

EXHIBIT

Ne/son #5
DA 11/11/85

Mr. Daniel Y. Hing

TO THE MARITIME COMMISSION
WASHINGTON, D. C.

INDUSTRIAL HEALTH SURVEY
OF THE
NORTH CAROLINA SHIPBUILDING COMPANY
WILMINGTON, NORTH CAROLINA

October 1, 2, 3, 1942

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EO 13526, Sec 7.3 FMC Ltr 10/29/82
By Shelley NAME, Date 6/20/83

GENERAL RECOMMENDATIONS

1. It is recommended that the proposed sub-dispensaries or first aid stations be placed in operation as soon as possible.
2. As it is anticipated that the number of women employees in the mechanical trades will increase rapidly it is recommended that provisions be made for the medical handling of this class of patients.
3. More doctors are needed for carrying on the work at the dispensary and an effort is being made to obtain them.
4. It is recommended that periodic examinations of those working in occupations potentially hazardous to themselves and others be conducted. This will require the services of more doctors and more room near or in the yard.
5. Dispersion of medical supplies is desirable to prevent the loss of the entire supply in case of a direct hit on the dispensary during an air raid.
6. All men who work around the ways or in the water in the vicinity of the sewer discharge should be immunized against typhoid fever.
7. The dishwashing machine in the cafeteria is too small. This situation should be corrected by the purchase of another machine, or the replacement of the present one.
8. Confined quarters such as the midship deep tanks should receive attention from the ventilation department. General ventilation is needed in these areas.
9. The ventilation crew is considered too small to handle the yard efficiently. We recommend that the department be increased so ships in wet dock will be included in the ventilation program.
10. Ventilation crew members should be provided with a ready means of

identification such as hard hats bearing the word "ventilation".

11. The staff of the safety department should be increased to include six more inspectors so that a more comprehensive safety program can be pursued at this yard.

12. A design has been suggested to yard officials for an exhaust system for welding in the sheet metal shop. We urge the installation of such a system at the earliest opportunity.

Turnover and Absenteeism: The turnover figures show an average of around 5% a month and compare favorably with the figures in East Coast yards of this size. Causes are about the same and in the same proportions as seen elsewhere.

The medical director of the company, Dr. Hooper, feels quite rightly that the lack of doctors in Wilmington will soon prove a serious problem to this yard and to the community and has given us a letter urging that the Maritime Commission intercede with the Medical Office of Procurement and Assignment in behalf of the community. We have noted similar situations in two other yards on the Gulf but nothing comparable in the North Atlantic or West Coast yards. We would again emphasize the importance of adequate medical care in shipyards. The yards like North Carolina Shipbuilding are new, the men, for the most part, are green and will leave their jobs if medical care is inadequate.

Dr. Vestal and Mr. Trice of the North Carolina Division of Industrial Hygiene of the State Health Department wrote Mr. Ring of the Maritime Commission on August 6th, 1942, about this yard, and we are glad to attach copies of their reports herewith.

Report of an Inspection
North Carolina Shipbuilding Co.
Wilmington, North Carolina

10-31-41

In company with Mr. Livesay, Safety Supervisor, a tour of the ship yard was made.

The flow-sheet of the process of shipbuilding is relatively simple. Sheet and angle steel arriving on flat cars is stored on the yard. From storage the steel goes to the layoff crew where it is marked for cutting according to pattern. It goes next to the burners, who use oxygen-propane torches to cut the steel. The fitters next assemble shipsections for delivery to the ways. The fitters spot weld and use an "Oxweld" cutting machine* to electrically weld together automatically great sheets of steel. The machine operates on 420 amperes at 30 volts. The steel goes from the fitters to the ways where all plates are electrically welded together. The hull plates are riveted to the ship ribs.

The number of men working on a ship varies. Mr. Livesay estimated that by the time the double bottom of the hull is taking shape that from 35 to 40 welders and additional accessory labor are at work. On one of the ships that is almost ready for launching he estimated that 200 men were at work.

The steel interior of one ship's hold was being painted. This paint comes already mixed ready for use. It conforms to a Maritime Commission formula, which is:

Pigment 67-69% (100% pigment that is 97% Pb_3O_4)

Vehicle 31- 33% (glyceryl phthalate resin, 38% min., and Mineral spirits (turpentine substitute) and drier 62% max.)

In building the crew's quarters emulsified asphalt is to be placed on the steel bulk heads before applying marinite panels.

The other paints and their uses are listed as follows:

1. Formula No. VIII Cream Gloss Paint

*Manufactured by the Linde Air Products Co. Unit of Union Carbide & Carbon Corp.
(3c)

3. Formula No. XIV - Gray Tent Eggshell
4. Formula No. XIV & XVIII - Gray Eggshell compromise
5. Formula No. XIV - Inside White Paint
6. Formula No. XVII - Light Gray
7. Formula No. XIV - Light Green Eggshell
8. Formula No. XVII - Orange Shellac
9. Formula No. XIV - Off White Eggshell
10. Formula No. VIII - Red Lead
11. Formula No. NC-52-R-1 1B Anti-Corrosive
12. Formula No. NC-52-B-1 1I Anti-Fouling

1. Store Room and lockers
2. 10' line up
3. Passage ways and officers quarters
4. Passage ways
5. Primer-veneering panels
6. All cargo holds and all door trim
7. Pilot house
8. Refrigerating space
9. Passage ways
10. 2 coats from 10 ft. line up, and over all ship entire interior.
11. 10' line down
12. Ditto

Metallic brown in all tanks underneath the fireroom and engine room water for boilers.

Metallic brown - see "Specifications for Paints and Paint Materials",
U. S. Maritime Commission.

Superintendent of Documents - U. S. Navy Appendix No. 6, latest edition -
15 cents. Bureau of Navigation. Above
gives breakdown of paints, etc.

Some possible occupational disease hazards are those resulting from welding and painting. It is possible that under some conditions the charcoal buckets in which rivets are heated would produce carbon monoxide which in a confined space would, of course, be hazardous. There is always the danger of air explosion, or fire, wherever paints are applied with a spray gun as most of the liquids used are inflammable. Some men may have their hearing impaired by the noise. "Ear Defenders" made by Mine Safety Appliances Co., Pittsburgh,

may be used to advantage.

As a protection to the welders working in the space between bottoms, there is used for ventilation a coppus Vane Blower (Worcester, Mass.).

The ships are to be 485 feet long; they are 10,000 ton vessels.

There are approximately 3400 men at work.

Persons seen: Mr. W. S. McMahon
Mr. Livesay, Safety Supervisor
Mr. Neill - Paint Shop
Mr. Aree - An Assistant foreman

M. P. Trice, Engineer, Div. of Industrial Hygiene

MPT:LP

cc: Mr. Livesay; Mr. Sorrell; Mr. Fletcher
Mr. Price

NORTH CAROLINA SHIPBUILDING COMPANY

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Date 10-2-42 by ER No.

MEMORANDUM for

Termination Statistics

For the Month of July 1942

All employees

Terminations for Month - 804

Termination Rate - 5.92 terminations per 100 employees

<u>Comparable termination rates</u>	<u>N.C.S.Co.</u>	<u>Shipbuilding Industry</u>
February		3.27
March	4.78	4.27
April	4.43	4.29
May	5.19	
June	6.19	
July	5.92	

Reason For Termination	<u>% of total monthly terminations</u>		
	<u>May 1942</u>	<u>June 1942</u>	<u>July 1942</u>
Non-attendance	23.2	20.6	21.7
Joining Armed Force	13.8	15.0	19.1
Personal Reasons	7.7	6.2	8.2
Stealing, loafing, insubordination, etc.	4.4	5.1	8.2
Sickness, other physical reasons	8.0	9.0	8.0
Dissatisfied with work or supervision	5.8	8.8	8.1
Going to Farm	4.4	5.3	4.5
Living Conditions	-	2.8	3.4
Unsatisfactory work	7.0	4.2	2.6
Not enough money	2.1	1.8	1.9
Under age	-	2.0	1.6
Transferred to EM	5.8	2.8	1.1
Going to Another Job	11.6	10.0	8.7
No reason Given	3.9	4.2	2.1
Miscellaneous	2.3	2.2	1.4
	100.0	100.0	100.0

Prepared by E. R. Miller

MEDICAL FACILITIES

All medical facilities including buildings, equipment, expendable supplies, transportation and personnel are furnished by the company for reimbursement by the Maritime Commission.

The dispensary is located near the main gate adjacent to the administration building. It consists of a waiting room, treatment room, two wards containing two beds each, X-ray room, doctor's office, and nurse's office. This has been considered inadequate and an addition is now under construction. This addition is to be used mostly for the handling of colored patients. When completed, the dispensary will still be too small to handle the volume of work without the establishment of another first aid station in the capacity of a sub-dispensary. It is anticipated that women are soon to be employed in the mechanical trades, and it will be necessary to provide space and equipment for the handling of injuries and illness of this class of patient.

A first aid station is now located at the southern end of the north yard. It is sufficiently equipped to handle the work required and saves time in the handling of those patients that do not require the services of a physician. Another such station is needed in the yard, and thought is now being given to this by the management.

Compensation for lost time cases is covered by the Liberty Mutual Insurance Company.

Those injuries requiring hospitalization are sent to the James Walker Memorial Hospital in Wilmington, N. C. This hospital has about 200 beds and is taxed at the present for facilities to handle the demand. However, as yet there have been no patients refused admittance from the yard due to lack of beds, although corridors have been used as temporary wards. At this time, negotiations are under way to build additional space to house 100 more beds.

The Community Hospital may also be used by the company for hospitalization of colored patients. It is located in Wilmington and has a capacity of about 100 beds.

Personnel: The company has secured the services of Dr. Hooper of Wilmington as the Chief Surgeon and Medical Director. Assistants are Dr. Koonce, Dr. Taylor, Dr. Fisher, Dr. Davis, and Dr. Thompson. There are 17 registered nurses on full time duty. The services of at least two more doctors are needed and an attempt is now being made to secure them.

Two doctors are present during the day shift, two during the swing shift, and another doctor is reporting soon to cover the graveyard shift. Eight nurses cover the day shift including two at the first aid station, five on the swing shift, and three on the graveyard shift. Two nurses are at the first aid station during the swing shift. The first aid station is closed during the graveyard shift.

Records: A "First Aid Pass" is issued to a workman reporting for treatment by his foreman or leadingman.

Upon reporting to the dispensary, a form is filled in giving the name and check number, date, shift, a description of accident, and time in. The remainder of the form, diagnosis, treatment, and time out, is filled in upon leaving the dispensary. This information is transferred to a permanent card system. If lost time is involved, a report is made to the Liberty Mutual Insurance Company. If it is necessary that the injured go home, a "Disability Gate Pass" is issued.

The major specialties of medicine are represented in Wilmington and are utilized as necessary. Should it be necessary to send the patient to a specialist, a "Reference Notice" form is accomplished.

A new system of records is to be established soon which is essentially the same as now in use, but will obviate some duplication that now exists.

Examinations: Pre-employment examinations are conducted on all candidates for employment. This is done in space provided for the purpose at the employment office building located in Wilmington. Drs. Davis and Thompson conduct these examinations. In addition to a complete physical examination, a Kline test for syphilis, blood typing, and urinalysis is done. The results are recorded on a permanent "Physical Examination Record" card. Those presenting a positive Kline test (about 15% among colored, and 1% among whites) are referred to a private physician or to the Board of Health for treatment. A card system is kept to show that these patients continue under treatment after employment.

Periodic examinations of those working in occupations potentially hazardous to themselves or others are not conducted.

Special examinations are conducted in the individual case as indicated.

Cases: There were 19,613 patients treated at the dispensary during the month of August, 1942, and of those, 11,949 were new cases.

Eye cases constituted a very high percentage of patients coming to the dispensary for treatment. About 50% of eye cases are ophthalmia due to the actinic rays of the welder's arc which indicates that protective eye equipment and screening of welding operations are not properly used.

Toe injuries are quite numerous which is to be expected since the wearing of safety shoes is not general.

Industrial illness is not common and no cases of lead poisoning have been detected. Cases of lead poisoning are to be expected, however, and may go undetected as periodic examinations of those engaged in the spraying of red lead paint are not conducted. An occasional patient is seen that presents the symptoms of metal fume fever, but this is rare in so long as very little welding is done on galvanized iron.

No record is kept of non-industrial illness. If the workman can be kept on the job by the administration of simple treatment, this is done. If the loss of time is necessary, he is referred to his private physician. Upon his return to work, he reports to the dispensary in order that his fitness may be ascertained, and he is issued a "Clinic Report for Return to Work".

Venereal diseases are rarely seen at the dispensary and are not considered to be a great factor in absenteeism.

Air Raid Precautions: An adequate number of first aid dressing stations have been established in the yard to be used in the event of an air raid. The doctors, nurses, and men trained in first aid measures have been assigned specific jobs and to designated dressing stations. As yet there has been no distribution of medical supplies, and no sandbags or other protection have been placed around the dispensary building.

Water Supply: Five wells furnish water to the yard for domestic use while a small pond is the standby supply in case of a fire. Even though the well water is of safe quality without treatment, it is chlorinated before use, as an added precaution. The two supplies are cross-connected. However, two gate valves and two check valves keep the pond water from entering the domestic supply. Here also, as an added precaution, the pond water is heavily chlorinated. The best of equipment is in use and all possible steps have been taken to assure the continued safety of the supply.

Sewerage: All sewage from the yard is disposed of by discharge directly into the river. The result is very bad as fecal material is washed up underneath the ways. Since it is necessary for men to work around these ways and in the water as well, a very real health hazard exists. Treatment of the wastes from the yard is impractical as the sewage fromilmington's estimated 80,000 people is discharged into the river just above the shipyard. One precautionary measure which can be taken, however, is the immunizing against typhoid fever of all

workers who in any way are exposed to these conditions.

There appeared to be a sufficient number of conveniently located toilets.

Cafeteria: A central cafeteria and several canteens are provided for the yard. The cafeteria is used only by the office personnel but does prepare all the food served by the canteens to the workers. Wrapped sandwiches, cakes, pastry, and cold drinks are served at the canteens. Hot coffee will be made available with the advent of cold weather. From a sanitary standpoint the food handling problem is quite satisfactory, but the dishwashing machine in the cafeteria is too small to handle properly the load of about 5,000 meals daily.

Food Supply Conditions: Since the question of food shortages was brought up several times during our inspection, a few comments are in order. A severe milk shortage had occurred the week before our arrival, and it had left the impression that milk could not be obtained in sufficient quantities. A conference with the largest milk distributor in Wilmington was held, and we were assured that for the present, an ample milk supply was available but that the transportation was becoming increasingly difficult. It was said that tank cars might be necessary to replace the milk trucks now in use. The milk plant is equipped to pasteurize about 10,000 gallons of milk daily. The present plant production is from 5,000 to 5,500 gallons daily.

Other food shortages were not reported as acute.

Mosquito Control: The safety department practices some mosquito control, but most reports indicated that very little control was necessary.

Garbage and Rubbish: Rubbish is collected and incinerated by the yard, while garbage is collected twice daily and hauled away by an outside party.

Housing: A housing shortage exists but federal and private projects are being completed which will greatly relieve the situation. The present facilities, mostly trailer camps, do not seem to present any great health risk.

VENTILATION

The ventilation of ships under construction has been detailed to the welding maintenance department, under Mr. R. L. Davis. Six welding maintenance department men per shift are assigned to the ventilation work as a permanent and exclusive job. These men are assigned to respective ways, which they patrol constantly, and are known by the various leadermen, who must request the ventilation, and by the crane operators who give the ventilation crew first priority when heavy blowers must be moved.

Blower equipment at the disposal of the ventilation department consists of the following:

350 Coppus Blowers (1500 c.f.m.)

100 Buffalo Blowers (approximately 1500 c.f.m.)

(40 more Buffalo blowers are on order, but not yet delivered)

In addition to the above, the department also has in stock 150 lengths of fifty feet each 3" diameter flexible metal hose for local exhaust. Some ten inch diameter flexible canvas duct is also available but infrequently used.

The ventilation problem is considerably simplified at this yard through the production methods employed in constructing the cargo ships. Both the fore and after-peaks are pre-assembled on welding slabs and welded in place on the ship when completed. There is only a limited amount of welding left to do in the peaks therefore, once the peaks are attached to the hull, and the crowded conditions usually encountered in these two positions are thereby eliminated.

During construction on the ways side plates (one on each side at the engine room) are assembled in place just before launching, the openings being used as access to the ship by the workmen, and at the same time being used to provide ventilation to the engine room. This helps to maintain

desirable working conditions in what is an habitual offender from the ventilation standpoint due to the overcrowded conditions and the varied forms of assembly work usually being carried on in the engine room.

Double bottoms are ventilated by the use of local exhaust hoses. Deck plates are assembled last so as to permit better circulation of air through the double bottoms and to reduce the number of closed compartments. Conditions in the double bottoms appeared to be satisfactory.

In addition to access holes into the deep tanks, ventilation holes are also cut into the bulkheads into which ventilation fans are mounted to introduce fresh air for dilution of the welding fumes. We observed that except for the double bottoms, the use of local exhaust lines appeared to be limited, and we believe that working conditions in the port and starboard midship deep tanks would be definitely improved if the welders were provided with local exhaust hoses to capture fumes at the point of origin. This is also true of all galvanized welding encountered anywhere in the water tanks, the engine room, and other confined compartments. It should be borne in mind that local exhaust should not be used exclusively, but in conjunction with the general ventilation.

The ventilation crew members have no easy means of identification. We urge strongly that all ventilation men be provided with hard hats bearing the word "ventilation" so they can be easily recognized and their services thus utilized most effectively.

Comparatively, this yard does not have a large enough ventilation crew. We discussed this matter with Mr. Davis who stated that he expected to have a larger crew in the near future. We consider the need to be definite, since the ventilation crew as it now stands cannot give any attention to the ships at the outfitting docks.

Under the present construction schedule, the ships remain at the outfitting dock twelve days, and some finish welding is done during this time, as well as considerable painting. We observed that the midship deep tanks, which by the time the ships reach outfitting are completely closed except for the access manhole, were particularly heavy with welding fumes. A simple general ventilation blower would improve conditions considerably in these sections, and is in order as a welder and helper spend the greater part of three days per ship in each tank.

SPRAY PAINTING

A large proportion of the spray painting done at the yard involves red lead paint, and the danger of possible lead poisoning among painters and helpers is thereby great.

As protection against the inhalation of paint mists and solvent vapors the paint department stocks three types of respirators, including the Pulmosan filter and chemical cartridge types and the Willson chemical cartridge respirator. The paint department foreman informed us that the men objected to air-line respirators and hoods as being too cumbersome.

We observed several spray painters in action, and all of them wore one of the types of respirators listed. In one case a man spraying the superstructure of a ship and wearing a filter type respirator was entirely covered with red lead as a result of spraying overhead and in close quarters. His helper stood nearby without any protection whatever and was thus dangerously exposed to paint mist. In another case a painter spraying one of the forward deep tanks with anti-corrosive paint relied solely on a charcoal cartridge respirator to purify the air he breathed. It should be pointed out that such respirators are effective only for short periods after which fresh cartridges must be inserted.

For the best protection against the inhalation of vapors and paint droplets it is recommended that only Bureau of Mines approved air-line respirators or masks be used when spraying must be done in confined spaces. When engaged in open work, painters and helpers should wear approved respirators and should be especially careful of personal cleanliness when working with red lead.

SHOPS

In many of the shops no health hazards were noted. In a few of the shops there were minor faults. The blacksmith's shop, for instance, could be improved by installing a canopy hood and connecting stack for each forge. In the copper shop, the man who does the silver brazing should be warned that the flux is poisonous both on inhalation and ingestion. Care on his part should be sufficient health protection for him.

Some paint spraying under the supervision of the paint shop is done in a small room ten feet by eight feet by six feet. The ventilation is provided by a wall fan - estimated capacity of 1500 cfm. The room is also used for sandblasting on rare occasions. For protection from dust we were told the sandblaster wrapped a cloth around his head. This is very bad practice, and marked improvements are necessary if either of the jobs is to be done in the room in the future.

For paint spraying a spray booth having air movement at a linear velocity of 150 feet per minute at the face of the booth will be necessary. A sand-tight blasting room and a Bureau of Mines approved sandblasting helmet will be necessary. A small sandblasting machine could be applied and probably would be much more satisfactory.

A small room in the paint shop is used as a place to clean brushes, old respirators and the like with a variety of solvents - naphtha, gasoline, alcohol, and, at times, commercial paint removers. One man per shift does the work. The room is ten feet by ten feet by eight feet and the ventilation is provided by two wall fans with an estimated capacity of 2000 cfm each. An improvement on the present set-up would be the installation of a working

welders' hats. Both types are issued as tools at no cost to the men.

Safety Shoes: Safety shoes are sold in the yard at a small store. A rotating fund is used to keep 600 pairs in stock. One salesman is on duty during the day shift, and we were informed that approximately 200 pairs of shoes are sold per month. There is considerable room for improvement here. Welders' shields and gloves are also on sale at this store.

Respirators: Twenty-four hundred type "B" Wilson respirators have been obtained by the yard. This type of respirator is used by scalers, clean-up men, and the like. For jobs of this nature involving only nuisance dusts, the type "B" respirator is adequate.

Painters use a Pulmosan chemical cartridge type respirator. Better protection and greater comfort would be had if supplied air respirators were used, especially on jobs involving spraying of red lead.

Goggles: Goggles are signed out to the men at a tool room. There is also a goggle repair service here. Goggles are sometimes sterilized by means of exposure to formaldehyde vapors in a small cabinet.

Five thousand pairs of impact goggles and twenty-one thousand pairs of anti-flash goggles have been purchased. The majority of the anti-flash goggles have been distributed to the men only a small percentage of whom were wearing them.