Role of National Labs in transportation security

Tom Ewing
Associate Division Director
Nuclear Engineering Division

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Origin of national labs…

- National Labs emerged out of WWII weapons projects
  - Manhattan Project
    - *Ames*
    - *Argonne*
    - *Los Alamos*
    - *Oak Ridge*
  - Radar
    - *MIT Radiation Lab*
- Need was for a large-scale (expensive), concerted effort, with access to first-rate scientists
- And these labs were a big success!
Argonne National Laboratory

- Founded in 1943, designated a national laboratory in 1946 – nation’s first lab
- Birthplace of nuclear power
- Managed by The University of Chicago for the Department of Energy (DOE)
  - ~ 3,000 employees; 4,000 facility users
  - ~ $500M budget; 1,500-acre site in Illinois
- “Multi-purpose” Lab:
  - Major user facilities
- Not a weapons laboratory
  - Homeland security an important component, but NOT the dominant component of the Lab
  - ‘Multi-purpose’ character evolved from the initial state as a civilian nuclear energy lab
What do the Labs have to offer?

- The DOE Labs conduct cutting edge R&D worth ~$10B annually and thus provide a high value leverage

  - Argonne National Laboratory
  - Brookhaven National Laboratory
  - Idaho National Laboratory
  - Lawrence Berkeley National Laboratory
  - Lawrence Livermore National Laboratory
  - Los Alamos National Laboratory
  - Oak Ridge National Laboratory
  - Pacific Northwest National Laboratory
  - Sandia National Laboratory

- Primarily funded by DOE, but also NIH, DHS, DOD, DOT, NSF, NASA, Commerce, Agriculture, EPA ...

- 85 Nobel prizes, 739 R&D 100 awards (total for DOE & predecessor agencies)
What do the Labs have to offer?

- Particularly effective for large, complex problems
  - Good at running large (& expensive), 1-of-a-kind facilities
  - Good at marshalling large, interdisciplinary research teams
  - Have line-management organizations (thus can reconfigure to best support specific missions)
  - Not bound by publish-or-parish reward system (accommodate proprietary or classified research)
  - Not bound by academic three-year grant cycles (in fact, take long term perspective)
DHS utilizes DOE National Labs

- DHS strategy: access expertise and associated infrastructure, wherever it lies
- Homeland Security Act (2002) established an “Office of National Laboratories” (ONL) to enable DHS access to DOE national labs
- DHS-S&T uses this DOE infrastructure to conduct homeland security-related research, development, testing, and evaluation (RDT&E) activities

\[ \text{Direct DHS Utilization is 5% of } \$10B \ldots \]

\[ \approx \$500M \text{ Total DHS Funding}^* \]

* Data from DHS Projects Active in FY 2006
More about Argonne…
…and how it supports the DHS paradigm

- **Facilities**
  - Classified environments and cleared staff
  - Home for DOE's *Radiological Assistance Program* for the upper Midwest (one of eight nationwide) for first responder support
  - Unique, large hot cells (for rad work)
  - NIH Biocontainment center (one of nine to be built nationally)
  - Infrastructure Assurance Center (major national center for infrastructure risk/vulnerability assessment)
  - Two transportation R&D centers (one DOE and one DOT sponsored)
  - FBI Joint Operations Center (JOC) established at Argonne during TOPOFF-2 for federal, state, local coordination of a regional emergency
  - Numerous bio, chem, rad analytic labs
  - Decontamination equipment & expertise
  - Large-scale, high-performance computing centers

- **Major initiatives** in Energy, Advanced Computing, Transportation, Biosciences, Nanotechnology, National Security, Accelerator-Based R&D, and the Environment

- **Know-how** to run large programs & facilities, safely and securely
Midwest Region’s significance:
A compelling security case for Argonne involvement

- Significant population and critical infrastructure makes us a potential terrorist target
- Nation’s largest intermodal freight distribution center for trucks, rail and air
- Convergence of major gas pipelines and electrical grids
- More nuke plants than any other state
- Nation’s second largest financial service center
- Third largest freight hub in the world (behind Hong Kong and Singapore); first in US
- Contains inland waterways which are part of the network linking 24 U.S. states that account for 54% of the U.S. population, 56% of heavy manufacturing, and 61% of agriculture jobs

- A disruption in the region would ripple throughout the nation and beyond
Regional Interactions

- Argonne has a long-time relationship with regional transportation organizations
  - Founding member of
    - Intelligent Transportation Systems (ITS) Midwest
    - Gary-Chicago-Milwaukee ITS Priority Corridor Coalition (GCM)
- Argonne has traditionally had close ties with universities
- Since 9/11 we strengthened these ties and established new relationships around regional security issues
  - We have also developed relations with
    - City of Chicago (911 center, fire/police, OEM)
    - State of Illinois (IDOT, IEMA, HSO, ITTF)
    - Great Lakes Partnership
    - Regional FBI offices
Argonne’s Regional Transportation Security Strategy

- Establish relations with regional partners to improve regional security, leveraging our science and technology strengths
- Be proactive with the first responder and incident management community on various task forces, coalitions, and advisory boards to support regional preparedness, planning, response, and
- Leverage lab’s federal contacts to improve interaction between key federal agencies and state/local organizations
Project: Simulate large-scale evacuation

- Goal: Development of a model for the simulation of an emergency evacuation scenario in the Chicago Business District
- Sponsored by a number of state and city agencies:
  - ITTF: Illinois Terrorism Task Force
  - IDOT: Illinois Department of Transportation
  - IEMA: Illinois Emergency Management Agency
  - IEPA: Illinois Environmental Protection Agency
  - USDOT/FHWA: US Department of Transportation / Federal Highway Administration
  - Chicago OEM companion project
Emergency evacuation simulation (continued)

- The Chicago Metropolitan Area is the largest freight-handling hub in the US, and the third-largest in the world.
- One scenario postulates a radioactive release following an explosion at the base of the Sears Tower.
- For security reasons, the scenario has been arbitrarily chosen and is not based on existing worst case scenarios.
Project: Inland Waterways Security

- Inland waterways commerce is vital to the nation’s economic strength and to the health and welfare of the American people.
- Illinois’ inland waterways are part of the network linking 24 U.S. states that account for 54% of the U.S. population, 56% of heavy manufacturing, and 61% of agriculture jobs.
- $100B worth, or about 2.2B tons of goods moved annually along this network as part of domestic and U.S. foreign trade.
- Many other critical infrastructure and key resource assets are in or near Midwestern rivers, such as locks and dams, levees, highway and rail bridges, chemical plants, food commodities handling and processing facilities, electric power plants.
- Because waterways support a vital supply chain of raw materials, energy, food, and other goods, and because many rail and truck alternatives are already at capacity and more costly, the nation is vulnerable to the disruption of these vital transportation links.
Pilot Project Objectives

- Develop an “end-to-end” systems risk analysis methodology for inland waterways that incorporates:
  - Infrastructure interdependencies
  - Cascading impacts
- Leverage available state, federal, and private-sector data, methodologies, tools, expertise, and existing studies
  - Minimize duplication
  - Ensure broad acceptance and applicability
- Apply methodology to a portion of the Illinois River
  - Pilot test and refine methodology
  - Address problem of importance to ITTF and other partners
Pilot Project Is a Partnership Among State, Federal, and Private-Sector Organizations
Concluding thoughts

- Argonne and the other national labs provide a high value leverage of technology and expertise; good at solving large, complex problems
  - Complement the academic and industrial research sectors
  - Capable of responsive interdisciplinary efforts unfettered by “publish-or-perish” constraints
  - Able to take the long view on technical issues of key economic importance to the nation
  - Capable of effectively sustaining large complex research facilities and operating them as national user facilities
- Our location in one of the busiest transportation corridors and major population and economic centers in the US provides a special opportunity and incentive to work together
- Transportation and security issues are regional and require cooperative, coordinated approaches by all stakeholders
- Funding is enhanced through collaboration
- **Argonne and other national labs are fully committed to supporting our nation’s Homeland Security mission**