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Graduate Education and Research in
Computer Security presentation to Admiral
William J. Flanagan, Jr. Commander in Chief,
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COMPUTER SECURITY PROGRAM BASED ON A STRONG FOUNDATION

ADM Flanagan

- **Teaching**
- **Non-Computer Science Students**
- **Computer Science Students**
- **Research**
- **Topics Span Industry and DoN/DoD Concerns**
- **Program Designed to Serve DoN/DoD Needs**



MORE CURRENT AND FUTURE DIRECTIONS FOR INFOSEC STUDIES AND RESEARCH

ADM Flanagan

- **Binding of Authentication to Access Control in Network Environments**
- **Security Policy Analysis**
- **Computer Intrusion and Misuse Detection**
- **Presentation and Display of Multilevel Database Information**
- **Tools for Secure Network Management**



CURRENT AND FUTURE DIRECTIONS FOR INFOSEC

STUDIES AND RESEARCH

ADM Flanagan

- **Cryptography Management for SBU Information - SPAWAR**
- **LAN Security for Multilevel Information**
- **Security for Remote Execution - WWW/JMCIS**
- **Multilevel Security on Large Networks - DARPA**
- **Experiments with MISSI Products**
- **Exfiltration Threats to Information**



RESEARCH IS VITAL

ADM Flanagan

“We must also continue to pursue research and development of technical and procedural solutions to protect our information systems, ...”

-- Hon. Emmett Paige, Jr., June 1996



TIE EDUCATION TO STRONG RESEARCH PROGRAM

ADM Flanagan

- **Education Benefits from Good Research**
- **Professors Current on Latest Developments**
- **Student Theses Contribute to Research Efforts**
 - > **Links to DoD research programs**
 - > **Co-advisors from industry when appropriate**
- **Some Graduates Continue Research at Next Assignment**
- **New Study Topics and Courses Emerge from Active Research Environment**



DISTINGUISHED LECTURE SERIES

ADM Flanagan

- **Notable Computer Security Experts**
- **Lectures to General Audience**
 - > students
 - > faculty
- **Varied Topics, esp. Computer Security for Commercial World**
- **Simultaneous Class for Smaller Group**
 - > read papers associated with lecture
 - > spend extra time with distinguished lecturer
- **Video Tape Lectures**
 - > make tapes available to other institutions
 - > incorporate video clips in multimedia materials
 - work with new CS multimedia program



NAVAL POSTGRADUATE SCHOOL PROTOTYPE COMPUTER SECURITY TRACK

ADM Flanagan

- **Introduction to Computer Security**
- **Management of Secure Systems**
- **Building a Secure System**
- **Policies, Models and Formal Methods**
- **Network Security**
- **Database Security**
- **Advanced Topics in Computer Security**
- **Thesis Research**



COMPONENTS OF GENERAL INFOSEC CURRICULUM

ADM Flanagan

- **Foundation - building security into a system**
 - > Well understood principles of computer security
 - > Learn methodology to map policy to implementations
- **System Security Planning and Management**
 - > Practical knowledge of INFOSEC techniques
 - > Students are equipped to understand and address current problems
- **Extensive Use of Laboratory Exercises**
 - > Hands-on demonstrations and projects
 - > Students gain valuable experience
- **Security in Complex Systems**



DOD BENEFITS OF NPS COMPUTER SECURITY PROGRAM

ADM Flanagan

- **Stress on Significant DoD Problem:
Protection of Classified Information**
- **High Payoff**
 - > **NPS computer security program insures a steady flow of well prepared military staff**
 - **officers with MS or Ph.D. in Computer Science**
 - **familiarity with INFOSEC research through thesis work**
 - > **Officers provide**
 - **real-world, operational experience**
 - **understanding of DoD needs and policies**
 - **understanding of interrelationships between services**



RELEVANCE OF INFOSEC FOR NAVAL POSTGRADUATE SCHOOL COMPUTER SCIENCE

ADM Flanagan

- **Military Relevance in Computer Security**
 - > Protection of Information Infrastructure tied to national security
 - > Information Security Requirements for the Warrior (C4IFTW)
 - > Computers in combat systems
 - > Computers in embedded systems
 - > Address threat of subversion of computer systems
- **Support of Emerging Military Service Needs in Computer Security**
 - > Successful rapid implementation of basic program specializing in computer security
- **Test Bed for Trusted System Technologies**
 - > INFOSEC concepts and techniques
- **Ties to Emerging Commercial Security Efforts**



ESTABLISHING INFOSEC CENTERS

ADM Flanagan

- **Two Institutions Receive NSA Startup Support**
- **DoD University**
 - > **Naval Postgraduate School**
 - **prototype program**
 - **DoD center for INFOSEC education**
 - > **Other DoD Universities Follow**
 - **service academies**
 - **Air Force Institute of Technology**
 - **others**
- **Civilian University**
 - > **University of Maryland**
 - **satisfy higher education needs of NSA**
 - > **Other civilian universities follow**



IS COMPUTER SECURITY IMPORTANT?

ADM Flanagan

“Our growing dependence on increasingly sophisticated and globally available information technologies creates vulnerabilities that can be exploited by any individual, group or nation in cyberspace. ...

Unprecedented is the Herculean task of protecting all of the nation’s electronic communications systems from unauthorized access, manipulation, corruption, and denial of service.”

- Hon. Emmett Paige, Jr., June 1996



TOPICS TO BE ADDRESSED

ADM Flanagan

- 1. Why Computer Security?**
- 2. NPS as a Center for INFOSEC Studies and Research.**
- 3. What INFOSEC topics should be taught?**
- 4. Computer security research at NPS.**



COMPUTER SECURITY
at the
NAVAL POSTGRADUATE SCHOOL

Graduate Education and Research
in
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Commander in Chief, U.S. Atlantic Fleet
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1 October 1996

by

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