SB 376

STEVE COWPER
GOVERNOR

376

STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

January 8, 1990

The Honorable Tim Kelly
President of the Senate
Alaska State Legislature
P.O. Box V
Juneau, AK 99811

Dear Mr. President:

Under the authority of art. III, sec. 18, of the Alaska Constitution, I am transmitting a bill expressly authorizing the Department of Labor to establish a crane operator certification program.

During the past three years, Alaska has had three fatal crane accidents and one that resulted in serious injury (loss of a leg). It should be noted that these four accidents occurred during years when construction activity in the state was drastically reduced. On a national level, cranes are involved in accidents more serious than those caused by other construction equipment, and contribute significantly to construction fatalities.

This trend is largely attributable to the fact that cranes have evolved from relatively simple machines to highly complex and sophisticated pieces of equipment. Not surprisingly, the skills necessary to operate them safely and proficiently have likewise become more sophisticated and complex. Unfortunately, training has not kept up to the pace of development, and, in some situations, has been neglected altogether. As a result, it is all too common to find inadequately trained personnel operating cranes. This situation jeopardizes the safety of the operator and the operator's co-workers as well as the general public. The attached bill addresses this problem by providing for crane operator training and certification (licensing).

Under the bill, effective May 15, 1991, all persons operating cranes in the state must be certified. After that date, persons who employ, contract with, or permit a person to operate a crane without a valid certificate will be subject to civil penalties. This program will be administered by the Department of Labor.

Persons interested in obtaining a crane operator certificate will be required to submit an application to the department with proof that they have completed a department-approved training program or that they have 2,000 hours of experience as a crane operator. The department will not actually operate training programs. Rather, it will establish minimum training program requirements. It will then review and approve programs proposed by contractors, labor organizations, public and private schools, vocational institutions, or any other organization interested in operating such a program.

Because of the critical and direct relationship that operator competency has on the safety and health of workers, by assuring that crane operators are properly trained and certified, I hope to minimize the number of crane accidents in our state. I urge your prompt and favorable action on this bill.

Sincerely,

Steve Cowper
Governor

STATE OF ALASKA
1990 LEGISLATIVE SESSION

BILL VERSION: SB 376
PUBLISH DATE: 1/8/90

FISCAL NOTE

REQUEST:

Revision Date:
Agency Affected: Labor
Title: " An Act relating to crane operator certification..."
BRU: Labor Standards & Safety
Sponsor: Rules Committee
Components: Occupational Safety & Health
Requestor: Governor

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96
PERSONAL SERVICES	43.6	87.1	87.1	87.1	87.1	87.1
TRAVEL	3.5	7.0	7.0	7.0	7.0	7.0
CONTRACTUAL	9.8	19.6	19.6	19.6	19.6	19.6
SUPPLIES	1.0	1.5	1.5	1.5	1.5	1.5
EQUIPMENT	3.0					
LAND&STRUCTURES						
GRANTS,CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	60.9	115.2	115.2	115.2	115.2	115.2
CAPITAL						
REVENUE	11.7	21.7	16.7	16.7	16.7	16.7

FUNDING: (Thousands of Dollars)

GENERAL FUND	60.9	115.2	115.2	115.2	115.2	115.2
FEDERAL FUNDS						
OTHER						
TOTAL	60.9	115.2	115.2	115.2	115.2	115.2

POSITIONS:

FULL-TIME	2.0	2.0	2.0	2.0	2.0	2.0
PART-TIME						
TEMPORARY						

ANALYSIS: (Attach a separate page if necessary)

see attached

Prepared by: Tom Stuart by DA
Ton. Stuart, Director
Phone: 465-2712
Division: Labor Standards & Safety
Date: 12/5/89

Approved by Commissioner: Jim Sampson
Date: 12/5/89
Agency: Department of Labor

Distribution (by preparer):
Legislative Finance
Legislative Sponsor
Requestor
Office of Management and Budget
Impacted Agency(ies)

Fiscal Note Analysis for:

"An Act relating to crane operator certification..."

This legislation would require the department of review and approve crane operator training programs, assist training vendors to develop training programs, and audit such programs. It would also require us to enforce the certification requirement.

Expenditures:

One new technical position will be needed to develop this new program, review and approve training programs, and assist training vendors in developing their training programs. While this new position will assist in the enforcement of the legislation, because of the number of potential work sites over a very large geographic area where cranes could be in use, existing staff would also have to assist in work site inspections.

It has been our experience that it is possible to develop a certification program with one technical position and absorb the supervision and clerical support with existing staff. However, since we added one technical position for a certification program for hazardous paint handlers, our support staff is now unable to cope with more work. Therefore, it will be necessary to add at least a clerical position along with the technical position for this legislation.

Thus, two new positions, a Crane Inspector Compliance Officer and a Clerk Typist III, along with associated non-personal services costs would be needed to operate this program. Since the effective date of the implementation of this bill is May 15, 1991, the new positions would be hired in January of 1991 to set up the program. In future years they would be funded for a full 12 months.

Revenues:

Two revenue sources are identified in this bill.

First, a fee would be charged once every three years to obtain certification. We estimate a fee of $100 with about 350 persons applying for the certificate. Thus approximately $35,000 would be generated every three years, or an average of $11,667 per year.

Second, there are penalties assessed for non-compliance with this legislation. We estimate $10,000 in fines in FY 92, and $5,000 per year as the deterrent effect of the fine takes place.

Position Title	No.of Positions	Range/Step	Barg. Unit
Occupational Safety Compliance Officer (Safety Officer)	1	50B	LTC

Time Status	Staff Months	Location	Election District
Full Time	6	Anchorage	8

Type of Expenditure		Amount
1	2	3
Salary	$22,100	
Benefits	$7,200	
Premium Pay		
Other		
Total Personal Services		$29,300
Travel		$3,500
Contractual		$7,300
Commodities		$700
Equipment		$1,500
Other		
Total Cost		$42,300

Funding Source for Total Cost		
Federal Receipts	1002	
G. F. Match	1003	
General Fund	1004	$42,300
GF Program Receipts	1005	
Other		

Justification

This position will develop the certification program, review and approve training programs, and assist training vendors in developing such training. Also this position will issue the necessary citations for violations.

Travel is for on-site inspection of work sites to determine compliance with certification requirements.

Contractual is for indirect costs associated with the position, space, legal services with the Department of Law, printing and advertising, postage, and miscellaneous contractual services.

Commodities are normal office supplies.

Equipment is for a desk, chair, etc., and is a one time item.

Request For New Position

Agency: Department of Labor
BRU: Labor Standards & Safety
Component: Occupational Safety & Health

Position Title	No.of Positions	Range/Step	Barg. Unit
Clerk Typist II	1	8A	GGU

Time Status	Staff Months	Location	Election District
Full Time	6	Anchorage	8

Type of Expenditure		Amount
1	2	3
Salary	$9,800	
Benefits	$4,500	
Premium Pay		
Other		
Total Personal Services		$14,300
Travel		
Contractual		$2,500
Commodities		$300
Equipment		$1,500
Other		
Total Cost		$18,600

Funding Source for Total Cost		
Federal Receipts	1002	
G. F. Match	1003	
General Fund	1004	$18,600
GF Program Receipts	1005	
Other		

Justification

This position will provide the necessary clerical support for this program.

Contractual is for indirect costs associated with the position, space, and miscellaneous contractual services.

Commodities are normal office supplies.

Equipment is for a desk, chair, filing cabinet, etc., and is a one time item.

Request For New Position

Agency: Department of Labor
BRU: Labor Standards & Safety
Component: Occupational Safety & Health

Revised Date

FY 90

TESTIMONY
ON

SB 376: An Act relating to crane operator certification; and providing for and effective date.

THANK YOU MR. CHAIRMAN. FOR THE RECORD MY NAME IS RESA JERREL I AM THE DIRECTOR OF GOVERNMENTAL RELATIONS FOR THE A.G.C OF ALASKA REPRESENTING MORE THAN 600 MEMBER FIRMS.

WE ARE OPPOSED TO THIS LEGISLATION. WHAT THIS BILL ESSENTIALLY REQUIRES: IS A STATE LICENSE TO OPERATE A CRANE IN THE STATE OF ALASKA. BUT IS THERE A NEED FOR SUCH A LICENSE? WE THINK NOT.

ON THE AVERAGE IN 1988 THERE WERE APPROXIMATELY 212,080 PEOPLE EMPLOYED IN THE STATE. IN JULY OF 1989 THERE WERE 61 NONUNION AND 21 UNION CRANE AND TOWER OPERATORS IN THE STATE. THAT IS ONLY .04% OF THE TOTAL NUMBER OF PEOPLE STATEWIDE IN THE WORK FORCE.

ALASKA ALREADY HAS 74 PAGES OF REGULATIONS COVERING CRANES AND THERE ARE 5 DEPARTMENT OF LABOR BOOKLETS REFERRING TO CRANES. ALSO, IN THOSE REGULATIONS THE EMPLOYER IS REQUIRED TO COMPLY WITH THE:

"POWER CRANE AND SHOVEL ASSOCIATION, MOBILE HYDRAULIC CRANE STANDARD NO.2"

SIDE BOOM CRANES MOUNTED ON WHEEL OR CRAWLER TRACTORS HAVE TO MEET THE REQUIREMENTS OF THE "SAE J743a, 1964." AND,

"ANSI B30.5-1968, SAFETY CODE FOR CRAWLER, LOCOMOTIVE AND TRUCK CRANES"

OPERATORS ALREADY ARE REQUIRED TO MEET THE FOLLOWING QUALIFICATIONS:

A. PASS A PRACTICAL OPERATING EXAMINATION, LIMITED TO THE SPECIFIC TYPE OF EQUIPMENT HE WILL OPERATE;

B. HAVE VISION, WITH OR WITHOUT GLASSES, AT LEAST 20/30 SNELLEN IN ONE EYE AND 20/50 IN THE OTHER EYE;

C. BE ABLE TO DISTINGUISH RED, GREEN, AND YELLOW REGARDLESS OF THE POSITIONS OF THE COLORS;

D. HAVE HEARING, WITH OR WITHOUT A HEARING AID, ADEQUATE FOR THE SPECIFIC OPERATION;

E. HAVE NO HISTORY OF EPILEPSY OR DISABLING CONDITION; AND,

F. BE FAMILIAR AND CONVERSANT WITH SAFE OPERATING PROCEDURES, THE CAPACITY AND LIMITATIONS OF THE EQUIPMENT HE WILL OPERATE, UNDERSTAND THE PROVISIONS OF THESE REGULATIONS PERTAINING TO INSPECTION, OPERATION, LOAD LIMIT TESTS AND BOOM RADII.

THE OPERATION OF A CRANE IS NOT A ONE PERSON OPERATION. IT IS A TWO PERSON OPERATION WITH AN OPERATOR AND AN ATTENDANT. THE ATTENDANT IS REQUIRED TO PASS A PRACTICAL EXAMINATION DEMONSTRATING FAMILIARITY WITH CRANE OPERATIONS AND SAFE HOISTING PROCEDURES, INCLUDING STANDARD VISUAL AND AUDIBLE SIGNAL SYSTEMS, AND THE LOAD LIMIT CAPACITIES OF THE EQUIPMENT HE WILL ATTEND. THE ATTENDANT IS TO ATTEND ONLY TO THE MACHINE HE IS ASSIGNED AND IS NOT TO PERFORM UNRELATED CONCURRENT DUTIES.

IF IT BECOMES NECESSARY TO REPLACE AN OPERATOR OR ATTENDANT PREVIOUSLY ASSIGNED TO A MACHINE, THE WORK MAY NOT COMMENCE UNTIL THE REPLACEMENT HAS BEEN INSTRUCTED BY COMPETENT SUPERVISORY PERSONNEL AS TO THE HAZARDS INVOLVED IN THE PARTICULAR WORK AND WORK PLACE.

WE DO NOT SEE THE NEED TO CREATE A NEW LICENSE FOR A SMALL FRACTION OF WORKERS AND BELIEVE THERE ARE SUFFICIENT REGULATIONS ON THE BOOKS WHICH COVER THE QUALIFICATIONS OF CRANE OPERATORS.

Alaska Wage Rates 1989
For Selected Occupations

State of Alaska
Steve Cowper, Governor

Alaska Department of Labor
Jim Sampson, Commissioner

Research and Analysis Section
Chuck Caldwell, Chief

Prepared by:

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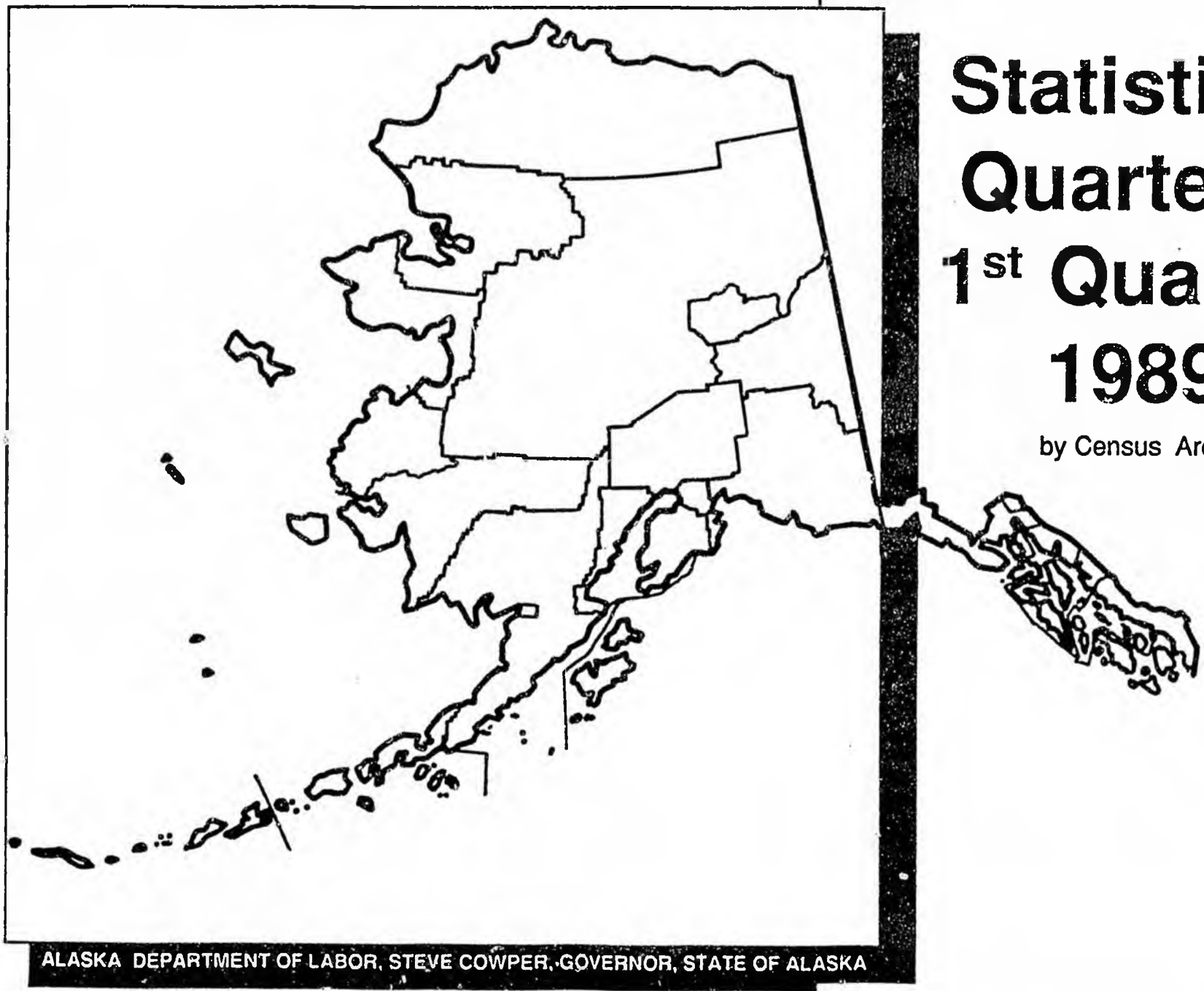
In cooperation with:

Alaska Occupational Information Coordinating Committee

Published: December 1989

Table 1.1
Wage Data for Selected Occupations
ALASKA STATEWIDE
July 1989

Occupation	Nonunion High	Nonunion Low	Nonunion Avg.	Nonunion No. of Firms	Nonunion No. of Employees	Union Avg.	Union No. of Firms	Union No. of Employees
SERVICE (cont.)								
Guards & Watch Guards	$17.14	$ 5.00	$ 7.14	17	249			
Hosts/Hostess: Restaurant/Lounge/Coffee Shop	10.00	5.00	6.27	11	37			
Housekeepers	25.38	5.25	9.51	28	68	$ 8.95	4	19
Janitors/Cleaners (except Maids/House Cleaners)	17.31	4.00	7.49	128	341	10.40	13	58
Maids & Housekeeping Cleaners	15.00	4.50	7.61	43	176	7.66	4	93
Medical Assistants	15.00	7.00	10.45	24	39			
Nursing Aides, Orderlies & Attendants	12.28	6.00	9.25	10	69			
Waiters & Waitresses	10.00	3.85	4.78	42	404	5.45	5	79
AGRICULTURE, FORESTRY, and FISHING								
Choke Setters	$14.50	$10.55	$12.04	5	50			
Fallers & Bucksers	28.57	23.08	26.49	4	44			
Gardeners & Groundskeepers (except Farm)	13.50	4.50	7.69	11	22			
Hook Tenders	16.80	15.00	16.28	5	31			
Log Handling Equipment Operators	16.50	13.55	15.11	5	43			
PRODUCTION/CONSTRUCTION/OPERATING/ MAINTENANCE/MATERIAL HANDLING								
Aircraft Pilots & Flight Engineers	$75.00	$ 9.23	$28.27	19	164			
Automotive Body & Related Repairers	19.80	5.00	13.49	15	56			
Baggers	7.00	4.00	4.93	8	21			
Bus Drivers	18.00	6.00	11.26	15	98			
Cannery & Cold Storage Workers	25.00	4.50	6.78	17	3,245	$ 6.31	6	1,258
Carpenters	33.50	8.00	20.92	42	288	29.01	10	1,223
Concrete & Terrazzo Finishers	28.59	15.00	20.53	3	9			
Crane & Tower Operators	23.00	6.50	15.43	12	61	23.68	5	21
Earth Drillers (except Oil & Gas)	24.47	8.00	16.30	4	24			
Electrical Powerline Installers/Repairers						26.22	13	119
Electricians	33.40	7.00	19.95	32	115	23.24	20	175
Freight, Stock, & Material Movers: Hand	25.82	4.00	9.86	29	96	12.49	7	20
Glaziers	22.17	10.00	15.85	5	11	22.40	4	15
Hand Packers & Packagers	15.50	5.00	8.65	13	166			
Heating, Air Conditioning, & Refrigeration Mechanics/Installers	25.18	7.60	15.38	11	43	19.34	4	13
Helpers, Laborers, & Material Movers: Hand	27.53	3.85	13.70	121	650	16.03	28	264
Hoist & Winch Operators	13.91	9.00	13.36	4	26	17.68	3	26
Industrial Truck & Tractor Operators	32.51	8.00	15.36	18	84	15.39	4	46
Laundry/Drycleaning Machine Operators (except Press)	11.67	4.50	7.75	18	45	7.86	3	13
Line Service Attendants	16.70	4.50	9.14	10	97			
Machinery Maintenance Workers	30.30	5.00	13.00	18	52	17.22	11	54
Machinists	23.10	5.50	15.67	19	53	14.88	7	46
Maintenance Repairers: General Utility	26.68	4.04	13.90	118	408	20.06	21	180
Mechanics: Aircraft	38.39	4.00	16.50	20	233			
Mechanics: Automotive	26.74	5.00	15.23	65	178	20.93	10	54
Mechanics: Bus/Truck & Diesel Engine Specialists	27.50	5.77	16.66	55	226	21.33	15	93
Operating Engineers	32.00	7.50	17.56	27	170	23.47	16	175
Painters/Paperhangers: Construction/Maintenance	24.50	5.00	16.07	9	54	22.52	3	20
Pasteup Workers	15.47	5.50	9.45	6	18			
Plumbers, Pipefitters & Steamfitters	25.20	6.00	14.26	9	16	24.40	18	135



Statistical Quarterly

1st Quarter 1989

by Census Area

ALASKA DEPARTMENT OF LABOR, STEVE COWPER, GOVERNOR, STATE OF ALASKA

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NONAGRICULTURAL WAGE AND SALARY EMPLOYMENT AND EARNINGS BY CENSUS AREA- 1988

	Nonagricultural Employment													Nonagricultural Earnings	
INDUSTRY	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Average Monthly Employment	Total Yearly Payroll	Average Monthly Wage
TOTAL	194,740	198,234	201,798	206,690	212,201	218,332	224,575	224,189	225,313	217,039	211,470	210,377	212,080	$5,879,980,794	$2,310
Aleutians East Borough	958	1,077	1,273	803	897	1,011	788	1,306	1,044	1,009	1,054	1,041	1,022	24,619,969	2,008
Aleutian Islands West C.A.	3,014	3,432	3,363	3,304	3,041	3,343	3,410	3,166	3,364	3,280	3,153	3,137	3,251	83,488,106	2,140
Anchorage Borough	95,550	96,462	97,248	97,503	98,958	100,229	100,900	99,380	100,391	101,700	100,051	100,375	99,052	2,831,261,861	2,382
Bethel Census Area	3,889	4,026	4,042	4,429	4,321	4,348	4,093	3,902	4,535	4,519	4,345	4,321	4,231	87,696,762	1,727
Bristol Bay Borough	743	751	792	870	1,108	1,313	2,059	1,279	1,095	850	823	806	1,041	24,606,096	1,970
Dillingham Census Area	1,561	1,666	1,611	2,001	2,385	2,958	3,573	2,052	2,486	1,993	1,900	1,986	2,256	50,081,968	1,850
Fairbanks North Star Borough	23,688	23,699	23,908	25,150	25,770	26,036	26,070	27,697	27,638	25,025	25,158	24,909	25,471	683,395,253	2,236
Haines Borough	777	885	1,087	1,155	1,191	1,341	1,529	1,573	1,407	1,249	1,228	1,193	1,218	34,687,253	2,373
Juneau Borough	11,798	12,032	12,243	12,724	12,837	12,746	12,998	13,017	13,476	13,102	12,955	13,038	12,747	357,847,278	2,339
Kenai Peninsula Borough	9,342	9,327	9,532	10,067	11,025	11,650	13,701	12,802	12,441	11,412	10,919	10,848	11,089	298,701,178	2,245
Ketchikan Gateway Borough	5,663	5,933	6,321	6,510	6,763	6,955	7,524	7,955	8,061	7,116	6,825	6,602	6,852	179,114,177	2,178
Kodiak Island Borough	4,354	4,527	4,721	4,268	4,454	4,670	5,284	5,496	5,567	5,078	4,954	4,651	4,835	104,860,236	1,807
Matanuska-Susitna Borough	5,722	5,806	5,867	6,098	6,269	6,077	6,083	6,082	6,502	6,293	6,238	6,107	6,095	139,129,733	1,902
Nome Census Area	2,697	2,601	2,649	2,724	2,752	2,858	2,832	2,893	2,945	3,067	2,943	2,885	2,837	68,903,916	2,024
North Slope Borough	6,005	6,323	6,556	6,632	6,684	7,227	6,658	7,178	7,216	6,735	6,721	6,686	6,723	326,978,646	4,053
Northwest Arctic Borough	1,761	1,739	1,794	1,665	1,682	1,527	1,629	1,707	1,942	2,076	1,980	1,914	1,785	45,438,750	2,122
Prince of Wales-Outer Ketchikan	1,488	1,549	2,064	1,911	2,080	2,173	2,258	2,343	2,293	2,006	1,977	1,912	2,005	50,249,724	2,089
Sitka Borough	3,350	3,354	3,480	3,667	3,747	3,712	3,950	3,953	4,070	3,810	3,610	3,470	3,681	90,337,628	2,045
Skagway-Yakutat-Angoon C.A.	1,008	1,125	1,173	1,368	1,699	2,011	1,990	2,030	2,038	1,555	1,414	1,358	1,573	34,106,204	1,807
Southeast Fairbanks C.A.	1,233	1,238	1,266	1,351	1,395	1,449	1,408	1,426	1,486	1,366	1,279	1,245	1,345	30,505,951	1,890
Valdez-Cordova Census Area	2,825	2,961	3,018	3,556	3,933	4,971	5,293	5,510	5,021	3,578	3,501	3,709	3,999	115,982,048	2,417
Wade Hampton Census Area	1,295	1,323	1,324	1,335	1,395	1,181	1,343	1,375	1,514	1,558	1,506	1,468	1,385	24,127,691	1,452
Wrangell-Petersburg C.A.	2,135	2,326	2,473	2,821	2,911	2,977	3,415	3,372	3,196	2,943	2,692	2,534	2,816	69,794,984	2,065
Yukon-Koyukuk Census Area	2,083	2,174	2,150	2,453	2,521	2,572	2,630	2,719	2,861	2,706	2,332	2,288	2,457	61,408,442	2,082
Undetermined Locations	1,661	1,698	1,843	2,305	2,377	2,993	3,157	3,076	2,724	2,003	1,912	1,894	2,304	62,656,940	2,267

CONSTRUCTION CODE

VOLUME II

OCCUPATIONAL SAFETY AND HEALTH STANDARDS

ALASKA DEPARTMENT OF LABOR
DIVISION OF LABOR STANDARDS AND SAFETY

JIM SAMPSON, COMMISSIONER STEVE COWPER, GOVERNOR

CONTENTS

(A) The employer shall comply with the manufacturer's specifications and limitations applicable to the operation of any and all cranes and derricks. Where manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a qualified engineer competent in this field and such determinations will be appropriately documented and recorded. Attachments used with cranes shall not exceed the capacity, rating, or scope recommended by the manufacturer.

(B) Rated load capacities, and recommended operating speeds, special hazard warning, or instruction, shall be conspicuously posted on all equipment. Instructions or warnings shall be visible to the operator while he is at his control station.

(C) Maximum safe working loads.

(i) The maximum manufacturer's rated safe working loads for the various radii at which the boom may be safely used with and without outriggers shall be conspicuously posted near the controls and shall be visible to the operator. The same chart shall be posted outside the cab to be visible to the attendant or signal man.

(ii) A radius indicator (boom-indicating device) shall be provided.

(iii) The posted safe working loads under conditions of use shall not be exceeded.

(D) Hand signals to crane and derrick operators shall be those prescribed by the applicable ANSI standard for the type of crane in use. An illustration of the signals shall be posted at the jobsite.

(E) The employer shall designate a competent person who shall inspect all machinery and equipment prior to each use, and during use to make sure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use.

(F) A thorough, annual inspection of the hoisting machinery shall be made by a competent person, or by a government or private agency recognized by the department. The employer shall maintain a record of the dates and results of inspections for each hoisting machine and piece of equipment.

(G) Wire rope shall be taken out of service when any of the following conditions exist:

(i) In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay;

(ii) Wear of one-third the original diameter of outside individual wires. Kinking, crushing, birdcaging, or any other damage resulting in distortion of the rope structure;

(iii) Evidence of any heat damage from any cause;

(iv) Reductions from nominal diameter of more than 1/64 inch for diameters up to and including 5/16 inch, 1/32 inch for diameters three-eighths inch to and including three fourths inch, one-sixteenth inch for diameter seven-eighths inch to one and one-eighths inches inclusive, 3/32 inch for diameters one and one-fourth to one and one-half inches inclusive.

(v) In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection;

(vi) Wire rope safety factors shall be in accordance with ANSI B.30.5-1968 or SAE J959-1966.

(H) Belts, gears, shafts, pulley, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating or other moving parts or equipment shall be guarded if such parts are exposed to contact by employees, or otherwise create a hazard. Guarding shall meet the requirements of the ANSI B.15.1-1958 Rev., Safety Code for Mechanical Power Transmission Apparatus.

(I) Accessible areas within the swing radius of the rear of the rotating superstructure of the crane, either permanently or temporarily mounted, shall be barricaded in such a manner as to prevent an employee from being struck or crushed by the crane.

(J) All exhaust pipes shall be guarded or insulated in areas where contact by employees is possible in the performance of normal duties.

(K) Whenever internal combustion engine powered equipment is used in enclosed spaces, an exhaust system shall be installed to vent exhaust gases to the outside air.

(L) All windows in cabs shall be of safety glass, or equivalent, that introduces no visible distortion interfering with the safe operation of the machine. Windows shall be in the front and on both sides to give the operator full visibility on both sides and forward. Visibility forward shall provide a vertical range adequate to cover the boom point at all times. The front window shall have a section which can be removed or held open.

(M) Where necessary for rigging or service requirements, a ladder, or steps, shall be provided to give access to a cab roof.

(i) Guardrails, handholds and steps shall be provided for easy access to the car and cab conforming to ANSI B30.5.

(ii) Platforms and walkways shall have anti-skid surfaces.

(N) Fuel tank filler pipe shall be located in such a position, or protected in such manner, as to not allow spill or overflow to run onto the engine, exhaust, or electrical equipment of any machine being fueled.

(i) An accessible fire extinguisher of 5BC rating, or higher, shall be available at all operator stations or cabs of equipment.

(ii) All fuels shall be transported, stored, and handled to meet the rules of sec. 60 of this subchapter. When fuel is transported by vehicles on public highways, U. S. Department of Transportation rules contained in 49 CFR Parts 177 and 393 concerning such vehicular transportation are considered applicable.

(O) Except where electrical distribution and transmission lines have been deenergized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines, equipment or machines shall be operated proximate to power lines only in accordance with the following:

(1) For lines rated 50KV. or below, minimum clearance between the lines and any part of the crane or load must be 10 feet;

(ii) For lines rated over 50 kV., minimum clearance between the lines and any part of the crane or load must be 10 feet plus 0.4 inch for each 1kV. over 50 kV., or twice the length of the line insulator, but never less than 10 feet;

(iii) In transit with no load and boom lowered, the equipment clearance must be a minimum of 4 feet for voltages less than 50 kV., and 10 feet for voltages over 50 kV., up to and including 345kV., and 16 feet for voltages up to and including 750 kV.

(iv) A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means;

(v) Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices must not alter the requirements of any other regulation of this subchapter even if such device is required by law or regulation;

(vi) Any overhaad wire must be considered to be an energized line unless and until the person owning the line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.

(vii) Before working near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter must be de-energized or tests must be made to determine if electrical charge is induced on the crane. The following precautions must be taken when necessary to dissipate induced voltages:

a. The equipment must be provided with an electrical ground directly to the upper rotating structure supporting the boom; and

b. Ground jumper cables must be attached to materials being handled by boom equipment when an electrical charge is induced while working near energized transmitters. Crews shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.

c. Combustible and flammable materials must be removed from the immediate area before any operations are begun.

(P) No modification or additions which affect the capacity or safe operation of the equipment shall be made by the employer without the manufacturer's written approval. If such modifications or changes are made, the capacity, operations and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

(Q) The employer shall comply with Power Crane and Shovel Association, Mobile Hydraulic Crane Standard No. 2.

(R) Side boom cranes mounted on wheel or crawler tractors shall meet the requirements of the SAE J743a-1964.

(2) Crawlers, Locomotive and Truck Cranes.

(A) All jibs shall have positive stops to prevent their movement of more than five degrees above the straight line of the jib and boom on conventional type crane booms. The use of cable-type belly slings does not constitute compliance with this rule.

(B) All crawler, truck, or locomotive cranes in use must meet the applicable requirements for design, inspection, construction, testing, maintenance and operation as prescribed in ANSI B30.5-1968, Safety Code for Crawler, Locomotive and Truck Cranes. However, the written, dated, and signed inspection reports and records of the monthly inspection of critical items prescribed in Section 5-2.1.5 of the ANSI B30.5-1968 standard are not required. Instead, the employer shall prepare a certification record which includes the date the crane items were inspected; the signature of the person who inspected the crane items; and a serial number, or other identifier, for the crane inspected. The most recent certification record must be maintained on file until a new one is prepared.

(C) Cranes shall be equipped with boom stops.

(D) Operating crew.

(i) Cranes equipped with a rotating working unit shall have a minimum crew of one operator and one attendant.

(ii) Only employees qualified by training and/or experience may operate and attend power cranes.

(iii) Operators and attendants assigned to specific equipment in a workplace shall be formally instructed by competent supervisory personnel as to the hazards involved in the particular work and workplace.

(iv) If it becomes necessary to replace an operator or attendant previously assigned to a machine, the work may not commence until the replacement has been instructed by competent supervisory personnel as to the hazards involved in the particular work and workplace.

(v) The operating crew shall consist of the designated operator plus an attendant who shall act only as a safety observer when the crane is in operation if any one of the following criteria exists:

a. If any employee working in the proximity concludes that a danger exists and requests the employer or his representative to assign a safety observer;

b. If the equipment is operating where any part is capable of reaching within 15 feet of an overhead power line;

c. If the equipment can swing in an arc of 360 degrees and the equipment is not accompanied by an oiler, who functions as a safety observer when the equipment is in operation; or

d. If a compliance officer of the Alaska Department of Labor concludes that a danger exists.

(vi) Operators shall be required to meet the following qualifications:

a. Pass a practical operating examination, limited to the specific type of equipment he will operate;

b. Have vision, with or without glasses, at least 20/30 Snellen in one eye and 20/50 in the other eye;

c. Be able to distinguish red, green, and yellow, regardless of the position of the colors;

d. Have hearing, with or without a hearing aid; adequate for the specific operation;

e. Have no history of epilepsy or disabling heart condition; and

f. Be familiar and conversant with safe operating procedures, the capacity and limitations of the equipment he will operate, understand the provisions of these regulations pertaining to inspection, operation, load limit tests and boom radii.

(E) Operating practices.

(i) The operator shall be responsible for operations under his direct control. Whenever there is any doubt as to safety, the operator shall have the authority to stop and refuse to handle loads until safety has been assured.

(ii) The operator shall respond to signals only from the designated attendant (signal man), but shall obey a "stop" signal no matter who gives it.

(iii) The operator shall engage in no practice which will divert his attention while actually engaged in operating the crane.

(iv) Before leaving his crane unattended, the operator shall

a. Land any attached load, bucket, lifting magnet, or other device;

b. Disengage the clutch;

c. Set travel, swing, boom brakes, and other locking devices;

d. Put controls in the "off" position;

e. Stop the engine;

f. Secure the crane against accidental travel;

g. Set ground chocks on truck and crawler cranes upon leaving crane overnight; and

h. Lower crane boom to ground level or otherwise fasten crane booms securely against displacement by wind loads or other outside forces.

(v) If there is a warning sign on the switch or engine starting controls, the operator shall not close the switch or start the engine until the warning sign has been removed by the person placing it there.

(vi) Before closing the switch or starting the engine, the operator shall see that all controls are in the "off" position and all personnel in the area are in the clear.

(vii) The operator shall familiarize himself with the equipment and its proper care. If adjustments or repairs are necessary, or any defects are known, he shall report the deficiencies promptly to his supervisor, and shall also notify the next operator of the defects upon changing shifts.

(ix) Booms which are being assembled or disassembled on the ground with or without support of the boom harness should be securely blocked to prevent dropping of the boom and boom sections.

(x) Cranes shall be operated only by the following personnel:

a. The designated qualified operator.

b. Learners under the direct supervision of the designated qualified operator.

c. Maintenance and test personnel, only when necessary for the performance of their duties.

d. Inspectors.

e. Persons being tested in an operator's examination.

(F) Operating precautions.

(i) During operations the operator may not leave his position until the load has been landed, or until the load and/or working slings and hook or hooks are returned to a point of rest.

(ii) The boom shall be lowered for maintenance or repair of the boom points.

(iii) The boom swing position shall be locked when the carrier equipment is moved.

(iv) Maintenance and repair of the machine may not be performed with the power unit in operation unless the master clutch is disengaged.

(v) When handling maximum rated loads the operator shall test the hoist brake after lifting the load a few inches; if the brake does not hold firmly, the brakes shall be adjusted prior to further operation.

(vi) Side pulls are prohibited. The boom shall be over the load for the initial liftoff.

(vii) The operator shall place all operating controls in the "off" position and disengage the master clutch before leaving his position.

(viii) Personnel may not ride or be hoisted on loads, hooks, slings, hammers, or buckets, unless the load platform is specifically approved by the Alaska Department of Labor as a manlift.

(ix) The operator shall not hoist, lower, swing, or travel while anyone is on the load or hook.

(x) The operator shall not carry loads over people.

(G) Crane attendants. Attendants ("signal men," "oiler") shall be required to meet the following qualifications:

(i) The attendant shall be required to pass a practical examination demonstrating familiarity with crane operations and safe hoisting procedures, including standard visual and audible signal systems, and the load limit capacities of the equipment he will attend.

(ii) Have the physical qualifications of an operator as set forth in (D)(vi) of this paragraph.

(iii) The attendant shall function as a safety observer in addition to his other normal duties as machine attendant. He shall attend only to the machine to which he is assigned and shall not perform unrelated concurrent duties.

(iv) In directing movement of the load, the attendant shall see that:

a. The crane is level and, where necessary, blocked properly.

b. The load is well-secured and properly balanced in the sling or lifting device before it is lifted more than a few inches.

c. Hoist rope is not kinked nor multiple lines twisted.

d. Hook is brought over the load in a manner to prevent swinging.

e. Rope is properly seated in the sheaves, especially if there has been a slack rope condition.

f. The operator is warned of critical loads and that loads approaching lift limits are tested before the lift is begun.

g. The operator is warned of hazardous conditions imposed by movement of other vehicles or construction operations.

(3) Hammerhead tower cranes.

(A) Adequate clearance shall be maintained between moving and rotating structures of the crane and fixed objects to allow the passage of employees without harm.

(B) Employees required to perform duties on the horizontal boom of hammerhead tower cranes shall be protected against falling by guardrails or by safety belts and lanyards attached to lifelines in accordance with sec. 50 of this subchapter.

(C) Buffers shall be provided at both ends of travel of the trolley.

(D) Cranes mounted on rail tracks shall be equipped with limit switches limiting the travel of the crane on the track and stops or buffers at each end of the tracks.

(E) All hammerhead tower cranes in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, inspection, and operation as prescribed by the manufacturer.

(4) Overhead and gantry cranes.

(A) The rated load of the crane shall be plainly marked on each side of the crane, and if the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or its load block, and this marking shall be clearly legible from the ground or floor.

(B) Bridge trucks shall be equipped with sweeps which extend below the top of the rail and project in front of the truck wheels.

(C) Except for floor-operated cranes, a gong or other effective audible warning signal shall be provided for each crane equipped with a power traveling mechanism.

(D) All overhead and gantry cranes in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, inspection, and operation as prescribed in the ANSI B30.2.0-1967, Safety Code for Overhead and Gantry Cranes.

(5) Derricks.

(A) All derricks in use shall meet the applicable requirements for design, construction, installation, inspection, testing, maintenance, and operation as prescribed in ANSI B30.6-1969, Safety Code for Derricks.

(B) Other specific requirements for design, construction, installation, inspection, testing, maintenance and operation of derricks are:

(i) All blocks, shackles, sheaves, and the top of connection of the mast shall be inspected prior to erection of derrick and defective equipment replaced.

(ii) All wire rope shall be inspected prior to use and defective material replaced. Wire rope shall be taken out of service in accordance with the criteria specified in (1)(G) of this subsection.

(iii) All sheave and pulley pins shall be oiled and inspected periodically after initial erection of derrick.

(iv) Derricks supported by the steel frame of a structure shall have limitations of load and stress determined by a qualified engineer competent in structural design. These determinations shall be appropriately documented and recorded.

(v) Guyed derricks may be anchored by means of logs buried in the ground ("deadman") provided the anchors are buried to a suitable depth to provide sufficient resistance to the resultant force exerted by the guy.

(vi) Stiff leg derricks shall be anchored to withstand a stress of one and one-half times the maximum load.

(vii) The top of the mast on guyed derricks shall be secured by a minimum of six equally spaced guy wires.

(viii) Derrick guys and masts shall be 30 degrees or greater if practicable. If such angle for two or more guys is less than 30 degrees, the maximum rated load shall be reduced by two percent for each degree less than 30 degrees for each such guy.

(ix) A minimum working clearance of 10 feet from energized power lines shall be maintained in accordance with (1)(O) of this subsection.

(x) Derrick hoisting brakes shall be capable of holding the maximum rated load. A test for maximum load shall be conducted at least once per week during continuous use.

(xi) Legible capacity plates shall be attached to derricks indicating permissible loads for the boom positions.

(6) Floating cranes and derricks.

(A) Mobile cranes mounted on barges.

(i) When a mobile crane is mounted on a barge, the rated load of the crane shall not exceed the original capacity specified by the manufacturer.

(ii) A load rating chart, with clearly legible letters and figures, shall be provided with each crane, and securely fixed at a location easily visible to the operator.

(iii) When load ratings are reduced to stay within the limits for list of the barge with a crane mounted on it, a new load rating chart shall be provided.

(iv) Mobile cranes on barges shall be positively secured.

(B) Permanently mounted floating cranes and derricks.

(i) When cranes and derricks are permanently installed on a barge the capacity and limitations of use shall be based on competent design criteria.

(ii) A load rating chart with clearly legible letters and figures shall be provided and securely fixed at a location easily visible to the operator.

(iii) Floating cranes and floating derricks in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, and operation as prescribed by the manufacturer.

(C) Protection of employees working on barges.

(i) The employer shall comply with the applicable requirements for protection of employees working on board marine vessels specified in subsection 150(f) of this subchapter.

(ii) Gangways and ramps for personnel on a floating plant shall be equipped with guardrails or lifelines and a nonskid walking surface.

(iii) Guardrails, lifelines or gratings shall be provided at all deck openings.

(iv) Catwalks or platforms with guardrails shall be provided at all locations where men are regularly employed above decks or water.

(v) All persons working aloft, except those on guarded catwalks and platforms shall be equipped with safety belts and lifelines.

(vi) No employee shall be permitted to enter a boiler, tank, cofferdam, double bottom, or other confined space until a safe air supply is assured, protective rescue equipment is at hand, and an attendant is stationed at the point of entry with a safety line to the confined workmen.

(vii) Suitable launches or tenders operated by a designated operator or crew shall be provided for transportation to and from the floating plant.

(viii) One or more life-saving skiffs in sufficient number for working personnel shall be provided for each floating plant and for each work place accessible to water. Life-saving skiffs shall be available for instant launching and used only for life-saving drills.

(7) Power shovels, backhoes and dragline excavators.

(A) Equipment requirements.

(i) Dragline excavators shall comply with applicable provisions for design, inspection, construction, testing, maintenance and operation as prescribed in ANSI B30.5-1968, Safety Code for Crawler, Locomotive and Truck Cranes.

(ii) Power shovels and backhoes (drag shovels) shall comply with the applicable provisions for design, inspection, construction, testing, maintenance, and operation as prescribed in Power Crane and Shovel Association Standards 1-1968, 2-1968, and 3-1968.

(B) Specific requirements for design, inspection, construction, testing, maintenance and operation of power shovels and backhoes.

(i) Unauthorized personnel are not allowed on the operating platform during operation.

(ii) The dipper of a shovel or hoe shall be placed on the ground or working surface when the machine is not in operation.

(iii) The operator shall not move the load over the cab of occupied trucks and other vehicles or over workmen on the ground.

(iv) Operators shall not leave the cab of the machine without disengaging the master clutch.

(v) Shovels and hoes shall be equipped with a warning whistle or horn to signal commencement and stoppage of operation.

(C) Operating crew. The provisions of (2)(D) of this subsection shall apply to operation of power shovels, backhoes, and dragline excavators.

(D) Operating precautions. The provisions of (2)(E) and (2)(F) of this subsection shall apply to the operation of power shovels, backhoes, and dragline excavations.

(8) Crane or derrick suspended personnel platforms.

(A) Scope, application and definitions.

(i) Scope and application. This paragraph applies to the design, construction, testing, use and maintenance of personnel platforms, and the hoisting of personnel platforms on the load lines of cranes or derricks.

(ii) Definitions. For the purposes of this subsection, the following definitions apply:

a. "Failure" means load refusal, breakage, or separation of components.

b. "Hoist" (or hoisting) means all crane or derrick functions such as lowering, lifting, swinging, booming in and out or up and down, or suspending a personnel platform.

c. "Load refusal" means the point where the ultimate strength is exceeded.

d. "Maximum intended load" means the total load of all employees, tools, materials, and other loads reasonably anticipated to be applied to a personnel platform or personnel platform component at any one time.

e. "Runway" means a firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the crane being used to lift and travel with the crane suspended platform. An existing surface may be used as long as it meets these criteria.

(B) General requirements. The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway,

aerial lift, elevating work platform or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions.

(C) Cranes and derricks.

(1) Operational criteria.

a. Hoisting of the personnel platform must be performed in a slow, controlled, cautious manner with no sudden movements of the crane or derrick, or the platform.

b. Load lines must be capable of supporting, without failure, at least seven times the maximum intended load, except that where rotation resistant rope is used, the lines must be capable of supporting without failure, at least ten times the maximum intended load. The required design factor is achieved by taking the current safety factor of 3.5 (required under 05.140(a)(2)(B) and applying the 50 percent derating of the crane capacity which is required by 05.140(a)(8)(C)(1)f.

c. Load and boom hoist drum brakes, swing brakes, and locking devices such as pawls or dogs must be engaged when the occupied personnel platform is in a stationary working position.

d. The load line hoist drum must have a system or device on the power train, other than the load hoist brake, which regulates the lowering rate of speed of the hoist mechanism (controlled load lowering). Free fall is prohibited.

e. The crane must be uniformly level within one percent of level grade and located on firm footing. Cranes equipped with outriggers must have them all fully deployed

following manufacturer's specifications insofar as applicable, when hoisting employees.

f. The total weight of the loaded personnel platform and related rigging may not exceed 50 percent of the rated capacity for the radius and configuration of the crane or derrick.

g. The use of machines having live booms in which lowering is controlled by a brake without aid from other devices which slow the lowering speeds is prohibited.

(11) Instruments and components.

a. Cranes and derricks with variable angle booms must be equipped with a boom angle indicator, readily visible to the operator.

b. Cranes with telescoping booms must be equipped with a device to indicate clearly to the operator, at all times, the boom's extended length, or an accurate determination of the load radius to be used during the lift must be made prior to hoisting personnel.

c. A positive acting device must be used which prevents contact between the load block or overhaul ball and the boom tip (anti-two-blocking device), or a system must be used which deactivates the hoisting action before damage occurs in the event of a two-blocking situation (two block damage prevention feature).

(D) Personnel platforms.

(1) Design criteria.

a. The personnel platform and suspension system must be designed by a

qualified engineer or a qualified person competent in structural design.

b. The suspension system must be designed to minimize tipping of the platform due to movement of employees occupying the platform.

c. The personnel platform itself, except the guardrail system and body belt/harness anchorages, must be capable of supporting, without failure, its own weight and at least five times the maximum intended load. Criteria for guardrail systems and body belt/harness anchorages are contained in Sections 050 and 130 of this subchapter.

(ii) Platform specifications.

a. Each personnel platform must be equipped with a guardrail system which meets the requirements of 05.130, Construction Code, and, must be enclosed at least from the toeboard to mid-rail with either solid construction or expanded metal having openings no greater than 1/2 inch (1.27 cm).

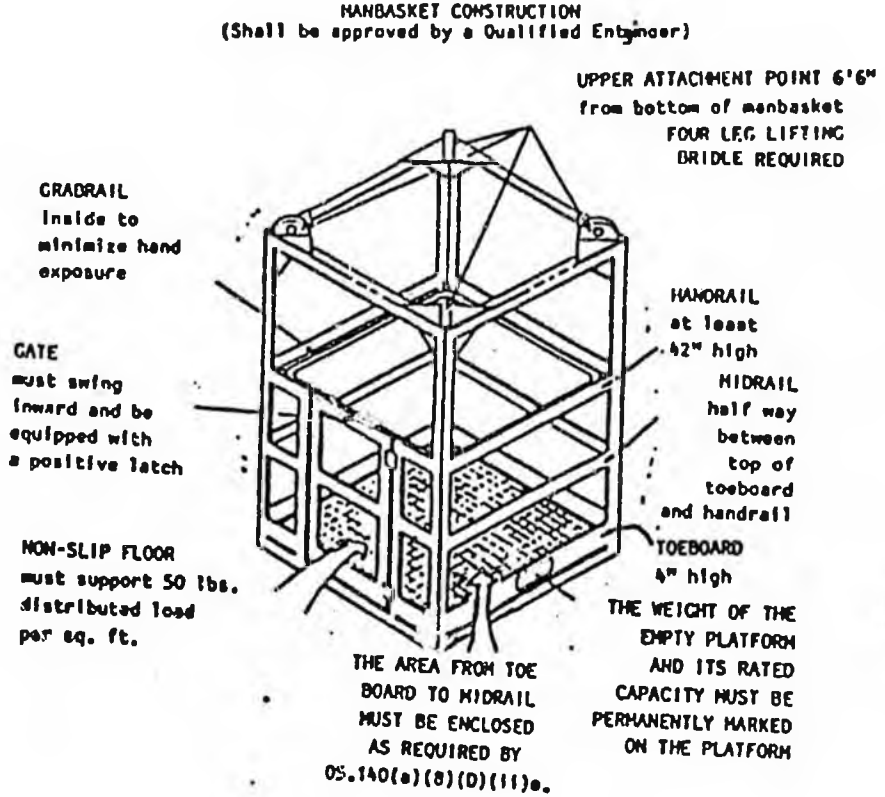
b. A grab rail must be installed inside the entire perimeter of the personnel platform.

c. Access gates, if installed, may not swing outward during hoisting.

d. Access gates, including sliding or folding gates, must be equipped with a restraining device to prevent accidental opening.

e. Headroom must be provided which allows employees to stand upright in the platform.

Figure 8



f. In addition to the use of hard hats, employees shall be protected by overhead protection on the personnel platform when employees are exposed to falling objects.

g. All rough edges exposed to contact by employees must be surfaced or smoothed in order to prevent injury to employees from punctures or lacerations.

h. All welding of the personnel platform and its components must be performed by a qualified welder familiar with the weld grades, types and material specified in the platform design.

i. The personnel platform must be conspicuously posted with a plate or other permanent marking which indicates the weight of the platform and its rated load capacity or maximum intended load.

(iii) Personnel platform loading.

a. The personnel platform may not be loaded in excess of its rated load capacity. When a personnel platform does not have a rated load capacity then the personnel platform may not be loaded in excess of its maximum intended load.

b. The number of employees occupying the personnel platform may not exceed the number required for the work being performed.

c. Personnel platforms may be used only for employees, their tools, and the materials necessary to do their work, and may not be used to hoist only materials or tools when not hoisting personnel.

d. Materials and tools for use during a personnel lift must be secured to prevent displacement.

e. Materials and tools for use during a personnel lift must be evenly distributed within the confines of the platform while the platform is suspended.

(iv) Rigging.

a. When a wire rope bridle is used to connect the personnel platform to the load line, each bridle leg must be connected to a master link or shackle in such a manner to ensure that the load is evenly divided among the bridle legs.

b. Hooks on overhaul ball assemblies, lower load blocks, or other attachment assemblies must be of a type that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used.

c. Wire rope, shackles, rings, master links, and other rigging hardware must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant rope is used, the slings must be capable of supporting without failure at least ten times the maximum intended load.

d. All eyes in wire rope slings must be fabricated with thimbles.

e. Bridles and associated rigging for attaching the personnel platform to the hoist line may be used only for the platform and the necessary employees, their tools and the materials necessary to do their work, and

may not be used for any other purpose when not hoisting personnel.

(E) Trial lift, inspection, and proof testing.

(i) A trial lift with the unoccupied personnel platform loaded at least to the anticipated liftweight must be made from ground level, or any other location where employees will enter the platform, to each location at which the personnel platform is to be hoisted and positioned. This trial lift must be performed immediately prior to placing personnel on the platform. The operator shall determine that all systems, controls and safety devices are activated and functioning properly; that no interferences exist; and that all configurations necessary to reach those work locations will allow the operator to remain under the 50 percent limit of the hoist's rated capacity. Materials and tools to be used during the actual lift can be loaded in the platform, as provided in (D)(iii)d and e of this subsection, for the trial lift. A single trial lift may be performed at one time for all locations that are to be reached from a single set up position.

(ii) The trial lift must be repeated prior to hoisting employees whenever the crane or derrick is moved and set up in a new location or returned to a previously used location. Additionally, the trial lift must be repeated when the lift route is changed unless the operator determines that the route change is not significant (i.e., the route change would not affect the safety of hoisted employees).

(iii) After the trial lift, and just prior to hoisting personnel, the platform must be hoisted a few inches and inspected to ensure that it is secure and properly balanced. Employees shall not be hoisted unless the following conditions are determined to exist:

a. Hoist ropes must be free of kinks;

b. Multiple part lines may not be twisted around each other;

c. The primary attachment must be centered over the platform; and

d. The hoisting system must be inspected if the load rope is slack to ensure all ropes are properly seated on drums and in sheaves.

(iv) A visual inspection of the crane or derrick, rigging, personnel platform, and the crane or derrick base support or ground must be conducted by a competent person immediately after the trial lift to determine whether the testing has exposed any defect or produced any adverse effect upon any component or structure.

(v) Any defects found during inspections which create a safety hazard must be corrected before hoisting personnel.

(vi) At each job site, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging must be proof tested to 125 percent of the platform's rated capacity by holding it in a suspended position for five minutes with the test load evenly distributed on the platform (this may be done concurrently with the trial lift). After proof testing, a competent person shall inspect the platform and rigging. Any deficiencies found must be corrected and another proof test must be conducted. Personnel hoisting may not be conducted until the proof testing requirements are satisfied.

(F) Work practices.

(i) Employees shall keep all parts of the body inside the platform during raising, lowering, and positioning. This provision does not apply to an occupant of the platform performing the duties of a signal person.

(ii) Before employees exit or enter a hoisted personnel platform that is not landed, the platform must be secured to the structure where the work is to be performed, unless securing to the structure creates an unsafe situation.

(iii) Tag lines must be used unless their use creates an unsafe condition.

(iv) The crane or derrick operator shall remain at the controls at all times when the crane engine is running and the platform is occupied.

(v) Hoisting of employees shall be promptly discontinued upon indication of any dangerous weather conditions or other impending danger.

(vi) Employees being hoisted shall remain in continuous sight of and in direct communication with the operator or signal person. In those situations where direct visual contact with the operator is not possible, and the use of a signal person would create a greater hazard for that person, direct communication alone such as by radio may be used.

(vii) Except over water, employees occupying the personnel platform must use a body belt/harness system with lanyard appropriately attached to the lower load block or overhaul ball, or to a structural member within the personnel platform capable of supporting a fall impact for employees using the anchorage. When working over water, the requirements of Section 050(g) of this subchapter apply.

(viii) No lifts may be made on another of the crane's or derrick's loadlines while personnel are suspended on a platform.

(G) Traveling.

(i) Hoisting of employees while the crane is traveling is prohibited, except for portal, tower and locomotive cranes, or where the employer demonstrates that there is no less hazardous way to perform the work.

(ii) Under any circumstances where a crane would travel while hoisting personnel, the employer shall implement the following procedures to safeguard employees:

a. Crane travel must be restricted to a fixed track or runway.

b. Travel must be limited to the load radius of the boom used during the lift.

c. The boom must be parallel to the direction of travel.

d. A complete trial run must be performed to test the route of travel before employees are allowed to occupy the platform. This trial run may be performed at the same time as the trial lift required by (E)(i) of this paragraph which tests the route of the lift.

e. If travel is done with a rubber tired-carrier, the condition and air pressure of the tires must be checked. The chart capacity for lifts on rubber must be used for application of the 50 percent reduction of rated capacity. Notwithstanding (C)(i)e of this subsection, outriggers may be partially retracted as necessary for travel.

(H) Pre-lift meeting.

(i) A meeting attended by the crane or derrick operator, signal person (if necessary for the lift), employees to be lifted, and the person responsible for the task to be performed must be

held to review the appropriate requirements of this paragraph and the procedures to be followed.

(ii) This meeting must be held prior to the trial lift at each new work location, and must be repeated for any employees newly assigned to the operation.

(b) Helicopters.

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safety of the vehicle. Such examination shall be made at least daily. Where industrial trucks are used on a round-the-clock basis, they shall be examined after each shift. Defects when found shall be immediately reported and corrected.

(8) Water mufflers shall be filled daily or as frequently as is necessary to prevent depletion of the supply of water below 75 percent of the filled capacity. Vehicles with mufflers having screens or other parts that may become clogged shall not be operated while such screens or parts are clogged. Any vehicle that emits hazardous sparks or flames from the exhaust system shall immediately be removed from service, and not returned to service until the cause for the emission of such sparks and flames has been eliminated.

(9) When the temperature of any part of any truck is found to be in excess of its normal operating temperature, thus creating a hazardous condition, the vehicle shall be removed from service until the cause for such overheating has been eliminated.

(10) Industrial trucks shall be kept in a clean condition, free of lint, excess oil, and grease. Noncombustible agents should be used for cleaning trucks. Low flash point (below 100° F.) solvents shall not be used. High flash point (at or above 100° F.) solvents may be used. Precautions regarding toxicity, ventilation, and fire hazard shall be constant with the agent or solvent used.

(11) Revoked.

(12) Industrial trucks originally approved for the use of gasoline for fuel may be converted to liquefied petroleum gas fuel provided the complete conversion results in a truck which embodies the features specified for LP or LPS designated trucks. Such conversion equipment shall be approved. The description of the component parts of this conversion system and the recommended method of installation on specific trucks are contained in the "Listed by Report."

01.0704 OVERHEAD AND GANTRY CRANES. (a) Definitions applicable to 01.0704.

(1) A "crane" is a machine for lifting and lowering a load and moving it horizontally, with the hoisting mechanism an integral part of the machine. Cranes, whether fixed or mobile are driven manually or by power.

(2) An "automatic crane" is a crane which when activated operates through a preset cycle or cycles.

(3) A "cab-operated crane" is a crane controlled by an operator in a cab located on the bridge or trolley.

(4) "Cantilever gantry crane" means a gantry or semigantry crane in which the bridge girders or trusses extend transversely beyond the crane runway on one or both sides.

(5) "Floor-operated crane" means a crane which is pendant or nonconductive rope controlled by an operator on the floor or an independent platform.

(6) "Gantry crane" means a crane similar to an overhead crane except that the bridge for carrying the trolley or trolleys is rigidly supported on two or more legs running on fixed rails or other runway.

(7) "Hot metal handling crane" means an overhead crane used for transporting or pouring molten material.

(8) "Overhead crane" means a crane with a movable bridge carrying a removable or fixed hoisting mechanism and traveling on an overhead fixed runway structure.

(9) "Power-operated crane" means a crane whose mechanism is driven by electric, air, hydraulic, or internal combustion means.

(10) A "pulpit-operated crane" is a crane operated from a fixed operator station not attached to the crane.

(11) A "remote-operated crane" is a crane controlled by an operator not in pulpit or in the cab attached to the crane, by any method other than pendant or rope control.

(12) A "semigantry crane" is a gantry crane with one end of the bridge rigidly supported on one or more legs that

run on a fixed rail or runway, the other end of the bridge being supported by a truck running on an elevated rail or runway.

(13) "Storage bridge crane" means gantry type crane of long span usually used for bulk storage of material; ;the bridge girders or trusses are rigidly or nonrigidly supported on one or more legs. It may have one or more fixed or hinged cantilever ends.

(14) "Wall crane" means a crane having a jib with or without trolley and supported from a side wall or line of columns of a building. It is a traveling type and operates on a runway attached to the side wall or columns.

(15) "Appointed" means assigned specific responsibilities by the employer or the employer's representatives.

(16) "ANSI" means the American National Standards Institute.

(17) An "auxiliary hoist" is a supplemental hoisting unit of lighter capacity and usually higher speed than provided for the main hoist.

(18) A "brake" is a device used for retarding or stopping motion by friction or power means.

(19) A "drag brake" is a brake which provides retarding force without external control.

(20) A "holding brake" is a brake that automatically prevents motion when power is off.

(21) "Bridge" means that part of a crane consisting of girders, trucks, end ties, footwalks, and drive mechanism which carries the trolley or trolleys.

(22) "Bridge travel" means the crane movement in a direction parallel to the crane runway.

(23) A "bumper" (buffer) is an energy absorbing device for reducing impact when a moving crane or trolley

reaches the end of its permitted travel; or when two moving cranes or trolleys come in contact.

(24) The "cab" is the operator's compartment on a crane.

(25) "Clearance" means the distance from any part of the crane to a point of the nearest obstruction.

(26) "Collectors" (current) are contacting devices for collecting current from runway or bridge conductors.

(27) "Conductors, bridge" are the electrical conductors located along the bridge structure of a crane to provide power to the trolley.

(28) "Conductors, runway" (main) are the electrical conductors located along a crane runway to provide power to the crane.

(29) The "control braking means" is a method of controlling crane motor speed when in an overhauling condition.

(30) "Countertorque" means a method of control by which the power to the motor is reversed to develop torque in the opposite direction.

(31) "Dynamic" means a method of controlling crane motor speeds when in the overhauling condition to provide a retarding force.

(32) "Regenerative" means a form of dynamic braking in which the electrical energy generated is fed back into the power system.

(33) "Mechanical" means a method of control by friction.

(34) "Controller, spring return" means a controller which when released will return automatically to a neutral position.

(35) "Designated" means selected or assigned by the employer or the employer's representative as being qualified to perform specific duties.

(36) A "drift point" means a point on a travel motion controller which releases the brake while the motor is not energized. This allows for coasting before the brake is set.

(37) The "drum" is the cylindrical member around which the ropes are wound for raising or lowering the load.

(38) An "equalizer" is a device which compensates for unequal length or stretch of rope.

(39) "Exposed" means capable of being contacted inadvertently. Applied to hazardous objects not adequately guarded or isolated.

(40) "Fail-safe" means a provision designed to automatically stop or safely control any motion in which a malfunction occurs.

(41) "Footwalk" means the walkway with handrail, attached to the bridge or trolley for access purposes.

(42) A "hoist" is an apparatus which may be a part of a crane, exerting a force for lifting or lowering.

(43) "Hoist chain" means the load bearing chain in a hoist. Note: Chain properties do not conform to those shown in ANSI B30.9-1971, Safety Code for Slings.

(44) "Hoist motion" means that motion of a crane which raises and lowers a load.

(45) "Load" means the total superimposed weight on the load block or hook.

(46) The "load block" is the assembly of hook or shackle, swivel, bearing, sheaves, pins, and frame suspended by the hoisting rope.

(47) "Magnet" means an electromagnetic device carried on a crane hook to pick up loads magnetically.

(48) "Main hoist" means the hoist mechanism provided for lifting the maximum rated load.

(49) A "man trolley" is a trolley having an operator's cab attached thereto.

(50) "Rated load" means the maximum load for which a crane or individual hoist is designed and built by the manufacturer and shown on the equipment nameplate(s).

(51) "Rope" refers to wire rope, unless otherwise specified.

(52) "Running sheave" means a sheave which rotates as the load block is raised or lowered.

(53) "Runway" means an assembly of rails, beams, girders, brackets, and framework on which the crane or trolley travels.

(54) "Side pull" means that portion of the hoist pull acting horizontally when the hoist lines are not operated vertically.

(55) "Span" means the horizontal distance center to center of runway rails.

(56) "Standby crane" means a crane which is not in regular service but which is used occasionally or intermittently as required.

(57) A "stop" is a device to limit travel of a trolley or crane bridge. This device is normally attached to a fixed structure and normally does not have energy absorbing ability.

(58) A "switch" is a device for making, breaking, or for changing the connections in an electric circuit.

(59) An "emergency stopswitch" is a manually or automatically operated electric switch to cut off electric power independently of the regular operating controls.

(60) A "limit switch" is a switch which is operated by some part or motion of a power-driven machine or equipment to alter the electric circuit associated with the machine or equipment.

(61) A "main switch" is a switch controlling the entire power supply to the crane.

(62) A "master switch" is a switch which dominates the operation of contractors, relays, or other remotely operated devices.

(63) The "trolley" is the unit which travels on the bridge rails and carries the hoisting mechanism.

(64) "Trolley travel" means the trolley movement at right angles to the crane runway.

(65) "Truck" means the unit consisting of a frame, wheels, bearings and axles which supports the bridge girders or trolleys.

(b) General requirements:

(1) Application. 01.0704 applies to overhead and gantry cranes, including semigantry, cantilever gantry, wall cranes, storage bridge cranes, and others having the same fundmental characteristics. These cranes are grouped because they all have trolleys and similar travel characteristics.

(2) New and existing equipment. All new overhead and gantry cranes constructed and installed on or after August 31, 1971, must meet the design specifications of the American National Standard Safety Code for Overhead and Gantry Cranes, ANSI B30.2.0- 967. Overhead and gantry cranes constructed before August 31, 1971 must be modified to conform to those design specifications, unless it can be shown that the crane cannot feasibly or economically be altered and that the crane substantially complies with the requirements of this section.

(3) Modifications. Cranes may be modified and rerated provided such modifications and the supporting structure are checked thoroughly for the new rated load by a qualified engineer or the equipment manufacturer. The crane

shall be tested in accordance with 01.0704(k)(2). New rated load shall be displayed in accordance with 01.0704(b)(5).

(4) Wind indicators and rail clamps. Outdoor storage bridges shall be provided with automatic rail clamps. A wind-indicating device shall be provided which will give a visible or audible alarm to the bridge operator at a predetermined wind velocity. If the clamps act on the rail heads, any beads or weld flash on the rail heads shall be ground off.

(5) Rated load marking. The rated load of the crane shall be plainly marked on each side of the crane, and if the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or on its load block and this marking shall be clearly legible from the ground or floor.

(6) Clearance from obstruction.

(A) Minimum clearance of three inches overhead and two inches laterally shall be provided and maintained between crane and obstructions in conformity with Crane Manufacturers Association of America, Inc., Specification No. 61, (formerly the Electric Overhead Crane Institute Inc.).

(B) Where passageways or walkways are provided obstructions shall not be placed so the safety of personnel will be jeopardized by movements of the crane.

(7) Clearance between parallel cranes. If the runways of two cranes are parallel, and there are no intervening walls or structure, there shall be adequate clearance provided and maintained between the two bridges.

(8) Designated personnel. Only designated personnel shall be permitted to operate a crane covered by this section.

(c) Cabs.

(1) Cab location.

(A) The general arrangement of the cab and the location of control and protective equipment shall be

such that all operating handles are within convenient reach of the operator when facing the area to be served by the load hook, or while facing the direction of travel of the cab. The arrangement shall allow the operator a full view of the load hook in all positions.

(B) The cab shall be located to afford a minimum of three inches clearance from all fixed structures within its area of possible movement.

(C) Repealed 9/12/84.

(2) Access to crane. Access to the cab and/or bridge walkway shall be by a conveniently placed fixed ladder, stairs, or platform, requiring no step over any gap exceeding 12 inches. Fixed ladders shall be in conformance with ANSI A14.3-1956.

(3) Fire extinguisher. A carbon dioxide, dry chemical, or equivalent hand fire extinguisher must be kept in the cab. Carbon tetrachloride extinguishers must not be used.

(4) Lighting. Light in the cab shall be sufficient to enable the operator to see clearly enough to perform his work.

(d) Footwalks and ladders:

(1) Location of footwalks. If sufficient headroom is available on cab-operated cranes, a footwalk must be provided on the drive side along the entire length of the bridge of all cranes having the trolley running on the top of the girders. In no case may less than 48 inches of headroom be provided.

(2) Construction of footwalks.

(A) Footwalks shall be of rigid construction and designed to sustain a distributed load of at least 50 pounds per square foot.

(B) Footwalks shall have a walking surface of anti-slip type. Note: Wood will meet this requirement.

R 9/12/84

(C) Repealed 9/12/84.

(D) The inner edge shall extend at least to the line of the outside edge of the lower cover plate or flange of the girder.

(3) Toeboards and handrails for footwalks. Toeboards and handrails shall be in compliance with sec 1103 of this subchapter.

(4) Ladders and stairways.

(A) Gantry cranes shall be provided with ladders or stairways extending from the ground to the footwalk or cab platform.

(B) Stairways shall be equipped with rigid and substantial metal handrails. Walking surface shall be of an anti-slip type.

(C) Ladders shall be permanently and securely fastened in place and shall be constructed in compliance with sec. 1107 of this subchapter.

(e) Stops, bumpers, rail sweeps, and guards.

(1) Trolley stops.

(A) Stops shall be provided at the limits of travel of the trolley.

(B) Stops shall be fastened to resist forces applied when contacted.

(C) A stop engaging the tread of the wheel shall be of a height at least equal to the radius of the wheel.

(2) Bridge bumpers.

(A) A crane shall be provided with bumpers or other automatic means providing equivalent effect, unless the crane travels at a slow rate of speed and has a faster deceleration rate due to the use of sleeve

bearings, or is not operated near the ends of bridge and trolley travel, or is restricted to a limited distance by the nature of the crane operation and there is no hazard of striking any object in this limited distance, or is used in similar operating conditions. The bumpers shall be capable of stopping the crane (not including the lifted load) at an average rate of deceleration not to exceed three feet/s/s when traveling in either direction at 20 percent of the rated load speed.

(B) Bumpers shall be so designed and installed as to minimize parts falling from the crane in case of breakage.

(3) trolley bumpers.

(A) A trolley shall be provided with bumpers or other automatic means of equivalent effect, unless the trolley travels at a slow rate of speed, or is not operated near the ends of bridge and trolley travel, or is restricted to a limited distance of the runway and there is no hazard of striking any object in this limited distance, or is used in similar operating conditions. The bumpers shall be capable of stopping the trolley (not including the lifted load) at an average rate of deceleration not to exceed 4.7 feet/s/s when traveling in either direction at one third of the rated load speed.

(B) When more than one trolley is operated on the same bridge, each shall be equipped with bumpers on their adjacent ends.

(C) Bumpers shall be designed and installed to minimize parts falling from the trolley in case of breakage.

(4) Rail sweeps. Bridge trucks shall be equipped with sweeps which extend below the top of the rail and project in front of the truck wheels.

(5) Guards for hoisting ropes.

(A) If hoisting ropes run near enough to other parts to make fouling or chafing possible, guards shall be installed to prevent this condition.

(B) A guard shall be provided to prevent contact between bridge conductors and hoisting ropes if they could come into contact.

(6) Guards for moving parts.

(A) Exposed moving parts such as gears set screws, projecting keys, chains, chain sprockets, and reciprocating components which might constitute a hazard under normal operating conditions shall be guarded.

(B) Guards shall be securely fastened.

(C) Each guard shall be capable of supporting without permanent distortion the weight of a 200 pound person unless the guard is located where it is impossible for a person to step on it.

(f) Brakes.

(1) Brakes for hoists.

(A) Each independent hoisting unit of a crane shall be equipped with at least one self-setting brake, hereafter referred to as a holding brake, applied directly to the motor shaft or some part of the gear train.

(B) Each independent hoisting unit of a crane, except worm-geared hoists, the angle of whose worm is such as to prevent the load from accelerating in the lowering direction shall, in addition to a holding brake, be equipped with control braking means to prevent overspeeding.

(2) Holding brakes.

(A) Holding brakes for hoist motors shall have not less than the following percentage of the full load hoisting torque at the point where the brake is applied.

(i) 125 percent when used in a control braking means other than mechanical.

(ii) 100 percent when used in conjunction with a mechanical braking means.

(iii) 100 percent each if two holding brakes are provided.

(B) Holding brakes on hoists shall have ample thermal capacity for the frequency of operation required by the service.

(C) Holding brakes on hoists shall be applied automatically when power is removed.

(D) Where necessary holding brakes shall be provided with adjustment means to compensate for wear.

(E) The wearing surface of all holding-brake drums or discs shall be smooth.

(F) Each independent hoisting unit of a crane handling hot metal and having power control braking means shall be equipped with at least two holding brakes.

(3) Control braking means.

(A) A power control braking means such as regenerative, dynamic or countertorque braking, or a mechanically controlled braking means shall be capable of maintaining safe lowering speeds of rated loads.

(B) The control braking means shall have ample thermal capacity for the frequency of operation required by service.

(4) Brakes for trolleys and bridges.

(A) Foot operated brakes shall not require an applied force of more than 70 pounds to develop manufacturer's rated brake torque.

(B) Brakes may be applied by mechanical, electrical, pneumatic, hydraulic, or gravity means.

(C) Where necessary, brakes shall be provided with adjustment means to compensate for wear.

(D) The wearing surface of all brake-drums or discs shall be smooth.

(E) All foot-brake pedals shall be constructed so that the operator's foot will not easily slip off the pedal.

(F) Foot-operated brakes shall be equipped with automatic means for positive release when pressure is released from the pedal.

(G) Brakes for stopping the motion of the trolley or bridge shall be of sufficient size to stop the trolley or bridge within a distance in feet equal to 10 percent of full load speed in feet per minute when traveling at full speed with full load.

(H) If holding brakes are provided on the bridge or trolley(s), they shall not prohibit the use of a drift point in the control circuit.

(I) Brakes on trolleys and bridges shall have ample thermal capacity for the frequency of operation required by the service to prevent impairment of functions from overheating.

(5) Application of trolley brakes.

(A) On cab-operated cranes with cab on trolley, a trolley brake shall be required as specified under 01.0704(f)(4).

(B) A drag brake may be applied to hold the trolley in a desired position on the bridge and to eliminate creep with the power off.

(6) Application of bridge brakes.

(A) On cab-operated cranes with cab on bridge, a bridge brake is required as specified under 01.0704(f)(4).

(B) On cab-operated cranes with cab on trolley, a bridge brake of the holding type shall be required.

(C) On all floor, remote and pulpit-operated crane bridge drives, a brake or noncoasting mechanical drive shall be provided.

(g) Electrical equipment:

(1) General.

(A) Wiring and equipment shall comply with the requirements of Subchapter 3, Electrical Code, AOSAHS.

(B) The control circuit voltage shall not exceed 600 volts for a.c. or d.c. current.

(C) The voltage at pendant pushbutton shall not exceed 150 volts for a.c. and 300 volts for d.c.

(D) Where multiple conductor cable is used, the suspended pushbutton station must be supported in some satisfactory manner that will protect the electrical conductors against strain.

(E) Pendant control boxes shall be constructed to prevent electrical shock and shall be clearly marked for identification of functions.

(2) Equipment.

(A) Electrical equipment shall be so located or enclosed that live parts will not be exposed to accidental contact under normal operating conditions.

(B) Electrical equipment shall be protected from dirt, grease, oil and moisture.

(C) Guards for live parts shall be substantial and so located that they cannot be accidently deformed so as to make contact with the live parts.

(3) Controllers.

(A) Cranes not equipped with spring-return controllers or momentary contact pushbuttons shall be provided with a device which will disconnect all motors from the line of failure of power and will not permit any motors to be restarted until the controller handle is brought to the "off" position, or a reset switch or button is operated.

(B) Lever operated controllers shall be provided with a notch or latch which in the "off" position prevents the handle from being inadvertently moved to the "on" position. An "off" detent or spring return arrangement is acceptable.

(C) The controller operating handle shall be located within convenient reach of the operator.

(D) As far as practicable, the movement of each controller handle shall be in the same general direction as the resultant movements of the load.

(E) The control for the bridge and trolley travel shall be so located that the operator can readily face the direction of travel.

(F) For floor-operated cranes, the controller or controllers if rope operated, shall automatically return to the "off" position when released by the operator.

(G) Pushbuttons in pendant stations shall return to the "off" position when pressure is released by the crane operator.

(H) Automatic cranes shall be so designated that all motions shall fail-safe if any malfunction of operation occurs.

(I) Remote-operated cranes shall function so that if the control signal for any crane motion becomes ineffective that crane motion shall stop.

(4) Resistors.

(A) Enclosures for resistors shall have openings to provide adequate ventilation, and shall be installed to prevent the accumulation of combustible matter too near to hot parts.

(B) Resistor units shall be supported so as to be free as possible from vibration.

(C) Provision shall be made to prevent broken parts or molten metal falling upon the operator or from the crane.

(5) Switches.

(A) The power supply to the runway conductors shall be controlled by a switch or circuit breaker located on a fixed structure, accessible from the floor, and arranged to be locked in the open position.

(B) On cab-operated cranes a switch or circuit breaker of the enclosed type, with provision for locking in the open position shall be provided in the leads from the runway conductors. A means of opening this switch or circuit breaker shall be located within easy reach of the operator.

(C) On floor-operated cranes, a switch or circuit breaker of the enclosed type, with provision for locking in the open position, shall be provided in the leads from the runway conductors. This disconnect shall be mounted on the bridge or footwalk near the runway collectors. One of the following types of floor operated disconnects shall be provided:

(i) Nonconductive rope attached to the main disconnect switch.

(ii) An undervoltage trip for the main circuit breaker operated by an emergency stop button in the pendant pushbutton station.

(iii) A main line contactor operated by a switch or pushbutton in the pendant pushbutton station.

(D) The hoisting motion of all electric traveling cranes shall be provided with an overtravel limit switch in the hoisting direction.

(E) All cranes using a lifting magnet shall have a magnet circuit switch of the enclosed type with provision for locking in the open position. Means for discharging the inductive load of the magnet shall be provided.

(6) Runway conductors. Conductors of the open type mounted on the crane runway beams or overhead shall be so located or so guarded that persons entering or leaving the cab or crane footwalk normally could not come into contact with them.

lamps. If a service receptacle is provi[illegible] cab or on the bridge of cab-operated cranes, it [illegible] grounded three-prong type permanent receptacle, no[illegible]ing 300 volts.

.h) Hoisting equipment:

(1) Sheaves.

(A) Sheaves grooves shall be smooth and free from surface defects which could cause rope damage.

(B) Sheaves carrying ropes which can be momentarily unloaded shall be provided with close-fitting guards or other suitable devices to guide the rope back into the groove when the load is applied again.

(C) The sheaves in the bottom block shall be equipped with close-fitting guards that will prevent

ropes from becoming fouled when the block is lying on the ground with ropes loose.

(D) Pockets and flanges of sheaves used with hoist chains shall be of such dimensions that the chain does not catch or bind during operation.

(E) All running sheaves shall be equipped with means for lubrication. Permanently lubricated, sealed and/or shielded bearings meet this requirement.

(2) Ropes.

(A) In using hoisting ropes, the crane manufacturer's recommendations shall be followed. The rated load divided by the number of parts of rope shall not exceed 20 percent of the nominal breaking strength of the rope.

(B) Socketing shall be done in the manner specified by the manufacturer of the assembly.

(C) Rope shall be secured to the drum as follows:

(i) No less than two wraps of rope shall remain on the drum when the hook is in its extreme low position.

(ii) Rope end shall be anchored by a clamp securely attached to the drum, or by a socket arrangement approved by the crane or rope manufacturer.

(D) Eye splices. (Reserved)

(E) Rope clips attached with U-bolts shall have the U-bolts on the dead or short end of the rope., Spacing and number of all types of clips shall be in accordance with the clip manufacturer's recommendation. Clips shall be a drop-forged steel in all sizes manufactured commercially. When a newly installed rope has been in operation for an hour, all nuts on the clip bolts shall be retightened.

(F) Swaged or compressed fittings shall be applied as recommended by the rope or crane manufacturer.

(G) Wherever exposed to temperatures, at which fiber cores would be damaged, rope having an independent wire-rope or wire-stand core, or other temperature-damage resistant core shall be used.

(H) Replacement rope shall be the same size, grade, and construction as the original rope furnished by the crane manufacturer, unless otherwise recommended by a wire rope manufacturer due to actual working condition requirements.

(3) Equalizers. If a load is supported by more than one part of rope, the tension in the parts shall be equalized.

(4) Hooks. Hooks shall meet the manufacturer's recommendations and shall not be overloaded.

(i) Warning device. Except for floor-operated cranes a gong or other effective warning signal shall be provided for each crane equipped with a power traveling mechanism.

(j) Inspection:

(1) Inspection classification.

(A) Initial inspection. Prior to initial use all new and altered cranes shall be inspected to insure compliance with the provisions of 01.0704.

(B) Inspection procedure for cranes in regular service is divided into two general classifications based upon the intervals at which inspection should be performed. The intervals in turn are dependent upon the nature of the critical components of the crane and the degree of their exposure to wear, deterioration, or malfunction. The two general classifications are herein designated as "frequent" and "periodic" with respective intervals between inspections as defined below:

(i) Frequent inspection - Daily to monthly intervals.

(ii) Periodic inspection - 1 to 12 months intervals.

(2) Frequent inspection. The following items shall be inspected for defects at intervals as defined in 01.0704(j)(1)(B) or as specifically indicated, including observation during operation for any defects which might appear between regular inspections. All deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard:

(A) All functional operating mechanisms for maladjustment interfering with proper operation. Daily.

(B) Deterioration or leakage in lines, tanks, valves, drain pumps, and other parts of air or hydraulic systems. Daily.

(C) Hooks with deformation or cracks. Visual inspection daily; monthly inspection with a certification record which includes the date of inspection, the signature of the person who performed the inspection and the serial number, or other identifier, of the hook inspected. For hooks with cracks or having more than 15 percent in excess of normal throat opening or more than 10° twist from the plane of the unbent hook refer to 01.0704(1)(3)(C)(i).

(D) Hoist chains, including end connections, for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations. Visual inspection daily; monthly inspection with a certification record which includes the date of inspection, the signature of the person who performed the inspection and an identifier of the chain which was inspected.

(E) Revoked.

(F) All functional operating mechanisms for excessive wear of components.

(G) Rope reeving for noncompliance with manufacturer's recommendations.

(3) Periodic inspection. Complete inspections of the crane shall be performed at intervals as generally defined

in 01.0704(j)(1)(B)(ii), depending upon its activity, severity of service, and environment, or as specifically indicated below. These inspections shall include the requirements of 01.0704(j)(2) and in addition the following items. Any deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard:

(A) Deformed, cracked, or corroded members.

(B) Loose bolts or rivets.

(C) Cracked or worn sheaves and drums.

(D) Worn, cracked or distorted parts such as pins, bearings, shafts, gears, rollers, locking and clamping devices.

(E) Excessive wear on brake system parts, linings, pawls, and ratchets.

(F) Load, wind, and other indicators over their full range, for any significant inaccuracies.

(G) Gasoline, diesel, electric, or other powerplants for improper performance or noncompliance with applicable safety requirements.

(H) Excessive wear of chain drive sprockets and excessive chain stretch.

(I) Repealed 9/12/84.

(J) Electrical apparatus, for signs of pitting or any deterioration of controller containers, limit switches and pushbutton stations.

(4) Cranes not in regular use.

(A) A crane which has been idle for a period of 1 month or more, but less than 6 months, shall be given an inspection conforming with requirements of 01.0704(j)(2) and 01.0704(m)(2) before placing in service.

(B) A crane which has been idle for a period of over 6 months shall be given a complete inspection conforming with requirements of 01.0704(j)(2) and (3), and 01.0704(m)(2) before placing in service.

(C) Standby cranes shall be inspected at least semi-annually in accordance with requirements of (2) of this subsection and (m)(2) of this section.

(k) Testing.

(1) Operational tests.

(A) Prior to initial use all new and altered cranes shall be tested to insure compliance with 01.0704 including the following functions:

(i) Hoisting and lowering.

(ii) Trolley travel.

(iii) Bridge travel.

(iv) Limit switches, locking and safety devices.

(v) The trip setting of hoist limit switches shall be determined by tests with an empty hook traveling in increasing speeds up to the maximum speed. The actuating mechanism of the limit switch shall be located so that it will trip the switch, under all conditions, in sufficient time to prevent contact of the hook or hook block with any part of the trolley.

(2) Rated load test. Before initial use all new, extensively repaired, and altered cranes must be tested by or under the direction of an appointed or authorized person, confirming the load rating of the crane. The load rating must not be more than 80 percent of the maximum load sustained during the test. Test loads must not be more than 125 percent of the rated load unless otherwise recommended by the manufacturer. The test reports must be placed on file where readily available to appointed personnel.

R 9/12/84

(l) Maintenance.

(1) Preventive maintenance. A preventive maintenance program based on the crane manufacturer's recommendation shall be established.

(2) Maintenance procedure.

(A) Before adjustments and repairs are started on a crane the following precautions shall be taken:

(i) The crane to be repaired shall be run to a location where it will cause the least interference with other cranes and operation in the area.

(ii) All controllers shall be at the off position.

(iii) The main or emergency switch shall be open and locked in the open position.

(iv) Repealed 9/12/84.

(v) Where other cranes are in operation on the same runway, rail stops or other suitable means shall be provided to prevent interference with the idle crane.

(vi) Where temporary protective rail stops are not available, or practical, a signalman should be placed at a visual vantage point for observing the approach of an active crane and warning its operator when reaching the limit of safe distance from the idle crane.

(B) After adjustments and repairs have been made the crane shall not be operated until all guards have been reinstalled, safety devices reactivated and maintenance equipment removed.

(3) Adjustments and repair.

(A) Any unsafe conditions disclosed by the inspection requirements of 01.0704(j) shall be corrected

before operation of the crane is resumed. Adjustments and repairs shall be done only by designated personnel.

(B) Adjustments shall be maintained to assure correct functioning of components. The following are examples:

(i) All functional operating mechanisms.

(ii) Limit switches.

(iii) Control systems.

(iv) Brakes.

(v) Power plants.

(C) Repairs or replacements shall be provided promptly as needed for safe operation. The following are examples:

(i) Crane hooks showing defects described in 01.0704(j)(2)(C) shall be discarded. Repairs by welding or reshaping are not generally recommended. If such repairs are attempted they shall only be done under competent supervision and the hook shall be tested to the load requirements of 01.0704(k)(2) before further use.

(ii) Load attachment chains and rope slings showing defects described in 01.0704(j)(2)(D).

(iii) All critical parts which are cracked, broken, bent, or excessively worn.

(iv) Pendant control stations shall be kept clean and function label kept legible.

(m) Rope inspection:

(1) Running ropes. A thorough inspection of all ropes must be made at least once a month and a certification record which includes the date of inspection, the signature of

the person who performed the inspection and an identifier for the ropes which were inspected must be kept on file where readily available to appointed personnel. Any deterioration, resulting in appreciable loss of original strength, must be observed and determination made as to whether further use of the rope would constitute a safety hazard. Some of the conditions that could result in an appreciable loss of strength are the following:

(A) Reduction of rope diameter below nominal diameter due to loss of core support, internal or external corrosion, or wear of outside wires.

(B) A number of broken outside wires and the degree of distribution or concentration of such broken wires.

(C) Worn outside wires.

(D) Corroded or broken wires at end connections.

(E) Corroded, cracked, bent, worn, or improperly applied end connections.

(F) Severe kinking, crushing, cutting or unstranding.

(2) Other ropes. All rope which has been idle for a period of a month or more due to shutdown or storage of a crane on which it is installed must be given a thorough inspection before it is used. This inspection must be for all types of deterioration and must be performed by an appointed person whose approval must be required for further use of the rope. A certification record must be available for inspection which includes the date of inspection, the signature of the person who performed the inspection and an identifier for the rope which was inspected.

(n) Handling the load:

(1) Size of load. The crane shall not be loaded beyond its rated load except for test purposes as provided in 01.0704(k).

(2) Attaching the load.

(A) The hoist chain or hoist rope shall be free from kinks or twists and shall not be wrapped around the load.

(B) The load shall be attached to the load block hook by means of slings or other approved devices.

(C) Care shall be taken to make certain that the sling clears all obstacles.

(3) Moving the load.

(A) The load shall be well secured and properly balanced in the sling or lifting device before it is lifted more than a few inches.

(B) Before starting to hoist the following conditions shall be noted:

(i) Hoist rope shall not be kinked.

(ii) Multiple part lines shall not be twisted around each other.

(iii) The hook shall be brought over the load in such a manner as to prevent swinging.

(C) During hoisting care shall be taken that:

(i) There is no sudden acceleration or deceleration of the moving load.

(ii) The load does not contact any obstructions.

(D) Cranes shall not be used for side pulls except when specifically authorized by a responsible person who has determined that the stability of the crane is not thereby endangered and that various parts of the crane will not be overstressed.

(E) While any employee is on the load or hook, there shall be no hoisting, lowering, or traveling.

(F) The employer shall require that the operator avoid carrying loads over people.

(G) The operator shall test the brakes each time a load approaching the rated load is handled. The brakes shall be tested by raising the load a few inches and applying the brakes.

(H) The load shall not be lowered below the point where less than two full wraps of rope remain on the hoisting drum.

(I) When two or more cranes are used to lift a load one qualified responsible person shall be in charge of the operation. He shall analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made.

(J) The employer shall insure that the operator does not leave his position at the controls while the load is suspended.

(K) When starting the bridge and when the load or hook approaches near or over personnel, the warning signal shall be sounded.

(4) Hoist limit switch.

(A) At the beginning of each operator's shift, the upper limit switch of each hoist shall be tried out under no load. Extreme care shall be exercised; the block shall be "inched" into the limit or run in at slow speed. If the switch does not operate properly, the appointed person shall be immediately notified.

(B) The hoist limit switch which controls the upper limit of travel of the load block shall never be used as an operating control.

(o) Other requirements, general:

(1) Ladders.

(A) The employer shall insure that hands are free from encumbrances while personnel are using ladders.

(B) Articles which are too large to be carried in pockets or belts shall be lifted and lowered by hand lines.

(2) Cabs.

(A) Necessary clothing and personal belongings shall be stored in such a manner as not to interfere with access or operation.

(B) Tools, oil cans, waste, extra fuses, and other necessary articles shall be stored in the tool box, and shall not be permitted to lie loose in or about the cab.

(3) Fire extinguishers. The employer shall insure that operators are familiar with the operation and care of fire extinguishers provided.

01.0705 CRAWLER, LOCOMOTIVE AND TRUCK CRANES. (a) Definitions applicable to 01.0705.

(1) A "crawler crane" consists of a rotating superstructure with power plant, operating machinery, and boom mounted on a base, equipped with crawler treads for travel. Its function is to hoist and swing loads at various radii.

(2) A "locomotive crane" consists of a rotating superstructure with power plant, operating machinery and boom, mounted on a base or car equipped for travel on railroad track. It may be self-propelled or propelled by an outside source. Its function is to hoist and swing loads at various radii.

(3) A "truck crane" consists of a roating superstructure with power plant, operating machinery and boom, mounted on an automotive truck equipped with a power plant for travel. Its function is to hoist and swing loads at various radii.

(4) A "wheel mounted crane" (wagon crane) consists of a rotating superstructure with power plant, operating machinery and boom, mounted on a base or platform equipped with axled and rubber-tired wheels for travel. The base is usually propelled by the engine in the superstructure, but it may be equipped with a separate engine controlled from the superstructure. Its function is to hoist and swing loads at various radii.

(5) An "accessory" is a secondary part or assembly of parts which contributes to the overall function and usefulness of a machine.

(6) "Appointed" means assigned specific responsibilities by the employer or the employer's representative.

(7) "ANSI" means the American National Standard Institute.

(8) An "angle indicator" (boom) is an accessory which measures the angle of the boom to the horizontal.

(9) The "axis of rotation" is the vertical axis around which the crane superstructure rotates.

(10) "Axle" means the shaft or spindle with which or about which a wheel rotates. On truck and wheel mounted cranes it refers to an automotive type of axle assembly including housings, gearing, differential, bearings, and mounting appurtenances.

(11) "Axle" (bogie) means two or more automotive-type axles mounted in tandem in a frame so as to divide the load between the axles and permit vertical oscilation of the wheels.

(12) The "base" (mounting) is the traveling base or carrier on which the rotating superstructure is mounted such as a car, truck, crawler or wheel platform.

(13) The "boom" (crane) is a member hinged to the front of the rotating superstructure with the outer end supported by ropes leading to a gantry or "A: frame and used for supporting the hoisting tackle.

(14) The "boom angle" is the angle between the longitudinal centerline of the boom and the horizontal. The boom longitudinal centerline is a straight line between the boom foot pin (heel pin) centerline and boom point sheave pin centerline.

(15) The "boom hoist" is a hoist drum and rope reeving system used to raise and lower the boom. The rope system may be all live reeving or a combination of live reeving and pendants.

(16) The "boom stop" is a device used to limit the angle of the boom at the highest position.

(17) A "brake" is a device for retarding or stopping motion by friction or power means.

(18) A "cab" is housing which covers the rotating super-structure machinery and/or operator's station. On truck-crane trucks a separate cab covers the driver's station.

(19) The "clutch" is a friction, electromagnetic, hydraulic, pneumatic, or positive mechanical device for engagement or disengagement of power.

(20) The "counterweight" is a weight used to supplement the weight of the machine in providing stability for lifting working loads.

(21) "Designated" means selected or assigned by the employer or the employer's representative as being qualified to perform specific duties.

(22) The "drum" is the cylindrical member around which ropes are wound for raising and lowering the load or boom.

(23) "Dynamic" (loading) means load introduced into the machine or its components by forces in motion.

(24) The "gantry" (A-frame) is a structural frame, extending above the superstructure, to which the boom support ropes are reeved.

(25) A "jib" is an extension attached to the boom point to provide added boom length for lifting specified loads. The jib may be in line with the boom or offset to various angles.

(26) "Load" (working) means the external load, in pounds, applied to the crane, including the weight of load-attaching equipment such as load blocks, shackles, and slings.

(27) "Load block" (upper) means the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended from the boom point.

(28) "Load block" (lower) means the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended by the hoisting ropes.

(29) A "load hoist" is a hoist drum and rope reeving system used for hoisting and lowering loads.

(30) "Load ratings" are crane ratings in pounds established by the manufacturer in accordance with 01.0705(c).

(31) "Outriggers" are extendable fixed metal arms, attached to the mounting base, which rest on supports at the outer ends.

(32) "Rail clamp" means a tong-like metal device, mounted on a locomotive crane car, which can be connected to the track.

(33) "Reeving" means a rope system in which the rope travels around drums and sheaves.

(34) "Rope" refers to a wire rope unless otherwise specified.

(35) "Side loading" means a load applied at an angle to the vertical plane of the boom.

(36) A "standby crane" is a crane which is not in regular service but which is used occasionally or intermittently as required.

(37) A "standing (guy) rope" is a supporting rope which maintains a constant distance between the points of attachment to the two components connected by the rope.

(38) "Structural competence" means the ability of the machine and its components to withstand the stresses imposed by applied loads.

(39) "Superstructure" means the rotating upper frame structure of the machine and the operating machinery mounted thereon.

(40) "Swing" means the rotation of the superstructure for movement of loads in a horizontal direction about the axis of rotation.

(41) "Swing mechanism" means the machinery involved in providing rotation of the superstructure.

(42) "Tackle" is an assembly of ropes and sheaves arranged for hoisting and pulling.

(43) "Transit" means the moving or transporting of a crane from one jobsite to another.

(44) "Travel" means the functions of the machine moving from one location to another, on a jobsite.

(45) The "travel mechanism" is the machinery involved in providing travel.

(46) "Wheelbase" means the distance between centers of front and rear axle. For a multiple axle assembly the axle center for wheelbase measurement is taken as the midpoint of the assembly.

(47) The "whipline" (auxiliary hoist) is a separate hoist rope system of lighter load capacity and higher speed than provided by the main hoist.

(48) A "winch head" is a power driven spool for handling of loads by means of friction between fiber or wire rope and spool.

(b) General requirements.

(1) Application. This section applies to crawler cranes, locomotive cranes, wheel mounted cranes of both truck and self-propelled wheel type, and any variations thereof which retain the same fundamental characteristics. This section includes only cranes of the above types, which are basically powered by internal combustion engines or electric motors and which utilize drums and ropes. Cranes designed for railway and automobile wreck clearances are excepted. The requirements of this section are applicable only to machines when used as lifting cranes.

(2) New and existing equipment. All new crawler, locomotive and truck cranes constructed and utilized on or after August 31, 1971, must meet the design specifications of ANSI B30.5-1968. Crawler, locomotive, and truck cranes constructed before August 31, 1971, must be modified to conform to those design specifications, unless it can be shown that the crane cannot feasibly or economically be altered and that the crane substantially complies with the requirements of this section.

(3) Designated personnel. Only designated personnel shall be permitted to operate a crane covered by this section.

(c) Load ratings.

(1) Load ratings - where stability governs lifting performance.

(A) The margin of stability for determination of load ratings, with booms of stipulated lengths at stipulated working radii for the various types of crane mountings, is established by taking a percentage of the loads which will produce a condition of tipping or balance with the boom in the least stable direction, relative to the mounting. The load ratings shall not exceed the following percentages for cranes, with the indicated types of mounting under conditions stipulated in (B) and (C) of this paragraph.

Maximum load ratings
(percent of tipping loads)

Type of crane mounting:	
Locomotive, without outriggers:	
Booms 60 feet or less	85
Booms over 60 feet	85 *
Locomotive, using outriggers fully extended	80
Crawler, without outriggers	75
Crawler, using outriggers fully extended	85
Truck and wheel mounted without outriggers or using outriggers fully extended	85

* Unless this results in less than 30,000 pound-feet net stabilizing movement about the rail, which shall be minimum with such booms.

(B) The following stipulations shall govern the application of the values in (C) of this paragraph for locomotive cranes:

(i) Tipping with or without the use of outriggers occurs when half of the wheels fartherest from the load leave the rail.

(ii) The crane shall be standing on track which is level with 1 percent grade.

(iii) Radius of the load is the horizontal distance from a projection of the axis of rotation to the rail support surface, before loading, to the center of vertical hoist line or tackle with load applied.

(iv) Tipping loads from which ratings are determined shall be applied under static conditions only, i.e., without dynamic effect of hoisting, lowering, or swinging.

(v) The weight of all auxiliary handling devices such as hoist blocks, hooks, and slings shall be considered a part of the load rating.

(C) Stipulations governing the application of the values in 01.0705(c)(1)(A) for crawler, truck, and

wheel-mounted cranes shall be in accordance with Crane Load-Stability Test Code Society of Automotive Engineers (SAE) J765.

(D) The effectiveness of these preceeding stability factors will be influenced by such additional factors as free suspended loads, track, wind, or ground conditions, condition and inflation of rubber tires, boom lengths, proper operating speeds for existing conditions, and, in general, careful and competent operation. All of these shall be taken into account by the user.

(2) Load rating chart. A substantial and durable rating chart with clearly legible letters and figures shall be provided with each crane and securely fixed to the crane cab in a location easily visible to the operator while seated at his control station.

(d) Inspection classification.

(1) Initial inspection. Prior to initial use all new and altered cranes shall be inspected to insure compliance with provisions of 01.0705.

(2) Regular inspection. Inspection procedure for cranes in regular service is divided into two general classifications based upon the intervals at which inspection should be performed. The intervals in turn are dependent upon the nature of the critical components of the crane and the degree of their exposure to wear, deterioration, or malfunction. The two general classifications are herein designated as "frequent" and "periodic" with respective intervals between inspections as defined below:

(A) Frequent inspection: Daily to monthly intervals.

(B) Periodic inspection: One- to 12-month intervals, or as specifically recommended by the manufacturer.

(3) Frequent inspections. Items such as the following shall be inspected for defects at intervals as defined in 01.0705(d)(2)(A) or as specifically indicated

including observations during operation for any defect which might appear between regular inspections. Any deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard:

(A) All control mechanisms for maladjustment interfering with proper operation: Daily.

(B) All control mechanisms for excessive wear of components and contamination by lubricants or other foreign matter.

(C) All safety devices for malfunction.

(D) Deterioration or leakage in air or hydraulic systems: Daily.

(E) Crane hooks with deformations or cracks. For hooks with cracks or having more than 15 percent in excess of normal throat opening or more than 10° twist from the plane of the unbent hook.

(F) Rope reeving for noncompliance with manufacturer's recommendations.

(G) Electrical apparatus for malfunctioning, signs of excessive deterioration, dirt, and moisture accumulation.

(4) Periodic inspection. Complete inspections of the crane shall be performed at intervals as generally defined in 01.0705(d)(2)(A) depending upon its activity, severity of service, and environment, or as specifically indicated below. These inspections shall include the requirements of 01.0705(d)(3) and in addition, items such as the following. Any deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard:

(A) Deformed, cracked, or corroded members, in the crane structure and boom.

(B) Loose belts or rivets.

(C) Cracked or worn sheaves and drums.

(D) Worn, cracked, or distorted parts such as pins, bearings, shafts, gears, rollers and locking devices.

(E) Excessive wear on brake and clutch system parts, linings, pawls, and ratchets.

(F) Load, boom angle, and other indicators over their full range, for any significant inaccuracies.

(G) Gasoline, diesel, electric, or other power plants for improper performance or noncompliance with safety requirements.

(H) Excessive wear of chain-drive sprockets and excessive chain stretch.

(I) Travel steering, braking, and locking devices, for malfunction.

(J) Excessively worn or damaged tires.

(5) Cranes not in regular use.

(A) A crane which has been idle for a period of one month or more, but less than 6 months, shall be given an inspection conforming with requirements of 01.0705(d)(3) and 01.0705(g)(2)(A) before placing in service.

(B) A crane which has been idle for a period of six months shall be given a complete inspection conforming with requirements of 01.0705(d)(3) and (4) and 01.0705(g)(2)(B) before placing in service.

(C) Standby cranes shall be inspected at least semi-annually in accordance with requirements of 01.0705(d)(3) and 01.0705(g)(2)(B). Such cranes which are exposed to adverse environment should be inspected more frequently.

(6) Inspection records. Certification records which include the date of inspection, the signature of the person who performed the inspection and the serial number, or other identifier, of the crane which was inspected must be made monthly on critical items in use such as brakes, crane hooks, and ropes. This certification record must be kept readily available.

(e) Testing.

(1) Operational tests.

(A) In addition to prototype tests and quality-control measures, each new production crane shall be tested by the manufacturer to the extent necessary to insure compliance with the operational requirements of 01.0705(e) including functions such as the following:

(i) Load hoisting and lowering mechanisms.

(ii) Boom hoisting and lowering mechanisms.

(iii) Swinging mechanism.

(iv) Travel mechanism.

(v) Safety devices.

(B) Where the complete production crane is not supplied by one manufacturer such tests shall be conducted at final assembly.

(C) Certified production-crane test results shall be made available.

(2) Rated load test.

(A) Written reports shall be available showing test procedures and confirming the adequacy of repairs or alterations.

(B) Test loads shall not exceed 110 percent of the rated load at any selected working radius.

(C) Where rerating is necessary.

(i) Crawler, truck, and wheel-mounted cranes shall be tested in accordance with SAE Recommended Practice, Crane Load Stability Test Code J765 (April 1961).

(ii) Locomotive cranes shall be tested in accordance with (c)(1)(A) and (B) of this section.

(iii) Rerating test report shall be readily available.

(D) No cranes shall be rerated in excess of the original load ratings unless such rating changes are approved by the crane manufacturer or final assembler.

(f) Maintenance procedure. General: After adjustments and repairs have been made the crane shall not be operated until all guards have been reinstalled, safety devices reactivated, and maintenance equipment removed.

(g) Rope inspection:

(1) Running ropes. A thorough inspection of all ropes in use must be made at least once a month and a certification record which includes the date of inspection, the signature of the person who performed the inspection and an identifier for the ropes must be prepared and kept on file where readily available. All inspections must be performed by an appointed or authorized person. Any deterioration, resulting in appreciable loss of original strength must be carefully observed and determination made as to whether further use of the rope would constitute a safety hazard. Some of the conditions that could result in an appreciable loss of strength are the following:

(A) Reduction of rope diameter below nominal diameter due to loss of core support, internal, or external corrosion or wear of outside wires.

(B) A number of broken outside wires and the degree of distribution of concentration of such broken wires.

(C) Worn outside wires.

(D) Corroded or broken wires at end connections.

(E) Corroded, cracked, bent, worn, or improperly applied end connections.

(F) Severe kinking, crushing, cutting, or unstranding.

(2) Other ropes.

(A) Heavy wear and/or broken wires may occur in sections in contact with equalizer sheaves or other sheaves where rope travel is limited, or with saddles. Particular care shall be taken to inspect ropes at these locations.

(B) All rope which has been idle for a period of a month or more due to shutdown or storage of a crane on which it is installed must be given a thorough inspection before it is used. This inspection must be for all types of deterioration and must be performed by an appointed or authorized person whose approval shall be required for further use of the rope. A certification record which includes the date of inspection, the signature of the person who performed the inspection, and an identifier for the rope which was inspected must be prepared and kept readily available.

(C) Particular care shall be taken in the inspection of nonrotating rope.

(3) Idle ropes. All rope which has been idle for a period of a month or more due to shutdown or storage of a derrick on which it is installed must be given a thorough inspection before it is used. This inspection must be for all types of deterioration. A certification record must be

prepared and kept readily available which includes the date of inspection, the signature of the person who performed the inspection, and an identifier for the ropes which were inspected.

(h) Handling the load:

(1) Size of load.

(A) No crane shall be loaded beyond the rated load, except for test purposes as provided in 01.0705(e).

(B) When loads which are limited by structural competence rather than by stability are to be handled, it shall be ascertained that the weight of the load has been determined within plus or minus 10 percent before it is lifted.

(2) Attaching the load.

(A) The hoist rope shall not be wrapped around the load.

(B) The load shall be attached to the hook by means of slings or other approved devices.

(3) Moving the load.

(A) The employer shall assure that:

(i) The crane is level and where necessary blocked properly.

(ii) The load is well secured and properly balanced in the sling or lifting device before it is lifted more than a few inches.

(B) Before starting to hoist, the following conditions must be noted:

(i) Hoist rope must not be kinked.

(ii) Multiple part lines must not be twisted around each other.

(iii) The hook must be brought over the load in such a manner as to prevent swinging.

(iv) If there is a slack rope condition, it must be determined that the rope is properly seated on the drum and in the sheaves.

(C) During hoisting, care shall be taken that:

(i) There is no sudden acceleration or deceleration of the moving load.

(ii) The load does not contact any obstructions.

(D) Side loading of booms shall be limited to freely suspended loads. Cranes shall not be used for dragging loads sideways.

(E) No hoisting, lowering, swinging, or traveling shall be done while anyone is on the load or hook.

(F) The operator shall not carry loads directly over people.

(G) On truck mounted cranes, no loads shall be lifted over the front area except as approved by the crane manufacturer.

(H) The operator shall test the brakes each time a load approaching the rated load is handled by raising it a few inches and applying the brakes.

(I) Outriggers shall be used when the load to be handled at that particular radius exceeds the rated load without outriggers as given by the manufacturer for that crane. Where floats are used they shall be securely attached to the outriggers. Wood blocks used to support outriggers shall:

(i) Be strong enough to prevent crushing.

(ii) Be free from defects.

(iii) Be of sufficient width and length to prevent shifting or toppling under load.

(J) Neither the load nor the boom shall be lowered below the point where less than two full wraps of rope remain on their respective drums.

(K) Before lifting loads with locomotive cranes without using outriggers, means shall be applied to prevent the load from being carried by the truck springs.

(L) When two or more cranes are used to lift one load, one designated person shall be responsible for the operation. He shall be required to analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made.

(M) In transit the following additional precautions shall be exercised:

(i) The boom shall be carried in line with the direction of motion.

(ii) The superstructure shall be secured against rotation, except when negotiating turns when there is an operator in the cab or the boom is supported on a dolly.

(iii) The empty hook shall be lashed or otherwise restrained so that it cannot swing freely.

(N) Before traveling a crane with load, a designated person shall be responsible for determining and controlling safety. Decisions such as position of load, boom location, ground support, travel route, and speed of movement shall be in accord with his determination.

(O) A crane with or without load shall not be traveled with the boom so high that it may bounce back over the cab.

(P) When rotating the crane, sudden starts and stops shall be avoided. Rotational speed shall be such that the load does not swing out beyond the radii at which it can be controlled. A tag or restraint line shall be used when rotation of the load is hazardous.

(Q) When a crane is to be operated at a fixed radius, the boom-hoist pawl or other positive locking device shall be engaged.

(R) Ropes shall not be handled on a winch head without the knowledge of the operator.

(S) While a winch head is being used, the operator shall be within convenient reach of the power unit control lever.

(4) Holding the load.

(A) The operator shall not be permitted to leave his position at the controls while the load is suspended.

(B) No person should be permitted to stand or pass under a load on the hook.

(C) If the load must remain suspended for any considerable length of time, the operator shall hold the drum from rotating in the lowering direction by activating the positive controllable means of the operator's station.

(i) Other requirements.

(1) Operating crew.

(A) Cranes equipped with a rotating unit shall have a minimum crew of one operator and one attendant.

(B) Only employees qualified by training and/or experience may operate and attend power cranes.

(C) Operators and attendants assigned to specific equipment in a workplace shall be formally instructed by competent supervisory personnel as to the hazards involved in the particular work and workplace.

(D) If it becomes necessary to replace an operator or attendant previously assigned to a machine the work may not commence until the replacement has been instructed by competent supervisory personnel as to the hazards involved in the particular work and workplace.

(E) The operating crew shall consist of the designated operator plus an attendant who shall act only as a safety observer when the crane is in operation if any one of the following criteria exists:

(i) If any employee working in the proximity concludes that a danger exists and requests the employer or his representative to assign a safety observer;

(ii) If the equipment is operating where any part is capable of reaching within 15 feet of an overhead power line in which case the provisions of AS 18.60.670-695 apply;

(iii) If the equipment can swing in an arc of 360 degrees and the equipment is not accompanied by an oiler, who functions as a safety observer when the equipment is in operation; or

(iv) If a compliance officer of the Alaska Department of Labor concludes that a danger exists.

(F) Operators shall be required to meet the following qualifications:

(i) Pass a practical operating examination, limited to the specific type of equipment he will operate;

(ii) Have vision, with or without glasses, at least 20/30 Snellen in one eye and 20/50 in the other eye.

(iii) Be able to distinguish red, green, and yellow, regardless of the position of the colors;

(iv) Have hearing, with or without a hearing aid; adequate for the specific operation;

(v) Have no history of epilepsy or disabling heart condition; and

(vi) Be familiar and conversant with safe operating procedures, the capacity and limitations of the equipment he will operate, and understand the provisions of these regulations pertaining to inspection, operation, load limit tests and boom radii.

(2) Rail Clamps. Rail clamps shall not be used as means of restraining tipping of a locomotive crane.

(3) Ballast or counterweight. Cranes shall not be operated without the full amount of any ballast or counterweight in place as specified by the maker, but truck cranes that have dropped the ballast or counterweight may be operated temporarily with special care and only for light loads without

full ballast or counterweight in place. The ballast or counterweight in place specified by the manufacturer shall not be exceeded.

(4) Cabs.

(A) Necessary clothing and personal belongings shall be stored in such a manner as to not interfere with access or operation.

(B) Tools, oil cans, waste, extra fuses, and other necessary articles shall be stored in the tool box, and shall not be permitted to lie loose in or about the cab.

(5) Refueling.

(A) Refueling with small portable containers shall be done with Underwriter's Laboratories or Factory Mutual Laboratories approved, or equivalent, safety type can equipped with an automatic closing cap and flame arrester.

(B) Machines shall not be refueled with the engine running.

(6) Fire extinguishers.

(A) A carbon dioxide, dry chemical, or equivalent fire extinguisher shall be kept in the cab or vicinity of the crane.

(B) Operating and maintenance personnel shall be made familiar with the use and care of the fire extinguishers provided.

(7) Swinging locomotive cranes. A locomotive crane shall not be swung into a position where railway cars on an adjacent track might strike it until it has been ascertained that cars are not being moved on the adjacent track and proper flag protection has been established.

(j) Operating near electric power lines.

(1) Clearances. Except where the electrical distribution and transmission lines have been deenergized and visibly grounded at point of work or where insulating barriers not a part of or an attachment to the crane have been erected to prevent physical contact with the lines, cranes shall be operated proximate to, under, over, by, or near powerlines only in accordance with the following:

(A) For lines rated 50 kV or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet.

(B) For lines rated over 50 kV minimum, clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1kV over 50 kV or twice the length of the line insulator but never less than 10 feet.

(C) In transit with no load and boom lowered, the equipment clearance shall be a minimum of four feet for voltages less than 50 kV, and 10 feet for voltages over 50 kV up to and including 345 kV, and 16 feet for voltages up to and including 750 kV.

(2) Boom guards. Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not operate to alter the requirements of 01.0705(j)(1).

(3) Notification. Before the commencement of operations near electrical lines, the owners of the lines or their authorized representative shall be notified and provided with all pertinent information. The cooperation of the owner shall be requested.

(4) Overhead wires. Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line.

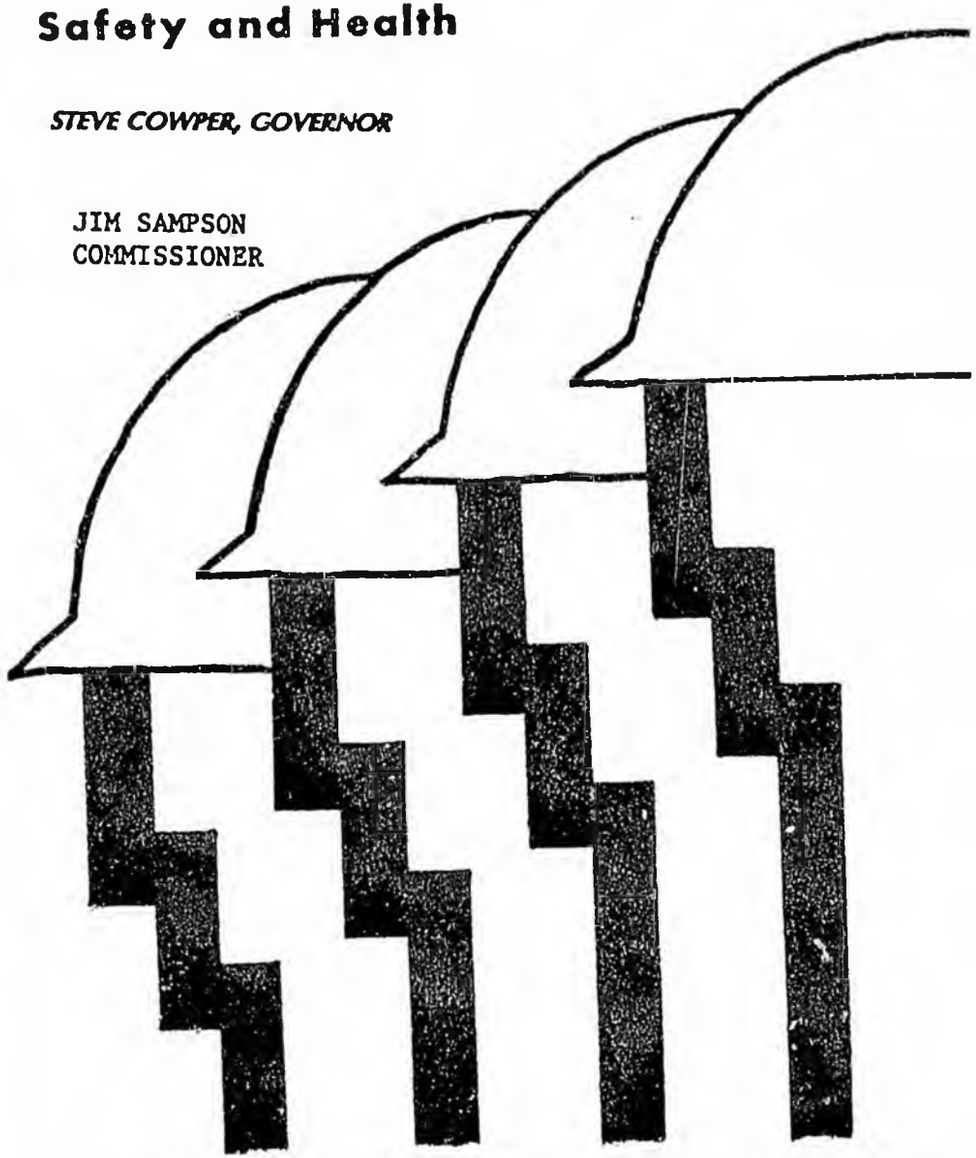
01.0706 DERRICKS. (a) Definitions applicable to 01.0706.

General Industry
Safety and Health Standards Digest

Alaska Department of Labor
Division of Occupational Safety and Health

STEVE COWPER, GOVERNOR

JIM SAMPSON
COMMISSIONER



16. CONE PULLEYS (Mechanical Power Transmission Equipment)

The cone belt and pulley shall be equipped with a belt shifter so constructed as to adequately guard the nip point of the belt and pulley. If the frame of the belt shifter does not adequately guard the nip point of the belt and pulley, the nip point shall be further protected by means of a vertical guard placed in front of the pulley and extending at least to the top of the largest step of the cone.

17. CONVEYORS

a. Open hoppers and chutes shall be guarded by standard railings and toeboards or by some other comparable safety device.

b. Safety standards for conveyors used in sawmills can be found in 07.215(r) and (s) of Subchapter 7, Article 2, Sawmill Code.

18. CRANES AND HOISTS (Overhead and Gantry)

a. All functional operating mechanisms, air and hydraulic systems, chains, rope slings, hooks, and other lifting equipment shall be visually inspected daily.

b. Complete inspection of the crane shall be performed at intervals depending on its activity, severity of service, and environment.

c. An overhead crane shall have stops at the limit of travel of the trolley, bridge and trolley bumpers or equivalent automatic services, and rail sweeps on the bridge trucks.

d. The rated load of the crane shall be plainly marked on each side of the crane, and if the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or its load block, and this marking shall be clearly legible from the ground or floor.

19. CYLINDERS, COMPRESSED GAS, USED IN WELDING

a. Compressed gas cylinders shall be kept away from excessive heat, shall not be stored where they might be damaged or knocked over by passing or falling objects, and shall be stored at least 20 feet away from highly combustible materials.

Construction Industry
Safety and Health
Standards Digest

Alaska Department of Labor
Division of Occupational
Safety and Health

STEVE COWPER
GOVERNOR

JIM SAMPSON
COMMISSIONER

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d. Formwork and shoring shall safely support all loads imposed during concrete placement. Drawings or plans of formwork and shoring systems shall be available at the jobsite.

11. CONVEYORS

a. Conveyor systems shall be equipped with an audible warning signal which can be sounded immediately before starting up the conveyor.

b. Where conveyors pass over work areas or aisles, guards shall be provided to protect employees from falling material.

c. Conveyors shall be in compliance with ANSI B20.1-1957, "Safety Code for Conveyors, Cableways, and Related Equipment."

12. CRANES AND DERRICKS

a. The employer shall comply with the manufacturer's specifications and limitations.

b. Rated load capacities, recommended operating speeds, and special hazard warnings or instructions shall be posted on all equipment and be visible from the operator's station.

c. Equipment shall be inspected before each use and all deficiencies corrected before further use.

d. Accessible areas within the swing radius of the revolving superstructure shall be barricaded.

e. Except where electrical distribution and transmission lines have been deenergized and visibly grounded at point of work, or where insulating barriers not a part of or an attachment to the equipment or machinery have been erected to prevent physical contact with the lines, no part of a crane or its load shall be operated within 10 feet of a line rated 50 kV or below; 10 feet + 0.4 inches for each kV over 50 kV for lines rated over 50 kV; or twice the length of the line insulator, but never less than 10 feet.

f. (For rules pertaining to Rigging Equipment, see item No. 67)

g. Crane records must be kept readily available.

13. DISPOSAL CHUTES

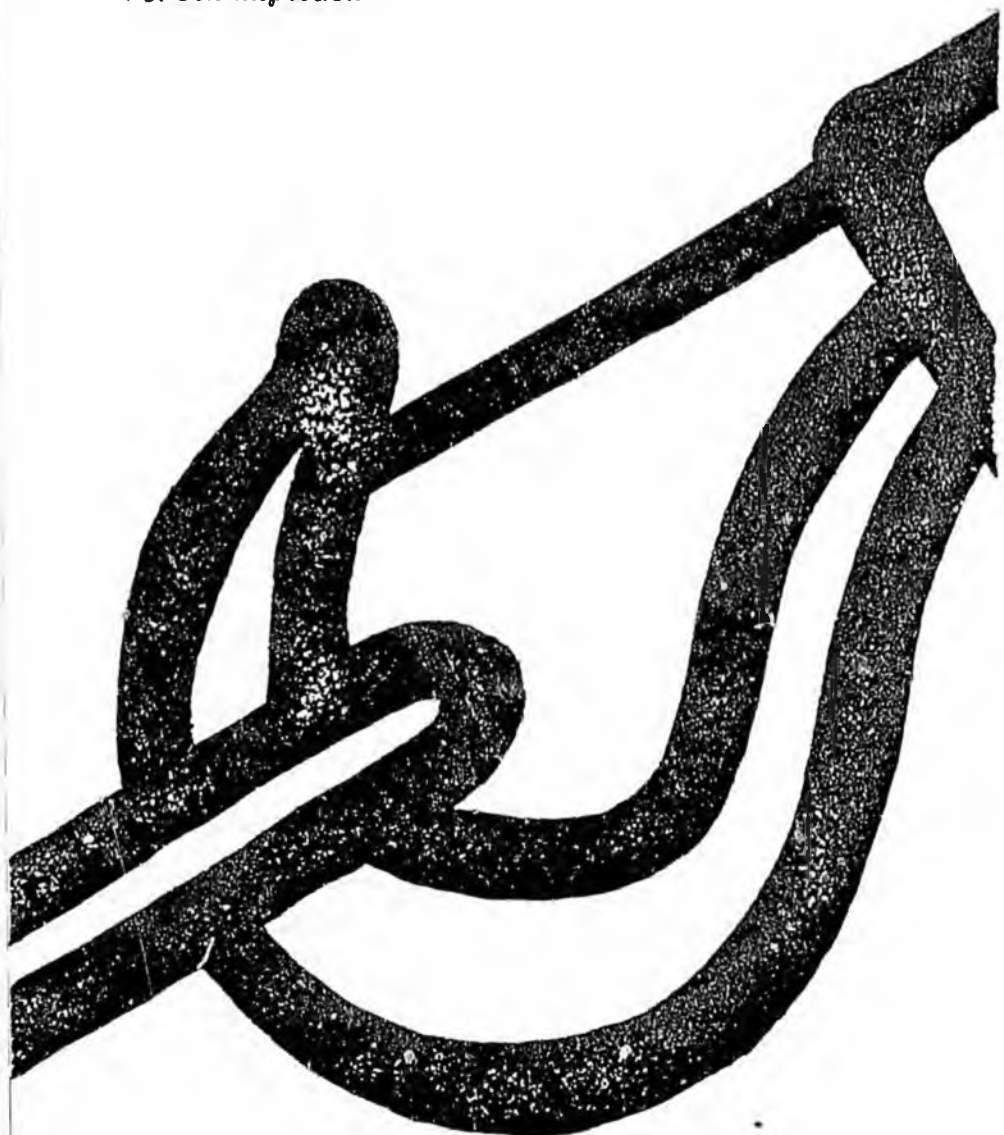
a. Whenever materials are dropped more than 20 feet to any exterior point, an enclosed chute shall be used.

b. When debris is dropped through holes in the floor without the use of chutes, the area where the material is dropped shall be enclosed with barricades not less than 42 inches high and not less than 6 feet back from the projected opening.

DIVISION OF LABOR STANDARDS AND SAFETY

Occupational Safety and Health

Construction Checklist
For Self-Inspection



	Yes	Needs Action
15. Are safety nets installed where the potential fall distance exceeds two stories or 25 feet?	☐	☐
16. Is a safety railing installed around temporarily floored openings?	☐	☐

DOSH Administration Phone Numbers

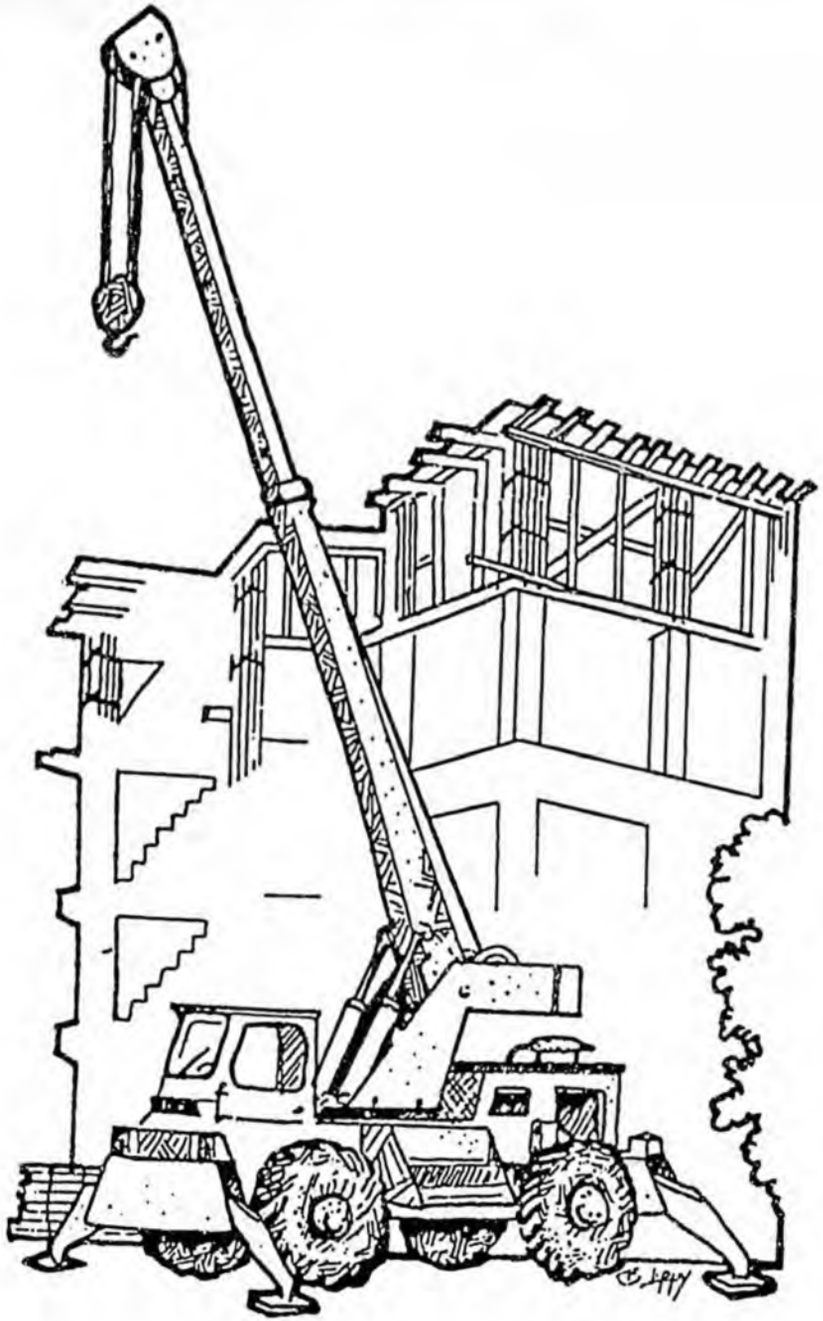
Consultation Services
Phone: (907) 284-2599

Complaints and Inspections
Phone: (907) 284-2697

Director
Phone: (907) 465-4855

CRANES

1. Are deadman controls in working order on powered traveling machines?	☐	☐
2. Does crane operation comply with manufacturer's specifications?	☐	☐
3. Are rated load capacities, operating speed, and instructions posted and visible to the operator?	☐	☐
4. Is machinery inspected daily prior to use to make sure it is in proper operating condition?	☐	☐
5. Are wire ropes, chains, ropes, and other rigging equipment inspected prior to use?	☐	☐
6. Are appropriate safety precautions taken when operating on electrical lines? (Reference to DOSH Standard)	☐	☐
7. Are accessible areas within swing radius barricaded?	☐	☐
8. Are cranes or derricks restricted from operating within ten feet or more of any electrical distribution or transmission line?	☐	☐



		Yes	Needs Action
9.	Is a fire extinguisher of at least 5 BC provided on the crane?	☐	☐
10.	Are illustrations of hand signals to crane and derrick operators posted on the job site?	☐	☐
11.	Does the hook-up man use correct signals for crane operator to follow?	☐	☐
12.	Are crane outriggers used as required?	☐	☐
13.	Are crane hooks safely latched or "moused" if applicable?	☐	☐

MATERIAL HOISTS

1.	Are workers prohibited from riding the hoist?	☐	☐
2.	Is overhead protection provided over the cage or platform?	☐	☐
3.	Is a load rating plate attached to the hoist?	☐	☐
4.	Has wire rope been inspected for harmful defects?	☐	☐
5.	Are there at least three full wraps on the winding drum when the platform is at the lowest point of travel?	☐	☐
6.	Is there at least three feet of clearance between the cathead sheave and the top of cage when it is at the uppermost terminal or landing?	☐	☐
7.	Are sheave bearings well lubricated?	☐	☐
8.	Are brakes capable of stopping and holding 125 percent of the rated load?	☐	☐
9.	Does the operator remain at the controls while the load is suspended or the master clutch is engaged?	☐	☐
10.	Are gears on the hoisting machine well guarded?	☐	☐