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TRANSACTIONS

32nd NATIONAL SAFETY CONGRESS



General Subject and
Industrial Sessions

CHICAGO
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Foreword

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THE Transactions of the 32nd National Safety Congress and Exposition of the National Safety Council are published in two volumes. Volume I contains the General Subject and Industrial Section sessions. Volume II contains the Public Safety, Child Education, Home Safety and Farm Safety sessions.

Volume I is distributed to all members of the Council. Volume II is sent to those members who are believed to be interested chiefly in the sessions it contains.

The Transactions are a record of the proceedings of the Congress, condensed and edited for reference purposes. They are therefore an abridged version of the papers and discussions. The original manuscripts, some of which have drawings and charts too expensive to reproduce here, are available in the files of the National Safety Council.

The National Safety Council, at its Congresses, seeks to eliminate from discussion matters which are not pertinent to the aims of the Congress, or which may be contrary to the Council's policies. However, it cannot accept responsibility for all views expressed, either in the discussions of the Congress itself or in this record of them.

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man after landing to quickly flip seat out from between his legs. The inboard end of the line passes through a block then over a cleat. Several turns of the line are always taken around the cleat.

On the end of each landing boom a light has been installed, the rays of which are directed downward and brightly illuminate the surface on which the deck hands have to land. Since putting these rules into effect in 1938, the most serious accident reported to date has been a sprained ankle.

You all know that the success of safety work depends upon the support received from company management, and in this regard I would like to say that the interest and support of our management has been excellent.

Safety aboard a lake freighter is a broad subject, but possibly you are now aware of some of the problems with which we are confronted each operating season.

With lake freighters performing such an important role in the transportation system of both the United States and Canada, it is imperative that the present manpower shortage is not aggravated by avoidable personal injuries. This challenge is being met. Lake freighters are carrying record cargoes of ore and coal cargoes vital to our war program.

THURSDAY AFTERNOON SESSION

October 7, 1943

Presiding: D. L. Hartnett, Regional Safety Consultant, U. S. Maritime Commission, Philadelphia, Pa.

The Control of Fumes in Shipyards

WILLIAM E. LAWRENCE
Safety Engineer, New York Shipbuilding Corp., Camden, N. J.

Many articles have been published on this subject, including miles of statistics; however, I am sure that every shipyard in this country today has acquired knowledge through experience and information unselfishly passed on by pioneers in ship welding until it is assumed that everyone knows the most satisfactory fume elimination is that of ventilation by exhaustion.

Extensive experiment during the past decade with different types of equipment proved that the surest method was to remove the trouble at its source. Blowers and exhausting devices were developed accordingly, with satisfactory results. Respirators fitted with metal fume filters will give some protection when fume concentrations are low.

In common with other shipyards and heavy industries, much care is being exercised by plant medical staffs in routine re-checks and re-examinations of workers exposed to welding fumes. In so far as we know, we still can honestly state that we have not had one case of lasting or permanent ill effect to anyone associated with welding, tacking, burning or heating.

New Method and Precautions

You may be interested to hear of a development new to us at our plant. It may be new to some of you also. I refer to carbon arc burning in connection with smoothing off the large countersunk heads of tap bolts in armor plate decks. These heads were formerly chipped and ground off flush with the deck plates. This was a long, tiresome, rough and costly job. By the use of the carbon arc, they are burned off so that only a small amount of grinding is necessary, thus cutting the time and labor to a minimum. (5/16" carbon, 400 amps., 7000° F.)

Of course, the fume and dust hazard had to receive special consideration. This was accomplished by the use of a compressed air jet, which blows the slag and carbon residue into exhauster funnels located at the ends of two 3" metallic flexible tubes with powerful portable ex-

hausters at the outlet ends of these same tubes. This equipment is skidded easily along the deck as required and is kept close to the job at all times, even eliminating the necessity for the use of respirators.

Seasonal Hazards

Many other fumes must be controlled in shipyards. One of the seasonal hazards in our own plant will have to receive attention before the advent of cold weather, which is just around the corner. Men will build fires in any kind of a receptacle in spite of safety men and supervision, and will use fuel, such as charcoal or coke, without stopping to realize the danger involved and the necessity for proper ventilation. The resulting carbon dioxide and carbon monoxide gases are both deadly and create oxygen deficiencies.

We recently issued a notice in connection with this hazard and posted it conspicuously. It stated that if any fire pots were found on ship contracts, plant protection men should immediately contact a safety inspector and be governed by his decision as to the removal of same.

Fumes From Fires

I think we should mention the danger of fumes from fires in ships on the ways, while under construction, and in the water after launching. Many of the fires may be trivial but there is always the possibility of men being trapped by smoke and toxic fumes and unable to get out from below decks. This is when the trained safety inspector or a good watch force man comes into the picture. He must quickly don a mask, hook on a life rope and go down to make sure everyone is out. He must be followed as closely as possible by another man with a powerful electric lamp. If any deficiency of oxygen is suspected, an oxygen breathing mask must be worn. Ventilation must be provided at once, smoke and fumes must be exhausted and a fresh supply of air blown in.

Much could be added about the maximum allowable concentration for carbon monoxide and carbon dioxide, but the main point to remember is that carbon monoxide is the number one poison killer, both in industrial and non-occupational life, following close upon auto accidents as a cause of death. It is true that wherever there is smoke you may suspect carbon monoxide.

By all means take no chances. Don't wait for a chemist's report on the samples of air from suspected areas. Ventilate! Constant alertness on the part of watch force men and safety inspectors is an absolute necessity to combat such hazards. The education of the men by their supervisors and the use of warning posters is recommended, but above all, ventilation by exhaustion and the introduction of a fresh supply of air is imperative under these dangerous conditions. Several narrow escapes from death have been experienced in shipbuilding due to the thoughtlessness of the men and not because of ignorance. They forget to think.

Insulation Materials

The use of insulation cement, if it contains toxic solvents such as carbon tetrachloride, is a menace to workmen unless precautions are taken to properly safeguard them under such hazardous conditions. A large shipyard recently experienced such conditions which were brought to the attention of the plant health committee and the management. The result was that the entire supply was re-distilled and a substitute safe solvent provided, thus eliminating the hazard without loss of material. This demonstrates again that careful planning will assure safety with production, always a winning pair.

The use of water repellent asbestos insulation has recently replaced some types of material formerly used in ship work. For protection against dust or possible asbestosis from such material, it is recommended that both on ships and in shops, or where the material is prepared, it be dampened and that dust respirators be worn, also that special ventilation be provided. Periodic medical examination of those exposed to such hazards is also necessary.

Sand Blasting and Plating

Sand blasting and shot blasting, with its silicosis hazard, can be done safely if provision is made for standard sand blast rooms or cabinets. Special ventila-

tion must be provided, with frequent inspections of all equipment by an experienced safety inspector or supervisor. This check-up must never be neglected.

Regular periodic examinations, including X-rays, are mandatory. The least suspicion of a leaking face piece can be easily detected by the operator and should be reported at once to the safety department for immediate correction. If an operator begins to eat sand, he will realize at once that his equipment is not safe.

Fumes and dust from friction saws in shops are easily removed by proper exhaust ventilation and should be carried by ducts from the machine to dust collectors out of the shops if possible.

Plating room fumes, with modern ventilating systems now available, are no longer a problem in any up to date shipyard. A few years ago, however, a different story could be told.

Recent changes in painting specifications on naval vessels have provided for the use of zinc chromate which, although perhaps not particularly toxic, must be considered when sprayed in small compartments. Respirators are advocated along with safe ventilation. When working in large shops where large plates are sprayed, after they are placed in racks from the pickling tanks, the use of air line respirators is recommended, as these areas are too large for efficient exhaust ventilation. However, crane operators handling material in such locations, especially above pickling tanks, should be provided with respirators. Fans may be placed in the crane cabs to blow fumes and vapor away from the operators.

Protection must be furnished for any job in which dust fumes or smoke from any substance containing lead is breathed daily, for example; when welding, cutting, burning, shrinking or straightening where material is metal, coated with paint containing lead. Special ventilation, using local exhaust hoods or tubing kept not less than 8" from the job and drawing 200 c.f.m. discharged where the contaminated air will not be breathed, is satisfactory.

In ship construction two types of ventilation are used, local exhaust to remove fumes at the point of origin and general ventilation to supply fresh air to confined working spaces.

Lacquer spraying, if done in approved booths, properly ventilated, presents no greater problem. When cleaning compounds are being used, chemical cartridge respirators will give protection if concentrations are low.

The use of proper extinguishers on different type fires must be considered. Fumes from the use of the wrong ones may cause the death of persons improperly instructed. Periodic demonstrations by those responsible should be made for the benefit of firemen, watch force men, and safety inspectors. The use of instructive posters and bulletins is also advised.

Fumigation of refrigerator spaces in ships practically ready for delivery is important. Precautions must be taken to safeguard men whose duty it is to open and ventilate such spaces after fumigation. They must wear all-service gas masks while installing temporary ventilation equipment and, if a deficiency of oxygen is suspected, an oxygen breathing apparatus must be used.

Cooperation of Management and Employees

An important item in ventilation of ships under construction is to impress management with the necessity for co-operative planning by the engineering department and drawing rooms for the early installation of as much of the ships permanent ventilation system as possible, especially in engine and boiler rooms. Present construction of naval vessels practically prohibits the use of temporary ventilation units, due to the inaccessibility of such spaces and the impossibility of bringing in fresh air, especially after they are closed in.

The importance of the availability of trained ventilation men must be considered. Their services are vital in the avoidance of delays in maintaining continuous production. The elimination of fumes by their alertness to such hazards and inconveniences will help to minimize absenteeism and assure delivery of ships ahead of schedule, thus assuring a quicker victory.

We must not forget the importance of organized first aid crews trained in the use of inhalators, resuscitators and approved methods of artificial respiration. These crews with portable emergency equipment must be available and ready to act at a moments notice.

Perhaps one of the most important methods of impressing employees, especially new ones, with the idea of danger from respiratory and other hazards is through safety instruction in orientation classes before they start to work. This is being done in many industrial plants with marked success. We believe that such a program will be of vital interest to those who have had no previous shipyard experience.

Before closing I want to mention the ventilation standards as recommended in the U. S. Navy Department—U. S. Maritime Commission, "Safety and Industrial Health Manual in Contract Shipyards" a recent issue, and the "1021 Answers to Industrial Health and Safety Problems" published this year by Occupational Hazards, Inc. They are most helpful and timely publications and should be available to everyone connected with safety programs in any industry.

Crane Safety

LIEUT. COMDR. L. F. KENGLE, U.S.N. (Ret)

A survey of the information at hand on crane safety shows that there is a wealth of material on this serious subject. It has been exhaustively studied and reported. As you know, standards of safety have been set up by the American Society of Mechanical Engineers, by the Bureau of Yards and Docks of the Navy Department, by the National Safety Council, by the American Standards Association, by the states in their Industrial Accident Commissions and by the insurance carriers for private concerns. It should be apparent then, that since these extensive standards cover the design of the structure and the safety of the mechanical equipment and protective devices, cranes may be acquired, redesigned and overhauled with a maximum of assurance that from the items of design every known hazard to health and safety will be eliminated.

Criticism of Present Rules

From the above sources there may also be gained a well-rounded set of rules covering inspection and test. Not only is this information available from these sources, but methods of reporting, checking and inspection can be set up, so that positive assurance may be had that these minimum standards will be maintained throughout the life of the equipment. Criticism may be leveled at these rules are: First, in the simplification of the rules so they may be easily understood by all operators; secondly, in the adequacy of the rules to cover all incidents; third, in the standardization of the equipment used; and, fourth, in providing weight indicators to supplement on the part of the operators.

It requires judgment to make the rules fit into one's own crane problems. It is recommended that they be perused thoroughly, so that sets of rules and instructions may be made out for each activity with extraneous material eliminated from the instruction books issued to the operative personnel.

Basis for Discipline

We find it is better to base your discipline on a violation of a rule rather than upon an incident. This establishes in the minds of the operating personnel a realization of the significance of a published rule or regulation. Although the violation of a rule may not result in an accident, the continued violation of a published rule will eventually lead to a serious incident. After an incident of serious nature, its effect has a disciplinary aspect. If the rules are adequate, concise, and understandable and are complied with by personnel, no incident

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Chairman, Technical Committee (Design & Accident Prevention Measures)—James L. Bates, Dir., Technical Div., U. S. Maritime Commission, Washington, D. C.

Chairman, Ship Inspection Committee and U. S. Government Bureaus—Capt. R. S. Field, U. S. Coast Guard, Washington, D. C.

Chairman, Committee on Education and Training of Ship Personnel—Telfair Knight, War Shipping Administration, Washington, D. C.

[illegible] Congress in Congress Session