

**North Carolina Department of Labor
Occupational Safety and Health Division**

Raleigh, North Carolina

Field Information System

Operational Procedure Notice 149

Subject: Special Emphasis Program for Amputations

A. Purpose and Scope.

This Operational Procedure Notice (OPN) establishes and implements the North Carolina Department of Labor (NCDOL) Occupational Safety and Health (OSH) Division's Special Emphasis Program (SEP) for safety and health inspections where employees may be exposed to amputation hazards on machinery due to lack of guarding and/or the failure to utilize energy control procedures. This SEP is intended to reduce occupational exposures to amputations by focusing on employers' lockout/tagout program and use of machine guarding. This instruction applies statewide to establishments under OSH Division jurisdiction.

This OPN also provides guidance to compliance safety and health officers (CSHOs) for conducting amputation SEP inspections. This document supplements procedures beyond the standard inspection protocol set forth in the NC Field Operations Manual (FOM).

B. Special Emphasis Program History.

An analysis of the accidents and referrals reported to the OSH Division from January 1, 2015 to May 29, 2018 revealed 576 separate incidents where at least a portion of a single digit had been amputated. 29 CFR 1904.39(b)(11)–Reporting Fatalities, Hospitalizations, Amputations, and Losses of an Eye as a Result of a Work-Related Incident to OSHA defines an amputation as, "... the traumatic loss of a limb or other external body part." "Amputations include a part, such as a limb or appendage, that has been severed, cut off, amputated (either completely or partially); fingertip amputations with or without bone loss; medical amputations resulting from irreparable damage; amputations of body parts that have since been reattached. Amputations do not include avulsions, enucleations, degloving, scalping, severed ears, or broken or chipped teeth."

In response to this information, the Amputations SEP was added to the OSH Division's five-year Strategic Management Plan (SMP) for federal fiscal years (FFY) 2019-2024. The first year, FFY 2019, is designed as a planning year. During this time, the SEP committee will research different ways to reduce workplace amputations. Formal SEP activity will be implemented beginning in FFY 2020 of the 2019-2024 SMP, which begins October 1, 2019.

C. Background.

The operation of machinery and equipment in the workplace can be extremely dangerous (Reference Appendix B for examples of machinery and equipment that can cause amputations). North Carolina employers have increasingly updated their processes and machinery to keep up with the demand to be efficient and cost-effective. This requires employers to automate processes, causing employees to work in close proximity to complicated high speed equipment,

which are powered by multiple sources of energy. The demand for this type of equipment brings with it a greater need for proper machine maintenance and machine guarding. Employee exposures to unguarded or inadequately guarded machinery are addressed in 29 CFR 1910.212–General Requirements for all Machines, 1910.213–Woodworking Machinery Requirements, 1910.217–Mechanical Power Presses, and 1910.219–Mechanical Power-Transmission Apparatus. Likewise, OSHA standards pertaining to employee exposures during servicing and maintenance activities can be found in 29 CFR 1910.147–The Control of Hazardous Energy (Lockout/Tagout).

The goal of this SEP is to reduce amputations statewide by a total of 10%, 2.5% for each of the remaining four years of the Strategic Management Plan. The numbers will be run from the OSHA Express (OE) “Serious/Fatal (UPA) Report” by selecting entries noted as either “Amputation-Digit” or “Amputation-Limb.” The baseline will be the average number of amputations from FFY 2016, 2017, and 2018, which was 168 (166, 167, and 170, respectively, for each of the three years). The goal for each year is as follows:

FFY	Yearly Goal	Cumulative Goal	Baseline	Goal
2020	2.5%	2.5%	168	163
2021	2.5%	5.0%	168	159
2022	2.5%	7.5%	168	155
2023	2.5%	10%	168	151

D. **Training.**

1. Due to the technical and specific nature of these inspections and machinery encountered, CSHOs who conduct these inspections must have adequate training and/or experience with both general and specific machine guarding concepts, as well as a thorough understanding of hazardous energy control (lockout/tagout) program requirements.
2. In late summer 2019, a one-day class will be taught by experienced members of NCDOL staff that will be offered in both the eastern and western portions of the state. This class will ensure Compliance, Consultation, and Education, Training and Technical Assistance (ETTA) staff have comprehensive knowledge of both machine guarding and energy control procedures. All NCDOL employees that are expected to work within the scope of the Amputations SEP are required to attend.
3. Copies of the slides from this class will be submitted to ETТА so that employees that are hired after these classes are offered can review them via the OSH One Stop Shop.

E. **Targeting/Selection.**

Amputations SEP inspections will be generated through accidents, complaints, referrals, and general industry North American Industry Classification System (NAICS) specific programmed criteria. Inspections can occur in both construction and general industry. Assignments will have priority based upon the schedule in FOM Chapter II–Compliance Programming, paragraph E – Inspection Priorities.

1. Unprogrammed Inspections.

- a. Reports of imminent danger, fatality/catastrophe reports, employer-reported referrals, formal and non-formal complaints, and safety and health referrals from other federal, state, county and city agencies, media reports, reports from physicians, other medical clinics, and the public will be investigated by the respective field office.
- b. The CSHO will follow the guidance for making referrals and expanding the scope under FOM Chapter IX–Complaints, Referrals, and Accidents.

In case of denial of entry, the field office will maintain documentation of the event leading up to the denial.

2. Programmed Inspections.

- a. OSH Compliance will utilize historical data to identify the NAICS codes with multiple amputations and a high rate of amputation injuries per 1000 employees in NC. The Planning, Statistics and Information Management (PSIM) Bureau will randomly select establishments within those NAICS codes for inspection and create assignment lists for each OSH Compliance district. The targeting methodology will include the following:
 - i. OE data will be compiled for the period of January 1, 2015 through December 31, 2018.
 - ii. The “Serious/Fatal (UPA) Report” will be used to identify the NAICS codes for all events classified as “Amputation-Digit,” “Amputation-Limb,” and “Pulled into Machinery.”
 - iii. PSIM will provide data regarding the number of NC employers and employees in each of those NAICS codes.
 - iv. The data from OE and PSIM will be used to calculate the number of amputation/pulled into machinery events per 1000 NC employees for each NAICS code.
 - v. NAICS codes with three or more “Amputation-Digit,” “Amputation-Limb,” or “Pulled into Machinery” events ($n \geq 3$) and an event rate greater than or equal to 1.5 per 1000 NC employees over the four-year data period (calendar years 2015-2018) will be included in the initial targeting schedule.
 - vi. From the list of NAICS codes, PSIM will randomly select 25 assignments for each OSH Compliance district.
 - vii. The compiled data, sorted by event rate per 1000 NC employees, is shown in Appendix A. NAICS codes included in the initial targeting schedule have been italicized.

- b. PSIM will review the generated assignment lists to eliminate sites that have received a comprehensive safety or health inspection within the last three years, as well as inactive and duplicate sites. Additional assignments will be pulled as needed by district at the request of the Compliance bureau chief or supervisor.
- c. OSH Compliance supervisors will use their professional judgement and may delete establishments based on local knowledge that the facility is not likely to have the targeted machinery or is out of business. CSHOs will proceed with the programmed inspection where it has been determined that a new business is using the same plant equipment of the previous business.

Please note: Employers that have received a comprehensive safety or health inspection within the last three years may still inadvertently be included on the lists provided by PSIM and should be deleted by the district supervisor if this error is found.

- d. All assignments will be inspected or deleted from the targeting schedule per paragraph E.2.c. prior to requesting another list from PSIM. Justification for deletion of an inspection assignment will be documented on the OSH Targeting System.

F. **Compliance Inspection Procedures.**

1. **General.**

- a. If a complaint, referral, or accident inspection is conducted in an establishment covered by this OPN, CSHOs will follow guidance listed below and in FOM Chapter IX–Complaints, Referrals and Accidents.
- b. If a fatality or catastrophe investigation is conducted in an establishment covered by this OPN, CSHOs will follow guidance listed below and in FOM Chapter VIII–Fatality and Catastrophe Investigations.

2. **Pre-Inspection Preparation.**

- a. CSHOs assigned to conduct programmed, partial-scope inspections under this SEP must review the site listing on the OSH Division Targeting System to determine if a deferral has been issued for the employer/site by the Consultative Services Bureau (e.g. consultative assistance, SHARP), ETTA (Carolina Star Program) or through an OSH Partnership. If the site has an exemption, the CSHO will refer to FOM Chapter III–Inspection Procedures, paragraph D.3.h., Exemptions from Compliance Programmed Planned Inspections, for guidance.
- b. Prior to opening a programmed inspection under this SEP, the CSHO shall review the “Amputation Data Jan15-Jul19” spreadsheet on the F:\ drive (under F:\BUREAUS\Compliance\Amputations SEP) to read through the details of previous amputation injuries within that NAICS code.
- c. CSHOs assigned to conduct a site inspection under this SEP will familiarize themselves with the following documents as appropriate:

- i. NC Field Operations Manual
- ii. CPL 02-00-147–Control of Hazardous Energy
- iii. CPL 02-01-025–Power Press Brakes
- iv. CPL 02-01-043–Slide-Locks
- v. 29 CFR 1910. 147–The Control of Hazardous Energy
- vi. 29 CFR 1910.212–General Requirements for All Machines
- vii. 29 CFR 1910.213–Woodworking Machinery Requirements
- viii. 29 CFR 1910.217–Mechanical Power Presses
- ix. 29 CFR 1910. 219–Mechanical Power-Transmission Apparatus
- x. Industry Data Reports (IDRs) for industries covered under this OPN. The IDRs describe the industry-specific processes and identify the common hazards. They are accessible under the Field Information System (FIS) link on the OSH One Stop Shop.
- xi. Related ANSI /ASME Standards (Reference Appendix C for a list of consensus standards associated with hazardous machinery and equipment).

3. Inspection Process.

- a. Unprogrammed assignments (e.g., complaints, employer-reported referrals) will be handled in accordance with FOM Chapter IX–Complaints, Referrals, and Accidents. CSHOs should specifically review paragraph A.9. regarding the inspection scope (partial) and the circumstances when it may be expanded to machinery or equipment not included in the original complaint or referral. Paragraph A.9.e.ii. of FOM Chapter IX applies for industries within a NAICS code that is targeted per section E.2.a. above.
- b. For program planned inspections, CSHOs will indicate during the opening conference that an SEP programmed inspection is being conducted for amputation hazards. The inspection will be partial in scope and will involve evaluating onsite machinery for machine guarding hazards, reviewing the employer’s lockout/tagout policies/procedures, and addressing any serious hazards in plain view. After obtaining the employer’s consent to continue with the inspection, the CSHO will proceed with the partial inspection by utilizing the inspection guidelines as outlined in FOM Chapter III–Inspection Procedures.
- c. OSHA 300 logs and 301 incident reports for the prior three years (including the current year) will be evaluated during the inspection to identify recorded amputations, severe lacerations, and/or crush injuries created by machinery and equipment. CSHOs should ensure those pieces of equipment are thoroughly evaluated during the walk-through portion of the inspection.

- d. CSHOs will establish/document the types of machinery and equipment present at the workplace and evaluate each one, with a focus on machinery, actions, and processes that could result in an amputation such as, but not limited to: ingoing nip points, pinch points, rotating parts, as well as shear points, cutting actions and other point of operation hazards. *Note: Some examples of machinery and equipment that can cause amputations are found in Appendix B.* CSHO should evaluate actual and potential (i.e., accidental, inadvertent) exposures during normal production operations and address any hazards under Subpart O–Machinery and Machine Guarding of 29 CFR 1910 or the General Duty Clause.
- e. CSHOs shall also evaluate potential exposures to amputation hazards during servicing and/or maintenance activities, particularly for machine operators. Those activities may include: setup/threading/preparation, clearing jams, making adjustments, cleaning of the machine, oiling or greasing of the machine, and scheduled/unscheduled maintenance. CSHOs shall conduct a comprehensive review of the employer’s lockout/tagout program, including but not limited to: the written and unwritten energy control procedures to ensure compliance with 1910.147(c)(4)(i) and (ii)–The Control of Hazardous Energy; the lockout/tagout training program content and documentation and to confirm employees received the correct level of training (i.e. affected or authorized) based on their specific job duties; the periodic inspection program and documentation; and the group lockout procedures if multiple employees are involved with servicing and/or maintenance activities. All CSHOs conducting inspections under the Amputations SEP must read and understand all the information in CPL 02-00-147 entitled “The Control of Hazardous Energy – Enforcement Policy and Inspection Procedures,” dated February 11, 2008.
- f. CSHOS are required to interview management officials and employees associated with machinery and equipment to determine if factors such as, but not limited to, are present: amputation hazards are present, there is a violation of the standard, there is employee exposure; and/or management could have been aware of the hazard.

4. Citation Guidance.

- a. Refer to the FOM and other appropriate reference documents (such as CPLs) prior to proceeding with citation issuance.

G. Recording and Tracking.

- 1. For all inspection activity (both programmed and unprogrammed) covered under this SEP, the code “Amputations SEP” must be marked under the Emphasis/Initiatives tab in OE from the “Strategic Plan Activity Description” pull-down menu.
- 2. Inspections covered under this SEP that result in a program improvement will be coded as “Program Improvements” under the Emphasis/Initiatives Tab in OE under “Strategic Plan Activity.”

H. **Outreach Activity.**

As outlined in the goals set forth in the most current Strategic Management Plan, ETTA and the Consultative Services Bureau will provide outreach that support this SEP such as developing publications, providing training and conducting consultative surveys.

I. **Effective Date.**

This OPN is effective on the date of signature. It will remain in effect until revised or canceled by the director.

Signed on Original
Tara Payne
SEP Team Co-Chair

Signed on Original
Kevin Beauregard
OSH Director

8/30/219
Date of Signature

Appendix A: Industry Type and NAICS Tables**NC Amputation Data in Order of Amputation Injuries per 1,000 Employees**

January 1, 2015 – December 31, 2018

Includes “Amputation-Digit,” “Amputation-Limb,” and “Pulled into Machinery”

Fed = On Federal OSHA Amputations NEP targeting list**Italics** = NAICS codes included in initial targeting schedule

NAICS	Title	NC Amputations 1/15 - 12/18	Fed/NC	# of NC Employers	# of NC Employees	Amputation Injuries per 1,000 Employees
314992	N/A (2007 Tire Cord and Tire Fabric Mills)	2	NC	2	84	23.8
<i>322221</i>	<i>N/A (absorbed into 322220 - Paper Bag and Treated Bag Manufacturing)</i>	6	<i>NC</i>	8	290	20.7
327120	Brick and Structural Clay Tile Manufacturing	2	NC	3	105	19.0
<i>315999</i>	<i>N/A (absorbed into 315990 - Apparel Accessories)</i>	6	<i>NC</i>	8	415	14.5
332116	N/A (2007 Metal Stamping)	2	NC	5	195	10.3
336212	Truck Trailer Manufacturing	1	Fed	4	103	9.7
<i>321912</i>	<i>Cut Stock, Resawing Lumber, and Planing</i>	4	<i>Fed</i>	40	554	7.2
<i>335911</i>	<i>Storage Battery Manufacturing</i>	3	<i>NC</i>	7	522	5.7
336330	Motor Vehicle Steering and Suspension Components	2	NC	9	354	5.6
<i>562219</i>	<i>Other Nonhazardous Waste Treatment and Disposal</i>	3	<i>NC</i>	32	564	5.3
<i>326122</i>	<i>Plastics Pipe and Pipe Fitting Manufacturing</i>	4	<i>NC</i>	12	768	5.2
311613	Rendering and Meat Byproduct Processing	1	Fed	4	195	5.1
334290	Other Communications Equipment Manufacturing	2	NC	14	414	4.8
<i>322214</i>	<i>N/A (absorbed into 322219 - Other Paperboard Container Manufacturing)</i>	4	<i>NC</i>	5	875	4.6
424470	Meat and Meat Product Merchant Wholesalers	6	NC	81	1333	4.5

NAICS	Title	NC Amputations 1/15 - 12/18	Fed/NC	# of NC Employers	# of NC Employees	Amputation Injuries per 1,000 employees
333319	N/A (2007 Other Commercial and Service Ind. Machinery)	2	NC	9	450	4.4
333612	Speed Changer, Industrial High-Speed Drive, and Gear Manufacturing	1	Fed	5	232	4.3
322219	<i>Other Paperboard Container Manufacturing (from 322214)</i>	4	<i>Fed</i>	21	955	4.2
321213	Engineered Wood Member Manufacturing	2	NC	11	482	4.1
333411	<i>N/A (absorbed into 333413 - Fan and Blower Air Purification Equipment Manufacturing)</i>	4	<i>NC</i>	20	978	4.1
332996	<i>Fabricated Pipe and Pipe Fitting Manufacturing</i>	3	<i>Fed</i>	26	745	4.0
335311	<i>Power, Distribution, and Specialty Transformer Manufacturing</i>	3	<i>NC</i>	12	754	4.0
336360	Motor Vehicle Seating and Interior Trim Manufacturing	2	NC	16	505	4.0
311511	<i>Fluid Milk Manufacturing</i>	3	<i>Fed</i>	9	815	3.7
311412	Frozen Specialty Food Manufacturing	2	Fed	9	549	3.6
331524	Aluminum Foundries	2	NC	6	586	3.4
321920	<i>Wood Container and Pallet Manufacturing</i>	10	<i>Fed</i>	98	2971	3.4
335932	Noncurrent-carrying Wiring Device Manufacturing	2	NC	7	608	3.3
321219	<i>Reconstituted Wood Product Manufacturing</i>	5	<i>NC</i>	13	1544	3.2
332439	<i>Other Metal Container Manufacturing</i>	3	<i>NC</i>	17	927	3.2
326111	<i>Plastics Bag and Pouch Manufacturing</i>	3	<i>Fed</i>	14	946	3.2
332117	Powder Metallurgy Part Manufacturing	1	Fed	2	329	3.0
332323	Ornamental and Architectural Metal Work Manufacturing	2	Fed	70	741	2.7
424590	Other Farm Product Raw Material Merchant Wholesalers	2	NC	39	770	2.6

NAICS	Title	NC Amputations 1/15 - 12/18	Fed/NC	# of NC Employers	# of NC Employees	Amputation Injuries per 1,000 employees
325211	<i>Plastic Material and Resin Manufacturing</i>	5	NC	61	1971	2.5
327211	<i>Flat Glass Manufacturing</i>	3	NC	6	1188	2.5
326121	Unlaminated Plastics Profile Shape Manufacturing	2	NC	17	799	2.5
311811	<i>Retail Bakeries</i>	4	Fed	230	1629	2.5
332812	<i>Metal Coating, Engraving and Allied Services</i>	3	NC	79	1240	2.4
313312	<i>N/A (absorbed into 313310 - Textile and Fabric Finishing Mills)</i>	3	NC	15	1254	2.4
332618	Other Fabricated Wire Product Manufacturing	2	NC	33	848	2.4
321918	<i>Other Millwork (including Flooring)</i>	8	Fed	85	3415	2.3
311813	Frozen Cakes, Pies, and Other Pastries Manufacturing	1	Fed	5	441	2.3
326140	<i>Polystyrene Foam Product Manufacturing</i>	7	NC	29	3128	2.2
313320	Fabric Coating Mills	2	NC	18	928	2.2
326113	<i>Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing</i>	4	Fed	19	1870	2.1
322220	<i>Paper Bag and Coated and Treated Paper Manufacturing (from 322221)</i>	6	Fed	49	2847	2.1
327331	<i>Concrete Block and Brick Manufacturing</i>	4	NC	46	1920	2.1
423510	<i>Metal Service Centers and Other Metal Merchant Wholesalers</i>	6	NC	385	3278	1.8
311612	<i>Meat Processed from Carcasses</i>	5	Fed	37	2746	1.8
332322	<i>Sheet Metal Work Manufacturing</i>	4	Fed	107	2287	1.7
313111	<i>Yarn Spinning Mills - Not active (now 313110)</i>	10	NC	32	5745	1.7
335999	<i>All Other Miscellaneous Electrical Equipment and Component Manufacturing</i>	3	NC	37	1805	1.7
332919	Other Metal Valve and Pipe Fitting Mechanisms	2	NC	13	1288	1.6

NAICS	Title	NC Amputations 1/15 - 12/18	Fed/NC	# of NC Employers	# of NC Employees	Amputation Injuries per 1,000 employees
322299	<i>All Other Converted Paper Product Manufacturing</i>	3	NC	24	1943	1.5
332321	<i>Metal Window and Door Manufacturing</i>	3	Fed	41	1992	1.5
451130	Sewing, Needle, and Piece Goods Stores	2	NC	156	1330	1.5
332999	<i>All Other Miscellaneous Fabricated Metal Product Manufacturing</i>	3	Fed	82	2033	1.5
323110	N/A (2007 Commercial Lithographic Printing)	2	NC	49	1396	1.4
423990	Other Miscellaneous Durable Goods Merchant Wholesalers	6	NC	382	4209	1.4
326160	Plastics Bottle Manufacturing	2	Fed	19	1431	1.4
321211	Hardwood Veneer and Plywood Manufacturing	3	NC	47	2254	1.3
331222	Steel Wire Drawing	2	NC	15	1521	1.3
321999	All Other Miscellaneous Wood Product Manufacturing	3	NC	96	2328	1.3
336211	Motor Vehicle Body Manufacturing	4	Fed	36	3140	1.3
335313	Switchgear and Switchboard Apparatus Manufacturing	2	NC	32	1619	1.2
321113	Sawmills	6	Fed	153	4906	1.2
336399	N/A (2007 All Other Motor Vehicle Parts Manufacturing)	9	NC	28	7424	1.2
488991	Packing and Crating	2	NC	58	1677	1.2
453991	Tobacco Stores	2	NC	498	1734	1.2
423310	Lumber, Plywood, Millwork, and Wood Panel Merchant wholesalers	9	NC	447	7859	1.1
423930	Recyclable Material Merchant Wholesalers	5	NC	286	4381	1.1
332312	Fabricated Structural Metal Manufacturing	6	Fed	160	5378	1.1
325220	Artificial and Synthetic Fibers/Filaments Manufacturing	2	NC	39	1808	1.1

NAICS	Title	NC Amputations 1/15 - 12/18	Fed/NC	# of NC Employers	# of NC Employees	Amputation Injuries per 1,000 employees
424130	Industrial and Personal Service Paper Merchant Wholesalers	3	NC	197	2840	1.1
322212	Folding Paperboard Box Manufacturing	6	Fed	29	5963	1.0
322211	Corrugated and Solid Fiber Box Manufacturing	5	Fed	75	5028	1.0
337122	Non-upholstered Wood Household Furniture Manufacturing	8	Fed	141	8187	1.0
313230	Nonwoven Fabric Mills	4	NC	52	4269	0.9
339999	All Other Miscellaneous Manufacturing	7	NC	134	8071	0.9
311615	Poultry Processing	32	Fed	48	37343	0.9
333611	Turbine and Turbine Generator Set Units Manufacturing	3	Fed	14	3512	0.9
321214	Truss Manufacturing	2	NC	44	2348	0.9
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	2	NC	17	2457	0.8
322121	Paper Mills	5	NC	36	6187	0.8
331491	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	2	Fed	6	2506	0.8
336612	Boat Building	2	NC	84	2572	0.8
337211	Wood Office Furniture Manufacturing	2	NC	42	2578	0.8
311821	Cookie and Cracker Manufacturing	3	NC	17	3895	0.8
326112	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	1	Fed	20	1329	0.8
311999	All Other Miscellaneous Food Manufacturing	1	Fed	29	1382	0.7
332991	Ball and Roller Bearing Manufacturing	2	Fed	15	2875	0.7
326199	All Other Plastics Manufacturing	10	NC	197	14458	0.7
339112	Surgical and Medical Instrument Manufacturing	4	NC	85	6270	0.6
922120	Police Protection	2	NC	147	3158	0.6
331111	N/A (2007 Iron and Steel Mills)	2	NC	7	3202	0.6

NAICS	Title	NC Amputations 1/15 - 12/18	Fed/NC	# of NC Employers	# of NC Employees	Amputation Injuries per 1,000 employees
327320	Ready-Mix Concrete Manufacturing	2	Fed	171	3262	0.6
532412	Construction, Mining, and Forestry Machinery Rental	2	NC	240	3470	0.6
333618	Other Engine Equipment Manufacturing	1	Fed	11	1816	0.6
335312	Motor and Generator Manufacturing	2	NC	33	3748	0.5
337127	Institutional Furniture Manufacturing	4	Fed	108	7530	0.5
337121	Upholstered Household Furniture Manufacturing	14	Fed	244	28256	0.5
311611	Animal (except Poultry) Slaughtering	9	Fed	43	19522	0.5
445299	All Other Specialty Food Stores	2	NC	206	4426	0.5
311991	Perishable Prepared Food Manufacturing	1	Fed	15	2241	0.4
313210	Broadwoven Fabric Mills	6	NC	104	13618	0.4
326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing	2	Fed	71	4821	0.4
561210	Facilities Support Services	2	NC	193	4930	0.4
311812	Commercial Bakeries	2	Fed	147	5076	0.4
442110	Furniture Stores	5	NC	806	13694	0.4
337215	Showcase, Partition, Shelving, and Locker Manufacturing	2	NC	148	5610	0.4
313311	N/A (absorbed into 313310 - Textile and Fabric Finishing Mills)	2	NC	32	5745	0.3
335921	Fiber Optic Cable Manufacturing	2	NC	23	5747	0.3
423830	Industrial Machinery and Equipment Merchant Wholesalers	5	NC	1439	15402	0.3
326211	Tire Manufacturing	2	NC	13	7465	0.3
336350	Motor Vehicle Transmission and Power Train Parts	2	NC	33	7567	0.3
924120	Administration of Conservative Programs	2	NC	338	7721	0.3
312229	Other Tobacco Product Manufacturing	2	NC	7	7790	0.3

NAICS	Title	NC Amputations 1/15 - 12/18	Fed/NC	# of NC Employers	# of NC Employees	Amputation Injuries per 1,000 employees
444190	Other Building Materials Dealers	7	NC	838	28649	0.2
562111	Solid Waste Collection	2	NC	417	8308	0.2
811111	General Automotive Repair	3	NC	2923	13256	0.2
333120	Construction Machinery Manufacturing	2	NC	55	9230	0.2
314999	All Other Miscellaneous Textile Product Mills	3	NC	159	14041	0.2
327991	Cut Stone and Stone Product Manufacturing	2	NC	118	10930	0.2
921190	Other General Government Support	3	NC	227	16610	0.2
337110	Wood Kitchen Cabinet and Countertop Manufacturing	1	Fed	297	6094	0.2
325412	Pharmaceutical Preparation Manufacturing	6	NC	123	37091	0.2
541330	Engineering Services	5	NC	2740	31998	0.2
445110	Supermarkets and Other Grocery Stores	24	NC	2059	153734	0.2
926120	Regulation and Administration of Transportation Programs	4	NC	109	26311	0.2
441110	New Car Dealers	5	NC	661	35676	0.1
561730	Landscaping Services	4	NC	4225	28621	0.1
423610	Electrical Apparatus and Equipment Merch. Wholesalers	2	NC	848	15587	0.1
424910	Farm Supplies Merchant Wholesalers	2	NC	459	15698	0.1
313110	Fiber, Yarn, and Thread Mills	2	NC	97	16362	0.1
484230	Scheduled Freight Trucking	2	NC	583	18849	0.1
561311	Employment Placement Agencies	4	NC	591	38200	0.1
722310	Food Service Contractors	3	NC	1176	31062	0.1
334513	Instruments and Related Products Manufacturing for Measuring, Displaying, and	1	Fed	48	11632	0.1
444110	Home Centers	4	NC	318	57068	0.1
441310	Automotive Parts and Accessories Stores	2	NC	1652	29234	0.1

NAICS	Title	NC Amputations 1/15 - 12/18	Fed/NC	# of NC Employers	# of NC Employees	Amputation Injuries per 1,000 employees
481111	Scheduled Passenger Air Transportation	2	NC	54	29846	0.1
611310	Colleges, Universities, and Professional Schools	4	NC	322	91493	0.0
922140	Correctional Institutions	2	NC	169	48302	0.0
561720	Janitorial Services	3	NC	2937	92892	0.0
561320	Temporary Help Services	6	NC	3057	825055	0.0
622110	General and Medical Surgical Hospitals	2	NC	786	336361	0.0
611110	Elementary and Secondary Schools	2	NC	3955	375169	0.0
332112	Nonferrous Forging	0	Fed	2	3	0.0
332114	Custom Roll Forming	0	Fed	2	62	0.0
311512	Creamery Butter Manufacturing	0	Fed	4	91	0.0
332992	Small Arms Ammunition Manufacturing	0	Fed	5	28	0.0
334517	Irradiation Apparatus Manufacturing	0	Fed	5	199	0.0
311411	Frozen Fruit, Juice, and Vegetable Manufacturing	0	Fed	6	37	0.0
334514	Totalizing Fluid Meter and Counting Device Manufacturing	0	Fed	7	203	0.0
333112	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	0	Fed	8	63	0.0
331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	0	Fed	9	160	0.0
333613	Mechanical Power Transmission Equipment Manufacturing	0	Fed	10	660	0.0
311513	Cheese Manufacturing	0	Fed	11	53	0.0
337124	Metal Household Furniture Manufacturing	0	Fed	11	567	0.0
332994	Small Arms, Ordnance, and Ordnance Accessories Manufacturing	0	Fed	16	586	0.0
337125	Household Furniture (except Wood and Metal) Manufacturing	0	Fed	16	634	0.0
323117	Books Printing	0	Fed	17	540	0.0

NAICS	Title	NC Amputations 1/15 - 12/18	Fed/NC	# of NC Employers	# of NC Employees	Amputation Injuries per 1,000 employees
332111	Iron and Steel Forging	0	Fed	18	418	0.0
333111	Farm Machinery and Equipment Manufacturing	0	Fed	18	355	0.0
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	0	Fed	21	764	0.0
334512	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	0	Fed	21	569	0.0
334516	Analytical Laboratory Instrument Manufacturing	0	Fed	21	926	0.0
332119	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	0	Fed	22	920	0.0
336214	Travel Trailer and Camper Manufacturing	0	Fed	22	340	0.0
321114	Wood Preservation	0	Fed	23	486	0.0
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing	0	Fed	30	1101	0.0
321911	Wood Window and Door Manufacturing	0	Fed	36	2107	0.0
334519	Other Measuring and Controlling Device Manufacturing	0	Fed	36	2178	0.0
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical	0	Fed	38	2798	0.0
332311	Prefabricated Metal Building and Component Manufacturing	0	Fed	41	1254	0.0
332313	Plate Work Manufacturing	0	Fed	48	1483	0.0
327390	Other Concrete Product Manufacturing	0	Fed	69	1629	0.0
323113	Commercial Screen Printing	0	Fed	246	1956	0.0
332710	Machine Shops	0	Fed	548	5843	0.0
323111	Commercial Printing (except Screen and Books)	0	Fed	558	9944	0.0

Appendix B: Examples of Machinery and Equipment That Can Cause Amputations

Note: This list is not inclusive of all machinery/equipment that can cause amputations.

1. Bailers
2. Aerial Lift Platforms
3. Benders, Rollers and Shapers
4. Cranes (Unspecified)
5. Casting Machinery
6. Conveyors – Belt, Chain, Live Roller, and Auger Screw
7. Heating and Cooking Machinery and Appliances
8. Drills – Stationary
9. Extruding Machinery
10. Food and Beverage Processing
11. Grinders, Abraders, and Meat Grinders
12. Material and Personnel Handling Machinery
13. Metal, Woodworking, and Special Material Machinery
14. Milling Machines
15. Mowing Machinery
16. Mixers, Blenders, Whippers, Slicers, and Food Beverage Processing Equipment
17. Packing, Wrapping, Bundling Machinery
18. Plastic Injection Molding Machinery
19. Press Brakes (All Types)
20. Presses (Mechanical, Hydraulic, and Pneumatic)
21. Printing Presses
22. Sawing Machinery - (Band, Table, Radial Arm Saws)
23. Shears (All Types)

Appendix C: Related ANSI /ASME Standards

Note: This appendix is not an inclusive list of all ANSI and ASME standards that are associated with hazardous machinery and equipment.

1. ANSI B11.1 – Mechanical Power Presses
2. ANSI B11.2 – Hydraulic Power Presses
3. ANSI B11.3 – Power Press Brakes
4. ANSI B11.4 – Shears
5. ANSI B11.5 – Ironworkers
6. ANSI B11.6 – Lathes
7. ANSI B11.7 – Cold Headers and Cold Formers
8. ANSI B11.8 – Drilling, Milling, and Boring Machines
9. ANSI B11.9 – Grinding Machinery
10. ANSI B11.10 – Metal Sawing Machines
11. ANSI B11.11 – Gear Cutting Machines
12. ANSI B11.12 – Roll-Forming and Roll-Bending Machines
13. ANSI B11.14 – Coil-Slitting Machines
14. ANSI B11.15 – Pipe, Tube, and Shape Bending Machines
15. ANSI B11.16 – Metal Powder Compacting Presses
16. ANSI B11.17 – Horizontal Hydraulic Extrusion Presses
17. ANSI B11.18 – Machinery and Machine Systems for Processing Strip, Sheet, or Plate From Coiled Configuration
18. ANSI B11.19 – Safeguarding When Referenced by the Other B11 Machine Tool Safety Standards
19. ANSI B5.37 – External Cylindrical Grinding Machines (Centerless)
20. ANSI B5.42 – External Cylindrical Grinding Machines (Universal)
21. ANSI B65.1 – Printing Press Systems
22. ANSI B65.2 – Safety Standard – Binding and Finishing Systems
23. ANSI B65.3 – Safety Standard for Guillotine Paper Cutters
24. ANSI B7.1 – Use, Care, and Protection of Abrasive Wheels

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25. ANSI B151.5 – Plastic Film and Sheet Winding Equipment
26. ANSI B151.20 – Plastic Sheet Production Machinery
27. ANSI B155.1 – Packaging Machinery and Packaging-Related Converting Machinery
28. ANSI B177.1 – Three Roller Printing Ink Mills
29. ANSI O1.1 – Woodworking Machinery
30. ANSI Z244.1 – Control of Hazardous Energy - Lockout/Tagout and Alternative Methods
31. ASME B5.52M – Mechanical Power Presses, General Purpose Single Point
32. ASME B15.1 – Mechanical Power Transmission Apparatus
33. ASME B15.1A – Addenda to B15.1
34. ASME BL5.1B – Addenda to B15.1
35. ASME B20.1 – Conveyors and Related Equipment, with Interpretations A and B
36. ASME B20.1A and B20.1B – Addenda to B20.1
37. ASME/CEMA 350 – Screw Conveyors
38. ASME/CEMA 401 – Unit Handling Conveyors - Roller Conveyors - Non-Powered
39. ASME/CEMA 402 – Unit Handling Conveyors - Belt Conveyors
40. ASME/CEMA 403 – Unit Handling Conveyors - Belt Driven Live Roller Conveyors
41. ASME/CEMA 404 – Unit Handling Conveyors - Chain Driven Live Roller Conveyors
42. ASME/CEMA 405 – Packaging Handling Conveyors - Slant Conveyors