

From: "James Jarvis" <jsjarvis@smtpgate.dphe.state.co.us>
To: <ANM@NRC.GOV>, <phl@NRC.GOV>
Date: 9/14/05 4:18PM
Subject: REVIEW OF COLORADO LICENSE CONDITION / APPROACH FOR

The Colorado Agreement State program is in the process of implementing the additional security controls for licensees of concern as promulgated by NRC/OAS/CRCPD/AS's. While the outcome and schedule is expected to be the same, the Colorado Program approach will be slightly different than that of the NRC and other Agreement States. Specifically:

1. Colorado will issue a letter to the affected licensees by the end of September 2005. The letter will in essence repeat most of what the NRC/Agreement State proposed letter says, with the exception that it will not be transmitted with an amended license. We will also exclude wording regarding the formal hearing, as all of our licensing actions can be protested by the licensee by Colorado Rule (the Colorado timeframe is however 60 days under Colorado Statutes). The letter will include the "Increased Controls" and "Table 1" documents as attachments - as information to the licensees. The letter will also indicate that their license will be amended within the 45 days following issuance of the letter (estimated to be before December 1, 2005). In this initial correspondence Colorado will require that the licensees respond within the 25 day timeframe their plans and schedule to comply with the requirements contained in the attachments to the letter.

2. Colorado plans to have an "informational session" for the licensees in mid-October, 2005 to allow licensees to ask questions and obtain additional information. Information on the date/time of this session will be included in the correspondence discussed in item 1 above. We believe this approach may help a smooth transition into the new requirements.

3. On or before December 2, 2005, the affected licenses in Colorado will receive a cover letter with their amended license. The amended license will incorporate the new security requirements. The new requirements will be incorporated into the actual license as an "Annex" to the license (rather than reference the requirements sent in correspondence).

The license "annex" approach is preferred for the following reasons:
- it provides for tighter enforcement actions should that be necessary;

- the Annex approach will work more easily for any new licenses issued after December 2005 that would fall into the categories of concern due to the fact that the license would reference a component of the license rather than a letter sent prior to that licensee having a license;
- By referencing a specific date in the license tie-down condition for an implementation due date rather than a "...within 6 months from the issuance..." statement eliminates potential problems whereby this 6 month "clock" could be reset should an unrelated license amendment be issued following issuance of the increased controls amendment.

Attached is an example license with the increased controls included as an Annex to the license (refer to highlighted portions in main body of license). Per the recent information provided in the NRC/AS teleconference, we request that you review and approve this

approach/wording as soon as possible. Note that there may be some slight variation in the date specified in the pertinent license condition due to scheduling/implementation, but will not go beyond December 6, 2005.

I am sending this on behalf of Steve Tarlton, Unit Leader of our program.

As Steve is out of the office until September 26, 2005 on other Department business, please contact me directly with any issues or comments. Thank you.

James S. Jarvis, M.S.
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CC: "JOE Vranka" <jsvranka@smtpgate.dphe.state.co.us>, "Steve Tarlton" <starlton@smtpgate.dphe.state.co.us>

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Subject: REVIEW OF COLORADO LICENSE CONDITION / APPROACH FOR
Creation Date: 9/14/05 4:17PM
From: "James Jarvis" <jsjarvis@smtpgate.dphe.state.co.us>
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Files	Size	Date & Time	
MESSAGE	3758	09/14/05 04:17PM	
EXAMPLE LICENSE WITH SECURITY CONTROLS REFERENCED.doc			37888
ANNEX A - Increased Controls.doc		56320	
Mime.822	134624		

Options

Expiration Date: None
Priority: Standard
Reply Requested: No
Return Notification: None

Concealed Subject: No
Security: Standard

State of Colorado
Department of Public Health and Environment

RADIOACTIVE MATERIALS LICENSE

Pursuant to the *Colorado Radiation Control Act*, Title 25, Article 11, *Colorado Revised Statutes*, and the State of Colorado *Rules and Regulations Pertaining to Radiation Control*, Part 3, and in reliance on statements and representations heretofore made by the licensee designated below; a license is hereby issued authorizing such licensee to transfer, receive, possess and use the radioactive material(s) designated below; and to use such radioactive material(s) for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations, and orders now or hereafter in effect of the Colorado Department of Public Health and Environment and to any conditions specified below.

1. **Licensee: ***** Inspection Company, Inc.**
 2. Address: 1234 Main St., Everwood, CO 80###
 3. Colorado License Number ###-01, Amendment Number **
 4. Expiration date: January 31, 2007
 5. Reference Number:
-

6. Authorized Radioactive Material and Uses:

- A. The licensee is authorized to possess and use Gamma Industries (GI) Gammatron 100A model exposure devices for industrial radiography; and Gamma Industries Model C-8 source changers for source exchange and storage. Each device contains, in sealed sources, not more than 3.70 TBq (100 Ci) of ⁶⁰Co.
- B. The licensee is authorized to possess and use Industrial Nuclear IR-100 model exposure devices for industrial radiography; and Amersham Model 650L, Industrial Nuclear Model IR-50, and Source Production and Equipment Company (SPEC) Model C-1 source changers for source exchange and storage. Each device contains, in sealed sources, not more than 3.70 TBq (100 Ci) of Iridium 192 (¹⁹²Ir).
- C. The licensee is authorized to possess and use Amersham Model 660 System model exposure devices for industrial radiography; and Amersham Model 650L, 500 SU and 855, Gamma Industries C-10, Industrial Nuclear Model IR-50, or SPEC Model C-1 source changers for source exchange and storage. Each device contains, in sealed sources, not more than 3.70 TBq (100 Ci) of ¹⁹²Ir.
- D. The licensee is authorized to possess and use SPEC Model 150 model exposure devices for industrial radiography and SPEC Model C-1 source changers for source exchange and storage. Each device contains, in sealed sources, not more than 5.55 TBq (150 Ci) of ¹⁹²Ir.

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- E. The licensee is authorized to possess and use up to 999 kilograms of depleted uranium contained as shielding material in the radiography exposure devices, source changers, and collimators authorized by this license.
 - F. The licensee is authorized to possess a total of eight (8) sealed sources for use in industrial radiography devices of the types listed in items 6.A.- 6.D.
-

CONDITIONS

- 7. Radioactive material shall be used and stored at temporary job sites of the licensee anywhere in the State of Colorado where the State of Colorado maintains jurisdiction for regulating the use of radioactive material.
- 8. Prior to the use of licensed materials outside the State of Colorado, or at any facility under exclusive Federal jurisdiction including a facility within the State of Colorado, the licensee shall comply with the applicable provisions of 10 *Code of Federal Regulations* 150.20, or if the use shall take place in an Agreement State the licensee shall comply with the applicable provisions of that State's reciprocity requirements.
- 9. The licensee shall comply with the provisions of the State of Colorado *Rules and Regulations Pertaining to Radiation Control*: Part 3, "Licensing of Radioactive Material"; Part 4, "Standards for Protection Against Radiation"; Part 5, "Radiation Safety Requirements for Industrial Radiographic Operations", Part 10, "Notices, Instructions and Reports to Workers; Inspections"; and Part 17, "Transportation of Radioactive Material".
- 10. Radioactive material shall be used by individuals who have been designated as radiographers by the Radiation Safety Officer, and as a minimum have been trained and certified in accordance with the personnel training and certification procedures contained in the ***** *Inspection Company, Inc. Operating and Emergency Procedures Manual for Use of Radiographic Exposure Devices*, Rev. 12/5/01, as submitted December 7, 2001.
- 11. Radioactive material shall be used under the direct supervision of a Radiographer Trainer, by individuals who have been designated as radiographer trainees by the Radiation Safety Officer, and as a minimum have been trained and certified in accordance with the personnel training and certification procedures contained in the ***** *Inspection Company, Inc. Operating and Emergency Procedures Manual for Use of Radiographic Exposure Devices*, Rev. 12/5/01, as submitted December 7, 2001.
- 12. The office located at [INSERT ADDRESS], shall maintain written records indicating the date and basis of approval of designated Radiographers and Assistant Radiographers.
- 13. The designated Corporate Radiation Safety Officer is John Doe.
- 14. The designated On-Site Radiation Safety Officer is Area Supervisor Mary Doe.

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15. Radioactive material authorized by Item 6 of this license shall be stored and used in a manner that will preclude use by unauthorized personnel.
16. Each sealed source authorized by this license shall be tested for leakage in accordance with the requirements of RH 5.10 of the State of Colorado *Rules and Regulations Pertaining to Radiation Control*, at intervals not to exceed six months.
17. Notwithstanding the periodic leak test required by RH 5.10 of the State of Colorado *Rules and Regulations Pertaining to Radiation Control*, such requirement does not apply to radiography sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.
18. Sealed sources authorized for use other than industrial radiography shall be tested as radiography sources in accordance with RH 5.10 of the State of *Colorado Rules and Regulations Pertaining to Radiation Control*.
19. Sealed sources containing radioactive material shall not be opened.
20. All users of radioactive material must be equipped with personnel monitoring devices capable of detecting gamma radiation.
21. The licensee is authorized to receive, possess, and use sealed sources of ^{60}Co or ^{192}Ir where the radioactivity exceeds the maximum amount of radioactivity specified in Item 6 of this license provided:
 - A. Such possession does not exceed the quantity per source specified in Item 6 by more than 20% for ^{192}Ir or 10% for ^{60}Co ;
 - B. Records of the licensee show that no more than the maximum amount of radioactivity per source specified in Item 6 of the license was ordered from the supplier or transferor of the byproduct material; and,
 - B. The levels of radiation for radiographic exposure devices and storage containers do not exceed those specified in RH 5.6 of the State of Colorado *Rules and Regulations Pertaining to Radiation Control*.
22. The licensee may transport radioactive material or deliver radioactive material to a carrier for transport, in accordance with the provisions of RH 17.5 of the State of *Colorado Rules and Regulations Pertaining to Radiation Control*, "Transportation of Licensed Material".

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23. The transportation of radioactive materials within the State of Colorado shall be subject to all applicable regulations of the Colorado Public Utilities Commission, Colorado Department of Transportation, Colorado Department of Public Safety, Colorado Department of Revenue (Port of Entry), U.S. Department of Transportation, and other agencies of the United States having jurisdiction. When the U.S. Department of Transportation Regulations (Title 49, Chapter I, *Code of Federal Regulations*) are not applicable to shipments by land of radioactive material by reason of the fact that the transportation does not occur in interstate or foreign commerce, the licensee must be in compliance with the requirements relating to packaging of the radioactive material, marking and labeling of the package, placarding of the transport vehicle, and accident reporting set forth in the regulations of the U.S. Department of Transportation.
24. The licensee shall comply with the requirements contained in Annex A to this license entitled "Increased Controls for Licensees that Possess Sources Containing Radioactive Material Quantities of Concern." The licensee shall complete implementation of said requirements by May 27, 2006 or the first day that radionuclides in quantities of concern are possessed at or above the limits specified in Table 1 of Annex A, whichever is later. Within 25 days after the implementation of the requirements of this condition, the licensee shall notify the Department in writing that it has completed the requirements of this condition.
25. The State of Colorado *Rules and Regulations Pertaining to Radiation Control* shall govern unless the licensee's statements, representations, and procedures contained in the application and correspondence are more restrictive than the Regulations. Except as specifically provided otherwise by this license, the licensee shall possess and use radioactive material described in Item 6 of this license in accordance with the statements, representations, and procedures contained in:
- A. the application and attachments dated December 7, 2001; and
 - B. the ***** Inspection Company, Inc. *Operating and Emergency Procedures Manual for Use of Radiographic Exposure Devices*, Rev. 12/5/01, as submitted December 7, 2001; and
 - C. Annex A of this license dated November **, 2005; and
 - D. the license correspondence and attachments dated April 4, 2003, June 9, 2003, June 24, 2003, October 10, 2003, and May 24, 2004.

For The Colorado Department of Public Health and Environment

Date: _____ By: _____

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**ANNEX A
INCREASED CONTROLS FOR LICENSEES THAT POSSESS SOURCES
CONTAINING RADIOACTIVE MATERIAL QUANTITIES OF CONCERN**

The purpose of the increased controls for radioactive sources is to enhance control of radioactive material in quantities greater than or equal to values described in Table 1, to reduce the risk of unauthorized use of radioactive materials, through access controls to aid prevention, and prompt detection, assessment, and response to mitigate potentially high consequences that would be detrimental to public health and safety. These increased controls for radioactive sources are established to delineate licensee responsibility to maintain control of licensed material and secure it from unauthorized removal or access. The following increased controls apply to licensees which, at any given time, possess radioactive sources greater than or equal to the quantities of concern of radioactive material defined in Table 1.

- IC 1. In order to ensure the safe handling, use, and control of licensed material in use and in storage each licensee shall control access at all times to radioactive material quantities of concern and devices containing such radioactive material (devices), and limit access to such radioactive material and devices to only approved individuals who require access to perform their duties.
- a. The licensee shall allow only trustworthy and reliable individuals, approved in writing by the licensee, to have unescorted access to radioactive material quantities of concern and devices. The licensee shall approve for unescorted access only those individuals with job duties that require access to such radioactive material and devices. Personnel who require access to such radioactive material and devices to perform a job duty, but who are not approved by the licensee for unescorted access, must be escorted by an approved individual.
 - b. For individuals employed by the licensee for three years or less, and for non-licensee personnel, such as physicians, physicists, house-keeping personnel, and security personnel under contract, trustworthiness and reliability shall be determined, at a minimum, by verifying employment history, education, and personal references. The licensee shall also, to the extent possible, obtain independent information to corroborate that provided by the employee (i.e., seeking references not supplied by the individual). For individuals employed by the licensee for longer than three years, trustworthiness and reliability shall be determined, at a minimum, by a review of the employees' employment history with the licensee.
 - c. Service providers shall be escorted unless determined to be trustworthy and reliable by an NRC-required background investigation as an employee of a manufacturing and distribution (M&D) licensee. Written verification attesting to or certifying the person's trustworthiness and reliability shall be obtained from the manufacturing and distribution licensee providing the service.

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- d. The licensee shall document the basis for concluding that there is reasonable assurance that an individual granted unescorted access is trustworthy and reliable, and does not constitute an unreasonable risk for unauthorized use of radioactive material quantities of concern. The licensee shall maintain a list of persons approved for unescorted access to such radioactive material and devices by the licensee.

IC 2. In order to ensure the safe handling, use, and control of licensed material in use and in storage, each licensee shall have a documented program to monitor and immediately detect, assess, and respond to unauthorized access to radioactive material quantities of concern and devices. Enhanced monitoring shall be provided during periods of source delivery or shipment, where the delivery or shipment exceeds 100 times the Table 1 values.

- a. The licensee shall respond immediately to any actual or attempted theft, sabotage, or diversion of such radioactive material or of the devices. The response shall include requesting assistance from a Local Law Enforcement Agency (LLEA).
- b. The licensee shall have a pre-arranged plan with LLEA for assistance in response to an actual or attempted theft, sabotage, or diversion of such radioactive material or of the devices which is consistent in scope and timing with realistic potential vulnerability of the sources containing such radioactive material. The pre-arranged plan shall be updated when changes to the facility design or operation affect the potential vulnerability of the sources. Pre-arranged LLEA coordination is not required for temporary job sites.
- c. The licensee shall have a dependable means to transmit information between, and among, the various components used to detect and identify an unauthorized intrusion, to inform the assessor, and to summon the appropriate responder.
- d. After initiating appropriate response to any actual or attempted theft, sabotage, or diversion of radioactive material or of the devices, the licensee shall, as promptly as possible, notify the CDPHE Radiation Management Unit at (303) 692-3300 during business hours or (877) 518-5608 via the 24 hour CDPHE spill line.
- e. The licensee shall maintain documentation describing each instance of unauthorized access and any necessary corrective actions to prevent future instances of unauthorized access.

IC 3. a. In order to ensure the safe handling, use, and control of licensed material in transportation for domestic highway and rail shipments by a carrier other than the licensee, for quantities that equal or exceed those in Table 1 but are less than 100 times Table 1 quantities, per consignment, the licensee shall:

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1. Use carriers which:
 - A. Use package-tracking systems,
 - B. Implement methods to assure trustworthiness and reliability of drivers,
 - C. Maintain constant control and/or surveillance during transit, and
 - D. Have the capability for immediate communication to summon appropriate response or assistance.

The licensee shall verify and document that the carrier employs the measures listed above.

2. Contact the recipient to coordinate the expected arrival time of the shipment;
 3. Confirm receipt of the shipment; and
 4. Initiate an investigation to determine the location of the licensed material if the shipment does not arrive on or about the expected arrival time. When, through the course of the investigation, it is determined the shipment has become lost, stolen, or missing, the licensee shall immediately notify the CDPHE Radiation Management Unit at (303) 692-3300 during business hours or (877) 518-5608 via the 24 hour CDPHE spill line. If, after 24 hours of investigating, the location of the material still cannot be determined, the radioactive material shall be deemed missing and the licensee shall immediately notify the NRC Operations Center or, for Agreement State licensees, the appropriate Agreement State regulatory agency.
- b. For domestic highway and rail shipments, prior to shipping licensed radioactive material that exceeds 100 times the quantities in Table 1 per consignment, the licensee shall:
1. Notify the NRC¹, in writing, at least 90 days prior to the anticipated date of shipment. The NRC will issue the Order to implement the Additional Security Measures (ASMs) for the transportation of Radioactive Material Quantities of Concern (RAM QC). The licensee shall not ship this material until the ASMs for the transportation of RAM QC are implemented or the licensee is notified otherwise, in writing, by NRC.

¹Director, Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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2. Once the licensee has implemented the ASMs for the transportation of RAM QC, the notification requirements of 3.b.1 shall not apply to future shipments of licensed radioactive material that exceed 100 times the Table 1 quantities. The licensee shall implement the ASMs for the transportation of RAM QC.
 - c. If a licensee employs an M&D licensee to take possession of the licensed radioactive material and ship it under its M&D license, the requirements of 3.a. and 3.b above shall not apply.
 - d. If the licensee is to receive radioactive material greater than or equal to the Table 1 quantities, per consignment, the licensee shall coordinate with the originating licensee to:
 1. Establish an expected time of delivery; and
 2. Confirm receipt of transferred radioactive material. If the material is not received at the expected time of delivery, notify the originating licensee and assist in any investigation.
- IC 4. In order to ensure the safe handling, use, and control of licensed material in use and in storage each licensee that possesses mobile or portable devices containing radioactive material in quantities greater than or equal to Table 1 values, shall:
- a. For portable devices, 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.
 - b. For mobile devices:
 1. that are only moved outside of the facility (e.g., on a trailer), 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.
 2. that are only moved inside a facility, have a physical control that forms a tangible barrier to secure the material from unauthorized movement or removal when the device is not under direct control and constant surveillance by the licensee.
 - c. For devices in or on a vehicle or trailer, licensees shall also utilize a method to disable the vehicle or trailer when not under direct control and constant surveillance by the licensee.

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- IC 5. The licensee shall retain documentation required by these increased controls for three years after they are no longer effective:
- a. The licensee shall retain documentation regarding the trustworthiness and reliability of individual employees for three years after the individual's employment ends.
 - b. Each time the licensee revises the list of approved persons required by 1.d., or the documented program required by 2, the licensee shall retain the previous documentation for three years after the revision.
 - c. The licensee shall retain documentation on each radioactive material carrier for three years after the licensee discontinues use of that particular carrier.
 - d. The licensee shall retain documentation on shipment coordination, notifications, and investigations for three years after the shipment or investigation is completed.
 - e. After the license is terminated or amended to reduce possession limits below the quantities of concern, the licensee shall retain all documentation required by these increased controls for three years.
- IC 6. Detailed information generated by the licensee that describes the physical protection of radioactive material quantities of concern, is sensitive information and shall be protected from unauthorized disclosure.
- a. The licensee shall control access to its physical protection information to those persons who have an established need to know the information, and are considered to be trustworthy and reliable.
 - b. The licensee shall develop, maintain and implement policies and procedures for controlling access to, and for proper handling and protection against unauthorized disclosure of, its physical protection information for radioactive material covered by these requirements. The policies and procedures shall include the following:
 1. General performance requirement that each person who produces, receives, or acquires the licensee's sensitive information, protect the information from unauthorized disclosure,
 2. Protection of sensitive information during use, storage, and transit,
 4. Preparation, identification or marking, and transmission,
 5. Access control,

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6. Destruction of documents,
7. Use of automatic data processing systems, and
8. Removal from the licensee's sensitive information category.

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Table 1: Radionuclides of Concern

Radionuclide	Quantity of Concern ¹ (TBq)	Quantity of Concern ² (Ci)
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	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
Combinations of radioactive materials listed above ³	See Footnote Below ⁴	

¹ The aggregate activity of multiple, collocated sources of the same radionuclide should be included when the total activity exceeds the quantity of concern.

² The primary values used for compliance with this Order are TBq. The curie (Ci) values are rounded to two significant figures for informational purposes only.

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 the ratios of the activity of each source, I of radionuclide, n , $A_{(I,n)}$, to the quantity of concern for radionuclide n , $Q_{(n)}$, listed for that radionuclide exceeds one. $[(\text{aggregated source activity for radionuclide A}) \div (\text{quantity of concern for radionuclide A})] + [(\text{aggregated source activity for radionuclide B}) \div (\text{quantity of concern for radionuclide B})] + \text{etc.} \dots \geq 1$

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Use the following method to determine which sources of radioactive material require increased controls (ICs):

- Include any single source larger than the quantity of concern in Table 1
- Include multiple co-located sources of the same radionuclide when the combined quantity exceeds the quantity of concern
- For combinations of radionuclides, include multiple co-located sources of different radionuclides when the aggregate quantities satisfy the following unity rule: [(amount of radionuclide A), (quantity of concern of radionuclide A)] + [(amount of radionuclide B), (quantity of concern of radionuclide B)] + etc... ≥ 1