

## MITIGATION - SCIENCE AND TECHNOLOGY ADVANCES FOR CHEMICAL AND BIOLOGICAL HAZARD MITIGATION

# Development And Implications Of A Prototype Explosive Detonation System For The Demilitarization Of Chemical Weapons In ROK

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The persistent risk posed by chemical weapons and the particular geopolitical tension on the Korean peninsula, underscored by North Korea's potential possession of such arsenals, necessitates advanced demilitarization technologies. This study explores the prototype development of an Explosive Detonation System (EDS) designed in South Korea, tailored specifically for the safe neutralization of unexploded ordnance and obtained chemical munitions. The need for the EDS in ROK is critical, not only for ensuring regional stability but also for advancing the Chemical Weapons Convention treaty.

The prototype EDS in this study shows a blast resistance capacity equivalent to 2.2 kg of TNT. The EDS can section for ammunition shells, safely containing, and neutralizing chemical agents within its chamber. This system meets the American Society of Mechanical Engineers (ASME) standards, having achieved the necessary certification. The detailed design of the EDS includes various critical features such as chamber rotation and stirring mechanisms, agent injection, and precise temperature and pressure control, all monitored internally to ensure operational safety and effectiveness.

Building upon this prototype's development experience, the next generation of EDS aims to refine and enhance the practical deployment capabilities of the military end-user for the EDS. By advancing this technology, we contribute to a safer demilitarization process, reducing the risk of chemical weapon usage and fortifying peace and security in the Korean peninsula and beyond.