

## Direct Combustion Technology for Aged Solid Rocket Motor Demilitarization

The Agency for Defense Development (ADD) in association with ENSOL Co. has developed a new demilitarization technology, which allows direct combustion of aged solid rocket motor. A pilot scale system has been fabricated for implementation at an Army Depot and performance evaluation has been conducted to prove the effectiveness of the newly developed solution to rocket motor demil. The major concerns are the environmental compliance and safety aspect. The installation consists of direct ignition / combustion tube followed by two distinctive Pollution Abatement System (PAS). The tube is designed to accommodate a nozzle removed 130mm MLRS motor (22.2kg NEW/round) and the peak chamber pressure goes up to 33bar and temperature of exit gas is about 1,600 °C during combustion. Through the 1st stage PAS, after-burning is self sustained with high temperature off gas and infiltrated air. Also, mono nitrous oxide is reduced by Selective Non-Catalytic Reduction (SNCR) mechanism, and most chlorine is converted into HCl, which is absorbed in the wet scrubber where the gas volume is greatly reduced also. The effluent gas from the scrubber is stored in a large buffer tank and treated at low flow rate through 2nd stage PAS which consists of filter, catalytic oxidizer, Selective Catalytic Reduction (SCR) reactor, and induction fan.

Emission results of CO, NO<sub>x</sub>, SO<sub>x</sub>, HCl, HCN and TSP meet and are far below the permitted levels. Another merit of this technology is low investment and processing cost. The capacity of the secondary PAS largely determines the treatment capability of the entire system, which is capable of treating two rounds of 130mm motor per hour under existing configuration.

This paper will provide a description of the system and discuss the test results of the performance evaluation.