UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

April 6, 2006

Docket No. 03012568 License No. 37-17332-01
EA No. 06-064

Javaid Alvi, Ph.D.
President
GeoMechanics, Inc.
600 Munir Drive
P. O. Box 386
Elizabeth, PA 15037-0386

SUBJECT: INSPECTION 03012568/2006001, GEOMECHANICS, INC., ELIZABETH, PENNSYLVANIA

Dear Dr. Alvi:

This refers to the inspection conducted on January 12, 2006, at your facility located in Elizabeth, Pennsylvania. The inspection consisted of a visit to your facility, interviews with members of your staff, and a review of selected documents. The inspection also included a review of the circumstances surrounding the theft of a Humboldt Scientific Model 5001 nuclear gauge. You identified the theft and reported the theft to NRC Operations Center on September 19, 2005 (Event No. 41999). On February 1, 2006, the inspector discussed with you during an exit meeting via telephone, the preliminary findings of the inspection. The enclosed report presents the results of this inspection.

Based on the results of this inspection, two apparent violations were identified and are being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at www.nrc.gov; select **What We Do**, **Enforcement**, then **Enforcement Policy**." The apparent violations include: (1) failure to use a minimum of two independent physical controls to secure a portable gauge while it was not under the control and surveillance of your staff, and (2) failure to provide the required written report within 30 days of theft of licensed material. Since the NRC has not made a final determination in this matter, a Notice of Violation is not being issued for these inspection findings at this time. In addition, the number and characterization of apparent violations described in the enclosed inspection report may change as a result of further NRC review.

A predecisional enforcement conference, open to public observation, to discuss these apparent violations has been scheduled for **1:00 p.m. on April 26, 2006**, at the Region I Office in King of Prussia, PA. The NRC announces enforcement conferences to the public by issuing a press release. The decision to hold a predecisional enforcement conference does not mean that the NRC has determined that a violation has occurred or that enforcement action will be taken. This conference is being held to obtain information to enable the NRC to make an enforcement decision, such as a common understanding of the facts, root causes, missed opportunities to identify the apparent violations sooner, corrective actions, significance of the issues, and the need for lasting and effective corrective action. In addition, this is an opportunity for you to

point out any errors in our inspection report and for you to provide any information concerning your perspectives on 1) the severity of the violations, 2) the application of the factors that the NRC considers when it determines the amount of a civil penalty that may be assessed in accordance with Section VI.B.2 of the Enforcement Policy, and 3) any other application of the Enforcement Policy to this case, including the exercise of discretion in accordance with Section VII. In presenting your corrective actions, you should be aware that the promptness and comprehensiveness of your action will be considered in assessing any civil penalty for the apparent violation. The guidance in the enclosed NRC Information Notice 96-28, "SUGGESTED GUIDANCE RELATING TO DEVELOPMENT AND IMPLEMENTATION OF CORRECTIVE ACTION," may be helpful.

You will be advised by separate correspondence of the results of our deliberations on this matter. No response regarding these apparent violations is required at this time.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and the enclosed inspection report will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm.html (the Public Electronic Reading Room).

Current NRC regulations are included on the NRC's website at www.nrc.gov; select **Nuclear Materials; Medical, Industrial, and Academic Uses of Nuclear Material;** then **Toolkit Index Page.** The current Enforcement Policy is included on the NRC's website at www.nrc.gov; select **What We Do, Enforcement,** then **Enforcement Policy.** Or you may obtain these documents by contacting the Government Printing Office (GPO) toll-free at 1-888-293-6498. The GPO is open from 7:00 a.m. to 9:00 p.m. EST, Monday through Friday (except Federal holidays).

Sincerely,

/RA Pamela J. Henderson for/

George Pangburn, Director
Division of Nuclear Materials Safety

Enclosures:
1. Inspection Report No. 03012568/2006001
2. NRC Information Notice 96-28
3. Directions to Region I Office

cc:
Walter Lorence, Radiation Safety Officer
Commonwealth of Pennsylvania

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U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Inspection No.	03012568/2006001
Docket No.	03012568
License No.	37-17332-01
Licensee:	GeoMechanics, Inc.
Address:	600 Munir Drive, P.O. Box 386 Elizabeth, Pennsylvania 15037-0386
Other Locations Inspected:	Temporary job site located at Marathon Oil, Route 837, West Elizabeth, Pennsylvania
Inspection Dates:	Onsite inspection January 12, 2006; and February 1, 2006, via telephone

Inspector: ***/RA/*** _____ ***04/06/06*** _____

James Schmidt, Health Physicist — date

Approved By: ***/RA Sattar Lodhi for/*** _____ ***04/06/06*** _____

John D. Kinneman, Chief, Materials Security and Industrial Branch, Division of Nuclear Materials Safety — date

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EXECUTIVE SUMMARY

GeoMechanics, Inc.
NRC Inspection Report No. 03012568/2006001

On January 12, 2006, an inspection was conducted at the licensee's facilities located in Elizabeth, Pennsylvania, and at a nearby temporary job site located in West Elizabeth, Pennsylvania. GeoMechanics is a small employee-owned geo-mechanical engineering firm that employs about 50 personnel, 10 of whom are authorized nuclear gauge users.

This inspection consisted of a review of the licensee's radiation safety program and a review of the circumstances surrounding the theft of a Humboldt Scientific Model 5001 nuclear gauge. The theft occurred on September 19, 2005. The gauge was found abandoned on a public highway in Danville, West Virginia on September 23, 2005. There was no apparent damage to the gauge and the sources were in their shielded position and the source rod was locked at the time of its recovery. The licensee notified the NRC Operations Center of the theft on September 19, 2005 (Event No.41999).

The inspection identified two apparent violations: (1) failure to use a minimum of two independent physical barriers to secure a portable gauge from unauthorized removal, and (2) failure to provide a written report within 30 days of theft of licensed material. The licensee submitted the required written report on February 9, 2006 (ML060890077), more than four months after the theft.

REPORT DETAILS

I. Organization and Scope of the Program

a. Inspection Scope

The inspector interviewed GeoMechanics personnel, including the vice president/radiation safety officer (RSO), to determine the organizational structure and the scope of licensee activities.

b. Observations and Findings

GeoMechanics is a small employee-owned geological-mechanical engineering company and has about 50 employees. Of these employees, ten are fully qualified as nuclear gauge users. The gauge users report to the vice president/radiation safety officer (RSO). The licensee owns nine nuclear gauges. During the normal construction months, typically summer, these moisture density gauges are used on a daily basis at temporary job sites primarily in Pennsylvania and West Virginia. The RSO reported that the use of reciprocity is rarely required due to limited licensee work in Agreement States.

c. Conclusions

GeoMechanics management structure was sufficient to support licensed activities. The scope of GeoMechanics activities is consistent with that authorized by License No. 37-17332-01.

II. Management Oversight of the Program

a. Inspection Scope

The inspector interviewed the RSO and several authorized users to determine the scope and level of management involvement and reviewed.

b. Observations and Findings

The RSO was found to be heavily involved with the radiation safety program. In addition to his routine management involvement, he provides on-site authorized user nuclear gauge training and refresher hazardous material training required by 49 CFR 172. Discussions with authorized users indicated that management expectations relative to authorized user responsibilities are concise and well understood. It was noted that the licensee uses the professional services of Applied Health Physics to support ongoing technical needs such as routine instrument calibration and annual programmatic reviews.

c. Conclusions

The licensee demonstrated an acceptable level of management involvement in the radiation safety program.

III. Facilities and Equipment

a. Inspection Scope

The inspector toured the licensee facility and inspected equipment being used by an authorized user at a temporary job site located in West Elizabeth, Pennsylvania.

b. Observations and Findings

The licensee's storage facility located within the GeoMechanics office was adequate to support safe nuclear gauge storage. The survey instrument maintained by the licensee was calibrated within the last year and was found to be in good working order. A sufficient quantity of locks, chains and bracing hardware was available to support safe public highway transportation. Appropriate bill of lading information was available to support transportation requirements.

c. Conclusions

The facilities and equipment provided by GeoMechanics are adequate to support safe licenced activities.

IV. Material Receipt, Use, Transfer, and Control

a. Inspection Scope

The inspector reviewed the transfer of a licensed nuclear gauge to a temporary job site and interviewed authorized users regarding licensed material security requirements presently in place.

b. Observations and Findings

No deficiencies were identified relative to the transfer of licensed material on the day of the inspection. Discussions with authorized users indicated that personnel are knowledgeable about the new security requirements established in 10 CFR 30.34. Personnel were sensitive to the need for close constant control of all nuclear gauges not properly secured in storage.

c. Conclusions

The use and control practices presently in place by the licensee are adequate to meet regulatory requirements.

V. Review of NRC Event No. 41999

a. Inspection Scope

The inspector reviewed the circumstances related to the theft of a Humboldt Scientific gauge on September 19, 2005 (NRC Event Notification 41999) and interviewed the authorized user responsible for the licensed material at the time of the theft.

b. Observations and Findings

The licensee notified the NRC Operations Center on September 19, 2005, of the theft of a nuclear gauge, a Humboldt Scientific Model 5001, Serial No. 4730. The licensee described the event as follows:

> The gauge was being transported in a licensee-owned vehicle (an open bed pick up truck) to a temporary job site by an authorized user. On September 18, 2005, the authorized user parked the truck in the parking lot of a motel in South Charleston, West Virginia, in preparation for temporary job site work the following day. The gauge was stored on the back of pick up truck in its transport container with its source rod locked in the shielded position. The transport container was also locked. The container was chained to the pickup truck bed using a single lock and chain to prevent its unauthorized removal.
>
> On the morning of September 19, 2005, the authorized user noted that someone had cut the lock and the transport container, including the gauge, had been removed. The local police and the NRC were immediately notified. The police report confirmed that a lock had been cut in order to steal the nuclear gauge case and its contents.
>
> On September 23, 2005, the nuclear gauge, still in its case, was found abandoned along a highway in Danville, West Virginia. At the time of the recovery, the nuclear gauge trigger lock was still secured in place. With this lock in place, licensed material within the gauge is maintained in the shielded position.

Based upon a review of this event and an interview with the authorized user responsible for the nuclear gauge at the time of the theft, the inspector determined that although the licensee had the nuclear gauge locked to the pickup truck bed, the locking mechanism did not include two separate, independent, means of physical security as required by 10 CFR 30.34(I). The RSO acknowledged that, at the time of the theft, the licensee had failed to implement the new portable gauge security requirements established in 10 CFR 30.34(I) which became effective July 1, 2005. He stated he was aware that new security requirements were coming into force; however, he erroneously missed the implementation date. The authorized user had, therefore, not been trained to implement the new security requirements.

The RSO stated that after the theft, this deficiency was noted and training was provided to all authorized users to implement the new security requirements. Personnel interviewed during this inspection confirmed that this training had been completed.

As of February 1, 2006, the written report required by 10 CFR 20.2201(b) had not been submitted to the NRC. The written report was submitted to the NRC on February 9, 2006 (ML060890077).

c. Conclusions

On September 18 and 19, 2005, the licensee was not using two means of physical security to prevent theft. This constitutes an apparent violation.

> 10 CFR 30.34(I) requires that the licensee establish a minimum of two independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal whenever portable gauges are not under the direct control and constant surveillance of the licensee.
>
> Contrary to the above, the licensee maintained only a single physical control to secure a portable gauge from unauthorized removal during a period when the portable gauge was not under direct control or surveillance. Specifically, on September 18, 2005, the licensee used a single chain and lock to secure Humboldt nuclear gauge serial number 4730 to a vehicle while parked unattended overnight. The nuclear gauge, in this configuration, was subsequently stolen from the licensee.

Failure to make a timely written report constitutes a second apparent violation.

> 10 CFR 20.2201(b) requires that a written report be submitted to the NRC within 30 days following a theft of radioactive material requiring an immediate telephone report mandated by 10 CFR 20.2201(a).
>
> Contrary to the above, the licensee made an immediate telephone report of licensed material as required by 10 CFR 20.2201(a) but did not submit a written report in timely fashion. Specifically, the immediate telephone report was made to the NRC on September 19, 2005, but as of February 1, 2006, the written report had not been submitted to the NRC.

VI. Training of Workers

a. Inspection Scope

The inspector interviewed authorized users, reviewed select qualification records, and evaluated the key elements of the licensee's training program.

b. Observations and Findings

The inspector found the two authorized users interviewed to be knowledgeable regarding radiation safety practices and sensitive to nuclear gauge security issues. A review of training records indicated that all personnel on the authorized users list maintained by the RSO had documents on file attesting to their initial nuclear gauge training and routine hazmat refresher training. It was noted during the record review that many of the authorized users had taken the nuclear gauge training more than once.

The inspector noted that this licensee is authorized to provide in-house training for nuclear gauge users. This authority had been in place since 1982 and was most recently re-authorized in License Amendment 6 issued on July 28, 2003 (License Condition 11). In the renewal application used to support this amendment, the licensee agreed to provide a training course which met the requirements of Appendix D to NUREG-1556, Volume 1, "Program Specific Guidance About Portable Gauge Licenses." This appendix includes a requirement that a written, graded, closed-book examination be provided as part of training process. The inspector identified that the existing training program did not include an examination. This disparity was discussed with the RSO. He stated that he missed this new requirement and would update the training program before any additional persons were trained. License requirements in place prior to License Amendment 6 did not require the use of written examination.

A review of licensee qualification records indicated that all training conducted since the issue of License Amendment 6 was completed for personnel previously provided initial approved training. As a result, this training program deficiency was not identified as an apparent violation.

c. Conclusions

The authorized users were found to be appropriately trained and knowledgeable regarding the safe use and storage of nuclear gauges. The licensee's training program was found to be deficient in that it has not been upgraded to include a written examination; however, this deficiency did not rise to the level of an apparent violation because the program was not used to initially qualify any authorized users.

VII. Radiation Surveys

a. Inspection Scope

The inspector conducted surveys of the licensee's nuclear gauge storage facilities using an Eberline E-120 (serial number 3176, calibration due date 4/21/2006).

b. Observations and Findings

The inspector found that all dose rates in unrestricted areas were below one mrem per hour. The inspector noted that the licensee maintains a calibrated survey instrument on the premises. This device was found to be functioning properly.

c. Conclusions

Exposure rates in unrestricted areas surrounding the nuclear gauge storage areas were found to be consistent with regulatory requirements established in 10 CFR 20.

VIII. Radiation Protection

a. Inspection Scope

The inspector reviewed dosimetry records for calender year 2005.

b. Observations and Findings

The inspector found that the licensee is providing NVLAP dosimetry to all authorized users with a monthly exchange frequency. The highest exposed individual for calender year 2005 is 60 mrem of deep-dose equivalent.

c. Conclusions

The licensee provided individual monitoring devices and the device results indicate that licensee activities are conducted in an ALARA fashion.

IX. Transportation

a. Inspection Scope

The inspector observed the shipping practices used to move a nuclear gauge to a temporary job site. Additionally, several nuclear gauge shipping containers located in the licensee's storage cabinet were inspected to assure proper package marking and labeling.

b. Observations and Findings

The inspector determined that the shipping practices used to move licensed material to the temporary job site were adequate and consistent with DOT requirements as specified in 49 CFR. The package was properly marked, labeled, braced during shipment, and the driver had a properly prepared bill of lading to support emergency response personnel, if necessary. The review of transportation packages containing nuclear gauges in storage indicated that all of the DOT Type A packages were properly marked to support transportation requirements.

c. Conclusions

The licensee met hazardous material transportation requirements. No deficiencies were identified.

X. Exit Meeting

An exit meeting by phone was held with the licensee on February 1, 2006. The results of this inspection, which included two apparent violations, were discussed with the licensee. Additionally, based upon the deficiency noted as part of the training program review, the licensee stated that the training program would be upgraded to include a written examination before the program would be used to provide nuclear gauge training for any additional personnel. This requirement is consistent with the commitment already established by the licensee in License Condition 11.

Licensee representatives were in agreement with findings as reported by the inspector during the inspection exit.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

Dr. Javaid Alvi, President, Geomechanics #
Todd Bolin, Geomechanics Lead Laboratory Technician
Justin Harakal, Geomechanics technician
Walter Lorence, Geomechanics Vice President *#
Ryan Mock, Geomechanics technician

* present at inspection entrance
# present at inspection telephone exit