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United States Nuclear Regulatory Commission
Protecting People and the Environment

U.S. NRC Security Requirements

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Objectives for NRC Security Requirements Presentation

- To introduce the basis for the NRC Security Requirements and their background
- To review the applicability of the different security regulatory requirements
- To review the application of these requirements with well logging operations

Byproduct radioactive material security since September 11, 2001

2018

Mar – 10 CFR Part 37 rulemaking plan for NEI proposed revisions due
Aug – Response to SRM on Baran COM due

2017

Mar – 10 CFR Part 37 compatibility for Agreement States
Mar - Nuclear Security Summit 2016, Washington DC
Dec – Report to Congress on effectiveness of Part 37 due

2016

Jan – NRC, DOT and DHS Transportation Security MOU
Apr – Commence 10 CFR Part 37 Program Review

2015

Mar – 10 CFR Part 37 compliance for NRC licensees and Nuclear Security Summit, Hague, Netherlands
Apr – NRC Rescinds Orders against NRC licensees and Report to Congress
Jun– GAO issues Additional Actions Needed to Increase the Security of Industrial Radiological Sources
Aug – Third Task Force Report on Source Security Issued
Dec – FY15 Energy Water Appropriations Act

2014

Mar – FRN 10 CFR Part 37 and Part 37 Implementation Guidance published
May – License Verification System deployed

2013

Mar – Commission Approves Part 37 and Nuclear Security Summit, Seoul, South Korea
Aug – Web-Based Licensing deployed
Oct – GAO Additional Actions Needed to Improve Security of Sources at Medical Facilities
Nov – NRC Hosts International Regulators Conference

2012

Jul - NRC Policy Statement for Security and use of cesium chloride
Apr – Nuclear Security Summit, Washington, DC

2011

Jun – NRC Proposed Rule Part 37

Sep – NRC and NNSA Joint Report to Congress on Protecting Radioactive Sources
Aug – Report by Radiation Source Protection and Security Task Force
Jan – Licensee NSTS Reporting Begins

2010

Jun – NSTS Expansion Rule – not approved
Dec – NRC Trustworthiness and Reliability Order for unescorted access to Category 1 and 2 for Service Providers

2009

Feb – NAS Radiation Source Use and Replacement Study
Sep – NRC Pre-licensing guidance revised

2008

Jul GAO Actions Taken by NRC to Strengthen licensing process for Radioactive Sources Not Effective
Dec – NRC and Agreement State Unescorted Access Fingerprinting Requirements

2007

Aug Radiation and Source Protection and Radiation Task Force Report
Sep-Nov SGI Fingerprinting Orders
Nov Part 20 National Source Tracking

2006

Jul Part 110 export and import rule, Category 1 and 2 NRC Transporters of Category 1 Orders
Aug Energy Policy Act of 2005
Nov NRC and Agreement State Increased Controls Requirements

2005

Jan IAEA, Code of Conduct on the Safety and Security of Radioactive Sources
NRC Manufacturers and Distributors Order
Jun G-8 Summit, Sea Island, Georgia, USA

2004

May NRC and DOE Report, Radiological Dispersal Devices
Jun NRC Irradiator Orders

2003

Security advisories issued for voluntary security measures

2002

Security requirements for inadvertent entry and simple theft are in 10 CFR Part 20.1801 and 20.1802, plus other sections

2001

Background – NRC Security Requirements

Security Requirements as of today

- 10 CFR 20.1801/1802
- 10 CFR 39.31/39.71
- 10 CFR Part 37 – for aggregate category 1 & 2 quantities of radioactive material
- Additional commitments made by the licensee tied to the license, e.g. procedures for key-control or activation restrictions for ‘prompt fission neutron sources’ (accelerator-based neutron generators)

Security in Part 20

Security Requirements as of today

- 10 CFR 20.1801 - secure licensed material in storage
- 10 CFR 20.1802 - control and surveillance of licensed material not-in-storage

Applies to all NRC licensed materials, sealed and unsealed, regardless of device, quantity (with minor exceptions), or authorized use

Security in Part 39

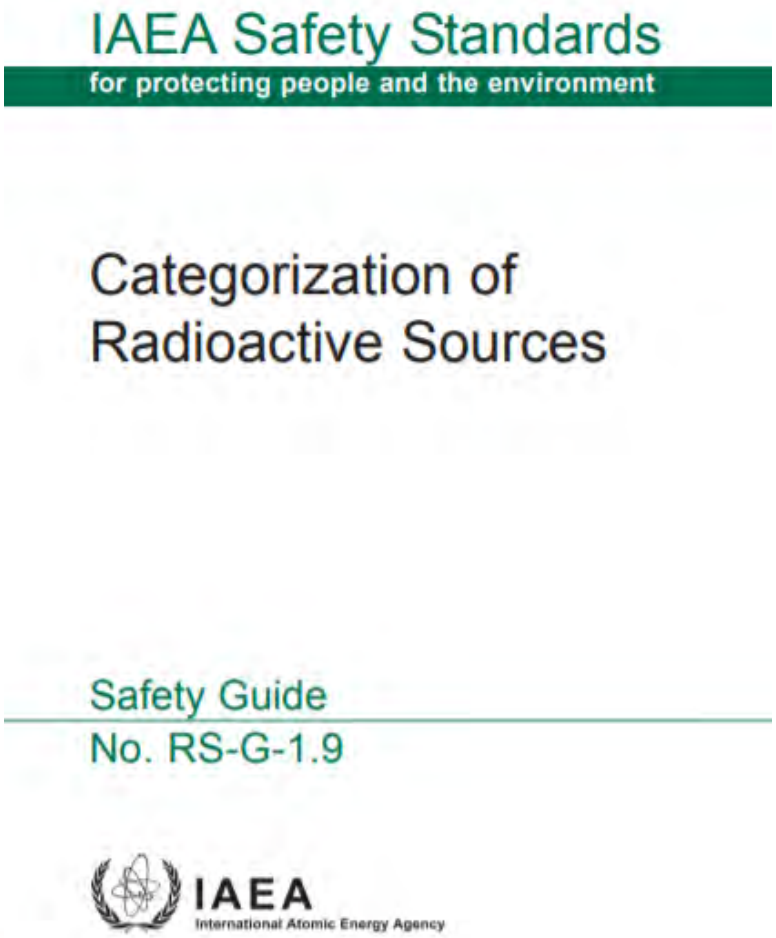
Security Requirements as of today

- 10 CFR 39.31 – (transport and storage) locked and physically secured to prevent tampering or removal by unauthorized personnel, minimize danger from explosion or fire
- 10 CFR 39.71 – Supervision of sources at temporary job sites during handling or when not in storage

Specific to sources regulated under 10 CFR Part 39

Security in Part 37

- Applies only to aggregate category 1 and 2 quantities of radioactive material
- Categories of radioactive quantities referenced from *IAEA Safety Standards, Categorization of Radioactive Sources*
- https://www-pub.iaea.org/MTCD/publications/PDF/Pub1227_web.pdf
- NRC Reference:
  10 CFR Part 37, Appendix A



U.S. National Materials Management Program

- Integrated Source Management Portfolio

- Up-to-date accounting of Category 1 and 2 sources in the U.S.
- Over 1,400 licensees and 80,000 sources
- Annual Inventory Reconciliation
- Deployed 2008

- Stores Category 1 and 2 licenses
- Capability to serve as nationwide license repository for over 20,000 licenses
- Needed to support license verification
- Deployed 2012

- Automates verification checks using WBL and NSTS data
- Users - regulators, government agencies, distributors/ licensees
- Deployed 2013

General Purpose of 10 CFR Part 37

To provide ***reasonable assurance*** of the security of Category 1 and Category 2 radioactive material by protecting from theft or diversion

Inspection Procedure

- NRC issued Inspection Procedure (IP - 87137) on April 03, 2014

https://www.nrc.gov/docs/ML1403/ML14030A144.pdf

- Provides specific inspection guidance for three focus areas:
  - Background Investigations and Access Authorization Programs
  - Physical Protection Requirements During Use
  - Physical Protection During Transit

10 CFR Part 37
Appendix A, Table 1

Values for sources typically used in well logging
Units of compliance are in TBq **(Regulatory Standard Conversion)**

Radioactive Material	Category 1 (TBq)	Category 1 (Ci)	Category 2 (TBq)	Category 2 (Ci)
Americium-241/Beryllium	60	1,620	0.6 **(.5994)**	16.2 16.2
Cesium-137	100	2,700	1 **(.9990)**	27.0 27.0

Aggregated Sources

1. The aggregate activity of multiple, collocated sources of the same radionuclide should be included when the total activity equals to or exceeds the Cat 1 or Cat 2 thresholds (pages 9-11 of NUREG 2155, Rev 1).
2. The terabequerel (TBq) value is the **Regulatory Standard**.
3. Radioactive materials are to be considered aggregated or collocated if breaching a **Common Physical Security Barrier** (e.g., a locked door at the entrance to a storage room) would allow access to the radioactive material or devices containing the radioactive material.
4. If several radionuclides are aggregated, the **"Sum of Fractions"** method for evaluating combinations of multiple sources or multiple radionuclides is to be used. **"Unity Rule"**
5. The curie (Ci) values are rounded to two significant figures for informational purposes only.

Aggregate & “Unity Rule”

- The **aggregated radioactive material** of the ***same radionuclide*** should be included when the ***total activity equals or exceeds*** the Cat 1 & Cat 2 threshold.

- If **several radionuclides** are **aggregated**, the sum of the fractions of the activity of each source where,

  (Activity of radionuclide source) ÷ (Threshold activity value for source).

Does the sum of the fractions ***equal to or exceed one?***

10 CFR Part 37 - Subparts

Addresses:

- Subpart A – General Provisions
- Subpart B – Background Investigations and Access Control Programs
- Subpart C – Physical Protection Requirements During Storage / Use
- Subpart D – Physical Protection in Transit

10 CFR 37 Subpart B – Background Investigations and Access Control Program

- Limit unescorted access to approved individuals
- Trustworthiness & Reliability
  - Initial investigation and Reinvestigation every 10 Years
  - Determinations and documentation made by licensee's "Reviewing Official"
  - Annual Review "Audit" of access authorization program content and implementation

10 CFR 37 Subpart C – Physical Protection During Storage & Use

- Development and Implementation of a Written Security Program and Security Plan implementing procedures
  - Training on the licensee's security program, responsibilities, etc.
- Establish permanent or temporary Security Zones
- Monitor, detect, assess, respond
  - Maintenance and testing of systems
  - LLEA coordination (annual review)
- **Requirements for mobile/portable devices** (important for well logging)
- Annual training & review of the security program

Principle Requirements of a Security Program

Monitor, Detect, Assess, Respond

- Continuous monitoring of points of access
- Immediate detection of unauthorized access
  - All reasonably foreseeable unauthorized access
- Detect unauthorized removal of material
- Assessment by automated devices or trained personnel
- Initiation of armed response without delay

Subpart C: Physical Protection Requirements During Use

10 CFR 37.41(a)

Applicability:

- Licensees that possess an aggregated Category 1 or Category 2 quantity
- New licensee before taking possession of aggregated Category 1 or Category 2 quantity
- Existing licensees newly subject to 10 CFR 37
  - Notify NRC (AS) 90 days before aggregating Category 1 or Category 2 quantity

Subpart C: Physical Protection Requirements During Use

10 CFR 37.41(b)

General Performance Objective

- Each licensee shall establish, implement, and maintain a security program that is designed to monitor and, without delay, detect, assess, and respond to an actual or attempted unauthorized access to Category 1 or Category 2 quantities of radioactive material

Requirements for Mobile Devices (1)

(10 CFR 37.53(a))

- Licensees that possess mobile devices containing Category 1 or Category 2 quantities of radioactive material must:
  - Have two independent physical controls that form tangible barriers to secure the material from unauthorized removal when the device is not under direct control and constant surveillance by the licensee

Requirements for Mobile Devices (2)

- 2 independent physical controls

Requirements for Mobile Devices (3)

- Vehicle disabling mechanism (w/ exception)

Aggregation DURING TRANSPORT

- RAM and devices are automatically considered aggregated during transport
- Applies whether or not vehicle/trailer have been immobilized
- Regardless of position of RAM or devices in or on vehicle/trailer
- Regardless of number and configuration of physical barriers
- RAM/devices in or on separate vehicles/trailers within close proximity at a site/location, are considered aggregated (Regulatory Issue Summary 2007-07)

10 CFR 37 Subpart D- Physical Protection in Transit

- Verification of license before transfer
- Pre-planning and coordination of arrival time/confirm receipt
- Different requirements for Category 1 versus Category 2 shipments
- Requirements for communications
- Package tracking, investigations
- Reporting of events

Aggregated Sources

Sources were stored in a bunker room which was locked & physically secured

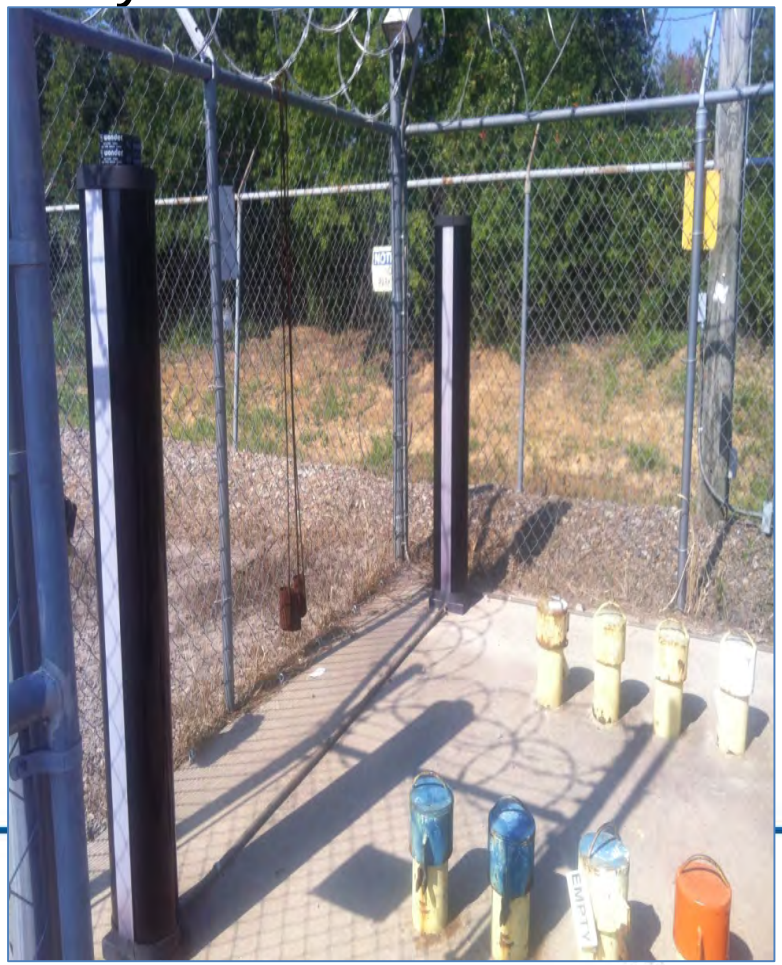
Aggregated Sources

Sources were stored in a lock box which was locked & physically anchored to the ground.

Storage Bunkers

Aggregated Sources

Sources were individually locked stored down-hole within a chain-link fence locked & physically secured.



Aggregated Sources

Sources were stored in down-hole sleeves within a chain-link fence locked & physically secured. A locked steel rod linked all the sleeves through eye bolts atop each cover.

Aggregated Sources

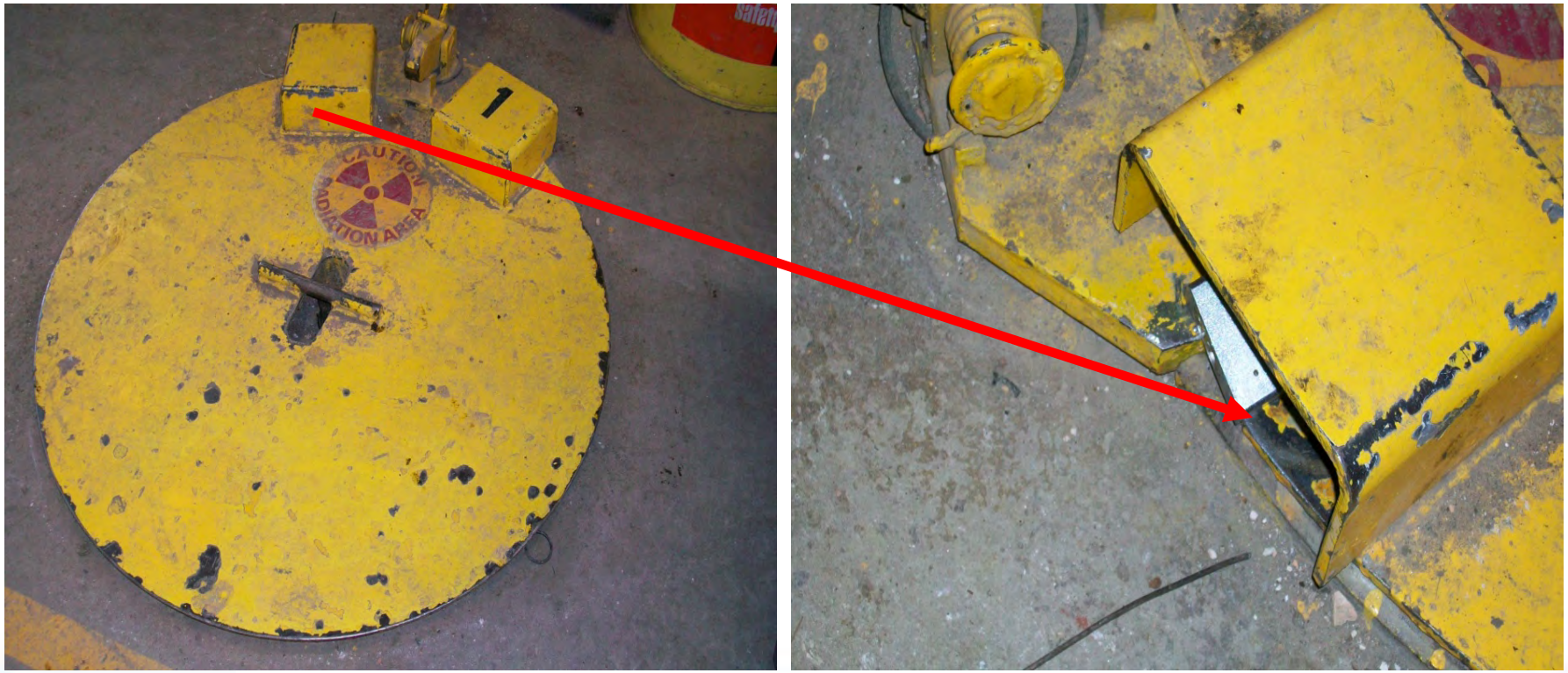
Sources were stored down-hole behind a locked and physically secured door.

Aggregated Sources

Sources were stored in cages inside a room behind a locked and physically secured door. Each cage has a locked lid

Does 10 CFR Part 37 Apply?

Down-hole storage with Two (2) independent physical barriers. Co-Located??



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Aggregated Sources

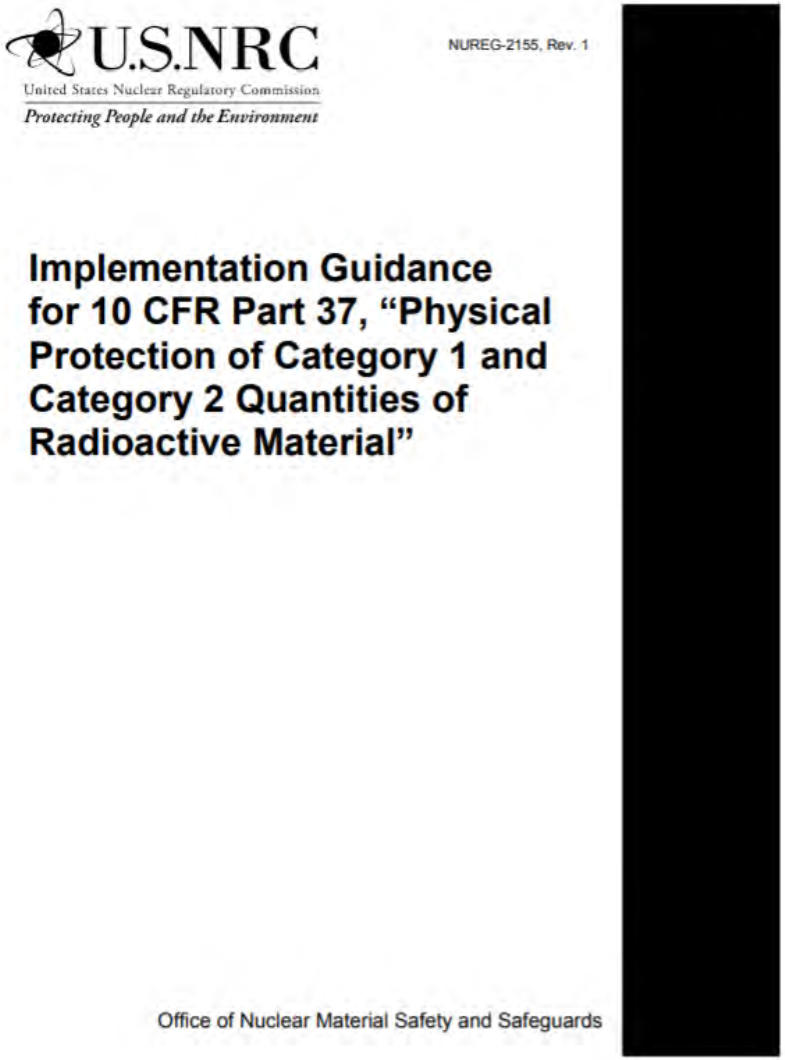
Sources were stored in down-hole storage with Two (2) independent locks. **Trust But Verify**

10 CFR Part 37 Implementation Guidance

NUREG-2155 (Rev.1)

https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr2155/

Direct PDF:
https://www.nrc.gov/docs/ML1501/ML15016A172.pdf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NUREG-2155, Rev. 1

Implementation Guidance for 10 CFR Part 37, "Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material"

Office of Nuclear Material Safety and Safeguards

NUREG-2155: Implementation Guidance

- Intended for use by applicants, licensees
- Presented in Question/Answer format, and is separated by each requirement of Part 37
- Different approaches are acceptable if they satisfy the requirements

§ 37.23, "Access Authorization Program Requirements" (continued)

§ 37.23(d), "Personal History Disclosure"

Any individual who is applying for unescorted access authorization shall disclose the personal history information that is required by the licensee's access authorization program for the reviewing official to make a determination of the individual's trustworthiness and reliability. Refusal to provide, or the falsification of, any personal history information required by this subpart is sufficient cause for denial or termination of unescorted access.

Regulation text

EXPLANATION:

These provisions establish that individuals applying for unescorted access authorization must disclose their personal history information.

Plain language explanation

Q&As:

Q1: What is a personal history disclosure?

A1: The personal history disclosure is the information that the individual who is seeking unescorted access to category 1 or category 2 quantities of radioactive material must provide. It is the type of information typically collected on an employment application. The information should include items, such as employment history, education, references, and any arrest record. It may also include, but is not required to include, information related to finances, such as bankruptcies. This information provides the RO with a starting point for the background investigation.

Q2: The information sounds like information provided for employment. May I use an employment application to gather the information?

A2: The information provided under a personal history disclosure is similar to information obtained by many companies in an application for employment. If the employment application contains adequate information, the licensee may use it for this purpose.

Question and Answer

NUREG-2155: Implementation Guidance

- Annex A:
  - Additional Guidance for Evaluating an Individual's Trustworthiness and Reliability
- Annex B:
  - Sample Consent Form for Background Investigations
- Annex C:
  - Examples of Reportable Suspicious Activities (10 CFR 37.57(b))
- Annex D:
  - Template for Advance Notifications (Cat 1) (10 CFR 37.77(b))
- Appendix A
  - Table of Category 1 & 2 RAM

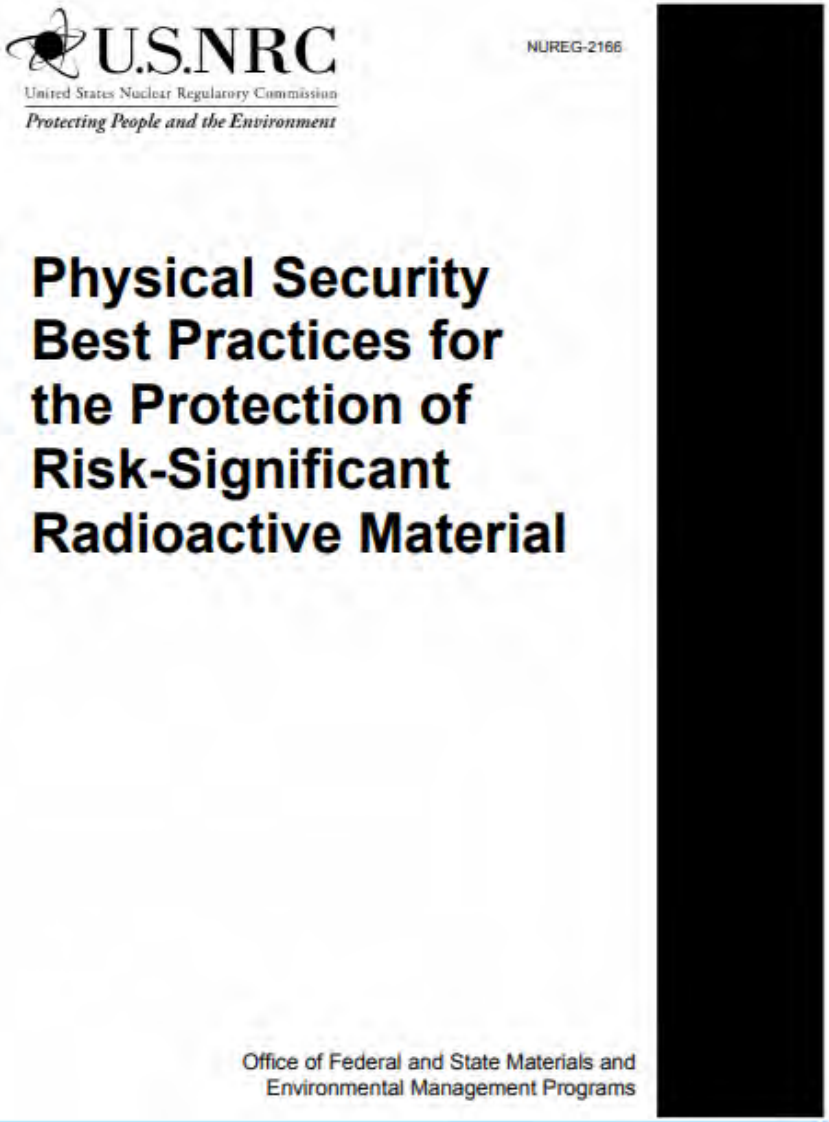
10 CFR Part 37 Best Practices Guidance

NUREG-2166

https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr2166/

Response to Government Accountability Office report findings and recommendations (Sept 2012)

https://www.gao.gov/products/GAO-12-925



NUREG-2166 “Physical Security Best Practices for the Protection of Risk Significant Radioactive Material

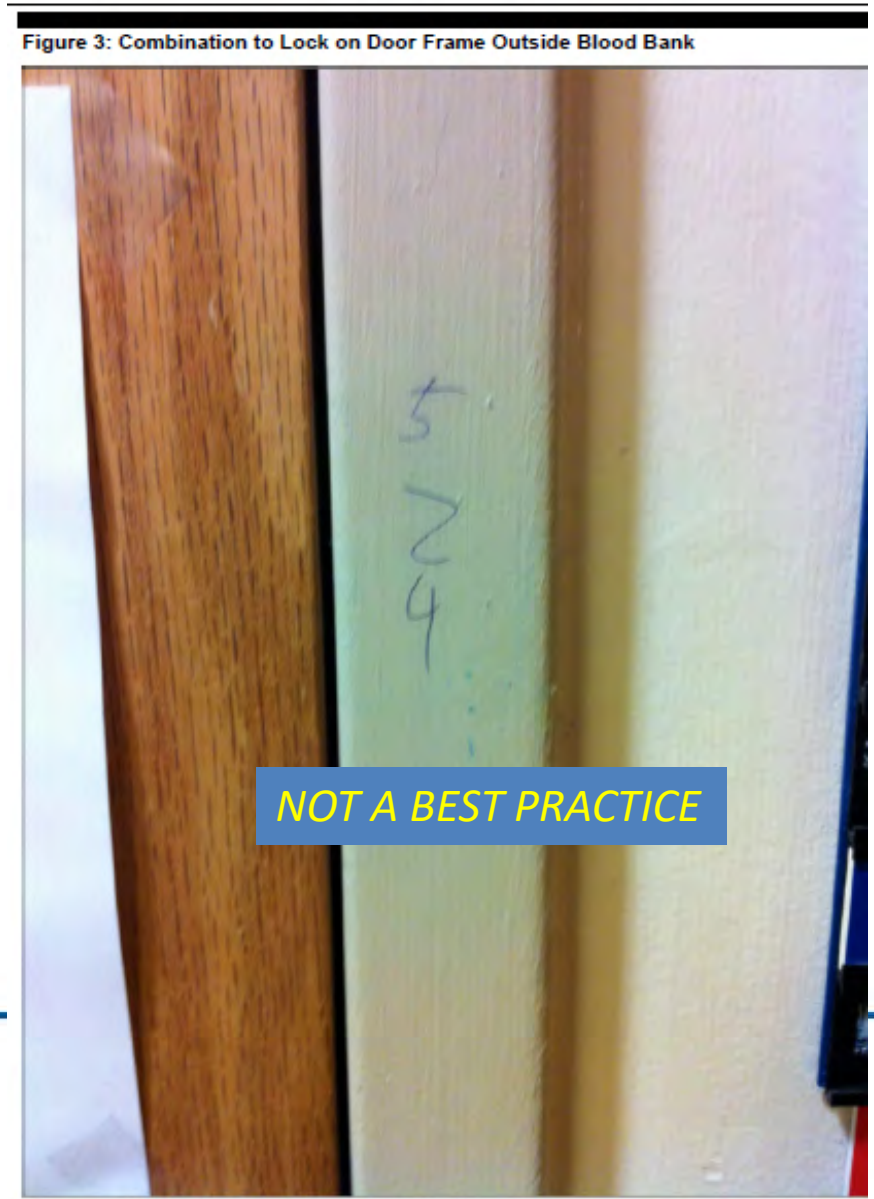
- Description of an effective Physical Protection Program
  - Determining the Objectives of the Physical Protection Program
  - Key Elements of a Physical Protection Program
- Administrative Security Measures
- Physical Security Best Practices that apply to all facilities
  - Defining the Security Zone
  - Monitoring the Security Zone
  - Alarm Assessment and Response
- Physical Security best practices for Mobile and Transportation Operations

NUREG-2166 “Physical Security Best Practices for the Protection of Risk Significant Radioactive Material

- Appendices
  - Developing a Physical Security Plan
  - Physical Security best practices for:
    - Panoramic and Underwater Irradiators
    - Self-shielded Irradiators
    - Fixed Gauges
    - Medical Devices that contain Risk-Significant Radioactive Material
    - Manufacturing and Distribution Facilities
    - **Well Logging Sources**
    - Industrial Radiography Sources
  - National Nuclear Security Administration (NNSA) security initiatives (Formerly Global Threat Reduction Initiative - GTRI; now Office of Radiological Security - ORS)

Best Practices Document

- Supplement existing guidance for licensees on how to adequately secure equipment containing high-risk radiological sources and conduct trustworthiness and reliability determinations.



Objectives for NRC Security Requirements Presentation

- Understand the basis for the NRC Security Requirements and their background
- Understand the applicability of the different security regulatory requirements
- Understand the application of these requirements with well logging operations

Questions?