

DEPARTMENT OF HOMELAND SECURITY
Office of the Under Secretary for Science & Technology
FY 2008 Report of Closed Meeting of the
Homeland Security Science & Technology Advisory Committee
Under Section 10(d)
Federal Advisory Committee Act

The Homeland Security Science & Technology Advisory Committee (HSSTAC) met in closed session on December 4-7, 2007 in Washington, DC. The determination to close the meeting was based on the consideration that the briefings and discussions during the meeting would involve classified information sensitive to homeland security. Disclosure of the information discussed could potentially increase the risk to our nation's security due to the identification of vulnerabilities and the potential areas of focus for future research to mitigate our vulnerabilities. All sessions of the meeting were closed to the public pursuant to the provisions of 5 U.S.C. 552b(c).

The objective of this quarterly meeting was to begin a study of the threat to society in the United States from the introduction of Improvised Explosive Devices (IEDs). This study was to develop recommendations for Department of Homeland Security (DHS), Science and Technology (S&T) investments that could lead to the initiation of new programs or modifications of existing efforts to detect, locate, and neutralize IEDs in the United States.

Mr. Norman Polmar, HSSTAC Chairman, opened the meeting by reviewing the reconstitution of the committee in August 2007 along with the charge to present recommendations to Under Secretary Jay Cohen on efforts geared towards a domestic counter-improvised explosive device (C-IED) campaign. The recommendations for the C-IED program could refer to any portion of the IED process, friendly or adversary.

Mr. Polmar proceeded to recount the proceedings and highlights of previous HSSTAC conferences, starting with the more recent fact-finding meeting in London (November 2007), followed by the regular quarterly meeting held in New York City (October 2007). These meetings provided information for the IED assessment.

London Meeting

On the committee's fact-finding session in London, which had been attended by only a fraction of the members, Mr. Polmar remarked that London officials have continuing concerns about the security of construction for the upcoming Summer Olympics in 2012, specifically the large number of individuals involved in the construction operations and the problems associated with clearing each individual for the high-profile contract. This led to a discussion on lessons learned from British officials, specifically with regard to the experience of the British Government with the Irish Republican Army (IRA) beginning in the 1970s.

Mr. Polmar reported that British law enforcement, first responder, and C-IED experts all briefed the committee while in London. The experts stressed public awareness and community

engagement in C-IED operations, especially in concentrated ethnic areas. The British experts stressed the importance of cultural awareness training for first responders, in conjunction with the engagement of ethnic communities and the public. British experts highlighted a number of psychological warfare principles in their briefings to HSSTAC members. In order to qualify the British briefs, the committee also noted the significant differences between the British and American models for government.

In further discussions, the committee noted that the IEDs used in the London subway bombings on July 7, 2005, consisted of homemade explosives ranging from two to five kilograms in weight. The bombers purchased the IED materials within the span of a few days. There was extensive research done by the terrorists prior to IED placement, including reconnaissance on security, entry routes, exit routes, placement of charges, and alternative placements. The terrorists exhibited good security awareness, as well as discipline and training in the careful use of cellular phones.

New York Meeting

From the meetings in New York City (NYC), it was noted that the first responder committee in NYC continues to work vigorously towards a better common operating picture (COP) procedure, an ongoing effort since September 11th, 2001. There is also a strong desire from NYC officials for a Blue Force Tracking system capable of penetrating subways and high-rise buildings. NYC officials communicated concerns over the ability to mass evacuate the multi-million inhabitants of Manhattan in the event of a massive incident.

Lessons Learned/Fact-Finding

Along the lines of lessons learned, the committee reflected on the experiences of Israel over the past several decades. The committee noted that Israel constructed series of checkpoints along the Gaza border capable of handling a high volume of traffic. At one point in time, 240,000 workers per day crossed various checkpoints; since that time the traffic has dropped to approximately 25,000 individuals per day. In conjunction with these major changes, the committee also noted that the Israeli Armed Forces have almost entirely redirected their capabilities to align with an anti-terror mission vice conventional military operations.

Mr. Ervin Kapos, Executive Director of HSSTAC, pointed towards the benefits of looking at the differences in British and American personal security in such areas as general security, travel security, and street security, with particular emphasis on the British lessons learned over the past several decades. Mr. Polmar suggested starting with an analysis of the differences between the IRA/Radical Islamic threats. The committee highlighted the presence of a large population sympathetic to the IRA embedded within virtually every walk of life in British culture. For the Radical Islamic threat, the committee noted that British Muslims lack sympathy for Radical Islamic terrorists, and that Muslims in the United Kingdom live amongst the general population, in contrast to the concentrated Muslim communities in Israel and the large Muslim population in the surrounding settlements.

The committee expanded the Israel/United Kingdom comparison to include the United States. Members noted the United States' general absence of large Muslim communities, and the greater integration of Muslims into the general population than in Israel or the United Kingdom. Sheriff Theoharris Kamatchus, Sheriff of Marshalltown, Iowa, and Immediate Past President of the National Sheriffs Association, noted the differing numbers of factions acting as terrorist sources in the three countries: one in Israel, two in the United Kingdom, and larger numbers in the United States. However, he noted several emerging trends including the radical nature of all factions and the importance of intelligence and other factors affecting operations "left-of-the-boom." Sheriff Kamatchus also noted the far broader governmental organization present in the United States as compared to those employed in Israel and the United Kingdom.

Mr. Polmar highlighted the British and Israeli efforts at long-term planning, multiple organizations, and funding. He also noted the large amount of coordination, communications, reconnaissance, and intelligence conducted by the IRA during their IED campaign. Major General Tom Garrett, Army National Guard (Ret.), Special Assistant to the Director of the New Jersey Office of Homeland Security and Preparedness, reemphasized the importance of the "human factors" including engaging the public in any C-IED efforts. MGEN Garrett also recounted the Fire Department of New York's (FDNY) ability to freely access public areas of all buildings in order to assess fire and hazardous material (HAZMAT) dangers, while lacking an overt relation to a specific intelligence-gathering operation. He stated the necessity of turning the public sentiment towards active cooperation in a C-IED campaign vice their current, generally apathetic posture. Dr. Steven Bellovin, Professor of Computer Science at Columbia University, expressed concerns over the potentially high false alarm rates and civil rights controversies involved with a large-scale effort to stimulate the public into cooperation. Mr. Ernest Mitchell, Past President of the International Association of Fire Chiefs, followed up by advising that DHS S&T use science and technology to engage the public and address the human factors of the IED process.

Sheriff Kamatchus observed that tests on systems for first responders that look past physical appearances have shown great promise. He also expressed concern that public engagement will potentially alert terrorists to weaknesses in American domestic C-IED capabilities. Mr. Kapos highlighted the inseparable nature of the processes of gathering and analyzing intelligence. Mr. Polmar followed up by emphasizing a need for awareness towards the danger of the "big brother" mentality among the general public.

Dr. A. Michael Andrews, Vice President and Chief Technology Officer (CTO) of L-3 Communications, highlighted issues of classification for sensitive information, including the problems presented by the Freedom of Information Act when compared to the British Official Secrets Act. He also indicated the shock of London officials towards Rick Atkinson's articles on C-IED efforts in Iraq appearing in the New York Times. Mr. Polmar indicated that the leak of classified information forms the primary issue, rather than American style of journalism. He continued to highlight the need for more cultural awareness for the protection of classified material. Sheriff Kamatchus highlighted the disturbing trend within the Washington, D.C., area of martyring those individuals that leak classified information. Members of the committee noted the trends of decreasing cooperation from the British because of such leaks. Mr. Kapos asserted the value of learning more regarding the gathering and processing of public information.

Briefings

Dr. Adam Cox, Chief of Staff of S&T's Office of Strategy, Policy, and Budget briefed the HSSTAC on S&T's budget for C-IED efforts. He first noted the \$20 million increase to start the C-IED effort within DHS S&T. He stated that DHS S&T needs a \$100 million program consistently over four to five years in order to maximize effectiveness. He further estimated the full counter-explosives budget at \$64 million. However, Dr. Cox qualified that figure as being heavily invested on the transportation sector, albeit with some cross-application potential.

For annual budgets for the C-IED effort, Dr. Cox listed \$8.5 million for FY 2008, a request for a \$20 million addition during FY 2008, and a placeholder for \$50 million in FY 2009. For efforts aimed towards explosives detection, \$15 million remains budgeted within S&T's Chemical/Biological Division. Dr. Cox used this particular number to highlight that many efforts relative to a C-IED campaign exist under the auspices of various divisions within DHS S&T. In reference to the \$64 million budgeted for counter-explosives efforts, \$15 million remain budgeted to the Manhattan II project and most other dollars remain focused on spiral improvements on screening capabilities. Dr. Cox posited that those spiral increments serve primarily towards moving detection and screening away from designated chokepoints, and aim to eventually transform entire transportation terminals into screening checkpoints, although this development currently lies approximately five years in the future.

Mr. Roger Shields, Director of the Terrorist Explosive Device Analytical Center (TEDAC), provided a brief overview of the history, development, and challenges of the domestic IED threat, as well as an overview of the creation and functional missions of TEDAC.

Mr. Shields began his briefing by reviewing the history of various IED incidents in the United States prior to September 11th, 2001, comprising primarily of disgruntled, "lone wolf" terrorists. These included several uses of car, briefcase, and pipe bombs; all considered IEDs by the Federal Bureau of Investigation (FBI). Some notable instances included the "Mad Bomber" of New York City during the 1940s and 1950s, Ted Kaczynski (a.k.a. "The Unabomber"), and Timothy McVeigh (Oklahoma City).

Mr. Rich Kikla, Deputy Director for the Office of Transition, DHS S&T, began with an overview of the Capstone Integrated Process Team (IPT) process. He explained that only about one-third of the current projects are deployable, and that the majority of them focus on multi-year programs and improvements. In response to a question, Mr. Kikla explained that the primary customers of his division remain the first responders, but that they also provided support for DHS-wide security efforts.

Mr. Ray Cole, from the National Operations Center, began his briefing by reviewing the mission and operational practices of the National Operations Center (NOC). He explained that the NOC functions as the single primary national level hub for domestic situational awareness, and as an around-the-clock multi-agency operations center for emergency response. To that end, Mr. Cole indicated that the NOC remains involved in each level of operational awareness from

local through the federal government. However, he stressed that the NOC remains a “function”, as opposed to a command, and that it remains outside formal chain of command.

Mr. John Kress and Mr. Richard Zink, from US Northern Command (USNORTHCOM), began their briefing by providing a brief overview of USNORTHCOM’s creation, and its evolving role in the C-IED effort. They explained that USNORTHCOM constitutes a relatively young command, created in 2002 following the terrorist attacks of September 11th, 2001. Mr. Kress and Mr. Zink indicated that its mission consists of ensuring the defense and security of the homeland, and providing military capability support to civil authorities.

Dr. Martha Lavender, from the Center for Domestic Preparedness (CDP), began her briefing with a short history of the CDP, starting with its previous existence as a US Army field artillery training site and as the US Army Chemical Center and School. In 1995, Camp McClellan, site of the CDP, appeared in the Base Realignment and Closure Act, officially closing in 1999. The Department of the Army transferred the facilities and land to the Department of Justice in 2001. Dr. Lavender highlighted the CDP’s official establishment in 1998 and its latest milestone of surpassing 400,000 resident students since its establishment. The CDP maintained the Army’s Chemical Center and School, renaming it the Chemical, Ordnance, Biological, Radiological, and Atomic Training Facility (COBRA) in order to train first responders on the effects, dangers, and response protocols for unconventional munitions. In 2001, the CDP trained local and state responders in support of the 2002 Winter Olympics in Salt Lake City using its first mobile training team. The Department of Justice transferred the facility to DHS in 2003. In each of the 2003 and 2004 years, the CDP saw a doubling of its training output in terms of numbers of students. In 2006, the CDP acquired more than 150,000 square feet of additional space for training, and an additional 240 rooms for student lodging. That same year, DHS transferred the CDP to the FEMA and integrated the Noble Training Facility (medical facility) with the CDP.

Dr. Frank Gordon and Dr. Wadad Dubbelday, from Space and Naval Warfare Systems Command, San Diego (SPAWAR, SSC-SD) briefed the HSSTAC members on the efforts of SSC-SD related to IEDs and C-IED capabilities. Dr. Gordon described SSC-SD as a Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) acquisitions center. SSC-SD projects have direct applications to anti-terrorism/force protection (AT/FP) and C-IED efforts. SSC-SD currently fields efforts to develop robotic technologies for IED mitigation. He indicated that SSC-SD’s advances towards non-linear dynamics and projects involving chaos theory are proving promising and may provide technological breakthroughs in the future.

Dave Masters, Deputy Director of Research for DHS S&T, visited the HSSTAC members for an informal question and answer session regarding current S&T programs relative to a domestic C-IED campaign.


Mr. Kenneth Rapuano, Private Consultant, and HSSTAC Member, presented a brief on his observations of the Joint IED Defeat Organization (JIEDDO) conference. Operational gaps noted for JIEDDO include persistent ISR capability, behavioral analysis tools, detection for deeply-buried IEDs, command wire detection, and stand-off threat detection with a low risk of

collateral damage and false alarm rates. Mr. Rapuano illustrated the major budgets spent on ground detection capability in FY 2007 and 2008. For FY 2007, JIEDDO had a budget of \$30.2 million for ground detection, out of a total budget of \$71.5 million. In FY 2008, JIEDDO will have a budget of \$21.5 million for ground detection, out of a total budget of \$183 million. Of these funds, Mr. Rapuano indicated the majority of dollars are spent on capabilities with limited domestic application. However, Mr. Rapuano indicated that those funds spent on capability gaps with domestic application stand far above the funds provided to DHS S&T.

Following the briefings, the Committee engaged in the following discussions:

- Concern of various agencies with C-IED operations exhibit a lack of an overarching C-IED strategy
- Interest, mission, and authority of DHS within the C-IED effort
- Proper emphasis for S&T's C-IED efforts
- Importance of determining a long-term C-IED strategy, and socializing it among Congress and the US population

The next meeting of the HSSTAC will be on March 20-21, 2008 in Arlington, VA.


Ervin Kapos
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The Homeland Security Science & Technology Advisory Committee (HSSTAC) met in closed session on March 20-21, 2008 in Arlington, VA. The determination to close the meeting was based on the consideration that the briefings and discussions during the meeting would involve classified information sensitive for homeland security. Disclosure of the information discussed could potentially increase the risk to our nation's security due to the identification of vulnerabilities and the potential areas of focus for future research to mitigate our vulnerabilities. All sessions of the meeting were closed to the public pursuant to the provisions of 5 U.S.C. 552b(c).

The objective of this quarterly meeting was to introduce the new organizational and structural changes within the HSSTAC. Three new panels were introduced to focus on the concerns of Under Secretary Cohen: Chemical / Biological (ChemBio) Defense, Cyber Security, and S&T Program Assessment, respectively.

Mr. Norman Polmar, Committee Chairman, opened the meeting by discussing the Under Secretary's response to the Committee's report on Improvised Explosive Devices (IEDs), which had been the focus of their previous committee meetings. He noted that the Under Secretary was generally pleased with their findings, and said that a new IPT for IED Defeat had been established, and that their report had helped to start a number of discussions in this regard. The panel proceeded to discuss their reactions to the report, and the information gathering process in general. Mr. Polmar pointed out that the new structure of three panels would make it much easier to find specific, targeted information in the future. Furthermore, he said, the reports based on each panel's work would help to generate more and better responses as time went on.

Briefings

Dr. Rich Roca, Chairman, Cyber-Security panel, began his briefing by providing an overview of the purpose of the panel, as well as identifying its two primary goals: 1) to help S&T direct its investments, and 2) to help focus DHS cyber operations. Mr. Kapos noted that HSPD 23, the new Cyber-oriented Presidential Directive, set up responsibility for S&T Programs on a national basis, and that it would be important to determine where DHS S&T fit in. Mr. Frank Fernandez, a private consultant and member of the HSSTAC, noted that it was important to understand the roles outlined in HSPD 23 and determine what the threat was. Dr. Steven Bellovin of Columbia University said that it would be useful to apply the same techniques to cyber-security investigations that the Committee had used regarding IEDs. He said it was important to start with a baseline assumption that most networks are vulnerable, and could be disabled.

Dr. Larry Papay, Chairman, S&T Program Assessment Panel, began the discussion by telling the Committee that an S&T Program Assessment had been mandated by Congress, and that their report would serve as a baseline not only for the Under Secretary, but for a new Administration as well. One of the first things that he noted about the organization was that its structural matrix was based on underlying assumptions that their current composition was the best and most relevant format for its needs. One of the primary purposes of the sub-panel would be to verify that. He went on to note that, generally speaking, an organization like S&T was only

as good as its results and would be judged based on them. Mr. Fernandez noted that other organizations model their needs and structural makeup by determining what challenge areas they had that could not be addressed by anyone else, and adjust so that they could accommodate them. He recommended that S&T follow this approach, but noted that it would be difficult to implement in a strategic manner.

Dr. Dave Franz, Chairman, Chem/Bio Defense Panel, began his discussion by noting that his sub-panel's report would be due earlier than those of the other two panels. He said that the intent of the Chem/Bio panel's work was to understand the key players in the community and establish a baseline for the threat. He said that their primary interaction would be with the Basic Research, Chem/Bio, and Health Affairs divisions of DHS, as well as relevant Federal agencies such as Health and Human Services. He further noted that HSPD 10 required a risk assessment every three years in this regard, and that they would likely have to reach beyond S&T in order to accomplish such a goal.

Mr. Rich Kikla, Acting Director of the Transition portfolio, began his briefing by noting that Transition held 50 percent of the budget given to the three portfolio leads. He went on to provide an overview of the 12 IPTs, and said that they were all progressing well with the exception of the Cyber-Security and Interoperability IPTs. He explained that a Technology Oversight Group, which was chaired by the Deputy Secretary of DHS, ensures the strategic balance of the IPTs.

Mr. Dave Masters, Deputy Director of the Innovation portfolio, began his presentation by providing the panel with a brief description of S&T's Innovation portfolio, as well as some of the distinguishing characteristics that differentiated it from the Transition and Research portfolios. He noted that Innovation was more flexible and technology oriented than the other two offices. He further explained that Innovation is characterized by focusing on technologies that do not normally go through the basic research vetting process, which he said led to higher returns on a product solution, as well as higher risk. Furthermore, he noted that their products could be put onto the market much more quickly in some cases.

Mr. Rolf Dietrich, Deputy Director of the Research portfolio, provided a program overview of the Basic Research portfolio to the members of the Committee, and he opened by describing its organization within S&T and its relationship with the customer. He said that it was customer-focused and output-oriented, and that their goal was to have a long-term positive effect on their customers based on strategic needs.

The briefings concluded the meeting. The next meeting of the HSSTAC will be on July 15-17, 2008 in Washington, DC.

A handwritten signature in black ink, appearing to read 'Ervin Kapos', is written over a horizontal line.

Ervin Kapos
Designated Federal Officer

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The Homeland Security Science & Technology Advisory Committee (HSSTAC) met in a partially closed session on July 15, 2008 in Arlington, VA. The determination to partially close the meeting was based on the consideration that the briefings and discussions during the meeting would involve classified information sensitive to homeland security. Disclosure of the information discussed could potentially increase the risk to our nation's security due to the identification of vulnerabilities and the potential areas of focus for future research to mitigate our vulnerabilities. All sessions of the meeting were closed to the public pursuant to the provisions of 5 U.S.C. 552b(c) with the exception of the open session on day one.

The objectives of this quarterly meeting were to discuss the last year's Improvised Explosive Device (IED) assessment (IEDs: Coming to America, 29 February 2008); review current committee efforts; and solicit input from attendees on future efforts.

Mr. Norman Polmar, Committee Chairman, welcomed the attendees and explained the HSSTAC, which was established in 2002, met for two years and then went into hibernation for over a year before it was reestablished last July. The committee was asked by the Under Secretary of the Department of Homeland Security (DHS), Directorate of Science & Technology (S&T) to put together an assessment of IED threats in the future. In order to meet this tasking, the committee broke into panels and looked at IEDs coming into the U.S. The methodology for doing this was conducting several interviews and briefings with various organizations, including many British organizations dealing with the IRA and other threats.

The assessment included varying views of what constituted an IED. There are two chains described in the report – the “kill chain,” which describes the steps necessary for the execution of the IED attack; and the “response chain,” used to related counter-IED (C-IED) activities to the terrorist kill chain. The key to effective C-IED measures is to get to the left of the kill chain, or in other words, try to get to people and the sources of the development of the bomb before it is set off.

The IED assessment that the committee finalized included six major findings:

1. The use of IEDs by terrorists within the United States is a real, agile, and complex threat.
2. Countering IEDs in the domestic environment is significantly different from countering them in combat zones based on different operational environments and policies.
3. DHS S&T does not effectively leverage applicable national counter-IED investments.
4. The current DHS S&T IED program is primarily focused on countering the devices and does not have sufficient emphasis on the human component of the IED threat.
5. DHS S&T does not sufficiently incorporate the requirements of diverse local, regional, and state responders in its planning.

6. DHS research and development (R&D) programs do not effectively support social and economic resilience to IED attack and post-attack restoration, although this role for DHS S&T is limited under the enabling legislation.

Each finding was briefly addressed during the committee meeting. For Findings #1 and #2, the threat is unlikely to be eliminated, because most potential terrorists expect to terminate themselves. Their goals are to create a loss of confidence in the US government and to force US isolation and withdrawal. Their targets are symbols, economic, infrastructure, and mass casualties. Furthermore, although there is generally broad leeway in Afghanistan and Iraq for IED counter-measures, in the US there are severe legal and social constraints.

For Finding #3, it was noted that the report was an assessment, so it is very critical of DHS and other federal organizations. The observation for Finding #4 was that most of the effort is in getting the device, so there is a need to continue to push interest and investment further to the left of the actual detonation. Finding #5 noted that S&T needs to better prepare first responders for the long term. Most of the first responders are volunteers so it is difficult for them to devote a lot of time to their jobs as first responders. This is very different from being a full-time federal employee, whose sole job it is to act as a first responder.

Finally, for Finding #6, S&T currently has inadequate R&D programs to support rapid restoration of social and economic activities after an IED attack.

Next, the leaders of the three HSSTAC Panels presented their progress.

Program Assessment Panel

Dr. Lawrence Papay of the Program Assessment panel presented his panel's objective and tasking to review, assess, and make recommendations with regard to relevance and completeness to the Under Secretary for S&T. Seven specific taskings were developed for the panel: 1) review the scope of S&T's mission; 2) evaluate strategic planning and operations; 3) get an understanding the S&T program; 4) review financial performance; 5) assess relationships with other S&T organizations; 6) review S&T directorates and how their process is tracked; and 7) provide recommendations on the health and quality of the S&T programs. Since there are several audiences for this panel's pending report, it can serve as a transition between administrations. Congress also requires updates on an annual basis.

In order to complete its taskings, panel members have talked to S&T Division Directors, the Chief Financial Officer, the Homeland Security Institute, and representatives from first responder organizations; they also plan to talk to Congressional staffers. A timeline was made in March 2008, and they have had meetings in April and June. They have been in fact-finding mode until now, and will start talking about where to go next and begin drafting the report in August.

Cyber Threat Response Panel

Dr. Richard Roca is the chair of the Cyber Threat Response panel. The panel's concern is the fact that the cyber domain is dynamic and evolving, so a constant evolution in the

measures taken to protect and defend it is necessary. The question becomes how technology informs procurement for various mechanisms. Multi-level security is involved, and the focus is on the reconstitution, remediation, and response to potential threats.

Cyber protection was compared to the anti-submarine program in the Navy, and the question was asked: Is there an analogous application (physics-driven) that can be used in the cyber world? There are several complications to government adapting to technological changes. Moore's law states that the government takes 18-24 months to adjust and adopt a new technology. However, by that point, the technology is already obsolete and more technologically advanced adversaries have already adjusted and adapted to a faster and more dangerous form of technology. The final panel report on cyber security will outline the issues and discuss what long-term investigations should focus on.

ChemBio Panel

The third panel, the ChemBio panel, is chaired by Dr. David Franz. Dr. Franz presented the timeline for the ChemBio Report, giving August 1st as the deadline to have the draft completed. Before 1997, all ChemBio defense work was done in DoD. There was a \$37 million budget until 9/11; afterwards, this number jumped into the billions. The terms of reference for this committee were to understand the form and function of S&T but focus on the seams between assets and stakeholders within and outside of DHS. Dr. Franz then presented the mission, 5-year deliverables, and recommendations that the report will include.

The panel briefings concluded this meeting. The next meeting of the HSSTAC will be on October 20-22, 2008 in Norfolk, VA.



Ervin Kapos
Designated Federal Officer