

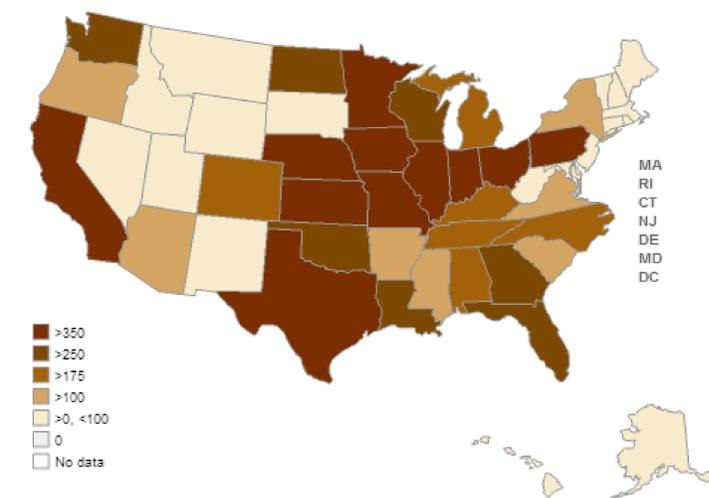
## Introduction

The EPA's Risk Management Plan Rule (RMP), under Section 112r of the Clean Air Act was established to accelerate chemical safety by hazard communication of worst and common case accident scenarios and requiring analysis of safety options. Such communication could lead to community, worker, and first responder dialogue about hazards and prevention. This project explores how communication of worst case accident scenarios can lead to accident prevention activities. In particular, the research focuses on two elements: A review of why companies have delisted in the past five years from the RMP rule reporting requirements and a review of prevention options for the 101 facilities that have the largest worst case scenarios, affecting more than one million people.

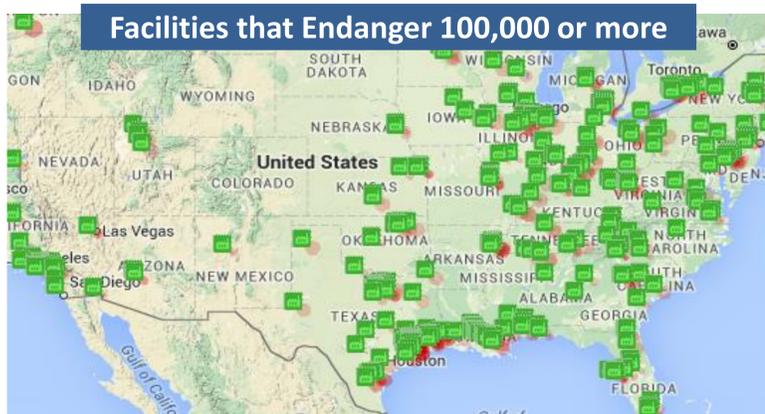
## Results: Survey Responses

We received few responses from the first emailed survey sent to the 100 high hazard facilities. Two completed surveys were returned, thirty four were undeliverable, and five calls were received from recipients. The survey was resent to the original list of 400 delisted facilities. Approximately ninety six surveys were undeliverable and nine completed surveys were returned. Follow up calls were made to the remaining sixty or so high hazard facilities that had not responded. The most common reason for deregistration was as a result of terminated operations. Facilities often changed business activities depending on the market timing or moved locations of chemical tanks to comply with RMP.

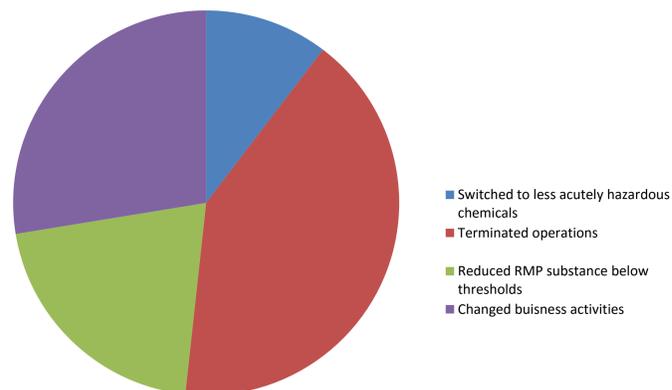
## Chemical Accidents by Year



## Facilities that Endanger 100,000 or more



## Facilities Reason for Deregistration



## Conclusions

Upon release certain chemicals have the ability to create toxic gas clouds that could potentially travel miles, and injure or kill thousands in the process. Preventing chemical spills and accidental or terrorism-related releases of hazardous chemicals is a major concern for the health and safety of many communities. Risk reduction – or chemical site security is also a concern in the post-9/11 world. Since the establishment of the RMP program in 1999, there have been significant changes in industrial processes and chemical storage leading improving chemical safety, and a decline in the number of hazardous chemical facilities. President Barack Obama's executive order to improve chemical facility safety and security has reinforced the urgency to eliminate the ever-present risk of a toxic release, and develop safer alternatives. The Center for American Progress confirms that many facilities across the United States have already successfully adopted safer alternatives, and actually reported saving money in the long run. Increased hazard communication and reinforcing the right-to-know has improved chemical accident prevention and continues to ensure a safer environment for communities. Eliminating the risk of storing a chemical with catastrophic potential, saves lives, prevents pollution, and protects property.

## Methods and Material

Based on previous research conducted by the Center for American Progress on chemical accident hazards in the United States, facilities were identified that had either delisted from RMP requirements or had worst case scenarios affecting more than one million people and for which safer alternatives had not been identified. We utilized the RMP database hosted by the Right-to-Know Network to review and examine Risk Management Plans for 400 companies that have deregistered from the program in the last five years. Based on findings from the RMP reports, facilities were then prioritized by type of chemical, amounts of stored chemicals, and size of vulnerability zones. A final list of the one hundred highest-hazard facilities consisted of a variety of facilities reporting different types of chemicals. A cover letter and short six question survey was created and emailed to these facilities. Follow up calls were made to non-responders. Alternatives to high concern processes and chemicals were investigated using databases housed by the Toxic Use Reduction Institute as well as Internet reviews and expert consultation.

## Results: Chemical Accident Prevention

Of the 400 facilities investigated, anhydrous ammonia was reported more than any other chemical. In cases where dry urea or liquid nitrogen is not a feasible alternative, improved safety measures were taken into consideration. EVAPCO has developed a solution to address these challenges. The Evapcold Low Charge Refrigeration product line for cold storage applications consists of over 250 different models designed to fit almost any industrial process. The Evapcold only requires 2.5 to 3.0 pounds of ammonia per ton of refrigeration for an entire system. Only a tenth of the refrigerant charge associated with traditional systems that typically require around 25 pounds per ton. The Evapcold system is an opportunity for facilities to reduce the amount of anhydrous ammonia in their refrigeration system by 90%, and limit the amount being transported over roads and through communities. Dimethyl Carbonate DMC was found to be a sustainable alternative to phosgene, in the production of plastic resins and polycarbonates.

## Acknowledgements

Thank you, to The Society of Chemical Hazard Communication for the great opportunity and making this research possible. Thank you also, Joel Tickner and Paul Orum for providing assistance in finding information, and helping me through every step of the research process, and to the many people who responded and provided ideas and technologies to reduce chemical hazards.

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