North Carolina Department of Labor
Division of Occupational Safety and Health

Raleigh, North Carolina

Field Information System Operational Procedure Notice 133

***Subject*:** Lumber and Wood Products, Furniture and Fixtures Injury Reduction (except SIC 2411)

A. Purpose.

This Operational Procedure Notice (OPN) establishes and implements a special emphasis inspection program that provides guidance to Compliance Safety and Health Officers (CSHOs) for conducting inspections targeted by this OPN. This OPN applies to employers within industries in Standard Industrial Classifications (SICs) 24 and 25 (excluding SIC 2411, which is addressed in the most current version of OPN 88).

This OPN also enables the CSHOs, in some instances, to limit the scope of inspections to those hazards that have been identified in recent compliance inspections. This document provides supplementary procedures beyond standard inspection protocol set forth in the OSHNC Field Operations Manual (FOM).

B. Scope.

This OPN applies to all assignments included in this special emphasis inspection program and is effective until cancelled by the Director.

C. Discussion.

The targeting program utilizes industry and establishment-specific employer information based on data collected annually by the Bureau of Labor Statistics (BLS) and other available data sources. Those SIC 24 and SIC 25 employers with high Days Away, Restricted, or Transferred (DART) rates are those that may be targeted for inspection.

D. Objectives.

This special emphasis inspection program sets the targeting priority of inspections of industries in SICs 24 and 25. The most recently published BLS data for North Carolina, obtained from Table 6 of BLS North Carolina, indicates that the current (2002) Total Case (DART) rate for all industries, including State and local government, is 2.2. The DART rate in NC for SIC 24 is 3.9, and for SIC 25 is 3.7. Employers with DART rates higher than the NC Total DART rate of 2.2 are considered high rate industries, and a reduction in injury and illness rates within targeted SICs will likely contribute to a reduction in the overall DART rate for the state of North Carolina. Employers controlling 10 or fewer employees will not be included in this targeting system, but could still be assigned for inspection as a result of an accident, complaint or referral.

E. Inspection Procedures and Guidelines.

1. Inspections conducted under this plan will be comprehensive programmed safety and health inspections as defined by the Compliance Operations Manual and conducted in accordance with the procedures described there and in other guidance documents.

Targeted inspections under this inspection program shall receive the same inspection priority as Programmed Inspections under other OSHNC initiatives including Silica, Lead, Long Term Care, Logging and Tree Felling Fatality Reduction, Construction Fatality Reduction, Public Sector, Fatality Site Reinspections and SST inspections. Consultation deferrals shall apply to sites selected for inspection under this OPN.

2. Once an inspection is planned, the Supervisor should insure the development of an intervention strategy to address those safety and health problem areas identified through review of employer or industry specific data. Included in the appendices of this OPN are Industrial Data Reports (IDRs) for several of the targeted SICs (2420, 2432, 2511, 2512, and 2514). CSHOs should use the information in the appendices of this OPN to assist with the identification of hazards in the relevant SICs.
3. When a site is targeted for either a safety only or health only inspection and the CSHO determines that both safety and health hazards are present, a joint inspection is preferred, but referrals may be considered when a joint inspection is not possible. Inspections under this plan may also be conducted either as one combined safety and health inspection by a cross-trained Compliance Officer (as established through specific training or demonstrated ability), or as separate safety and health inspections.

4. Focused Inspection Exemption.

   a. A focused inspection may be conducted if a site is determined to have an effective safety and health program (as defined below, in Paragraph 4.b.), including a designated person/committee responsible for and capable of implementing the program/plan **AND** the site's DART rate is less than or equal to the State Total DART rate (**2.2** for 2002) as determined by the CSHO's review and calculation of data found on the **2002** OSHA 300 log (see Paragraph 4.d.).

      If a focused inspection is to proceed, a partial walkthrough will be conducted and employees will be interviewed in order to confirm and verify the effectiveness of the safety and health program. Any serious violations that are observed in the vicinity or brought to the attention of the Compliance Officer shall be investigated and cited as appropriate. If all of these conditions are met, the CSHO shall initiate a focused inspection pursuant to the following guidelines. If all of the above conditions are not met or records are not available for Compliance Officers to make this determination, the comprehensive workplace safety and health inspection will proceed and appropriate citations shall be considered.

   b. Evaluation of the Safety and Health Program. The compliance officer shall evaluate and document the safety and health program in effect at the site using the following criteria and minimum requirements:

      i. Comprehensiveness.

         Confirmation that the program is comprehensive in scope entails an overall evaluation of the features of the program and the physical characteristics of the site. The site's safety and health program/plan must address the full range of hazards normally encountered at sites of the type being inspected (review applicable Industrial Data Reports, if available).

ii. Safety and Health Training Program.

Evaluate the need for and effectiveness of any specialized or trade-specific safety and health training programs applicable to conditions at the site. Factors to be considered include the need for special training in view of unique conditions/hazards likely to be encountered at the site as well as specific requirements for such ongoing or periodic training/retraining of employees.

iii. Communication.

Employees must be aware of and have access to the services alleged to be provided through the site's safety and health program/plan. The employer must provide evidence showing how the program is communicated to employees and contractors (e.g., oral instruction, booklets, memoranda, posters, safety meeting minutes/attendance rosters, etc.). The CSHO should consider whether the employer holds safety meetings, their frequency, and who conducts them (e.g., plant manager, line supervisors, safety director, etc.). The CSHO should evaluate the effectiveness of the safety and health program/plan through employee interviews.

iv. Investigations.

Evaluate the employer's efforts to make accident/injury/illness investigations and determine if corrective actions are taken as a result.

v. Enforcement.

Safety and health rules must be enforced. Identify the principal enforcement methods used (e.g., warnings, written reprimands, disciplinary action, discharge, etc.), and the effectiveness of these methods as applied at the site.

c. Conduct of the Focused Inspections.

i. The Focused Inspection, for programmed inspections, will begin after a determination is made that the site qualifies as set forth in Paragraph 4.a. of this OPN. The walk around will include the site's safety representative and employee representative according to existing policies for conduct of inspections. The site shall be evaluated, concentrating on: 1) the applicable hazards, as referenced in Appendix A; 2) the site's safety and health program/plan; and 3) serious hazards observed by the CSHO(s). If conditions observed on the project indicate that the site's safety and health program/plan is not effective as initially determined, the CSHO may immediately terminate the Focused Inspection and conduct a comprehensive inspection. The discovery of serious violations during a Focused Inspection does not automatically convert the Focused Inspection into a comprehensive inspection - the CSHO(s) conducting a

Focused Inspection is not required to inspect the entire site. Only a representative portion of the project need be inspected.

ii. On sites where unprogrammed inspections are being conducted (complaints, referrals or accidents), Focused Inspections will be conducted where expanding the scope of the inspection is allowed and conditions at the assigned site meet the criteria in this OPN and after the complaint, referral or accident has first been addressed and with supervisory approval.

iii. Focused inspections shall concentrate primarily on the site's safety and health program/plan, and the applicable industry hazards, as noted in Appendix A. However, during the course of the focused inspection, violations shall also be proposed for any serious violations observed and for any other-than-serious violations which are not immediately abated during the walk around. Other-than-serious violations which are immediately abated shall not be cited, but will be noted in the case file (narrative) by the CSHO.

iv. A brief justification will be included in each case file as to why a Focused Inspection was or was not conducted.

d. The DART rate (includes Lost Workdays and Days of Restricted Work Activity and Transfer to another job) will be calculated as follows:

***Total DART Rate**:
DART Rate = [N / EH] x 200,000; where,

N = total of columns H and I on the OSHA 300 log,
EH = total number of employee hours worked for a calendar year, and
200,000 = base of working hours for 100 full-time equivalent employees.

F. Recording and Tracking.

1. For all SEP inspections assigned via the OSH Targeting System web page (SIC 24/25), the OSHA-1 forms must be marked as "programmed planned" in item 24. For all unprogrammed inspections conducted in conjunction with an SIC 24/25 inspection, the OSHA-1 forms must be marked as "unprogrammed" in item 24 with the appropriate unprogrammed activity identified.

2. In addition, OSHNC will code the OSHA-1 in item 25f (Strategic Plan Activity) with the value **"SIC24/25"**.

G. Managing the Inspection Assignment List.

1. The Planning, Statistics and Information Management Bureau (PSIM) will provide each District Office with an inspection assignment list via the OSH Targeting System webpage (SIC24/25 Assignment Cycle list) of eligible sites.

2. The SIC24/25 Assignment cycle size (number of assignments on the SIC24/25 assignment list) will be based on consideration of available resources, competing

strategic priorities, geographic range of the office, and the number of employers in the SIC24/25 database. Within a list, the establishments may be scheduled and inspected and in an order that makes efficient use of available resources. When a list is completed, the District Office may request a new list through their respective Bureau Chief. All of the establishments in a Cycle must either be inspected or removed from the list by the Program Administrator in the Planning, Statistics and Information Management Bureau before any establishments on a new list may be inspected. All of the establishments in a Cycle must either be inspected or removed from the list by the SEP Program Administrator in the PSIM Bureau before any establishments on a new list may be inspected.

3. Compliance Bureau management shall determine the appropriate strategy for meeting inspection activity levels in each area of strategic focus.

4. Compliance Supervisors along with the Compliance Bureau Chiefs will be responsible for making recommendations regarding establishments on a SIC24/25 Assignment Cycle list that should be skipped or deleted from the current list of SIC24/25 sites planned for inspection. For example, establishments that have received a recent comprehensive safety and health inspection may be skipped or deleted from the current inspection assignment list/cycle. Supervisors will document in the comments column of the SIC 24/25 targeting page the reason why an establishment was skipped or deleted. All requested changes to this targeting schedule must be in writing to the PSIM Bureau.

H. Administration.

The OSHNC SIC24/25 Targeting Program set forth in this operational procedure notice will be administered through the PSIM Bureau.

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
Kevin Beauregard
Assistant Director

Signed on Original
Allen McNeely
Director

11/02/04
Date of Signature

Appendix A

The following areas of concern have been identified based upon hazards identified by affected industries (e.g., combustible dust, ergonomics), and data from inspections conducted during the period 10/99 – 9/04. Lists of the most frequently cited standards for that period were generated. The top ten standards cited for these five years included violations in most of the following areas. Therefore, based upon the CSHOs professional judgment, these areas should be addressed during the course of a Focused Inspection.

Areas of concern to be addressed during focused compliance inspections of industries in SICs 24 and 25:

- Electrical (including classified locations)
- Toxic and hazardous substances (including hazard communication)
- Machinery and machine guarding (including abrasive wheels, woodworking machinery, mechanical power-transmission)
- Hand and portable powered tools and other hand-held equipment
- Hazardous materials (including flammables/combustibles, spray finishing, dipping/coating)
- Materials handling and storage (including powered industrial trucks)
- Fire protection and emergency action
- Personal protective equipment
- Occupational health and environmental controls (including combustible dust, noise, PRCS, ventilation, LO/TO)
- Walking-working surfaces
- Recordkeeping
- Special industries (including sawmills)
- Ergonomics (CSHOs should reference FOM Ch. XVII)

Appendix B

The following data reports are included below:

1. **NC-OSHA INDUSTRIAL DATA REPORT No. 24-1**
   SUB-GROUP: Saw Mills and Planing Mills, SIC 2420

2. **NC-OSHA INDUSTRIAL DATA REPORT No. 24-2**
   SUB-GROUP: Plywood and Veneer, SIC 2432

3. **NC-OSHA INDUSTRIAL DATA REPORT No. 25-1**
   SUB-GROUP: Upholstered Household Furniture, SIC 2512

4. **NC-OSHA INDUSTRIAL DATA REPORT No. 25-2**
   SUB-GROUP: Wooden Furniture (case goods), SIC 2511

5. **NC-OSHA INDUSTRIAL DATA REPORT No. 25-3**
   SUB-GROUP: Metal Furniture, 2514

NORTH CAROLINA DEPARTMENT OF LABOR
OSHA DIVISION
NC-OSHA INDUSTRIAL DATA REPORT

No.	24-1
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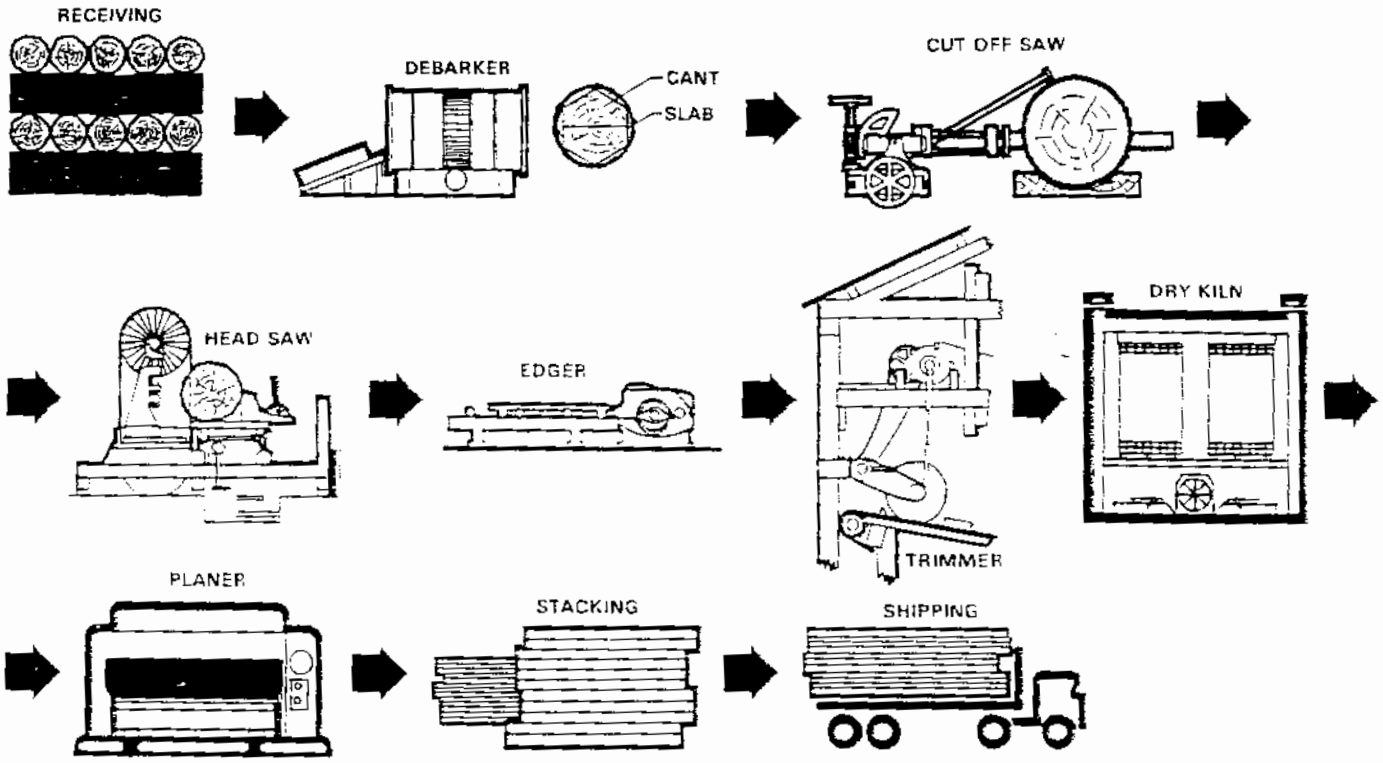
INDUSTRY: Lumber and Wood Products | SUB-GROUP: Saw Mills and Planing Mills | SIC: 2420

PROCESS DESCRIPTION: After the logs have been received on the storage yard they are transported to the mill and debarked. Following the removal of slabs, the head saw cuts the remainder into cants. The cants may then go to a resaw for further cutting or go directly to the edger. The purpose of the edger is to rough cut to the desired size (later the lumber may be dressed). After being edged the lumber continues via chain or belt conveyor to the trimmer where it is cut to the most usable lengths (usually 6', 8', 10', 12', 16', 18'). From the trimmer or trim saw the lumber may be dipped into a chemical solution to prevent it from turning blue (keeping logs wet by water spray in log storage yard also accomplishes this purpose). The lumber is graded before being dipped and then sorted into piles by length and grade. If lumber is to be kiln dried it is stacked and placed in a kiln. If air dried, it is stacked and placed on the yard. The drying process may take from twelve to sixty hours depending on desired moisture content. The lumber is still rough at this point and if it is to be dressed on one or both sides it is sent to the planer. With this accomplished, the finished lumber is again graded, cut to desired length, stacked, packaged and shipped or stored.

PROCESS FLOW:



OSHA HAZARDS ANALYSIS

MAJOR HAZARDS			OTHER HAZARDS		
LOCATION	ITEM	HAZARD	LOCATION	ITEM	HAZARD
Log storage	Logs in piles and stacks	Potential falling and collapsing	Resaw	Resaw, infeed rolls and guides, roll-cases, chain conveyor, cants and lumber	Amputation, lacerations, mangled and bruised limbs, dust and chips in eyes, loss of hearing, splinters in hands, arms, and thighs, blows to head and body, slips and falls
Debarker	Log deck chain conveyors, log flipper, pike pole, peavy, barker, head, log hold down, bark, noise, walkways, steps	Amputations, lacerations, mangled limbs, bark and dust in eyes, falls, slips, cuts, bruises, sprains			
Head rig	Head saw log carriage track, log deck, cants and slabs, chair conveyors, roll cases, noise, logs, open motors and power	Amputations, lacerations, mangled and bruised limbs, bark, dust and chips in eyes, loss of hearing, splinters in hands, arms and thighs, electrical shock, slips and falls	Edger	Edger blades, infeed rolls, lumber, chains, sprockets, and v-belt drives, roll cases and conveyors, live rolls	Mashed and mangled limbs, dust and chips, in eyes, loss of hearing, splinters in hands, arms and thighs, slips and falls, cuts and bruises
Trim saw	Trim saw blades, chain conveyor	Amputation of limbs, bruises and cuts, dust and chips in eyes, loss of hearing, slips and falls, punctures and abrasions from splinters, sprains and strains	Planer	Planer, conveyors, live rolls, pineapple and pressure rolls, planer knives, power transmission gear	Cuts and lacerations of limbs, loss of hearing, slips and falls, splinters in hands, arms and thighs, loss of fingers and hands
			Kiln	Control room, live steam lines power transmission gear, floors, stair rails	Burns, mangled limbs, slips and falls, bruises, sprains, and strains
Chipper	Chipper knives, chain conveyors, roll conveyors, slabs, cants, waste	Cuts, punctures, bruises, splinters on hands, arms and thighs, slips and falls, chips and dust in eyes, loss of hearing, strains and sprains and loss of life by falls into chipper		Doors	Entrapment
Planner infeed	Planer conveyors unstacked infeed and pineapple roll, cutting knives and heads, live rolls	Mangled, cut and bruised limbs, loss of hearing, chips and dust in eyes, slips and falls			

INJURY TYPE AND SOURCES

The incidence rate is 15.0 for this industry.
In sawmills and planing mills, cuts, lacerations and punctures were common with the fingers and lower extremities being the most frequently injured body parts. The source of injury in nearly one-third of the cases was wood items.

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KEY OSHA STANDARDS — 29 CFR 1910 General Industry

REF. NO.	STANDARD	REF. NO.	STANDARD
.23	All floor and wall openings protected as prescribed in 1910.23.	.303(e)	Marks of identification on electrical equipment clearly visible.
.265(c)(4)(vi)	. . .Walkways and stairways provided with standard handrails. . .	.132(a)	. . .Where necessary employees provided with and required to wear such protective equipment. . .
.265(c)(21)(i)	The feed system to the chipper arranged so the operator does not stand in direct line with chipper spout (hopper). . . Spout enclosed to a height of 36 inches from floor or operators platform.	.94(d)	Open surface tank operations conform to the requirements of 1910.94(d).
.265(c)(26)(v)	Main control switches so designed that they can be locked in the open position.	.265(c)(18)(ii)	Spiked live rolls guarded.
.265(c)(27)(iii)	Piles of lumber which have become unstable immediately made safe. . .	.265(c)(20(ii)	. . .Mills with machines which make dust, chips, or slivers equipped with collective system. . .
.219	The construction, operation and maintenance of all mechanical power transmission apparatus in accordance with the requirements of 1910.219.	.265(e)(5)(i)(b)	Edgers not located in the main roll case behind the head saw.
.265(c)(11)	Physical hazard marking as specified in 1910.144.	.265(e)(5)(ii)(a)	The top and the openings in end and side frames of edgers adequately guarded and gears and chains fully housed. . .
.265(d)(3)(vi)	Where reciprocating log cut off saws (drag saws) are provided, not project into walkway or aisle.	.265(e)(5)(ii)(b)	All edgers equipped with pressure feed rolls.
.265(d)(3)(vii)	Circular log bucking or cutoff saws so located and guarded as to allow safe entrance to and exit from the building.	.265(e)(5)(ii)(c)	Pressure feed rolls on edgers guarded against accidental contact.
.265(d)(4)(i)	Rotary barking devices so guarded as to protect employees from flying chips, bark, or other extraneous material.	.265(e)(5)(iii)(a)	Edgers provided with safety fingers or other approved methods of preventing kickbacks or guarding against them.
.265(d)(4)(iii)	The hazardous area around ring barkers and their conveyors fenced off or posted as a prohibited area for unauthorized persons.	.265(f)(3)(ii)(a)	If operating procedures require access to kilns, kilns provided with escape doors that operate easily from inside, swing in the direction of exit, and are located in or near the main door at the end of the passageway.
.265(d)(4)(iv)	Hydraulic barkers enclosed with strong baffles at the inlet and outlet. The operator protected by adequate safety glass or equivalent.	.213(a)(4)	Any automatic cut off saw that strokes continuously without the operator being able to control each stroke not used.
.265(d)(4)(v)	Hold down rolls installed at the infeed and outfeed sections of mechanical ring barkers to control the movement of logs.	.213(b)(2)	On machines driven by belts and shifting, a locking-type belt shifter or an equivalent positive device used.
.265(e)(1)(iv)	A positive means provided to prevent unintended movement of the carriage. This may involve a control-locking device, a carriage tie down, or both.	.213(b)(5)	On each machine operated by electric motors, positive means provided for rendering such controls or devices inoperative while repairs or adjustments are being made to the machine they control.
.265(e)(1)(v)	A barrier provided to prevent employees from entering the space necessary for travel of the carriage. . .warning signs posted at possible entry points to this area.	.213(b)(6)	Each operating treadle protected against unexpected or accidental tripping.
.265(e)(2)(ii)(c)	Band saw wheels completely encased or guarded, except for a portion of the upper wheel immediately around the point where the blade leaves the wheel. . . band head rigs equipped with saw catcher or guard of substantial construction.	.213(e)(1)	Each circular resaw guarded by a hood or shield of metal above the saw. . .
.265(e)(20)(v)	. . .Dust chambers emptied so as to as to avoid dust explosions.	.265(e)(4)(ii)(a)	Trimmer saws guarded in front by adequate baffles to protect against flying debris and securely bolted to a substantial frame. . .
		.265(e)(4)(ii)(b)	The end saws on trimmers guarded.
		.265(e)(4)(ii)(c)	The rear of trimmer saws with a guard the full width of the saws and as much wider as practical.
		.213(g)(2)	Each swing cutoff saw provided with an effective device to return the saw automatically to the table when released at any point of its travel.

KEY OSHA STANDARDS — 29 CFR 1910 General Industry

REF. NO.	STANDARD	REF. NO.	STANDARD
.265(d)(3)(ii)	Log decks provided with adequate stops, chains, or other safeguards to prevent logs from rolling down the deck onto the carriage or its runway.	.213(g)(3)	Limit chains or other equally effective device provided to prevent the saw from swinging beyond the front or back edges of the table, or beyond a forward position where the gullets of the lowest saw teeth will rise above the table top.
.265(d)(3)(i)	Safe access to headrig provided.		
.265(d)(3)(v)	Swing saws on log decks equipped with a barricade and stops for protection of employees who may be on the opposite side of the log haul chute.	.213(e)(2)	Each circular resaw (other than self-feed saws with a roller or wheel at back of saw) provided with a spreader fastened securely behind the saw. . .
.213(g)(1)	Each swing cutoff saw provided with a hood that will completely enclose the upper half of the saw, the arbor end, and the point of operation at all positions of the saw. . .its hood so designed that it will automatically cover the lower portion of the blade. . .	..213(r)(2)	Drag saws so located as to give at least a 4-foot clearance for passage when the saw is at the extreme end of the stroke; or if such clearance is not obtainable, saw and its driving mechanism provided with a standard enclosure.
.213(i)(3)	Feed rolls of band resaws protected with a suitable guard to prevent the hands of the operator from coming in contact with the in-running rolls at any point.	95	Hearing Conservation Program

INSPECTION ANALYSIS

The inspection should begin with the log storage yard. Insure that logs are properly stacked with no tilting of piles and that base logs are secure. Follow log handling procedure and equipment. Inspect log handling equipment to insure use of positive devices to prevent uncontrolled lowering; limit switches to prevent lift arms from traveling too far; operator protection; audible signaling devices and lights. In debarker area observe operator for protection from flying bark, chips, etc., also unguarded foot tredles in cab. Look for unguarded power transmission equipment around log deck, stair rails to cab and standard rails around log deck and platform if required. Observe conveyor and chains on log deck and log hall. Insure log haul has standard rail if it has a walkway, and insure guarding chain drive mechanism. observe barker, check type and note whether hold down rolls and baffles are installed if required.

In the sawmill proper, being with head-rig (sawyer) check for log stops on deck to prevent logs from going into carriage or runway and insure carriage way is provided with bumpers. Check safety guides on circular saws and enclosures if band head saw is used. Chain conveyors, power transmission equipment, safe access to sawyer position, open motors, floor holes, uneven floors, walkways over conveyors, etc., must also be observed. Look at sawyer and slab puller for personal protective equipment.

From head rig go to resaw position, then to edger and trim saw area. In each section observe operator at each position. Note his equipment, how he gets to his machine i.e., over/under conveyors, roll cases, live rolls, blind corners, etc., observe equipment guards, anti-kickback devices. In trim saw area check for guards on end saws and across back of unit and for baffle in front.

At each operator position with the mill determine noise level.

In the planer mill an enclosed planer will be less of a noise hazard. In general, observe employees for exposure to unguarded conveyors, chains and sprockets, live rolls, hold down rolls and pineapple. For the trim saw in planer mill the inspection is the same as the sawmill.

If the mill has a kiln, check for proper egress from kiln and in control room inspect for live steam pipes. Exposed v-belt drives and fly wheels for compressors must be checked. As most control rooms are upstairs and at rear of kiln, note stair rails, and condition of floor (usuallywet, damp and sometimes rotten).

Other positions in the sawmill and planer mill that require checking are: kiln loader, mechanic, millwright, electrician, welder and shop.

In all machine centers throughout mill check for lockout/tagout procedures.

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INDUSTRY: Lumber and Wood Products	SUB-GROUP: Plywood and Veneer	SIC: 2432

PROCESS DESCRIPTION: The first few phases of plywood or veneer production are essentially the same as that from almost any other sawmill. The logs are received, debarked and cut on headsaws in the same manner. In most cases, however, cants or lumber are not cut. For veneer (fine or high grade hardwood), if the log is 32 inches or less in diameter it is cut into halves; if over 32 inches it is generally cut into quarters. If logs are small and intended for plywood only, they will not be cut by headsaw but bucked to length and go directly to a steam or hot water vat or tank for cooking.

In veneer production the logs are placed in a cooking vat which is approximately ten feet deep and eight feet by 20 feet. The temperature is raised from 5° to 10° per hour until it reaches approximately 140° where it is held for 24 hours, then up to 200°-220° where it remains for from one to five days depending on color desired. The "flitch" as it is now called is removed from the cooking vat, cleaned, planed and ends trimmed or cut off. Then a backing board is applied by glue. (This operation allows more veneer to be cut from a single flitch). Once backing board is applied with glue or cement it is placed in a flitch press to secure a proper bond. The flitch is placed in a holding tank of splashing hot water. The tank is approximately 25½ inches deep. When ready to be cut the flitch is placed on a "Stay-Log Table". The cutting knife is set in position in a frame approximately 45 inches above the work platform. The knife is stationary and the Stay-Log table moves up and down to cut or slice veneer. The tables make approximately 70 strokes per minute and cuts a 12 foot slice. From here the veneer is moved to the sweat or holding room. It remains here until the desired color is reached. Forklift trucks move veneer out of the sweat room to the dryer where it hand fed into the jet or fan dryer. A conveyor carries the veneer through at a speed form .8 to 15 feet per minute and at a temperature of from 90° to 120°F. After drying it goes to a clipper, then it is packaged and stored or shipped.

If plywood is to be made, the logs are debarked and cut into 8 to 10 foot lengths referred to as blocks. The blocks are steamed to soften the wood fibers. The time and temperature requirements will vary according to wood species and desired depth of heat penetration. This process is generally of a shorter duration than with pure veneer production. When this softening process is properly performed, the resultant benefits can be smoother veneer with a reduction of checking or fracturing of wood fibers, all of which are assets in the latter stages of plywood manufacturing. The most common method of producing veneers (or plies) is by rotary cutting on a lathe. Rotary lathes are equipped with chucks attached to spindles and are capable of revolving large blocks against a knife which is bolted to a moveable carriage. From the debarking and steaming, the blocks are moved to the lathe chargers. Their purpose is to position blocks to receive the lathe chucks. The blocks are chucked either in their geometric center or the heart center of the block. After the block is in place the chuck revolves the block against the knife and the veneer "peeling" begins. The thickness of the veneer will range from 1/16 to 1/4 inch and the mill will usually seek to produce a standard thickness for the plywood they are producing. Softwood blocks are cut at high speed and veneer coming from the lathe is fed into a belt conveyor. The number and length will vary from mill to mill. Positioned along the belt conveyor are rotary clippers that cut the veneer to desired size. This operation takes place along the "green chain".

From the "green-end" the veneer goes to dryers much as in the pure veneer production. Some direct-fired dryers have temperatures up to 500°F. Most common maximum temperature is less than 400°F. The dry veneer is graded and stored according to width and grade. After drying the plywood is built by placing each layer, or ply, at right angles to the grain of the core. This is cross-lamination and produces strength and rigidity. Plywood is constructed with an odd number of plies such as 3, 5, 7, 9, 11, etc. Prior to laying up of the layers, each ply is run through a glue or adhesive spreader. After the glue is applied and the layers stacked, the plywood is placed into presses. Here, pressures of 175 to 200 p.s.i. and high temperature are applied for 12 to 15 minutes. The wood panels are then removed, cut to size (usually four feet by eight feet) and then sanded and stored or shipped.

PROCESS FLOW:

VENEER MILL

LOG STORAGE YARD
↓
DEBARKER
↓
HEAD SAW
↓
COOKING VAT
↓
FLITCH BACKING, CLEANING AND TRIM
↓
VENEER CUTTER
↓
SWEAT ROOM
↓
DRYER
↓
CLIPPER
↓
PACKAGE AND TIE
↓
STORE OR SHIP

PLYWOOD MILL

LOG STORAGE YARD
↓
DEBARKER
↓
LOG BUCKING (CUT TO BLOCKS)
↓
STEAM ROOM
↓
LATHE (ROTARY CUTTING)
↓
CLIPPER
↓
DRYER
↓
GLUE SPREADER
↓
LAY-UP
↓
PRESS (TEMPERATURE AND PRESSURE)
↓
CUT TO SIZE
↓
SANDER (BELT OR DRUM)
↓
STORE OR SHIP

OSHA HAZARDS ANALYSIS

MAJOR HAZARDS			OTHER HAZARDS		
LOCATION	ITEM	HAZARD	LOCATION	ITEM	HAZARD
Log Storage Yard	Logs in piles and stacks, forklifts, mechanical lifting devices, cables, binders and unloading trucks	Potential falling, collapsing and injury to body, hazards of being dropped or slipping from equipment	Debarker	Log deck, chain conveyor, log flippers, pike pole peavy, barker head, log hold down rolls, flying bark, noise, steps, walkways, foot treadles	Amputations, lacerations, mangled limbs, bark and dust in eyes, slips, falls, splinters, sprains, cuts, bruises, loss of hearing
Head rig	Head saw, log carriage track, log deck roll cases, conveyors. Open motors and electrical equipment, chips and dust.	Amputations, lacerations, bruises, slips, sprains, falls, splinters in arms, hands, etc. Loss of hearing. Electrical shock			

OSHA HAZARDS ANALYSIS

MAJOR HAZARDS			OTHER HAZARDS		
LOCATION	ITEM	HAZARD	LOCATION	ITEM	HAZARD
Log Bucking or block cutting	Chain saw, circular saw, drag saw, log cut off saw, etc. Chain conveyors, log deck	Amputations, laceration, bark and dust in eyes, slips, falls, sprains, bruises, strains, loss of hearing. Splinters in limbs	Veneer slicers and rotary cutters (stay-log table and lathes)	Veneer slicers, blades, carriage, power drive gears, chains, belts, rotary cutter	Amputations, cuts, bruises, sprains and strains, mashed fingers, hands, and arms, splinters and punctures
Cooking vat/ tank, steam room	Open vats and tanks, live steam lines and outlets, walkways, buck boards hoist, slings, and cables	Burns, loss of hearing, slips, falls, hot water splashes in eyes and body, falling "flitches" or "blocks"	Clipper	Clipper, knife, power drives, belts and chains, etc.	Amputation, cuts, bruises, mashed fingers and hands
Flitch cleaner/ planer and board backing area	Flammable glue, chain saws, flitch planer, hoist, cables, slings or wire rope, buckboards, walkways, hot water and steam, floors, fire	Cuts and bruises, falls, sprains and strains, hot water or steam in eyes, burns, slips, loss of hearing	Dryer	Heat, open chains, belts and power drives, conveyors	Burns, splinters in hands and arms. Pinch and nip points for fingers and hands, loss of hearing
Hot press	Hydraulic hot press	High temperature and pressure. Nip and pinch points, burns, (temperature to 700°F and pressure to 2000 pounds)	Glue spreader	Spreader roll, belts, chains, power drives drives, doctor roll, conveyor	In-running nip and pinch points, mashed fingers and hands, splinters in hands, arms and thighs
Sanding area	Drum sanders and wide belt sanders, belts	Nip points, splinters, dust in eyes	Trim area	Band saws, circular saws	Cuts, amputations, chips and dust in eyes, splinters
			Glue spreader	Glue fumes and liquid	Eye and throat irritation from glue fumes containing formaldehyde; dermatitis from contact with glue

INJURY TYPE AND SOURCES

The incidence rate is 11.0 for this industry.
In the manufacture of plywood and veneer, cuts, lacerations and punctures were common with fingers, upper and lower extremities and the back being the most frequently injured body parts. Wood items led all other sources of injury in this industry.

KEY OSHA STANDARDS — 29 CFR 1910 General Industry

REF. NO.	STANDARD	REF. NO.	STANDARD
1910.30(c)(1)	Sides of steam vat extend to height of not less than 36 inches above the floor, working platform, or ground.	1910.213(q)(7)	Power-driven guillotine veneer cutters, other than continuous trimmers, provided, in addition to the brake or other stopping mechanism, with an emergency device which will prevent the machine from operating in the event of failure of the brake when the starting mechanism is in the non-starting position.
1910.30(c)(2)	Large steam vats divided into sections provided with substantial walkways between sections. Each walkway provided with a standard handrail on each exposed side. These handrails may be removable, if necessary.		

KEY OSHA STANDARDS — 29 CFR 1910 General Industry

REF. NO.	STANDARD
1910.30(c)(3)	Covers removed only from that portion of steaming vats on which men are working and a portable railing placed at this point to protect the operators.
1910.30(c)(4)	Workmen not ride or step on logs in steam vats.
1910.213(q)(1)	Veneer slicer knives guarded to prevent accidental contact with knife edge at both front and rear.
1910.213(q)(3)	Sprockets on chains or slat-belt conveyor enclosed.
1910.213(q)(4)	Where practicable, hand and foot power guillotine veneer cutters provided with rods, plates or other satisfactory means, so arranged on the feeding side that the hands cannot reach the cutting edge of the knife while feeding or holding the stock in place.
1910.213(q)(5)	Power-driven guillotine veneer cutter except continuous feed trimmers, equipped with:
(i)	Starting devices which require the simultaneous action of both hands to start the cutting motion and of at least one hand on a control during the complete stroke of the knife; or;
(ii)	An automatic guard which will remove the hands of the operator from the danger zone at every descent of the blade, used in conjunction with one-hand starting devices which require two distinct movements of the device to start the cutting motion, and so designed as to return positively to the non-starting position after each complete cycle of the knife.
1910.213(q)(6)	Where two or more workers are employed at the same time on the same power-driven guillotine veneer cutter equipped with two-hand control, the device so arranged that each worker is required to use both hands simultaneously on the controls to start the cutting motion, and at least one hand on a control to complete the cut.
1910.145(f)	"Do Not Start" tags provided on machinery under repair, inspection or cleaning until a more positive means (lockout) can be employed.
.151(c)	Suitable facilities for quick drenching or flushing of the eyes and body provided within the area of immediate use.
.1000	Employees not exposed to levels of toxic substances (esp. formaldehyde) exceeding those in Table Z-2.
1910.213(r)(1)	The feed rolls of roll type glue spreaders guarded by a semicylindrical guard. The bottom of the guard within three-eighths inch of a plane formed by bottom of contact face of the feed roll where it touches the stock.
1910.213(s)(13)	Whenever veneer slicers or rotary veneer-cutting machines have been shut down for the purpose of inserting logs or to make adjustments, operators assure that machine is clear and other workmen are not in a hazardous position before starting the machine.
1910.213(s)(14)	Operators not ride the carriage of a veneer slicer.
1910.213(p)(1)	Feed rolls of self-feed sanding machines protected with a semicylindrical guard to prevent the hands of the operator from coming in contact with the in-running rolls at any point.
1910.213(p)(2)	Each drum sanding machine provided with an exhaust hood, or other guard if no exhaust system is required.
1910.213(p)(4)	Belt sanding machines provided with guards at each nip point where the sanding belt runs onto a pulley. . .
1910.22(c)	Covers and/or guardrails provided to protect personnel from the hazards of open pits, tanks, vats, ditches, etc.
1910.23(c)(3)	Regardless of height, open-sided floors, walkways, platforms or runways above or adjacent to dangerous equipment guarded with a standard railing and toe board.
1910.23(d)(1)	Every flight of stairs having four or more risers equipped with standard stair railings or handrails is specified in this standard.
1910.106(e)(6)	Adequate precautions taken to prevent the ignition of flammable vapors. Sources of ignition include but are not limited to open flames; lighting; smoking; cutting; welding; hot surfaces; frictional heat; static; electrical and mechanical sparks; spontaneous ignition; and radiant heat.
1910.132(a)	Personal protective equipment for the eyes, face, head and extremities provided, used and maintained wherever it is necessary by reason of processes or environment (safety glasses, hard hats, safety shoes, gloves, etc.)

KEY OSHA STANDARDS — 29 CFR 1910 General Industry

REF. NO.	STANDARD	REF. NO.	STANDARD
1910.176(a)	Permanent aisles and passageways appropriately marked.		
1910.176(b)	Storage of materials not creating a hazard.		
1910.178	Powered industrial trucks selected and maintained in accordance with this section.		
1910.219	Mechanical power transmission apparatus (chains, belts, gears, etc.) guarded in conformity with this section.		
1910.242(b)	Air pressure used for cleaning purposes reduced to less than 30 p.s.i. and eye protection used.		
1910.309(a) NEC	All electrical equipment shall be installed according to the National Electrical Code.		
1910.95	Employees not exposed to noise levels exceeding those listed in Table G-16.		

INSPECTION ANALYSIS

This inspection will be very similar to that in a sawmill. Start with the storage yard and assure that logs are properly stacked with no tilting of piles and that base logs are secure. Check proper log handling procedure and equipment. In debarker area observe the operator for protection from flying bark, chips, and check for unguarded power transmission equipment, walkways, stair rails and log deck. Also look at drag saw or chain saw. In plywood mills chain saws are often used after debarking to cut logs into blocks. If head rig (head saw) is used, check as you would in a saw mill, with particular emphases on open electrical junction boxes and motors, walkways, guard rails, conveyors, protection against flying particles, and log deck guarding.

*(**NOTE: Remember that even though the equipment and procedures are the same, 29 CFR 1910.265 does not apply to plywood and veneer plants.)*

Continue on to the cooking vats or steaming area. Note manner of handling logs, blocks, or flitches (by hoist and sling or forklift). Check depth of vat or tank, cover and walkway height above working level, water temperature, noise and personal protection.

In veneer plant check the flitch backing area. Is flammable glue being sprayed? Check saws, planer (hand held), holding tank, water temperature and tank height. The next area of concern in a veneer plant is the veneer cutter. Assure that employees are protected from the cutting knife, stay-log table, power drives, belts and chains. In a plywood mill the lathe is important. There will probably be a pit where the knife is located. Check lock-out procedures when changing knives or during maintenance.

In both types of mills observe the clipper operation. Check for in-feed and out-feed guarding, employee protection and proper guards.

The remainder of both plants requires inspection techniques similar to any plant operating equipment with power drives, in-running nip points, gears, presses, belts, saws, sanders, rolls, and other miscellaneous equipment.

NORTH CAROLINA DEPARTMENT OF LABOR OSHA DIVISION NC-OSHA INDUSTRIAL DATA REPORT	No. 25-1 Date: 8-1-76 Page 1 Of 4

INDUSTRY: Furniture and Fixtures	SUB-GROUP: Upholstered Household Furniture	SIC: 2512

PROCESS DESCRIPTION: The manufacture of upholstered furniture includes the use of both wood and metal as basic materials. It also utilizes materials from other industries such as cotton batting, hair, rubberized hair, cotton, shoddy (shredded rags), excelsior, cardboard, metal springs and straps, foam rubber and polyurethane foam and textile upholstery materials. In this data report, only those processes actually involved in the upholstering of furniture are covered. In those instances where a particular firm manufactures its own furniture frames, the information covering that portion or sub-group can be found in a specific data report.

Prior to the actual upholstering process, several concurrent functions must be performed: Those portions of the furniture frame which are intended to remain exposed after the upholstering process are finish sprayed with stain, varnish, and lacquer. The material covering the outside of the finished piece is cut to pattern then sewn into cushion covers and slip-cover-like units. The cushion covers are fitted with zippers and some pieces are pleated and seamed into what later becomes "kick-pleats" for the bottom of the finished furniture piece.

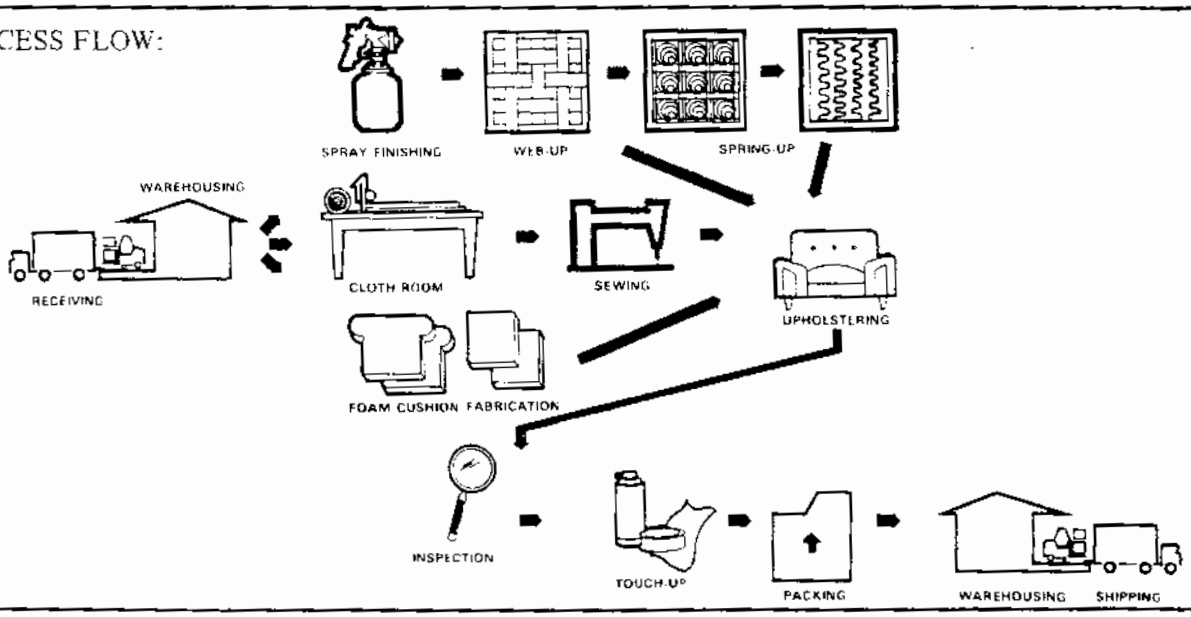
The foam rubber or polyurethane foam cushions are cut from bulk, shaped and glued into desired forms and sizes. If the pieces have buttons on the finished item of furniture, the cushions have 5/8" to 1" holes punched into the rubber or foam, to mark the position of and facilitate later installation of the buttons.

The upholstery operation begins with the spring-up/web-up process in which cloth or elastic tape is stapled to the furniture frame. Steel bands or straps and either hand-tied coil springs or stapled "zig-zag springs" are likewise attached. Non-supporting areas of the frame, except the webbed and sprung areas under the seats, are covered with cardboard-like filler panels to support the shape of padding and cushions. These filler panels are also attached by nails or staples.

All padded and cushioned areas of the piece are now completed and the entire piece is covered with the upholstery material. A wide range of design and texture possiblities from brocade and quilted materials to tweed, plaid and coarse burlap, often treated to attain stain resistance, is used. Omitted from such covering are those areas intended to remain as "exposed wood". The sprung-areas are covered with a pre-fabricated pad to protect the cushions from the springs. This padded area is then covered with either a light (muslin) material or is "self-decked" (covered with the same upholstery material).

Cushions are fitted with their covers and installed on the piece. Ornamental buttons are added at this time. Finally, the pieces are inspected and any defects on the exposed woodwork or upholstery are removed. The pieces are wrapped in paper padding and boxed in combination cardboard and wood furniture boxes, banded, warehoused and shipped.

PROCESS FLOW:



NORTH CAROLINA DEPARTMENT OF LABOR
OSHA DIVISION
NC-OSHA INDUSTRIAL DATA REPORT

No. 25-1
Date: 8-1-76

OSHA HAZARDS ANALYSIS

MAJOR HAZARDS			OTHER HAZARDS		
LOCATION	ITEM	HAZARD	LOCATION	ITEM	HAZARD
Receiving area/ dock	Open sided platforms	Falls from height, usually above 4 feet	Receiving area/ dock/shipping	Chocks for vehicles and dockboards, conveyors	Falls from height caused by shifting of vehicle or dockboard, falling material and material handling equipment
Warehouse	Unstable storage	Falling materials due to non-uniform shapes, sizes and weights			
Spraying area of booths	Ventilation	Overexposure to toxic air contaminants	Warehouse	Unmarked aisles, exits	Irregular storage due to unmarked aisles restricts movement of personnel and handling equipment. Hampered evacuation
		Accumulation of flammable overspray residue			
Flammable storage area	Ventilation	Overexposure to toxic air contaminants			
	Bonding and grounding	Fire and explosion hazard from unapproved electrical system or static discharge		Carbon	Accumulation from handling equipment and subsequent exposure due to inadequate ventilation
Cloth room	Cutting tools	Cuts, amputations and mangled limbs caused by unguarded blades	Spraying areas– spray booth	Lighting, bonding and grounding	Fire hazards and explosion hazards due to unapproved system and/or static discharge
Sewing room	Sewing machines	Finger and hand punctures and possible eye injuries due to unguarded needles	Cloth room	Housekeeping	Trip, fall and fire hazards caused by scrap and leftover materials
Web-up/spring up	Staple machines	Eye injuries from flying staples			
Foam cushion fabrication	Cutting tools	Cuts, amputations and mangled limbs by unguarded blades	Web-up/spring-up	Hammers and springs	Hand injuries by hammers. Injuries caused by released spring action
	Vinyl chloride	Possible release through hot process cutting	Foam cushion fabrication	Spray glue and ventilation	Overexposure to air contaminants, also fire hazards
	Organic vapors	Various system illnesses	Upholstering	Hammers and tacks	Hand injuries and possible eye injuries
Upholstering	Stapling machines	Eye injuries and puncture wounds by staples		Lifting	Non-use of handling equipment and subsequent injuries caused by manual lifting of heavy furniture pieces
Touch-up	Ventilation	Open spraying of hazardous and flammable materials, overexposure to air contaminats			
	Flammable materials and hot surfaces	Amount or mode of storage and ignition source	Throughout	Housekeeping	Slips, trips, and falls, fire potential
Packing	Staple machines	Possible eye and puncture injuries by staples			
	Banding	Injuries by spring action of metal bands			
	Lifting	Internal injury potential from manual lifting			

INJURY TYPE AND SOURCES

The incidence rate is 11.3 for this industry.
In this industry, the fingers and backs of employees were injured in fifty-three percent of the cases. Many of the injuries involved machines and hand tools used in this industry.

KEY OSHA STANDARDS		29 CFR 1910 General Industry	
REF. NO.	STANDARD	REF. NO.	STANDARD
.22(b)	Aisles and passageways marked and maintained clear.	.133	Utilization of protective eye-wear in hazardous operations such as web-up/ spring-up and the upholstery areas. Standards Notice 8, (Rev. 4/18/75) interpets 1910.133 for use of staple guns.
.23(c)(1)	Every open sided floor or platform four feet or more above adjacent floor or ground guarded.	.145(f)	All power operated equipment tagged and locked out at the power source to prevent accidental starting of the machine during maintenance operations.
.1017	Permissible exposure limits, monitoring, regulation, methods of compliance, protection, hazardous operations, emergency situations, training, medical surveillance, signs and labels, records and reports of concern for areas where vinyl chloride is known to be present or is encountered/ discovered.	.1000	Employees not exposed to toxic materials exceeding the standards.
.106(d)	Required construction features, allowable capacities of containers and of inside storage rooms for flammable and combustible liquids.	.212(a)(3)	Point of operation guarding of machinery whose use/operation exposes an employee to injury. Sewing machines and cloth cutting tools as well as foam cushion cutting tools are included.
.106(e)	Use and storage of flammable and combustible liquids in industrial plants.	.219	Guarding of power transmission parts of machinery such as flywheels, gears, belts, pulleys, shaft ends, sprockets and chains, friction drives, found in general and special industries (NOTE: special industry standards apply and make reference to this standard.)
.107(b)	Construction, operation cleaning and illumination of spray booths.		
.107(c)	Hazards of ignition of flammable materials through electrical and other means at spray booths.		
.107(d)	Detailed requirements for mechanical ventilation of spraying areas for the removal of flammable vapors, mists and powders.	.219(m)(n)(o) and Table O-12	Types, materials and tolerances/ clearances of guards for the fore-going paragraphs.
.107(e)	Storage and handling of flammable and combustible liquids in connection with spraying operations.		
.107(f)	Fire protection within buildings containing spray finishing operations.		
.107(g)	Maintenance and operations requirements within spraying areas, including cleaning, residue disposal, clothing storage, use of cleaning solvents, posting of "No Smoking" areas and dangers of hazardous materials combinations.		

INSPECTION ANALYSIS

The process flow should be followed as the route of the inspection. While side trips to machine/maintenance shops, compressor rooms and similar non-process areas may be necessary, product flow provides the best possible method for inspection. Inspection of the receiving dock and warehouse may also encompass the shipping areas, eliminating the need for returning. The flammable storage area/room must be inspected in conjuction with or immediately following inspection of the spraying areas/booths. In the cloth room, debris and left-over materials often create tripping/fire hazards. This is also true in the foam cushion fabrication areas. Pressure reduction requirements of compressed air, used for cleaning purposes, warrant close scrutiny in the sewing and foam cushion fabrication areas. In the touch-up areas, the presence of hot surfaces, open spraying of flammable materials and problems of flammable material storage outside of inside storage rooms (open containers, excessive amounts, etc.) must be evaluated. Due to the possibility of Vinyl Chloride release through hot process cutting of vinyl materials and urethane foam, and the use of a wide variety of lacquers and thinners in the spraying processes, as well as the variety of spray glues used in the fabrication of foam cushions, an industrial hygiene referral will likely be necessary.

In the receiving area of the warehouse(s), the nature of the received material, such as furniture frames of odd sizes and shapes, bolts and rolls of upholstery materials and various sizes of foam materials often create irregular storage.

OTHER PERTINENT COMMENTS: The inspector can anticipate considerable discussion relative to point of operation (needle) guards in the sewing room and the use of eye protective equipment in the web-up/spring-up, upholstery and packing areas where staple guns are used.

NORTH CAROLINA DEPARTMENT OF LABOR
OSHA DIVISION
NC-OSHA INDUSTRIAL DATA REPORT

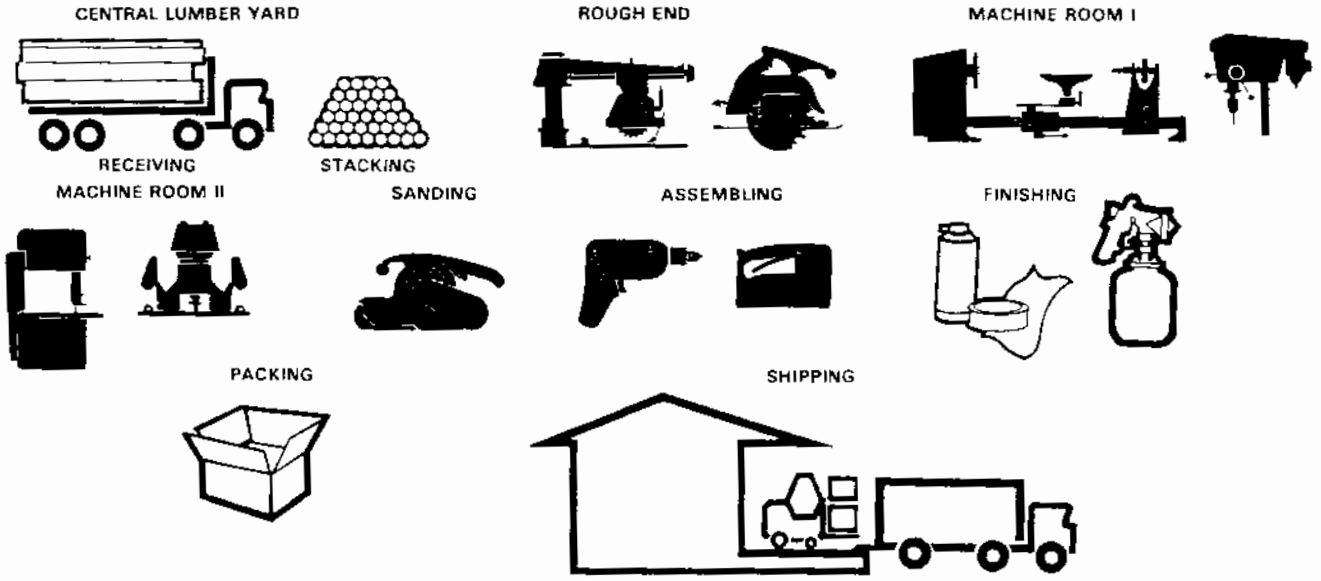
No. 25-2
Date: 8-1-76
Page 1 Of 3

INDUSTRY: **Furniture and Fixtures** | SUB-GROUP: **Wooden Furniture (case goods)** | SIC: **2511**

PROCESS DESCRIPTION: Case goods as applied to wooden furniture manufacturing is an industry term for bedroom, dining room and living room furniture covering the entire process spectrum. Some case goods finally incorporate upholstery. For a description of the upholstery process, refer to the appropriate data sheet. Raw materials are received by truck and/or rail. The process includes inside and outside storage. If rough lumber is received, it is normally kiln dried prior to use.

The manufacturing process normally includes five distinct steps: (1) **Rough end**–initial cutting and trimming; (2) **Machining**–shaping, forming and boring individual furniture parts; (3) **Sanding**–smoothing and shaping rough cuts and preparing surfaces for finishing applications; (4) **Assembling**–combining and fastening of individual parts into units; (5) **Finishing**–application of paints, stains or preservatives (sanding of some degree may be required at any point in the process). After finished furniture units are inspected they are rerouted for touch up as required and packaged and stored or shipped.

PROCESS FLOW:



OSHA HAZARDS ANALYSIS

MAJOR HAZARDS			OTHER HAZARDS		
LOCATION	ITEM	HAZARD	LOCATION	ITEM	HAZARD
Storage area	Lumber in stacks	Potential falling and collapsing	Finishing area	Toxic paint materials	Skin irritation, allergies, damage to body systems
Kilns	Heat/system	Burns, asphyxiation			
Rough end, machining and sanding areas	Point of operation as on saws, lathes, tenoners, planers, moulders, routers, shapers, jointers, borers, carvers	Amputations, lacerations, mangled limbs from contact with moving parts and cutting edges	Throughout	Flyings, sawdust shavings, flammable materials	Fire hazard, especially where electrical wiring and equipment does not comply with NEC Articles 501 and 503
Throughout	Mechanical power transmission apparatus conveyor systems	Amputations, mangled limbs from contact with belts, pulleys, chains and sprockets, gears		Housekeeping	Slipping, tripping, and falling hazards
			Throughout	Dust	Damage to respiratory system and explosions
Rough end, machining, sanding & assembling	Flying particles, nails, tacks, hand tools	Eye and face lacerations			
Throughout	Noise	Hearing loss			

INJURY TYPE AND SOURCES

The incidence rate is 10.1 for this industry.
The injuries in this industry most frequently affected the fingers and upper extremities of employees. In two of every five cases (40.2%) machines or wood items were the sources of injury.

KEY OSHA STANDARDS — 29 CFR 1910 General Industry

REF. NO.	STANDARD	REF. NO.	STANDARD
.213(a)(9)	All belts, pulleys, gears, shafts and moving parts guarded in accordance with the specific requirements of 1910.219	.213(k)(3),(n)(1)	Each tenoning machine, planer, molder, sticking and matching machine with all cutting heads and saws covered by metal guards.
.213(b)(1)	Mechanical or electrical controls provided on each machine to make it possible to cut off power by operator without leaving his position at the point of operation.	.213(m)(1)	Each woodshaper or other similar machine not automatically fed, enclosed by a case or guard to keep hands away from cutting edges.
.213(b)(5)	On each machine operated by electric motors, positive means provided for rendering controls inoperative while repairs or adjustments are made.	.213(o)(1)	Each profile and swing head lathe with all cutting heads covered by a metal guard.
.213(b)(7)	Feeder attachments with the feedrolls or other moving parts, so covered or guarded as to protect the operator from hazardous points.	.213(p)(4)	Each belt sander with guards at each nip point where the sanding belt runs onto the pulley. Unused portions of the belt guarded against accidental contact.
.213(a)(13)(c)(1), and (d)(1)	Each hand fed double arbor, ripsaw and cross cut table saw guarded by a hood that completely encloses that portion of the saw above the table and the material being cut.	.213(q)(1)	Veneer slicer knives guarded to prevent contact with knife edge at both front and rear.
.213(e)(1)	Each circular resaw guarded by a hood that completely encloses that portion of the saw above the table and the material being cut.	.95	Employees not exposed to noise levels exceeding those listed in Table G-16.
.213(f)	Self feed circular saws with feed rails and saws protected by a hood or guard to prevent hands from contacting in-running rolls at any point.	.212(a)(1)	Points of operation, ingoing nip points and rotating parts (not specifically covered by .213) guarded.
.213(g)(1),(h)(1)	Swing/sliding cutoff saws and radial saws guarded by a hood that completely encloses the upper half of the sawblade, arbor end and point of operation and automatically covers the lower portion of the blade.	.106(e)	Incidental storage and use of flammable and combustibles must conform to requirements listed.
.213(i)(1)	All portions of the band saw and resaw blades enclosed or guarded except the working portion between the guide rolls and table. Bandsaw wheels fully enclosed.	.107	Spray finishing operations and spray booth conform to requirements listed.
.213(j)(4)	Each hand fed jointer with horizontal cutting head provided with an automatic guard which covers all the cutting head on the working side and behind the gage or fence.	.1000	Air contammant exposure not exceeding threshold limit value (TLV) listed in Table Z-1, Z-2, Z-3.
		..309(a) NEC 501, 503	Wiring, switches, motors and other electrical equipment conform to the NEC for Class I and Class III locations.

INSPECTION ANALYSIS

The inspection should begin in the receiving area and/or outside storage area, checking especially for powered industrial truck operations, walking-working surfaces and stacking of lumber/furniture parts. As appropriate, dry kilns must be checked for emergency exits, pits and steam carrying apparatus. Rough end and machining and sanding areas should be carefully checked for properly guarded machinery (power transmission apparatus, points of operation and rotating parts) and noise level. All wiring, motors and other electrical equipment subjected to wood dust must meet NEC Article 503 specifications. Assembling areas must be closely checked for portable power tool guarding and operation and for eye and face protection. Finishing area must be checked for air contaminant potentiality, storage and handling of flammable and combustible materials and spray booth construction and operation. Electrical apparatus in spray areas must meet NEC Article 501 specifications. Throughout, check for housekeeping, especially heavy accumulations of sawdust and shavings and aisles and passageway clearance.

OTHER PERTINENT COMMENTS: The 1974-1975 edition of the directory of North Carolina manufacturing firms lists one hundred and sixty-six SIC Code 2511 establishments within the state. The North Carolina statistics division reports show the total employment in the non-upholstered household furniture industry represents eighteen percent of the North Carolina workforce employed in non-agriculture industries.

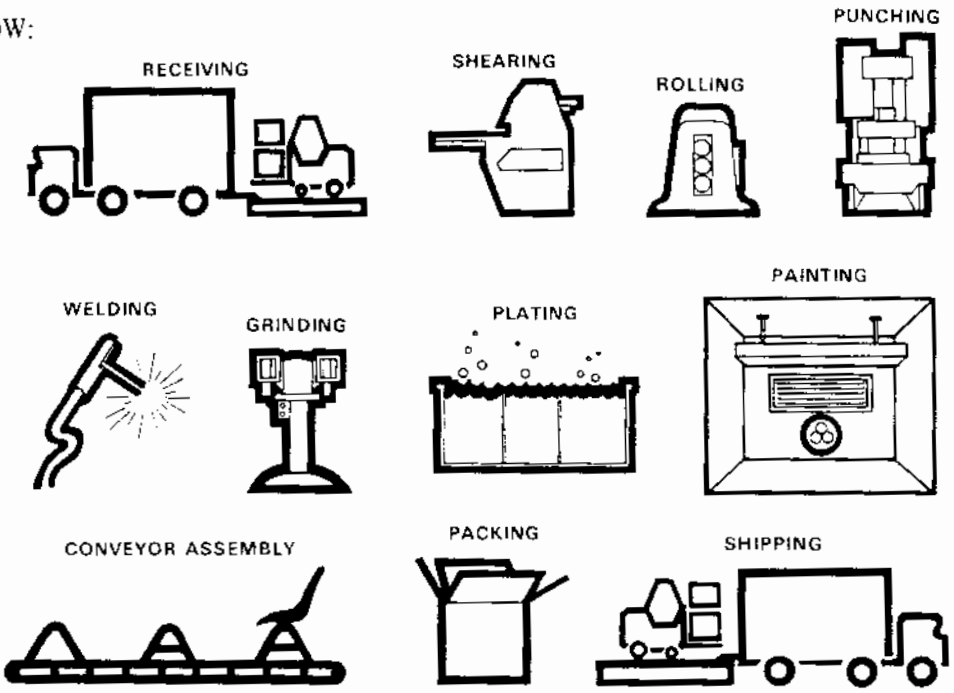
NORTH CAROLINA DEPARTMENT OF LABOR
OSHA DIVISION
NC-OSHA INDUSTRIAL DATA REPORT

No. 25-3
Date: 8-1-76
Page 1 Of 2

INDUSTRY: **Furniture** | SUB-GROUP: **Metal Furniture** | SIC: **2514**

PROCESS DESCRIPTION: Raw materials include steel, dye castings, stampings, high pressure laminates, plastic molded parts, wood, fabric, nuts, bolts, screws, plating chemicals, paints and finishes. Metal is sheared to size, punched, notched, stamped, formed and rolled. Succeeding steps include welding (spot welding, arc welding, and projection welding), sanding and/or grinding, dip tank plating, painting or spray painting, buffing and assembling. Packaging and shipping completes the process.

PROCESS FLOW:



OSHA HAZARDS ANALYSIS

MAJOR HAZARDS			OTHER HAZARDS		
LOCATION	ITEM	HAZARD	LOCATION	ITEM	HAZARD
Machine room	Shears, punch presses, brakes, metal rollers	Finger and hand amputation	Receiving and shipping areas	Mechanical handling equipment	Single vehicle accidents, vehicle accidents, vehicle-pedestrian accidents
Plating room	Plating chemicals and tanks	Inhalation of harmful fumes, gasses, and chemical burns	Throughout	Heavy materials	Back, foot and toe injuries
Grinding or sanding room	Sanders, grinders	Eye, face and body injuries from flying debris, also possible inhalation of dust			
Welding shop	Spot and arc welders	Flash burns, and welding burns from lock down or cycle type spot welders, also inhalation of welding fumes			
Painting areas	Dip tank and spray painting apparatus	Fire and/or explosion from flammable materials, also dermatitis and inhalation problems resulting from harmful solvents			

INJURY TYPE AND SOURCES

The incidence rate of 10.7 for SIC 251 represents household furniture, of which metal furniture is a part.
In this industry, cuts, lacerations and punctures accounted for over one-third (35.0%) of the cases. Most commonly, the fingers and upper extremities were affected.

KEY OSHA STANDARDS — 29 CFR 1910 General Industry

REF. NO.	STANDARD	REF. NO.	STANDARD
.106(e)(2)	Flammable or combustible materials stored in tanks or closed containers.	.212(a)(1)	One or more methods of machine guarding provided to protect the operator and other employees in the machine area from hazards such as those created by point of operations, ingoing nip points, rotating parts, flying chips and sparks. Examples of guarding methods are—barrier guards, two hand tripping devices, electronic safety devices, etc.
.106(e)(6)(ii)	Class I liquids not dispensed into containers unless the nozzle and container are electrically connected.		
.108(e)	No open flames, spark producing devices, or heated surfaces having a temperature sufficient to ignite vapors in any vapor area. . .electrical wiring and equipment in any vapor area according to the requirements of subpart S of this part for Class I, Group D locations and otherwise conforming to supbart S of this part for areas at dip tanks.	.215(a)	Safety guard provided for spindle end, nut and flange projections.
		.217(c)(1)	Employer's responsibility is to provide and insure the usage of "point of operation guards" or properly applied and adjusted point of operation devices on every operation performed on a mechanical power press.
.133(a)	Protective eye and face equipment required where there is a reasonable probability of injury that can be prevented by such equipment.	NEC 501-4	Wiring in paint spray booth approved for Class I, Division 1 hazardous location.
.151(c)	Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching of the eyes and body provided within the work area for immediate emergency use.	NEC 501-6(a)	Switches in Class I Division 1 hazardous location (such as spray paint booth and dip tank) approved for those areas.
		NEC 501-9(a)(1)	Light fixtures as approved for Class I, Division 1 hazardous location provided in spray booth and dip tank.

INSPECTION ANALYSIS

The inspection should follow the process flow, beginning where raw goods are received and passing into the machine room, paying particular attention to the shears, presses, and other machinery which may require machine guarding or point of operation guarding. Eye protection may also be needed around these machines. Generally the welding shop is next where the inspector must also look for eye protection, welding screens, frayed cables, harmful fumes, and possible point of operation guards on lock down type spot welders. The sanding and grinding department usually follows where eye protection and guards on sanding belts and abrasive wheels may be needed. The plating room is next where various types of personal protective equipment are needed and where electrical requirements exist for hazardous locations (depending upon the plating materials). In the spray paint or dip tank painting area, fixtures, lights, receptacles and wiring must be approved for that location as well as in any adjacent flammable storage area. The inspection would normally terminate in the shipping area.

OTHER PERTINENT COMMENTS:

A. Before inspection read sections on
   1. Dip and plating tanks
   2. Spray painting
   3. Machine and point of operation guarding
   4. NEC articles on requirements for hazardous locations

B. Make Industrial Hygiene referral for plating chemicals, spray areas, and any other area in question.