



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
2443 WARRENVILLE ROAD, SUITE 210  
LISLE, ILLINOIS 60532-4352

February 1, 2019

EA-18-157

Mr. Darrel Moore  
VP/GM – Michigan-Indiana Operations  
Gerdau – Monroe Mill  
3000 East Front Street  
Monroe, MI 48161

SUBJECT: NRC ROUTINE INSPECTION REPORT NO. 03014021/2018001(DNMS) AND  
NOTICE OF VIOLATION – GERDAU – MONROE MILL

Dear Mr. Moore:

On July 12, 2018, an inspector from the U.S. Nuclear Regulatory Commission (NRC) conducted a routine inspection at your facility in Monroe, Michigan, with continued in-office review through January 4, 2019. The purpose of the inspection was to review activities performed under your NRC license to ensure that activities were being performed in accordance with NRC requirements. The in-office review included a review of documentation not available at the time of the onsite inspection. The enclosed inspection report (Enclosure 2) presents the results of the inspection.

During this inspection, the NRC staff examined activities conducted under your license related to public health and safety. Additionally, the staff examined your compliance with the Commission's rules and regulations as well as the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, one apparent violation of NRC requirements was identified and is being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's website at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>. The apparent violation concerned the routine installation and removal of gauges from service, contrary to the prohibitions in Condition 16 of NRC Materials License No. 21-18673-01 (your license).

Because the NRC has not made a final determination in this matter, the NRC is not issuing a Notice of Violation for this inspection finding at this time. Mr. Ryan Craffey of my staff discussed the circumstances surrounding the apparent violation, the significance of the issue, and the need for lasting and effective corrective action with you and Mr. Craig Metzger, your Radiation Safety Officer, at the inspection exit meeting on January 4, 2019.

Before the NRC makes its enforcement decision, we are providing you an opportunity to either: (1) respond in writing to the apparent violation addressed in this inspection report within 30 days of the date of this letter, or (2) request a Predecisional Enforcement Conference (PEC). **Please contact Aaron T. McCraw at 630-829-9650 or [aaron.mccraw@nrc.gov](mailto:aaron.mccraw@nrc.gov) within ten days of the date of this letter to notify the NRC of your intended response.**

If you choose to provide a written response, it should be clearly marked as "Response to the Apparent Violation in Inspection Report No. 03014021/2018001(DNMS); EA-18-157," and should include, for the apparent violation: (1) the reason for the apparent violation, or, if contested, the basis for disputing the apparent violation; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid further violations; and (4) the date when full compliance was or will be achieved. In presenting your corrective actions, you should be aware that the promptness and comprehensiveness of your actions will be considered in assessing any civil penalty for the apparent violations. The guidance in NRC Information Notice 96-28, "Suggested Guidance Relating to Development and Implementation of Corrective Action," may be useful in preparing your response. You can find the information notice on the NRC's website at: <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/info-notices/1996/in96028.html>. Your response may reference or include previously docketed correspondence, if the correspondence adequately addresses the required response. Your response should be sent to the NRC's Document Control Desk, Washington, DC 20555-0001, with a copy mailed to the NRC Region III Office, 2443 Warrenville Road, Suite 210, Lisle, Illinois 60532, within 30 days of the date of this letter. If an adequate response is not received within the time specified or an extension of time has not been granted by the NRC, the NRC will proceed with its enforcement decision or schedule a PEC.

If you choose to request a PEC, it will afford you the opportunity to provide your perspective on the apparent violation and any other information that you believe the NRC should take into consideration before making an enforcement decision. The topics discussed during the conference may include the following: information to determine whether a violation occurred, information to determine the significance of a violation, information related to the identification of a violation, and information related to any corrective actions taken or planned to be taken. If a PEC is held, the NRC will issue a press release to announce the time and date of the PEC. The PEC will be open to public observation.

Based upon NRC's understanding of the facts and your corrective actions, it may not be necessary to conduct a PEC in order to enable the NRC to make a final enforcement decision. Our final decision will be based on your confirming on the license docket that the corrective actions previously described to the staff have been or are being taken.

Please be advised that the number and characterization of the apparent violations described in the enclosed inspection report may change as a result of further NRC review. You will be advised by separate correspondence of the results of our deliberations on this matter.

In addition, based on the results of the inspection, two additional violations of NRC requirements were identified. The violations were also evaluated in accordance with the Enforcement Policy, and were characterized at Severity Level IV. The violations concerned: (1) the failure to assure that a radiological survey is performed to determine radiation levels in accessible areas around gauges after installation, contrary to License Condition 19 of your license; and (2) the failure to assure that the shutter mechanism of each gauge is locked in the closed position during periods when a portion of an individual's body may be subject to the direct radiation beam, contrary to License Condition 21 of your license. These violations are cited in the enclosed Notice of Violation (Enclosure 1). The NRC is citing these violations in the enclosed Notice of Violation (Notice) because the NRC identified them.

You are required to respond to this letter regarding the cited Severity Level IV violations, and should follow the instructions specified in the enclosed Notice when preparing your response. The guidance in NRC Information Notice 96-28 may be also useful in preparing your response to these violations. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with Title 10 of the *Code of Federal Regulations* (CFR) 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC's Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC's website at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made publicly available without redaction.

Please feel free to contact Mr. Craffey if you have any questions regarding this inspection. Mr. Craffey can be reached at 630-829-9655.

Sincerely,

***/RA by Christine A. Lipa Acting for/***

Mohammed Shuaibi, Acting Director  
Division of Nuclear Materials Safety

Docket No. 030-14021  
License No. 21-18673-01

Enclosures:

1. Notice of Violation
2. IR No. 03014021/2018001(DNMS)

cc w/encls: Craig Metzger, RSO  
State of Michigan

Letter to Darrel Moore from Mohammed Shuaibi, dated February 1, 2019.

SUBJECT: NRC ROUTINE INSPECTION REPORT NO. 03014021/2018001(DNMS) AND  
NOTICE OF VIOLATION – GERDAU – MONROE MILL

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NAME	RCraffey:cl via e-mail		AMcCraw		JCameron		MShuaibi CLipa for	
DATE	1/15/2019		1/24/2019		1/24/2019		2/1/2019	

**OFFICIAL RECORD COPY**

## NOTICE OF VIOLATION

Gerdau – Monroe Mill  
Monroe, Michigan

License No. 21-18673-01  
Docket No. 030-14021

During a U.S. Nuclear Regulatory Commission (NRC) inspection conducted on July 12, 2018, with in-office review through January 4, 2019, two violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

- A. Condition 19 of NRC Materials License No. 21-18673-01, Amendment 10 states, in part, that prior to initial use and after installation, the licensee shall assure that a radiological survey is performed to determine radiation levels in accessible areas around, above, and below the gauge with the shutter open.

Contrary to the above, as of July 12, 2018, on multiple occasions, the licensee failed to assure that a radiological survey was performed to determine radiation levels in accessible areas around, above, and below the gauge with the shutter open after routine reinstallation of four Berthold LBL-300-ML source holders containing sealed sources of cobalt-60 following periods of routine caster maintenance.

This is a Severity Level IV violation (Section 6.3).

- B. Condition 21 of NRC Materials License No. 21-18673-01, Amendment 10 states, in part, that the licensee shall assure that the shutter mechanism of each device is locked in the closed position during periods when a portion of an individual's body may be subject to the direct radiation beam.

Contrary to the above, as of July 12, 2018, on multiple occasions, the licensee failed to assure that the shutter mechanism of each device was locked in the closed position when a portion of an individual's body could have been subject to the direct radiation beam through movement and storage of the devices during the removal and installation of four Berthold LBL-300-ML source holders containing sealed sources of cobalt-60 following periods of routine caster maintenance.

This is a Severity Level IV violation (Section 6.3).

Pursuant to the provisions of 10 CFR 2.201, Gerdau – Monroe Mill is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region III, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation; IR No. 03014021/2018001(DNMS)" and should include: (1) the reason for the violations, or, if contested, the basis for disputing the violations or their severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken, and (4) the date when full compliance will be achieved. Your response may reference or include previously docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

Your response will be made available electronically for public inspection in the NRC's Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC's website at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made publicly available without redaction.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 1<sup>st</sup> day of February 2019.

**U.S. Nuclear Regulatory Commission  
Region III**

Docket No.	030-14021
License No.	21-18673-01
Report No.	03014021/2018001(DNMS)
EA No.	EA-18-157
Licensee:	Gerdau – Monroe Mill
Facility:	3000 East Front Street Monroe, MI 48161
Inspection Dates:	July 12, 2018, with in-office review through January 4, 2019
Exit Meeting Date:	January 4, 2019
Inspector:	Ryan Craffey, Health Physicist
Approved By:	Aaron T. McCraw, Chief Materials Inspection Branch Division of Nuclear Materials Safety

## **EXECUTIVE SUMMARY**

### **Gerdau – Monroe Mill NRC Inspection Report 03014021/2018001(DNMS)**

This was an unannounced, routine inspection of Gerdau – Monroe Mill (the licensee), a specialty steel manufacturing plant authorized by U.S. Nuclear Regulatory Commission (NRC) Materials License No. 21-18673-01 to possess and use radioactive material in fixed gauges for level measurements on a four-strand steel caster at its facility in Monroe, Michigan.

As a result of this inspection, the NRC identified one apparent violation and two violations related to the licensee's handling of its fixed gauges during periods of caster maintenance. The apparent violation involved the installation and removal of the gauges from service, contrary to the prohibition in License Condition 16 of the NRC license. The violations involved: (1) the failure to assure that a radiological survey is performed after installation of a gauge, contrary to License Condition 19 of the NRC license, and (2) the failure to assure that the shutter mechanism of each gauge is locked in the closed position during periods when a portion of an individual's body may be subject to the direct radiation beam, contrary to License Condition 21 of the NRC license.



## **REPORT DETAILS**

### **1 Program Overview and Inspection History**

Gerdau – Monroe Mill is a specialty steel manufacturing plant in Monroe, Michigan. The plant manufactures a variety of automotive components, which are produced from steel billets cast on site by a four-strand continuous caster. The plant is authorized by NRC Materials License No. 21-18673-01 for the possession and use of fixed nuclear gauges to control the level of molten steel in each of the caster's four copper-lined molds. At the time of the inspection, the plant had six Berthold LB-300-ML gauges, each nominally containing 3.5 millicuries (mCi) of cobalt-60 (Co-60). Four of these gauges were in service; the other two were in long-term storage. Three individuals (including the RSO) were listed as authorized users; however, only two still worked at the plant.

The licensee was last inspected by the NRC in January 2009 and June 2013. No violations were identified as a result of those routine inspections.

### **2 Maintenance Activities**

#### **2.1 Inspection Scope**

The inspector toured the mill in Monroe; observed the conduct of caster maintenance; and interviewed the licensee's authorized users, caster operators, maintenance personnel, and management.

#### **2.2 Observations and Findings**

The inspector toured the facility while the caster was down for an extended outage and was able to observe the licensee performing maintenance on the caster. As part of the work, the licensee had removed all four fixed gauge source holders from their respective cavities in each mold assembly and had placed them in a nearby storage cabinet.

Through discussions with licensee staff, the inspector learned that the licensee routinely removed these source holders from service. As molten steel passed through the molds, the copper linings of each deteriorated over time, requiring that the molds be exchanged periodically for refurbished assemblies. The source holders, therefore had to be removed from the outgoing assemblies and installed into the refurbished ones, at a frequency of approximately once per week per assembly.

Condition 16 of NRC Materials License No. 21-18673-01 states that the following services shall not be performed by the licensee: installation, initial radiation surveys, relocation, removal from service, dismantling, alignment, replacement, disposal of the sealed source and non-routine maintenance or repair of components related to the radiological safety of the gauge (i.e. the sealed source, the source holders, source drive mechanism, on-off mechanism (shutter), shutter control, shielding). These services shall be performed only by persons specifically licensed by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services. The licensee's routine conduct of installation and removal of source holders from service is an apparent violation of License Condition 16.

As corrective action, on September 27, 2018, the licensee submitted a request to seek authorization for non-routine maintenance, citing training, procedures, and equipment already in place. At the time of publication of this inspection report, the licensee was

actively working with Region III licensing staff on additional information required to complete this amendment request.

Through discussions with licensee personnel, and a review of the licensee's procedures for source holder removal, the inspector identified two additional violations of License Conditions.

#### A. Radiological Surveys

The inspector determined that the licensee did not perform any radiological surveys during any phase of these activities. Rather, the licensee used process line instrumentation to verify the closure of each source holder shutter mechanism. The licensee did maintain a survey meter at its facility, but only for emergencies.

Condition 19 of NRC Materials License No. 21-18673-01 states, in part, that prior to initial use and after installation, relocation, dismantling, alignment, or any other activity involving the source or removal of shielding, the licensee shall assure that a radiological survey is performed to determine radiation levels in accessible areas around, above, and below the gauge with the shutter open. The licensee's failure to assure surveys were performed following installation of the source holders is a violation of License Condition 19.

The inspector noted that the likelihood of a significant radiation level, expected or otherwise, existing in any accessible area once the gauges were reinstalled was low. Each shutter was opened only after the mold assemblies and source holders were reinstalled in their positions below the operating platform grade, and because the source holders could only fit in the mold assemblies if aligned correctly, the chances that any portion of an operator's body being inadvertently subject to a misaligned radiation beam was low.

As corrective action, the licensee committed to use the survey meter already in its possession to perform the required surveys.

#### B. Locking Out Shutter Mechanisms

The inspector determined that the licensee closed but did not lock out the shutter mechanisms of each gauge prior to removing them from service. Once removed, the licensee placed the gauges horizontally on a shelf in a nearby storage cabinet. Depending on the orientation of the source holders, beams of radiation could have pointed directly above, below, or to the sides of the cabinet if the shutters were not closed, potentially exposing operators and other staff walking or sitting in the vicinity of the cabinet. By design, the shutters must be in the closed position in order to lock them out, as a safety precaution.

Condition 21 of NRC Materials License No. 21-18673-01 states that the licensee shall assure that the shutter mechanism of each device is locked in the closed position during periods when a portion of an individual's body may be subject to the direct radiation beam. The licensee shall review and modify, as appropriate, its "lock-out" procedures whenever a new device is obtained to incorporate the device manufacturer's recommendations. The licensee's failure to assure that the shutter mechanism of each device is locked in the closed position during periods when a portion of an individual's body may be subject to the direct radiation beam is a violation of License Condition 21.

The inspector noted that the likelihood of any individual actually being exposed to a direct radiation beam from one of these gauges was low. The inspector found that operators did follow the licensee's established procedures for source holder removal, which required the shutters be closed and verified as such with process line detection instrumentation prior to source holder removal. The inspector also confirmed that the shutters of all four in-service gauges were closed during the inspection, and found no evidence to suggest that the shutters were not routinely closed and verified as such during previous periods of caster maintenance. Moreover, the shutters required substantial force using hand tools to open and close; therefore, it was unlikely to inadvertently open shutters during the removal or installation processes.

As corrective action, the licensee revised its procedure for source holder removal to include a step requiring that operators keep the lifting lugs locked to each source holder upon removal, thereby immobilizing the shutter mechanism while out of the mold assembly.

## 2.3 Conclusions

The inspector identified an apparent violation of License Condition 16 and violations of License Conditions 19 and 21.

## 3 **Other Areas Inspected**

### 3.1 Inspection Scope

The inspector toured the mill's maintenance shop, interviewed the licensee's RSO by telephone, and conducted in-office review of a selection of records not available at the time of the onsite inspection.

### 3.2 Observations and Findings

The inspector found that the licensee had adequately secured its gauges in long-term storage from unauthorized access. The shutters of both gauges were locked in the closed position.

The inspector conducted independent surveys in the vicinity of all six gauges using a Canberra UltraRadic energy-compensated Geiger-Muller meter (Serial No. 13000531, last calibrated on April 24, 2018). Readings in unrestricted areas were below regulatory limits to members of the public, while readings in the vicinity of source holders were, accounting for decay, consistent with the radiation profiles provided in Sealed Source and Device Registry safety evaluation.

The inspector interviewed an equipment operator and other nearby staff to discuss radiation safety principles and ALARA practices. Based on these discussions, the staff had an adequate understanding of these principles and practices, relative to their assigned duties.

The inspector also reviewed documentation of recent leak tests, shutter checks, physical inventories, and routine radiological surveys performed by an authorized service provider every six months.

### 3.3 Conclusions

The inspector had no findings in these other areas inspected.

## 4 **Exit Meeting Summary**

The NRC inspector presented preliminary inspection findings following the onsite inspection and during a final exit meeting by telephone on January 4, 2019. The licensee acknowledged the findings presented.

### **LIST OF PERSONNEL CONTACTED**

- Valmar Carmino, Gerdau-Monroe Mill employee
- Robert Edgar, Gerdau-Monroe Mill employee
- Les Hartford, Gerdau-Monroe Mill employee
- # Craig Metzger – Regional Environmental Manager, Gerdau Special Steel – MI & IN Operations (RSO)
- # Darrel Moore – VP/GM, Gerdau Special Steel – MI & IN Operations
- # Participated in final exit meeting by telephone on January 4, 2019.

### **INSPECTION PROCEDURES USED**

IP 87124 – Fixed and Portable Gauge Programs