in Airborne Systems
Blast	DPI <sub>classI</sub>	DPI <sub>classII</sub>	DPI <sub>classIII</sub>	DPI <sub>classIV</sub>	DPI <sub>classV</sub>
Thermal	[fluence, flux] <sub>classI</sub>	[fluence, flux] <sub>classII</sub>	[fluence, flux] <sub>classIII</sub>	[fluence, flux] <sub>classIV</sub>	[fluence, flux] <sub>classV</sub>
INR	[total dose, neutron fluence, gamma dose rate] <sub>allclasses</sub>				
SREMP	Derived from [total dose, neutron fluence, gamma dose rate] <sub>allclasses</sub>				
HEMP	ABCA Standard in Vol. II, QSTAG 244 and QSTAG 1031				

\* Dominating susceptibility, but associated effects criteria are also stated.

DPI: dynamic pressure impulse

INR: initial nuclear radiation

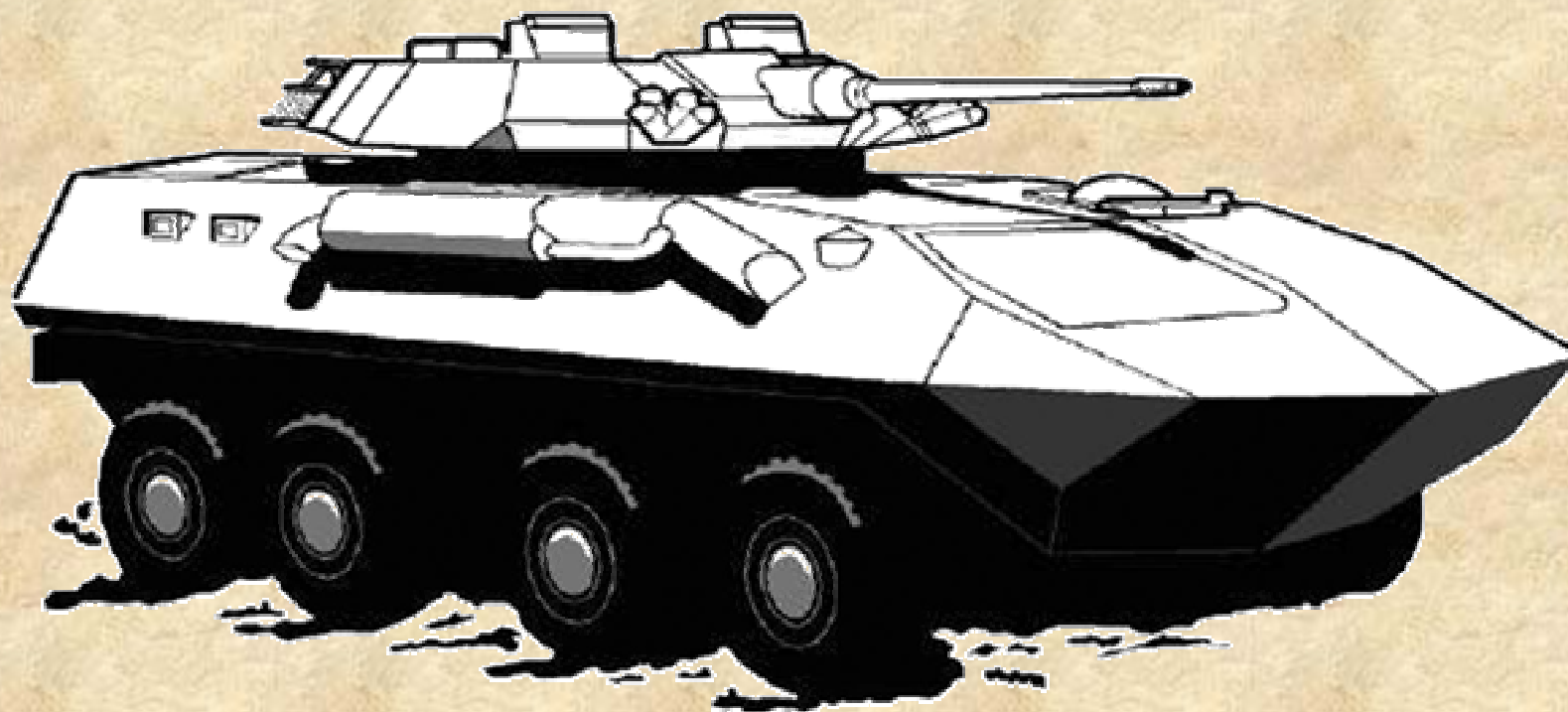
SREMP: source region electromagnetic pulse

HEMP: high-altitude electromagnetic pulse





# Example





# Example

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## Unmanned Armored Scout Vehicle (USAV)

- A realistic, but hypothetical, system
- 15-ton wheeled replacement for the LAFV
- All digital electrics (IFF, C4ISR, WMD sensors)
- Remotely-controlled 60 mm EM rail gun
- USAV could be a part of the new Objective Force family of systems



# Example

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## Objective Force Unit of Action (UA)

- 23-25 Future Combat System types, including 4 UAVs, 3 UGVs, and 3 unmanned sensors
- All types must be self-sufficient for 3-5 days
  - systems will be thrown away or maintained
  - goal is zero logistics line



# Example

- Unmanned systems operating near (1 km or less) manned equivalents will have same criteria as manned equivalents (QSTAG 1031)
- Unmanned systems operating far from (more than 1 km) manned equivalents will have criteria from Susceptibility Chart
  - typically, INR effects on electronics will drive the susceptibility
  - blast damage will be limited to MOD 1 levels



# Conclusions

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- Unmanned equipment will become an integral part of future Army systems (Objective force and beyond)
- Unmanned MGB equipment will have a NWE survivability requirement if they support critical missions
- NWE hardening criteria for that MGB equipment will be based upon QSTAG 2041 rationale