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Title: REPORT OF FIRE PROTECTION 19 APRIL 1956

Serial No: 142C

Pages: 27

Notes: NRDL + OTHER BUILDINGS

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SAN FRANCISCO NAVAL SHIPYARD  
 SAN FRANCISCO 24, CALIFORNIA

1420

A 2 2  
 A 3-140

19 April 1956

## MEMORANDUM

From: Industrial Engineering Officer  
 To: All Department Heads

Subj: San Francisco Naval Shipyard; Fire Protection Survey, report of  
 (OPNAV Report 11320-2)

Ref: (a) Shipyard Regulations, Articles 1508 and 1511  
 (b) NAVSHIPYDSFRANINST 5040.3 of 20 Mar 1956

Encl: (1) COM 12ND Ltr WD12-44D:ha:cy ser 5229 of 6 Apr 1956

1. The subject report, enclosure (1), contains a comprehensive report of fire protection deficiencies throughout the Shipyard. Enclosure (1) requires that comments be made on each recommendation and that requests for funds or approval be submitted by separate correspondence where necessary to effect the recommendations. Recommendations of a minor or maintenance nature developed during the fire protection survey are covered by separate correspondence.
2. It is requested that the department indicated as "lead code" prepare the required comments and forward them to the Industrial Engineering Officer by 1 May 1956. Assist codes are requested to provide assistance to the lead code as may be required. Comments should be limited to a statement of (1) concurrence indicating that a special project will be developed, where appropriate, with an estimated date for programming; or (2) non-concurrence supported by a complete justification. In keeping with the responsibilities assigned by reference (a), it is requested that the Administrative Officer sponsor special projects under the appropriate facility program to accomplish those recommendations requiring approval or funding by higher authority.
3. The Industrial Engineering Officer will prepare the consolidated Shipyard report for signature of the Shipyard Commander in accordance with the responsibilities assigned by reference (b).

Copy to:  
 Codes 136, 137, 138,  
 139, 3-140

  
 S. J. HOFFMAN

61884

COMMANDANT  
TWELFTH NAVAL DISTRICT  
FEDERAL OFFICE BUILDING  
SAN FRANCISCO 2, CALIFORNIA

IN REPLY  
REFER TO

ND12-44D:hatcy  
Serial 5229

6 APR 56

From: Commandant, Twelfth Naval District  
To: Chief of Naval Operations  
Via: (1) Commander, San Francisco Naval Shipyard  
(2) Commandant, Twelfth Naval District  
(3) Chief of the Bureau of Yards and Docks (M-244)  
Subj: San Francisco Naval Shipyard, San Francisco, California; Fire  
Protection Survey, Report of (OPNAV REPORT 11320-2)  
Ref: (a) OpNav Instruction 11320.5A of 14 Mar 1956  
Encl: (1) Report of Fire Protection Survey (OPNAV REPORT 11320-2)

1. The enclosed report has been prepared in accordance with the requirements of reference (a). It is requested that the Commander of the Shipyard take the following action as required by reference (a):

a. Comment on each new and resubmitted recommendation indicating those which have been or will be adopted and specifically state reasons for any nonconcurrency.

b. Where special funds or approval are necessary to effect recommendations, request such funds or approval by separate correspondence.

c. Furnish copies of endorsement to originator, endorsees, and information addressees.

d. Handle the report expeditiously so that decisions and action involved may be effected without undue delay.

JOHN R REDMAN



R. P. CARLSON  
By Direction

Copy to:  
OPNAV (Op442) (w/encl) (Advance)  
BUDOCKS (M-244) (w/encl) (Advance)  
BUSHIPS (w/encl)  
DPWO 12ND (w/encl)

592400

DISTRICT PUBLIC WORKS OFFICE  
TWELFTH NAVAL DISTRICT  
SAN BRUNO, CALIFORNIA

NAVDOCKS 2080(2-55)

OPNAV REPORT 11320-2

REPORT OF FIRE PROTECTION SURVEY

NAME OF ACTIVITY: San Francisco Naval Shipyard, San Francisco, California.

LOCATION: Hunters Point, in southeast section, City of San Francisco, California.

DATES OF SURVEY: 28 November 1955 to 6 January 1956, and 14 March 1956.

DATE OF REPORT: 21 March 1956.

1.a. CHANGES SINCE LAST REPORT: 26 JANUARY 1955.

A six-story, windowless, concrete and protected steel building (412' x 108') known as the Naval Radiological Defense Laboratory Building No. 815 previously reported under construction has been completed and is occupied. Fire protection features include proper separation from other structures, enclosed interior stairways, ample exits properly located, exit lights, evacuation alarms, auxiliary fire alarm boxes, annunciators, complete systems of automatic sprinklers, electric driven centrifugal water pumps to augment water pressure in sprinkler mains, dry type standpipes in each stairway with siamese connections at all floor levels, and 6 fresh water hydrants supplied from 8" stubs off a 16" water main.

1.b. OPERATIONS: The station is at a normal level of activity. A few buildings are secured at the present time due to the consolidation of the Naval Radiological Defense Laboratory operations in their new building, No. 815. Many of the vacated buildings are at the present time being remodeled for the new occupancies.

1.c. CONDITION OF FIRE APPLIANCES: Periodic inspections and necessary maintenance are provided, and at the time of the survey the first-aid and portable fire extinguishing equipment appeared to be in good condition. Some corroded and leaky water pump cans were found during the survey and were replaced as they were found. A few valves on the inside standpipe and hose systems were found leaking and were reported to the proper organizations for repairs.

ENCLOSURE (1) to Coml2 Serial  
5229 of 6 Apr 1956

l.d.

SUMMARY

Composite Evaluation of

Fire Protection FAIR Previously FAIR

REMARKS: The composite evaluation of FAIR is based on major deficiencies found on the station as follows: large undivided floor areas, mutual exposure between buildings, inadequate water storage capacity, unreliable fire alarm system, lack of required automatic sprinkler protection in many buildings, deficient emergency exit facilities and inherent fire hazards involved in various operations conducted at the shipyard.

Structural Conditions FAIR Previously FAIR

Water Supply FAIR Previously FAIR

Fire Alarm System POOR Previously POOR

Fire Protection Equip-  
ment and Devices FAIR Previously NONE

Fire Prevention FAIR Previously FAIR

Life Safety FAIR Previously FAIR

Protection for Common  
Hazards FAIR Previously NONE

Protection for Special  
Hazards FAIR Previously NONE

l.e. DESCRIPTION: The station covers an area of approximately 565 acres with about 90% of the area built up. The station is mainly flat and partially on filled ground. Steep slopes lead to the Administration Building area, Officers' Club, Quarters area and part of Solomons Village area. The station enjoys moderate temperatures with extended dry periods in the summer. Average annual rainfall is approximately 20 inches. Moderate to strong prevailing winds are mainly from the southwest. There are approximately 415 buildings on this station, mostly of wood frame construction, but including all types to fire resistive construction. The source of potable water is from the City of San Francisco water distribution system. An extensive salt water system is installed on the station with a total pumping capacity of 12,500 GPM, taking draft from the bay. Approximately 25% of the hydrants are fed with fresh water and 75% with salt water. Automatic sprinklers provide complete protection in 31 buildings and partial protection in six others.

1.f. LOSS RECORD: No significant fire loss has occurred since the previous report dated 26 January 1955.

1.g. PROMINENT UNDESIRABLE FEATURES:

(1) Storage capacity for water is less than one-third the required amount for a minimum reserve for fire protection as required by TP-Pu-4 "Fire Prevention and Fire Protection".

(2) The unreliable and difficult to maintain fire alarm system.

(3) The large number of buildings without automatic sprinkler systems as required by TP-Pu-4 "Fire Prevention and Fire Protection".

(4) The large number of discrepancies in emergency exit facilities on the station.

#### DETAILS

2.a. STRUCTURAL CONDITIONS - EVALUATION FAIR:

(1) CONSTRUCTION: There are approximately 415 buildings on this station. Of these approximately 245 are family quarters buildings and 62 are buildings with floor areas of less than 1000 square feet. A majority of the buildings on the station are of combustible construction and are one or two stories high. Complete automatic sprinkler protection is provided in 31 buildings and partial automatic sprinkler protection is provided in six. The storehouses on the station consist of a four-story fire-resistive building protected with automatic sprinklers, nine single-story combustible storehouses with floor areas of 30,000 to 45,000 square feet protected with automatic sprinklers and numerous small unsprinklered Butler-type non-combustible storehouses. Numerous shops peculiar to shipyards are located in buildings varying in construction from combustible to fire-resistive and in ground floor areas to approximately 182,000 square feet. The stairways and elevators in these buildings are, for the most part, open; exceptions are found in the permanent buildings of fire-resistive construction where standard enclosures are used at floor openings. Buildings used as barracks, BOQ, clubs, Administration Building, etc., are generally of two-story combustible construction. Large areas of these buildings are open joist or sheathed with combustible fiber board, and, for the most part, proper protection against the vertical spread of fire is not provided.

Building tabulation - excluding family quarters buildings

Height	Fire-Resistive	Masonry	Non-Combustible	Combustible
1	23	4	34	88
2	3	-	-	42
3	-	-	-	2
4	1	-	-	-
5	1	-	1	-
7	1	-	-	-
<b>Total</b>	<b>29</b>	<b>4</b>	<b>35</b>	<b>132</b>

(2) BRIG: The brig on the station is secured and future use is not contemplated. At the present time, prisoners are taken to Treasure Island Naval Station for confinement. The station brig is located in the basement of Bldg. No. 110. It is of reinforced-concrete construction and completely cut off from the rest of the building. It has one exit, directly to the outside, and contains two small cells with a capacity of one person each.

(3) EXPOSURES:

(a) Off Station - No off-station exposure is presented to the main shipyard area. Light exposures are presented to Quarters buildings in the Solomon Village area by wood frame dwellings, stores, etc. The exposure grades as light.

(b) On Station - A majority of the larger buildings, such as the storehouses and shops are provided with 100 feet or more clearance. However, in a number of cases, especially in the quarters areas, sub-standard spacing of buildings was noted as follows:

1 Solomon Village two-story 8-unit apartment buildings, wood frame, stucco walls, 40-100 feet.

2 Officer and civilian quarters, wood and stucco walls, 10-30 feet.

3 Homoja Housing, Quonset type, 20-30 feet.

4 Navy barracks 507, 508, 509, 512, 513, 514, 515, 516, & 517 two-story, stucco walls, 40-60 feet.

5 Industrial buildings 116 and 119, 30 feet; 121 and 146, 10 feet; 123, 124 and 134, 30-40 feet; 128, 130 and 147, 60 feet; 141 and 142, 50 feet; 148 and 149, 10 feet; 204, 205, 207 and 208, 15-30

feet; 211 and 231, 50 feet; 302, 302A and 304, 30 feet; 270, 271, 272 and 273, 10-60 feet; 368 and 369, 40 feet; 418, 419, 420, 421 and 424, 20-50 feet, and 801 and 816, 10 feet. In most of the above-listed substandard spaced groups, wood frame walls with unprotected windows are exposed. The mutual exposure grades as light on the station with the above groups grading moderate.

(c) Interior - The following buildings have ground floor areas exceeding 40,000 square feet:

Table of large-size buildings:

<u>Bldg No.</u>	<u>Name</u>	<u>Ground Floor Area</u>	<u>Con-struction</u>	<u>Sub-Division</u>	<u>Protection</u>
411	Shipfitters, welders, and boilermakers shops	182,000	non-combustible	-	10% automatic sprinklers
211 & 253	Machine, electrical, & optical & ordnance shops	115,000	combustible	draft curtain	automatic sprinklers
231	Inside machinist shop	105,000	combustible	-	-
813	Supply office & storehouse	71,500	fire-resistive	-	automatic sprinklers
123	Battery overhaul and storage	65,500	combustible	-	-
101	Administration office	54,500	combustible	-	-
404	Supply storehouse	50,000	combustible	-	automatic sprinklers
815	Naval Radiological Defense Laboratory	46,000	fire-resistive	2 fire walls	automatic sprinklers
400	Supply storehouse	43,000	combustible	-	automatic sprinklers
251	Temporary services and central tool room	40,000	combustible	-	automatic sprinklers
405	Supply storehouse	40,000	combustible	-	automatic sprinklers

<u>Bldg No.</u>	<u>Name</u>	<u>Ground Floor Area</u>	<u>Con-Struction</u>	<u>Sub-Division</u>	<u>Protection</u>
406	Shipping, packing and preserving	40,000	combustible	-	automatic sprinklers
407	Supply storehouse	40,000	combustible	-	automatic sprinklers
808	Supply storehouse	40,000	combustible	-	-

The entire shipfitters, welders and boilermakers shops, Building No. 411, having a ground floor area of 182,000 square feet is subject to a single fire. The possibility of a fire starting in this building is increased due to the large amount of combustible ships molds that are stored in an unsprinklered area.

(d) Percentage of station value subject to a single fire -- The largest values subject to a single fire would be in the sprinklered, combustible storehouse, Bldg. No. 404, (approximately \$13,750,000) and the non-sprinklered, non-combustible storehouse, Bldg. No. 808 (approximately \$14,000,000). In either of these buildings about 9% of the station value (approximately \$152,000,000) would be subject to a single fire. The greatest effect on the mission of the station would result from a major fire in the two-story fire-restive Plans Storage Vault in the Administration Building, No. 101, containing nearly all of the station's design tracings, Public Works tracings, and original correspondence having intangible value and generally irreplaceable.

2.b. WATER SUPPLY - EVALUATION FAIR :

(1) General description: Water for domestic use, fresh water hydrants, and automatic sprinkler systems is supplied by a 16" public water main through four 8" compound meters on Crisp Avenue and an 8" connection to an 8" public water main through eight 2" meters on Inness Avenue. Both public mains are supplied through the San Francisco Water Department distribution system from a 116,000,000 gallon reservoir located approximately two and one-half miles west of the shipyard. Two electrically-driven centrifugal booster pumps take suction at the 16" connection and discharge into the 420,000 gallon tank through approximately 1900 feet of 8" main. The salt water system provides a total pumping capacity of 12,500 GPM at 120 pounds pressure by twelve pumps installed in five widely separated locations. The fresh water and salt water distribution systems are both, for the most part, looped and grid-ironed, but do contain some dead end sections. The pumps are electrically driven with reliable power supplied by the local public utility company. Approximately one-third of the salt water pumping capacity is dual-driven with a secondary drive of gasoline engines.

(2) General adequacy and reliability of the water supply as a whole:

Due to the limited amount of storage and deficiencies in the distribution system, the fresh water system is inadequate to supply automatic sprinklers in large area and/or multi-story buildings under major fire conditions. This situation is aggravated by the lack of draft curtains in large area, sprinklered buildings, which increase the water demand of the sprinkler systems, and by the lack of fresh water hydrants in the vicinity of sprinkler system siamese connections to permit fire department pumps to increase volume and pressure available to the sprinkler systems. The water storage available is approximately one-third of the average daily consumption and accordingly, does not provide a reserve to meet major fire flow requirements. While the total salt water pumping capacity is in excess of the maximum fire flow demands for the shipyard, the quantity available at any one area for fire fighting purposes is limited by the distribution system. The layout of the salt and fresh water hydrants does not provide for maximum utilization of both the salt and fresh water systems at areas of heavy demand.

The reliability of the public water supply to the shipyard is considered only FAIR due to the fact that the yard is comparatively remote from the large sized distribution grid of the public water system. The shipyard is mainly dependent upon a single 16" main which extends approximately 9,000 feet from the yard system to the first main of comparable size in the city distribution system. A failure in the 16" main would produce a critical situation, particularly if a serious fire occurred during such failure. Since dual drives are not provided for booster pumps which fill the 420,000 gallon storage tank, these pumps may be placed out of service by power failure. However, power from the Pacific Gas and Electric Company is supplied to the yard by four feeds at separated locations, two of which can be tied to an auxiliary sub-station, and is considered reliable. The dual drives (electric motors and gasoline engines) for three salt water pumps totaling 3250 GPM capacity provide good reliability for one third of the yard's salt water pumping capacity in the event of power failure.

(3) Storage: One ground level steel tank with a capacity of 420,000 gallons is located on the hill in the quarters area. The storage tank supplies the quarters area and Officers' Club. When the distribution system pressure in the industrial area falls below 45 pounds, the tank supply becomes available for this area by the opening of a balance valve. The water storage available is approximately one-third of the average daily consumption and accordingly does not provide a reserve to meet major fire flow requirements.

(4) Pumps:

<u>System</u>	<u>Location</u>	<u>No. of Pumps</u>	<u>Type</u>	<u>Capacity GPM</u>	<u>Prime Mover</u>	<u>Auxiliary Power</u>
Fresh	815	2	Centrifugal	1,000	Electricity	-
Salt	145	2	Turbine	1,250	Electricity	Gasoline (1)
Salt	204	2	Centrifugal	1,000	Electricity	-
Salt	203	1	Turbine	500	Electricity	-
Salt	203	2	Turbine	1,000	Electricity	Gasoline (1)
Salt	308	1	Turbine	500	Electricity	-
Salt	308	2	Turbine	1,000	Electricity	Gasoline (1)
Salt	523	2	Turbine	1,500	Electricity	-

(5) Distribution system:

(a) Mains - The fresh water mains are mostly cement-lined cast-iron pipe 6" and 8" diameter with some 10" and 16" sizes. The system is mostly looped and gridironed with some dead end mains. The majority of the salt water mains are 8" diameter with some 6" and 10" sizes, mostly cement-lined cast-iron pipe with the exposed pipe under the piers steel, protected against corrosion. The system is mostly looped and gridironed with some dead end mains.

(b) Sectional and main control valves - The hydrants are provided with individual control valves and generally, adequate numbers of sectional valves are provided in both the fresh water and salt water distribution systems.

(c) Fire hydrants - Hydrants are of the California type having two 2½" and one 4½" outlets with National Standard Threads. Approximately 75% of the hydrants are connected to the salt and 25% to the fresh water system. Spacing of hydrants varies from 50 feet to 700 feet providing an excess of hydrants in some areas and a deficiency in others. There is a general lack of fresh water hydrants within reasonable distances of siamese connections to automatic sprinkler systems.

(d) Required fire flow for the station - 6000 GPM is required as a fire flow in the vicinity of Buildings Nos. 211, 231, 253 and 411. In all cases the buildings have undivided ground floor areas of over 100,000 square feet and in Buildings Nos. 231 and 411, large unsprinklered areas.

(e) Pressures and flows -

1 Average station pressure - approximately 60 psi in the industrial area and varying from 10 to 35 psi in the housing area on the hill.

2 Results of most recent flow test - 8 February 1956. Previous flow tests conducted April 1948.

System	Location Bldg. No.	Static Pres. psi		Flow GPM		Resid. Pres. psi		Est. GPM Avail. at 20 psi	
		Pres.	Prev.	Pres.	Prev.	Pres.	Prev.	Pres.	Prev.
Fresh	513	-	65	-	1190	-	48	-	2000
Fresh	253	60	65	1565	1050	36	54	2300	2250
Fresh	119	60	58	1200	960	24	39	1400	1400
Fresh	Hsg	35	-	290	-	22	-	290	-
Fresh	815	58	-	2820	-	34	-	4000	-
Fresh	411	60	-	2650	-	33	-	4000	-
Salt	Pier 2	115	-	1880	-	25	-	2000	-
Salt	211	120	-	2055	-	40	-	2800	-
Salt	123	120	-	1650	-	36	-	2000	-

(f) Maintenance - The general level of maintenance for the fire protection water supply appeared good and all components apparently were in good operating condition during the survey.

2.c. FIRE ALARM SYSTEM - EVALUATION POOR :

(1) Telegraphic -

(a) Make, class and type of circuits - A proprietary fire alarm system (Auto Call - Howe impulse type) is provided on the station. This system is the outgrowth of a combination watchman-signaling and fire alarm system which originally consisted of less than 20 boxes. Alarm boxes are provided in all sections of the station.

(b) Number of box and alarm circuits - The fire alarm system consists of one alarm and five box circuits.

(c) Wiring - Approximately 90% of the alarm wiring is under ground.

(d) Number of standard coded boxes and special transmitters on each box circuit -

Circuit No.	Standard Boxes	Special Transmitters		Total
		Water Flow	Valve Supervisory	
1	29	7	7	43
2	31	9	9	49
3	11	20	20	51
4	33	13	13	59
5	10	58	62	130
Total	114	107	111	332

(e) Power supply - The regular source of power is from the station alternating current power supply through rectifiers. The emergency source of power is provided by batteries which ride the system and automatically supply the system in the event of interruption of the normal power supply.

(f) Testing - Each circuit is tested daily for operation, shorts and grounds, and every box is operated at least once a month.

(g) Condition and maintenance - The fire alarm circuits were tested for grounds and short circuits. Insulation resistance to ground was measured on each circuit and found to vary from .1 to .8 megohms. The low insulation resistance readings were probably due to high humidity conditions resulting from an extremely long siege of rainy weather. Two alarm boxes were pulled simultaneously and correct and complete signals were received from each box. The fire alarm equipment presents an extremely difficult maintenance problem since slight amounts of corrosion, pitting, changes in resistance and slight adjustment of relays and transmitters cause the system to operate improperly. There were periods in the past where one or more box circuits were inoperative for long periods of time. This condition is more hazardous than if no alarm system existed as a fire could get out of control before it was realized that the system was out of order.

(2) Telephonic:

(a) Type of system - No telephonic alarm system is installed; however, the regular dial system installed on the station is used as a secondary means to report fires.

(b) Fire Department fire call number - 2111.

The station cannot presently comply with the OpNav instruction specifying fire call number 3 or a succession of 3's because the

block of numbers assigned to the station's exchange does not include the number 3300 series and are all 4-digit numbers. It is felt that the least confusion will arise by continuing to use the present number which has been in use for a number of years until it is possible to use the specified number.

2.d. FIRE PROTECTION EQUIPMENT AND DEVICES - EVALUATION FAIR :

(1) Automatic fire alarms:

(a) Type and coverage - Fixed temperature, electric, fire detection systems are provided in the Records Vault Section of Bldg. No. 101, Administration Building, and the unsprinklered rooms of Bldg. No. 816, NRDL High Voltage Accelerator Building.

(b) Tests and maintenance - A schedule has not been set up by the station for the regular testing and maintenance of these systems.

(2) First aid extinguishing equipment:

(a) Types - All types of extinguishers are used on the station; however, the majority of the extinguishers are confined to the water pump and carbon dioxide types.

(b) Distribution - In general, ample numbers of correct types of extinguishers are provided where needed on the station.

(c) Inspection and maintenance - Extinguishers are inspected monthly by Fire Department personnel, and records are kept on extinguisher tags. Fire extinguishers appeared to be well maintained at the time of the survey; however, a few water pump cans were found to be leaking and were replaced as they were found. It was noted during the survey that the procedure of providing lead seals on carbon dioxide extinguishers was not followed. In many cases throughout the station, especially in the storehouse area, extinguishers were noted hanging above the level recommended in N.F.P.A. standards, Pamphlet No. 10.

(3) Automatic sprinklers:

(a) Types - Wet pipe automatic sprinklers are installed in thirty-seven buildings on the station.

(b) Buildings protected - The following thirty-one buildings were provided with wet pipe automatic sprinkler protection throughout the building: 113, 115, 116, 121, 211, 217, 241, 251, 253, 270, 271, 272, 302, 351A, 363, 366, 400, 402, 404, 405, 406, 407, 413, 414, 506, 507, 509, 518, 803, 813 and 815.

Partial wet pipe automatic sprinkler protection was provided in the following six buildings: Battery Overhaul and Storage

Building, No. 123 - 90%; Central Cafeteria Building, No. 228 - 90%; Inside Machinists Shop Building, No. 231 - 50%; Building Trades Shop Building, No. 401, - 85%; Shipfitters and Boilermakers Shop Building, No. 411 - 10%; and Naval Radiological Defense Laboratory High Voltage Accelerator Building, No. 816, - 90%.

A substandard homemade wet pipe sprinkler system is installed in the Public Works Equipment Shelter Building No. 705, and outside cornice sprinklers are provided on Barracks Buildings, Nos. 512, 513, 514, 515 and 516.

(c) Adequacy - A number of the buildings that were provided with 100% sprinkler protection at the time of the initial installation have since been modified and have had partitions moved creating unprotected areas. Recommendations have been made to correct these conditions in Buildings Nos. 115, 211, 228, 231, 251, 253, 270, 271, 272, 302, 401, 404, 414, 507 and 813. Complete systems of automatic sprinklers should be installed in Buildings Nos. 101, 128, 130, 205, 214, 231 (second floor), 302A, 307, 364, 411, 415, 416, 432, 433, 434, 503, 505, 510, 510A, 524, 525, 526, 808, 809 and 810. The sprinkler system installed in Building No. 705 is substandard, but since the value of the building and contents is relatively low no recommendation is being made to correct the deficiency.

(d) Testing and maintenance - The automatic sprinkler system installations on the station are inspected quarterly by the Fire Department inspectors in conjunction with Public Works personnel. Records are made of the inspections and kept on file. In a number of cases, protective covers were noted as missing from the siamese connections to the sprinkler systems.

(4) Other types of automatic or manual extinguishing systems: None.

2.e. FIRE PREVENTION - EVALUATION FAIR :

(1) Building inspections:

(a) Frequency, effectiveness, qualifications and training of personnel conducting: The two fire department inspectors under the direction of the Fire Chief make monthly inspections of all buildings on the station. The low fire loss rate of a station is indicative of the effectiveness of the inspection program. The inspectors appear to be qualified for the work and each has had many years of experience at the shipyard.

(b) Compliance with recommendations - Most recommendations to correct fire prevention discrepancies are complied with upon verbal request. Provision is made to use the Fire Inspector's Report Form requiring the supervisor's signature showing compliance with recommendation when action is not forthcoming upon verbal request.

(2) Fire regulations:

(a) Adequacy and completeness - The fire regulations are included and published as part of the station's regulations. A recommendation is being made to assemble the fire regulations, revise them where necessary to reflect present standards and conditions, and publish them as a separate unit of the station's regulations.

(b) Publication and/or posting - A condensed version of the fire regulations is published on the Station Fire Bill which is posted in buildings throughout the station.

(c) Enforcement - The enforcement of the fire regulations appeared to be fair. A number of violations were noted during the survey; however, the discrepancies were brought to the attention of the supervisor concerned and corrective action was promised.

(3) Fire prevention training:

(a) For inspectors, Fire Department personnel, station personnel - Weekly classes are held for the Fire Department personnel which cover all phases of fire prevention.

(b) Adequacy and frequency of instruction - The instruction appeared adequate for Fire Department personnel.

(c) Reference material - The fire prevention library is considered satisfactory and includes OpNav Technical Publication TP-Pu-4, "Fire Prevention and Fire Protection," NFPA Handbook of Fire Protection, NFPA Inspection Manual, a number of NFPA and NBFU standards and various other pieces of fire prevention literature.

2.f. LIFE SAFETY - EVALUATION FAIR :

(1) Adequacy of emergency exit facilities - In a majority of cases, exit facilities are adequate in number, of proper width, unobstructed, and with doors swinging in the proper direction.

(a) Deficiencies - Additional exits are needed to provide a secondary means of egress in the following areas: Building No. 120, Enlisted Men's Club (second floor); Building No. 146 - Industrial and Photo Lab (second floor); Building No. 251 - Temporary Services Building, (mezzanine deck, locker area, center of shop); Building No. 272 - Riggers and Laborers Shop (mezzanine deck, locker room, west side, south end); Building No. 302 - Transportation Shop, (mezzanine deck, conference room, northwest corner); Building No. 363 - Woodworking Shop (mezzanine deck, conference room, east end, north side); and Building No. 519 - Chapel (altar end, main chapel).

A secondary means of escape from the following areas is provided by vertical ladders which should be replaced with standard outside stairs -- Building No. 101, Administration Building (the ends of each wing); Building No. 217 - Sheet Metal Shop (conference room); Building No. 270 - Paint Shop (roof near conference room); Building No. 363 - Woodworking Shop (mezzanine office); and Building No. 520 - Dental Clinic (north end, northwest wing).

In a number of buildings, outside stairs are exposed at the first floor by ordinary windows. They should be replaced with wired glass in steel sash in the following buildings: Building No. 102 - Personnel and Security; Building No. 103 - Submarine Barracks; Building No. 108 - Temporary Marine Barracks; and Building No. 117 - Submarine Barracks.

In a few cases, exit doors and/or screen doors were found to swing in opposition to the direction of egress. Recommendations are being made to remove or re-swing these doors in the following buildings: Building No. 110 - Marine Barracks, Building No. 210 - Infirmary, and Building No. 507 - Ships Barracks.

In many cases, Barracks, Areas used for public assembly and buildings containing large numbers of personnel have exits not provided with panic hardware. Discrepancies were noted in the following buildings; Building No. 101 - Administration Building (cafeteria), Building No. 102 - Personnel and Security, Building No. 116 - Submarine Subsistence Building (drill hall), Building No. 118 - Submarine BOQ, Building No. 121 - Submarine Office and Apprentice School, Building No. 228 - Central Cafeteria, Building No. 411 - Shipfitters; Welders and Boilermakers Shops (cafeteria), Building No. 505 - Ships Canteen (bowling alley), Building No. 511 - Surface Ship Training, Building No. 519 - Temporary Chapel and Religious Center, Building No. 520 - Dental Clinic, Building No. 813 - Supply Office and Storehouse (first floor northeast end); Building No. 901 - Officers Mess and Barracks Buildings Nos. 103, 117, 502, 503, 507, 512, 513, 514, 515 and 516.

A few buildings used for the bunking of personnel or containing large numbers of persons, are lined with combustible sheathing with a high flame spread characteristic. Recommendations are being made to correct this condition in the following buildings: Building No. 101 - Administration Building, Building No. 102 - Personnel and Security, Building No. 104 - Barracks, Building No. 110 - Barracks, No. 118 - Submarine BOQ, Building No. 120 - Enlisted Men's Club and Building No. 500 - Ships BOQ.

(2) Exit alarms and drills: Electrically operated signals are provided in most major buildings on the station. In most cases a sufficient number of horns are installed to provide an audible signal in all sections of the building, and one operating switch is located centrally. Drills are held periodically in the major production buildings

on the station.

2.g. PROTECTION FOR COMMON HAZARDS - EVALUATION      FAIR:

(1) Description:

(a) Station lighting is electric with wiring of nonmetallic sheathed cable, metallic conduit and with large amounts of open knob and tube using a bare conductor for the neutral side. The circuits are protected with standard fuses and breakers. In most cases correct types of fixtures etc., are used in hazardous locations. Recommendations are being made to correct the deficiencies noted on survey. The electrical equipment was not grounded in all cases where required. The station Electrical system rates as FAIR.

(b) Heat is provided to most buildings on the Station by steam from a central heating plant. In a few areas gasfired warm air systems are provided. Stove pipes and gas vents have satisfactory clearance. In some cases, combustible radiator enclosures are provided; however, these are being replaced with noncombustible ones as time and funds permit. Overall rating for heat on the Station rates as GOOD.

(c) The power equipment is generally safely arranged. The upper portion of the electric substation Building No. 123, is of combustible construction; however, automatic sprinkler protection is being planned for this area. In Building No. 211 proper cutoff is not provided between transformer room and rest of the building. Fire safety for power rates - FAIR.

(d) Air conditioning installation mainly in the Naval Radiological Defense Laboratory is considered GOOD.

(e) Oils and paints are not always held down to operational (one day) supplies in the buildings. In many areas, low flash point flammables were not kept in safety containers and in some cases automatic closing devices on cleaning tanks etc., were out of adjustment. The overall fire safety rating for oils and paints is FAIR.

(2) Housekeeping: Good housekeeping practices are generally followed throughout the Station. Rubbish is generally collected at least daily on the station. In a few areas there appeared to be more than a single day's accumulation of trash and steps were immediately taken to dispose of it. Trash containers in buildings are not in all cases provided with covers.

(3) Control of grass, weeds and brush growth: Vegetation is kept under good control on the station property and no serious exposure is presented to any buildings.

(4) Smoking:

(a) Posting of signs in restricted areas: "No Smoking" areas were adequately posted in most cases.

(b) Enforcement - Evidences of smoking were noticed in some posted areas. These violations were brought to the attention of the personnel in the areas and enforcement of the regulations was promised.

(c) Inspection of clubs, recreation facilities after securing hours - The persons in charge of the various clubs, etc., are held responsible for the inspection of the facilities after securing hours. At the present time the Fire Department does not regularly provide such service.

(5) Cooking:

(a) General arrangement of ranges, ovens etc.- The ranges, ovens, etc. in the galleys are generally well arranged. Electrical equipment in the galleys was not grounded in all cases. A number of coffee messes throughout the station were noticed using make-shift hot plates and automatic electric coffee makers. In some cases, insufficient clearance was provided to combustible surfaces. Recommendations were made to correct these deficiencies during the survey.

(b) Hoods and vents -

1. Grease filters and general cleanliness - Filters are not provided on all hoods. The station has an outside contract for the cleaning of the range hoods. Excess accumulations of grease were not noted during the survey.

2. Clearances - No separate gas vent for the gas-fired ranges are provided in the kitchens in Buildings Nos. 228 and 815. Insufficient clearance was provided between the hood ducts and combustible surfaces over the grills in Buildings Nos. 228 and 505.

(6) Control of welding and cutting in repair, maintenance and alterations: The main welding shops are generally well arranged. In some cases unprotected combustible surfaces were noted in the shops in Buildings Nos. 128, 130, 368 and 369. No permit system is used by the station for welding operations outside the established shops; However, the Fire Department provides a stand-by fire watch when requested.

2.h. PROTECTION OF SPECIAL HAZARDS - EVALUATION

FAIR:

(1) Spray painting: Spray painting is mainly done in Buildings Nos. 128, 217, 231, 251, 253, 271, 302A, 366 and 530. In many cases the installations were substandard with the spray areas not properly cut off from the rest of the building. Substandard duct clearance, electrical fixtures and ventilation were noted in some cases.

Open containers of flammables, heavy accumulations of paint residue in the booth and violations of smoking restrictions were also noted. Action was taken to correct these last conditions during the survey. Fire safety of this hazard rates POOR on the Station.

(2) Woodworking: Woodworking is mainly done in Buildings Nos. 363, 400 and 401. In addition to the above areas there are numerous locations where woodworking operations are conducted on a smaller scale. Automatic sprinkler protection is provided in the major woodworking areas and dust-collecting equipment is provided for most of the machines. The fire safety of this hazard rates FAIR.

(3) General storage: In general, good storage practices are followed in the storehouse areas. The main storehouse buildings are of combustible construction and are, for the most part, protected with automatic sprinklers. In a few cases material was observed stored too close to sprinkler heads and light fixtures. These discrepancies were pointed out during the survey and corrective action was taken. The unsprinklered storehouse buildings include: 307, 415, 416, 432, 433, 434, 524, 525, 526, 808, 809 and 810. The fire safety of this hazard rates FAIR.

(4) Garage: The overhaul and repair of vehicles on this Station is mainly conducted in the wood-frame Transportation Building, No. 302 protected with automatic sprinklers. The various operations found in hazards of this sort were satisfactorily arranged. Beverage dispensing machines etc., were noted with ordinary electrical connections etc., below the 18" level. Fire safety of this hazard rates FAIR.

(5) Boat shop: At the time of the survey, Building No. 366, of non-combustible construction with automatic sprinkler protection was being converted to the boat shop and limited operations were being conducted in the building. Present plans call for all operations from welding to paint spraying to be conducted in the building with no provision made for separation of hazards. The fire safety of this hazard rates FAIR.

(6) Ship mold loft: This operation is conducted on the second floor of the Shipfitters, Welders and Boilermakers Shops, Building No. 411, of noncombustible construction, with only a small portion of the second floor (the roof area over the mezzanine) provided with automatic sprinkler protection. The floor surfacing of wood and the ship molds constructed of light-weight plywood, veneer, etc., present highly combustible surfaces. Extremely large amounts of these molds are stored on and below the mezzanine. Approximately one-half of the storage area containing these highly combustible patterns is unsprinklered endangering not only the Mold Loft but also the Welding and Boilermakers Shops underneath. Smoking is prohibited on the entire second floor except for small designated areas. The fire safety in this hazard rates FAIR.

(7) Plans vault: Most of the Station records and drawings are stored in the two-story windowless fire-resistive structure, an addition to the Administration Building No. 101. Each floor is divided in half by a four-hour reinforced-concrete fire wall with openings protected by double Class "A" fire doors, resulting in areas of approximately 1,250 square feet each. A fire detection system connected to the Station fire alarm system is provided in this area. The drawings are stored in open-faced metal racks. The fire detection units were blocked in some cases by the drawing racks that extended from the floor to the ceiling. The fire safety of this hazard rates GOOD.

(8) Theater: The theater is located in Building No. 518 of combustible construction protected with automatic sprinklers. The projection booth is well arranged. Adequate exits are provided in theater area with panic hardware and lighted exit signs. The fire safety of this hazard is GOOD.

(9) High Pressure Boilers: The high pressure oil-fired boiler for steam testing operations located in the north leanto section of Building No. 231. The boiler operates at pressures up to 1,500 pounds and stack temperatures of 700 to 800 degrees Fahrenheit. The ceiling over the boiler is wood plank on steel beam with the area directly over the boiler protected by metal lath and plaster. The boiler presents a severe fire hazard in its present location.

### 3. POST INSPECTION CONFERENCE:

The Post-Inspection Conference was attended by the Administration Officer, Public Works Officer, civilian representatives of Public Works Department, Station Fire Department, various other departments of the Shipyard and the Assistant District Fire Protection Engineer on 14 March 1956. The major elements of the report, the deficiencies found on the Station during the survey, and recommendations to correct them were discussed. No major objections were made to recommendations on the report. Due to the scope of some of the recommendations, funds must be requested through projects included in the long-range planning of the Station.

### 4. RECOMMENDATIONS:

A. Compliance with previous recommendations: Compliance with the recommendations made on the last report is considered good; approximately 20% of the recommendations were fully complied with and on other recommendations, which cover a number of buildings, the recommendations have been partially complied with and are being reworded and resubmitted. A number of the recommendations made were of a major scale and projects have been submitted for funds, which to date have not been received. Recommendations made on previous report dated 26 January 1955 which have not yet been fully complied with are listed as follows: 1, 2, 3, 10, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 29, 30, 31, 32, 33, 34, 36, 37, 39, 41, 42, 45, 47, 48, 49, 50, 51, 52, 53, 54, 55 and 56.

400 lead  
137  
138  
139  
150  
800

b. New and resubmitted recommendations: Recommendations are listed in the order of their importance and priority. The number in the parenthesis following the recommendation number indicates the year of original submission of the recommendation.

(1) (1956) The combustible sheathing with high flame spread characteristics such as fibre board and plywood in Buildings Nos. 102, 104, 110, 118, 120, 500 and 515 should be replaced or covered with a noncombustible sheathing such as gypsum board, or the entire building protected with automatic sprinklers installed under the light hazard standards, upon determining which method would be the most economical.

400 lead

(2) (1948) Enclosures having a minimum fire retardant rating of one hour should be provided for all open stairways in buildings, to prevent the vertical passage of fire, heat and/or smoke. Plans for activation of secured buildings should include the provision of stairway enclosures prior to occupancy.

400L  
800

(3) (1955) Evacuation alarm systems connected to the station fire alarm system and with operating switches on each wing of each floor, and sufficient audible alarm devices to be heard in all parts of the buildings should be installed in Buildings Nos. 103, 104, 117, 118, 228, 366, 505, 511, 512, 513, 514, 515, 516, 519, 520 and 901.

400L

(4) (1955) Additional exit facilities should be installed at the following locations to provide adequate secondary means of egress:

a Building No. 120 - Enlisted Men's Club, second floor. (Door and outside stairway)

b Building No. 146 - Industrial and Photo Laboratory, second floor. (Door and outside stairway)

c Building No. 251 - Temporary Services Building, mezzanine deck, locker area, center of shop. (Door and stairway)

d Building No. 272 - Riggers and Laborers Shop, mezzanine deck, locker room, west side, south end. (Door and stairway).

e Building No. 302 - Transportation Shop, mezzanine deck, conference room, northwest corner. (Door and outside stairway).

f Building No. 363 - Woodworking Shop, mezzanine deck, office and conference room, east end, north side. (Door and outside stairway).

g Building No. 519 - Chapel, altar end of main chapel to outside of building. (Door and stairs). Second floor, Sunday School rooms, through Thrift Shop and down inside stairs.

400L (5) (1948) Vertical ladders should be replaced by stairways to provide adequate means of secondary escape from the following locations:

- a Building No. 101 - ends of each wing.
- b Building No. 217 - conference room.
- c Building No. 270 - from roof near conference room.
- d Building No. 503 - from roof near bunk room.
- e Building No. 520 - north end, northwest wing.

400L (6) (1955) Ordinary glass windows within fifteen feet of outside fire escape on Buildings Nos. 102, 103, 108 and 117 should be replaced with wired glass in steel sash.

400L (7) (1955) Panic type hardware should be provided for exit doors on the following Buildings: 101 (Cafeteria), 102, 103, 116 (Drill Hall), 117, 118, 121 (second floor), 228, 351 (second and fifth floors rear doors), 411 (Cafeteria), 502, 503, (CPO Mess), 504 (Mess Hall), 505 (Bowling Alley), 507, 511, 512, 513, 514, 515, 516, 519, 520, 813 (first floor, north end to outside) and 901.

400L (8) (1955) Sprinkler systems should be extended to cover unsprinkled areas, or corrected as indicated, in the following buildings:

- a Building No. 115 - Additional heads under platform in 8A Attack Teachers' section.
- b Building No. 211 - Office Section, (Shop 51) and mens wash-room - additional branch lines.
- c Building No. 228 - Additional heads; Meat cutting room, first floor, under large hood; Master's dining room, second floor; refrigeration machinery room, second floor (in the combustible ventilator openings at the roof).
- d Building No. 231 - Valve testing section, north side - additional branch line; additional heads, mezzanine floor, north side, west end.
- e Building No. 251 - One additional head needed above vault; additional heads needed under three platforms extending out from mezzanine into main bay area. Tool room section in center of shop, two additional heads needed.
- f Building No. 253 - Additional heads, sixth floor spray booth. Third floor, spray room - additional head needed under blower platform and under canopy.

g Building No. 270 - Mirror room - sprinkler head needed under canopy.

h Building No. 271 - Sprinkler heads needed in single spray booth and exhaust duct in section known as Paint Laboratory.

i Building No. 272 - Sprinkler heads needed inside of screened enclosed storage areas. An additional head need under stairs in southeast corner.

j Building No. 302 - Sprinkler head needed under platform extending from mezzanine deck between building frames 36 and 37.

k Building No. 401 - Additional heads: first floor, cloak and stationary closets, office area; mezzanine deck stockroom, mezzanine deck training room; under mezzanine deck near stairway at northwest section of building; under mezzanine deck carpenter shop.

l Building No. 404 - Additional branch lines needed in unsprinklered aisles between racks under mezzanine.

m Building No. 414 - Additional heads: Public Works storage section, east end.

n Building No. 507 - Additional branch lines under wide ventilator ducts in central corridor, first floor.

o Building No. 813 - Replace sprinkler heads in elevator penthouses on roof. Additional heads: second floor north stairway vestibule. Second floor, men's washroom - rearrange branch lines near ceiling and under ventilation ducts. Second floor, southeast section - additional branch sprinkler line needed between ventilation duct and outside wall. Second floor, duplicating room - one additional head needed where ventilation duct has been installed and additional heads needed in plywood dark room. First floor, southeast section at wood partition separating storage from office section - additional heads needed. First floor, east end between columns Nos. 1 D 9 and 1 D 10, additional heads needed.

4002  
(9) (1948) Complete systems of automatic sprinklers, installed in accordance with the National Board of Fire Underwriters standards, with supervisory connections to station fire alarm system, should be provided in the following Buildings: 101, 128, 130, 205, 214, 231 (second), 302-A, 307, 364, 411, 415, 416, 432, 433, 434, 503, 505, 510, 510-A, 524, 525, 526, 808, 809 and 810.

4002  
(10) (1956) The salt water distribution system should be modified and the pumping capacity increased in the drydock and berthing areas to meet the requirements set forth in BuShips, Letter N26-6 (588) N16-1, Serial 588-1869 dated 9 Sep 1954 to BuDocks.

4002

(11) (1948) A 1,000,000 gallon reservoir with a 16-inch supply main and 16-inch connection to the Yard fresh water distribution system should be installed to provide adequate water storage facilities for domestic and fire fighting purposes.

4002

(12) (1948) Additional, large size blowoffs should be provided on the salt water system to facilitate thorough flushing of the system.

4002

(13) (1948) Proposed improvements to the fresh water distribution system for fire fighting purposes should be completed. (Note: SSDB Project No. 12ND39 (rev) includes additional large sized loops, completion of existing grids, sectional valves and some hydrants).

4002

(14) (1948) Additional fresh water hydrants should be provided at the following locations:

800

- a At the intersection of Spear Avenue and "H" Streets.
- b On "H" Street, Buildings Nos. 401 and 404.
- c On "H" Street between Buildings Nos. 404 and 407.
- d On "H" Street near southwest corner of Building No.507.
- e On "H" Street between Buildings Nos. 509 and 516.
- f At the intersection of "H" Street and Second Avenue.
- g At the intersection of "I" Street and Third Avenue.
- h On "H" Street near the southeast corner of Building No.526.
- i On "J" Street near the southeast corner of Homoja M-13.

4002  
800

(15) (1948) In view of the unreliable performance of the existing fire alarm system and the extremely difficult and expensive maintenance problem involved, it is recommended that a program for the rehabilitation of the system and equipment be developed. Such a program should include a survey by the equipment manufacturer to provide recommendations and cost estimates of the necessary improvements to obtain reliable operation and reduce maintenance costs. Since shipyard experience has shown the transmitters of the present system to be particularly vulnerable to salt air and condensation and their performance to be sensitive to slight amounts of corrosion, manufacturers' recommendations should provide for specific remedies to this problem.

4002  
300

(16) (1948) A standard fire wall (four-hour fire retardant rating), with Class "A" automatic fire doors at necessary openings, should be provided to separate wood frame Building No. 211 and the exposed steel

frame Building No. 253.

400 l  
500

(17) (1955) A two-hour fire partition, similar to the partition installed on the second floor, should be provided on the first floor of Building No. 813 to separate the storage area from office section.

300 l

(18) (1956) The spray painting operation of the Boat Shop, Building No. 366, should be conducted in a spray room built and protected in accordance with the National Fire Protection Association Pamphlet No. 33, "Spray Finishing " and separated from the rest of the building by a tight partition with a minimum fire retardant rating of 1 hour.

500 l

(19) (1955) In the event that the infra-red dryer located in Building No. 406 is to be used again it should be separated from the other areas of the building by a partition having a minimum fire retardant rating of one hour.

400 l  
800

(20) (1948) Draft curtains of non-combustible construction, extending from roof to lower cord of trusses should be provided in high roof sections of Buildings Nos. 113, 123, 217, 241, 251, 270, 272, 302, 363, 401, 402, 411 (in saw teeth at mold loft around mezzanine), 413, 414 and 808. (Note: Draft stop areas are limited to 3,000 square feet if the building is unsprinklered and the roof is combustible, or 10,000 square feet if the roof is non-combustible.)

800 l

(21) (1955) Spray painting installations in Buildings Nos. 128, 211, 217, 231, 253 (fourth and sixth floor), 271 (paint laboratory section), 366 (spray painting shack located outside on south side), 401, 530 and 815 should be altered where necessary to conform to the following:

139  
300  
400

a Spray painting operations should be separated from main building areas by enclosures having a minimum fire retardant rating of one hour.

b The exhaust ducts from spray booths should be provided with at least nine inches clearance from combustible roof members. This clearance may be reduced to six inches provided that a standard double ventilating metal thimble is installed where duct passes through the roof.

c Electric interlocks should be provided between compressed air supply to spray guns and the exhaust fans, at all spray booths and/or spray rooms, to prevent spraying operations without operation of exhaust systems.

3-100

d Electric installations in spray booths and/or spray rooms should be revised where necessary to conform with the National Electrical Code.

e Adequate mechanical ventilation should be provided to prevent formation of explosive mixtures. (An average air velocity of approximately 100 lineal feet per minute across the open frontal booth area should be sufficient for vapor removal).

f All spray booths should be protected by automatic sprinklers.

500 l  
400  
(22) (1948) A storehouse of fire resistant construction should be provided for the storage of large quantities of flammable liquids in place of wood frame Building No. 810. A separate area, cut off by a standard fire wall, should be provided for red labeled flammable liquids. Fire walls should be provided to limit fire areas to a maximum of 20,000 square feet.

400 l  
(23) (1948) The wood frame upper portion of the electrical sub-station adjoining Building No. 123 should be replaced with fire resistive (reinforced concrete) type of construction or the wet pipe automatic sprinkler system should be extended to provide protection in this area.

400 l  
(24) (1956) The open knob and tube wiring using bare wire conductors for neutral leads should be modified to meet the requirements of the National Electrical Code.

200 l  
400  
(25) (1956) In order to provide complete fire detection for the Plan vault area of Building No. 101, the top sections of the storage racks should be removed to provide a minimum of twelve inches clearance to the ceiling, or the heat detection units should be relocated and additional units installed where necessary so that at least one unit is in every aisleway.

400 l  
139  
300  
500  
(26) (1948) Dust collecting equipment should be provided for all woodworking machines not now so equipped in Buildings Nos. 141, 302-A, 323, 351, 406, 511-A and 526.

400 l  
(27) (1948) Fixed foam installations should be provided for the protection of the above-ground fuel oil tanks located south of Building No. 521 and the diesel oil tanks located south of Building No. 134.

400 l  
300  
(28) (1948) The wood frame partition between the main area of of Building No. 231 and the southwest leanto section should be sheathed with a non-combustible material to provide a fire retardant value of not less than one hour or the area provided with automatic sprinkler protection.

500L  
400

(29) (1955) Totally enclosed lights should be provided above the cleaning and preservation tanks located in Building No. 406 and all electrical equipment within twenty feet horizontally of tanks should be Class I, Group D, Division 2, in accordance with the hazardous area section of the National Electrical Code.

400L

(30) (1955) All gas fired and electric type hot water storage heaters, not now so equipped, should be provided with combination pressure temperature relief valves.

300L  
400

(31) (1948) The 1500-pound boiler, installed in the north leanto section of Building No. 231, with low ceiling of wood plank on steel construction, should be relocated and separated from other occupancies by a partition having a fire retardant rating of not less than two hours.

400L  
150  
3-100

(32) (1955) The flues from gas ranges in Building No. 228 and 815 should be vented direct to the outside of building and not connected into grease duct.

400L  
150  
800

(33) (1956) Six-inch clearance through a double ventilated metal thimble should be provided between the ventilation ducts over the grills and the combustible surfaces of ceiling and roof in kitchens of Buildings Nos. 228 and 505.

400L

(34) (1956) All electrical fixtures, outlets, etc., within eighteen inches of the floor in the garage area of Building No. 302, Transportation Shop, should be approved for a Class I, Group D, Division 2 location. A number of electrically operated beverage machines, etc., were noted in the area. These should either be removed or placed on 18-inch platforms to insure that all electrical parts are above the 18-inch level.

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