

ENHANCING THE SAFETY AND SECURITY OF RADIOACTIVE MATERIAL

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Affiliates Fair
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Overview



- NRC Mission
- Changing Environment
- Prioritization of High-Risk Radioactive Materials
- IAEA Code of Conduct: Implementation & Challenges
- Interim Database & National Source Tracking System
- NRC Security Initiatives
- Federal & State Interactions
- Opportunities for Licensee Community
- Conclusions

NRC Mission



To license and regulate the Nation's civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of the public's health and safety, common defense and security, and environmental protection.



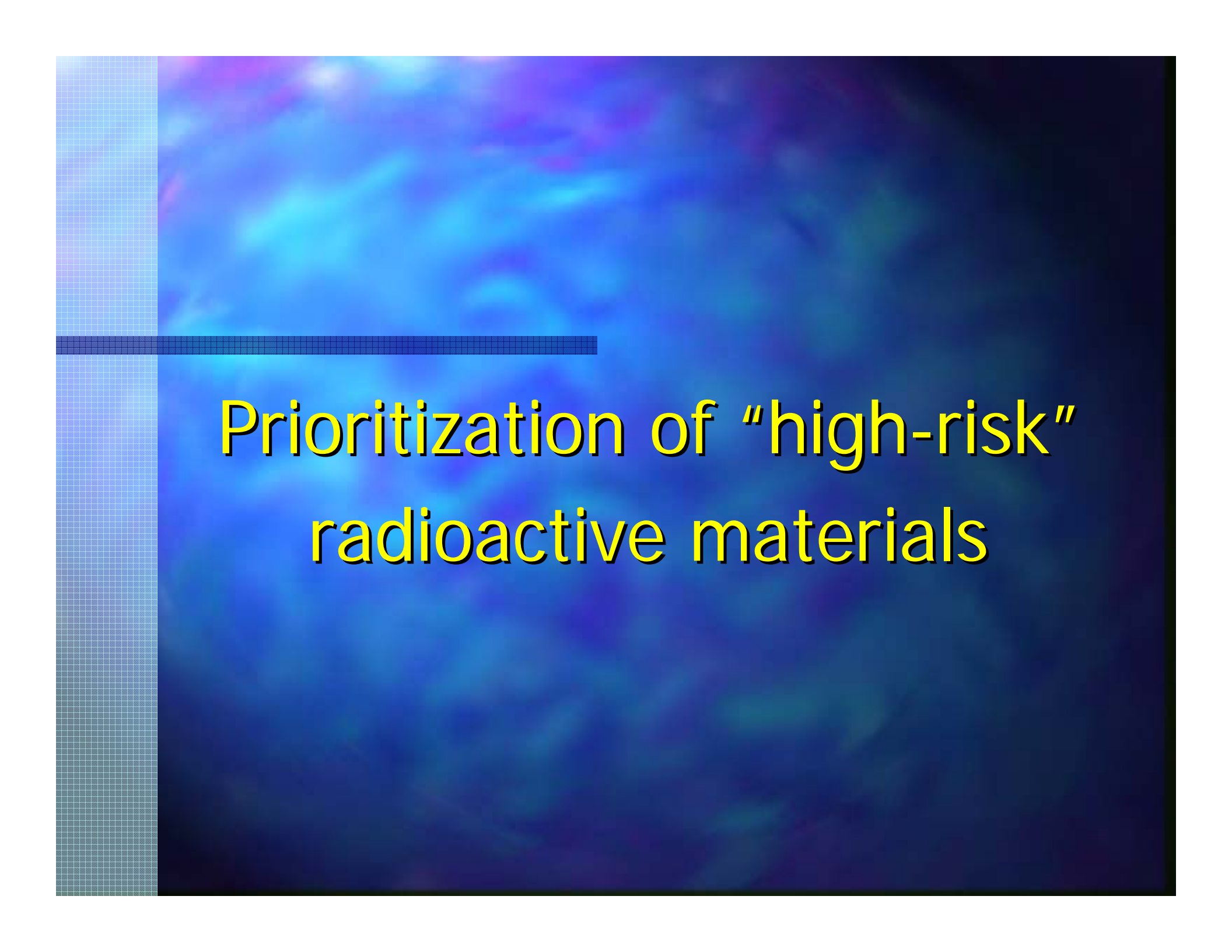
NSIR Mission



- To prevent nuclear security incidents and respond to safety and security events
 - Ensuring the security of the nation's commercial nuclear activities;
 - Focusing on the proactive and realistic development of regulatory policy, oversight, and integrated response
 - Developing security program enhancements to prevent malevolent acts against licensed activities in radioactive materials, transportation, and waste storage

A Changing Environment

- National security is dominant concern
- Obtain a new balance between
 - Safety
 - Openness, and
 - Security
- Multiple layers of systems, infrastructures



Prioritization of “high-risk” radioactive materials

NRC/DOE Joint Report on RDDs

Report addresses 4 areas:

- **Materials of greatest concern and thresholds**
- Tracking and inventory of sources
- Tagging and monitoring
- Disposal of unsecured sources

RADIOLOGICAL DISPERSAL

DEVICES: 卐

AN INITIAL STUDY TO IDENTIFY RADIOACTIVE MATERIALS OF GREATEST CONCERN AND APPROACHES TO THEIR TRACKING, TAGGING, AND DISPOSITION 卐

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Report to the 卐

Nuclear Regulatory Commission 卐

and the 卐

Secretary of Energy 卐

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May 2003 卐

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Prepared by 卐

The DOE/NRC Interagency Working Group on 卐

Radiological Dispersal Devices 卐

http://www.energy.gov/engine/doe/files/dynamic/96200392047_RDDRPTF14MAY.pdf

Cradle to Grave

Radioisotope producer



Radioactive source manufacturer



Equipment manufacturer



User

Useful life of source



Recycling programs

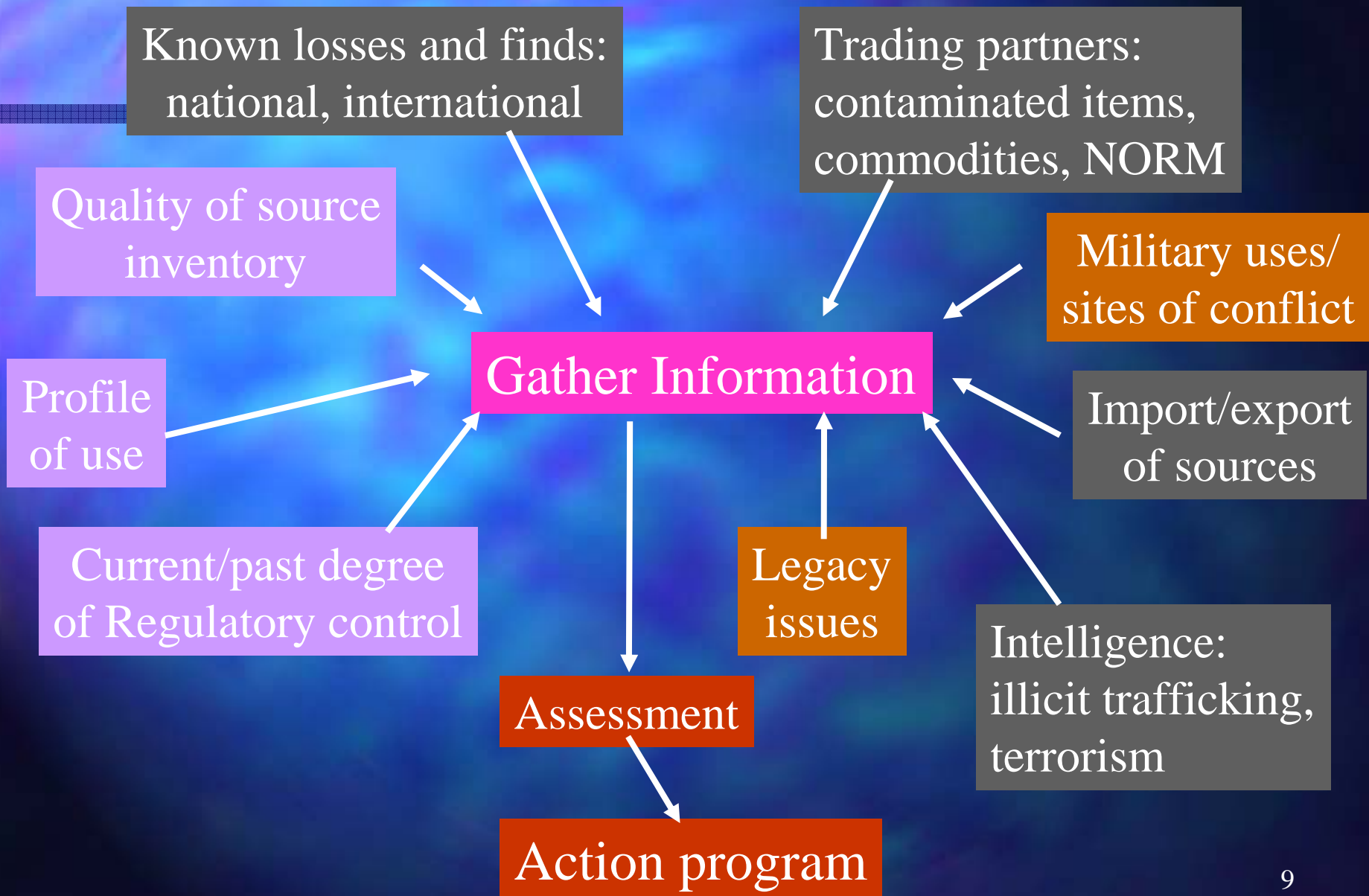


Loss of control


- orphan source
- malicious intent

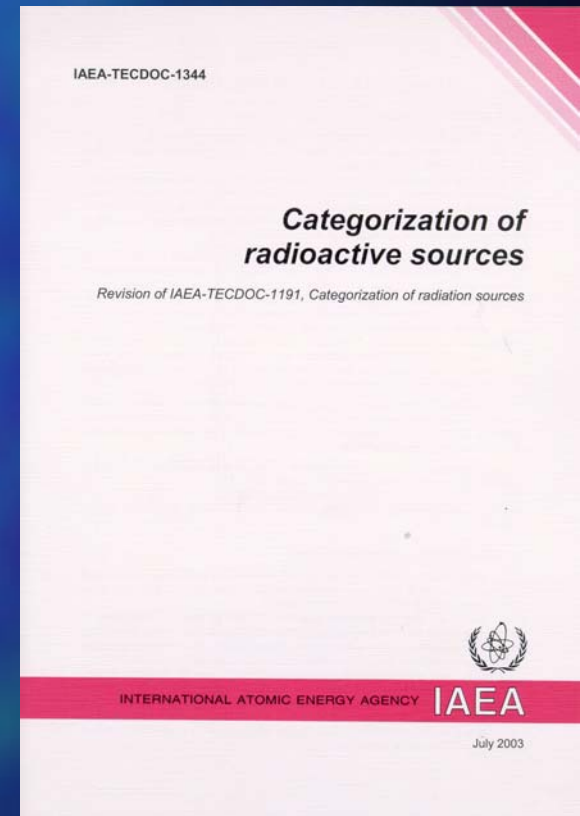
Controlled waste disposal arrangements

Assessment of Threats



Strengthening Security of High-Risk Sources

- Security is important, but ...
- Safety of sources still paramount
- IAEA-TECDOC-1344 
- IAEA's *Code of Conduct on the Safety and Security of Radioactive Sources*



IAEA Code of Conduct

- ❖ Published in final form in January 2004
<http://www-pub.iaea.org/MTCD/publications/PDF/Code-2004.pdf>
- ❖ Covers radioactive sources that may pose a significant risk to individuals, society, and the environment — Sources listed in Annex I of the Code.
- ❖ Annex I states that the Code applies to the top three source categories (the highest risk sources) of the five categories defined by IAEA TECDOC-1344
- ❖ Code's scope is further limited to Category 1 and 2 for:
 - National source tracking registry
 - Import/export provisions

Radionuclide	IAEA Category 1 & 2 Thresholds	
	Cat 1 (TBq)	Cat 2 (TBq)
Am-241 (Be)	60	0.6
Cf-252	20	0.2
Cm-244	50	0.5
Co-60	30	0.3
Cs-137	100	1
Gd-153	1000	10
Ir-192	80	0.8
Pm-147	40000	400
Pu-238	60	0.6
Pu-239 (Be)	60	0.6
Ra-226*	40	0.4
Se-75	200	2
Sr-90	1000	10
Tm-170	20000	200
Yb-169	300	3

**NRC now has authorization under the Energy Policy Act of 2005*

The Challenge of Code Implementation: World-Wide

- ❖ Some countries may lack the enabling legislation and/or regulatory infrastructure needed to fully implement the Code
- ❖ Situation presents challenge to developed countries who desire to export sources to nations who lack many of the elements of policy and programmatic controls for the safe/secure management of sealed sources



NRC Security Initiatives

Security Measures: Overall Program of Initiatives

- Enhance controls on sources
- Develop and implement revised inspection procedures for materials security
- Close collaboration with State Officials & licensees
- Reassess General License authorizations
- Conduct consequence assessment & security analyses for uses of radioactive sources and devices
- Revise import/export regulations
- Endorse the IAEA Code of Conduct and associated TECDOC-1344 high-risk isotopes and thresholds by revising regulations

Goals of Enhanced Controls on Sources

- Enhance existing controls to prevent unauthorized access
- Focus on high-risk radioactive sources
- Prevent theft/diversion for malevolent use
- Prompt detection, assessment, and reporting
- Prompt Local Law Enforcement Agency response
- Confirm shipping/receiving
- Add security for radioactive materials in transit
- Enhance Import/Export controls
- Enhance security and control using practical measures

Orders Issued Regarding Security

- Power reactors (02/02)
- Conversion facility (03/02)
- Decommissioning reactors and wet ISFSIs (05/02)
- Gaseous diffusion plants (06/02)
- Fuel fabrication facilities (08/02; 1/03)
- Transportation of spent nuclear fuel (10/02)
- Dry ISFSIs (10/02)
- Non power reactors >2 MW (10/02)

Orders Issued Regarding Security (Materials Licensees)

- Compensatory Measures for Panoramic Irradiators issued by Order dated June 6, 2003
- Additional Security Measures for Manufacturing and Distribution (M&D) Licensees issued by Order dated January 12, 2004
- Transportation of Radioactive Material Quantities of Concern (RAM QC) Order dated July 19, 2005
- Increased Controls for the Medium-Priority Licensee Groups 1 – 4 Underway

Increased Controls for Medium Priority Licensees Groups 1 - 4

Licensee Groups:

Group 1:

- Self-shielded irradiators (e.g., blood irradiators)
- Panoramic irradiators (<10,000 Ci)
- Teletherapy devices
- Gamma knife devices
- High and medium dose rate afterloaders

Group 2: Radiographers & well loggers

Group 3: Broad scope licensees & master materials licenses

Group 4: Calibration sources, waste brokers, remote service providers, general service licensees

Group 5: Radioisotopic thermal generators (RTGs)*

Status of Groups 1-4 Increased Controls

- Developed controls with States
- Controls informed by security assessments
- Increased Controls approved by the Commission 8/15/05
- NRC Chairman Letter to Governors of All Agreement States (9/2/05)
- NRC issued press release on 9/6/05
- NRC notification to other Federal and international agencies 9/6/05
- NRC & Agreement States to issue increased controls by 12/05

Increased Controls (ICs)

- Licensees that possess sources greater than IAEA Category 2 quantities

IC-1	Control Access
IC-2	Monitor, Detect, Assess, & Respond
IC-3	Transportation Security
IC-4	Additional controls to secure portable and mobile devices
IC-5	Document Retention
IC-6	Information Protection

Increased Controls (ICs)

IC-1 Control Access

- Access limited, at all times, to approved individuals to perform their duties.
 - a. Unescorted access
 - b. Trustworthiness & Reliability
 - c. Service providers shall be escorted
 - d. Document basis trustworthiness & reliability determination and maintain list

Increased Controls (ICs)

IC-2 Monitor, Detect, Assess, and Respond

- a. Monitor and immediately detect, assess and respond to unauthorized access
- b. Pre-arranged plan with LLEA for assistance
- c. Dependable means to communicate
- d. Notify the NRC or Agreement State
- e. Document each instance of unauthorized access & corrective actions

Increased Controls (ICs)

IC-3 Transportation Security

a. Table 1 < Sources < 100 times Table 1
Per consignment

- Carrier requirements
- Coordinate the expected arrival time of the shipment
- Confirm receipt of the shipment
- Investigate if the shipment does not arrive on or about the expected arrival time

Increased Controls (ICs)

IC-3 Transportation Security (Cont)

- b. 90 day advanced notification for >100 times the quantities in Table 1, per consignment (Transportation RAM QC Orders)
- c. If an M&D Licensee takes possession & ships PM 3.a. and 3.b above shall not apply
- d. Coordinate receipt of RAM with the originating licensee
 - Establish an expected time of delivery
 - Confirm timely receipt
 - Assist in any investigation

Increased Controls (ICs)

IC-4 Additional controls to secure portable and mobile devices

- Two independent physical controls that form tangible barriers to secure the material from unauthorized removal when not under direct control and constant surveillance

Increased Controls (ICs)

IC-6 Information Protection

- a. Control access to individuals that:
 - Have an established need to know the information and
 - Are considered to be trustworthy and reliable.
- b. Policies and procedures for controlling access to, and for proper handling and protection against unauthorized disclosure

NRC and Agreement State Oversight

- Temporary inspection procedures verify licensee implementation of the requirements
- Panoramic Irradiator inspections were completed January 2005
- Manufacturer and Distribution licensee inspections are due to be completed the last quarter of FY 2005.
- NRC entered into Agreements with interested Agreement States to conduct inspections
- Complete inspection of increased controls for highest risk licensees (Groups 1-4) within 1 year of implementation

Orphan Source Activities

Two Aspects to Orphan Source Control:

1. Maintain control of sources -

- Lost Source Enforcement Policy (2001)
- General License Tracking System (2002)
- Final Rule on Portable Gauges (2005)
(70 FR 2001)
- National Source Tracking System (2006)

Orphan Source Activities

2. Recover sources that become orphaned –
 - DOE's Offsite Source Recovery Program (1990)
 - MOU with DOE on Management of Sources (June 1999)
 - CRCPD National Orphan Radioactive Material Disposition Program (2001)
 - Trilateral Initiative with US/Mexico/Canada (2002)

Interim Database

Initial Database

- ~2300 NRC and Agreement State licensees contacted Nov 2003
- A 'snapshot' in time, update on annual basis
- IAEA Category 1 and 2 sources
- Collected basic data
- Data used to inform security Orders, advisories, & inform national source tracking system
- Will be periodically updated

National Source Tracking System

- Joint NRC/DOE report on RDD recommended development of a national source tracking system
- IAEA Code of Conduct recommends establishment of a national register of radioactive sources
- US Government has made a non-legally binding commitment to the Code of Conduct
- Will include sources from NRC and Agreement State licensees and DOE facilities

National Source Tracking System

- Proposed Rule
 - *Federal Register Notice* July 28, 2005
(70 FR 43646)
 - Comment period ends October 11, 2005.
 - **Public Meeting September 20, 2005, Houston**
- Final rulemaking July 2006
- Phased implementation Fall 2006

IAEA Code of Conduct Import & Exports

- Recipient country has Regulatory infrastructure
- Recipient is authorized to receive/possess sources
- Prior notice of Categories 1 & 2 sources
- Prior consent for shipments of Category 1 sources
- Exceptional circumstances

NRC Revisions: Import & Exports

- ✓ Export licenses can be issued for multiple high-risk radioactive materials, multiple countries & recipients
- ✓ NRC is contacting known recipient countries of U.S. origin high-risk radioactive material.
- ✓ NRC will request recipient countries to authorize release of IAEA mission reports to USG that assess programs for controlling radioactive material
- ✓ NRC will verify US recipient's authorization to possess material for NRC and Agreement State Licensees
- ✓ Proposed rule Sept 2004; Commission approved May 2005; Final rule effective Dec 2005

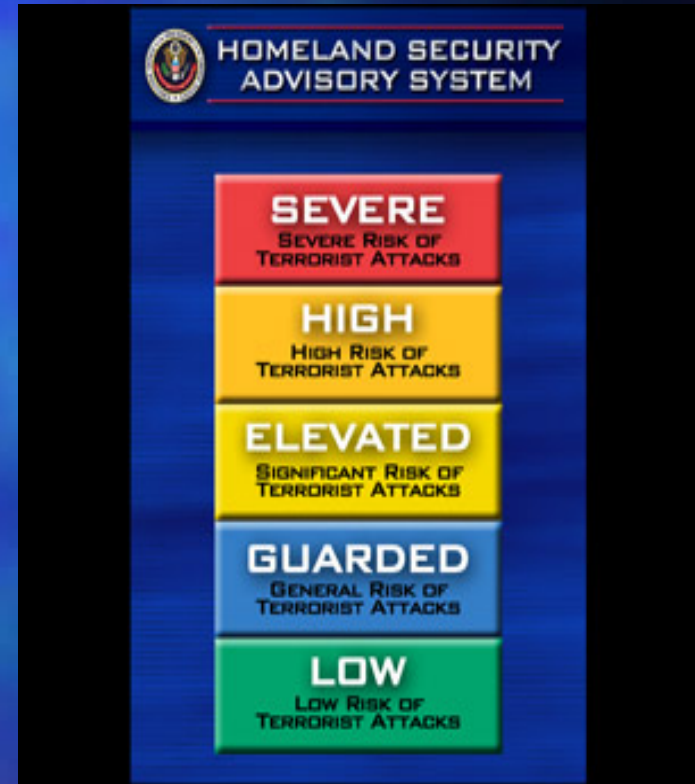
Coordination With Other Agencies



- Department of Homeland Security
- Federal Aviation Administration
- Environmental Protection Agency
- Federal Emergency Management Agency
- Department of Defense
- Department of Energy
- Department of Justice
- States
- Locals



Deal with probabilities



Not possibilities . . .

??? What If ???

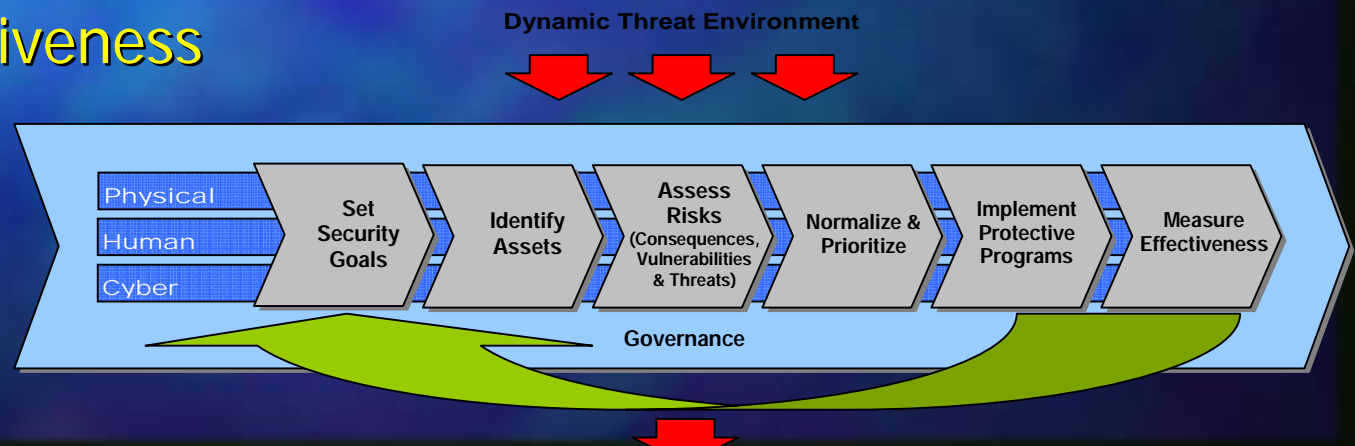
Federal Interaction on Critical Infrastructure Protection

Sector-Specific Agencies (SSAs)

Critical Infrastructure Sectors	Agriculture, Food	USDA
	Public Health, Healthcare, Food	HHS
	Drinking Water, Water Treatment	EPA
	Defense Industrial Base	DoD
	Energy	DOE
	Banking and Finance	TREAS
	National Monuments & Icons	DOI
	Transportation Systems	DHS
	Information Technology	DHS
	Telecommunications	DHS
	Chemical	DHS
	Emergency Services	DHS
	Postal and Shipping	DHS
Key Resources	Commercial Facilities	DHS
	Government Facilities	DHS
	Dams	DHS
	Nuclear Reactors, Materials, & Waste	DHS

Development of Sector-Specific Plans

- The Interim NIPP and supporting Sector-Specific Plans describe the *processes* to form the SSPs so they:
 - Set Security Goals
 - Identify assets
 - Assess risks
 - Normalize and Prioritize
 - Implement protective programs
 - Measure Effectiveness



Federal Interaction on Protective Action Guides for RDDs and INDs

- Prior to 2003, no agreed upon recovery criteria for sites following a radiological incident
- Department of Homeland Security-led RDD/IND Preparedness Working Group
- Working Group consisted of representatives from all major Federal U.S. Agencies
- State and local officials participated in a focus group, and comments incorporated.

Protective Action Guides for RDDs and INDs

- Based on EPA's 1992 *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents* (EPA 400-R-92-001)
- Guidance represent Federal consensus
- Early phase guidelines: 1 – 5 rem, with an understanding that doses above 5 rem may be unavoidable for first responders performing life saving missions.
- Intermediate phase: 2 rem first year
- Late phase (subsequent years): 500 mrem/yr projected dose

Protective Action Guides for RDDs and INDs

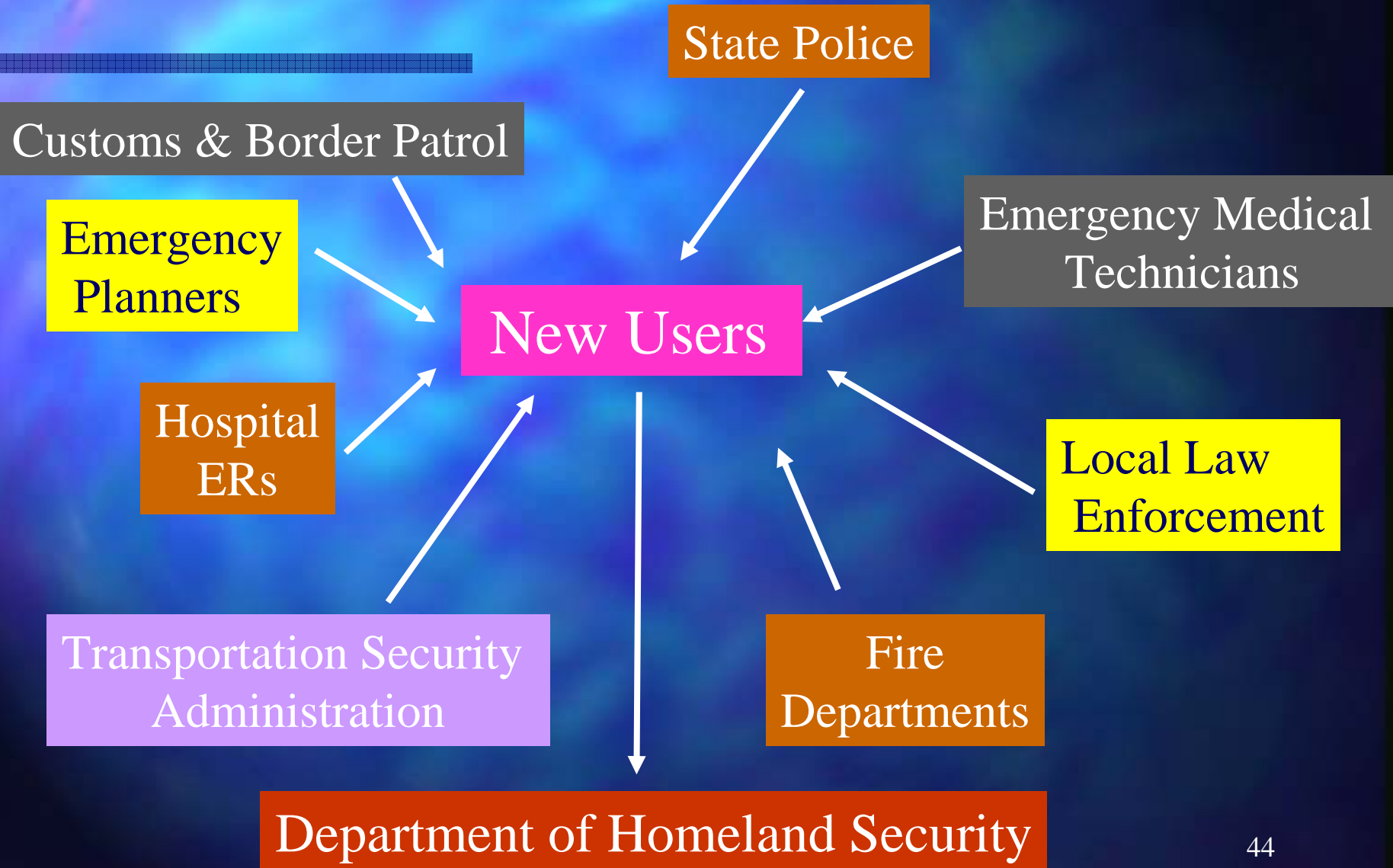
- The PAG uses an optimization process rather than setting a specific level for the late phase because clean up feasibility and economic and other tradeoffs will be highly dependent on the specifics of the situation.
- The next phase: publication in the Federal Register in the Fall 2005, to obtain broad public distribution and input.
- A communications strategy has been developed to ensure maximum response to the Federal Register Notice.

Effective Communication

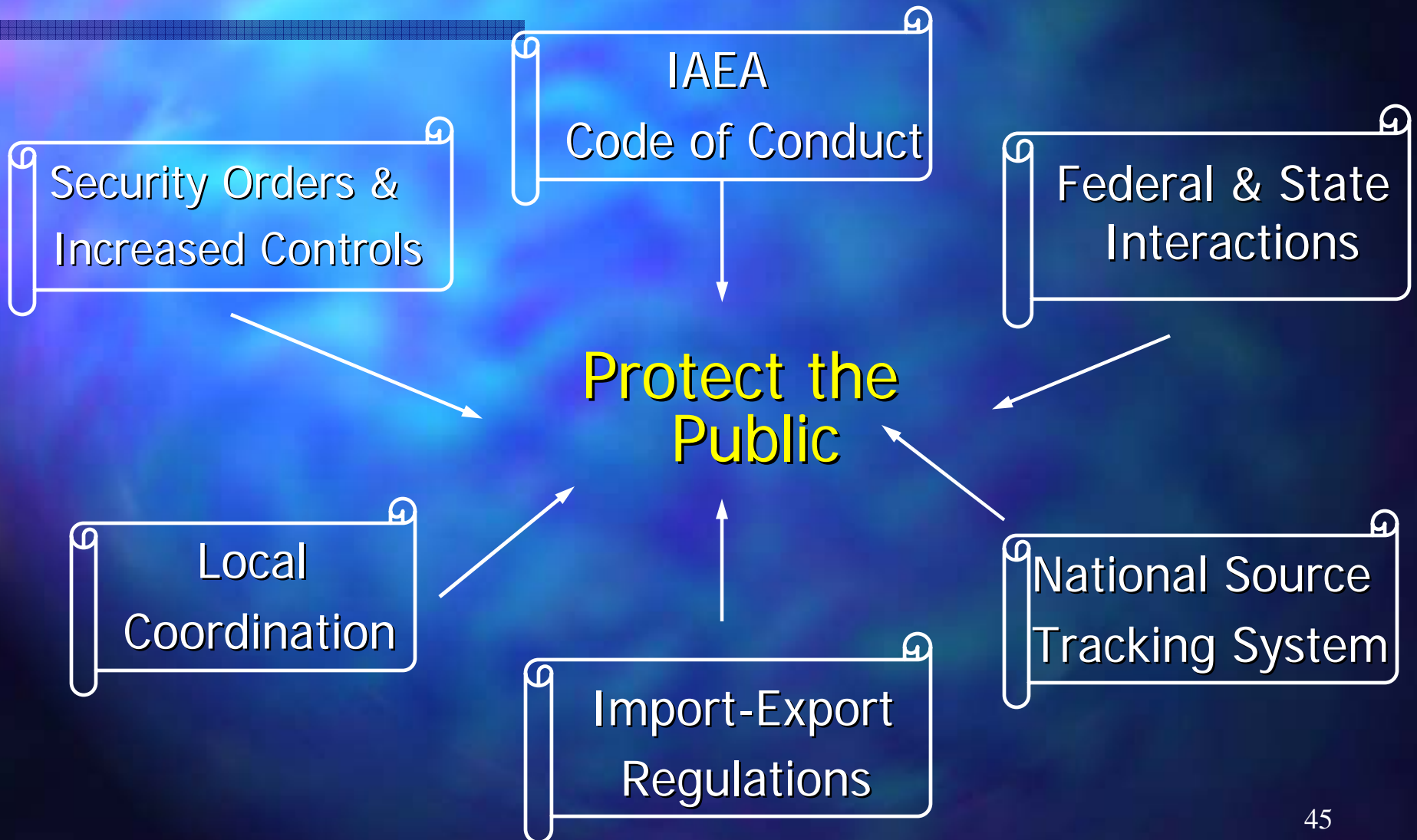
- Not easy
- Sound bites galore
- Nuclear “phobia”
- Acceptability of risk
- Balance of cost & benefits
- Responsibility of the regulator, licensees and radiation protection professionals



Expanded Opportunities



Conclusions



Thank you!



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