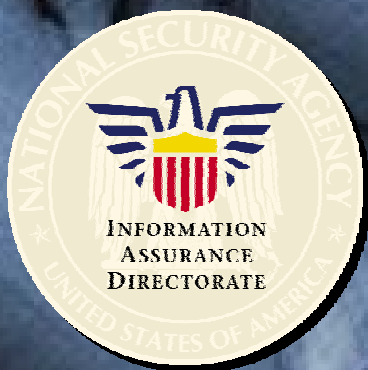


# National Information Assurance Education and Training Program



<http://www.nsa.gov/isso/programs/nietp/index.htm>

*Sherry Borrer s.borrer@radium.ncsc.mil*

# AGENDA

## INFOSEC Training and Education

- **Documented Need**
- **Partnerships address long time problem**
- **NSA's Response:**
  - **NIETP**
  - **NIST-CNSS-NSA**
- **Linkage/Partnerships**
- **Future Initiatives**

# OBJECTIVE

*Let's Take Advantage of Work Already Done, and  
Work In Progress.*

CONTINUE THE PARTNERSHIP

# INFOSEC Professionals: Today

- **Many full/part-time personnel not trained for the job they hold.**
  - Self Taught. . . . . “You Figure it out”
  - One the Job Training. . . . . “Learn by mistake”
  - Peer-to-peer exchange. . . . . “Security Guides and INFOSEC Lore”
  - Conferences, Vendor, and Govt.....Courses..... “If funds Available”



## To Demonstrate Existence of a Career Field

---

- 1. Distinct Body of Knowledge  
EDACUMS have documented
- 2. Body of Literature  
Nat'l Conference & UC-Davis Project
- 3. Career Progression  
Already exists in several agencies  
Proposed in NCSC Pub #27
- 4. Sufficient Numbers of Personnel  
(Dedicated to that Profession)  
OPM study nearly completed

# Long Time Problem

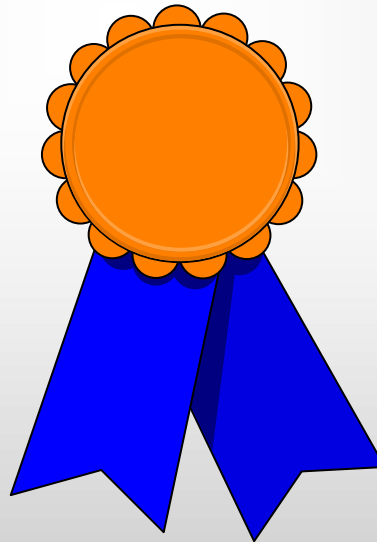
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## **INFOSEC/IA Personnel Shortfalls**

- Many security tasks not being adequately performed due to lack of personnel, training, and tools
- Critical security responsibilities assigned as additional duties
- Lack of comprehensive, consistent training for ISSOs security engineers, certifiers, accreditors



- NSTISSC 1993 report
  - INFOSEC Education and Training listed in top three priorities





“Education, training, and awareness are countermeasures that effectively reduce exposure to a variety of known risks. In order to achieve this end, it is essential to have a federal work force that is aware of, and educated about, the problems of information systems security (INFOSEC).”

Charles A. Hawkins, Jr.  
Acting Chairman, NSTISSC  
25 Feb. 1993





- Redefining Security 1994 report

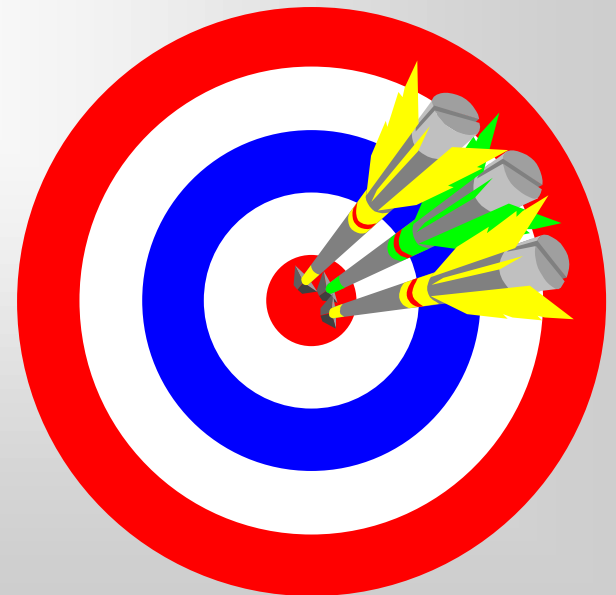
- “Uniformity in skills and knowledge taught security professionals is needed not only to ensure the quality of work, but also to foster a common understanding and implementation of security policies and procedures.”





- OTA 1994 Report

- To be comprehensive, however, the generally accepted practices must be defined at several levels of detail, and different sets of the standards would apply to different users and applications.”



# OTA Report

*CONTINUED*

**“Some experts estimate that over one-half of the total financial and productivity losses in information systems is the result of human errors...”**

Information Security and Privacy in Network Environments

Office of Technology Assessment. Sept. 1994

# DOCUMENTED NEED

- **President's Commission on Critical Infrastructure Protection**
  - **“NIST, NSA, and the U.S. Department of Education work in collaboration with the private sector to develop programs for education and training of information assurance specialists and for the continuing education as technologies change. This effort should also support “training the trainers” to provide an adequate cadre of qualified instructors to teach technicians.”**

Critical Foundations: Protecting America's Infrastructures. The report of the President's commission on Critical Infrastructure Protection. Oct., 1997. P71.  
(<http://www.pccip.gov/>)

# NSA's RESPONSE



## *Mission*

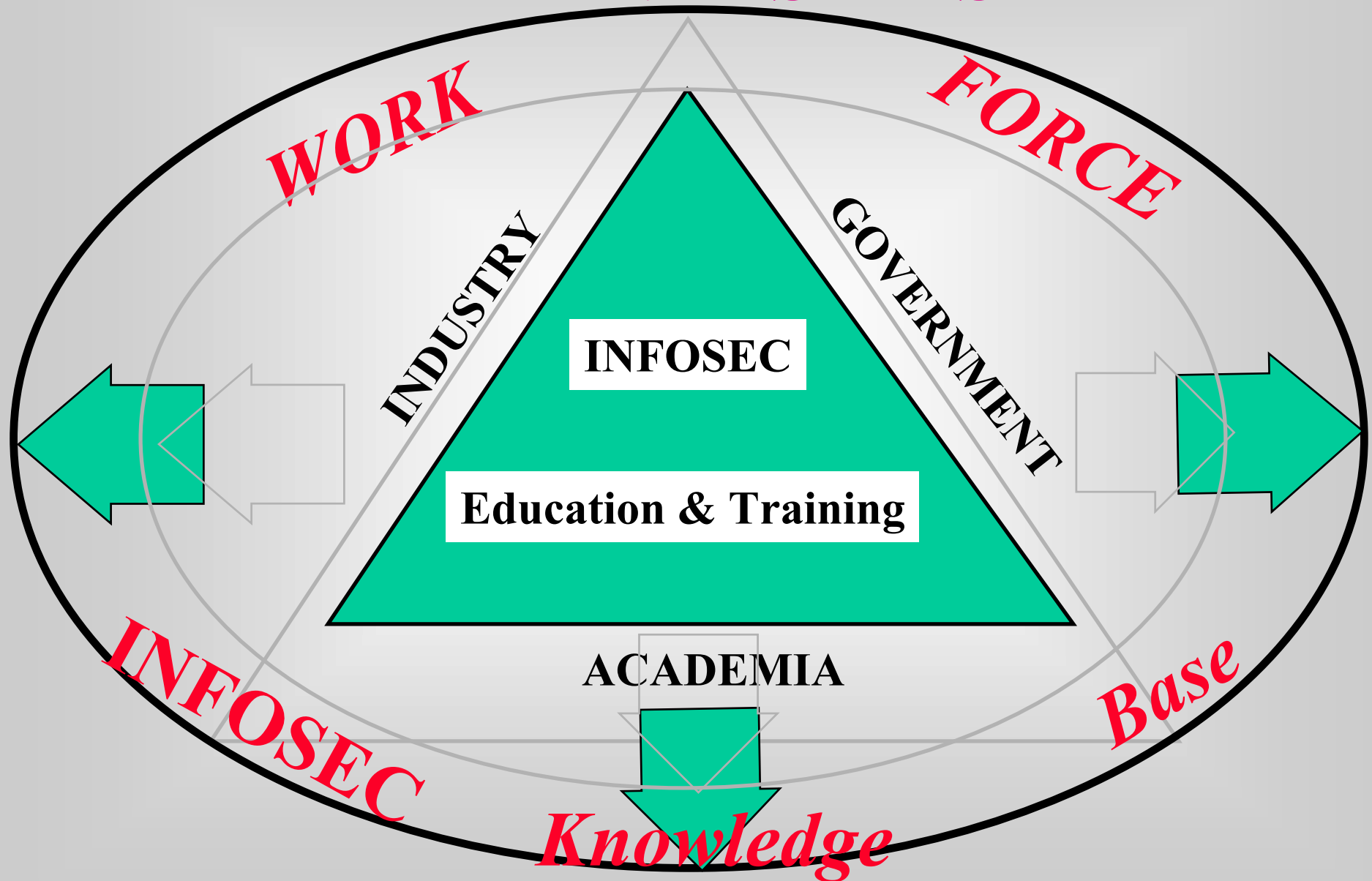
Be a leading advocate for improving information system security (INFOSEC) education and training nationwide.

# NIETP Activities Related to PDD63

## *Highlights at a glance*

- **National INFOSEC Education & Training Program (NIETP)** (<http://www.nsa.gov:8080/isso/programs/nietp/index.htm>)
  - **National Training Standards**
  - **National Colloquium for Information Systems Security Education**
  - **Centers of Academic Excellence in Information Assurance Education**
  - **Courseware Evaluation Program for Certification**
  - **Support to Military Services**
  - **Academic Outreach**
  - **Products**
  - **Support to President's Critical Infrastructure Protection Board**

# PARTNERSHIPS



# NSA Designated Executive Agent

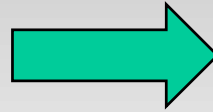
*Assistant Secretary of Defense  
Command, Control, Communications and Intelligence  
MEMO Dated July 2, 2001*

“I hereby delegate to the Director, National Security Agency, the authorities and responsibilities of the Secretary of Defense under the following statute:

Public Law 106-398

**Department of Defense Scholarships for Service Program**

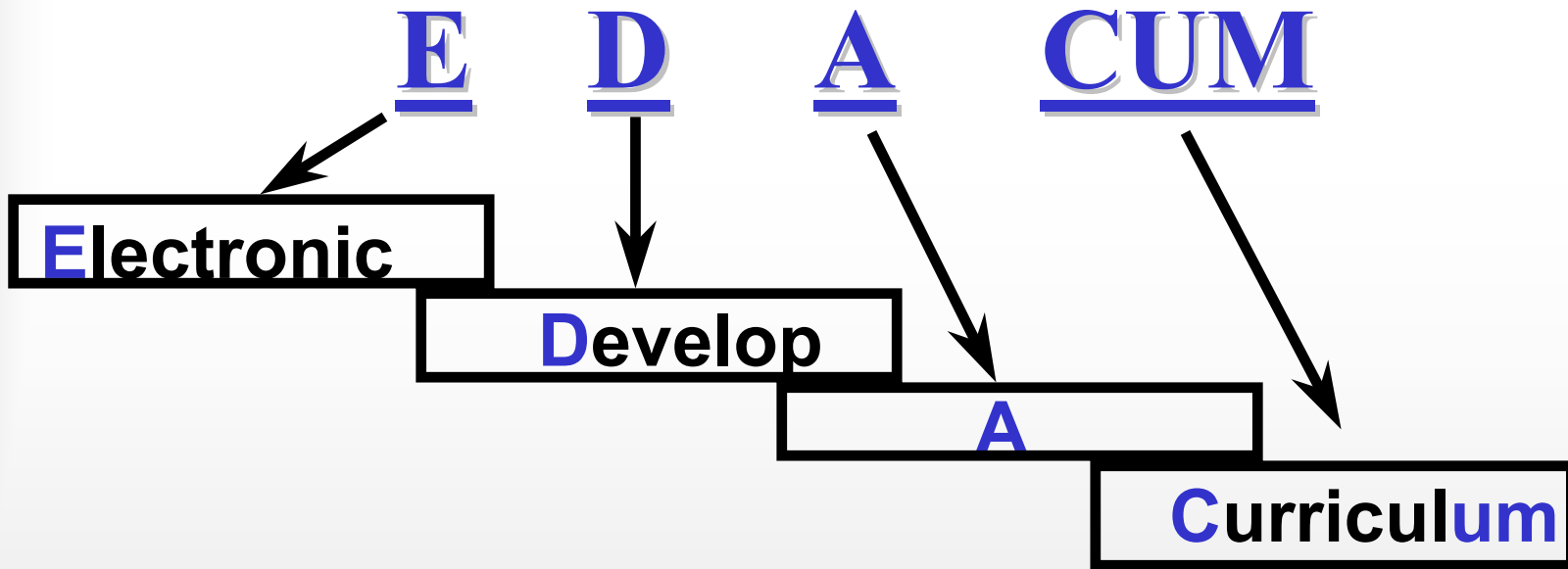




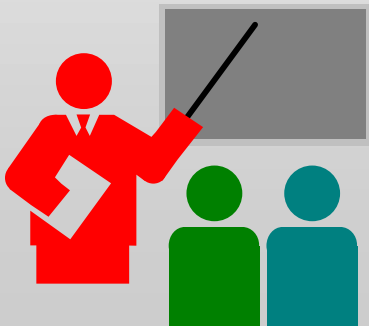
***NSTISSC redesignated CNSS***

## **Committee on National Security Systems**

***“The CNSS provides a forum for discussion of policy issues, sets national policy, and promulgates direction, operational procedures, and guidance for the security of national security systems through the CNSS issuance system”.***



**A method of involvement and consensus building to determine training needs as identified by skilled workers and professionals.**



**A joint NSA and ISU venture  
for producing CNSS  
Training Standards**



# EDACUM

**A consortium of over 1000 INFOSEC Professionals  
from:**

## Government

NSA  
NIST  
DISA  
SERVICES  
EDUCATION  
COMMERCE  
HHS  
TREASURY  
House of Reps

## Industry

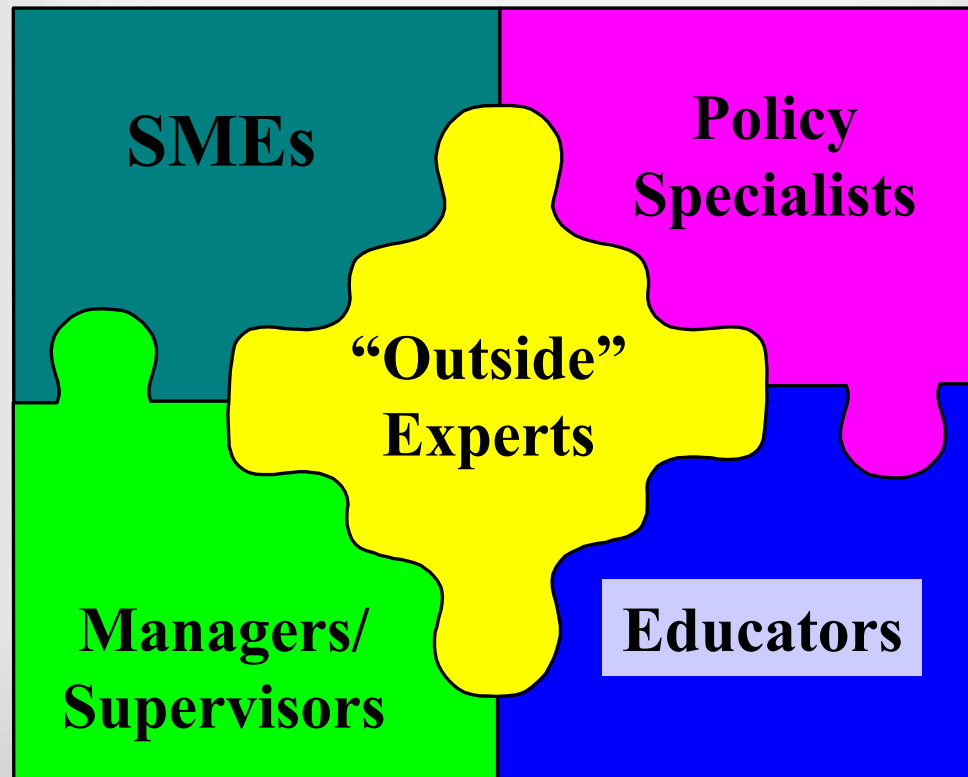
ISI  
ISSA  
ISC  
ARCA  
MIS  
Rockwell

## Academia

Idaho State University  
Navy PGS  
NCS

# EDACUM Principle

Strength Through Diversity



Stakeholders and Partners in Change

# K S A S

- **KNOWLEDGE**: Broad comprehension of a subject that cannot necessarily be applied
- **SKILL**: Comprehension of a subject that is/can be specifically applied to a job
- **ATTRIBUTE (ABILITY)**: Personality characteristics which are/can be developed to enhance job performance

# KSA...to...BEHAVIORAL OBJECTIVE: PROGRESSION

- ▶ KSA
  - “Password Protection”
- ▶ PERFORMANCE ITEM
  - “Construct password protection schema”
- ▶ BEHAVIORAL OBJECTIVE
  - CONDITION: “Given password protection algorithm”
  - BEHAVIORAL: “Construct password instruction set for a Windows NT network”
  - STANDARD: “Which provides minimum 6 letter character and 30 day expiration date per new password”

# System Administrator

## Audit Function (Entry Level)

Work Closely with ISSO to ensure the AIS or network is used securely

---

- **Policy and Procedures**

- Explain the purpose of a system audit
- State logging policies
- Reproduce documentation required in event of a detected intrusion to the system
- Explain Electronic Records Management policy by monitoring notification
- Describe the need for separation of duties
- Explain Audit
- State audit trails and logging policies
- Reproduce documentation

# Example INFOSEC Standard

## System Administrator:

---

### **Competency # 2: Access Control**

#### **KSA # 2.a Policies/Administration (\*9)**

##### **Performance Item # 2.a.1**

*“Use network access change controls as designed”*

### **Competency # 4: Audit**

#### **KSA # 4.c Tools (\*7)**

##### **Performance Item # 4.c.6**

*“Identify two intrusion detection systems”*



# INFOSEC Electronic DACUMs to date

**DACUM I:** Establishing the basics

- Aug '92: Define A, T, & E levels/  
produce awareness materials.

**DACUM II:** Creation of new AT&E Matrix

- Aug '93: Build Nat'l. AT& E Model

**DACUM III:** Unified Taxonomy for ISS Professors

- Nov '93: Define and categorize KSAs.

**DACUM IV:** From Theory to Instruction

- Apr '94: Defined 3 operational level training Reqs.

**DACUM V:** National Training Standards

- Sept '94: Producing 3 draft NSTISSI 40XX.

**DACUM VI:** System Certifier Standard

- June '95: Define Trng. Std. for Certifier.

# INFOSEC Electronic DACUMs to date

## Cont.

### DACUM VII: Completing A Picture

- June '98; Integrating DITSCAP

### DACUM VIII: Defining Risk Analyst

- March '99: An emerging career

### DACUM IX: Updating the Previous Work

- June 2000, Transforming standards from INFOSEC to IA

### DACUM X: Putting IA into all of the standards

- March 2002 – Using Govt., Industry and Academia to transform the standards.



# National Training Standards

*<http://www.nstissc.gov/html/library.html>*

**Information Systems Security Professionals - No. 4011**

**Designated Approving Authority - No. 4012**

**System Administrators (INFOSEC) - No. 4013**

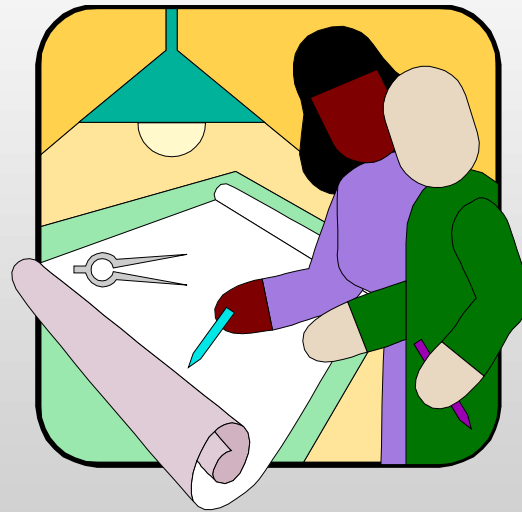
**Information Systems Security Officers - No. 4014**

**System Certifiers - No. 4015**

**Risk Analyst - No. 4016**     *Under Development*



# Quality of Training



NSTISSI - 4011  
NSTISSI - 4012  
NSTISSI - 4013



NSTISSI - 4014  
NSTISSI - 4015  
NSTISSI - 4016

*Notification*

**Information Assurance  
Courseware Evaluation  
Project**

*Certification*

**Departments  
Agencies &  
Institutions**

*Delivery*

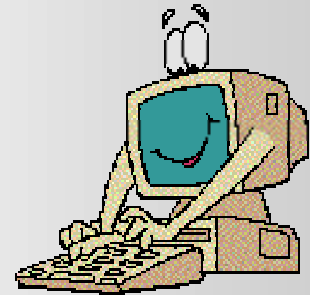
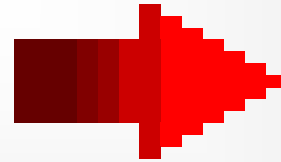
**Certified  
Training  
Provider**

# *Electronically Submit to Web*

*ACADEMIA*

**Data**

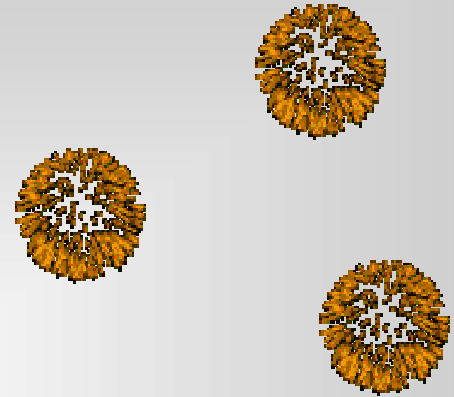
*GOVERNMENT*



*COMMERCIAL*

**Data**

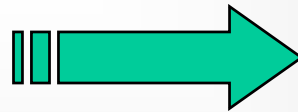
# 100% MAPPING



*National Standards*



*Curriculum*



*Certification*

# *Certified Organizations*



**AIR FORCE INSTITUTE OF TECHNOLOGY - 4011**

**ARC INFORMATION ASSURANCE INSTITUTE – 4011, 4012, 4015**

**GEORGE MASON UNIVERSITY – 4011**

**GEORGE WASHINGTON UNIVERSITY - 4011**

**FLORIDA STATE UNIVERSITY – 4011**

**IDAHO STATE UNIVERSITY – 4011, 4013, 4014, 4015**

**INDIANA UNIVERSITY OF PENNSYLVANIA - 4011**

**INFORMATION RESOURCES MANAGEMENT COLLEGE – 4011**

**IOWA STATE UNIVERSITY – 4011**

**JOHN HOPKINS UNIVERSITY - 4011**

**NAVAL POST GRADUATE SCHOOL – 4011**

**NORWICH UNIVERSITY – 4011, 4014**



# *Certified Organizations*



**NEW MEXICO TECH - 4011**

**NORTHEASTERN UNIVERSITY - 4011**

**PURDUE UNIVERSITY - 4011**

**STATE UNIVERSITY OF NEW YORK AT BUFFALO – 4011**

**STATE UNIVERSITY OF NEW YORK AT STONY BROOK - 4011**

**TOWSON UNIVERSITY - 4011**

**UNIVERSITY OF CALIFORNIA, DAVIS - 4011**

**UNIVERSITY OF IDAHO – 4011**

**UNIVERSITY OF MARYLAND UNIVERSITY COLLEGE – 4011**

**UNIVERSITY OF NEBRASKA AT OMAHA – 4011**

**UNIVERSITY OF TEXAS AT SAN ANTONIO - 4011**

**UNIVERSITY OF TULSA – 4011, 4012, 4013, 4014, 4015**



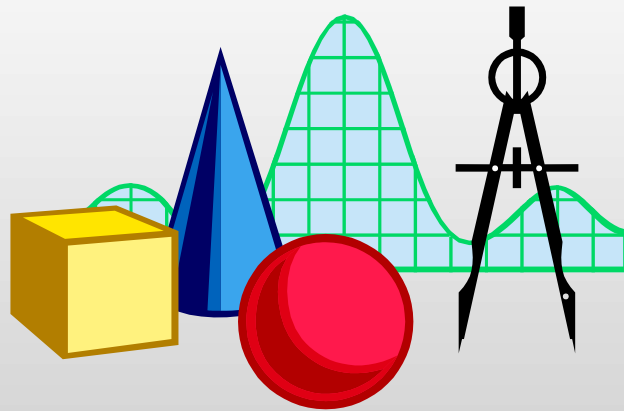
## *Certified Organizations*

**SANS INSTITUTE – 4013**

**UNIVERSITY OF WISCONSIN, MILWAUKEE - 4011**

**UNIVERSITY OF FINDLAY - 4011**

# ACADEMIA



# Emerging Role of Academia

- The number of colleges teaching INFOSEC is increasing.
- Integrated & stand alone courses.
- Whole degree programs.
- Good geo-locations.

**A Force Multiplier**



## The Not So Good News\*

- Today there are only **four** declared, dedicated computer security research centers in degree granting departments at universities in the United States
- Over the past five years, approximately 5,500 PhDs in computer science and engineering were awarded by universities in the US. Only 16 of those were awarded for security-related research at these major centers (only **8 of the 16 were U.S.** Nationals)

Dr. Eugene Spafford  
Testimony to House Science Comm.  
Feb. 11, 1997



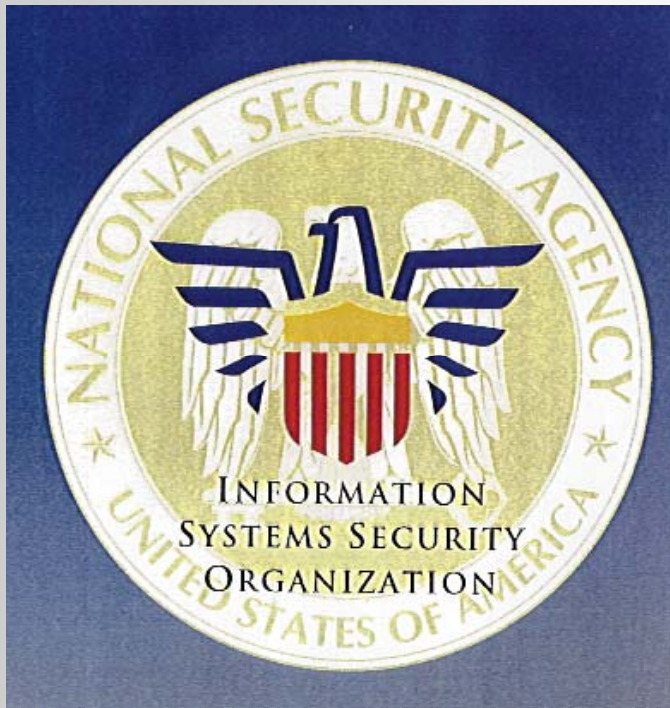
The White House  
2000

### Defending America's Cyberspace

“In developing the Federal Cyber Service initiative, we can leverage existing Federal education, training and awareness programs. In education, the NSA has a program to designate universities as Centers of Academic Excellence in Information Assurance Education based on established criteria rooted in the **National Security Telecommunications and Information Systems Security Committee (NSTISSC)** training standards.”

# Partnerships with Academia

## Centers of Academic Excellence in Information Assurance Education



Reducing the vulnerability of our NII by promoting higher education in information assurance, and producing a growing number of professionals with IA expertise in various disciplines.

<http://www.nsa.gov/isso/programs/coeiae/index.htm>



## **Centers Of Academic Excellence in Information Assurance Education (Graduate and Undergraduate Levels)**

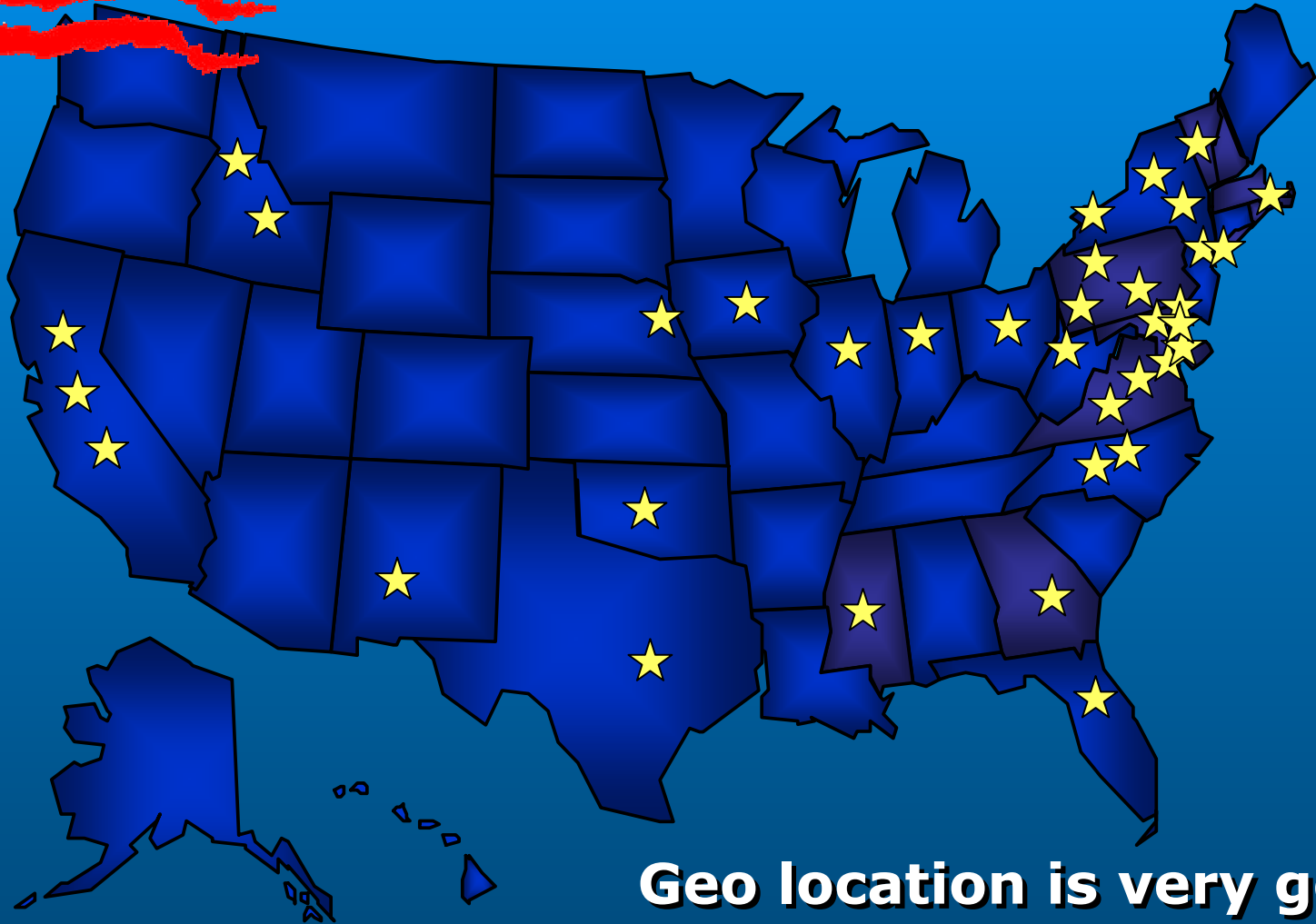
### **Criteria for Measurement**

<http://www.nsa.gov:8080/isso/programs/coeiae/measure.htm>

- 1. Use of NSTISSC Training Standards**
- 2. I A treated as multidisciplinary**
- 3. Demonstration of use of IA within the university**
- 4. Encourages research in IA**
- 5. IA curriculum reaches beyond normal geographic borders**
- 6. Faculty active in IA research and practice**
- 7. State of the art IA reference system/materials**
- 8. Declared concentrations in IA**
- 9. Declared center for I A education**
- 10. More than one faculty member**



# NSA-Designated Centers of Academic Excellence in Information Assurance Education Partnership for Critical Infrastructure Security



**Geo location is very good.**

★ Centers of Academic Excellence in IA Education



# **Centers of Academic Excellence in Information Assurance Education**

## *Academic Years 1999-2002*

**James Madison University  
George Mason University  
Idaho State University  
Iowa State University  
Purdue University  
University of California at Davis  
University of Idaho**

## *Academic Years 2000-2003*

**Carnegie Mellon University  
Florida State University  
Information Resources Management  
College, National Defense University  
Naval Postgraduate School  
Stanford University  
University of Illinois at Urbana Champaign  
University of Tulsa**

## *Academic Years 2001-2004*

**Drexel University  
Georgia Institute of Technology  
Mississippi State University  
Norwich University  
Syracuse University**

**United States Military Academy, West Point  
University of Maryland, Baltimore County  
University of North Carolina, Charlotte  
West Virginia University**



# **Centers of Academic Excellence in Information Assurance Education**

*continued*

*Academic Years 2002-2005*

## **New Designations:**

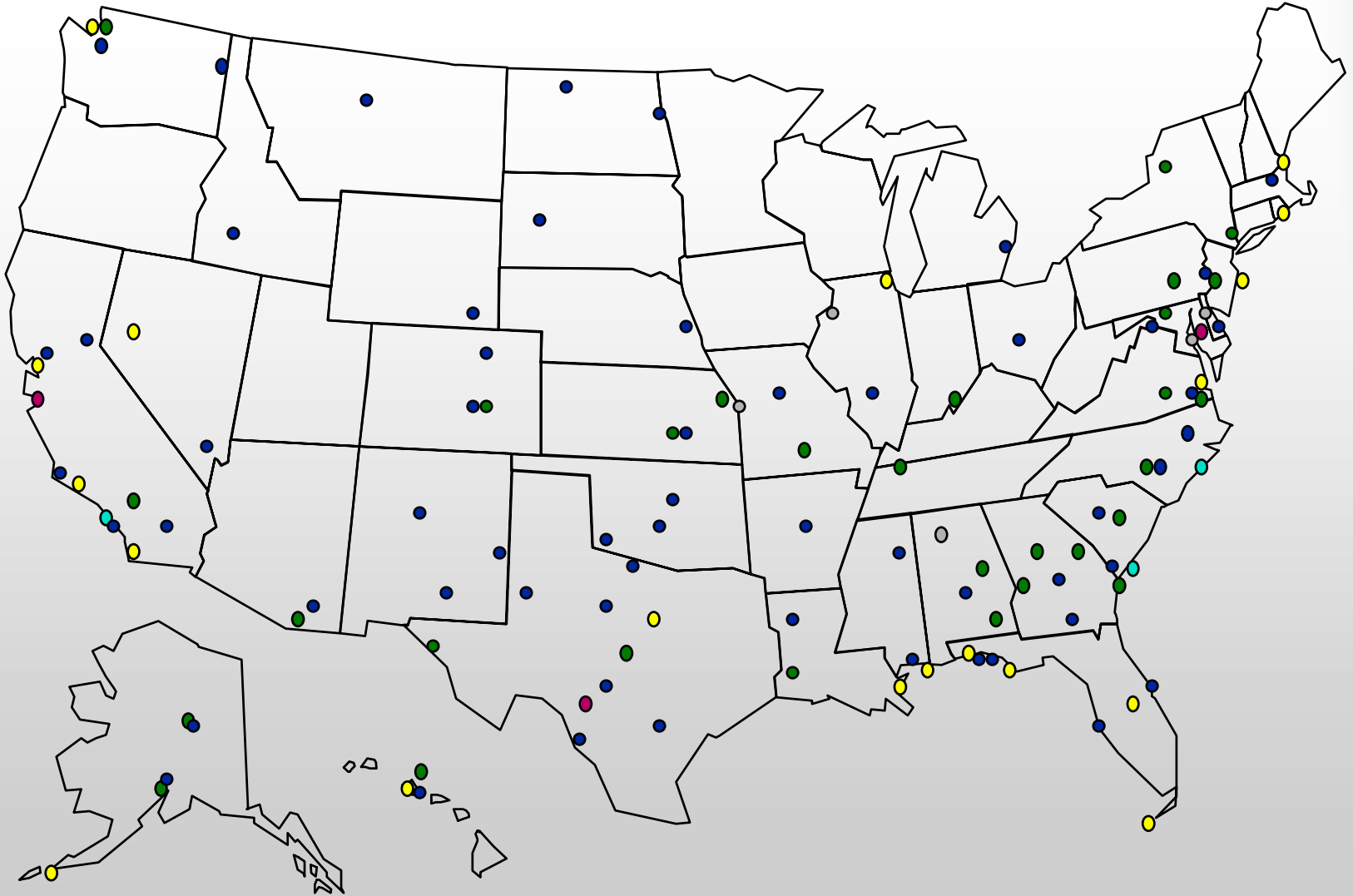
Air Force Institute of Technology  
George Washington University  
Indiana University of Pennsylvania  
New Mexico Tech  
North Carolina State University  
Northeastern University  
Polytechnic University  
State University of New York, Buffalo  
State University of New York, Stony Brook  
Towson University  
University of Maryland, University College  
University of Nebraska, Omaha  
University of Texas, San Antonio

## **Re-Designations:**

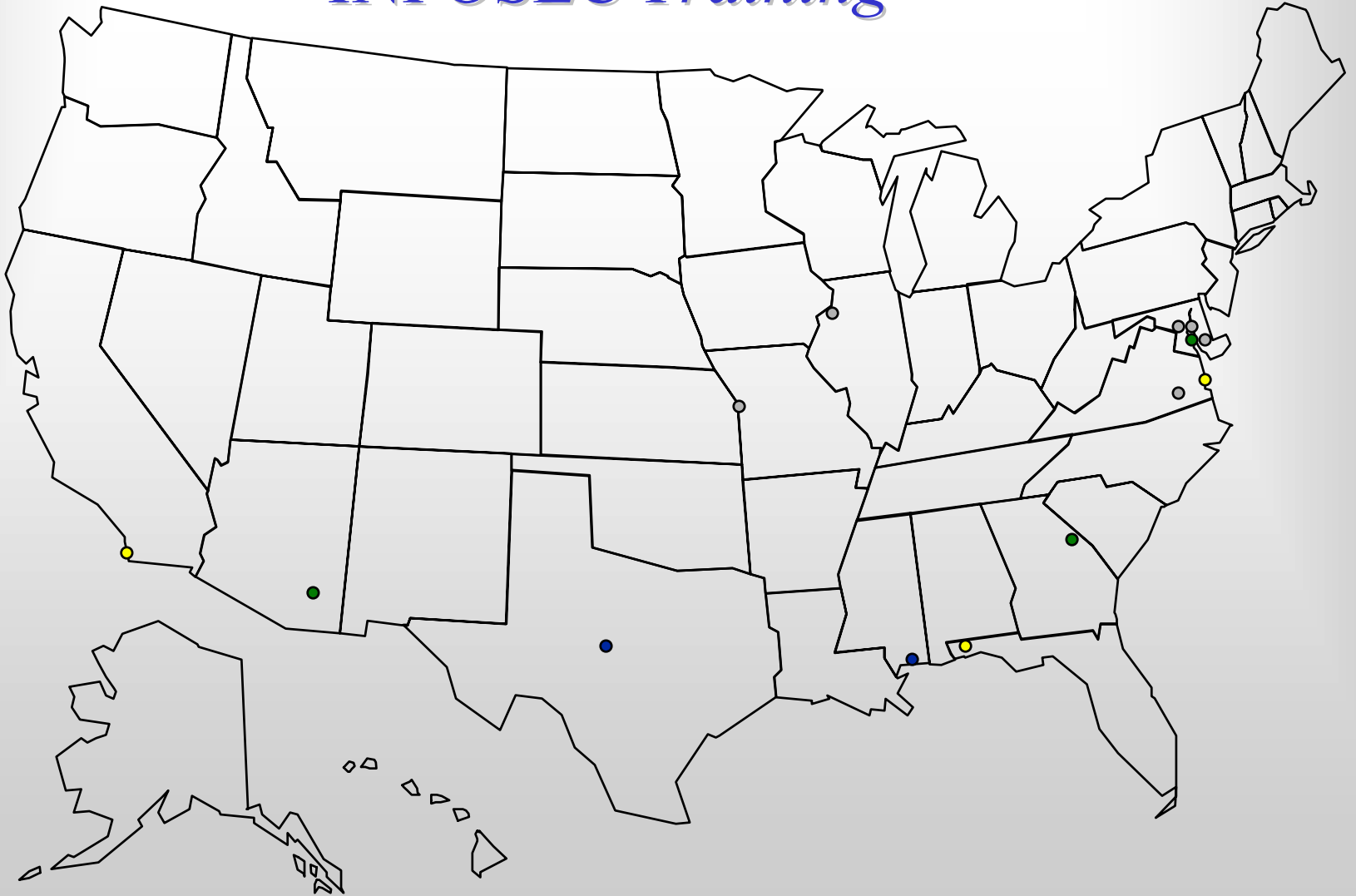
James Madison University  
George Mason University  
Idaho State University  
Iowa State University  
Purdue University  
University of California, Davis  
University of Idaho

# Major DoD Military Installations

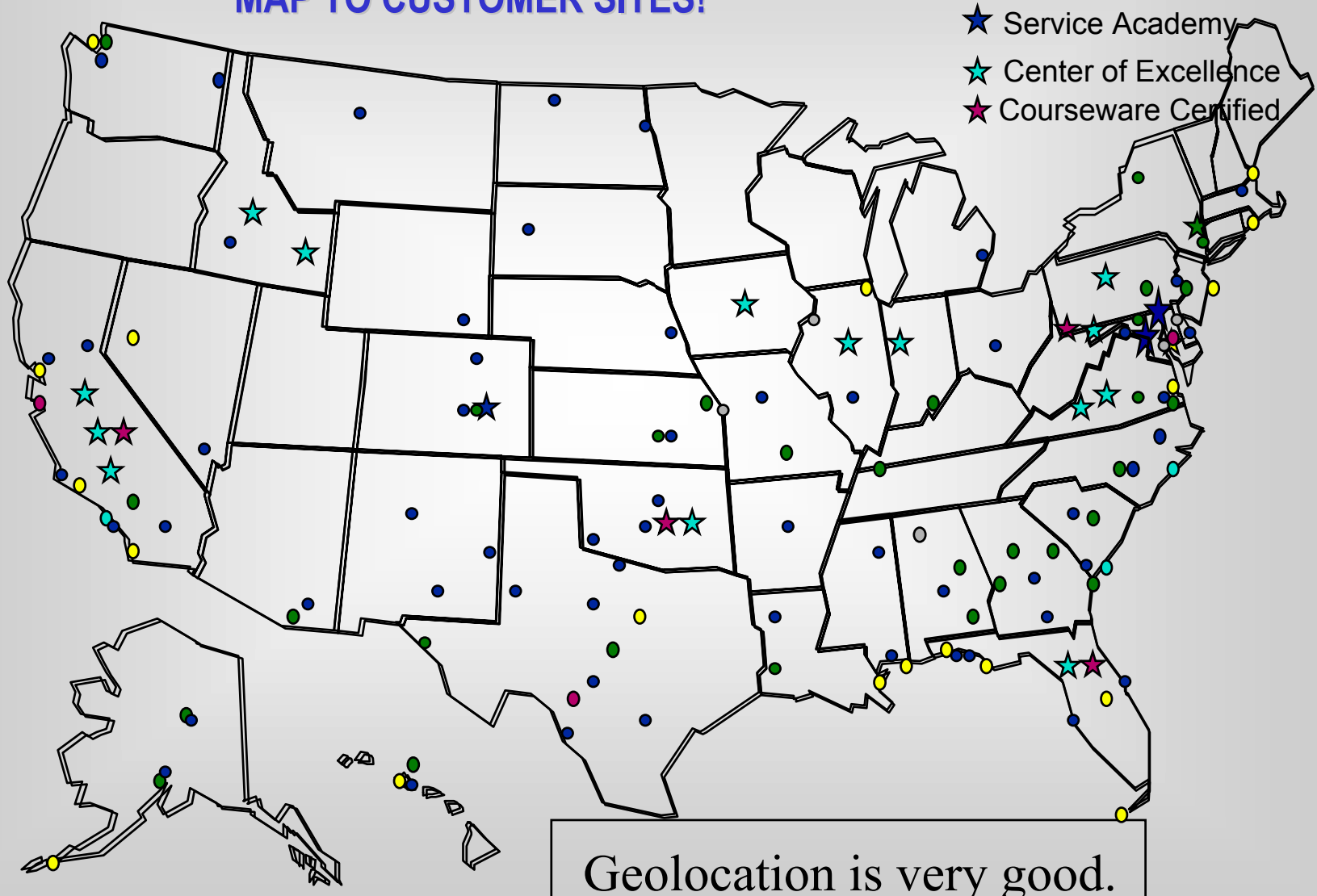
● Army    ● Navy    ● Air Force    ● Joint/Dual    ● USMC    ● Gov't



# Gov't/DoD Bases/Agencies w/ INFOSEC Training



**NSA Centers of Academic Excellence in IA Education  
Service Academies  
Institutions with NSTISSC IA Certified Courseware  
MAP TO CUSTOMER SITES!**



## *University Based Web Sites*

**George Mason: Center For Secure Information Systems**

<http://www.isse.gmu.edu/~csis>

**Purdue University: Center for Education and Research  
in Information Assurance and Security**

<http://www.cerias.purdue.edu>

**University of California, Davis: Security Lab**

<http://seclab.cs.ucdavis.edu/Security.html>

**James Madison University**

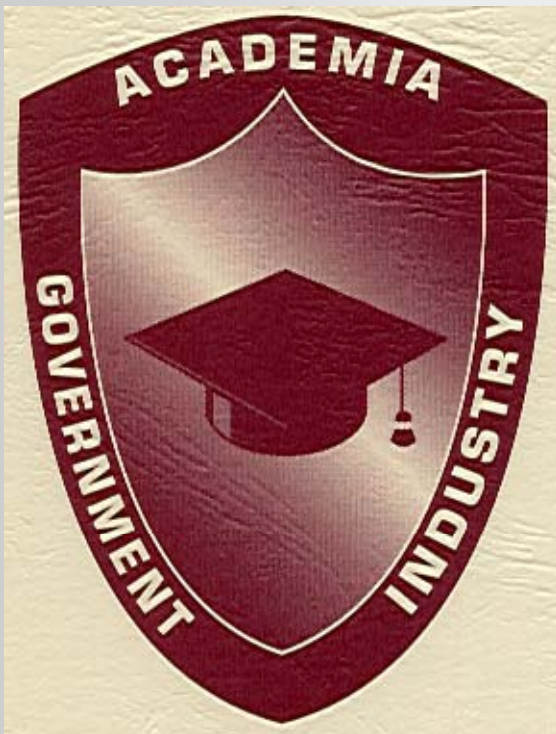
<http://www.infosec.jmu.edu>

[http://cob.jmu.edu/mba/MBAPgms.htm#TheInformation  
Security MBA](http://cob.jmu.edu/mba/MBAPgms.htm#TheInformationSecurityMBA)

**Colloquium for Information Systems Security Education**

<http://www.infosec.jmu.edu/ncisse>

# Partnerships with Business, Academia, & Government



## National Colloquium for Information Systems Security Education

*Purpose: The Colloquium provides a forum for leading figures in government, industry and academia to work in partnership to define current and emerging requirements for information security education and to influence and encourage the development and expansion of information security education, especially at the graduate and undergraduate levels.*

<http://www.infosec.jmu.edu/ncisse>



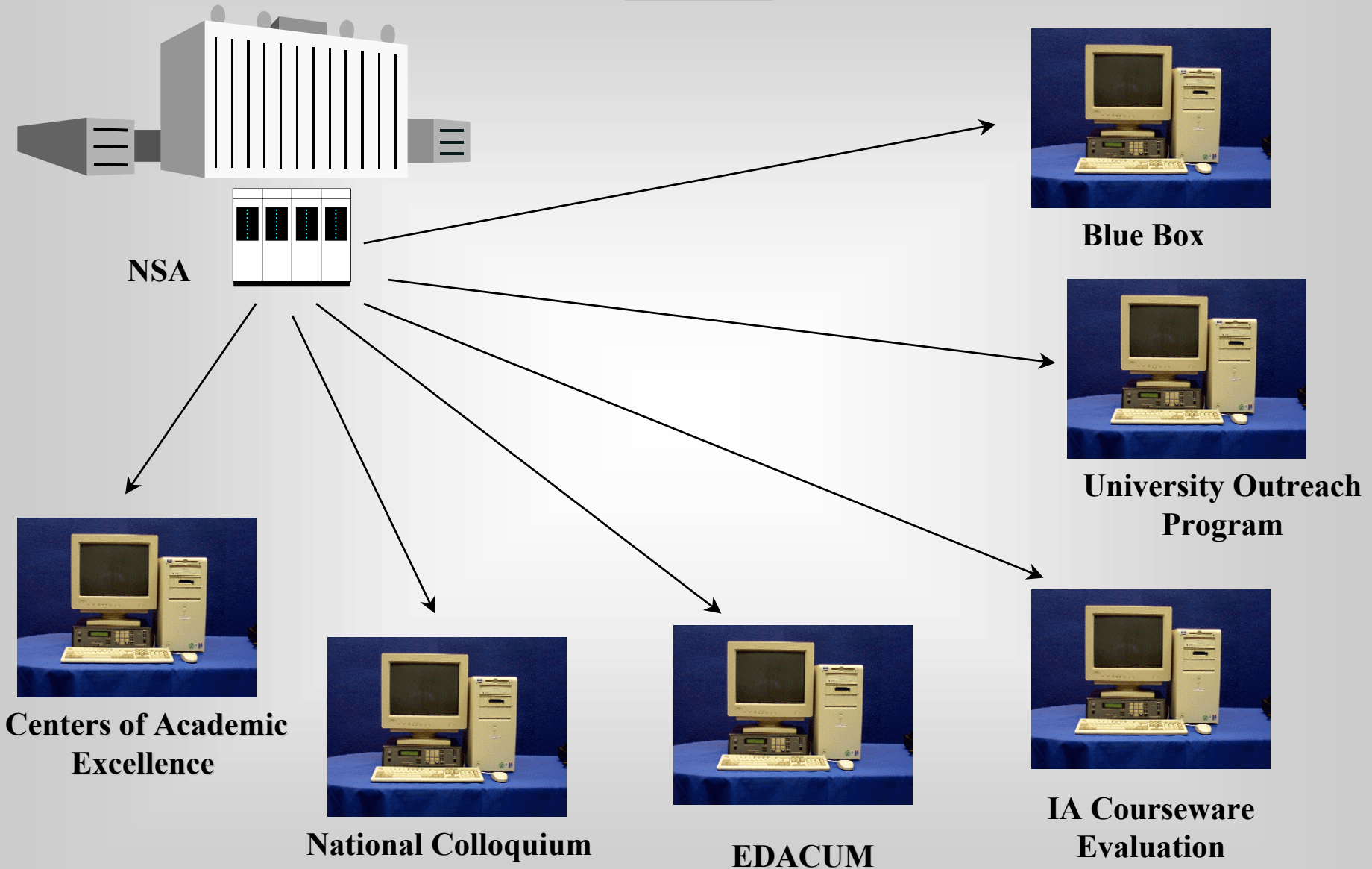


# **In Summary**



# National INFOSEC Education & Training Program

(NIETP)



***“Educational Solutions for a Safer World”***

**National**

**INFOSEC**

**Education**

**&**

**Training**

**Program**

**National Security Agency**

**ATTN: I2**

**9800 Savage Road**

**Fort Meade, Maryland 20755-6000**

**Dr. Vic Maconachy, Program Manager:**

**[w.macona@radium.ncsc.mil](mailto:w.macona@radium.ncsc.mil)**

**Phone: (410) 854-6206**

**FAX: (410) 854-7043**