
Systems Engineering Modeling Useful in Combating Terrorism

**James Long, President of Vitech Corp.
Dr. William F. Mackey, CSC and the
University of Maryland**

**INCOSE 13th Annual International Symposium
Washington, D.C.**

Systems Engineering Modeling Useful in Combating Terrorism

- q **Paper Thesis:** The multidisciplinary approach of systems engineering is useful in evaluating terrorist threats, identifying existing system vulnerabilities, and reducing or eradicating international terrorism
- q In addition, the ability to model those events may assist in determining the functional design of the terrorist threat and perhaps permit insight into the physical design as well.
- q **The functional design (or modus operandi) is frequently unchanged from one terrorist activity to another, and often only the physical design changes.**

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 the reduction and eradication of international terrorism

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

 - Volunteer members of INCOSE

The Anti-Terrorism System Behavioral Model

- q **System = “An interacting combination of elements viewed in relation to function”**

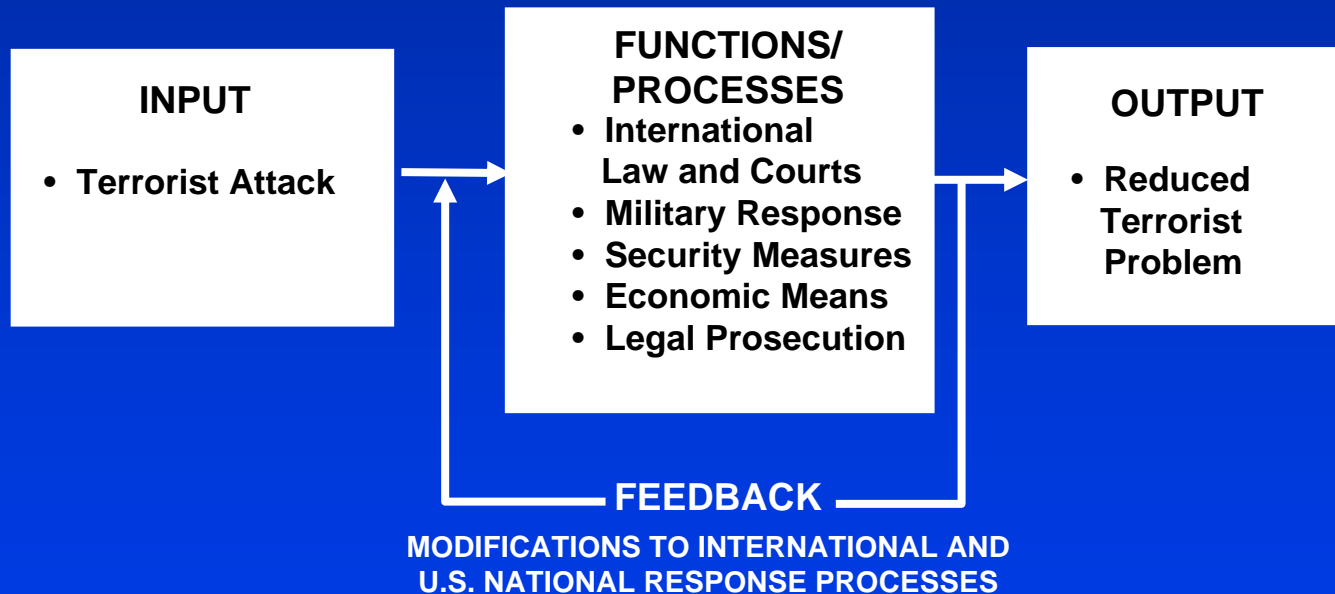
- q **Functions of the Anti-Terrorism System Behavioral Model**
 - **To reduce or eradicate the effects of international terrorism**
 - **To eliminate the stimuli that initiate the development of international terrorism**

The Anti-Terrorism System Behavioral 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 combat international terrorism**
- q Mechanisms - people, technologies and processes used to combat international terrorism**
- q Feedback controls - the modifications that can increase or decrease terrorism activity**

THE ANTI-TERRORISM BEHAVIORAL RESPONSE SYSTEM

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



The Anti-Terrorism Behavioral Concept Model



Multiple Disciplines Required to Address Terrorism Challenges

- 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**
- This challenge is truly multidisciplinary**

The Approach to Creating the Anti-Terrorism Behavioral Concept Model

- q **The approach to resolving the Terrorism Problem can only be accomplished by**
 - **Understanding the thought processes of the terrorists who perpetrate such crimes**
 - **Understanding the thought processes of the nations and peoples being attacked**

- q **Creating the Anti-Terrorism System Concept Model must incorporate the understanding of multiple complex disciplines and issues**