
Systems Approach to Anti-Terrorism

July 30, 2002

SEITC

Anti-Terrorism International Working Group (ATIWG)

Mission and Structure

- q **ATIWG Mission:** Involve entire membership in the creation of an INCOSE-wide product, which demonstrates the use of systems engineering principles, techniques, and practices to reduction and eradication of international terrorism

- q **ATIWG Structure:**
 - Steering Committee
 - W. Mackey, TB and ATIWG Chair
 - H. Crisp, BOD
 - B. Ewald, BOD
 - H. Stoewer, Pres-Elect and Germany Chapter
 - A. Fairbairn, IEWG Cochair and UK Chapter
 - D. Cropley, INCOSE 2001 Tech Chair and SESA Member
 - Jas Madhur, INCOSE 1998 Symp Chair and Vancouver Chapter Member
 - P. Sweeney, SEITC Chair
 - Volunteer members of INCOSE

Current Status

- q **SEITC Status:**
 - Charter created Sept. 17, 2001
- q **ATIWG Status:**
 - Charter created Sept. 18, 2001
 - Steering Committee formed
- q **Anti-Terrorism System Model - Proposed Strawman**
- q **Questions to be answered - Proposed Strawman**

ATIWG Proposed Approach

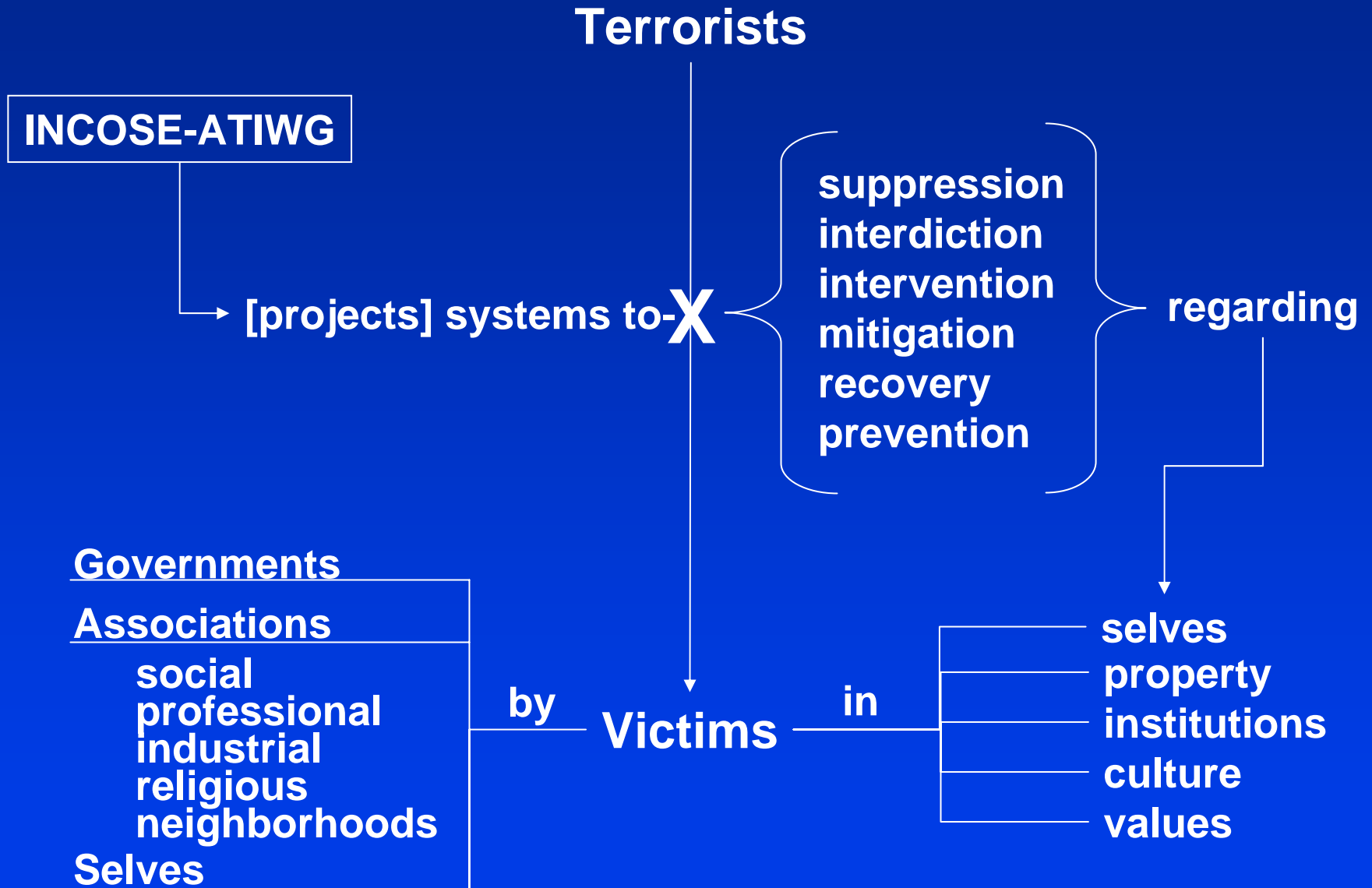
- q **Step 1: Identify Customers and Stakeholders**
- q **Step 2: Develop Problem Statement**
- q **Step 3: Evaluate Issues**
- q **Step 4: Establish Criteria for Project Selection**
- q **Step 5: Identify SE Opportunities**
- q **Step 6: Evaluate Alternative Opportunities**
- q **Step 7: Select INCOSE Project(s)**

Step 1: Identify Customers and Stakeholders

- q **Customers (any entity that addresses the terrorism issue through an INCOSE solution or product)**
 - **Government**
 - **Federal (e.g., USN, FAA)**
 - **State and Local**
 - **Non-Government**
 - **Commercial**
 - **Non-profit**

- q **Stakeholders (any entity that benefits from the solution)**
 - **World governments**
 - **General public**
 - **Military**
 - **Government agencies**
 - **Associations**

Relationship Scenario



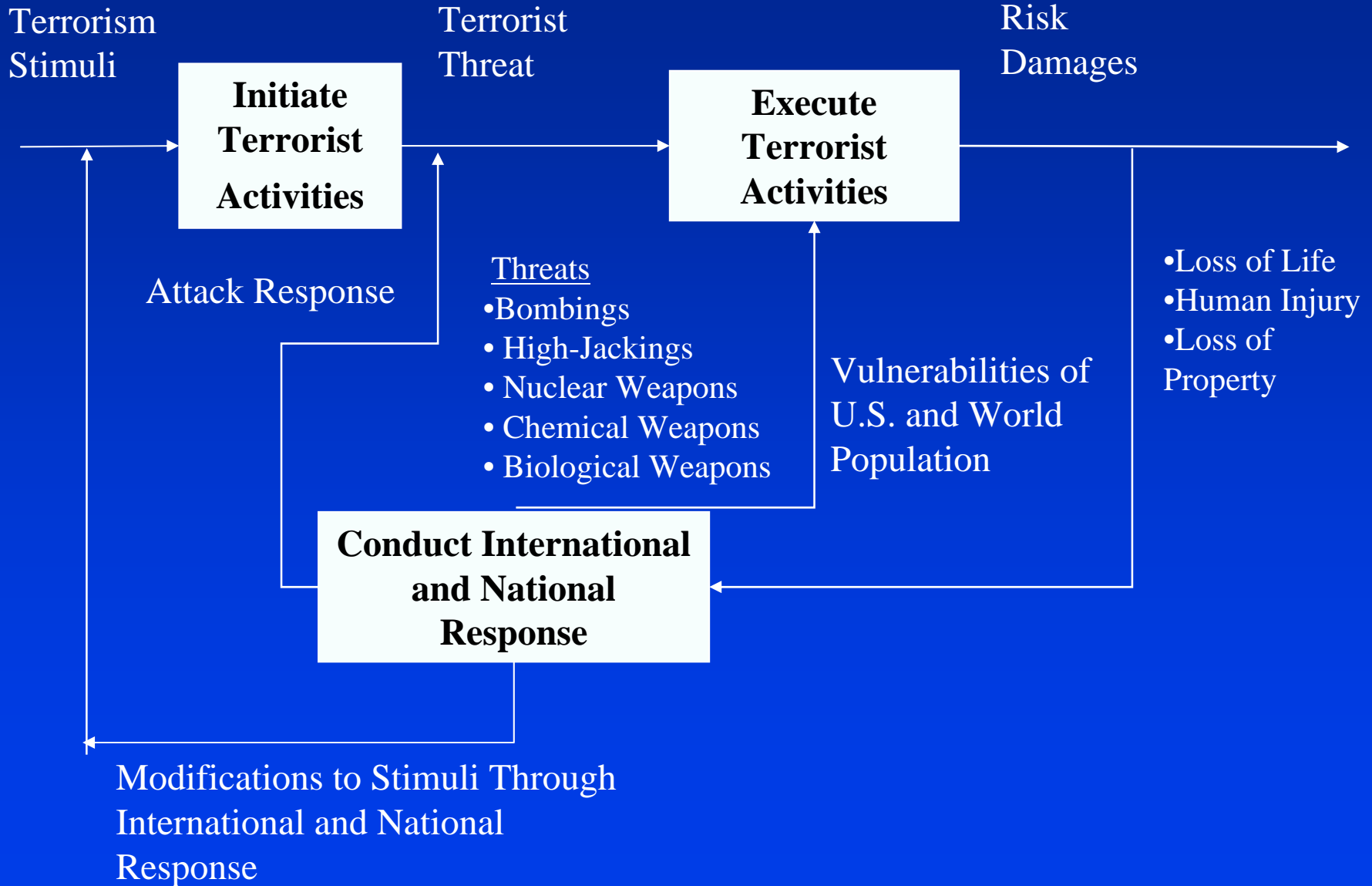
The Anti-Terrorism System Model

- q **System = “An interacting combination of elements viewed in relation to function”**
- q **Functions of the Anti-Terrorism System Model**
 - **To reduce or eradicate the effects of international terrorism**
 - **To eliminate the stimuli that initiate the development of international terrorism**

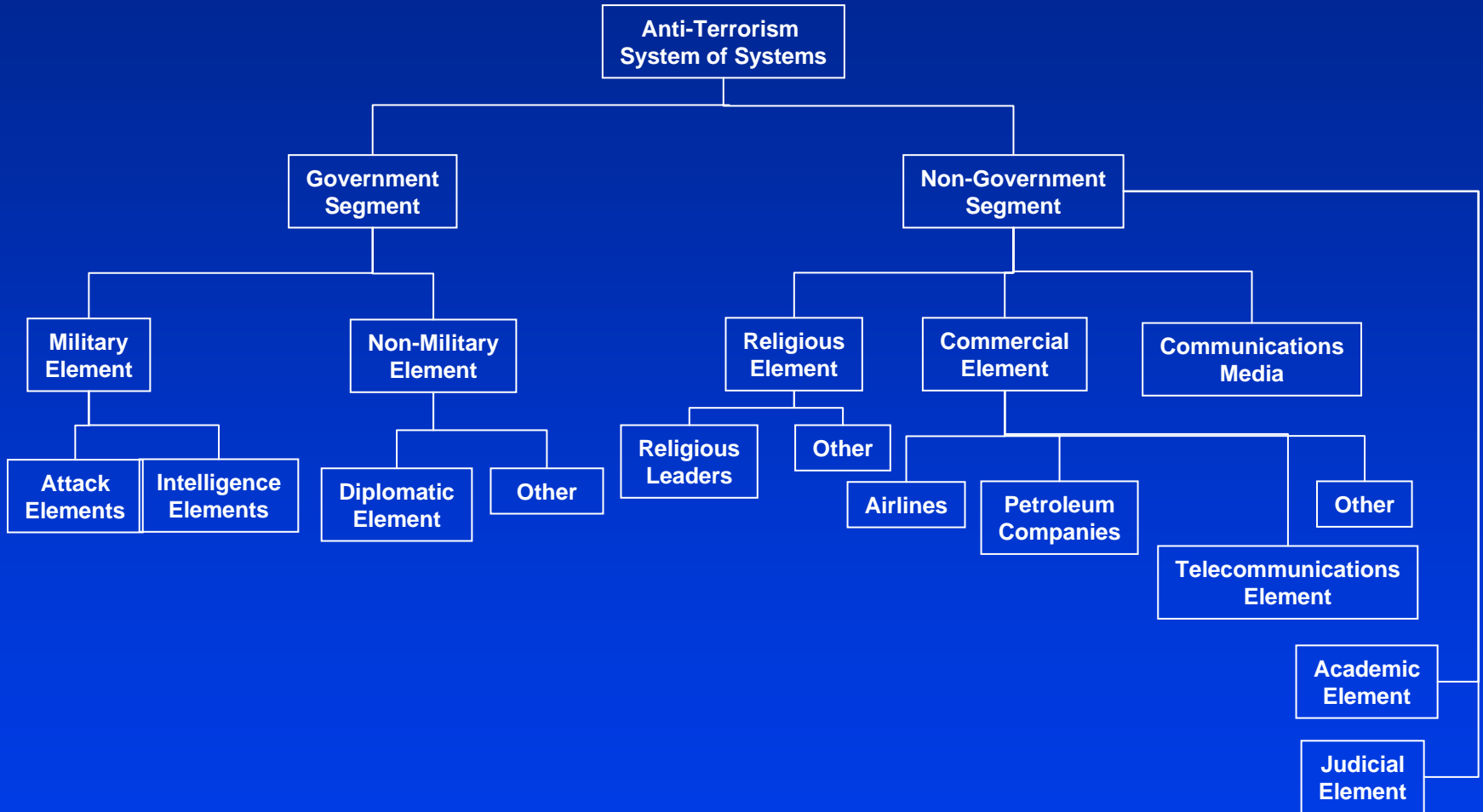
The Anti-Terrorism System Model (cont'd)

- q Input - stimuli that initiate potential terrorists' desires to commit acts of terrorism in order to satisfy their needs and requirements**
- q Output - the damages arising from loss of life, personal injury and destruction of property resulting from a terrorist's activities**
- q External constraints - international law, economics, environmental prohibitions, geography, etc.**
- q Functions - the activities and processes conducted to prevent international terrorism**
- q Mechanisms - people, technologies and processes used to prevent international terrorism**
- q Feedback controls - the modifications that can increase or decrease terrorism activity**

The Anti-Terrorism System Concept Model



Anti-Terrorism System of Systems Hierarchy



Step 2: Problem Statement

- Q **NEED:** Victims are seeking assistance and protection against threats and acts of terrorists from governments, industry and associations
- Q **PREMISE:** SE principles, techniques and practices can be effectively applied to reduce and eradicate the acts of terrorists.
- Q **OPPORTUNITY:** A window exists to focus the application of SE on the integration and coordination of efforts that lessen the effects of terrorism.
- Q **INTENTION:** INCOSE will apply SE to provide selected services and products that respond to and prevent current and future acts of terrorism.

Step 3: Evaluate Issues

- q **Should the project be Classified or Unclassified?**
 - Agreed to Unclassified

- q **To what extent does this WG make its products open and visible to the public?**
 - Agreed to open and visible

- q **We will Bound the Problem**
 - Agreed that we have a well constrained, problem for our initial activity(s); Allow us to build INCOSE reputation/integrity
 - Address a problem that reflects future view (a postulated view of the terrorist threat)

- q **Should the WG be concerned about the personal risks?**
 - Agreed that this is not material provided that we adhere to the above guidelines

Step 3: Evaluate Issues (cont'd)

- q **What are the cultural and political issues?**
 - **Desire for cultural diversity in WG constituency**
 - **Prior agreement on international composition of WG must adhere to INCOSE regulations (per US Law)**
- q **How do we separate security issues from anti-terrorist issues?**
 - **Anchor point is anti-terrorism**

Step 4: Establish Criteria for Project Selection

The project should:

- q Have international applicability**
- q Be amenable to systems engineering**
- q Be of interest to the INCOSE membership**
- q Have a customer**
- q Add value and not duplicate existing efforts**
- q Be capable of being performed by volunteers**
- q Fit within the scope of the Working Group**
- q Be a well bounded problem**
- q Be unclassified, unrestricted, open and visible**

Step 5: Identify SE Opportunities

- q **Partnership with American Society of Naval Engineers**
 - “Maritime aspects of Homeland Security” Workshop or Conference this Fall to address long term solutions
- q **NSWCDD (Dahlgren)**
 - Develop significant concepts
- q **Coastal System Station , NSWCDD (FL)**
 - Protection of maritime assets
 - Building a virtual port to test capabilities of “first responders”
- q **FAA**
 - Rosetta stone translation and taxonomy effort for INFOSEC
- q **Expand and refine the Anti-Terrorism Exploration Concept Document**

Step 7: Select INCOSE Projects

- q **“The Role in Combating Global Terrorism” Panel at INCOSE 2002**
 - **Panelists may include:**
 - **FAA representative**
 - **Former military and commercial pilot**
 - **DOD and/or contractor representative**
 - **ATIWG representative(s)**
 - **Ft Detrick biotechnology expert (?)**
 - **Prof. Aguillar network evaluation expert (?)**

Format for the System Concept Model Concept Exploration Document

- Context of the Discipline (e.g. economics, political science, religions and culture, psychology and sociology, geography and geology, international law, etc.)**
- Issues and questions addressed**
- Discussion of each issue**
- Findings**
- Systems engineering challenges**
- Conclusions and recommendations**
- Experts and contacts**
- References**
- Author of segment**

The Terrorist Activity Stimuli

- q **Economics**
- q **Religion**
- q **Culture**
- q **Psychology and Sociology**
- q **Politics and Struggle for Power**
- q **Geography and Geology**
- q **Energy Production, Distribution and Consumption**

THE ANTI-TERRORISM RESPONSE SYSTEM

THE ANTI-TERRORISM RESPONSE PROCESS IS
A TRADITIONAL SYSTEM WITH FEEDBACK
RESPONSE



Example Expertise Required to Address Challenge

- ↳ Economics
- ↳ Political Science
- ↳ Religions and Culture
- ↳ Psychology and Sociology
- ↳ Geography and Geology
- ↳ Military and Defense
- ↳ International Law
- ↳ Terrorism and Counter-Terrorism
- ↳ Intelligence Collection, Analysis and Distribution
- ↳ Telecommunications and Computer Engineering
- ↳ Aviation and Space Technologies and Engineering
- ↳ Security Engineering
- ↳ Biological, Chemical and Nuclear Technologies and Engineering
- ↳ Energy Production, Distribution and Consumption

***Association for Enterprise Integration (AFEI)
Conference on – Systems Approach to Terrorism***

**George Washington University
July 15-16 2002**

AFEI Conference Summary

- q **A two day conference designed to explore a systems approach to fighting terrorism.**
- q **The conference provided insight on how terrorism impacts different domains. Some domains addressed:**
 - **Geo-Political**
 - **Economics**
 - **Cyber-terrorism**
 - **Transportation**
- q **The conference also provided insight into methods and tools that are or will be available to better analyze and combat terrorism.**

Systems Approaches Discussed

- q **Address the problem at three levels:**
 - **Perimeter Defense (National Defense)**
 - **Interior Defense (Homeland Security)**
 - **Consequence Management (if the first two fail)**
- q **Address not only the “Terror Act” but also the people committing the act.**
 - **Analyze why they pick certain targets, what methods could they use on those targets, and what factors influence when the event happens (timing)**

Infrastructure Protection

- q **This issue was addressed by several of the speakers.**
- q **MG Lawlor, Senior Director of Protection and Prevention, OHS**
 - **Identify assets by function.**
 - **Develop criteria to determine asset criticality and prioritize**
 - **Assess Vulnerabilities**
 - **Develop Solutions**
- q **SE Challenges**
 - **Identify interfaces of the critical assets**
 - **Develop a “one to end” list of critical assets across functional lines.**

SE Approach to Anti-Terrorism - Pitfalls

- q **Focusing on an event to develop strategy**
- q **Discount the importance of analyzing the situation from the other sides point of view**
- q **Emotional Responses and Opinions**