



~~**SENSITIVE SECURITY INFORMATION**~~

# OSC-BDA Briefing

## History, Use, and Utility of 2 SPOT Indicators

July 16<sup>th</sup>, 2013



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# Briefing Purpose

The purpose of this briefing is to provide the Chief Counsel with background material regarding:

- Behavior Detection & SPOT History
- The history, background, and basis for inclusion into SPOT of two indicators that OCC has recently expressed concerns about:

(b)(3):49 U.S.C. § 114(r)

- The AIR SPOT Indicator Optimization Study
- The current results of the study in regards to the two indicators of concern.

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# SPOT History

- For over four decades, domestic law enforcement entities and security agencies have conducted training for their officers to be able to identify individuals exhibiting behaviors indicative of stress, fear, and / or deception.
- In July 2003, the FBI Behavioral Analysis Unit established a new behavioral assessment unit to provide support on matters involving terrorism.
- One of the most recognized international programs that utilizes a behavior model is **Behavior Pattern Recognition™ (BPR™)**. BPR™ has been employed by Israeli security forces for over three decades.

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# SPOT History

- After 9/11, the command staff of the Massachusetts State Police (MSP) assigned to Logan International Airport (BOS) was trained in BPR™.
- MSP recognized the value of utilizing behavioral analysis in the airport environment and modified the BPR™ program to meet the legal and social limitations of the US.
- MSP named this program **Behavior Assessment Screening System (BASS)**.
- BASS involved voluntary encounters with individuals transiting the airport. These encounters were used by the LEOs to determine if any individual was displaying behaviors that would indicate elevated suspicion.

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# SPOT History

- The course of action available to resolve such elevated suspicion remained voluntary on the part of the individual.
- In the event that such elevated suspicions reaches reasonable suspicion as defined by the US legal system, the LEOs may then implement the appropriate and available actions.
- In June 2003, Carl Maccario (TSA) and Sergeant Peter DiDomenica (MSP), both having been trained in behavior detection methodologies by separate Israeli firms, began exploring the possibility of adapting the BASS program for implementation by TSA at BOS.
- This distinctive program, **Passenger Assessment Screening System (PASS)**, was designed to both meet TSA's specific security and public service needs.

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# SPOT History

- In December 2003, members of a review team (Mike Kimlick, Dr. Joshua Rubinstein and Diana Depp) visited BOS to observe and review the PASS program.
- Recognizing that the program contained the essential elements that would support a pilot effort, they began validating the content of the PASS program using subject matter experts in the field.
- A working group was created in February 2004 and was comprised of various TSA and DHS components.
- In addition, consultation was held with subject matter experts at the FLETC Behavioral Science Division; the FBI Behavioral Analysis Unit; and Northeastern and Arizona Universities.

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# SPOT History

- The working group completed the following activities:
  - Refined the training curriculum; included more substantial sections on privacy, racial profiling, and identifying false credentials; and created videotaped scenarios;
  - TSA Office of Civil Rights and Liberties (OCRL) and the Office of Chief Counsel reviewed several versions of the curriculum and suggested changes were incorporated as result;
  - TSA OCRL coordinated with the DHS Office of Civil Rights, to ensure TSA's Program is in compliance with DHS' and DOJ's directives on racial profiling;
  - Finalized the Standard Operating Procedures;
  - Renamed the program to the Screening of Passengers by Observation Techniques (SPOT);
  - Received approval to acknowledge BOS as the original test bed;
  - Received approval to initiate additional pilot efforts

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# History of Indicators

- The BASS, PASS, and later SPOT indicators were collected from the best practices and utilization by various governmental and non-governmental (industry, academia) entities. These entities include:
  - Federal Bureau of Investigation
  - Alcohol Tobacco and Firearms
  - Customs and Border Patrol
  - Federal Air Marshal Service
  - Federal Transit Admin. - "Terrorist Activity Recognition and Reaction" program
  - Coast Guard Coastal Watch program
  - Massport "Logan Watch"
  - National Transit Institute Employee Awareness Program
  - Royal Canadian Mounted Police Watch program
  - Behavior Analysis Training Institute
  - New Age Security System's Behavior Pattern Recognition (BPR™)
  - Chameleon Associates

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# History of Indicators

- The indicators were originally grouped into two distinct categories:
  - Behavior and Appearance
  - Signs of Deception
- Currently indicators are grouped into six categories:
  - Stress Factors
  - Fear Factors
  - Deception Factors
  - Signs of Deception
  - Suicide Bomber Indicators
  - Surveillance Activities
- The assignment of specific indicators to groups can be considered at some level arbitrary or a matter of convenience

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# History of Indicators

- It should be noted that there are additional indicators grouped as:

(b)(3) 49 U.S.C. § 114(n)

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# History, Background, and Basis of Inclusion for Indicators of Concern

(b)(3)-49 U.S.C. § 114(r)

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# History, Background, and Basis of Inclusion for Indicators of Concern

• (b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

- Originally used by the Bureau of Alcohol Tobacco and Firearms
- Originally entitled “(b)(3):49 U.S.C. § 114(r)”
- Absorbed into BASS and hence included in PASS and SPOT

– (b)(3):49 U.S.C. § 114(r)

– (b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

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# Indicator Optimization Study

- Since AIR has previously provided briefing material to OSC regarding the study, their material is the best suited to present to study.
- As such the relevant slides are included, following this slide, as originally presented to the OSC-AA (minus material not of concern for this brief)
- Project is on schedule
- 3 project deliverables have already been provided, reviewed, and revised
  - Deliverable 1.2.2 Cultural Bias in Suspicious Indicators Literature Review
  - Deliverable 2.1.1 Updated Literature Review on Pre-Incident Indicators of Suicide Attack
  - Deliverable 2.1.2 Summary Document for Review of Suspicious Indicators
  - Deliverable 2.1.3 Analysis of SPOT Referral Report Operational Database (2006-2012) – Under revision
- Next steps: SME Panel Member selection, Human Factors Study Design

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# American Institutes for Research

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Established in 1946, with headquarters in Washington, D.C., AIR is an independent, nonpartisan, not-for-profit organization that conducts behavioral and social science research and delivers technical assistance both domestically and internationally.

As one of the largest behavioral and social science research organizations in the world, AIR is committed to empowering communities and institutions with innovative solutions to the most critical challenges in education, health, workforce, and international development.



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# Overview

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# Study Overview

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## ■ Study Aim

- Optimize SPOT Referral Report indicator set, including the development of standardized definitions and associated training materials
- Examine and develop scientific foundation for the SPOT approach

## ■ Major Tasks

- Review of existing materials
- Expert review
- Human factors studies
- Training development for revised indicator list
- Design of pilot study

# Research Goals

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1. Refine SPOT Referral Report indicators and develop operational definitions for each
2. Develop and test new training materials associated with revised indicator list
3. Examine BDOs' cognitive workload and fatigue
4. Design pilot test to test revised indicator list



# Previous work on SPOT indicators

## ■ SPOT Validation Study

- Examined extent to which use of SPOT indicators, individual and as a set, lead to correct screening decisions
- Supported program validity

## ■ Standardized Manual of Indicator Definitions

- Developed standardized, operational definitions of each indicator, with exemplars
- Supported training

## ■ Suspicious Indicators Literature Review

- Examined indicators associated with suicide attack, and their relation to SPOT indicators

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# Methodology

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# Tasks

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- Task 1: Review Existing Materials and Update Analyses
- Task 2: Expert Review
- Task 3: Human Factors Studies
- Task 4: Training Development
- Task 5: Pilot Test Study Design



# Task 1: Review Existing Materials

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- Systematically review and summarize relevant materials
  - SPOT Program documents, including training materials
  - SPOT Validation Study results
  - Suspicious Indicators work
  - Other background materials from TSA, DHS S&T
- Develop summary document
  - Reference tool for internal and external review
  - Comprehensive and current, scientifically-based information

# Task 1: Update Analyses

- Update SPOT Validation Study analyses
  - Summary statistics
  - Indicator predictive utility
- Update Suspicious Indicators literature reviews
  - Conduct literature searches 2009 – present
  - Code new data and re-analyze findings
- Qualitative analysis of Suspicious Indicators interviews
  - Content code interview transcripts to identify important themes about pre-incident indicators and associated definitions

## Task 2: Expert Review

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- Experts will review summary document to consider:
  - Revising indicator wording and/or standardized definition
  - Combining current indicators that represent the same construct
  - Removing indicators not linked to important outcomes
  - Adding indicators linked to important outcomes
  - Examining indicator groupings
  - Considering approaches to revise current indicator weights
  - Identifying performance measures to evaluate the revised indicator list



## Task 3: Human Factors Studies

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- Examine cognitive workload and fatigue as they relate to the BDO job
  - Operational contexts in which BDOs experience fluctuations in cognitive workload and fatigue
  - Specific factors that affect the demand for mental resources

## Task 4: Training Development

- Revisions to indicators will require updated training
- Updated training will:
  - Be systematic and comprehensive
  - Ensure uniform use of the tool across individuals, teams
  - Serve as opportunity to further refine current training course
- Training materials will be tested (trial run) for effectiveness before larger roll out

# Task 5: Pilot Test Study Design

- Design pilot test of revised SPOT Referral Report
  - Study design and statistical power analysis
  - Revised SPOT procedures (as needed)
  - Data collection protocols and instruments
  - Data collection monitoring protocols and instruments
  - Data entry requirements
  - Analysis plan
- Pilot study implementation will occur in Year 2



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# Current Results – Indicators of Concern

- The Indicator Optimization Study is a multi-year effort that started April 1, 2013.
- Initial analysis of Section 2 Indicators is complete.
  - Study is focused on the Section 2 Indicators.
- Analysis of the Section 4 Indicator “(b)(3); 49 U.S.C. § 114(r)” was conducted at the request of the OSC-BDA branch.
  - Further Section 4 Indicators analyses will occur at a later date.

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# Current Results – Indicators of Concern

- How to read the results:
  - *Frequency of Occurrence*: The percentage of time the particular indicator occurred in proportion to all indicators observed.
  - *Ranks*: The degree of the use of an indicator across settings (Year and Hub size) when ranked from most frequent to least frequent overall.
  - *Item-Level Predictive Utility*:
    - Odds ratio (OR) statistics describe the ratio of the odds of a positive outcome among those exhibiting a given indicator to the odds of a positive outcome among those not exhibiting a given indicator.
      - The higher the number the better
    - Sig(nificance) value describes a calculation of whether the observations reflect a pattern and not than just random chance
      - The smaller the better

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# Current Results – Indicators of Concern

- How to read the results:
  - *Factor Analysis:* An exploratory factor analysis (EFA) of the SPOT Referral Report Section 2 indicators. Results of the EFA produced a four-factor model, which appeared to represent four prototypical traveler profiles:

1.

(b)(3):49 U.S.C. § 114(r)

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# Current Results – Indicators of Concern

- How to read the results:
  - *Relationship to Pre-incident Suicide Attack Indicators*: Presence of the indicator in AIR literature review on behavioral indicators of suicide attack. A rank of 1 signifying that the indicator appeared the most in the overall findings.
  - *Presence in SME and Eyewitness Interviews*: Information based on a preliminary review of data from interviews with 12 Israeli SMEs and four eyewitnesses. Behavioral indicators of suicide attack mentioned by participants were mapped to indicators on the SPOT Referral Report.
  - *Presence in SME Workshop (DHS effort)*: Information based on a SME workshop on indicators of suicide attack identified through an examination of proxy crimes. Behaviors identified were mapped to indicators on the SPOT Referral Report to the extent possible.

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# Current Results – Indicators of Concern

(b)(3):49 U.S.C. § 114(r)

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# Current Results – Indicators of Concern

- Factor Analysis

	Factor Loadings			Notes
	Subset 1	Subset 2	Best Fit	
(b)(3):49 U.S.C. § 114(r)	0.00	0.02	--	Strong loadings on Factor 3; very little loading on any other factor
	-0.01	0.00	--	
	0.77	0.83	Yes	
	0.10	0.06	--	

- Relationship to

(b)(3):49 U.S.C. § 114(r)		
Presence in Literature Review	(b)(3):49 U.S.C. § 114(r)	Base on AIR literature review
Presence in SME and Eyewitness Interviews		Based on prelim AIR interview data
Presence in SME Workshop		DHS Behavioral Indicators Report, Table 3

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**WARNING:** THIS RECORD CONTAINS SENSITIVE SECURITY INFORMATION THAT IS CONTROLLED UNDER 49 C.F.R. PARTS 15 AND 1520. NO PART OF THIS RECORD MAY BE DISCLOSED TO PERSONS WITHOUT A "NEED TO KNOW," AS DEFINED IN 49 C.F.R. PARTS 15 AND 1520, EXCEPT WITH THE WRITTEN PERMISSION OF THE ADMINISTRATOR OF THE TRANSPORTATION SECURITY ADMINISTRATION OR THE SECRETARY OF TRANSPORTATION. UNAUTHORIZED RELEASE MAY RESULT IN CIVIL PENALTIES OR OTHER ACTION. FOR U.S. GOVERNMENT AGENCIES, PUBLIC DISCLOSURE GOVERNED BY 5 U.S.C. 552 AND 49 C.F.R. PARTS 15 AND 1520.



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# Current Results – Indicators of Concern

(b)(3):49 U.S.C. § 114(r)

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# Current Results – Indicators of Concern

- Factor Analysis – Not applicable since Factor Analysis conducted for SPOT Section 2 indicators only

- Relationship to

(b)(3)-49 U.S.C. § 114(r)		
Presence in Literature Review	(b)(3)-49 U.S.C. § 114(r)	Base on AIR literature review
Presence in SME and Eyewitness Interviews		Based on prelim AIR interview data
Presence in SME Workshop		DHS Behavioral Indicators Report, Table 3

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