



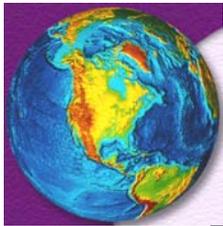
National Nuclear Security Administration

“Controlled Scientific and Technical Information (STI) – Why Protect It?”

Anatoli Welihozkiy

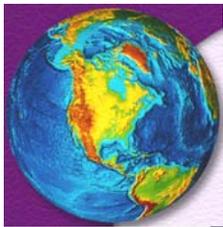
Deputy Director

Office of International Regimes and Agreements (NA-243)
National Nuclear Security Administration



NA-243 Objectives

- Deny rogue state and non state actors the acquisition of weapons of mass destruction by strengthening treaties, regimes, and international institutions, such as the NPT, the IAEA and NSG.
- Work to prevent and counter proliferation of WMD technology, equipment, delivery systems and expertise by supporting domestic and international mechanisms.
- Acting as a resource on regulatory and statutory requirements, provide support to DOE and broad NA-20 nonproliferation activities
- Promote high level Administration policies to promote nuclear technology development by supporting evolving safeguards, physical protection, security, regulatory and interdiction policies.
- Actively engage with USG and foreign governments to counter emerging and ongoing proliferation threats.
- Develop cutting edge analyses on nonproliferation topics for dissemination to USG policy makers and international experts.



NA-243: USG Technical Lead for Nuclear Technology

Functional Overview

Domestic Controls

International Controls

Industry

DOE Complex

USG

Multilateral

Safeguards/IAEA

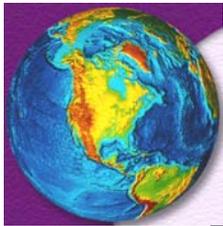
- Part 810 Authorizations
- Dual-Use
- Munitions
- NRC Assurances

- Surplus Equipment
- Deemed Exports
- Nuclear Software
- 2-yr Waiver (Reviews)
 - CRADAs
 - GIPP
- NP Seminar Series
- ECI
- RD Declassification

- Support to
- DHS:CBP,ICE
- DHS/Border Patrol,
- US Coast Guard
- FBI
- DOC/BIS/EE
- DOD and Treasury

- NSG
- Zangger Cmtee
- Wassenaar Arrgmt.
 - MTCR
 - AG
 - NPT
- 123 Agreements
- Interdiction

- Safeguards Policy
- Additional Protocol Implementation
- IAEA Governors and General Conference
- TC Reviews



NA-20
DEFENSE NUCLEAR NONPROLIFERATION
 Deputy Administrator – William Tobey

NA-24
 ADA Adam Scheinman
 DADA Cynthia Lersten

OFFICE OF INTERNATIONAL REGIMES & AGREEMENTS NA-243
 Richard Goorevich – Director / Anatoli Welihozkiy – Deputy Director

Safeguards

- Safeguards
- Safeguards Policy
- Safeguards Technology Applications
- Safeguards Tech Base
- Fuel Cycle Issues
- Global Nuclear Energy Program (GNEP)
- GNEP Safeguards - India Civil-Military Separation
- Rad Source Code of Conduct
- US-IAEA STET Agreement
- U.S./IAEA SG Agreement
- Additional Protocol
- Committee on Safeguards and Verification (CSV)

Treaties and Agreements

- 123 Agreements
- Fissile Material Cutoff Treaty
- Nonproliferation Treaty Policy
- Reliable Fuel Supply
- Nuclear Regulatory Commission Licensing
- IAEA Technical Cooperation
- IAEA TC Meeting Request
- Administrative Arrangements
- Biological Weapons Convention

Physical Protection

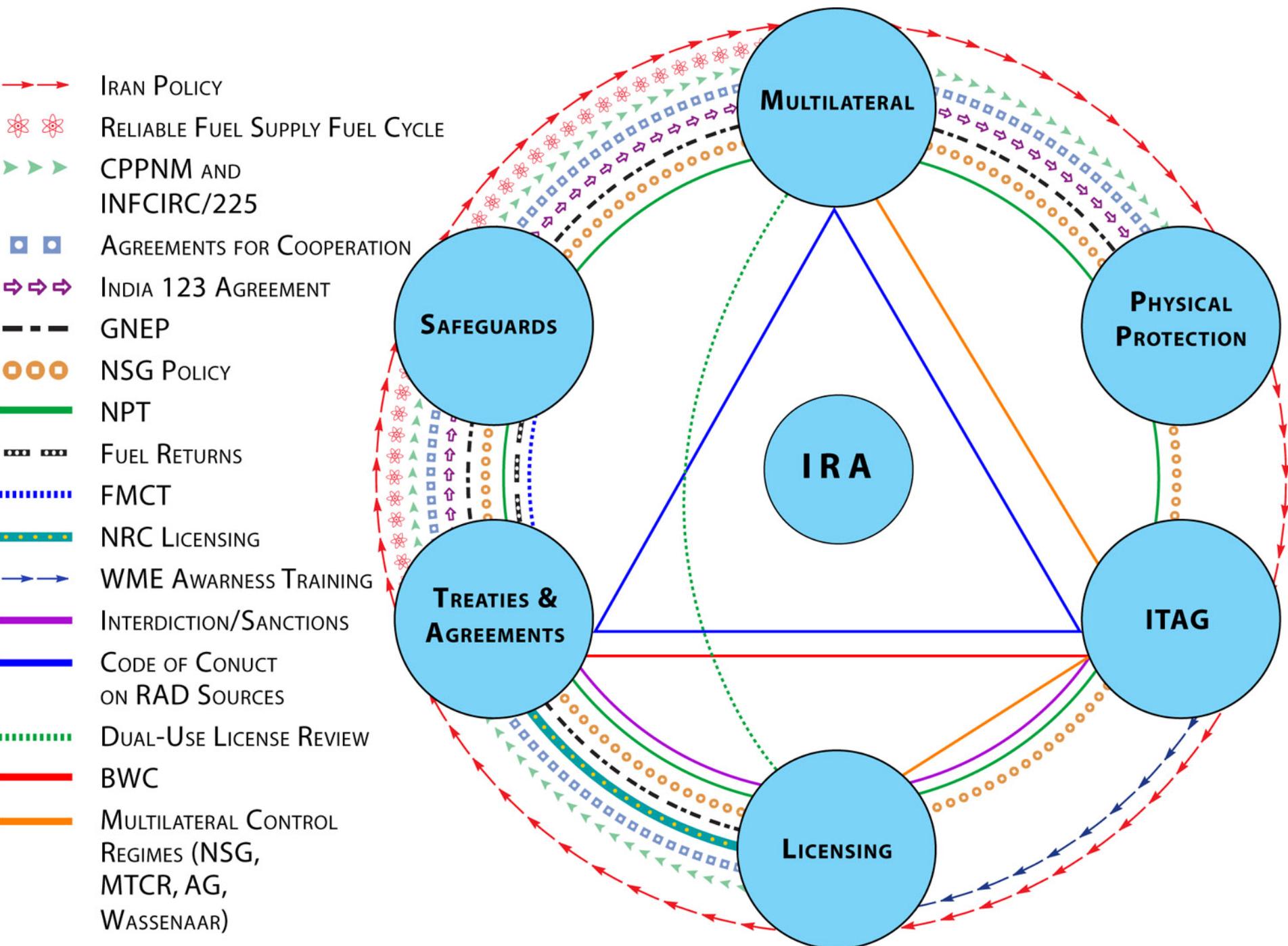
- INFCIRC/225
- Physical Protection Bilaterals
- Nuclear Suppliers Group Policy
- Zangger Committee Policies
- Proliferation Security Initiative (PSI)
- Interdiction
- Global Nuclear Energy Policy Technical Review
- High Enriched Uranium Guidelines
- Nuclear Security Documentation with IAEA
- Counterterrorism
- Convention on the Physical Protection of Nuclear Material Amendment

Multilateral

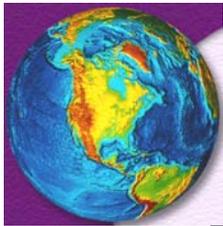
Licensing / Interdiction Tech Analysis Group

- DOC and State Nuclear License Reviews
- 10 CFR 810 Nuclear Technology Authorizations
- DOE Software Code Reviews
- Missile License Cases
- National Security Cases
- Chem/Bio License Reviews
- ACEP / Operating Committee
- MTCR
- Australia Group
- Wassenaar
- SNEC / NIAG
- MTEC / MTAG
- Shield Licensing
- Shield Interdiction
- Sanctions Issues
- Two-year Waivers
- RD Declassification
- DOE EC Assurance Program
- Property Management Course
- Nonproliferation Seminar Series
- WMD Training

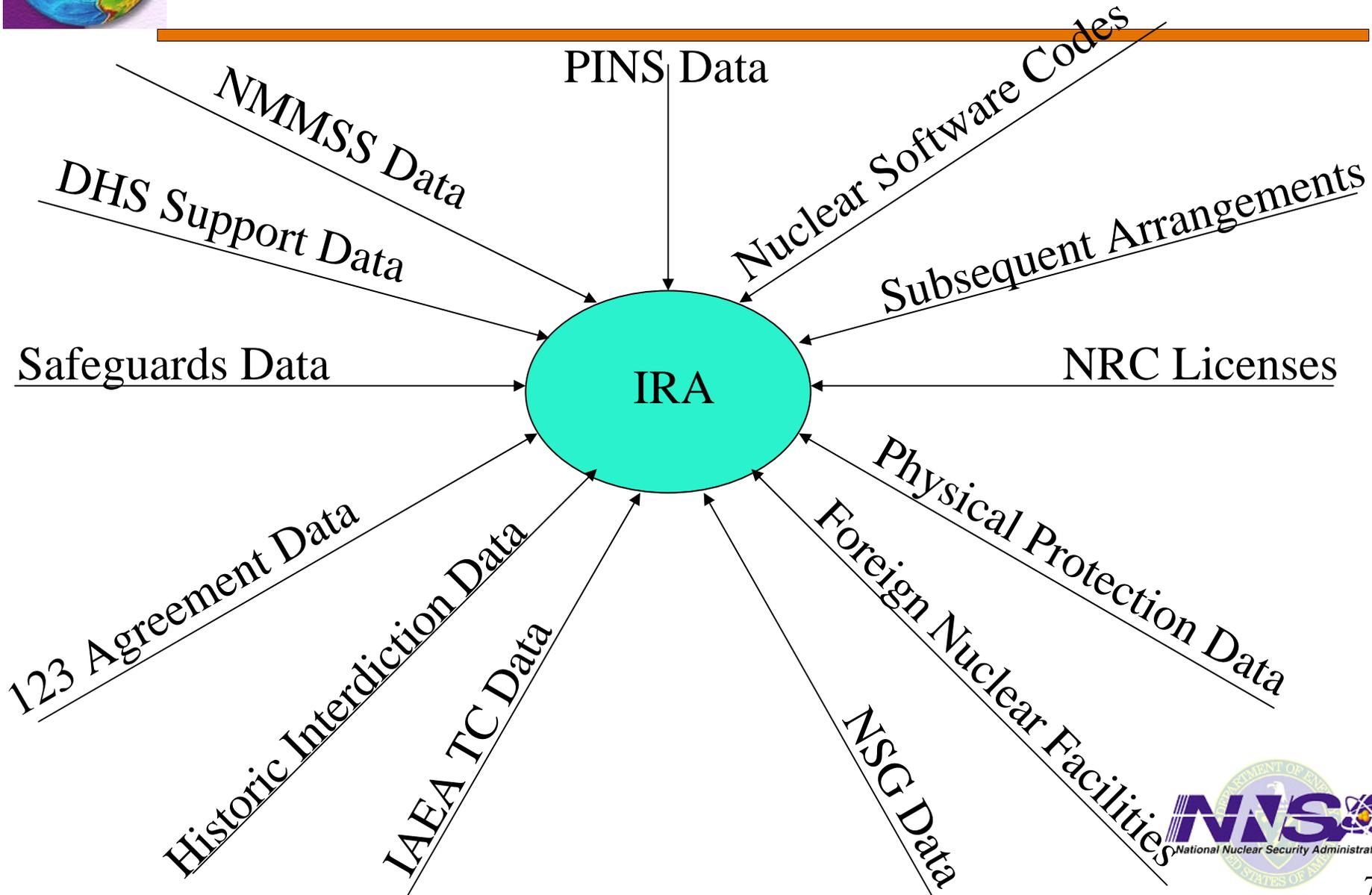


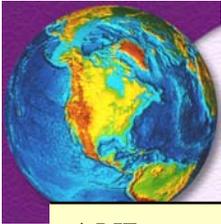


	Global Regimes	Safeguards	Licensing	Multilateral	Physical Protection	ITAG
Agreements for Cooperation	Light Blue					
BWVC	Orange					Orange
Code of Conduct on Rad Sources		Yellow		Yellow		Yellow
CPPNM/ INFCIRC/225	Dotted Light Blue					
Export Request Reviews			Light Green			
FMCT	Purple					
Fuel Returns	Grey					
GNEP	Brown					
India 123 Agreement	Pink			Pink		Yellow
Interdiction			Dark Green			
Iran Policy	Teal					
Multilateral Control Regimes			Red			Red
NPT	Light Purple					
NRC Licensing	Light Purple		Light Purple			
NSG Policy	Dotted Yellow					
Reliable Fuel Supply/ Fuel Cycle	Diagonal Green			Diagonal Green		
Sanctions	Vertical Green		Vertical Green			Vertical Green
WME Awareness Training			Orange			Orange



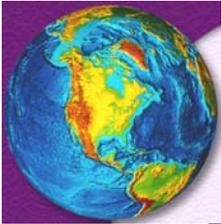
Information Integration



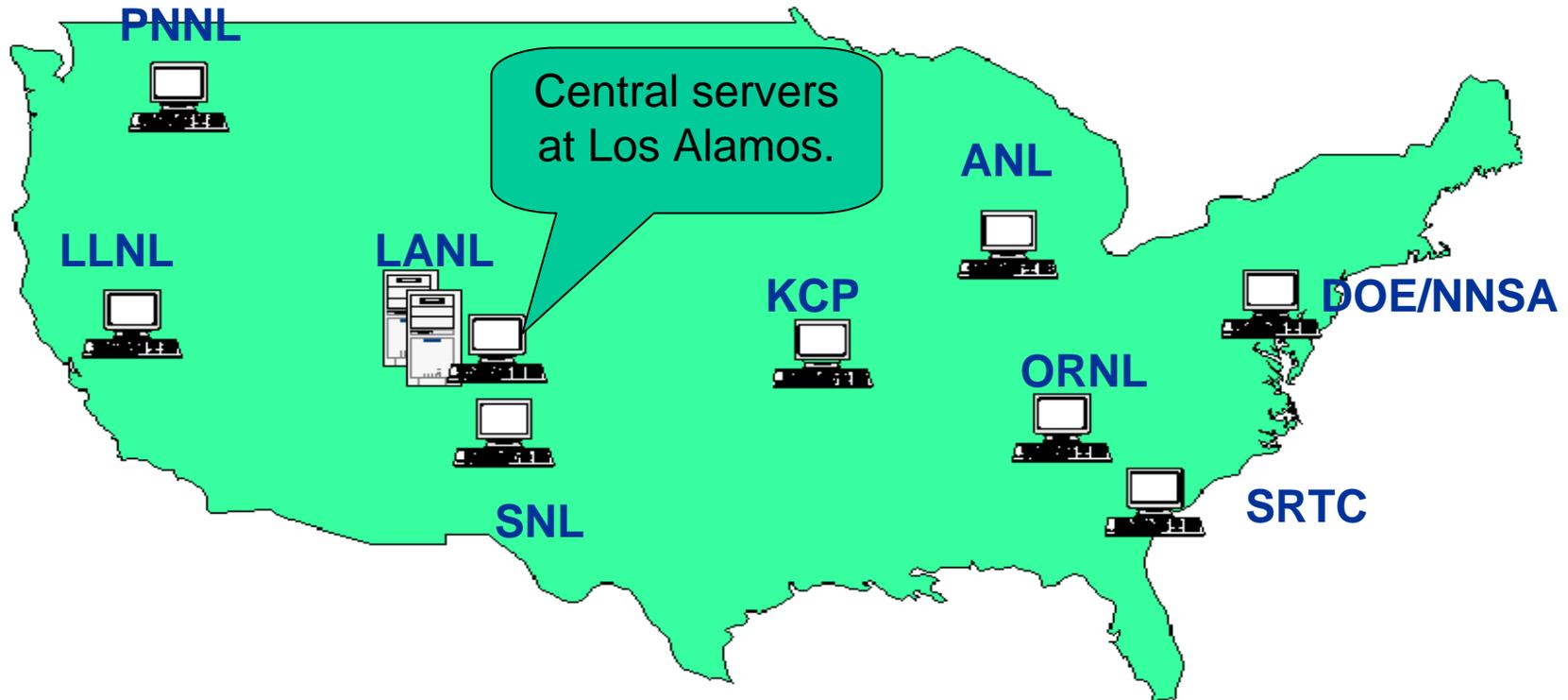


National Labs/Sites & Missions

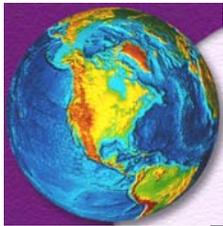
ANL	DuPage County, IL	Science & energy research, environmental management, national security.
BNL	Long Island, NY	Nuclear physics, chemistry of materials, nonproliferation.
INEL	Idaho Falls, ID	Global Nuclear Energy Partnership, Reactor Research and Design.
KCP	Kansas City, MO	Stockpile stewardship, production of non-fissionable nuclear weapon components.
LLNL	Livermore, CA	Stockpile stewardship, nonproliferation, safeguards, homeland security, research.
LANL	Los Alamos, NM	National security, stockpile stewardship, nonproliferation, modeling & simulation.
Oak Ridge	Roane County, TN	Neutron science, biological systems, energy, advanced materials, supercomputing.
PNNL	Richland, WA	Basic & applied research, national security, chemical, physical, and biological sciences.
Pantex	Amarillo, TX	Stockpile stewardship, weapon dismantlement, high explosives, storage of nuclear materials.
SNL	Albuquerque, NM	Weapon design, nonproliferation, energy research, military applications, national security.
SRNL	Central Savannah River Area, SC	Nuclear materials management, environmental restoration, nonproliferation, safety.



DOE Technical Review Network

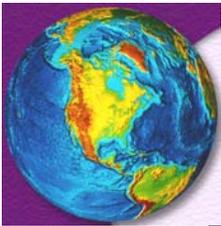


- Currently nine government sites connected via encryption units
- Approximately 130 users
- Additional servers at DOE/NNSA/NA-243, LLNL, and ANL



FY 2007 Overview

- **Estimate review of 7,000 export requests (FY06 reviewed 7,323) for export control licensing requirements and WMD proliferation concerns.**
- **Provide WMD awareness training for 800 U.S. export enforcement officials, and about 150 nonproliferation policy officials in NP Seminar series (HQ, LANL/NTS, LLNL, KCP/SNL, ORNL, and SRNL).**
- **Prepare the Proliferation Trade Control Database (PTCD) for use by USG licensing and enforcement officials, and spin-off export controlled product identification for ECCO and High Risk Property Use**
- **Develop PART 810 policy and procedures for**
 - **Hyde Act requirements**
 - **GNEP Projects**



Step 1: Search Commodities

NNSA
National Nuclear Security Administration

Office of Nonproliferation and International Security

HOME | CONTACT | CHANGE PASSWORD | LOGOUT | ABOUT US | UPLOAD

PTCD Search

Official Use Only -- Business Proprietary: Protected by 12(c) of the Export Administration Act

Search the Directory by Commodity

You may use any of the criteria below to limit your results.

Search for Commodities by key word

Commerce Control List (CCL) Short Description

Standard Product Name

ECCN

Schedule B

Official Use Only -- Business Proprietary: Protected by 12(c) of the Export Administration Act

Official Use Only

Search Commodities

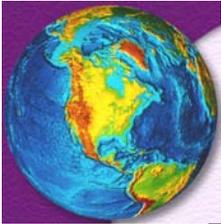
Search Companies

Guides/Handbooks

Reports

EAR 744.2 Nuclear Facilities

Training



Step 2: Select Framing Camera

Office of Nonproliferation and International Security

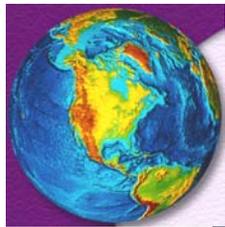
HOME | CONTACT | CHANGE PASSWORD | LOGOUT | ABOUT US | UPLOAD PTCD Search

Official Use Only -- Business Proprietary: Protected by 12(c) of the Export Administration Act

CCL Search Results

Search Criteria: CCL Short Description:cameras;

Commodity Overview	License Records	CCL Short Description (43 found)	ECCN List	Schedule B List
		Cameras (still), for underwater use	8A992.b	
		Cameras (still), underwater photographic	8A002.e	
	<input button"="" camera="" data-bbox="357 839 396 868" icon"="" type="button" value="+</input></td><td>Cameras, electronic streak type</td><td>6A003.a.3, 6A203.b.1</td><td></td></tr><tr><td>	<input #"="" button"="" type="button" value="+</input></td><td>Cameras, mechanical</td><td>6A203.a.1, 6A003.a</td><td></td></tr><tr><td></td><td></td><td>Cameras, photo-optical step and repeat</td><td>3B991.b.2.d.1</td><td></td></tr><tr><td></td><td></td><td>Cameras, radiation hardened TV</td><td>6A203.c</td><td></td></tr><tr><td></td><td></td><td>Cameras, scanning & scanning camera systems</td><td>6A003.b.2</td><td></td></tr><tr><td></td><td></td><td>Cameras, video using solid state sensors</td><td>6A003.b.1</td><td></td></tr></tbody></table><p> <<Previous Page 1 of 4 Pages Next>> <p>Official Use Only -- Business Proprietary: Protected by 12(c) of the Export Administration Act</p>		



Step 3: Read the Description

CCL Short Description: [Cameras, framing \(click for suppliers\)](#)

ECCN

(click on ECCN for control language)

[6A003.a](#)

[6A203](#)

Schedule B



- A 1995 state-of-the-art electronic framing camera. Inside showing from right to left the input lens beam-splitting optics microchannel-plate image intensifiers and electronic components surrounding a CCD output.

Description

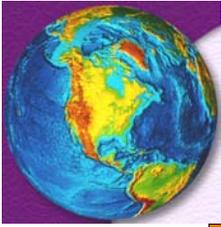
elements (for example lenses and beam splitters) and/or an electronic sweep tube inside the camera enclosure. There may also be internal image intensifiers. There will be electronic components for controlling shuttering or sweep speed and also for generating high voltages needed by tubes or image intensifiers. The figure shows a 1995 state-of-the-art electronic framing camera. Framing cameras might use generation II or III military night vision tubes or close variations that incorporate microchannel-plate electron multipliers and proximity-focused diode intensifier tubes. One indication of the probable use of such tubes for a fast-gating

generally be sufficient for these Auxiliary computers or other trade in older surplus units in do-it-

used in developing high explosive also are used in studies of

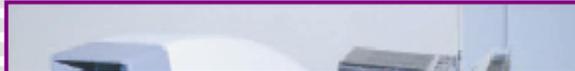
approximately rectilinear with a input) and a screen resembling as a microchannel plate coupled to ra for recording the image which video recorder. There will probably osure. There will be optical imaging





Step 4: Click on the ECCCN

CCL Short Description: [Cameras, framing \(click for suppliers\)](#)



6A203 Cameras and components, other than those controlled by 6A003, as follows (see List of Items Controlled).

ECCCN

(click on ECCCN for control language)

[6A003.a](#)

[6A203](#)

Schedule B

Description

License Requirements

Reason for Control: NP, AT

Control(s)

NP applies to entire entry

AT applies to entire entry

Country Chart

NP Column 1

AT Column 1

License Exceptions

LVS: N/A

GBS: N/A

CIV: N/A

List of Items Controlled

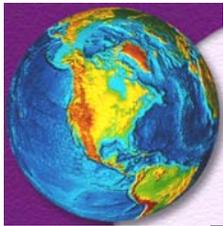
Unit: Equipment and components in number; parts and accessories in \$ value

Related Controls: (1) See ECCCNs 6E001 ("development"), 6E002 ("production"), and 6E201 ("use") for technology for items under this entry. (2) Also see ECCCN 6A003.a.2, a.3, and a.4.

Related Definitions: N/A

Items:



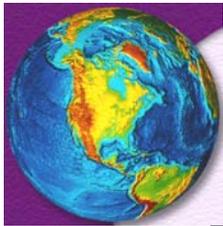


WMD Awareness Training Implementation Locations

- Atlanta, GA*
- Baltimore, MD
- Blaine, WA
- Boise, ID
- Boston, MA*
- Buffalo, NY *
- Carson, CA
- Charleston, SC *
- Chicago, IL
- Columbus, OH *
- Corpus Christi, TX
- Chula Vista, CA *
- Dallas, TX
- Del Rio, TX
- Denver, CO
- Detroit, MI
- El Paso, TX*
- Ft. Lauderdale, FL*
- Glynco, GA *
(FLETC)
- Houston, TX*
- Jacksonville, FL
- Laredo, TX *
- Los Angeles, CA*
- Memphis, TN
- McAllen, TX *
- Miami, FL *
- Nashville, TN
- Newark, NJ *
- New Orleans *
- New York, NY *
- Nogales, AZ
- Oakland, CA*
- Orlando, FL *
- Omaha, NE
- Philadelphia, PA
- San Antonio, TX *
- San Diego, CA*
- San Francisco, CA *
- San Jose, CA
- Savannah, GA*
- San Juan, PR
- Seattle, WA*
- St. Paul, MN
- Tacoma, WA
- Tampa, FL*
- Tucson, AZ
- Washington, DC*
- Wilmington, OH

* - Multiple training sessions





NUCLEAR SUPPLIER GROUP MEMBERSHIP

Argentina

Australia

Austria

Belarus (NSG only)

Belgium

Brazil

Bulgaria

Canada

China

Croatia (NSG only)

Cyprus (NSG only)

Czech Republic

Denmark

Estonia

Finland

France

Germany

Greece

Hungary

Ireland

Italy

Japan

Kazakhstan

Korea, Republic of

Latvia

Lithuania

Luxembourg

Malta

Netherlands

New Zealand

Norway

Poland

Portugal

Romania

Russia

Slovakia

Slovenia

South Africa

Spain

Sweden

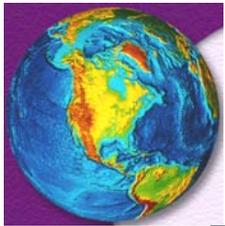
Switzerland

Turkey

Ukraine

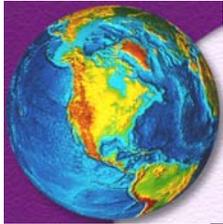
United Kingdom

United States



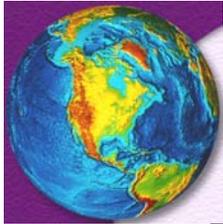
Compliance Advisory: DEEMED EXPORTS

- Technical documents, including software: Before sharing with foreign nationals an Export Controlled Information (ECI) review needs to be performed. The review should confirm whether the technical information or software supports and/or describes -- the design, development, production, operation, repair, refurbishment, overhaul, installation, or maintenance of export controlled equipment, parts, components, or materials. ECI can not be shared until it can be confirmed whether an export license is required from Commerce, NRC or State or a DOE authorization under 10 CFR 810.



Compliance Advisory: DEEMED EXPORTS (continued)

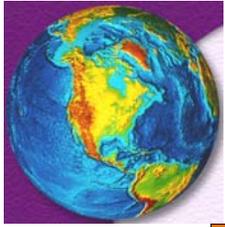
- When conducting fundamental research foreign nationals can not be given full access to use (operate, repair, refurbish, overhaul, perform maintenance, and install) equipment and/or materials and/or software unless it has been determined whether the items are export controlled to the person's country and where applicable export licenses have been received.



Sensitive Technical Information

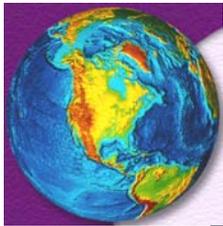
Can be contained in speeches, presentations, abstracts, handouts, blueprints, plans, diagrams, models, tables, engineering designs or specifications, manuals, or instructions written or recorded on other media or devices such as disk, tape, or read-only memories on the construction, production engineering, manufacture, integration, assembly, inspection, testing or quality assurance process for the following:

- 1) Production and test equipment;
- 2) Export controlled metals, equipment, and materials; and
- 3) Software (including computational tools and techniques).



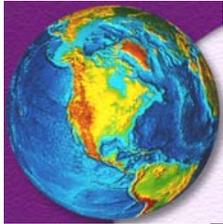
Examples of Science and Technology Information Categories

- Applied Technology
- Copyrighted Information
- Protected Data (such as CRADA)
- Export Controlled Information (ECI)
- Official Use Only documents
- Legal documents
- Limited Rights Data (such as trade secrets)
- Naval Nuclear Propulsion Information (NNPI)
- Patent Pending documents or information
- Personally Identifiable Information (PII)
- Unclassified Controlled Nuclear Information (UCNI)



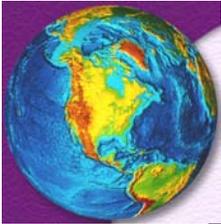
Sensitive Subjects List (SSL)

- The Sensitive Subjects List (SSL) is a generic compilation of technical subject matter or technologies that is intended to aid the *Department of Energy* (DOE) when to consult an export control specialist and/or the EAR + ITAR.
- The list identifies subjects related to the development and production of weapons of mass destruction (nuclear, chemical, and biological) and their delivery systems (including missiles), conventional weapons, and other technologies deemed significant to the national security of the United States.



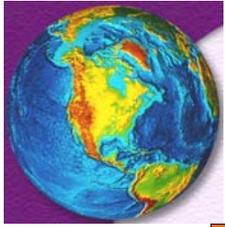
Sensitive Subjects List (SSL) -cont

- Nuclear Weapons Development and Testing
- Nuclear Fuel Cycle Activities
- Nuclear-Related Material Production and Safeguards
- Rockets and their Delivery Systems
- Conventional Arms and other Defense Technology
- Topics related to Chemical and Biological Weapons
- Advanced Scientific Computers and Software



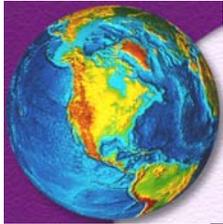
Definition of a U.S. Person

- Lawful permanent resident as defined by 8 U.S.C. 1101(a)(20) or who is a protected individual as defined by 8 U.S.C. 1324b(a)(3) such as a refugee or asylum grantee.
- Can also mean any corporation, business association, partnership, society, trust, or any other entity, organization, or group that is incorporated to do business in the United States. This also includes any government entity (federal, state, or local).



Definition of a Foreign person

- Any natural person who is not a lawful permanent resident as defined by 8 U.S.C. 1101(a)(20) or who is not a protected individual defined by 8 U.S.C. 1324b(a)(3) such as a refugee or asylum grantee.
- Can also mean any foreign corporation, business association, partnership, society, trust, or any other entity, organization, or group that is not incorporated or organized to do business in the United States. This also includes any international organizations, foreign government (including their agencies or subdivisions such as foreign diplomatic missions).

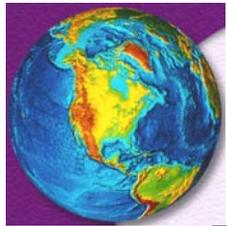


Commerce Control list Categories

- 0 = Nuclear Materials, Facilities, and Equipment (and Miscellaneous Items)
- 1 = Materials, Chemicals, Microorganisms and Toxins
- 2 = Materials Processing
- 3 = Electronics
- 4 = Computers
- 5 = Telecommunications and Information Security
- 6 = Sensors and Lasers
- 7 = Navigation and Avionics
- 8 = Marine
- 9 = Propulsion Systems, Space Vehicles, and Related Equipment

Five Product Groups

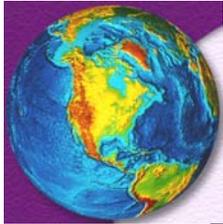
- A. Systems, Equipment and Components
- B. Test, Inspection and Production Equipment
- C. Material
- D. Software
- E. Technology



Catch All Control

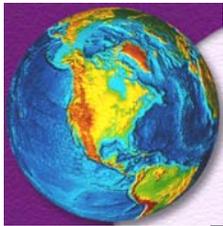
(15 CFR Part 744 of the EAR)

- Even for commodities (equipment, materials, software, and technical documents) that do not appear on the control list, a license is required to all destinations where the commodity could be used directly or indirectly in proscribed nuclear or chemical or biological or missile activities.



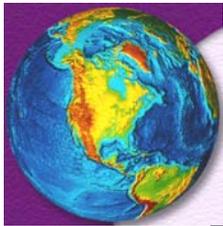
State Department- Directorate of Defense Trade Controls over Weapons

- Authority Arms Export Control Act 1976, Section 38
- I Firearms, Close Assault Weapons and Combat Shotguns
- II Guns and Armament
- III Ammunition/Ordinance
- IV Launch Vehicles, Guided Missiles, Ballistic Missiles, Rockets, Torpedoes, Bombs, and Mines
- V Explosives and Energetic Materials, Propellants, Incendiary Agents, and Their Constituents
- VI Vessels of War and Special Naval Equipment
- VII Tanks and Military Vehicles
- VIII Aircraft and Associated Equipment
- IX Military Training Equipment and Training
- X Protective Personnel Equipment and Shelters



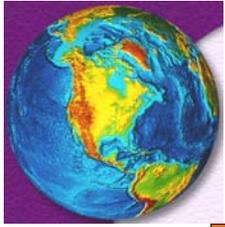
State Department- Directorate of Defense Trade Controls over Weapons (continued)

- XI Military Electronics
- XII Fire Control, Range Finder, Optical and Guidance and Control Equipment
- XIII Auxiliary Military Equipment
- XIV Toxicological Agents, Including Chemical Agents, Biological Agents, and Associated Equipment
- XV Spacecraft Systems and Associated Equipment
- XVI Nuclear Weapons, Design and Testing Related Items
- XVII Classified Articles, Technical Data and Defense Services Not Otherwise Enumerated
- XVIII Directed Energy Weapons
- XIX [Reserved]
- XX Submersible Vessels, Oceanographic and Associated Equipment
- XXI Miscellaneous Articles



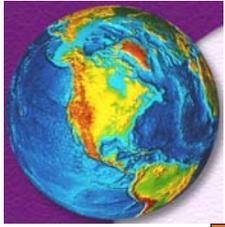
State Department -International Traffic in Arms Regulations (lists controlled weapons)

- U.S. Munitions List Exports Reviewed by Energy
 - Category V – Explosives, Propellants, Incendiary Agents
 - Category XVI Nuclear Weapons Design and Test Equipment
 - (a) Any article, material, equipment, or device which is specifically designed or modified for use in the design, development, or fabrication of nuclear weapons or nuclear explosive devices.
 - (b) Any article, material, equipment, or device which is specifically designed or modified for use in the devising, carrying out, or evaluating of nuclear weapons tests or any other nuclear explosions (including for modeling or simulating the employment of nuclear weapons or the integrated operational use of nuclear weapons), except such items as are in normal commercial use for other purposes.
 - (c) Nuclear radiation detection and measurement devices specifically designed or modified for military applications.



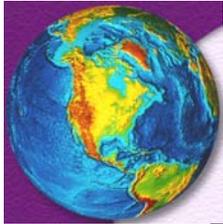
Nuclear Regulatory Commission

- NRC licenses exports of Trigger List items:
 - Nuclear reactors
 - Special nuclear material
 - Byproduct material
 - Components and other parts of facilities
 - Deuterium
 - Nuclear grade graphite



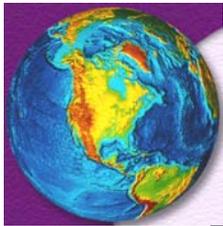
U.S. has Section 123 Agreements for Cooperation with these Parties:

- Argentina, Australia, Bangladesh, Brazil, Bulgaria, Canada, China, Columbia, Czech republic, Egypt, Euratom, Hungary, Indonesia, IAEA, Japan, Kazakhstan, South Korea, Morocco, Norway, Peru, Poland, Romania, Slovakia, South Africa, Switzerland, Taiwan, Thailand, Ukraine
- Agreements with the Russian Federation and India are currently being negotiated by Department of State and Department of Energy.



Department Of Energy - Part 810 Authorization (export of unclassified nuclear technology)

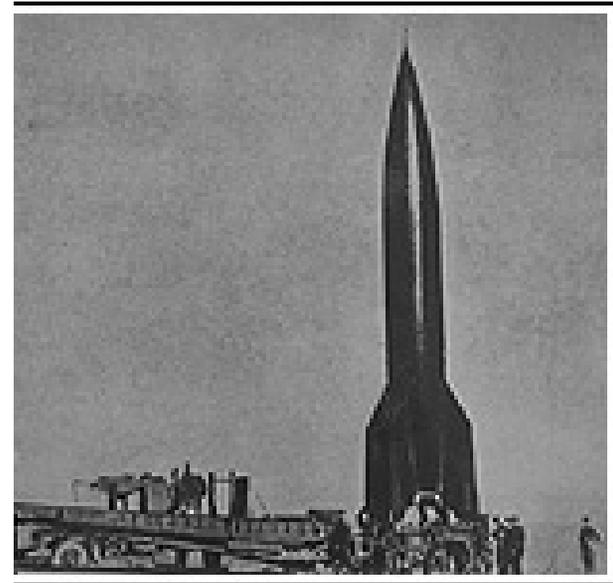
- Implementing Section 57b of the Atomic Energy Act, which requires that:
 - Secretary of Energy must authorize U.S. persons to engage directly or indirectly in the production of Special Nuclear Material outside the U.S.
 - Special nuclear material is enriched uranium and plutonium, persons includes individuals and corporations
 - Secretary must have concurrence of Department of State and must consult Departments of Defense and Commerce, and Nuclear Regulatory Commission.



Reverse Engineering and Development via Technical Documents and Assistance

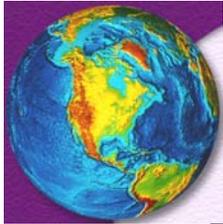


German V-2 Ballistic Missile



Soviet R-2 Ballistic Missile

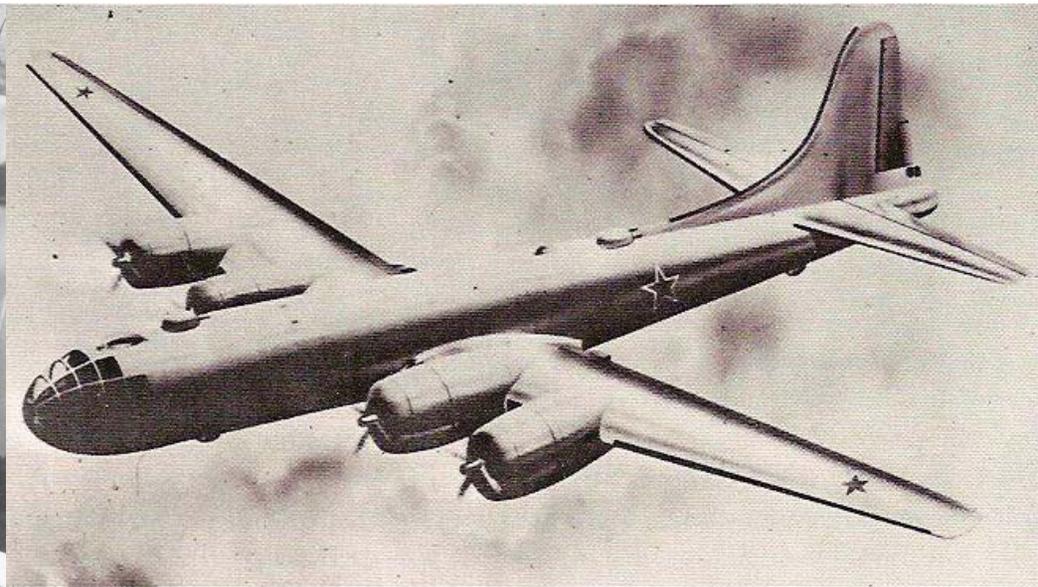
- Western allies captured most of the German V-2 technical documents
 - US - Guidance
 - USSR - Propulsion
- Soviets utilized captured German scientists to recreate technical documents critical to the production process.



Reverse Engineering

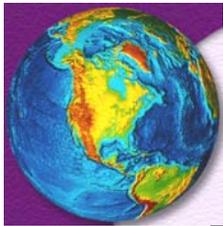


American B-29 Bomber



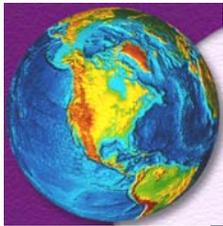
Soviet Tu-4 Bomber

- B-29 “Hap Arnold Special” taken apart for reverse engineering
- Soviet agents sent to the United States to acquire parts and documents
- Soviet program advanced by 5 years and built ~850 Tu-4s composed of 105,000 parts



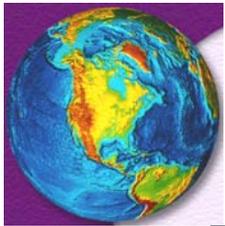
Diversion of “Blueprints”

- In early 1980’s, PRC foreign nationals purchased masks (glass) containing layered electronic circuit design of U.S export-controlled microprocessor.
- Similar to technical documents, the masks could enable replication given specialized fabrication equipment was also available.



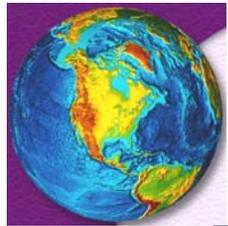
Pratt & Whitney 1998

- 42 violations of the Export Administration Regulation (EAR)
- Pratt failed to obtain export licenses for controlled technical data related to material coating and gas turbine engine components, which were sent to China, Japan, and Singapore.
- Pratt also violated “deemed export” provisions of the EAR releasing export controlled data to foreign nationals from Germany, Spain, and the Netherlands
- Pratt charged a \$150,000 civil penalty.



DOE IG-06045 April 13, 2004

- Ames Laboratory hired two foreign nationals to conduct fundamental research
- Research evolved from fundamental to applied to development of dual-use prototype
- Foreign nationals developed technical documents, design drawings and prototype.
- A small series production line was configured – all absent an export control review.



STI Loss Scenario – ITT Night Vision

- “A five-year criminal investigation began in August 2001 when special agents from the Defense Department's Criminal Investigative Service found that ITT had illegally sent a classified U.S. military *document* about night-vision technology to foreign nationals in Britain.”
- Consequence: ITT fined \$100 million for illegally sending night-vision technology to foreign countries. The combination of documentation and hardware in foreign hands may improve reverse engineering.



National Nuclear Security Administration

THE END