

Increased Controls (IC's)



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- After 9/11, the NRC began issuing advisories & orders for licensees to enhance security & requiring additional controls, including:
 - Installation of additional physical barriers & security systems
 - Enhanced coordination w/ law enforcement
 - More restrictive site access controls
 - Personnel background checks
 - Up-to-date RAM inventory



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- NRC has classified most radiography sources as "radionuclides of concern"
- Threat: source stolen by insider or by violent means & used in a radiological dispersal device (RDD or "dirty bomb") or other means to expose the public to radiation
- Threshold levels for sources used by radiographers:

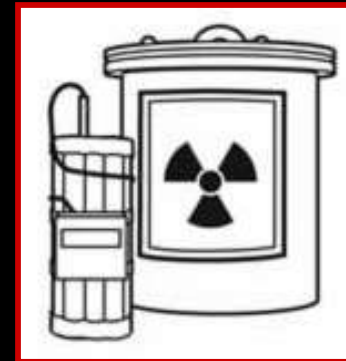
<u>Isotope</u>	<u>IC Threshold Level</u>
Cs-137	27 Ci
Co-60	8 Ci
Ir-192	21 Ci
Se-75	54 Ci

Radionuclides of Concern / Threshold Levels

Radionuclide	TBq	Curies
Am-241	0.6	16
Am-241 / Be	0.6	16
Cf-252	0.2	5.4
Cm-244	0.5	14
Co-60	0.3	8.1
Cs-137	1.0	27
Gd-153	10	270
Ir-192	0.8	22
Pm-147	400	11,000
Pu-238	0.6	16
Pu-239 / Be	0.6	16
Se-75	2	54
Sr-90 (Y-90)	10	270
Tm-170	200	5,400
Yb-169	3	81

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- Licensees have established security measures to enhance control & reduce potential for theft of RAM
- Objective of ICs: improve security & control of RAM
- ICs can't prevent 100% of attempts at theft, sabotage or diversion, but can provide multiple layers of control ("defense in depth")
- Goal: prevent loss of control of RAM, & if attempt is made, to ensure prompt detection, assessment & response



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- Documents describing specific measures to meet IC orders are designated as Sensitive Unclassified Non-Safeguards Information (SUNSI) to be withheld from public disclosure
- IC procedures must be kept separate from other records, with access restricted to authorized personnel



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Personnel Requirements

- Allow only **trustworthy & reliable (T&R)** individuals, approved in writing, to have unescorted access to RAM
- Approve for unescorted access only those individuals with job duties that require access
- Personnel who require access but aren't approved for unescorted access must be escorted by an approved individual
- T&R for individuals employed for <3 yrs. shall be determined by verifying employment history, education & references
- T&R for individuals employed for >3 yrs. shall be determined by reviewing their employment history

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- All radiographic personnel are typically authorized for unescorted access to RAM
- Keys to cameras & storage room are restricted to authorized personnel
- Access to RAM is controlled at all times; only T&R personnel allowed to have unescorted access to RAM; only workers w/ job duties that require access are considered
- Workers with duties requiring access but aren't approved must be escorted



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- Licensees must document their basis for concluding a worker is T&R & maintain a list of approved personnel
- Service providers (employees of mfr./distribution co.) are escorted unless documentation of T&R provided
- Written verification of trustworthiness of FedEx personnel has been provided by FedEx to its clients



Workers must be trained on new IC procedures

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Personnel Requirements

- To the extent possible, independent info should be obtained to corroborate info provided by the employee
- Service providers must be escorted unless they have been determined to be T&R by their employer, & written verification of their T&R has been provided
- Licensees must document their basis for concluding a person is T&R, & must maintain a list of persons approved for unescorted access



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Threat Assessment: Licensed Material in Use or Storage

- Document program to monitor and immediately detect, assess, and respond to unauthorized access.
- Have pre-arranged plan with Local Law Enforcement Agency (LLEA).
- Respond immediately to actual or attempted threat, sabotage or diversion of radioactive material.
- Response shall include requesting LLEA assistance.
- Have dependable means to transmit information between / among intrusion detectors and assessors, and to summon responder.
- Document unauthorized access and corrective actions.

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Carrier Requirements (if other than licensee)

- Verify that your radioactive material carriers:
 - Use package tracking systems.
 - Assure driver's trustworthiness and reliability.
 - Maintain constant control / surveillance in transit.
 - Can immediately summon assistance.
- Contact recipient to coordinate ETA.
- Confirm receipt of shipment.
- Investigate if shipment does not arrive on time.
- Verify that your radioactive material carriers:
- Large shipments have additional requirements.

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When Receiving Radioactive Material:

- Establish an ETA.
- Confirm delivery.
- If shipment does not arrive, notify shipper and assist in any investigation.
- Fingerprints must be obtained by licensee and submitted to FBI via NRC.

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To Ensure Safe Handling, Use and Control:

- Portable Devices or Mobile Devices only moved outside facility (e.g. on a trailer), Have two independent physical controls that form tangible barriers to secure radioactive material from unauthorized removal when the device is not under direct control and constant surveillance.
- Mobile Devices only moved inside a facility, only one physical control needed that secures material from unauthorized movement or removal.
- Devices in / on vehicle / trailer, disable vehicle / trailer when not under direct control and constant surveillance.

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Additional requirements for greater than 100X threshold values:

- Enhanced monitoring.
- Notify NRC in writing 90 days prior to shipment to licensee.
- Implement Additional Security Measures Order for transportation.

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Questions?