

# NJ FOIS INVESTIGATION REPORT



*Fatal Occupational Injuries Surveillance Project*

FOIS 16-NJ-05

June 13, 2017

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## **Machinist Dies After Being Pulled Into Engine Lathe**

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A 57-year-old male machinist died after being pulled into the engine lathe he was operating. The incident occurred in a small commercial metal machining facility in northern New Jersey. On the day of the incident, the victim was filing a 36-inch long, two-inch diameter, high-nickel, stainless-steel alloy rod on an engine lathe. With the chuck rotating, the victim was using a metal file to smooth out portions of the bar when the sleeve of his sweater became caught in the jaws of the chuck. He was pulled up into the lathe and sustained traumatic blunt impact injuries to his left arm and head. The victim died instantly, and was pronounced dead at the scene.

### Contributing Factors:

- Victim wearing a long-sleeved, loose-fitting sweater
- Working in close proximity to rotating chuck

NJ FOIS investigators recommend that these safety guidelines be followed to prevent similar incidents:

- **A safety and health plan based on a job hazard analysis should be developed by the employer and followed where workers are assigned tasks.**
- **While operating an engine lathe, long sleeves should never be worn.**
- **An emergency stop system should be in place that the operator can access at any time.**
- **A lathe spindle (with chuck) should be adequately guarded to prevent operator contact.**
- **Refresher training should be provided to all workers on a regular basis.**



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## **INTRODUCTION**

In winter 2016, NJ FOIS staff was notified of the death of a 57-year-old male machinist who was killed after being pulled into an engine lathe. The incident occurred in a small, nonunion machine shop in northern NJ. The victim had worked for the company for approximately eight years, but had experience using a lathe for almost 20 years at another company. The current employer verbally noted health and safety training occurred, but no documented records of machine operator training were provided.

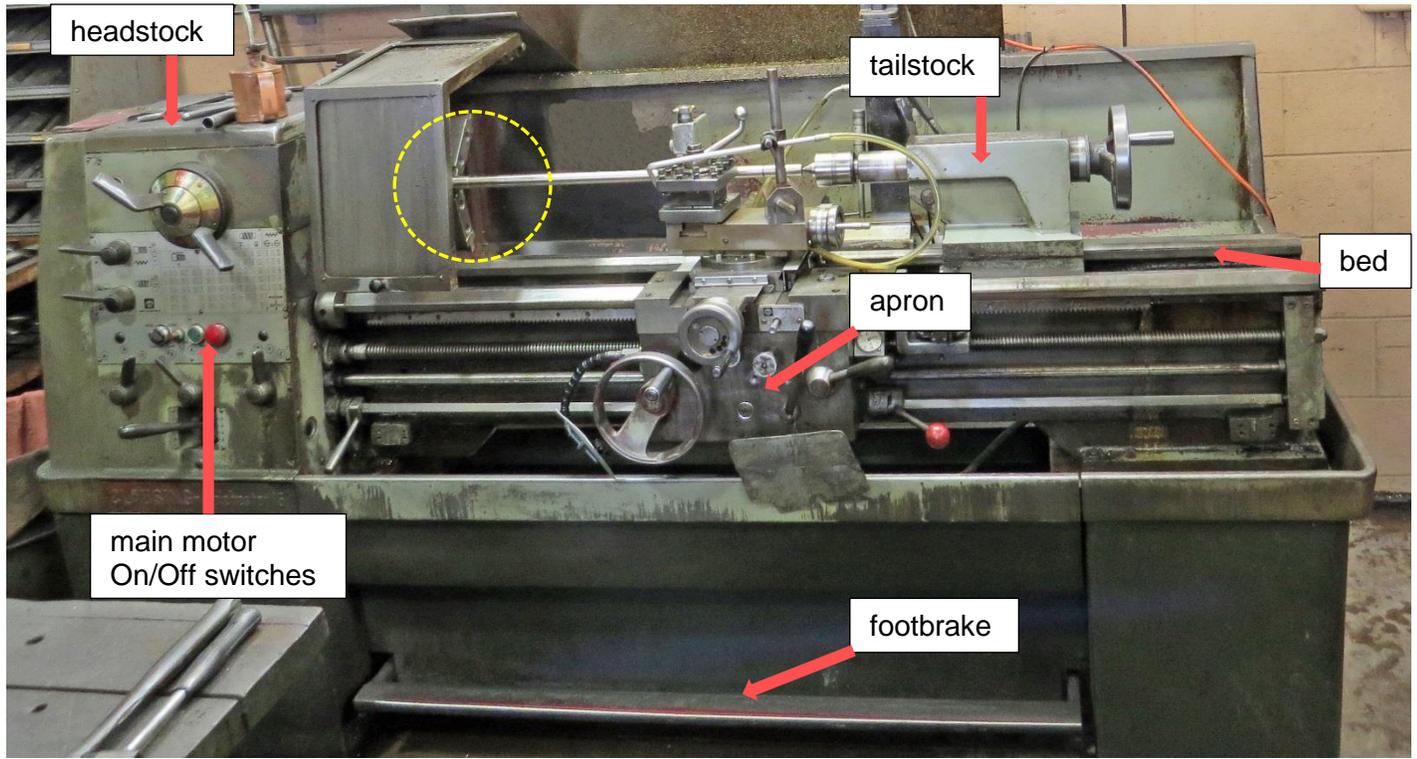
An NJ FOIS investigator contacted the OSHA Area Office and conducted a concurrent investigation. Additional information was obtained from the medical examiner's report, death certificate, and police report.

## **INVESTIGATION**

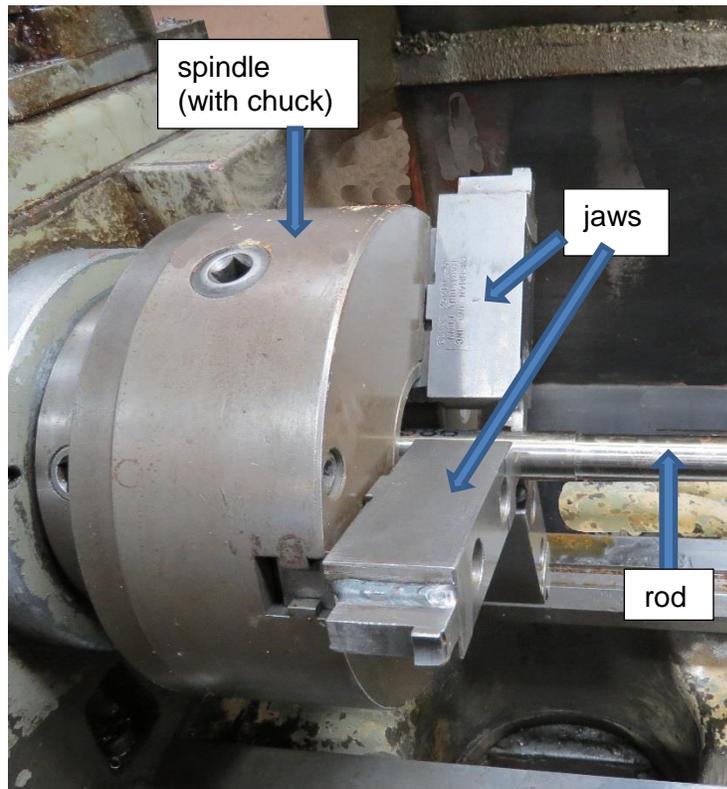
The incident site was the machine floor of a small metal machining company in northern NJ. The employer owned the facility, which was contracted to machine various pieces of stainless steel and other metals to specification for clients. The majority of the outputs of the shop were finished shafts for commercial pumps. The piece the victim was working on was a high-nickel content, stainless steel, 2" diameter rod (36" long), intended for a high-temperature smelter. The increased nickel content of the steel provided the needed temperature resistance for the client.

On the day of the incident, the victim was using an engine lathe to cut and finish the rod (Figures 1-2), a task he had performed many times in the past. He was using a 15" metal file to smooth down areas of the rod (Figure 3). According to the manager of the facility, in order to file correctly, the rod had to be rotating (that is, the chuck was spinning).

**FIGURE 1: Front view of engine lathe the victim was operating. Yellow circle indicates the point where the incident occurred; a close-up view of this can be seen in Figure 2.**



**FIGURE 2. Close-up view (with the guard raised) of spindle with chuck. The jaws hold the part to be machined (in this case, a rod) to the chuck.**

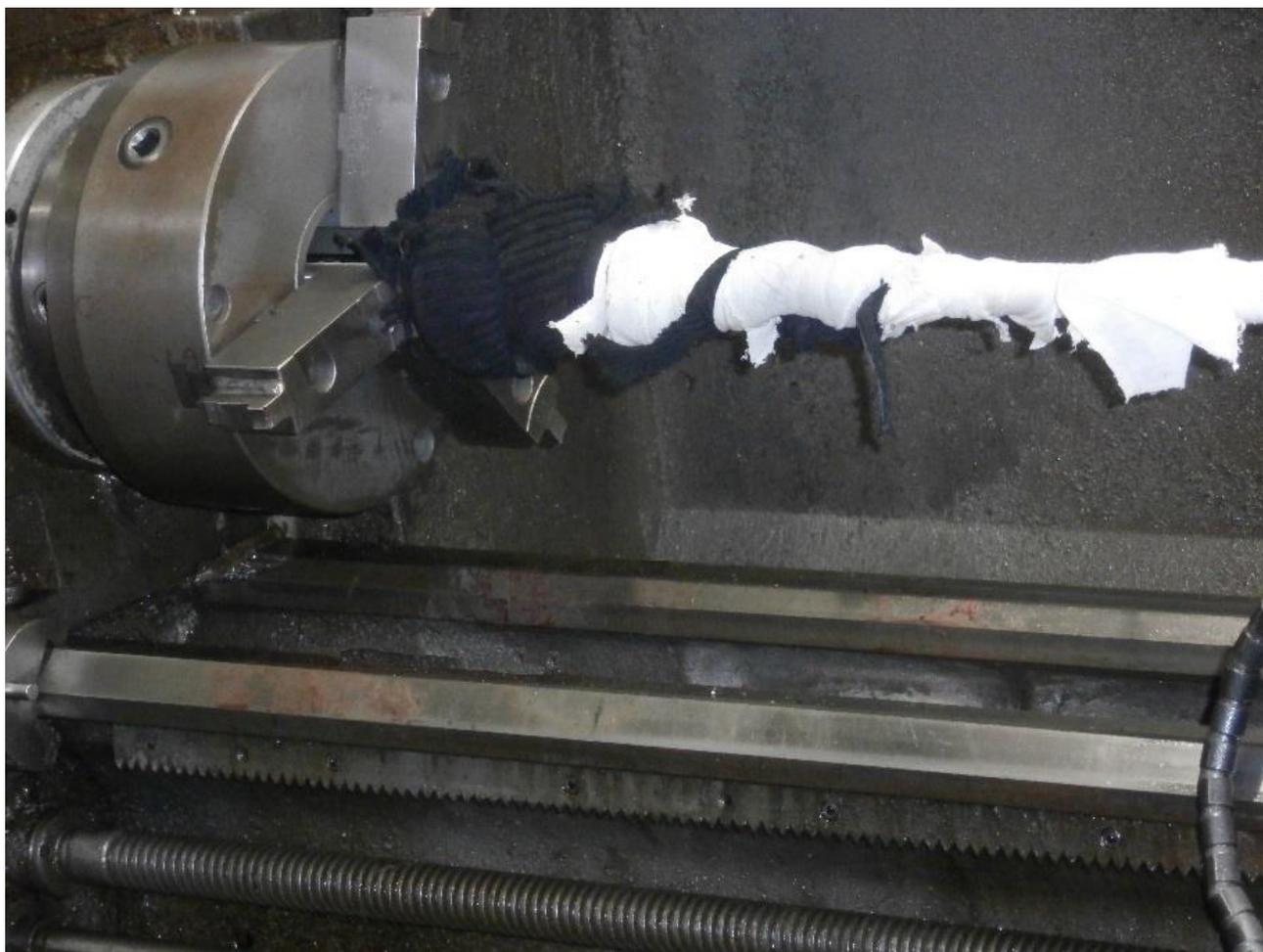


**Figure 3. Fifteen-inch, metal file used by the victim.**



Although there were no witnesses, based on where the victim was in the machining process and the condition he was found in, it was concluded that the victim, who was right handed, was filing perpendicular to the bar with his right hand forward. He was wearing a long-sleeve, loose-fitting sweater. As he was filing, he misjudged his proximity to the rotating spindle, his sweater caught in the jaws, and he was pulled up and into the lathe. The two coworkers in the shop, who were operating computer numerical controlled (CNC) lathes toward the front of the shop at the time, heard a “popping, thumping” noise that they knew did not originate from normal lathe work. One of the coworkers called to the victim but heard no response. He ran over and found the victim lying on the floor bleeding from the head, with both his sweater and undershirt pulled from his body and entrapped in the lathe (Figure 4). He suffered a severely fractured left arm and massive head injuries. He died instantly from his injuries, and was pronounced dead at the scene by the Medical Examiner.

**Figure 4. Victim's sweater and undershirt entrapped by the lathe.**



## RECOMMENDATIONS/DISCUSSIONS

**Recommendation #1: A safety and health plan based on a job hazard analysis should be developed by the employer and followed where workers are assigned tasks.**

**Discussion:** Employers should conduct a job hazard analysis, with the participation of employees, of all work areas and job tasks. A job hazard analysis should begin by reviewing the work activities for which the employee is responsible, and the equipment that is needed. Each task is further examined for mechanical, electrical, chemical, or any other hazard the worker may encounter. A source of information on conducting a job hazard analysis can be obtained from the US Department of Labor.<sup>1</sup>

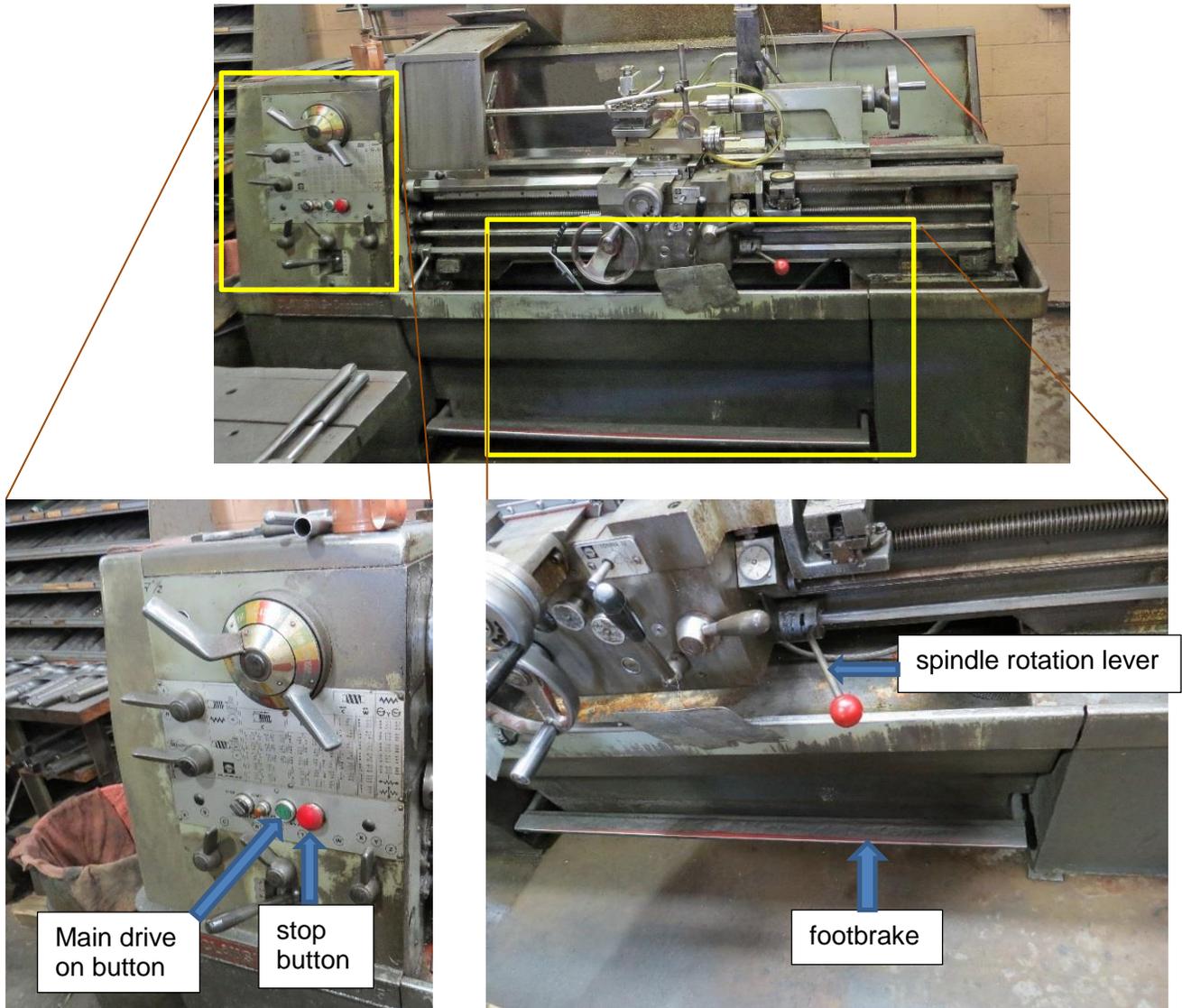
**Recommendation #2: While operating an engine lathe, long sleeves should never be worn.**

**Discussion:** When working with any machine, OSHA describes that safe work practice procedures should prohibit employees from wearing loose-fitting clothing, jewelry, or gloves that can be entangled in moving machine parts.<sup>2</sup> In this case, the victim was wearing a long-sleeve, loose-fitting sweater. NJ FOIS recommends employers provide all machine operators appropriate uniform clothing, and adopt strict machine shop rules that prohibit any long sleeves, loose-fitting clothing, jewelry, unsecured long hair, or gloves that could become entangled in machinery. In addition, all lathes should have a posted warning label indicating to never operate the machine while wearing long sleeves, jewelry, or anything else that can become entrapped in moving parts.

**Recommendation #3: An emergency stop system should be in place that the operator can access at any time.**

**Discussion:** During the normal operation of the engine lathe used in this incident, a lever and footbrake are used to start and stop the spindle (Figure 5). With the machine's main drive motor on (green button, Figure 5), the operator uses the spindle rotation lever to begin the rotation of the object to be worked upon. When the operator needs to stop the rotation, the footbrake is pressed. However, during this incident, as the victim was being pulled upward into the lathe, he could no longer reach the footbrake. There is a stop button located next to the main drive motor, but this is out of reach for any operator working the machine (Figure 5). NJ FOIS recommends that the manufacturer develop a stop mechanism or stop system that can be accessed anytime and from anywhere the operator is working.

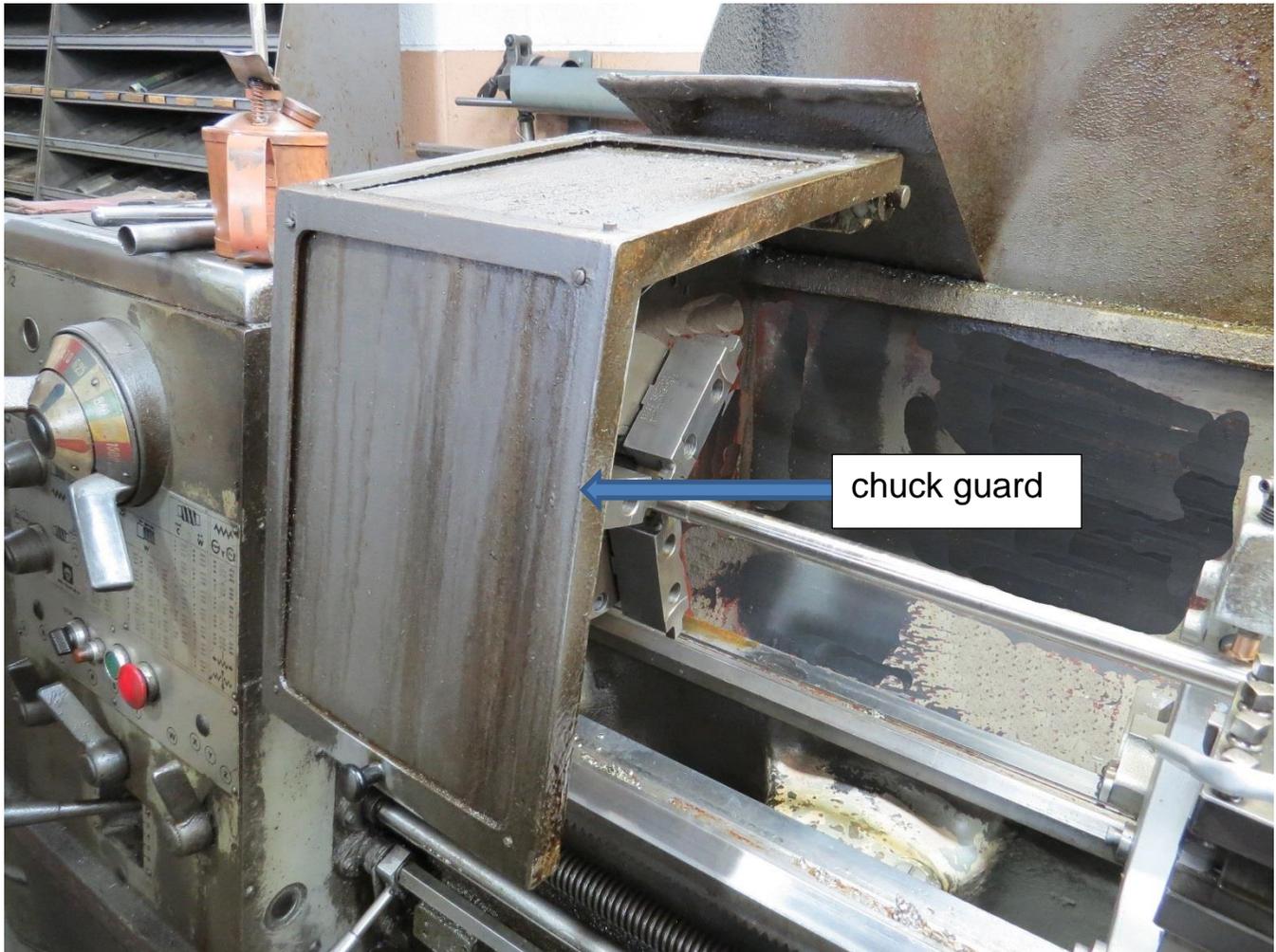
**FIGURE 5. View of Stop Button and Footbrake.**



**Recommendation #4: A lathe spindle (with chuck) should be adequately guarded to prevent operator contact.**

**Discussion:** According to 29 CFR 1910.212(a)(1), the point of operation of equipment such as lathes must be guarded to protect the operator.<sup>3</sup> Moreover, ANSI B11.6.21 specifies that manual lathes shall be safeguarded with a chuck guard.<sup>4</sup> This particular engine lathe had a metal guard that covered the chuck (Figure 6), which the operator could swing up or down. At the time of the incident, while the operator was filing the stainless-steel alloy rod, the guard was in the “up” position, leaving the spindle exposed. NJ FOIS recommends that the guard always be in the “down” position while the spindle is rotating, however, if this would inhibit the job task, then a different type of guard should be used that would protect the operator from contacting the chuck.

**FIGURE 6. Engine lathe with guard in “down” position.**



**Recommendation #5: Refresher training should be provided to all workers on a regular basis.**

**Discussion:** This incident occurred even though the operator was highly skilled and experienced with an engine lathe. NJ FOIS recommends that lathe operators undergo refresher training to be reminded of safe work practices. This should include the importance of not wearing loose fitting clothing, or jewelry while operating a lathe, and should review emergency shut down procedures. An example of a relevant refresher program can be found here: <http://bit.ly/2oDxloS>. Each employee should also be provided with and tested on the manufacturer's recommended procedures for safe use of the machinery.

## APPENDIX

### RECOMMENDED RESOURCES

It is essential that employers obtain accurate information on health, safety, and applicable OSHA standards. NJ FOIS recommends the following sources of information which can help both employers and employees:

#### **U.S. Department of Labor, Occupational Safety & Health Administration (OSHA)**

Federal OSHA can provide information on safety and health standards on request. OSHA has several offices in New Jersey that cover the following counties:

☎ Hunterdon, Middlesex, Somerset, Union, and Warren counties.....	732-750-3270
☎ Essex, Hudson, Morris, and Sussex counties.....	973-263-1003
☎ Bergen and Passaic counties.....	201-288-1700
☎ Atlantic, Burlington, Cape May, Camden, Cumberland, Gloucester, Mercer, Monmouth, Ocean, and Salem counties.....	856-596-5200
💻 Web site: <a href="http://www.osha.gov">www.osha.gov</a>	

#### **New Jersey Public Employees Occupational Safety and Health (PEOSH) Program**

The PEOSH Act covers all NJ state, county, and municipal employees. Two state departments administer the Act: the NJ Department of Labor and Workforce Development (NJDLWD), which investigates safety hazards, and the NJ Department of Health (NJDOH), which investigates health hazards. PEOSH has information that may also benefit private employers.

##### NJDLWD, Office of Public Employees Safety

☎ Telephone: 609-633-3896

💻 Web site: [http://lwd.dol.state.nj.us/labor/lwde/employer/Public\\_Employees\\_OSH.html](http://lwd.dol.state.nj.us/labor/lwde/employer/Public_Employees_OSH.html)

##### NJDOH, Public Employees Occupational Safety & Health Program

☎ Telephone: 609-984-1863

💻 Web site: <http://www.nj.gov/health/workplacehealthandsafety/peosh/>

##### On-site Consultation for Public Employers

☎ Telephone: 609-984-1863 (health) or 609-633-2587 (safety)

💻 Web site: <http://www.nj.gov/health/workplacehealthandsafety/peosh/consultation.shtml>

#### **New Jersey Department of Labor and Workforce Development, Occupational Safety and Health On-Site Consultation Program**

This program provides free advice to private businesses on improving safety and health in the workplace

and complying with OSHA standards.

☎ Telephone: 609-984-0785

🌐 Web site: [http://lwd.dol.state.nj.us/labor/lsse/employer/peosh\\_consultation.html](http://lwd.dol.state.nj.us/labor/lsse/employer/peosh_consultation.html)

### **New Jersey State Safety Council**

The New Jersey State Safety Council provides a variety of courses on work-related safety. There is a charge for the seminars.

☎ Telephone: 908-272-7712

🌐 Web site: [www.njsafety.org](http://www.njsafety.org)

### **Internet Resources**

Other useful Internet sites for occupational safety and health information:

- CDC/NIOSH – [www.cdc.gov/niosh](http://www.cdc.gov/niosh)
- USDOL Employment Laws Assistance for Workers and Small Businesses – [www.dol.gov/elaws](http://www.dol.gov/elaws)
- National Safety Council – [www.nsc.org](http://www.nsc.org)
- NJDOH FOIS reports – [http://nj.gov/health/workplacehealthandsafety/occupational-health-surveillance/fatal-injuries/njface\\_reports.shtml](http://nj.gov/health/workplacehealthandsafety/occupational-health-surveillance/fatal-injuries/njface_reports.shtml)
- CDC/NIOSH FACE – [www.cdc.gov/niosh/face](http://www.cdc.gov/niosh/face)
- OSHA – [www.osha.gov](http://www.osha.gov)
- ANSI – [www.ansi.org](http://www.ansi.org)

### **REFERENCES**

1. Job Hazard Analysis. US Department of Labor Publication # OSHA-3071, 1998 (revised). USDOL, OSHA Publications, PO Box 37535, Washington DC 20013-7535
2. OSHA. Safeguarding Equipment and Protecting Workers from Amputations. Available at: <https://www.osha.gov/Publications/osh3170.pdf>. Accessed March 6, 2017.
3. OSHA. 29 CFR 1910.212(a)(1): *Machinery and Machine Guarding; Types of Guarding*.
4. ANSI. B11.6.21. *Safety Requirements for Manual Turning Machines w/ or without Auto; Safeguarding*.

**Fatality Assessment and Control Evaluation (FOIS) Project**  
**Investigation # 16-NJ-05**

This report was prepared by staff members of the New Jersey Department of Health's Occupational Health Surveillance Unit. The goal of FOIS is to prevent fatal work-related injuries by studying the work environment, the worker, the task, the tools the worker was using, the energy exchange resulting in the fatal injury, and the role of management in controlling how these factors interact. FOIS gathers information from multiple sources that may include interviews of employers, workers, and other investigators; examination of the fatality site and related equipment; and reviewing OSHA, police, and medical examiner reports, employer safety procedures, and training plans. The FOIS program does not determine fault or place blame on employers or individual workers. Findings are summarized in narrative investigation reports that include recommendations for preventing similar events. All names and other identifiers are removed from FOIS reports and other data to protect the confidentiality of those who participate in the project.

Please visit the NJ FOIS Web site at [www.nj.gov/health/surv/face/index.shtml](http://www.nj.gov/health/surv/face/index.shtml) or the CDC/NIOSH FACE Web site at [www.cdc.gov/niosh/face/faceweb.html](http://www.cdc.gov/niosh/face/faceweb.html) for more information. The contents of this report are solely the responsibility of the authors and do not necessarily represent the official views of the CDC.



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