Workshop on Atmospheric Dispersion Modeling

Session I

Requirements

Forecasting Toxic Hazards in Support of Space and Missile Operations at the Eastern and Western Ranges

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Forecasting Toxic Hazards in Support of Space and Missile Operations at the Eastern and Western Ranges

- **Introduction**
- **Current Prediction Methods**
- **New/Unmet Requirements**

Introduction

- **Air Force Eastern and Western Ranges process and launch dozens of space vehicles each year**

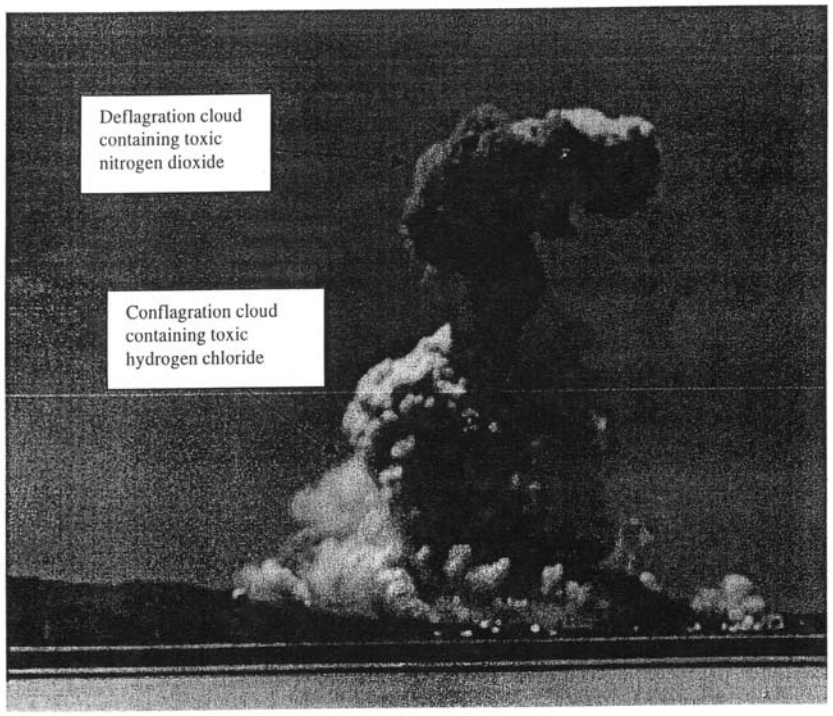
- **Possible toxic emissions during any phase of operations**

  Launch preparations (cold spill)
  Normal launch (ground cloud)
  Catastrophic abort (hot spill)

- **Need for toxic hazard predictions**

  Long-term planning
  Launch and daily operations
  Emergency response
  Protect on-base workers and off-base populations
  Comply with federal and local exposure guidelines

Titan 34D-9 Abort Clouds



Current Prediction Methods

- **Hot Spills**

  Rocket Exhaust Effluent Diffusion Model (REEDM) V7.09
  Eastern Range Dispersion Assessment System (ERDAS) RAMS/HYPACT

- **Cold Spills**

  Meteorological and Range Safety Support (MARSS) System (observed winds)
  ERDAS (Regional Atmospheric Modeling System (RAMS) predicted 3-D winds)

  Ocean Breeze/Dry Gulch Model (OB/DG)
  Hybrid Particle and Concentration Transport (HYPACT) Model
  Air Force Toxics (AFTOX) Model (at WR)

New/Unmet Requirements

- **Ranges need a real-time Range Dispersion Monitoring System (RDMS)**

  Purpose

    Observe actual toxic cloud location and concentration
    Predict future location and concentration of the cloud
    Fully validate and refine current predictive models

  Possible Components

    Remote Sensing
      Radar
      Lidar
      Cameras (visible and IR)

    In-Situ Measurements
      Ground-based fixed or mobile sensors
      Airborne sensors