



**Materials Inspection Record**

1. Licensee Name: Mistras Group, Inc.		2. Docket Number(s): 030-35114		3. License Number(s) 12-16559-02	
4. Report Number(s): 2022-001			5. Date(s) of Inspection: August 16-17, 2021; exit March 15, 2022		
6. Inspector(s): Ryan Craffey		7. Program Code(s): 04312	8. Priority: 1	9. Inspection Guidance Used: IP 87121	
10. Licensee Contact Name(s): Matt Kim - Corporate RSO		11. Licensee E-mail Address: matt.kim@mistrasgroup.com		12. Licensee Telephone Number(s): 740-818-8933	
13. Inspection Type: <input checked="" type="checkbox"/> Routine <input checked="" type="checkbox"/> Announced <input type="checkbox"/> Non-Routine <input type="checkbox"/> Unannounced		14. Locations Inspected: <input checked="" type="checkbox"/> Main Office <input type="checkbox"/> Field Office <input checked="" type="checkbox"/> Temporary Job Site <input type="checkbox"/> Remote		15. Next Inspection Date (MM/DD/YYYY): 08/16/2022 <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Extended <input type="checkbox"/> Reduced <input type="checkbox"/> No change	

16. Scope and Observations:

Mistras Group was a multinational non-destructive testing company authorized to use radioactive material for industrial radiography at numerous field stations and at temporary job sites throughout NRC jurisdiction. The company employed approximately 1,500 radiographers and assistants throughout the United States. The licensee's Corporate RSO (CRSO) was based at a field office in Heath, Ohio, and maintained overall responsibility for the radiation safety program. The CRSO was assisted in his oversight of the program by two assistant RSOs, one administrative assistant, and site RSOs who were assigned day-to-day oversight of each field station.

The inspector met with the CRSO at a field station in Longmont, Colorado, discussed the status and oversight of activities performed under the license, and reviewed the results of field station audits completed since the last NRC routine inspection. The inspector noted that the licensee currently stored/used material at all authorized locations except those in West Virginia, both of which the licensee has since requested be removed from the license. The inspector also noted that the Waterford, Connecticut location received a sub-standard audit score in 2021, and that the licensee's work in Prudhoe Bay, Alaska had markedly increased. The inspector also confirmed that the licensee maintained an adequate supply of source retrieval equipment in Longmont to support field work in Wyoming.

The following day, the inspector accompanied the CRSO and two radiography crews at a temporary job site at 1500 Campstool Road in Cheyenne, Wyoming. The inspector conducted independent and confirmatory surveys in the vicinity of these operations, and found that the crews established adequate barriers to limit exposure to members of the public below regulatory limits whenever radiographic operations were in progress. The inspector also noted that the crews maintained and properly utilized appropriate instrumentation and dosimetry, and adhered to physical presence requirements for radiography. The inspector found the crews to be knowledgeable and conscientious of radiation protection principles, licensee procedures, and regulatory requirements.

While at the job site, the inspector also reviewed EN 55344, NMED 210291, and the licensee's 30-day written report for a source disconnect at the Cheyenne job site on July 7, 2021, report to the NRC the following day. The crew initially had difficulty locking their source in the shielded position, and contacted the Longmont office for assistance. A trained individual responded, and discovered that the source had disconnected inside the exposure device. The individual and the crew were eventually able to lock the source in the shielded position using a plunger to push the source pigtail in from the front. Doses trained individual and the crew received 30 millirem and 8-33 mrem, respectively, including previous radiographic testing from the day. The licensee concluded (and the inspector agreed) that the direct cause of the incident was a failed drive cable, and the root cause a lack of diligence in the conduct of periodic maintenance and daily inspections of radiography equipment.

## Materials Inspection Record (Continued)

Two violations of NRC requirements were revealed as a result of the event. One was for the crew's failure to follow the licensee's operating procedures per Condition 16.A of licensee 12-16559-02, the other for failure to ensure that the equipment was in good working condition as required by 10 CFR 34.31(a).

After initially speaking to the trained individual about the equipment malfunction, the crew returned to the camera and again surveyed it and the guide tube. They concluded that the source was fully inside the camera, so one of the radiographers rotated the outlet port cover, which rotated an internal tungsten port shield in front of the outlet. This helped ensure that the source remained inside the device and provided a modest degree of shielding. They then removed the guide tube and completed the rotation of the outlet port cover to the fully closed position, thereby securing the source inside the camera. The inspector found that the crew demonstrated an adequate awareness of the situation and used it to mitigate potential consequences of the equipment's degraded condition and to ensure that the source remained in a shielded position. However, their actions were contrary to the licensee's procedural commitments in 100-RAD-001 Rev. 2 (Radiation Safety Operating and Emergency Procedures Manual) Section 21.2.d.4, which is part of the licensee's renewal application dated May 9, 2019: "Contact the nearest Radiation Safety Manager or Supervisor immediately. Do not attempt any type of source retrieval until you have been instructed to do so by an authorized radiation safety personnel."

The root cause of this violation was a lack of understanding of emergency procedures; specifically, the degree to which the licensee limited radiographers in operating radiography equipment when the source did not lock in the fully shielded position. As corrective action, the CRSO sent a Radiation Safety Memo on the incident to all RSOs, instructing them to review the incident with their personnel and remind them of the licensee's expectations regarding the operation of radiographic equipment in abnormal circumstances.

The licensee also noted after the event that the drive cable used by the crew that day was in poor condition, as the inner core showed signs of rust and embrittlement near the source connector, where the cable eventually failed. The inspector confirmed that the crew had documented the completion of daily inspections of their equipment that day, and that the Longmont field office personnel had documented the completion of periodic maintenance at required intervals, all with no issues noted. However, neither of these checks, as performed, ensured that the equipment was in good working condition before use on July 7, 2021.

The root cause of this violation was a lack of attention to detail in the conduct of periodic maintenance and daily inspections of radiography equipment. As corrective action, the licensee sent an email with details of the source locking incident to all RSOs and general managers in the company instructing immediate inspections on all radiography equipment currently in service. The licensee has obtained and distributed several "wearable tablet" headsets so that Corporate radiation safety staff can observe, evaluate, and assist site personnel during their conduct of equipment maintenance and other radiation safety-related duties such as field audits.

No other violations of NRC requirements were identified as a result of this inspection, and the NMED item is considered closed. The inspector held an exit meeting with the licensee's CRSO by telephone on March 15, 2022.