

THREAT AGENT DEFEAT MODELING AND TESTING

Jack Rabbit Iii: Filling Critical Atmospheric Dispersion Modeling Gaps For Emergency Planning And Response

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Understanding the atmospheric behavior from releases of anhydrous ammonia is critically important to protect life and save resources. Ammonia is the most produced and widely transported toxic industrial chemical (TIC) in the United States. It is receiving surging global interest as an alternative renewable zero-carbon energy source to fuel ships and as a hydrogen carrier. With the current and projected production, transport, and storage of ammonia surging domestically and worldwide, there is a concomitant increase in risk to public health and economic impact from potential accidental or intentional releases of this chemical. Millions of tons of liquefied ammonia are manufactured annually in the U.S. and transported in bulk via pipeline, rail cars, highway tanker trucks, nurse tanks, and refrigerated barges.

In the Jack Rabbit (JR) III program, the Department of Homeland Security (DHS) Science and Technology (S&T) Chemical Security Analysis Center (CSAC) and interagency partners are conducting research to fill data and knowledge gaps for anhydrous ammonia hazards to enhance the ability to predict the behavior and consequences of a release through transport and dispersion modeling. Atmospheric dispersion modeling gaps have been identified, studied, and addressed in JR III through modeling comparison exercises, laboratory experiments, and technology surveys. An international model inter-comparison exercise was launched to evaluate global plume modeling capabilities, develop modeling methodologies supporting emergency response, and support planning of potential future outdoor ammonia field release experiments.

JR III Scientific Advisory Group and Technical Working groups continue to work collaboratively with partners from government, industry, and academia to identify and address gaps and stakeholder needs in emergency preparedness, response, mitigation, and multifunctional sensing and surveillance technologies. This briefing will present the latest results of JR III focused research and efforts to develop strategic technology solutions for incident countermeasures, decontamination, protection, and emergency response.