

ABSTRACT OF THESIS

ASSESSMENT OF INDUSTRIAL CHEMICAL THREATS TO MILITARY OPERATIONS

Until recently military commanders and their staffs lacked a uniform methodology for determining risk estimates for potential toxic industrial chemical (TIC) releases. Changing geo-political conditions and the emergence of a different type of opponent have increased the threat associated with an intentional release of industrial chemicals. Military conflicts over the last decade provide ample evidence of the use of industrial chemicals as weapons.

There is a perception among military and civilian leaders that exposure to TICs represents a serious risk to US forces but very little research has been done to evaluate the actual level of risk. Decisions about protective measures for US forces are made based more on a "gut" feeling rather than on actual science. This thesis evaluates a general strategy to assess risk from heavier than air toxic industrial chemicals in the context of the military's operational risk paradigm.

Predicted concentration and duration of exposures at various distances were estimated from a provisional dispersion model and used to assess the level of risk based on the proposed medical risk assessment process. The military decision making process is analyzed in order to highlight pertinent factors related to the level of risk associated with TIC releases. By refocusing military planning procedures and decision-making techniques on TIC releases, a systematic method of evaluating the hazard was developed. Risk levels from a chlorine release were found to range from "High" to "Low" with the majority of the risk residing in the "Moderate" to "Low" category depending on conditions.

Using the medical risk assessment model an accurate level of risk could be determined. With further improvement in dispersion modeling for TIC releases, the overall strategy developed here will allow field commanders to make informed decisions which balance the environmental health risks with other operational risks in order to complete their missions without adverse health consequences from TIC releases.

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