

GENERAL HEADQUARTERS
SUPREME COMMANDER FOR THE ALLIED POWERS
APO 500

AG 463.47(22 Jul 48)NR/MG
SCAPIN 1928/1

25 January 1949

MEMORANDUM FOR: JAPANESE GOVERNMENT

SUBJECT: Preparation and Implementation of Safety Code
for Petroleum Producing Industry

1. Reference Memorandum for Japanese Government, AG 729.3
(22 Jul 48)NR/MG, SCAPIN 1928, subject: Preparation and Imple-
mentation of Mine Safety Codes and Administration of Mine Safety
Program, 24 August 1948.

2. The Japanese Government is directed to include in the
mine safety program provision for safety in the petroleum pro-
ducing industry. Inclosure 1 is forwarded for use as a guide
by the Japanese Government in the preparation of a safety code
for the petroleum producing industry.

FOR THE SUPREME COMMANDER:

1 Incl
as indic in par 2
(for addressee only)

R m Levy
R. I. LEVY,
Colonel, AGD, 6
Adjutant General.

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SAFETY CODE FOR THE
JAPANESE PETROLEUM PRODUCING INDUSTRY
(proposed)

A.9. 729.3, BL#1
Incl. to 1928/1

NATURAL RESOURCES SECTION
GENERAL HEADQUARTERS
SUPREME COMMANDER FOR THE ALLIED POWERS

1948

(Handwritten initials)

Incl/

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DEFINITION OF TERMS

- Blow Out Preventer: Valve type attachment that is installed at the surface of the bore hole and which may be closed to seal off pressure in the annulus between drill pipe and the bore hole.
- Blocks: Device of one to several sheaves, providing mechanical advantage necessary in heavy hoisting and hauling by reeving of lines between two blocks.
- Christmas Tree: An assemblage of valves designed for controlling the flow of oil and gas from the well during the period of natural flow.
- Cat Head: Rotating spool on which lines are wound to give mechanical advantage.
- Cat Line: Rope or wire line wound on cat head to give mechanical advantage, usually employed in spinning up drill pipe and lifting heavy materials.
- Draw Works: Embodies a hoisting drum with suitable clutches and speed reducing mechanisms to regulate the hoisting speed, and powerful brakes to control rotation of the drum under load.
- Driller: Workman in charge of a shift and operator of the draw works.
- Derrick Man: Worker who racks the drill pipe, etc, working up in the derrick when going in or out of the hole.
- Elevators: Used for lifting or lowering a joint or column of pipe suspended vertically; acts as clamps which grip the pipe securely, and to which the necessary hoisting cable is suitably attached.
- Fire Wall: Earth wall erected at a predetermined distance from and surrounding oil storage tanks.
- Gauger: Workman charged with the measurement of oil in tanks and calculation of a well's flow over determined periods.
- Headache Post: A safety device used as a guard to protect the draw works operator.
- Rig Builder: Workers who erect derricks.
- Rotary Table: Turn table that revolves drill pipe.
- Slips: Steel wedges that fit between rotary table and pipe to secure pipe.
- Tool Pusher: Foreman in charge of drilling and operations of one or more drilling rigs.
- Traveling Block: Large block with hook attached, used in hoisting and lowering drill pipe, etc, in the derrick.
- Well Head: The surface of the ground at the well bore.
- Workover Well: A well which has been completed previously but is being reworked at a later date.

ARTICLE I - PURPOSE AND JURISDICTION

Section A. Purpose

1. The purpose of this ordinance is to provide standards of safety for the operations in the petroleum producing industry, and the means of enforcing the safety regulations prescribed.

Section B. Jurisdiction

1. The provisions of this ordinance apply to all petroleum producing operations, including gallery mining for oil.

ARTICLE 2 - DEPARTMENT OF PETROLEUM SAFETY AND INSPECTION

Section A. Establishment of the Department

1. The chief of the appropriate bureau, board, or similar organization, under the direction of the competent minister, is charged with the enforcement of this ordinance and the correction of any violation thereof. He shall establish under his jurisdiction a separate section to be known as the Department of Petroleum Safety and Inspection for that purpose.

Section B. Governing Board and Duties

1. The Department of Petroleum Safety and Inspection shall be governed by a board of five (5) men, appointed by the competent bureau chief, qualified by education and at least 10 years experience in the petroleum producing industry, and not less than 30 years of age, to conduct examinations and to issue certificates of positions of Driller, Safety Engineer, Tool Pusher, and Derrick Man.

Section C. Violations

1. It shall be a violation of this ordinance for any petroleum producer or company to employ other than certified persons for any position enumerated in the foregoing paragraph, except as provided hereinafter. When it is not possible to secure certified men for positions mentioned in Section B above, the governing board may issue temporary employment permits for such positions for a period not to exceed ninety (90) days.

ARTICLE 3 - GENERAL SUPERVISION

Section A. Appointment and Qualifications of District Petroleum Safety Inspectors

1. The Department of Petroleum Safety and Inspection shall appoint a sufficient number of District Petroleum Safety Inspectors to carry out the provisions of this ordinance. Such inspectors shall be graduates of a university or technical school and have specialized in the technical phase of the petroleum producing industry. They must, in addition, have been employed in the operating phase of petroleum production for a period of not less than four (4) years and should be at least 30 years of age and have passed the examination given by the Department of Petroleum Safety and Inspection.

Section B. Duties of Petroleum Safety Inspectors

1. Petroleum Safety Inspectors of the Department of Petroleum Safety and Inspection shall inspect petroleum producing operations in accordance with the provisions contained in this ordinance. They shall visit and make personal examination of producing operations, examining the operation for general safety conditions. They shall see that all provisions of this ordinance are strictly carried out. They shall also have authority to make recommendations for improving health and safety conditions or practices not covered by this ordinance.

2. In those instances where a Petroleum Safety Inspector finds that an imminent danger exists, he shall take immediate action through the operating manager or his representative, to have all workmen withdrawn from the unsafe area until such danger is corrected.

3. The Petroleum Safety Inspector shall deliver to the owner of the mining right of each operation inspected a certificate of inspection, and shall post a duplicate certificate at or near the operation, where it may be read by all employees.

Section C. Neglect of Duties by District Petroleum Safety Inspectors

1. Upon petition signed by not less than 25 workers engaged in the operating phase of the petroleum producing industry, or an operator, and with the affidavit of one or more of the petitioners attached, in which it is claimed that any Petroleum Safety Inspector is neglectful or is incompetent to perform the duties of his office, the competent bureau chief shall immediately suspend this individual from office, pending a formal review of the entire petition. Should the facts as stated in the petition prove to be true, upon investigation, said inspector shall be discharged and his certificate cancelled for a period of three years. The said certificate can be renewed only by a new examination in accordance with rules and regulations of the Petroleum Safety Examining Board.

ARTICLE 4 - DERRICKS

Section A. Specifications for Derrick Foundations

1. Two principal service requirements must be met in the design of concrete foundations for derrick foundations: first, sufficient area to distribute the derrick load properly on the bearing soil; second, sufficient weight to prevent the derrick from overturning during high winds. Good design practice dictates that the minimum dimensional requirements for load distribution should be first determined and, then, if the weights of these minimum corner foundations are less than those required to prevent overturning of the derrick by wind action, sufficient additional volume must be added at the bottom to bring the total weight up to the minimum set by consideration of wind action only. If however, owing to soft bearing soils, etc, the weights on the minimum dimension foundations for load distribution are greater than those required to prevent overturning of the derrick by wind action, the minimum dimensions should not be reduced.

Section B. Wind Resistance Requirements

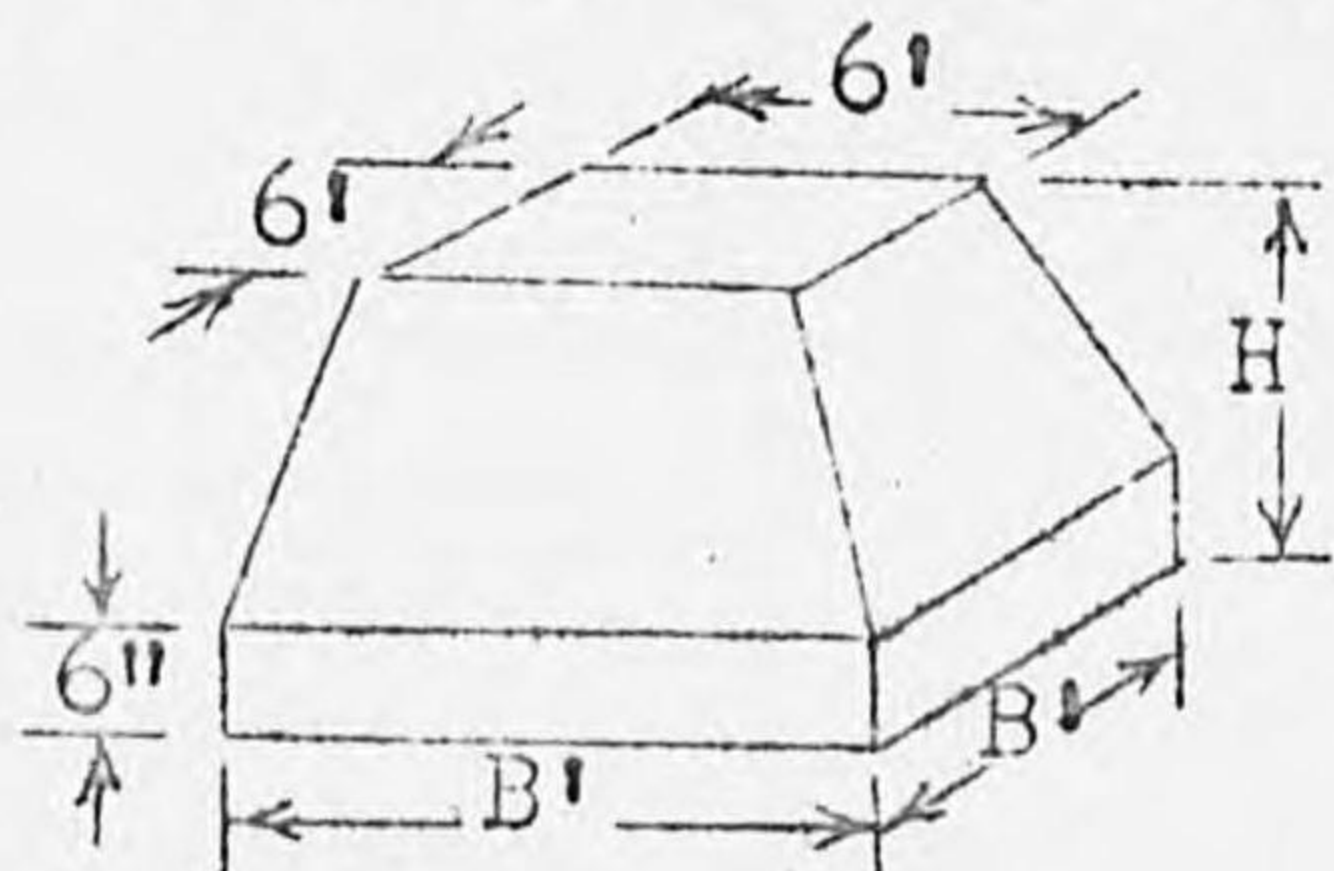
1. Derricks must be designed to withstand safely the pressure of a wind having a velocity of 70 miles per hour, which develops a horizontal pressure of 11.76 pounds per square foot on all surfaces directly exposed to it. On

computing the surface exposed to the wind, it should be assumed that the wind pressure is exerted against the outside of one side or panel of the derrick and on the inside of the opposite panel. It should also be assumed that a set back of drill pipe of a specified size is leaning against the "finger board" of the derrick at an angle of $2\frac{1}{2}$ degrees from the vertical, racked in its normal position between the finger board and the adjacent side of the derrick.

2. A 120 miles per hour wind develops a pressure of 34.56 pounds per square foot of exposed surface. This may be considered as a maximum. It is understood to be more or less the general practice among derrick manufacturers to use the same system and size of bracing for all derricks of a given height, regardless of the leg size, and to base the exposed area upon the maximum leg size. It is advisable to make vertical the lower six inches of the sides.

<u>Derrick Size</u>	<u>Derrick No. API</u>	<u>b'</u>	<u>B'</u>	<u>H</u>	<u>V a/</u>
122' x 24' x 24' x 5'6"	16	2'-0"	8'-9"	3'-9"	$4\frac{1}{2}$
94' x 24' x 24' x 5'6"	12	1'-9"	7'-9"	3'-3"	3
87' x 24' x 24' x 5'6"	11	1'-9"	7'-9"	3'-3"	3
80' x 20' x 20' x 5'6"	10	1'-7"	7'-0"	3'-0"	$2\frac{1}{3}$
73' x 20' x 20' x 4'4"	9	1'-4"	5'-7"	2'-3"	$1\frac{1}{4}$

a/ Volume in cubic yards for each corner



Typical Foundation

3. The data given above are applicable only to soil having a bearing capacity of 3,000 pounds per square foot. It is recommended that the size and weight of the derrick (including other loading conditions), in addition to bearing capacity of soil, be considered for every individual installation and that the size of derrick corners be proportioned in accordance with such detailed calculations.

4. In the design of concrete foundations it will be found that variations in soil bearing capacity may result in differences in the amount of concrete required simply to prevent overturn action by wind, as compared with amount of concrete required to support the derrick safely. In any case, the larger quantity should be used.

Section C. Stress in Derrick Guy Ropes

1. In guying a derrick it is advantageous to keep the guys as nearly horizontal as possible, since the stress increases very rapidly as the guy becomes more nearly vertical. The inclination should not be steeper than 45° . On level ground the length of the guy ropes should be about three times the height of the mast. From 8 to 24 guy wires may be used, that is, from 2 to 6 on each leg. These are to be attached at two or three points between the derrick crown and the floor and are led off from the structure in the direction of the diagonal plane through the opposite leg. Guy wire should be of a diameter

between 5/64"-5/8" in diameter and composed of seven strands of galvanized wire.

Section D. Derricks for Drilling Purposes

1. Derricks for drilling purposes should be selected by consideration of the expected maximum load (usually the dead load of casing to be run in the well); a friction allowance of 25-50 percent should be added.

Section E. Timber Derricks

1. A safety factor of $2\frac{1}{4}$ is recommended for timber structures. Long-period loading requires use of a safety factor $1\frac{1}{2}$ times that for short-period loading. It will be considered unsafe to rely upon timber for more than 75 percent of its apparent compressive strength as determined by ordinary test methods.

2. Thickness of timber used in derrick leg construction shall not be less than two inches; ends of abutting leg members shall be properly faced to provide a uniform bearing throughout the structure and splices in leg members shall be at least two feet apart.

3. The safe load capacity of a derrick leg will be computed by the aid of the following formula:

$$P = 3/2 (AC)$$

P is the safe load capacity of the leg in pounds; A is the cross sectional area of the leg in square inches; C is the allowable working stress in pounds per square inch. Suggested values of C for use in this formula are as follows:

<u>Grade of Lumber</u>	<u>Short Solid Columns</u>	<u>Built-up Columns</u>	
		<u>2x8s or 2x10s</u>	<u>2x12s</u>
Sugi	1,050	1,050	1,050
Red Pine	1,100	1,000	900

4. Broken and rotten timber must be replaced at once.

Section F. Steel Derricks

1. After determination of the maximum dead load to which the derrick is likely to be subjected, the necessary minimum of the leg members is to be determined. The following table gives dimensions, weights and capacities of API structural steel derricks, and are not to be exceeded:

<u>Size</u>	<u>Dimens Height (ft)</u>	<u>Base Size (ft)</u>	<u>Size of Running Legs (in)</u>	<u>Approximate Weight (lb)</u>	<u>Safe Working Capacity (lb mild steel)</u>
8	66	20	4 x 4 x 1/4	8,590	86,000
			4 x 4 x 3/8	9,730	127,000
9	73	20	5 x 5 x 3/8	10,660	186,000
			4 x 4 x 1/4	9,420	86,000
			4 x 4 x 3/8	10,560	127,000
10	80	20	5 x 5 x 3/8	11,490	186,000
			4 x 4 x 1/4	11,080	86,000
			4 x 4 x 3/8	12,320	127,000
			5 x 5 x 3/8	13,350	186,000
11 A	87	20	6 x 6 x 3/8	14,590	246,000
			6 x 6 x 1/2	14,460	323,000
			4 x 4 x 1/4	11,590	86,000
			4 x 4 x 3/8	12,940	127,000
			5 x 5 x 3/8	14,080	186,000
12	94	24	6 x 6 x 3/8	15,530	246,000
			6 x 6 x 1/2	17,600	323,000
			4 x 4 x 1/4	14,390	86,000
			4 x 4 x 3/8	15,940	127,000
			5 x 5 x 3/8	17,080	186,000
			6 x 6 x 3/8	18,530	246,000
16	122	24	6 x 6 x 1/2	20,800	323,000
			5 x 5 x 3/8	22,870	186,000
			6 x 6 x 3/8	24,840	246,000
			6 x 6 x 1/2	27,530	323,000
18	136	26	6 x 6 x 5/8	30,120	398,000
			6 x 6 x 3/8	30,220	246,000
			6 x 6 x 1/2	33,120	323,000
			6 x 6 x 5/8	36,020	398,000
			8 x 8 x 1/2	37,980	465,000
			8 x 8 x 5/8	41,610	577,000
18 A	136	30	8 x 8 x 3/4	45,750	687,000
			6 x 6 x 5/8	41,920	398,000
			8 x 8 x 1/2	43,470	465,000
			8 x 8 x 5/8	47,090	577,000
			8 x 8 x 3/4	51,230	687,000

Section G. Cellar Exits

1. At every drilling and re-drilling well having a cellar, there shall be an inclined runway from the bottom of cellar to the top of the ground; or the floor of the runway shall be equipped with cleats to insure safe footing.

Section H. Gin Poles

1. The gin poles at the crown of every derrick shall have two uprights and a cross beam. The clearance between the water table and the cross beam shall not be less than seven feet.

Section I. Crown Sheaves

1. The gudgeons of all sheaves on every derrick crown shall be provided with boxings of metal straps on top to prevent the sheaves from jumping out of the bearings.

Section J. Suspended Runways

1. Suspended runways must be at least 24 inches wide, floored with steel grating, or not lighter than two-inch straight grain No. 1 grade dressed lumber or equivalent. Hangers and cross supports must be made not lighter than $2\frac{1}{2}$ x $2\frac{1}{2}$ x $\frac{1}{4}$ inch angle iron, or not lighter than 4 x 4 straight grained No. 1 grade dressed lumber or equivalent. Runways must be equipped with hand rails and toe boards.

Section K. Fixed Ladders

1. On every derrick constructed, a ladder shall be provided from the floor to the water table as follows:

(a) The ladder shall be continuous or sections thereof may be offset sideways, such offsets to occur at outside derrick platforms only.

(b) The ladders, if made of lumber, shall be of at least two-inch by four-inch structurally sound lumber or equivalent, and shall terminate three and one-half feet above the pump house when the ladder is installed on the side of the pump or engine house.

(c) The rungs shall be one-inch by four-inch structurally sound lumber, or equivalent, uniformly spaced not to exceed 16 inches on centers and shall be securely fastened to the stringers. The width of the ladder shall not be less than 12 inches in the clear between the stringers.

(d) A clearance of at least four inches shall be maintained back of the ladder rungs.

(e) The rungs must be secured so as not to be pulled off.

(f) Each ladder section shall be secured to the derrick with belts.

(g) Any section of the ladder shall not lean back from the vertical.

Section L. Derrick Crown Platforms

1. On every derrick a platform of steel or heavy lumber at least two feet wide shall be provided around the edges of the derrick crown. This platform shall be equipped on its outer edges with a standard handrail.

Section M. Inside Derrick Platforms

1. The double, the thribble, the fourble board, and each drill pipe or other working platform in every derrick shall completely cover the space from the working edge of the platform back to the legs and girts of the derrick. The decking plank on the working side of the platform shall be secured to the derrick girts.

Section N. Finger Board

1. On all rotary rigs, when a finger board is used at fourble platforms, finger boards shall be secured to the derrick by a safety wire or cable attached to the outer end of the finger.

Section O. Loading Racks

1. Loading racks must be equipped with standard handrails and toe boards.

Section P. Inspection of Derricks

1. Before drilling or other operations are begun, the derrick will be inspected under the direction of a rig-building foreman, who will require that all bolts be present and adequately tightened and that all girts and bracings are present and not excessively bent.

2. In the case of wooden derricks, all timbers are to be ascertained to be in good working condition and properly nailed and/or belted.

ARTICLE 5 - ELECTRICITY

Section A. Regulation of Electric Motors, Service Lines, Etc

1. Regulation of electric motors, service lines, etc, will be governed by Article 9 of the Mine Safety Code for Japanese Coal Mines (revised) NRS, GHQ, SCAP, except that the following sections and paragraphs may be deleted for surface operations but will be made to apply in oil mining operations: Section B, paragraphs 3, 5; Section C, paragraphs 1, 2; Section D paragraphs 1, 2, 3, 8, 9; 11; Section G, paragraphs 1, 2.

Section B. Stands for Transformers and High Voltage Lines

1. Stands for transformers and high voltage lines shall be installed not less than 30 meters away from the bore hole.

Section C. Electrical Current Switches

1. Electrical current switches will be cut-off when gas or oil flows openly at the surface. Every drilling rig shall be provided with switches installed adjacent to the driller's normal working position capable of entirely cutting off the pressure from the electrical installations in the derrick and drilling rig.

Section D. Wells Flowing Gas or Oil, or Being Swabbed or Bailed

1. Wells flowing gas or oil, or being swabbed or bailed should be flood-lighted from outside the derrick for night operations.

ARTICLE 6 - SPECIFICATIONS FOR WIRE ROPE

Section A. Types of Lines to be Used

1. Cable tool drilling lines shall be 3/4 -, 7/8 -, 1 -, and 1 1/8 - inch diameter; 6 x 19 construction. Rotary drilling lines or casing lines shall be 3/4 -, 7/8 -, 1 -, 1 1/8 -, 1 1/4 - inch diameter, 6 x 19 construction. Sand-lines shall be 3/8 -, 1/2 -, 9/16 -, and 5/8 inch diameter, 6 x 7 construction. Rotary bailing lines shall be 9/16 -, 5/8 -, and 3/4 inch diameter, 6 x 9 construction.

Section B. Loadings

1. The following table indicates permissible load with various numbers of lines up, retaining a safety factor of 5 (which should be maintained at all times):

1 - Inch	Lines up	6	8	10	12
	Maximum line load (lbs)	77,660	99,000	119,600	137,800
	Maximum drill pipe load (lbs)	47,600	69,200	89,600	107,800

1 1/8 Inch	Lines up	6	8	10	12
	Maximum line load (lbs)	95,800	122,200	147,500	170,000
	Maximum drill pipe load (lbs)	65,800	92,200	117,500	140,000

1 1/4 Inch	Lines up	6	8	10	12
	Maximum line load (lbs)	120,000	153,500	185,000	213,000
	Maximum drill pipe load (lbs)	90,000	123,500	155,000	183,000

Section C. Replacement

1. Replacement or repair of wire lines should be effected immediately when:

(a) owing to overstrain, kink or localized wear has caused weakening of one or more strands and loss of elasticity (b) a "necked down" condition of wires is obvious and one or more whole strands is parted (c) the ropes are unduly corroded (d) the ropes are damaged by improper hauling or socketing (e) the ropes show kinks, dog legs and other distorted places (f) the ropes are damaged by hooking back slack too tightly to girt (g) the ropes show excessive wear in spots (h) damage has been caused by improperly fitted clamps (i) there are fatigue breaks in wire (j) spiraling or curling is observed (k) the ropes show excessive flattening or crushing (l) the core pops.

2. Spliced lines should be inspected frequently.

Section D. Attaching Clips (clamps) to Wire Lines

1. The roddle should be in contact with the long end of the wire rope and the U-bolt in contact with the short end of the loop in the rope.

ARTICLE 7 - MANILA CORDAGE

Section A. Drilling Cables

1. Drilling cables shall be made up of right laid three-strand ropes, left laid in one cable, extremely hard.

2. Nominal sizes and weight, with tolerances as shown in the following table, shall be a guide for loadings as required:

<u>Diameter (in)</u>	<u>Circumference (in)</u>	<u>Pounds per foot</u>	<u>Ultimate Strength of new rope (lb)</u>
1 1/2	4 1/2	0.949	17,000
1 3/4	5 1/4	1.280	25,000
2	6	1.580	30,000
2 1/4	7	1.790	37,000
2 1/2	7 1/2	2.330	43,000

3. The ends of the rope shall be tied in a manner that will prevent them from unlaying, and all fag ends shall be cut-off.

4. Rope should not be stored longer than necessary and never longer than one hot season; rope must never be stored with acid in the same building.

5. A safety factor of not less than five (5) should be used for new rope.

6. Sudden loads should be avoided, as should jerking, and chafing while drilling.

Section B. Cat Lines

1. Cat lines shall not be linked under a strain and should not be jerked when under a heavy load. The lines should be checked at regular intervals and badly worn ones retired from service. Unnecessary burning on cat head should be avoided and idle line should not be left on cat head. The line should be kept off derrick floor, when not in use. Diameter of catheads should be at least 10 inches and made of wear-resisting material, in order that grooving by wear will be minimized. The key seat and projection key on every cathead shall be covered with a smooth thimble.

ARTICLE 8 - ROTARY EQUIPMENT

Section A. Weight Indicators

1. Weight indicators are to be used in all drilling and work over operations. Frequently checks should be made of the indicator for approximate accuracy. The weight on the blocks and hook should be known at all times.

Section B. Draw Works Brakes

1. Brake blocks should be installed so as not to extend beyond the curved portion of the brake band; i.e., 100 percent contact with the flange is required.

2. The brake band should be installed, so that when the brake is fully applied, the angle between the band and the lever will be about 90 degrees.

3. Draw works brake bands should be kept as nearly a perfect circle as possible.

Section C. Rotary Hoses

1. Rotary hoses must be capable of withstanding the abrasive action of high velocity mud, high pulsating pressures and any crushing action incidental to normal operations.

2. Wire reinforced-type hose should approximate the following:

<u>Type</u>	<u>Bursting Pressure</u> <u>(lb/sq in)</u>	<u>Working Pressure</u> <u>(lb/sq in)</u>
2 - wire	7,000	1,500
3 - wire	8,000	3,000
5 - wire	10,000	3,500

3. Safe working pressures for steel rotary hose should approximate:

<u>Hose Size</u> <u>(in)</u>	<u>Length</u> <u>(ft)</u>	<u>Approximate Weight</u> <u>(lbs)</u>	<u>Safe Working Pressure</u> <u>(lbs)</u>
3	45 or 50	835	3,500
4	45 or 50	1,050	3,000

4. The couplings for rotary hoses should consist of a steel shank which is inserted in the hose and a heavy clamp on the outside. The hose should also be reinforced for a distance of at least three feet from the end.

5. Swivel gooseneck connection outlets shall be threaded internally with API line pipe threads in 2-inch, 2 1/2-inch, 3-inch, 3 1/2-inch and 4-inch sizes, threading to be in accordance with API standard 5-F (API specifications for threads in valves, fittings and flanges for use with API tubular material).

6. The pump end of every rotary hose shall be fastened to the derrick, and the other end of the hose shall be fastened to the gooseneck, or to the swivel bail with a chain or with a wire cable.

Section D. Elevators, Hooks, Blocks, Bails, Spiders etc

1. Elevators, hooks, blocks, bails, spiders, etc, will not be employed with weights beyond their rated capacity.

Section E. Rotary Pipe Tongs

1. Back-up tongs should be snubbed to the sub-structure at the legs of the derrick, the two lines forming a wide angle at the tongs. The snubbing lines (usually 5/8 - inch wire rope) should have just sufficient slack (and no more) to allow the tongs to be readily latched onto a drill pipe.

2. The break out tongs should be snubbed to the derrick legs directly across the derrick from the cat head.

3. Tong counterbalance weights which have been rigged to hand in the corner of the derrick should be close to the derrick leg, and close enough to the floor, so that if the supporting line breaks, the weights cannot fall onto a man. These weights may also be snubbed to the derrick leg, or placed upon pipe guides either inside or outside the derrick. The weights, if hung outside of the derrick, should be surrounded by a guard rail, so that men cannot get under them.

4. Ends of snubbing lines should be secured with wire-line clips, and ends of lines should be seized or welded for the protection of the workers' hands.

Section F. Guards

1. Guards will be placed around rotary chains, gears and all similar moving parts of the rigs or machinery. Workers will at no time cross over these parts.

Section G. Traveling Blocks and Hooks

1. Every traveling block shall be equipped with a safety housing containing no square bolt heads or other abrupt projections. The housing is to be arranged with holes or slots for cable to pass through before it reaches or travels to

sheaves, in order to protect workmen from having hands or fingers drawn in between sheave and cable.

2. Every drill pipe, casing, tubing and sucker rod hook shall be of a type with a catch or guard, to prevent the elevator links and other equipment from becoming accidentally disengaged from the hook. The safety catch or guard must be of an approved type and elevator links shall be securely chained or cabled to hook.

Section H. Headache Post

1. The driller or draw works operator will be protected by a headache post, from jerk line and rotary pipe tongs. A "U" bolt or other suitable device, shall be set in the jack post at a point below the cat head to support the snapping line.

ARTICLE 9 - WELL CONTROL

Section A. Blow-Out Preventers

1. Blow-out preventers must be used on all drilling and workover operations. They shall be tested frequently and ascertained to be with proper size rams. Double blow out preventers are highly desirable where high pressures may be encountered; using blind rams in one preventer, and the proper size rams for the particular size pipe being used in the other.

2. The stems controlling the blow out preventers and control heads should be so extended that they may be adjusted in case of necessity from a point outside of the derrick.

Section B. Drilling Fluid

1. A hydrostatic head of enough weight should be maintained to control any expected reservoir pressure.

2. When gas cut mud is obvious at the flow line, the weight of the drilling mud should be increased.

Section C. Minimum Tubing

1. A minimum length of tubing to be used in wells with high reservoir pressures should be that which will over balance the well pressure at the surface, e.g., fifty 30-foot joints of 2 1/2 - inch external upset tubing are required to balance 1,500 pounds well head pressure.

Section D. Tubing Heads

1. The design of the head should permit re-entering the well under high pressure to adjust tubing, if necessary. The packing elements must insure permanent seal of pressure.

Section E. Casing Heads

1. Valves and connections used in the well head connections, or christmas tree, must be of a test pressure capable of withstanding any expected working pressure plus a safety factor of two.

ARTICLE 10 - GENERAL SAFETY PROVISIONS

Section A. Derrick

1. Derricks must be provided with (a) an emergency escape device for derrick men, (b) railing around open sections of derrick floor, (c) railing around water table, (d) at least 36 - inch wide platform for derrick men, (e) safety belts for derrick men, (f) walks and platforms insured, as much as possible, against slip-
page and slipping.

Section B. First Aid Kits

1. First aid kits must be available to rig workers.

Section C. Safety Clothing

1. Gloves and shoes will be worn as they are made available. Clothing should fit well and be kept on.

Section D. Women and Adolescents

1. No male under the age of 16 years or female shall be allowed on the floor of a drilling rig during the time any well is being drilled or repaired.

Section E. First Aid

1. When material is available, all employees should be given first-aid training, as soon as possible after being employed. When an injury occurs, a doctor shall be notified immediately.

Section F. Instruction to Employees

1. New employees with no experience shall be instructed in the particular danger incident to their work, by the supervisor, tool pusher, or some one capable of giving satisfactory instruction.

Section G. Additional Safe Guards For Mechanical Equipment

1. Additional safe guards for mechanical equipment shall be governed by Article 10, Section B, Mine Safety Code for Japanese Coal Mines.

Section H. Safety Organization

1. If practical, a safety organization of officials and employees should be established. Joint safety meetings of men and officials should be held.

Section I. Report of Accidents

1. The administrative office shall be notified immediately of any accident. A record shall be kept by the management of all lost-time accidents; these should be summarized monthly, as well as annually.

Section J. Duties and Responsibility of Workers

1. A workman climbing into the derrick shall, when carrying tools or other material, secure these to the person.

2. Workers shall not let no time pass over chains, belts, gears or other moving parts of the machinery.
3. No one will at any time ride the elevators or blocks.
4. Workers will stand clear of a line in tension, e.g., in bailing or swabbing operations.
5. Wire lines must not be guided by hand, when being reeled or unreel.
6. Dust respirators and goggles should be used by men mixing cement.
7. Valves under pressure will be opened slowly.
8. Workmen shall at all times comply with all ordinances and company rules promulgated for their protection and the preservation of property, and cooperate with management in the enforcement of any such ordinances, regulations or rules.
9. The derrick, sheave blocks, life lines, safety belts, cables, fittings, etc, should be examined frequently by the drilling crews.

ARTICLE 11 - PRODUCTION PRACTICES

Section A. Gauging of Oil Tanks

1. Ladders and gauge hatches should be placed on the windward side of the tank; if hydrogen sulfide gas is present, two men should be present, and the gauger must wear a gas mask. Work must always proceed on the windward side of the gauge hatch.
2. Provision must be made to prevent the gauger from falling into open-top tank.

Section B. Cleaning Storage Tanks

1. All lines leading into the tank must be disconnected. Gas masks must be worn while working inside the tank. Not more than two or three men should work in a tank at one time. Walks and ladders must be secure and provided with material or otherwise fashioned to minimize foot slippage.

Section C. Pipe Fittings and Valves

1. Pipe fittings and valves in use will be of a higher test pressure than any pressure to which they may be exposed. Careful attention must be given, before use of cast iron tees and elbows.

Section D. Safety Valves

1. Pressure lines and tanks shall be equipped with standard safety valves. No stop valve of any kind shall be permitted between the regular safety valve and compressor.

Section E. Keys Shafting, Set Screws and Collars

1. All exposed keys should be cut off, or safely enclosed. All dead ends of shafting must be cut-off or completely enclosed with a guard that does not revolve with the machinery. Protruding set screws must be replaced with

approved safety set screws, allowing no part of the set screws to project above the surface.

Section F. Counterbalance

1. No counterbalance shall clear the ground by more than five feet, unless suitable provision is made to prevent its falling on persons working below.

ARTICLE 12 - EXPLOSIVES AND BLASTING

Section A. Governing Regulations

1. Explosives and blasting shall be governed by provisions of Article 4, Mine Safety Code for Japanese Coal Mines.

ARTICLE 13 - OIL MINING

Section A. Governing Regulations

1. Oil mining shall be governed by the provisions of the Mine Safety Code For Japanese Coal Mines.

ARTICLE 14 - FIRE PREVENTION

Section A. Fire Hazard

1. Smoking will be prohibited in and about the rig.
2. If matches are necessary, only the safety variety should be permitted.
3. Forges for dressing tools shall not be placed in the derrick.
4. Boilers should be placed at a reasonable distance away from the well.
5. Spark arresters shall be placed on boilers' stacks.
6. Electric lights should be used in preference to any form of lamp or torch.
7. If the well is flowing gas or oil, the rig lights should not be used but floodlighted from outside the derrick.
8. No bare electric wires shall be permitted.
9. Static electricity generated by the band-wheel belt, brakes or other moving parts must be prevented from causing fires.
10. All parts should be properly grounded and belts should be provided with copper brushes attached to a grounded pipe.
11. Sparks from steel being struck on steel must be watched.
12. The use of open fire for heating purposes in the proximity of a derrick or drilling rig is to be prohibited.

Section B. Storage Tanks

1. Steel storage tanks having vapor-tight steel roofs present less fire hazard than other types.
2. Vent lines should be connected to breather valves, so that the vapors can be discharged at an appreciable distance from the tanks or be conveyed to a gasoline plant.
3. Small tanks may be grouped and have one fire-wall. Large tanks (over 2,000 bbl.) should have an individual, circular fire-wall.
4. Fire walls must have an embankment that will be high and strong enough to withstand the force of a wave of oil traveling toward it at a high velocity during a boiling over. The embankment shall be high enough to retain a capacity that is at least 50 percent in excess of the tank capacity.
5. The area should be oiled to prevent growth of vegetation, and trash should not be allowed to accumulate near by.
6. Lightning arresters should be interspaced among oil storage tanks.
7. Smoking must be prohibited inside fire walls.

Section C. No Smoking Signs

1. "No Smoking" signs with red letters on white background shall be posted in obvious places near (a) tank batteries, or single storage or flow tanks (b) wells flowing gas and/or oil openly at the surface (c) gas compression stations and gasoline plants.

2. It is to be understood by all concerned that smoking is prohibited on drilling and work over rigs at the locations of flowing or pumping wells.

ARTICLE 15 - REVIEW, REVISION, ENFORCEMENT

Section A. Review and Revision

1. From time to time, upon the request of an organization representing petroleum producing organizations or of labor organizations, the provisions of this ordinance may be reviewed and revised. Such review and revision may be with respect to its general application, applications to types, conditions and methods being employed in drilling and producing oil wells, or application in specific cases.

Section B. Enforcement

1. The competent Bureau Chief, under the competent Minister, shall be the exclusive agency charged with the enforcement of this code (ordinance) and the correction of violations thereof.

Section C. Compliance

1. When non-compliance with this ordinance is found by the inspector from the Department of Petroleum Safety, it shall be reported immediately by him to the manager of the oil company's district within which the violation has occurred.

with a recommendation for the elimination or correction of such violation, (setting a time limit for compliance). If compliance is not effected within the time limit set by the inspector, operation of the equipment or installation in question shall cease until compliance is met. Continued operation of equipment or of an installation by any person or company that has been ordered stopped by the Petroleum Safety Inspector shall be subject to a fine of £10,000 for each 24 hours that such operation has been continued after notice of suspension has been ordered by the petroleum Inspector.