Standard Interpretations

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Occupational Safety & Health Administration
200 Constitution Avenue, NW

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Standard Interpretations

06/30/1993 - Cord and plug connected electric equipment.

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- **Standard Number:** 1910.147

June 30, 1993

Ms. Cheryl A. Hansen,
Librarian Engineering Systems, Inc.
3851 Exchange Avenue
Aurora, Illinois 60504

Dear Ms. Hansen:

This is in response to your April 7 letter which requested an interpretation of 29 CFR 1910.147(a)(2)(iii)(a) as to what "under the exclusive control of the employee" means with respect to cord and plug connected electric equipment.

"Under the exclusive control of the employee" means that the authorized employee would be able to prevent the equipment from becoming reenergized during his or her servicing or maintenance of that equipment. The plug is under the exclusive control of the employee if it is physically in the possession of the employee, or within arms reach and in line of sight of the employee, or if the employee has affixed a lockout/tagout device on the plug in compliance with the 29 CFR 1910.147.

Thank you for your interest in occupational safety and health. If we can be of further assistance, please contact us.

Sincerely,

Roger A. Clark, Director
Directorate of Compliance Programs

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Standard Interpretations

11/16/1999 - Verification procedures for group lockout/tagout.

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- **Standard Number:** 1910.147(d); 1910.269(d); 1910.333(b)(2)(iv)(B)

November 16, 1999

Mr. Kenneth J. Yotz
Senior Vice President
Environmental, Management, and Training Systems, Inc.
919 St. Andrews Circle
Geneva, IL 60134-2995

Dear Mr. Yotz:

Thank you for your May 14, 1999 letter to the Occupational Safety and Health Administration's (OSHA's) Directorate of Compliance Programs. In your letter, you develop a worksite scenario and then pose questions regarding verification of a lockout/tagout (LOTO) procedure by authorized employees pursuant to the Control of Hazardous Energy Standard, 29 CFR §1910.147, and the Electrical Power Generation, Transmission, and Distribution Standard, 29 CFR §1910.269. Your group LOTO scenario, your related questions, and our reply follow:

Scenario: As you know, 1910.147(d)(6) and 1910.269(d)(6)(vii) are virtually identical although the power generation standard contains an additional sentence clarifying that normally energized parts must be tested to ensure that they are de-energized. Because the facility where this issue arose is a power plant, the power generation standard would normally apply but, conceivably, circumstances may exist where LOTO is applicable.

At a power plant some LOTOs are rather simple and involve few workers. Others, however, such as a turnaround, involve many workers and multiple energy isolation sources which must be LOTOed. In addition, various trades are involved, each of which may hire workers from the local union hall. Task demands may require a varying number of workers on a given day. The preamble to these standards appears to require each authorized worker to walk down the system before starting work. Due to the complexity of the situation, few workers can fully determine whether all of the appropriate energy isolating devices have been LOTOed.

Work orders which detail the LOTO are prepared at this facility before each job is begun, a pre-job briefing is held, and a group LOTO box is used.

Question #1: The above identified standards concern verification. Must this verification be performed by **each** authorized employee or may one worker such as a supervisor or other representative perform the verification for all or for even a group of workers (i.e., each

contractor or trade)?

Reply: As you have stated, the preambles to both standards [54 FR 36678 (September 1, 1989); 59 FR 4358, 4359 (January 31, 1994)] emphasize that each authorized employee must ensure that the hazardous energy control procedure has been implemented to isolate effectively the machine or piece of equipment. This verification step, which may require that workers walk through the affected work areas to verify effective isolation, must be accomplished before the authorized employees begin the servicing and/or maintenance work. You also state that normally energized parts must be tested to ensure that they are deenergized. Test instruments may be an appropriate means to verify machine or equipment deenergization, and such instruments are in fact required in the referenced power generation standard whenever employees are exposed to possible electrical hazards. [1]

OSHA has recognized the need for an alternative to the verification requirement where complex LOTO operations involve many employees and numerous energy isolating devices. In such situations, the employer may designate a **primary authorized employee**, with the primary responsibility for a set number of employees working under the group LOTO device (s). The primary authorized employee must implement and coordinate the LOTO of hazardous energy sources and verify that the steps taken, in accordance with the specific energy control procedure, have in fact isolated the machine or equipment effectively from the hazardous energy sources. This must be accomplished **before** authorized employees participating in the group LOTO affix their personal lockout or tagout device to the group LOTO box and **before** they perform servicing/maintenance activities.

In addition to the primary authorized employee, each authorized employee participating in the group LOTO must be informed of their right to verify the effectiveness of the lockout measures, and each authorized employee must be allowed to personally verify that hazardous energy sources have been effectively isolated, if they so choose. An authorized employee, who opts to verify the effectiveness of the isolation measures, must perform this verification **after** affixing his or her personal lockout or tagout device to the lock box and **before** performing servicing/maintenance activities.

With respect to your concern that few workers can determine whether all of the appropriate energy isolating devices have been locked or tagged out, it is nonetheless imperative that the each authorized employee understands the hazards of the work and how to control the hazards. It is for this reason that OSHA requires, in paragraphs §1910.147(d)(1) and §1910.269(d)(6)(i), that authorized employee(s) have knowledge regarding the type and magnitude of the energy, the hazards of the energy to be controlled, and the procedure to be used to control the hazardous energy.

Question #2: Must **each** authorized employee physically walk down the system prior to beginning work or is it sufficient that they review the tests during the pre-job briefing and then "verify" that the group lock box remains locked prior to adding their lock to the box?

Reply: Each authorized employee, or alternatively the primary authorized employee as described above, must verify isolation of hazardous energy sources to the extent necessary to ensure that the servicing/maintenance can be performed safely. This may involve a walk through the affected work area(s), together with operations personnel, to verify effective isolation prior to beginning work. It is not sufficient for authorized employees, and primary authorized employees, to merely review tests in a job briefing and to rely on a locked lock box. Rather, each applicable energy isolation device must be verified to assure effective energy isolation.

Question #3: Under the circumstances identified in question 2 above, must each worker verify the LOTO by walking it down **each day**?

Reply: Yes. Verification is required on **each** shift before any authorized employee(s) begin work. An oncoming employee should not depend on the actions of another employee or supervisor, particularly one who has left the workplace for the day, for assurance that it is safe to work on the machinery or equipment. Additionally, specific procedures, as required by §1910.147(f)(4) and §1910.269(d)(8)(iii), must be developed and utilized to ensure continuation of LOTO protection for employees throughout the shift and during personnel changes.

Question #4: Under the circumstances identified in Question #3, must **each** worker verify the LOTO by walking it down each day the worker remains signed-on to the LOTO and though they do not remove their lock from the group lock box until their job has concluded perhaps several days later.

Reply: No, provided that each worker performing the servicing/maintenance work has had their lock(s) attached to the appropriate master lock mechanism since the last time they applied and verified that the hazardous energy was effectively isolated.

Thank you for your interest in occupational safety and health. We hope you find this information helpful. Please be aware that OSHA's enforcement guidance is subject to periodic review and clarification, amplification, or correction. Such guidance could also be affected by subsequent rulemaking. In the future, should you wish to verify that the guidance provided herein remains current, you may consult OSHA's website at http://www.osha.gov. If you have any further questions, please feel free to contact the Office of General Industry Compliance Assistance at 202-693-1850.

Sincerely,

Richard E. Fairfax, Director
Directorate of Compliance Programs

[1]The same test instrument verification provision for electrical utilization systems is contained in the Electrical Safety-Related Work Practices Standard, §1910.333(b)(2)(iv)(B).(Back to text)

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Standard Interpretations

08/05/1991 - Motor starter circuits and energy isolation devices

Standard Interpretations - Table of Contents

• **Standard Number:** 1910.147

August 5, 1991

MEMORANDUM FOR: MICHAEL G.CONNORS
REGIONAL ADMINISTRATOR

FROM: PATRICIA K. CLARK, DIRECTOR
DIRECTORATE OF COMPLIANCE PROGRAMS

SUBJECT: Interpretation of "Energy Isolation Device" Application of 1910.147 to Conveyors

This is in response to your memorandum of February 12, requesting answers to three questions concerning the relationship of motor starter circuits and energy isolation devices as defined in the Lockout/Tagout Standard, 1910.147. Please accept our apologies for the delay in responding. Your questions and our answers are listed below.

1. Question: It is recognized that a motor starter is a control circuit device. Did the writers of these standards intend that assured control of the motor starter in the "off" condition be accepted as an energy isolation device?

Answer: The intent of the standard was not to include motor starter circuits within the scope of the definition of energy isolation devices.

For further clarification, the definitions of certain terms that have application to the 1910.147 (Lockout/Tagout) standard can be found in the complementary electrical OSHA standard, Subpart S of 1910. Three appropriate definitions are as follows:

1910.399(a)(31) Controller. A device or group of devices that serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected.

1910.399(a)(40) Disconnecting Means. A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

1910.399(a)(124) Isolating Switch. A switch intended for isolating an electric circuit from the source of power. It has no interrupting rating, and it is intended to be operated only after the circuit has been opened by some other means.

2. Question: It is our understanding that the electric motor, once it is stopped using the motor-controller "stop" button and is spun down to a full stop, cannot restart without being activated by the motor-controlled starter and its control circuit. It is further our belief that deactivation of the motor-starter device, using two independent keyed energy isolation

devices properly wired and installed, can be effective in preventing the motor from starting and energization of its control circuit. Does the standard prohibit the use of this type of control circuit device as an energy isolation device for lockout purposes?

Answer: The intent of the standard was not to accept motor-controlled stop buttons or motor-controlled starter circuits as energy isolation devices. Thus during the servicing and/or maintenance of equipment, such mechanisms will not be sufficient to provide the protection envisioned by the standard. On the other hand, for normal production operations, such as during routine, repetitive package clearing operations on conveyor belts, mechanisms that permit work to be performed by using alternative measures which provide effective protection would be acceptable. Further clarification on this issue is provided in OSHA Instruction STD 1-7.3, Appendix C, Paragraphs A.1. through 4. Also, please see the note under Paragraph 1910.147(a)(2)(ii)(B) of the Lockout/Tagout Standard.

It has been claimed in one of the OSHA Region V Area Office letters (to ARA-Technical Support thru Michael G. Connors dated 12/10/90) that "... A diagram from the 1990 NEC Handbook, which tends to support the company's proposed application of control energy isolation, has been provided as Attachment B." We have not seen Attachment B. However, from our knowledge of the 1990 NEC Handbook, we are not familiar where this support is given. It might be that reference is being made to Article 430-111 of the NEC which states the conditions under which a switch or circuit breaker is permitted as both controller and disconnecting means. This requirement, taken from the 1990 NEC, is repeated here for convenience as follows:

430-111. Switch or Circuit Breaker as Both Controller and Disconnecting Means. A switch or circuit breaker complying with Section 430-83 shall be permitted to serve as both controller and disconnecting means if it opens all ungrounded conductors to the motor, if it is protected by an overcurrent device (which shall be permitted to be the branch-circuit fuses) that opens all ungrounded conductors to the switch or circuit breaker, and if it is of one of the types specified in (a), (b), (c) below:

(a) Air-Break Switch. An air-break switch, operable directly by applying the hand to a lever or handle.

(b) Inverse Time Circuit Breaker. An inverse time circuit breaker operable directly by applying the hand to a lever or handle.

(c) Oil Switch. An oil switch used on a circuit whose rating does not exceed 600 volts or 100 amperes, or by special permission on a circuit exceeding this capacity where under expert supervision.

The oil switch or circuit breaker specified above shall be permitted to be both power and manually operable.

The overcurrent device protecting the controller shall be permitted to be part of the controller assembly or shall be permitted to be separate.

An autotransformer-type controller shall be provided with a separate disconnecting means.

If this is the NEC Article referenced by the Cincinnati Area Office as Attachment B, then it obviously can be seen that it is not applicable to the proposed UPS installation since neither the Air-Break Switch, the Inverse Time Circuit Breaker nor the Oil Switch, as specified in 430-111(a), (b) and (c), is used in the UPS design. It should be further noted that both the

Air-Break Switch and the Circuit Breaker must be "operable directly by applying the hand to a lever or handle." And again the UPS method would not satisfy this requirement.

3. Question: It has been proposed, since the motor starter includes control circuit devices and is itself a control circuit device, that it would not be acceptable as an "Energy Isolation Device," per the 1910.147 standard. In the event of control circuit or motor starter failure it could cause the actual three- phase wires feeding power to the motor, coils, armature, and the motor starter circuit to become energized. Do you agree?

Answer: We agree.

The OSHA standard, 1910.147 (Lockout/Tagout), clearly stipulates that in order not to be covered by the standard while performing minor servicing activities during normal production operations, the work must be performed using alternative measures which provide effective protection (emphasis provided). To provide effective protection, the isolation from the source of power must be positive. A dependency on automatically controlled circuits to provide this isolation, even where all ungrounded conductors to the motor are opened, is not positive.

With the proposed UPS method of conveyor stoppage, one scenario may occur as follows:

An UPS package jams on the conveyor and other packages quickly begin to pile up. The attendant immediately actuates the stop button at one of the keyed lockout (field station) devices. The conveyor comes to a stop and the attendant climbs aboard the conveyor to free the jammed packages. Lacking the direct control of a manually operated switch or breaker to remove power by disconnecting all power conductors, motor stoppage becomes dependent on the proper functioning of the control circuits. In this case, we assume that the automatic control circuitry in the motor control center malfunctions such that only one phase of the three phase source to the motor is opened (not an uncommon occurrence especially where the overcurrent protection device opens the third phase (L3) without disturbing the motor starter circuit). Because of the additional load placed on the belt by the jammed packages, the motor, now only operating on two phases, has insufficient torque and stalls, and the belt stops. The attendant, believing that the conveyor has been safely stopped because the maintained stop button on the keyed lockout device was actuated, climbs upon the belt in order to free the jammed parcels. However, as the jam is removed, the resulting load on the conveyor motor is reduced and the belt starts again with sufficient start-up torque from the two remaining phases which have not been disconnected. The attendant becomes unbalanced by the moving conveyor, slips and falls, and is injured.

Other scenarios can also be postulated as a result of the lack of effective (positive) energy isolation.

Wiring Considerations. In accordance with 29 CFR 1910, Subpart S, Electrical Standards, the UPS conveyor motor control installation must comply with the 1910.305(j)(4) requirements. The following table estimates UPS compliance based on the UPS submitted schematic diagram:

OSHA Standard UPS Compliance

1910.305(j)(4)(ii)(a)

A disconnecting means shall be No located in sight from the controller location (Refer to 1910.305(j)(4)(i) for definition of "In sight from.")

1910.305(j)(4)(ii)(c)

If a motor and the driven machinery are not in sight from the controller location, the installation shall comply with one of the following conditions:

(1) The controller Unknown disconnecting means shall be capable of being locked in the open position.

(2) A manually operable switch that will No disconnect the motor from its source of supply shall be placed in sight from the motor location.

1910.305(j)(4)(ii)(d)

This disconnecting means shall plainly indicate whether it is Unknown in the open (off) or closed (on) position.

1910.305(j)(4)(ii)(e)

The disconnecting means shall be readily accessible. If No more than one disconnect is [Refer to UPS compliance with provided for the same 1910.305(j)(4)(ii)(a)] equipment, only one need be readily accessible.

UNITED STATES DEPARTMENT OF LABOR

Occupational Safety and Health Administration
230 S. Dearborn Street, Room 3244
312-353-2220

DATE: August 8, 1991

MEMORANDUM FOR: Assistant regional Administrators
Area Directors District Supervisors

FROM: William Q. Wiehrdt
Assistant Regional Administrator
Technical Support

SUBJECT: Interpretation of "Energy Isolation Device" Application Of 1910.147 To Conveyors

Enclosed is a recent interpretation from the National Office on the Lockout/Tagout Standard. The memo discusses several issues related to conveyor usage. Please share this information with your staff.

Enclosure

U.S. DEPARTMENT OF LABOR

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
REGION V

.....

DATE: January 31, 1991

REPLY TO: William M. Murphy Facsimile Transmittal
Area Director

REGARDING; INTERPRETATION OF "ENERGY ISOLATION DEVICES"
IN ACCORDANCE WITH 1910.147

TO: William Wiehrdt
ARA-Technical Support

THROUGH: Michael G. Connors
Regional Administrator

In memos previously sent to the Regional Office on December 10, 1990 (copy attached, less original attachments), December 10, 1990 (copy attached), January 7, 1991, and January 24, 1991, the Cincinnati Area Office requested an official interpretation of the term "energy isolation devices" as applied under OSHA's lock out standard (1910.147). This request was in regard to a proposed abatement method submitted by United Parcel Service (UPS) for the deenergizing of conveyor belts to protect workers when they climb onto the conveyors to clear jams and/or locate missing parcels. Included in the information submitted was an electrical schematic of the locking device to be used.

In the memorandum from the regional Office which this office received on January 26, 1991 it appears that the response to our inquiry is that an energy isolating device is "designed to positively disconnect power..." and that the device in question is an acceptable device.

Despite your response, there are still unanswered questions in this matter. It appears from our discussion with the company and review of the information supplied that the locking switch involved is a switch on a control circuit which controls a motor starter. The lock out standard defines an energy isolation device as one which "physically prevents the transmission or release of energy". It also indicates that the term "does not include a push button, selector switch, and other control circuit type device".

We believe that the schematic submitted by UPS reflects that the keyed lockout switch is merely a selector switch which is a control circuit that stops the motor through a motor starter. In our view, this would not meet the "energy isolation device" definition based upon the switch being a control circuit device.

If this device would be considered an unacceptable control type circuit, then we would request some further clarification of the acceptability of devices. Specifically we would need additional information as to why this method does comply and what types of control circuit methods and devices would comply.

Our purpose in raising this issue was not simply based on a concern for this particular facility, but on the possible ramifications at UPS facilities throughout the United States. It is important to ensure that modifications instituted by UPS are consistent with agency policy and in accordance with the standard. Based upon the nationwide implications we recommend having this issue forwarded to the National Office for their review and response.

Finally, time is of the essence in this matter. As I have pointed out in my previous memos on this subject, the formal settlement of two contested cases with UPS rests in part on the agency's interpretation of "energy isolation devices". We would appreciate a thorough but

expedient review of this information in order to conclude the case.

If any further information is needed regarding this matter, please contact our office.

Attachments

U.S. Department of Labor
Occupational Safety and Health Administration
Washington, D.C. 20210

Reply to the attention of:

December 14, 1990

MEMORANDUM FOR: William M. Murphy
Area Director
Cincinnati Area Office

FROM: W. O. Wiehrdt
Assistant Regional Administrator
Technical Support

SUBJECT: United Parcel Service: Lock Out Proposal

As discussed between you and James Kontos, the correct interpretation of "Energy Isolation Devices" is: "A mechanism, tool, or other piece of equipment designed to positively disconnect the power capable of doing work. This mechanism will release energy only by the person who locked the energy, no one else."

The electrical schematic supplied to us with your second memorandum depicts this type of device; however it does not show that the lock out control is on the "off" position. As shown in the drawing now it is a close circuit "on position."

We have marked the schematic for your information.

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Standard Interpretations

10/24/2000 - Authorized employees may, but are not required to, verify energy isolation in group LO/TO.

Standard Interpretations - Table of Contents

- **Standard Number:** 1910.147(f)(3)

OSHA requirements are set by statute, standards and regulations. Our interpretation letters explain these requirements and how they apply to particular circumstances, but they cannot create additional employer obligations. This letter constitutes OSHA's interpretation of the requirements discussed. Note that our enforcement guidance may be affected by changes to OSHA rules. Also, from time to time we update our guidance in response to new information. To keep apprised of such developments, you can consult OSHA's website at http://www.osha.gov.

October 24, 2000

Ms. Vernette Francis
P.O. Box 2743
Port Arthur, TX 77643

Dear Ms. Francis:

Thank you for your June 28, 2000 letter to the Occupational Safety and Health Administrations's (OSHA's) Directorate of Compliance Programs (DCP). You had a specific question regarding group lockout procedures.

Question: "...must a member of other work groups (maintenance, servicing and contractors) be present to verify the effectiveness of the lockout while the primary authorized employee is performing the steps necessary for energy isolation and control?"

Reply: 29 CFR 1910.147(f)(3), **Group lockout or tagout,** does not require that a member from each work group be present to verify the effectiveness of the lockout/tagout (LO/TO) procedures if the employer has designated a **primary authorized employee** , with the primary responsibility for a set number of employees working under the group LO/TO device (s). The **primary authorized employee** must implement and coordinate the LO/TO of hazardous energy sources and verify that the steps taken, in accordance with the specific energy control procedure, have in fact isolated the machine or equipment effectively from the hazardous energy sources. This should be accomplished **before** the **authorized employees** participating in the group LO/TO, affix their personal lockout or tagout device to the group LO/TO box and **before** they perform servicing/maintenance activities.

If the employer elects to assign a **primary authorized employee** to verify effective energy

isolation, each **authorized employee** participating in the group LO/TO must be informed of their right to verify the effectiveness of the lockout measures and each **authorized employee** must be allowed to personally verify that hazardous energy sources have been effectively isolated, if they so choose. An **authorized employee**, who opts to verify the effectiveness of the isolation measures, must perform this verification **after** affixing his or her personal lockout or tagout device and **before** performing servicing/maintenance activities.

Thank you for your interest in occupational safety and health. We hope you find this information helpful. Please be aware that the enforcement guidance contained in this response represents the views of OSHA at the time the letter was written based on the facts of an individual case, question, or scenario and is subject to periodic review and clarification, amplification, or correction. It could also be affected by subsequent rule making; past interpretations may no longer be applicable. In the future, should you wish to verify that the guidance provided herein remains current, you may consult OSHA's website at http://www.osha.gov. If you have any further questions, please feel free to contact the Office of General Industry Compliance Assistance at 202-693-1850.

Sincerely,

Richard E. Fairfax, Director
Directorate of Compliance Programs

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Standard Interpretations

08/05/1994 - Authorized employees and periodic lockout/tagout inspections.

Standard Interpretations - Table of Contents

- **Standard Number:** 1910.147

August 5, 1994

Mr. M. L. Hall
Safety/Emergency Response
Program Manager
IBM Mail Drop 3600
Somers, N.Y. 10589

Dear Mr. Hall:

This is in response to your telefaxed memorandum of July 6 to Mr. Ronald J. Davies of my staff requesting clarification of 29 CFR 1910.147 - Control of Hazardous Energy Standard. Specifically, you requested confirmation that the individual performing a periodic inspection required by 1910.147(c)(6) must be an authorized employee.

Pursuant to 1910.147(c)(6)(i)(A), a periodic inspection must be performed by an authorized employee other than the one(s) utilizing the energy control procedure being inspected. For the purpose of complying with the intent of this standard, authorized employee means a qualified person whom the authority and responsibility to perform a specific lockout or tagout inspection has been given by the employer. A qualified person is a person who has been trained and has demonstrated proficiency, in compliance with 1910.147(c)(7), to perform servicing and maintenance on the machine or equipment to be inspected. In your memorandum you described three periodic inspection scenarios. The individuals in these scenarios must be authorized employees, as noted above.

Periodic inspection by an authorized employee is intended to assure that the energy control procedure continues to be implemented properly and that the employees involved are familiar with their responsibilities under that procedure. The inspection must be able to determine three things: first, whether the steps in the energy control procedure are being followed; second, whether the employees involved know their responsibilities under the procedure; and third, whether the procedure is adequate to provide the necessary protection, and what changes, if any, are needed. The Final Rule, a copy of which is enclosed for your use, provides some additional guidance as to the inspector's duties in performing a periodic inspection, to assure that necessary information about the energy control procedure and its effectiveness is obtained. The preamble discussions of the definition of an authorized employee, page 36665, and on the periodic inspections, page 36673, were referenced for the preceding clarifications.

We appreciate your interest in employee safety and health. If we can be of further assistance,

please contact [the Office of General Industry Compliance Assistance at (202) 693-1850].

Sincerely,

John B. Miles, Jr., Director
Directorate of Compliance Programs

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