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10 CFR Part 37

Physical Protection of Byproduct Material

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Career Experience

- **Regulatory**
 - Nuclear Regulatory Commission
 - Department of Energy
- **Consulting**
 - Science Applications International Corporation, Inc.
 - Lamb Associates, Inc.
 - Advanced Technology and Laboratories, Inc.
 - The Environmental Company, Inc.
- **Association/Non-Profit**
 - Nuclear Energy Institute
 - National Council on Radiation Protections and Measurements
 - American College of Radiology
 - AAPM
- Member Advisory Board School of Health Sciences – Purdue University
- Member of the Peer Review Team for DOE/NNSA on U.S. medical isotope production capability





NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

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NRC AMENDS REGULATIONS ON SECURITY OF RADIOACTIVE MATERIALS

The Nuclear Regulatory Commission is amending its regulations to codify and expand upon recent security measures the agency has imposed for certain sensitive radioactive materials.

In a final rule to be published soon in the *Federal Register*, the NRC adds a new Part 37 to its regulations in Title 10 of the U.S. Code of Federal Regulations (10 CFR), and makes conforming changes to other parts of NRC regulations regarding radioactive materials.

The new regulation, which takes effect one year after publication, establishes security requirements for the most risk-significant radioactive materials (those in Category 1 and Category 2 of the International Atomic Energy Agency's rankings of radiation sources), as well as for shipments of small amounts of irradiated reactor fuel.

Why is Part 37 Needed?

- NRC considers Category 1 and Category 2 quantities* to be risk significant and therefore to warrant additional protection.

*Category 1 and Category 2 quantities are based on the quantities established by International Atomic Energy Agency (IAEA) in its Code of Conduct on the Safety and Security of Radioactive Sources



Category 1 and Category 2 Radioactive Materials

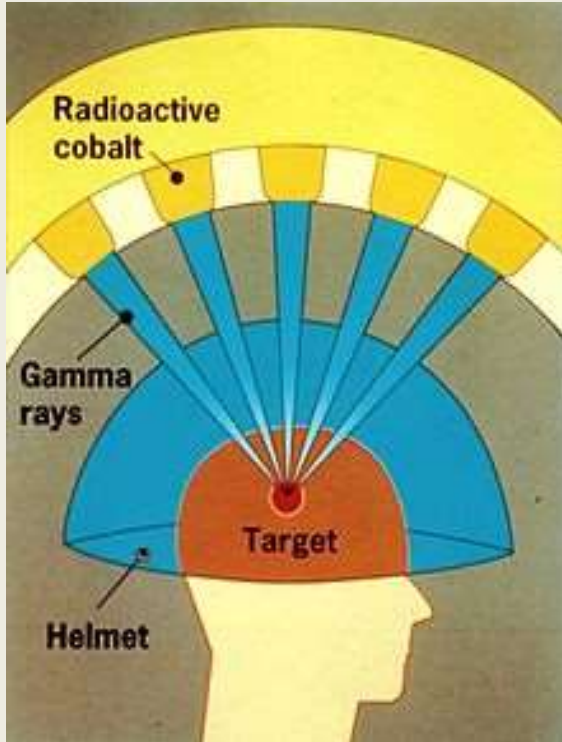
Category 2 Radioactive Materials

Radioactive material	Category 1 threshold		Category 2 Threshold	
	Terabecquerels (TBq)	Curies (Ci)	Terabecquerels (TBq)	Curies (Ci)
Curium-244	50	1,350	0.5	13.5
Cobalt-60	30	810	0.3	8.10
Cesium-137	100	2,700	1	27.0
Gadolinium-153	1000	27,000	10.0	270
Iridium-192	80	2,160	0.8	21.6
Plutonium-238	60	1,620	0.6	16.2
Plutonium-239/Beryllium	60	1,620	0.6	16.2
Promethium-147	40,000	1,080,000	400	10,800
Radium-226	40	1,080	0.4	10.8
Selenium-75	200	5,400	2.0	54.0
Strontium-90 (Yttrium-90)	1,000	27,000	10.0	270
Thulium-170	20,000	540,000	200	5,400
Ytterbium-169	300	8,100	3	81.0

Gamma-Knife
RadioSurgery
~6000 Ci Cobalt-60

ViewRay™ System
~35,000 Ci to 45,000 Ci Cobalt-60

Gammacell® Irradiator
1000 Elite / 3000 Elan
~ 750 Ci to 3000 Ci Cs-137



Examples of Category 2 Sources





Final Rule

- Create new 10 CFR Part 37 for physical protection of byproduct material
 - Category 1 and Category 2
 - Irradiated fuel (<100 grams)
- Conforming changes to Parts 20, 30, 32, 33, 34, 35, 36, 39, 51, 71, and 73



10 CFR 37 – *Physical Protection of Byproduct Material*

- **The Rule Objective:**

To provide reasonable assurance of preventing the theft or diversion of category 1 and category 2 quantities of radioactive material

- Final Rule: Issued March 19, 2013 [[78 FR 16921](#)]
- Effective Date: May 20, 2013
- Compliance Date: March 19, 2014



Part 37 Subparts

- Subpart A - General Provisions
- Subpart B - Access Authorization Program
- Subpart C - Security During use
- Subpart D - Transportation Security
- Subpart E - Reserved
- Subpart F – Records
- Subpart G - Enforcement



Scope

- Subparts B and C of Part 37 **apply to any person who, under the regulations possesses or uses at any site,** an aggregated category 1 or category 2 quantity of radioactive material.
- Subpart D of Part 37 applies to any person who, under the regulations of Part 37:
 - (1) Transports or delivers to a carrier for transport in a single shipment, a category 1 or category 2 quantity of radioactive material; or
 - Imports or exports a category 1 or category 2 quantity of radioactive material; the provisions only apply to the domestic portion of the transport.



General Provisions

- Part 37 only applies to those that have an aggregated quantity of category 1 or category 2 radioactive materials
- Definitions



General Provisions

- Exemptions [10 CFR § 37.11]
 - NRC-licensed activities are exempt from Subparts B and C of this part to the extent that its activities are included in a security plan required by Part 73 *Physical Protection of Plants and Materials* security plan
 - Radioactive waste containing Category 1 and 2 quantities of radioactive material is exempt from Subparts B, C, and D of Part 37.
 - Unless it contains discrete sources, ion-exchange resins, or activated material that weighs < 2,000 kg (4,409 lbs.) is not exempt from the requirements of Part 37.



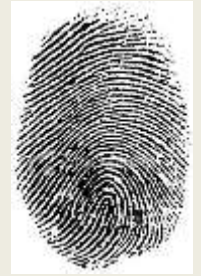
Access Authorization Program

- Limit unescorted access to authorized individuals
- Background investigation
 - Initial
 - Every 10 years
- Grandfather provision





Background Checks



- Elements
 - Fingerprinting and criminal history record check
 - Verification of true identity
 - Work and education history evaluation
 - Character and reputation determination
 - Independent information
- **No credit check** required as part of background check
 - NRC received numerous negative comments
- Licensee can transfer the background check information to another licensee when the employee authorizes this.
- Initial check you must go back 7 years and recheck every 10 years



T& R Grandfather Requirements

- If an individual was found to be trustworthy and reliable (T&R) for unescorted access to category 1 or category 2 materials under the Fingerprint Orders they may continue to have unescorted access to category 1 or category 2 materials without further investigation.
- They are subject to reinvestigation requirements.





Reviewing Official

- The Reviewing official **must have** an FBI background check and **must have unescorted access to Cat 1 or 2 security zones or access to SGI.**
 - HR personnel impact
- Licensee can designate the Reviewing official, must submit to NRC under oath – T&R, **NRC does not need to approve.**



Access Authorization Program cont.

- Determinations made by licensee approved reviewing officials
- Documented determination basis
- Right to correct and complete information
- Provision for transfer of information



Access Authorization Program cont.

- Relief for certain categories of individuals
- Procedures
- Records – 3 year retention
- Protection of information
- Annual program review



Physical Protection Requirements During Use

- Security plan
- Implementing procedures
- Training commensurate with responsibilities
- Protection of information



Physical Protection Requirements During Use cont.

- Local Law Enforcement Agency (LLEA) coordination
- Security zones
- Monitoring and detection of unauthorized entry
- Assessment and response



Physical Protection Requirements During Use cont.

- Mobile device measures
 - Relief from disabling of vehicle, if health and safety issue
- Maintenance and testing
 - Manufacturer suggested frequency
- Reporting of events
- Annual program review



Physical Protection During Transit

- Verification of license before transfer
 - Not needed for within company transfers
 - New emergency provision
- Preplanning and coordination
- No-later-than arrival time (Category 2)
- Advance notifications (Category 1)
- Reporting of events



License Verification

- **Must verify** Category 2 source transfers through the NRC Licensing verification system, or if this system is not in place, **must contact the regulatory authority** that issued the receiver's license to verify.
- If you can't get hold of regulator, you can accept certification from receiving licensee but you **must get approval from regulator by close of next business day**. This verification must be documented.



Shipping and Receiving

- The no later than arrival time needs to be agreed between shipper and receiver. **Receiver must notify shipper of receipt.**
- If **source is not received** by the agreed no later than arrival time, **must immediately investigate.**
- If the source is determined to be missing or lost **must notify NRC within 4 hours.**
- If still missing after 24 hours (allows time to trace through carrier system) **must immediately notify NRC.**
- If there is a safety concern, do not have to disable the vehicle.



Transportation Security – Category 1

- Use carriers with movement control centers to actively monitor shipments
- Monitoring by a telemetric position monitoring system
- Primary/backup communications
- Procedures



Transportation Security – Category 2

- Constant control and/or surveillance
- Capability for immediate communication
- Carriers with package tracking systems that require signature prior to release of package





Local Law Enforcement Agency (LLEA)

- Coordinate a response plan with LLEA, if LLEA still refuses attempts at coordination after 60 days of initial attempt **must notify NRC within 3 days**. Need annual meeting with LLEA to review response plan.
- No notification of LLEA required for temporary job site.
- No notification by LLEA of a degradation in response.



Impact

- Substantial administrative burden
 - Additional systems and procedures need to be developed
 - Increase in the documentation requirements
 - Training
 - Audits

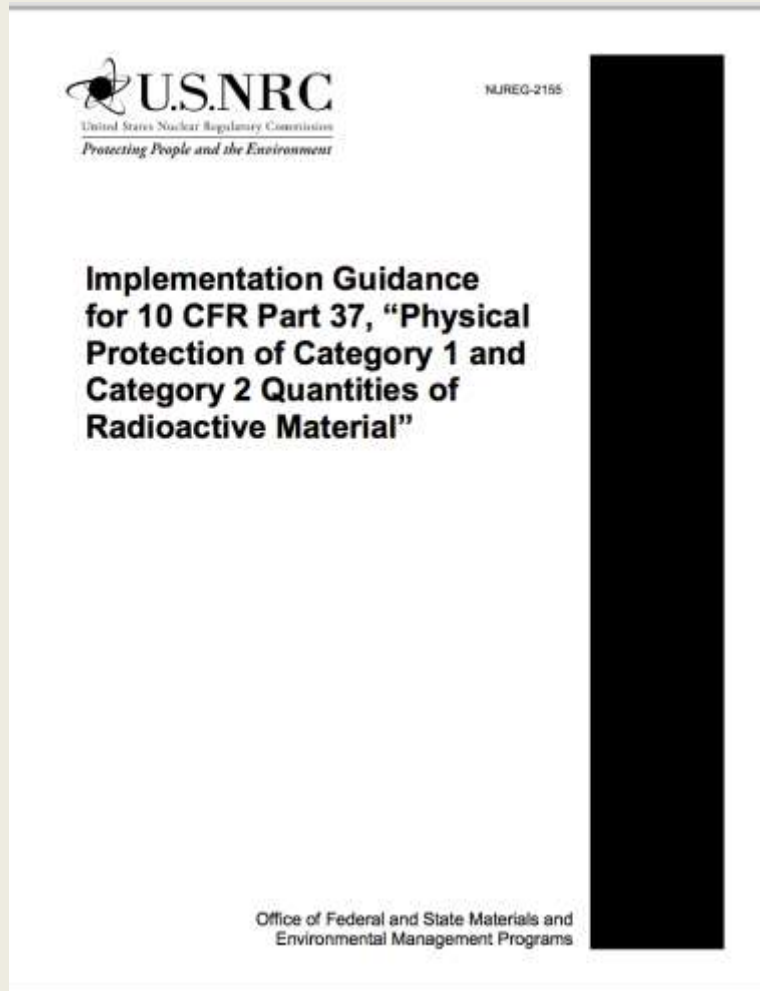


Implementation

- Costs
 - Total \$400-500 million
 - Average cost to implement – \$23,000
 - Annual cost – \$21,000



Guidance Document – NUREG-2155



- NUREG-2155 – Implementation Guidance for 10 CFR Part 37, “Physical Protection of Category 1 and 2 Quantities of Radioactive Material”
- Issued February 2013
- Link: <http://pbadupws.nrc.gov/docs/ML1305/ML13053A061.pdf>



NUREG-2155 Purpose

- The intent of this technical report is to provide guidance on, and to assist applicants and licensees in, the implementation of Title 10 of the Code of Federal Regulations (10 CFR) Part 37, “Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material.”
- This document describes methods that the U.S. Nuclear Regulatory Commission (NRC) finds acceptable for implementing the regulations.



NNSA Additional Enhancement

- Initially funded from NNSA
- Maintenance of the enhancement is on the facility – cost range ~\$20,000
- What Is the negative of not volunteering for the enhancement?
- No obvious negative.
- Facility security – are they considered LLEA?
- Do they carry weapons? Typically indicative of LLEA authority.
- Verification of relationship with facility security and LLEA



Next Installment or Stay Tuned!

