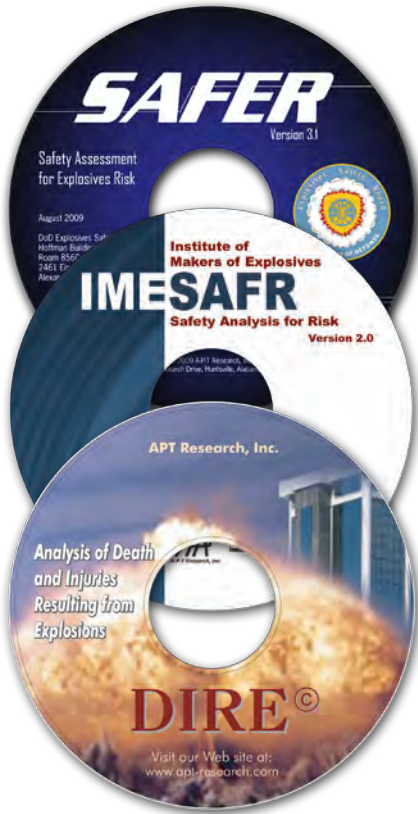


# EXPLOSIVES QUANTITATIVE RISK ASSESSMENTS

A-P-T Research, Inc. has unique experience and capability in providing explosives quantitative risk assessments (QRAs). APT provides explosives QRAs using APT-developed software tools, Safety Assessment For Explosives Risk (SAFER®); IME Safety Analysis For Risk (IMESAFR®); and Death and Injuries Resulting from Explosions (DIRE®).



**SAFER** is used to assess the risks to people and buildings at inhabited building distance, public traffic route, and intraline distance scenarios. This model was developed for Government use and includes models for Government facilities and explosives.

**IMESAFR** is used to assess the risks to people and buildings in and around commercial explosives operations. This model was developed specifically for the commercial explosives industry and includes models for commercial facilities and explosives.

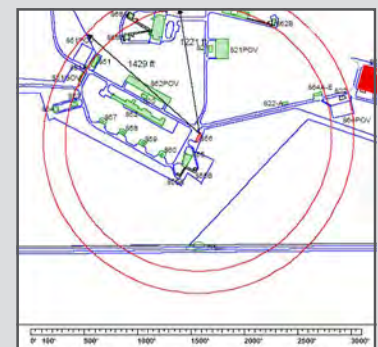
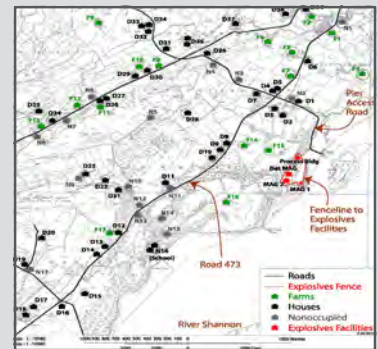
**DIRE** is a consequence model that is used to analyze the effects and consequences of an explosion by considering overpressure, impulse, building collapse and debris using state-of-the-art modeling.

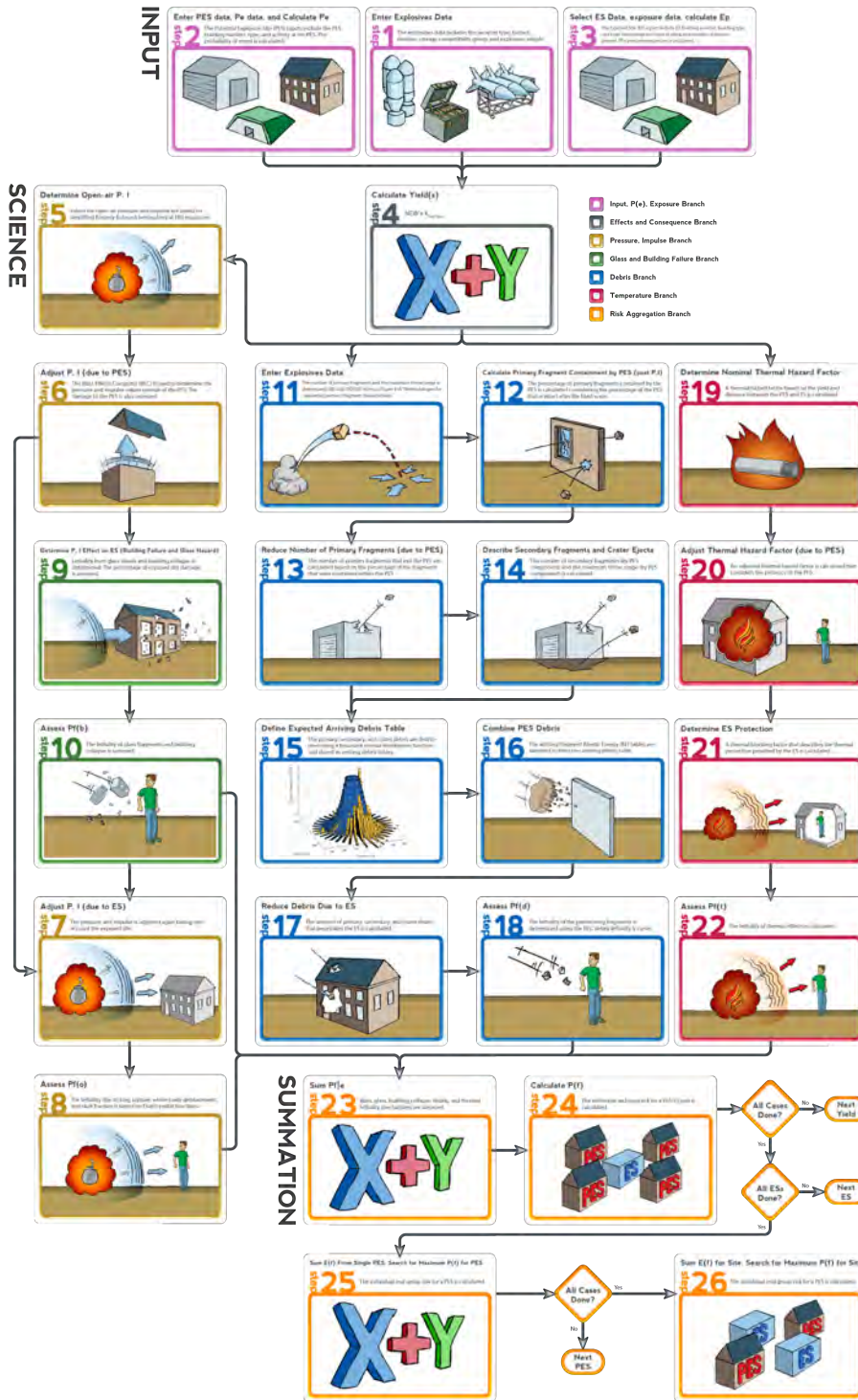
## Capabilities

- Evaluation of High Risk Scenarios
- Identification of and Minimization of Worst Case Risks

## Customers

- Department of Defense
  - Air Force Safety Center
  - U.S. Army Technical Center for Explosives Safety
  - U.S. Marine Corps
- DoD Support Contractors
- Commercial Explosives Manufacturers and Users
- International Explosives Safety Community
- Chemical Safety Board

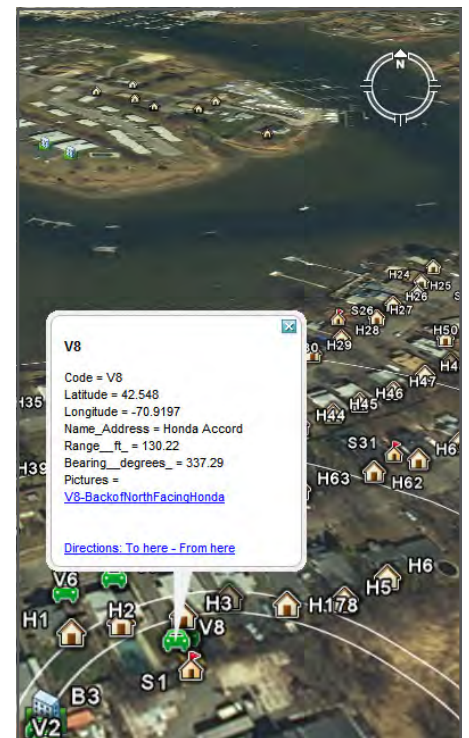




APT uses a 26-step process for explosives QRAs. This process begins with the standard risk equation:

$$\text{Risk} = \text{Likelihood} \times \text{Consequence}$$

From this basic equation, a specific risk equation has been derived in mathematical terms to reflect the scientific and probabilistic situation in an explosives risk assessment.



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