Roldan, Lizette

From: Roldan, Lizette
Sent: Thursday, August 04, 2011 11:18 AM
To: 'mmccullough@sanjel.com'
Subject: REQUEST FOR ADDITIONAL INFORMATION REGARDING RENEWAL CONTROL 575054
Attachments: sr1556v4.pdf

License No.: 54-27692-01
Docket No.: 030-35652
Control No.: 575054

Dear Mr. McCullough:

This is in reference to your application dated April 29, 2011 requesting a renewal for Nuclear Regulatory Commission License 54-27692-01. In order to continue our review, we need the following information:

1. Please note that since there will be a mailing address change from Canada to Colorado there will be a new license number issued at the time of your renewal. The aforementioned license number will be terminated concurrently with the issuance of the new license.

2. Please provide a statement: "Operating and emergency procedures will be developed, implemented, maintained, and distributed, and will meet the Criteria in the section entitled "Radiation Safety Program – Operating and Emergency Procedures," in NUREG 1556 Vol. 4."

3. Your application is not clear in terms of non-routine maintenance. Please review the guidance specified in Chapter 8 Section 8.10.8 and Appendix N of NUREG 1556 Volume 4 which describes what is considered non-routine maintenance and either provide a statement: "The gauge manufacturer, distributor or other person authorized by the NRC or an Agreement State will perform non-routine operations such as installation, initial radiation survey, repair, and maintenance of components related to the radiological safety of the gauge, gauge relocation, replacement, and disposal of sealed sources, alignment or removal of a gauge from service." **OR** provide information listed in Appendix N of NUREG1556 Vol. 4 supporting a request to perform non-routine operations in house.

4. Please provide a statement: "We will develop, implement, maintain and distribute procedures that meet the Criteria in the section entitled "Radiation Safety Program – Fixed Gauges Used at Temporary Job Sites" in NUREG-1556 Volume 4, dated October 1998."

I have attached the NUREG 1556 Volume 4 for your convenience. We will continue our review upon receipt of this information. Please reply to my attention at the Region IV Office and refer to Mail Control No. 575054. Please respond to this e-mail by September 5, 2011.You may reply via e-mail as long as the response is attached in a PDF format or by fax to 817-860-8263.

Thanks,

Lizette Roldán-Otero, Ph.D.
Health Physicist
Nuclear Regulatory Commission
612 E. Lamar Blvd., Suite 400
Arlington, TX 76011
Office: 817-276-6596
Fax: 817-860-8263

Sanjel (USA) Inc. 511 16th St, Suite 300 Denver, CO 80202 P 303.893.6866 F 303.893.6864
Corporate Head Office 200, 505 2nd St SW Calgary, AB T2P 1N8 P 403.269.1420 F 403.269.1433

8/16/11

United State Nuclear Regulatory Commission
Lizette Roldán-Otero
612 E. Lamar Blvd., Suite 400
Arlington, TX 76011

Re: Request for Additional Information Dated August 4, 2011

Sanjel acknowledges that a new license number will be issued and the previous number will be terminated concurrently as listed in item one of your request.

In response to item number two in your request; Sanjel has developed implemented and distributed operating and emergency procedures which meet the criteria in the section entitled "Radiation Safety Program – Operating and Emergency Procedures" in Nureg 1556 Vol. 4". Sanjel will maintain these procedures.

In response to item three in your request; Please review the information outlined below along with the included supporting documentation.

Personnel responsible for carrying out non-routine operations have training commensurate to the level of risk, and must be authorized by the RSO to engage in such operations. Personnel responsible for carrying out non-routine operations are limited to the following job titles, and only when authorized by the RSO to perform such operations:

RSO
HSE Advisor
Electronics Technician

Training for non-routine operations in addition to non-routine training shall include the following:

- Units of radioactivity and radiation dose
- Radiation dose control - aims and objectives
- Radiation dose limits
- Basic nuclear theory
- Nuclear interactions and the properties of Cesium-137
- Nuclear gauge radiation detector calibration, servicing and repair procedures
- External radiation dose control procedures
- Correct use of radiation survey meters
- Sealed radioactive source leak testing
- Nuclear gauging device storage and security
- Sanjel Corporations radioactive materials license requirements
- Introduction to nuclear gauging systems
- Radiation hazard warning signs

- Radioactivity and radiation dose
- Radiation dose limits
- Properties of radioisotopes being used
- Radiation dose control procedures during the use and transportation of fixed nuclear gauges
- Nuclear gauge security
- Nuclear gauge incident response
- Sanjel Corporation radiation safety management structure

Non-routine operations are limited to the following activities

- Calibration and servicing of Texas Nuclear and Thermo Measure Tech, models 5190 & 5192NS nuclear gauging devices per manufacturer's instructions, manufacturer recommendations will be followed for all parts and lubricants
- The preparation, arranging for transport and / or the transportation of nuclear gauging devices.
- Collect sealed radioactive source leak test samples from nuclear gauge source holders per manufacturer's instructions (attached)
- Mounting and dismounting of nuclear gauges onto Sanjel Units
- Replacement of the gauge housing pup following the manufacturer's instructions (attached)
- Replacement and alignment of the gauge electronic detector following the manufacturer's instructions. (attached)
- Maintenance and replacement of gauge labels

Sanjel does not perform maintenance that requires the sealed source to be removed from the source housing. Sealed source replacement and / or disposal will be completed by returning the gauge to the manufacturer for service.

Sanjel does not badge employees based on dose rate calculation completed in April 2011 (attached)

Sanjel utilizes a Ludlum Model 3 Survey Meter with Ludlum Model 44-38 Detector at each location that performs non-routine operations. All meters are maintained and calibrated in accordance with the manufacturer's recommendations and instructions.

Sanjel will ensure that radiation levels in area's that non-routine operations are performed do not exceed the limits established in 10 CFR 20.1301 through completion of surveys as outline in the attached procedures. Completed surveys will be maintained for a period of three years as required in 10 CFR 20.2103.

Item four request; Sanjel will develop, implement, maintain and distribute procedures that meet the criteria in the section entitled "Radiation Safety Program – Fixed Gauges Used at Temporary Job Sites" in NUREG – 1556 Vol. 4 dated October 1998.

Sanjel (USA) Inc. 511 16th St, Suite 300 Denver, CO 80202 P 303.893.6866 F 303.893.6864
Corporate Head Office 200, 505 2nd St SW Calgary, AB T2P 1N8 P 403.269.1420 F 403.269.1433

Feel free to contact me with any questions or concerns.

Kind Regards,

Mark A. McCullough
Radiation Safety Officer
Sanjel USA Inc.
116 Flatiron Drive
Buffalo, WY 82834
Phone: (307)-684-1800
Cell: (307)-620-2876
Fax: (307)-684-9337
mmccullough@sanjel.com

Only those persons who have received the required level of training are authorized to service and calibrate the model 5190 and 5192 nuclear gauge radiation detector assemblies

14.11.1. Model 5190 (Shutterless) Nuclear Gauge Detector Servicing and Calibration

- Establish a radiation control zone around the area where the radiation detector assemblies are to be serviced and calibrated. The gamma radiation intensity at the control zone perimeter should not cause personnel, who are not Radiation Workers to receive a radiation dose in excess of the allowable public dose.
- Perform radiation survey (document data on the installation check list Appendix D)
- Insert a lead plug into the pipe on which the source holder is mounted. Use a radiation survey meter to confirm that the lead plug is correctly positioned.
- Follow the manufacturers' instructions for the servicing and calibration of the detector assembly.
- Complete a "Radiation Source Transfer Record" and forward to RSO to amend the "Nuclear Gauge Inventory Records".

14.11.2. Model 5190 Nuclear Gauge Detector Servicing and Calibration

- Establish a radiation control zone around the area where the radiation detector assemblies are to be serviced and calibrated. The gamma radiation intensity at the control zone perimeter should not cause personnel, who are not Radiation Workers to receive a radiation dose in excess of the allowable public dose.
- Close and lock the source holder shutter in the closed position. Use a radiation survey meter to confirm that the shutter is fully closed (record data on the installation checklist Appendix D).
- Follow the manufacturers' instructions for the servicing and calibration of the detector assembly.
- Complete a "Radiation Source Transfer Record" and forward to RSO to amend the "Nuclear Gauge Inventory Records".

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Procedures for Non-Routine Maintenance Radioactive Sealed Source
Models 5190 & 5192The following written procedures are to be performed only by properly trained personnel who are authorized by Sanjel administration. Proof of training must be on file with the RSO before work is commenced.

ELECTRONIC COMPONENT REMOVAL/REPLACEMENT

Keep unnecessary personnel back at least three meters from the gauge while performing the following procedure.

1. Place the shutter in the "OFF" position and apply a lock. If the unit does not have a shutter skip this step and go to step two.
2. Gain access to either end of the pup joint the source and detector are installed on, place a lead bar into the joint assuring that it extends beyond the source opening. This will block the beam from entering the detector. Secure the lead bar to prohibit its accidental movement.
3. Perform a radiation survey, document the results on the appropriate form and send a copy to the RSO
4. Remove the four screws holding the detector cap, remove the cap, disconnect the wire connectors, set the cap aside.
5. Remove the electronic components.

In this condition the densometer cannot be left unguarded. Someone must remain with the unit to keep others at a safe distance until it is restored to working condition.

6. Install the repaired or replacement electronic component in the detector housing. Retrieve the cap, connect the wiring harness and install the cap paying close attention to the "O" rings condition. Replace if necessary.
7. Release and remove the lead bar from the pup joint. Remove the lock and open the shutter.
8. Perform a radiation survey, document the results on the appropriate form, and send a copy to the RSO.
9. Calibrate and test the unit.

Procedures for Non-Routine Maintenance
Radioactive Sealed Source

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Models 5190 & 5192

The following written procedures are to be performed only by properly trained personnel who are authorized by Sanjel administration. Proof of training must be on file with the RSO before work is commenced.

IRON PIPE (PUP JOINT) REPLACEMENT (RELOCATION)

Keep unnecessary personnel back at least three meters from the gauge while performing the following procedure.

1. Place the shutter in the "OFF" position and apply a lock. If the unit does not have a shutter, skip this step and go to step two.
2. Perform and document survey.
3. Place the unit in a position with the source end on top and resting on the detector. Be sure to protect the cable attachment plug from damage.
4. Before proceeding further verify that you have all tools and parts available to complete the task.
5. Using an appropriate tool cut the four bolts holding the source and detector onto the pup joint. Grind off any welds to the mounting system to enable the two to be separated.

> Use extreme caution particularly on units without shutters as the particle beam is constantly emitting radiation that can be very hazardous to living tissue. **DO NOT ALLOW ANY BODY PART TO PASS THROUGH THE ENERGY BEAM.**

6. Maintaining complete control of the source head move it to the side. Do not allow the source holder to tip or otherwise change the downward direction of the beam.
7. Another individual can then remove the pup joint and replace it with the new one in the same configuration.
8. Immediately replace the source holder back onto the unit, insert new bolts, and torque to specification. The mounting system should insure proper alignment of the energy beam but check to be sure. The beam should be directly centered over the detector. If there is any misalignment loosen the bolts slightly and realign the mounting system. Re-torque the bolts.
9. Weld the nuts to the bolts and replace any welds that were earlier removed from the mounting system to adhere to safety requirements and prevent unauthorized removal. After cooling welds should be painted to discourage corrosion.
10. Perform a radiation survey, document the results on the appropriate form, and send a copy to the RSO.
11. Calibrate and test the unit.

14.1. NUCLEAR GAUGE INSTALLATION AND REMOVAL PROCEDURES

14.1.1. Nuclear Gauge Source Holder Installation

The installation of models 5190 and 5192 nuclear density gauges on cement and fracturing trucks shall only be carried out by properly trained and authorized personnel. Non-routine procedures shall be followed see Appendix E & F Prior to installation of the source holder the following steps shall be taken:

- Carry out a visual inspection of the source holder to confirm that there is no obvious damage to the source holder.
- Confirm that the source shutter is in the closed position and locked out. Use a radiation survey meter to confirm that the source shutter is in the fully closed position (record data on densitometer installation checklist Appendix D).
- Confirm that shutterless source holders have been mounted onto a section of pipe (PUP) by the manufacturer. If this is not the case inform the RSO.
- Confirm that shutterless source holders have a lead bar inserted in the pup before any handling by personnel.
- Use a radiation survey meter to confirm that the radiation field around the source holder does not exceed 50 µSv/h at one foot (30 cetimeters).
- Install the source holder in compliance with the manufacturer's engineering drawings and specifications.
- If required, protect source holder from high temperature, chemical and / or physical damage.
- Following installation of the source holder, measure and record the radiation intensities at thirty (30 centimetres) from the source holder. Take these measurements around the source holder with the source shutter in the ***ON*** and ***OFF*** positions. Record the radiation intensity values on ***(Densitometer Installation Checklist Appendix D)***, and forward a copy of this document to the RSO.

  (CAUTION): DO NOT ATTEMPT TO MEASURE THE RADIATION INTENSITY OF THE PRIMARY RADIATION BEAM.

  - Post radiation warning signs in accordance with U.S NRC requirements
  - Complete **(Radiation Source Transfer Record Appendix A)** (if applicable) and forward a copy to RSO to amend the Nuclear Gauging Device Inventory Record to show the new location for the nuclear gauge source holder.

14.1.2. Nuclear Gauge Source Holder Removal

Sanjel (USA) Inc. 511 16th St, Suite 300 Denver, CO 80202 F 303.893.6866 F 303.893.6964
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Removal of a nuclear gauge source holder from cement or fracturing truck shall only be carried out by properly trained and authorized personnel. Source holder removal shall follow the sequence described below:

- Before removal of the source holder confirm that the shutter is closed and locked out. Use a radiation survey meter to confirm that the source shutter is in the closed position (record data on densitometer installation checklist Appendix D).
- Shutterless source holders shall remain attached to their pipe section (PUP) during the entire removal procedure.
- Examine the source holder for any visible damage, if there is any evidence of damage; seek the advice of qualified personnel before proceeding with the removal.
- Follow manufacturer's instructions for the removal of the source holder from its operating position.
- When source holder is free from unit a lead bar shall be inserted into the pup or carry caps installed before any further handling by personnel.
- If the source holder is being removed for equipment maintenance purposes, it is to be transferred to the nuclear gauge storage area until the maintenance procedure is finished

ThermoFisher SCIENTIFIC

The world leader in serving science

FIXED GAUGE
LEAK TEST WIPE PROCEDURE - QT/1K
(02/06)

The gauge or instrument must NOT be dismantled or disassembled in order to perform the leak test wipe. The wiping along/near the external seams, flanges, and surfaces are usually adequate. Each kit is designed and supplied to test one source.

If the device to be tested has a shutter, position the shutter in the closed position. However, if you cannot close the shutter perform the wipe where the shutter may rub against the beam port area. (Remember: performing and documenting shutter function checks and physical inventories are a six month regulatory requirement.) If there appears to be a problem with the shutter operation, contact Thermo MeasureTech.

Visually inspect the source head with attention to the welded areas, shutter block and handle, as well as making sure the name plate is visible, clear, and legible. If the gauge is chain mounted, inspect chain and/or seams for any signs of stress. If any unusual items appear evident, notify Thermo MeasureTech immediately.

1. Carefully read and understand the information contained in these instructions and the drawing for the specific model device to be wiped. DO NOT RETURN THESE INSTRUCTIONS WITH YOUR KIT. MAINTAIN THESE PROCEDURES IN YOUR FILE FOR AGENCY REVIEW.

2. Remove two cotton-tipped applicators, alcohol packet, device identifying label, and plastic bag. From the device tag, verify or identify the device being tested by Manufacturer, Model, Serial Number, Isotope, and Activity. You may include the plant device location for identifying your devices on the *Leak Test Identification* form.

3. Make any changes on the *Leak Test Identification* form. Any changes must be noted on the *Leak Test Identification* form NOT on the preprinted label. This form must be signed, dated and returned with your test samples. Without this form, we may not be able to identify and analyze the samples.

4. Open the alcohol packet and moisten the applicators by inserting them into the packet. Remove applicators and wipe the source holder surfaces and near the shutter block. The sampling areas of most devices are defined in drawings attached to this procedure.

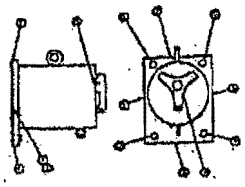
5. Do not touch the cotton end of the applicators after performing the wipe. After wiping, place both applicators back into the alcohol packet. Break the stick end of the applicators off so the sample will fit into the plastic bag. Place the appropriate supplied device ID LABEL ON THE PLASTIC BAG so we can identify the sample. Make sure the plastic bag is sealed well.

Process Instruments | 1410 Gillingham Lane | Sugar Land, TX 77002 | (713) 272-0404 | (713) 272-2273 fax | www.thermofisher.com

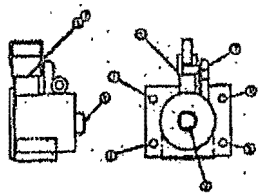
Additional Information: *Fixed Gauges QT/1K*

Identify the units Model Number and perform the leak test wipe by those areas denoted by the arrow. If the Model Number of your particular device is not shown below please feel free to contact our Leak Test Lab at 1.800.736.0801.

TN 5174 & 5176

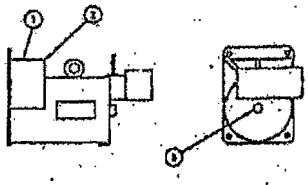


TN 5178, 5179, 5180, 5181, 5182 & 5183

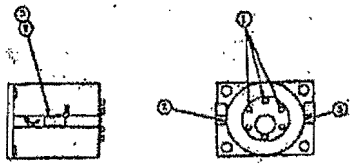


TN 5184

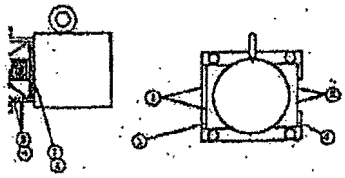
SOURCE HEAD NO. 5184



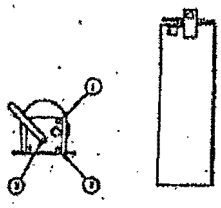
TN 5188



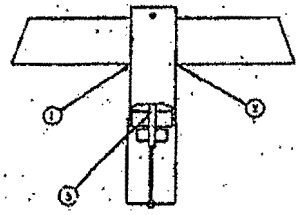
TN 5189, 5190, 5191, 5192, 5193 & 5199



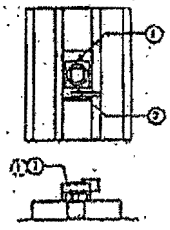
TN 5194, 5195 & 5196



TN 5197



TN 5198



Crew Size	1 to 2		Work days per year: 260					Jobs using Nuclear Gauge: 60						Annual Individual Cal. Exp. (mR)	
	Events per year	Crew per Event	Hours per Event	Hours per year	Radiological Data cm	mCi.	mR/Hr.	Torso cm	mR/Hr.	hours	Hands cm	mR/Hr.	hours	Torso	Hands
PUP Swap	1	2	1	2	1	200	100	15	20	2	1	100	1	20.00	50.00
Detector Swap:	1	2	1	2	1	200	100	15	20	2	1	100	1	20.00	50.00
Calibration:	1	2	0.5	1	30	200	5	30	5	1				2.50	0.00
Storage:	1	2	0.25	0.5	30	200	5	30	5	0.5				1.25	0.00
Quarterly Insp.:	4	1	0.25	1	30	200	5	30	5	1	1	100	0.01	5.00	1.00
Sign Replacement:	2	1	0.5	1	30	200	5	30	5	1	1	100	1	5.00	100.00
Semi-annual LT/Inv.:	2	1	0.5	1	30	200	5	30	5	1	1	100	0.2	5.00	20.00
Total per Job:	12		4	8.5										58.75	221.00

Data used for calculations:

Shifts are 15 days on, 6 days off.

Total days:	260
Actual Field Days:	200
% of Jobs w/ Gauges:	100%
Total # Jobs w/ Gauges:	12
Min Crew Size:	1
Gauges per Job /Size Crew:	1
Annual Gauge Job per Ind.:	12

Conservative Assumptions

All gauges are new (no decay).
All gauges have shutters
All gauges are relocated.
All gauges are 200 mCi.
47% are 200 mCi.
6% are 145 mCi.
47% are 100 mCi.
That only 10% of workers will do 100% of radiation task.