MALCOLM PIRNIE

INDEPENDENT ENVIRONMENTAL
ENGINEERS, SCIENTISTS
AND CONSULTANTS

Malcolm Pirnie, Inc.
104 Corporate Park Drive, Box 751
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T: 914.694.2100 F: 914.694.9286
www.pirnie.com

P-2

January 19, 2010

Ms. Jenny Johansen
United States Nuclear Regulatory Commission
Region 1
475 Allendale Rd.
King of Prussia, PA 19406
Attn: License Assistance Team

03038179

RECEIVED
REGION 1
2010 JAN 22 PM 12: 22

07-31392-01

Re: Malcolm Pirnie, Inc., New License, Control No. ~~144274~~

Dear Ms. Johansen:

07-31392-01

We are writing this letter to amend License #~~144274~~ due to the change in the location of the equipment. The meter will be stored at the following location:

Sentinel Self Storage (Storage Unit #338)
141 Edgemoor Rd.
Wilmington, DE 19809

Attached are photos and public dose calculations for the reference storage unit. The storage unit is 15ft x 10ft in size. The storage unit will be locked at all times when not in use and only authorized personnel will have access. The steel storage container, which houses up to 3 meters, will have 2 separate locks and be chained to the structural supports of the storage unit. The meters will be housed inside their carrying cases within the steel storage container.

Also attached is description of the equipment to be purchased.

Also attached is the verification of the nuclear density meter training hands-on training received by John Greblunas, RSO.

Please feel free to contact me if you have any questions.

Yours truly,

MALCOLM PIRNIE, INC.

Charles J. Myers
Sr. Associate

cc: Sattar Lodhi
Att/

144393

MALCOLM PIRNIE

# Interoffice Correspondence

Date: 1/13/10 (revised 1/18/10)

To: Charles Myers

Copy: File

From: Todd Minehardt, MPI-Albany

Re: John Greblunas - Densitometer Training

On 12/15/2009 John Greblunas of Malcolm Pirnie visited the Town of Colonie Division of Environmental Services Facility at which Malcolm Pirnie maintains a field office that also serves as our permanent storage facility for two nuclear densitometer gauges licensed to our Malcolm Pirnie Albany office by the New York State Department of Health.

John met with John Nead of Malcolm Pirnie, a certified densitometer gauge operator to review gauge operation and view our storage area as a possible example for the implementation of gauge storage for a new license being sought.

John Nead covered to following items while at the site:

- A 3440 gauge was used to demonstrate standard block calibration, programming of proctor data, handling of gauge during actual testing, and wipe testing for gauge leakage.
- John Greblunas operated the gauge after direction by John Nead.
- John Nead reviewed the method of storage and vehicle transport employed by the Albany office.

John Grebunas visited me at a second project office I had been working at. We reviewed the densitometer gauge manuals and master manual that I maintain as the Albany Office RSO. We discussed the arrangement and contents of the data files which included:

- All license files and associated correspondence.
- Bill of lading for transport and DOT requirements for vehicle transport.
- Fed-Ex shipment of gauge as a dangerous goods and IATA requirements.
- Personnel monitoring (dosimeter badges) and summation of data/data review.
- Leak testing logs for the gauges.
- Daily block logs and quarterly inventory logs.
- Packaging certificates and source certificates.
- Annual refresher for operators.
- Operator certificates and DOT training certificates.

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Testing Equipment for Construction Materials

# HUMBOLDT

## NRC LICENSE APPLICATION INFORMATION

**ITEM 1**

**Check appropriate box and enter current license number, if applicable**

**ITEM 2**

**Name and mailing address of applicant.**

**ITEM 3**

**Physical Storage address (not a P.O. Box) diagram of storage location will be included with application**

**ITEM 4**

**Name and telephone number of contact person for additional information**

**SUBMIT ITEMS 5-11 on 8 ½ x 11 paper. (follow application guide as to what information to include – information from item 7 on is only suggestion as to information requested)**

**ITEM 5**

| Radioactive Material | Chemical and/or Physical Form | Maximum Amount of Radioactive Material and/or Quantity of Radioactive Material which Licensee May Possess at Any One Time |
|---|---|---|
| A. Cesium 137 | Sealed Source (as specified in Registry sheet NR136S200S or equivalent | No Single Source to exceed 11 millicuries |

**Humboldt Mfg. Co.**, 3801 North 25th Avenue, Schiller Park, IL 60176
1.800.544.7220 • 1.708.456.6300 • 1.708.456.0137 (fax) • hmc@humboldtmfg.com • www.humboldtmfg.com

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| | | |
|---|---|---|
| **B. Americium 241/ Beryllium** | **Sealed Source (as specified in Registry sheet NR136S138U or equivalent** | **No Single Source to exceed 50 millicuries** |

**ITEM 6**

**Intended use: For use in a Humboldt 5001 Series, Troxler 3400 Series or Campbell Pacific Nuclear MC Series compaction Control Gauge used to measure the moisture and density of engineering materials.**

**ITEM 7**

***NAME RSO***

(LIST QUALIFICATIONS) EX: Proposed RSO has completed one of the training courses described in Criteria in the section entitled "Individual(s) Responsible for Radiation Safety Program and Their Training and Experience – Radiation Safety Officer" in NUREG-1556, Vol. 1, Rev. 1, "Consolidated Guidance about Material Licenses: Program-Specific Guidance about Portable Gauge Licenses," dated November 2001".

list any other qualifications eg: Education; job title & work responsibilities

**ITEM 8**

"Before using licensed materials, authorized users will have successfully completed one of the training courses described in Criteria in the sections entitled 'Training for Individuals Working In or Frequenting Restricted Areas' in NUREG-1556, Vol. 1, Rev. 1, 'Consolidated Guidance about Materials Licenses: Program-Specific Guidance about Portable Gauge Licenses,' dated September 2001". Certifications of these employees may be seen at "list location of certificates" in the RSO's files.

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ITEM 9

No information needed.

ITEM 10

You may want to put together a radiation safety plan similar to the one presented in Humboldt's radiation safety training class offered. The following need to be addressed:

Look at 8.10.3 and decide your option. We offer Certified Survey Meters for $575.00.

8.10.4 requires response

8.10.5 requires response

8.10.7 requires response

8.10.8 requires response

Licensee authorized to collect leak test samples at intervals approved by NRC or an Agreement State for analysis by Humboldt Scientific, Troxler Electronics or Campbell Pacific Nuclear.

8.10.9 requires response

Also, supply diagram of storage location and distances to nearby work stations. Also, may want to list any survey devices you will be using to monitor amounts of radiation coming from storage area.

ITEM 11

Disposal will be performed by transferring to properly licensed user or returned to the manufacturer

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ITEM 12

License fees may be obtained from NRC.

I looked at the NRC's site on the internet and they discuss licensing. You may want to look at that and see if it may be a more convenient way to apply for your license. I have not spoken with anyone who has done this yet.

Please call if you have any other questions.

Thanks,
Ed Hall

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Figure 1- Meter Storage Location (10ft x 15ft)
Notes: Meter container to be chained to structural supports in right of photo

**Model 3068 KNAACK® CLASSIC Storage Chest**

Weight (lbs.): 225 Dimensions: H:37 W: 30 L: 60

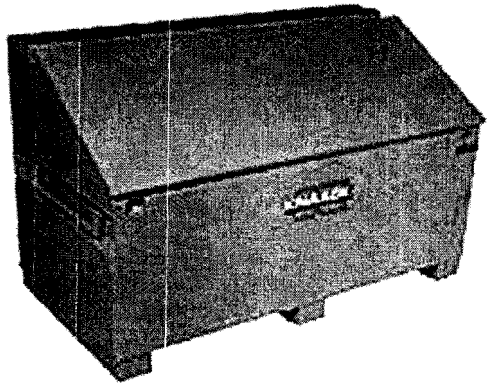

Figure 2- Steel Storage Container to be purchased

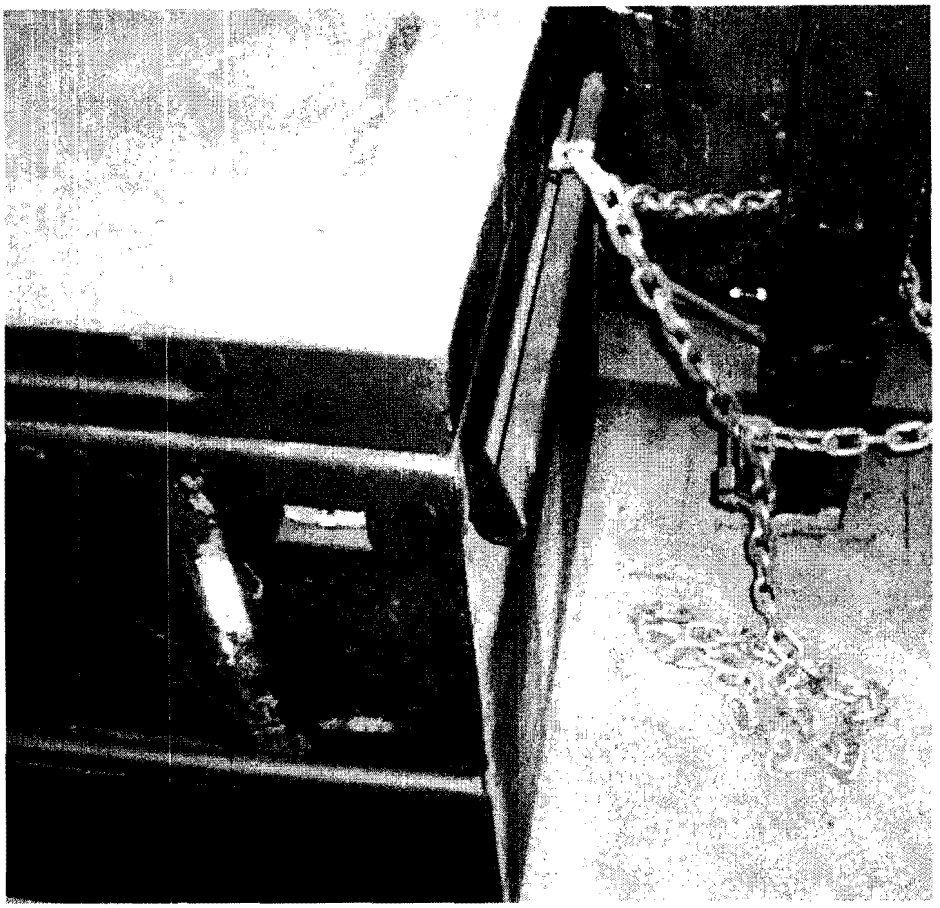

Figure 3-Example of Secured Container

## APPENDIX G - PUBLIC DOSE CALUCATION WORKSHEET

The maximum dose to any member of the public will be less than 100 millirem in a year and the maximum dose in an y unrestricted area will be less than 2 millirem in any hour. The typical limiting case involves the storage or gauges. Several simplifying and conservative assumptions are made in this calculation method:

- No shielding other than the shielding in the gauge is assumed to be present.
- All gauges are assumed to be at the same distance as the closed gauge.
- Sources are assumed to remain in the shielded position within the gauge.
- Each gauge is assumed to be a point source and dose rates are assumed to decrease with the inverse square of distance from the gauge.
- Gauges are assumed to be in storage all of the time.

More realistic assumptions can be made or actual measured dose rates can be used if necessary to demonstrate compliance.

| Step | Instruction | Result |
|---|---|---|
| 1. | Identify the individual member of the public likely to receive the highest dose from gauges in storage. This will be the person who spends the most time in the vicinity of the stored gauges or who is closed to the gauges. This individual will be the focus of the calculation. | Persons using adjoining storage units |
| 2. | Determine the maximum dose rate in mrem/hr at a distance of three feet (1 meter) for each gauge kept in the storage location. This value may be obtained from the radiation profile in the gauge operation manual, from the manufacturer, or from Transport Index on the Yellow II label on the transport case. Calculate the sum of the dose rate values for all of the gauges that may be stored at this location and enter the result. Remember to include both gamma and neutron dose. | 1.8 mrem/hour for 3 gauges (reference Troxler 3440 Manual p.141) |
| 3. | Enter the distance in feet from the position occupied by the person identified in step 1 to the nearest gauge in the storage area. | 3 ft |
| 4. | Calculate the square of the distance from step 3 and enter the result. | 9 ft |
| 5. | Divide the value from step 4 by 9 and enter the result. This is the factor that accounts for the difference between the dose rate at 3 feet and the dose rate at the distance at which the person is located. | 3 |
| 6. | Divide the dose rate (mrem/hr) from step 2 by the result from step 5 and enter the result. | 0.6 |
| 7. | Enter the number of hours in a year that the individual will be present in the vicinity of the gauges. For example, an individual working full-time near the gauges, would be present approximately 2000 hrs in a year (8 hrs per day x 5 days per week x 50 weeks per year). | 125 hrs (occupancy factor T/16) |
| 8. | Multiply the result from step 6 by the result from step7 and enter the result. This is the maximum dose in mrem the individual could receive in one calendar year. If this value is less than 100 mrem, the annual dose limit is met; continue with step 9 to determine if the unrestricted area dose rate limit is met. | 75 mrem/yr |
| 9. | Determine the minimum distance in feet to any unrestricted area outside the gauge storage area and record the value. This could be an area above, below, or adjacent to the storage area that is unrestricted for the purpose of radiation control. The area need not be occupied, just accessible to members of the public, which may include company employees. | 3 ft |
| 10 | Calculate the square of the distance from step 9 and enter the result. | 9 ft |
| 11 | Divide the value from step 10 by 9 and enter the result. This is a factor that accounts for the difference between the dose rate at 3 feet and the dose rate at the distance in step 9. | 1 |

| | | |
|---|---|---|
| 1<br>2 | Divide the dose rate (mrem/hr) from step2 by the result from step 11 and enter the result. This is the maximum dose in mrem that could be received in one hour in the closest unrestricted area. If this value is less than 2 mrem, the dose limit for unrestricted areas is met. | 1.8 mrem/hr |
| **Calculations performed by:** John Greblunas, RSO | | **Date:** 1/13/2010 |

*If either dose limit is exceeded,* you should either recalculate that dose using more realistic assumptions and data or take steps to reduce the dose received by members of the public using the principles of time, distance, and shielding.

- Limit the time personnel spend in the vicinity of the gauges.
- Increase the distance between the gauges and personnel.
- Add shielding to reduce the dose rate.

**OCCUPANCY FACTORS**

The following occupancy data may be used when data for specific personnel are not available:

| Area | Occupancy Factor (T) |
|---|---|
| Work areas such as offices, laboratories, shops, wards, nurses' stations; living quarters; children's play areas; and occupied space in nearby buildings | Full Occupancy<br>(T=1) |
| Corridors, rest rooms, elevators using operators, unattended parking lots. | Partial Occupancy<br>(T= ¼) |
| Waiting rooms, toilets, stairways, unattended elevators, janitor's closets, outside areas used only for pedestrians or vehicular traffic. | Occasional Occupancy<br>(T= 1/16) |

Reference: NCRP Report No. 49, Structural Shielding Design and Evaluation for Medical Use of X-rays and Gamma Rays of Energies Up to 10 MeV, 1976.

**SHIELDING HALF-VALUES***

| Material | Cs-137 Gamma Radiation | Am:Be Neutron Radiation |
|---|---|---|
| Lead | ¼ in. | N/A |
| Concrete | 2 in. | 4 in. |

The half-value is the thickness of material that will reduce the dose rate by one-half.

This is to acknowledge the receipt of your letter/application dated

1/18/2010, and to inform you that the initial processing which includes an administrative review has been performed.

☑ AMEND. 07-31392-01
There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

☐ Please provide to this office within 30 days of your receipt of this card

_____.

A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 144393.
When calling to inquire about this action, please refer to this control number.
You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI)
(6-96)

Sincerely,
Licensing Assistance Team Leader