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Mr. Daniel King

EXHIBIT

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TO THE MARITIME COMMISSION
WASHINGTON, D.C.

INDUSTRIAL HEALTH SURVEY
OF THE
BETHLEHEM - FAIRFIELD SHIPYARD, INC.
BALTIMORE, MARYLAND

September 24-25, 1942

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GENERAL RECOMMENDATIONS

The dispensary is now being enlarged, but not sufficiently to take care of a work load of 40,000 treatments per month. It is anticipated that women will soon be employed and arrangements will have to be made at the dispensary to take care of this class of patients. It is suggested that sub-dispensaries be located under the building ways to take some of the work load off the dispensary and also to make medical services available to workmen nearer their jobs and obviate the time lost in walking to the dispensary.

It is understood that X-ray equipment is to be secured for use at the dispensary. All efforts should be made to expedite this due to the loss of time in sending patients to be X-rayed to town and the inconvenience of waiting a day for a report.

An increase in the number of doctors is needed and appreciated by management and the Medical Director. At least one doctor is needed for the day shift at the Fabrication Division Plant. A minimum of two and preferably three doctors are needed in addition to those present at the dispensary.

In addition to preemployment examinations periodic examinations of those engaged in occupations potentially hazardous to themselves and others is highly desirable. Occupational disease in this way may be discovered early when a change in occupation may prevent irreparable disabilities.

A form to be filled out by the foreman or leadingman authorizing a visit to the dispensary is desirable. This provides the foreman or leadingman with knowledge of the whereabouts of his men and discourages unnecessary visits to the dispensary without preventing necessary visits.

A form for revisits to the dispensary which indicates the time of reporting and the time of release provides a foreman or leadingman with the knowledge of where his men have spent their time while away from the job.

A break down of cases as to effect as well as cause is needed. This will provide the safety department with information as to where personal protective equipment and special safety measures are needed.

Housekeeping aboard the ships under construction should be improved, and insanitary practice eliminated promptly.

General ventilation, or ventilation by dilution, which is the present method of ship ventilation used here, should be supplemented by the use of local exhaust ventilation. The necessary equipment, now lacking, should be purchased.

Fresh air should be introduced into confined spaces by means of duct work from the outside air. We recommend as the most practical for this yard, considering equipment available, the use of flexible canvas duct in combination with the Corpus or Robertson blowers.

The ventilation department is at present undermanned for the coverage it must make. The department should consist of enough men to cover the sixteen ways and outfitting docks efficiently and often.

Members of the ventilation crew should be provided with hard hats on which is printed "ventilation" so that the crewmen will be easily recognizable.

Members of the ventilation department are lacking in experience and training. To offset this, a standard ventilation set-up should be devised for the ships under construction and the crew men made entirely familiar with these set-ups.

Turnover and Absenteeism: We talked at some lengths with Messrs. Willis, Hodgekinson, Kendall, Robbins, and Dr. Shaffer regarding conditions in general. The present working population is about 30,000 with a weekly turnover of about 800 and an absenteeism rate of about 18%. There seems to be no reason for these high figures which do not apply with equal force to many other new yards -- that is, housing and transportation problems are no worse here than in many other districts.

Like all other new yards this one has many green men but the parent company, Bethlehem Steel Corporation, has one of the largest steel mills in the country at nearby Sparrows Point. Naturally, the parent company furnished a fair nucleus of men with experience both in shipbuilding and in general steel fabrication. For the medical and safety departments they drew on well established organizations in the parent company. We have criticized certain phases in both departments but the criticisms definitely are not because the persons concerned lack experience.

MEDICAL FACILITIES

The medical facilities consist of a dispensary at the shipyard proper and a first aid station located at the Fabricating Division about two miles away.

The dispensary is located close to the main gate and consists of a one story building containing a treatment room, eye room X-ray room, physiotherapy room, doctor's office, operating room a four bed ward and a locker room for personnel.

The first aid station at the Fabricating Division adjoins the Personnel Department and consists of a treatment room, combination eye room and ward, an office, and a preemployment examination room.

The buildings and equipment pertaining to medical activities have been furnished by the Maritime Commission who also furnishes the expendable supplies.

Personnel for the dispensary consists of three doctors of whom Dr. F. E. Shaffer is the Medical Director, three female registered nurses and twenty-three first aid men.

The first aid station has for its personnel eight first aid men.

The dispensary is covered during the day by two physicians, Dr. Delaney and Dr. Pound, three registered nurses and five first aid men. The swing and graveyard shifts are covered by five first aid men on each shift.

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For medical services the last two shifts are covered by Dr. Shaffer and Dr. Delaney who are on call at all times.

Insurance for the yard is carried by the Maryland Casualty Company, who furnishes 75% of the payroll for medical services while the Maritime Commission furnishes 25%.

Patients requiring hospitalization are transferred to the Maryland General Hospital. Transportation is supplied by one Maritime Commission ambulance and two station wagons at the yard. Within a few days it is anticipated that a Maritime Commission ambulance will be in use at the Fabrication Division plant.

Specialists in the major branches of medicine are available in Baltimore and are consulted as necessary.

There is no visiting nurse service.

Records: There is no form authorizing treatment required from men reporting to the dispensary for treatment.

Upon reporting to the dispensary for treatment a form is filled in giving the name, date of injury, check number, occupation, residence, nationality, and a description of the accident. The injured takes this form to the nurse or doctor who treats the patient and records his findings. The data are later transferred to a permanent card system. If lost time is involved, a "Surgeon's Report" is accomplished and sent to the insurance carrier. If the patient is sent home, or to the Hospital, a "Personal Pass" is completed which allows the injured to leave the yard. This form is also used in cases of non-industrial illness which necessitates leaving the yard for treatment.

A form is not in use for revisits to the dispensary. In case of redressings and retreatments data are recorded on a special form.

A standard nomenclature of diseases and conditions is not in use.

Cases: There were 39,373 treatments given at the dispensary during the month of August 1948, and of these 14,781 were new cases.

Eye cases constitute a very high percentage of patients coming to the dispensary for treatment. No figures are available as to the actual number, but it is estimated that at least 25% of all cases seen are eye injuries and there are about equally divided between foreign bodies and actinic ray ophthalmia.

The records are not broken down to show the number of back disabilities, but it is the opinion of the physicians that they are quite numerous.

Industrial illness is not common and no cases of lead poisoning have been detected. Early cases may go undetected, however, in the absence of periodic examinations. About 10% of the dermatitis cases appearing at the dispensary are considered to be of industrial origin. There is no specific occupation or operation considered responsible for these cases.

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

Approximately 1000 cases of non-industrial illness are seen monthly. This does not include the group who remain at home or are seen by private physicians.

Examinations: Preemployment examinations are done on all prospective employees. These examinations are performed by first aid men who consult the dispensary physicians as necessary. During the month of August 1942, there were 4920 such examinations conducted with 435 rejections. The main causes for rejection are defective vision, cardiovascular abnormalities, hernia, and extreme varicosities of the extremities.

Periodic examinations of crane operators are now being conducted, with the eyes and cardiovascular systems being carefully checked. The routine examination of other employees engaged in occupations hazardous to themselves or others is not done.

Examinations such as X-ray are performed by the Maryland Casualty Company if the patient is ambulatory and by the Maryland General Hospital, if the patient is hospitalized.

Collaboration with the Safety Section: The safety department is notified in case a seriously injured patient is brought to the dispensary in order that an early investigation of the circumstances may be made. The medical records are furnished the safety department for their information and for statistical purposes.

Air Raid Precautions: There are eleven first aid stations located throughout the yard for use during air raids. Each station contains a large first aid box containing a stretcher, blankets, splints and a supply of dressings and antiseptics. These stations will be manned by volunteer yard workers who have been given the American Red Cross Standard First Aid Course.

Evacuation of the wounded will be carried out by the Red Cross.

No sand bag or other protection has been afforded the dispensary or first aid station to protect them against flying bomb fragments.

Water Supply: The main yard and the pre-fabricating division are both provided with Baltimore's municipal water supply. Pumps are provided which can supply salt water in the event of a fire. No crossconnection exists with the city supply.

Sewerage: Septic tanks provide primary treatment for sewage from the main yard before it is discharged into the ocean. An adequate number of conveniently located toilets is provided for the main yard as a whole but adequate hand washing facilities are not provided for the employees handling food in the yard's canteens. No treatment is provided for the wastes from the too few toilets serving the prefabricating yard. The City of Baltimore is supposed to make a sewer line available to this yard but has not done so. Until such a sewer is provided it is not planned to install more toilets for the 6000-7000 workers in this yard. Steps should be taken to relieve the present need of toilets.

Rubbish and Garbage: The rubbish and garbage are collected regularly by the municipality but the housekeeping of the yard is so poor in places that garbage was observed in considerable quantities on the ground around the various canteens.

Canteens: The yard has one large building which was previously used as a cafeteria and several small shacks throughout the yard which are being used as canteens. The small shacks are being

supplied with pies, cakes, etc. from the main canteen building where regular restaurant equipment is available. The general setup is satisfactory but the following objectionable conditions were observed:

1. Fly control in the canteens was very poor.
2. Pies were stored in the open where flies could easily get at them. Several pies were noted which were practically covered with flies.
3. Refrigerators in several of the shacks were dirty inside.
4. Garbage pails were not provided for all of the canteens.
5. In general, cleanliness and housekeeping was poor.
6. No handwashing and toilet facilities were readily available to the persons handling food in the canteens and as only one toilet is available for colored employees of the yard, it is necessary for the colored employees in the canteens to go a long distance to toilet facilities. No soap or towels were provided for those who did make use of handwashing facilities.

Housekeeping: We have called to the attention of those responsible that housekeeping aboard the ships under construction is noticeably poorer than most yards of comparable size, presenting possible hazards to health and safety, and making for a certain amount of inefficiency among the workers.

Welding lines, air hoses, burners' lines, and electric light cables are strewn quite carelessly over ramps and ledges, along scaffolding walks, and in other positions where inattention underfoot might easily cause a man to trip or fall. We recognize

that these lines are in such quantity as to be difficult to control, but we feel that in this yard the matter has gone unnecessarily far.

Workmen are apparently unusually careless about leaving waste building material about the ships. We observed the hold of one ship in the outfitting dock to contain several days' accumulation of lunch bags, in addition to a quantity of waste excelsior, wood, shavings, nuts and bolts, planking, and considerable unclassified material, all of which presented an excellent point of origin for a fire. The presence of the material is not surprising in itself, for a quantity of such waste as this must be collected and removed frequently. It was quite obvious, however, that no attempt at collection had been made for some time in this case.

The practice of using the ship as a toilet is particularly apparent in this yard. Means should be found to stop the practice altogether. It is not done because of the lack of convenient toilet facilities, for clean and conveniently placed toilets are at the head of every way, but has started by laziness, and because no one has felt or assumed the responsibility to put an end to it. We urge strongly that the responsibility for ending this, be assigned and offenders be suspended or dismissed.

VENTILATION

Mr. Vincent Evans, safety inspector, is the ventilation foreman at this yard. Under him is a day shift staff of nine (four checkers and five laborers), a swing shift staff of the same number, and a graveyard shift staff of three laborers whose activities are directed by a safety inspector.

Both checkers and laborers are members of the laborers department, and are lent to the safety department for assignment to the ventilation work according to the needs of the department. The checkers' work consists of locating blowers (which are frequently moved by the welders) and determining positions requiring ventilation. The checkers further direct the work of the laborers who move and set up blowers, clean and repair them, and generally act as blower maintenance men.

The ventilation department has the following equipment on hand:

400 Coppus (1500 c.f.m.) blowers

23 Robertson (3000 c.f.m.) blowers

4 Large Capacity (10,000 c.f.m.) blowers

150 Lengths (12' each) Flex tube duct, 8"

In addition to the above, twenty Robertson fans are on order.

The company does not have any flexible metal hose for local exhaust.

From observation, and discussion with the ventilation foreman, it was learned that ventilation on ships under construction is accomplished by general ventilation only. This is not in keeping with accepted practices of good ventilation, for while general ventilation is undeniably better than nothing, it

cannot be depended upon to maintain clean air under all conditions.

Previous to the time of our visit, the ventilation department had made some limited use of the flexible canvas duct for general ventilation in the deep tanks and fore and after peaks. They determined to their own satisfaction that the blowers which they had in their department were not capable of maintaining air flow through a sufficiently long length of tubing to warrant continuing its use. However, the department now has in stock a number of Robertson blowers with more on order, and these might very well be put to work with the flexible canvas duct. If these blowers cannot be released for this work, we feel that the Coppus blowers could be used to deliver a sufficient quantity of air to make the practice worth while. We took the opportunity to run a Coppus blower in conjunction with twenty-four feet of the Flextube duct at this yard, and while the results were not impressive, we believe that confined spaces would benefit by use of this combination.

As was previously mentioned, the yard makes no use of local ventilation. The department does not have any local exhaust tubing, and is in no position with its present equipment to initiate any uses of ventilation by local exhaust. We observed many instances in the double bottoms, in the fore and after peaks, and in the deep tanks in which local exhaust is a definite necessity. The engine room is also a source of trouble due to the galvanized welding which must be carried on in this space, and should have local exhaust to com-

plement the general ventilation.

The ventilation department crew is untrained, and, compared to usual standards, inadequately manned. According to Mr. Hodgkinson, management's representative, the organization of the ventilation department is in a state of flux due to recent changes brought about by the drafting of the ventilation foreman a few weeks ago. When the matter is finally settled, however, we recommend that the department consist of enough men to cover sixteen ways and the outfitting docks efficiently and often. We further recommend that the men be equipped with identification of a type easy to recognize. Hard hats with the word "ventilation" lettered thereon has proven very satisfactory in other cases.

The ventilation problems which the invasion barges will represent is not considered difficult to overcome. The working spaces will not be particularly confining or small, and a combination of local exhaust and general ventilation should be entirely satisfactory for ventilating purposes. The ventilation set-ups can be standardized right from the beginning because of the similarity of the tanks throughout the length of the ship.

We recommend that the ventilation department purchase a number of lengths of flexible metal tubing suitable for use as a local exhaust duct. A manifold should be purchased to be used with the flexible metal hose for attachment either to the Coppus blowers or the Robertson blowers, whichever seems more suitable for the job in the opinion of the ventilation foreman.

Standard set-ups should be devised for ventilation of the two types of ships with which the department will be concerned (invasion barges and Liberty ships) with the equipment available to the ventilation department. Every man in the department should be made familiar with these set-ups so that for any given stage in ship construction he will be able to install effective ventilation.

It will be noticed that the department has purchased one manufacturer's fan to the exclusion of others. It was explained to us that the yard has only twenty-five cycle current available with which to operate electrical equipment, and that only the Coppus fan was available in quantity with a twenty-five cycle motor. While we believe the Coppus fan is satisfactory for ship ventilation, it is not sufficiently high in capacity or pressure to serve for all purposes. We are glad to see that some higher capacity fans have recently been purchased, for we believe that they are needed in this yard.

Spray-Painting: For the protection of painters spraying paint in confined areas such as inner bottoms, MSA air-line respirators are provided. The equipment is approved and adequate, but, according to information gathered at the paint shop, it is seldom used by the men. The complaint is that the device is too bulky and that the air line and filter arrangement causes too much difficulty in moving about in small compartments. Rather than be handicapped thus, the painters prefer to use MSA "COMFO" chemical cartridge respirators. The cartridges will not protect against high concentrations and must be replaced frequently. It is suggested that the air line respirators be used as much as possible since they offer more

positive protection and greater comfort for the workmen than do filter type respirators.

Red lead paint is applied by spraying, and the necessity of taking every precaution against possible inhalation of paint mists cannot be too strongly emphasized. Respirators should be worn even while working in open spaces such as ship's holds. Splash back and air currents may endanger a painter spraying the outer hull surface by exposing him to paint mists. The operation appears safe, but is not.

An example of carelessness or ignorance was encountered during our inspection of ships in the wet dock. A painter was engaged in spraying superstructure surfaces and neglected to wear the respirator fastened around his neck. Visible clouds of paint droplets were noted in his breathing zone.

A paint remover containing methylene dichloride, or dichloromethane, is used occasionally. This compound is non-combustible and a good solvent, but it is toxic. It is readily volatilized to the vapor state and should be used only with adequate ventilation or with protection supplied by airline masks or chemical cartridge respirators.

Welding: Lack of figures makes impossible an estimate of the number of cases of eye flash. In recent months, however, such injuries at the prefabricating plant have been reduced to a minimum due to the highly successful goggle campaign. Everyone working in the vicinity of welding arcs as well as welders themselves has been supplied with anti-flash goggles, and the results have been gratifying.

No such campaign has been attempted at the main yard, and it was noted that few men wore goggles. Welders are not wearing goggles beneath their helmets. The safety department stated that protective goggles were extremely difficult to obtain, but we found a considerable supply of spectacle type anti-flash goggles stored in the tool rooms at the head of the ways. The distribution of the goggles, in our opinion, would aid in decreasing the number of flash burns.

Screening of welding operations in the shops is generally good. The screens used are semi-permanent types. Portable screens should help further in preventing unnecessary exposures. Similarly, portable screens should be used on open welding jobs in the yard.

The practice of welding or burning steel which has been previously painted with red lead creates a hazard likely to escape attention. The heat of the electric arc converts the paint to a lead oxide fume, and particularly in confined spaces a welder's exposure to the fume may be sufficient to cause lead poisoning. Chronic poisoning will result from inhalation of small doses of fume over long periods, acute poisoning is possible when gross amounts of fume have been inhaled in a short time.

Safety Department: Safety personnel consists of one safety engineer, Mr. Robbins, and twenty inspectors. They are split up between the shipyard (day shift eight, swing five, graveyard four) and the fabricating shop (day shift two, swing one, graveyard one). In all, there are sixteen hulls at the yard and

two wet docks each capable of accomodating four hull each. In the near future, additional wet dock is to be provided. There are twenty-seven labor divisions and a total of about a dozen shops in the shipyard and fabricating division.

The educational program here is good. Green men, are trained in a period of six weeks. Sixteen hundred men attend the school at one time. The safety men lecture in about three class rooms, for twenty hours, one day each week. The subjects included in this "JL" Learners School are accident causes, eye flashes, and foreign bodies, first aid instruction, safe clothing, care of equipment, fire prevention, etc. Several sound slide films are used in this lecture course. Supervisors are given safety talks about every two weeks.

In addition to the safety classes, education further includes the use of various kinds of posters and other types of literature. These are posted throughout the yard on about a hundred bulletin boards. These posters are changed with each new safety drive.

As a part of the regular safety program, this yard stages a monthly safety contest on the ways. The safest way flies a distinction flag. At the fabricating division safety contests have also been applied fairly successfully to the problem of eye flashes.

In general, the impressions of the safety work that had been done were favorable.

Personal Protective Equipment: Hard Hats: Hard hats are checked out to the men. Not as many men (8000) as the safety department desires are wearing these hats. To correct this situation

14,000 hats have been requisitioned but these as yet haven't been delivered.

Goggles: Impact and anti-flash goggles together number 16,000 to 20,000 pairs. The percentage of flash goggles is small (probably 20%), consequently not as many men as desirable are provided with them. The situation as elsewhere is undoubtedly due to inadequate deliveries from the optical houses. At the fabricating shop the proportion of men wearing anti-flash goggles was obviously very much better. Goggles are distributed from a central tool room. In the case of anti-flash goggles alone, it is necessary for the men to get approval slips from the safety department. There is a goggle repair shop.

Respirators: It was estimated that the yard has on hand 400 Pulmosan No. 5 respirators, 50 to 200 Willson No. 770 lead fume respirators and 12 MSA metal fume respirators. It was not known just how many respirators have been checked out. However, it was assumed the supply was adequate because of the numbers still on hand. The dust respirator is used by scalers and painters and the fume respirator is at times used by welders. For paint spraying a Comfo cartridge type respirator is used. In addition the yard has purchased four air line respirators for the painters. This was a result of the fact that the painters complained about the lack of respirators. Since the first rush, however, these have been little used. All respirators are issued from several tool rooms.

There is no regular procedure followed for cleaning respirators. The men are issued respirators, and it is their responsibility to keep them as clean as they desire.

Safety Shoes: There is not sufficient drive to the safety shoe sales program in the yard. The plant has put on safety shoe campaigns, and some men, as a result, have purchased shoes in the city. With this kind of an arrangement, it is little wonder that few safety shoes are worn at the yard. About 30% of the men in the fabrication division were said to wear safety shoes. It was the impression, after a more or less superficial visual check that the percentage of men wearing safety shoes was much lower.

The safety department feels strongly that the whole shoe program would be more effective if a shoe store could be located in the yard. Since payroll deductions are unlawful, no way of accomplishing this end is seen by the safety department. At other plants, a payroll advance system has worked, i.e., the company advances money to pay for the shoes and is repaid on payday.

Shops: The several shops in both the shipyard and the fabricating division were visited. For the most part there was little if any exposure to occupational diseases.

One instance of poor ventilation was noted in the section of the machine shop where galvanized pipe is welded and cut. Three canopy hoods and two 7000 c.f.m. propellor fans in the ceiling were provided for ventilation. Together the systems did not control the fumes at all adequately. In an area 25 ft. by 15 ft. about ten welders were working. The welding locations changed frequently and the percentage of the time that the fumes rose into the space controlled by the ventilation system was slight. In spite of the adverse situation the fume concen-

trations were not very high. Work of this nature is best ventilated by means of a flexible-duct, local exhaust system.

There is no sandblasting here, no asbestos shop of any importance, and no other hazardous occupations which occasionally we have found in other yards.

Pipe Covering Shop: All Fiberglas being used as insulation is being put in place with metal clips instead of with Dolfinite cement. The practice eliminates any possible hazard from toxic varieties of Dolfinite.

Pipe coverings are made up of a mixture of 85% magnesia and 15% asbestos. The material is prepared outside the yard and has only to be covered with asbestos cloth before being placed on the shops. The only health hazard involved is in the cutting of the asbestos cloth, and the danger is considered slight. One worker is involved.

Both Fiberglas installation and pipe covering are done by outside contractors.