The History of Naval Industrial Hygiene Officers

First Graduating Class of Industrial Hygiene Officers, 10 Aug 1942, Columbia University, College of Physicians & Surgeons, DeLamar Institute of Public Health

Feb 97

PREFACE

In 1994, our then Corps Director Admiral Fisher asked each Specialty Leader to submit history input for the Medical Service Corps 50th anniversary publication due out this year. As Specialty Leader at the time I knew this tasker was too big for one person. Since CDR Carol Pickerel was the Assistant Specialty Leader, she *enthusiastically* volunteered which meant she was able to spend *more* time at BUMED.

Our research took us first to the National Archives I, where we spent days combing through files 50-70 years old. The search was fruitful as we discovered plenty of correspondence which helped us reconstruct the genesis of occupational health and industrial hygiene in the Navy. Next stop was National Archives II, where we looked for anything on file in terms of print or motion picture. We found vintage WW II safety and occupational health films which we were able to copy with the aid of the Naval Media Center and the Naval School of Health Sciences.

We would be remiss if we did not mention ex-Navy Occupational Health Physician Sam Foreman who did similar research in the mid-eighties on occupational health and published an excellent article in Navy Medicine. We drew considerable inspiration from Sam's research and his stirring presentation at the NEHC workshop, which in my mind remains an all time classic.

We also were assisted by the memories, documents and notes of many others including Jerry Shultz (CNO N-45), Tom German (Jacksonville IH and official Navy IH historian extraordinaire), CAPT Dave Macys (IHO), Leighton Turner (CDR-IHO-Ret), Merlynn Densley (CDR-IHO-Ret), Sam Barboo (CAPT-IHO-Ret), Lee Smith (CAPT-IHO-Ret), Warren Pickerel (CDR-IHO-Ret), Guido Rosati (Mare Island IH/IHO - Ret) and the list goes on...

This document is meant to be **evolutionary** in nature and will by necessity need to be updated as time marches on, but also as we discover new information about old events and people that we were unable to discover in this our first attempt. We would appreciate folks sending us information you might have which would clarify or indeed correct the information we have presented here.

And lastly, we believe it to be extremely important that we as a community understand where it is we came from. The peaks and valleys in our overall sustained growth and the sacrifices made by individuals which have moved our community forward making us one of the largest, most diverse and fleet savvy subspecialties in the Navy Medical Department. We believe "*If you don't know where you came from, how are you gonna know where you're going?* If we remember our original mission of direct line support, we will indeed remain a strong viable community even in this era of downsizing and outsourcing.

It has been our pleasure to serve you, the industrial hygiene community, in this effort and look forward to hearing from you with more stories to keep our history effort alive.

Send any pertinent photos, slides or stories to either:

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Cover photo: Industrial Hygiene Officer first graduating class, 10 Aug 1942, Columbia University, College of Physicians & Surgeons, DeLamar Institute of Public Health
Top Row left to right: Walstaff, Dilustro, Farnsworth, Kamala, Levinson, Levesy, Munton, Norton
Bottom Row left to right: Bessmer, Kerkian, Kardong, Bjorklund, Byrd, Gillard, Ruben, Rosati (not shown)

The History of Naval Industrial Hygiene Officers

In the beginning...

The history of industrial hygiene in the Navy reflects the growth and development of one of the largest Federal industries during peace or war. It is a story set in shipyards, public works centers, aviation depots, hospitals, ships, and overseas. The history of Navy industrial hygiene and occupational health is a history

paralleling, and at times ***leading*** the development of occupational health in this country.

Occupational health and safety have been a concern for the Navy from the beginning when, on October 13, 1775, the Second Continental Congress passed legislation authorizing the acquisition of ships and the establishment of a United States Navy; a day now celebrated as "Navy Day". Occupational illnesses fell under the realm of the medical providers who were organized into the Bureau of Medicine and Surgery (BUMED) in 1842. Four other bureaus were

established at the same time under the Secretary of the Navy. They were:
- the Bureau of Yards and Docks,
- the Bureau of Construction, Equipment, and Repair,
- the Bureau of Provisions and Clothing, and
***-the Bureau of Ordnance and Hydrography*.**

For the next 40 years it remained the days of...

where shipbuilding was not nearly the hazardous occupation it became in the 20th century. Then, in 1883, new seagoing technologies revolutionized warfare and multiplied Navy occupational health hazards. With the advent of iron warships with vastly improved gunnery systems and advanced armor plating, the construction, repair and maintenance of ships became a much more dangerous and heavy industry. These new hazards included riveting, welding, painting with corrosion resistant lead paint, chipping, sandblasting, metal casting, ordnance loading, and electric wiring.

1920's

Physicians were the first to practice industrial hygiene in the Navy and early in this century, they regarded non-physician provided industrial hygiene as an invasion of the doctor's domain. LT Linwood Smith, MC, was the first of these physicians to be *formally* trained in occupational health when, in 1923, the Boston Naval Shipyard Clinic sent him to complete postgraduate training at the Harvard School of Public Health when it was realized that knowledge above and beyond a general medical practitioner was necessary to recognize and treat the variety of occupationally related medical conditions seen at the shipyard.

1930's

By the late 1930s most of the workplace industrial hygiene in the Navy was provided by a small group of *"iron men, wooden ships and sail propulsion"...* full-time occupational health physicians.

Meanwhile, the occupational health and industrial hygiene field was growing in the United States under the influence of the Social Security Act, which provided funds for improving workplace conditions. Those Industrial hygienists in this country who were responsible for delivering these services in the government sector founded the **American Conference of Governmental Industrial Hygienists (ACGIH)** in 1938 to share and disseminate technical information and to standardize methods for surveying working conditions. ACGIH also began establishing Threshold Limit Values (TLVs). In 1939, the **American Industrial Hygiene Association (AIHA)** was formed as the states pressed large private companies to improve workplace conditions, causing them to in turn to employ industrial hygienists. Initially, AIHA had only about 50 members who formed a nucleus around which industrial hygiene was developed and became recognized as a separate professional entity. Industrial hygiene was undergoing rapid development with industrial hygiene units being set up in state or city departments of health through funds released by the passage of the Social Security Act. These trends reflected a definite renaissance in industrial hygiene as a phase of public health in the U.S.

Although World War II officially began for the United States at 07:55 a.m. on December 7, 1941 with the surprise attack on Pearl Harbor, the war in Europe in the fall of 1939 was an omen of things to come and preparations were being made to meet the approaching national danger.

Even though America was officially neutral before the attack on Pearl Harbor, President Roosevelt had been keeping on eye on growing world tensions and making preparations for inevitable U.S. involvement. In addition to providing aid and military supplies to allies, he had taken steps to ramp up the armed forces. By 1941, the military had grown to 1.8 million from 458,000 the previous year. Forces would increase twelve-fold during the next five years.

The President, long before the war, realized the need to establish health and safety programs in the Federal Departments. In confidential war plans dating to 1935, the importance of industrial hygiene had already been identified as a key service to the industrialized Navy. The President requested the Secretary of Labor to organize an Inter-Departmental Safety Council. So, in June of 1939, by Executive Order 21, the first meeting of the **Federal Inter-departmental Safety Council** occurred. All government agencies received a mandate to reduce deaths and injuries to government employees by at least 40% within 3 years. The Secretary of the Navy (SECNAV) was on this policy board and, although the board originally focused on safety, by 1940, an era of enormous expansion in naval construction unparalleled in the history of the U.S., it was apparent an implemented industrial hygiene program was going to be equally as necessary.

At the beginning of the war the Navy Medical Department numbered less than 13,000 individuals. By the end of the war, it had peaked at 170,000 men and women. Industrial hygiene was one of the many professional areas in the Medical Department experiencing tremendous growth.

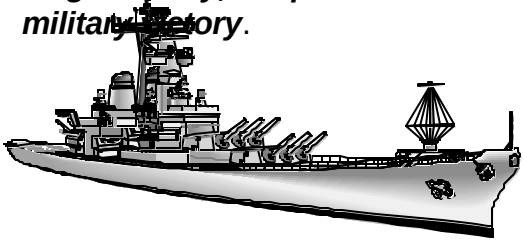
World War II

This was a war of global proportions unique to the history of mankind. Troops were needed not only on two fronts, but in several theaters of operation all over the world. The Navy was on the eve of massive changes by 1940, poised to expand its submarine and aviation forces to match the power of its surface fleets. Too, the destruction of the Pacific battleship fleet at Pearl Harbor ended the decades-old debate about which major naval ships were the most valuable, putting the conduct of the war on the shoulders of the carrier force particularly to handle the vastness of the Pacific. The Navy's other new giant, the submarine force, moved from being the coastal defense weapon of WW I to

one of the most important strategic weapons in WW II.

The War took many able bodied men workforce. Rural America migrated to the coastal seaports for employment in Navy and civilian shipyards. Retired persons, those with physical disabilities and women comprised a large part of the industrial workforce. This meant the majority of the workers were inexperienced with shipyard and other heavy industrial work. For the first time, the basic principle of human efficiency or *health promotion* was considered for the industrial worker to keep him or her on the job and it became apparent that industrial efficiency must be measured in terms of military gain or loss.

When a ship was built without a single fatality, it represented a military victory.



Other factors also led to the continued growth of occupational health programs at clinics. Some workers were experiencing lost work time because they were improperly treating themselves. First aid boxes were taken out of the workshops and workers now had to report to a first aid station or the main dispensary for treatment and advice for injuries or overseas and out of the industrial illness. For the first time, the practice of seeing civil service employees at the industrial dispensary for trivial illness not work-related began to save time and, therefore, production.

The war created a shortage of certain strategic materials necessitating a continuous search for substitutes. The occupational health and industrial hygiene specialist had to stay abreast of these initiatives to control the hazards introduced by new processes. Problems with illumination due to increased night work became manifest, along with fatigue, hazardous new metal alloys, increased metal plating and use of radioactive luminous compounds.

The National Safety Council called an Emergency Safety Conference in October of 1941 to react to a proclamation by President Roosevelt concerning the rapidly rising accident rate. He called for the Council to mobilize its nation-wide resources in leading an intense focused campaign against accidents. Subsequently, SECNAV issued a letter directing expansion of the safety and industrial health program at Naval industrial shore establishments. Commandants or Commanding Officers of the principal stations in each Naval District were directed to recruit Industrial Hygiene Officers (IHOs) and establish an **Industrial Health Office**.

BUMED created a new section of Industrial Health under the Division of Preventive Medicine. CDR Charles S. Stephenson, MC, USN of BUMED's Preventive Medicine Division was assigned to additional duty (ADDU) as the designated liaison officer with the *SECNAV Shore Establishment's Division in Safety Engineering and Industrial Health Relations*. He was also designated as the liaison officer for consultative purposes with the **U.S. Public Health Service**, an organization that already had 20 years experience in applied industrial hygiene and research at that time.

SECNAV issued a letter later in 1941 discussing the problems of recruiting qualified IHOs. Specifically, only 2 qualified IHOs had been obtained out of 25 that were wanted. Commandants were ordered to increase their efforts. SECNAV also ordered the personnel, equipment and services of the Industrial Health Office render service *beyond* the boundaries of each Naval District as necessity dictated. There were 12 Naval districts at the time and this appears to be the **first** effort to regionalize occupational health services.

Each district had mobilization and procurement quotas for IHOs. There were 20 IHO positions designated for the Navy Yards at:

- Portsmouth
- Boston
- New York
- Philadelphia
- Washington D.C.
- Norfolk
- Charleston
- Mare Island
- Puget Sound
- Pearl Harbor and
- Cavite City in the Philippines,

and 14 positions at BUMED for emergency assignment.

Other industrialized activities at the time which needed industrial hygiene support included specialized industrial plants at:

-Portsmouth, NH and Mare Island, CA for building submarines;

- the Naval Gun Factory at the Washington Navy Yard for the manufacture of high caliber naval guns, torpedo tubes and accessories;

-Newport, RI and Alexandria, VA for torpedo manufacturing;

-Indian Head, MD for the production of smokeless powder;

-Philadelphia for the production of experimental aircraft construction and repair;

- Charleston, W. VA. Naval Armor Plate Plant and

- the Brooklyn Naval Clothing Factory.

There were also five major naval air stations at the time.

Industrial Hygiene Training

In early 1941, CDR Charles S. Stephenson, MC, USN who was instrumental in designing and implementing the Navy occupational medicine program in WWII, sent two Medical Officers (Drs Otto Burton and Howard K. Sessions) to the **Harvard School of Public Health, Department of Industrial Hygiene** for an intensive three-month short course to complete their Occupational Medicine Masters and appraise the curriculum for future use by Navy Medical Officers and IHOs. Following their training and favorable reports, in May 1941, CDR Stephenson recommended this training for BUMED personnel. By 1942, 25 more medical officers of the regular Navy, and in 1943, 41 medical officers of the reserve completed either the Harvard course in industrial hygiene or a similar course at the **DeLamar Institute of Public Health at Columbia University**.

Twenty-nine IHOs also completed training at Harvard and Columbia and were augmented with 13 who already had adequate civilian experience for a total of **42 IHOs**. Initially, the Navy required 5 years of education and experience for Officers commissioned directly as IHOs; however, due to recruitment problems, this was eventually reduced to 2 years of education and experience. The IHOs were designated **H-V(S)** officers,

which stood for **Hospital Corps-Volunteer (Specialist)**.

Among the first IHOs in the Navy were: Daniel J. Bessmer, Roland E. Byrd, Salvatore Dilustro, K. R. Doremus, J. T. Ege, George A. L. Johnson, Joe Jordon, Robert S. Kennon, Victor H. Kindsvatter, Seymour Levinson, L. W. Miller, J. P. Morgan, Alexander V. Munton, K. W. Nelson, Robert Owens, Guido J. Rosati, Morwick Ross, Oscar J. Sobol, Ernani D. Storlazzi, Herbert J. Worsham, Frederick J. Viles, L. G. Wayne, and L. E. Woodman.

The Hospital Corps was the forerunner of the Medical Service Corps which was not established until later in 1947. The IHOs were commissioned as officers in the Naval Reserve with back-grounds in chemistry, chemical engineering, sanitary engineering, and mechanical engineering. These IHOs made up 10% of the Hospital Corps in WWII.

By the war's close some 111 Navy physicians and IHOs had completed the industrial hygiene courses, mostly

at Harvard School of Public Health, with a few going to Columbia University. Both IHOs and medical officers shared formal lectures but separated each afternoon for lab periods. Doctors went to clinics whereas IHOs learned sampling strategies, laboratory assays and hazard control techniques. This was one of the first groups to receive formal training in modern Industrial Hygiene. The Navy was charged $200 per student for the training.

At Harvard these courses were taught by **Philip Drinker, Ph.D.**, who joined the faculty at Harvard Medical School in 1921 as an instructor in ventilation and illumination. He added courses in air analysis, control technology and toxicology developing the first industrial hygiene program in an academic institution in the United States and one that formed the framework for the industrial hygiene program at Harvard for the next 50 years.

HARVARD SCHOOL OF PUBLIC HEALTH
COURSE CURRICULUM FOR NAVY IHOs

DAY	TOPIC	TIME	SCHOOL
Monday	Sanitary Chemistry	8-9 AM	Engineering School
	Air Conditioning	9-10 AM	Engineering School
	Sanitary Bacteriology	10-11 AM	Engineering School
	Industrial Hygiene Lab	2-5 PM	School of Public Health
Tuesday	Ecology	9-10 AM	School of Public Health
	General Sanitation	10-11AM	School of Public Health
	Vital Statistics	11-12:30 AM	School of Public Health
	Industrial Hygiene Lab	2-5 PM	School of Public Health
Wednesday	Sanitary Chemistry	8-9 AM	Engineering School
	Air Conditioning	9-10 AM	Engineering School
	Sanitary Bacteriology	10-12:30 AM	Engineering School
	Industrial Hygiene Lab	2-5 PM	School of Public Health
Thursday	General Sanitation	9-11AM	School of Public Health
	Vital Statistics	11-12:30 AM	School of Public Health
	Industrial Hygiene Lab	2-5 PM	School of Public Health
Friday	Sanitary Chemistry	8-9 AM	Engineering School
	Air Conditioning	9-10 AM	Engineering School
	Sanitary Bacteriology	10-11 AM	Engineering School
	Industrial Hygiene Lab	2-5 PM	School of Public Health
Saturday	Ecology	9-10 AM	School of Public Health
	Vital Statistics	11-12:30 AM	School of Public Health

HARVARD SCHOOL OF PUBLIC HEALTH
LABORATORY CURRICULUM FOR NAVY IHOs

Tuesday and Thursday afternoons:

SUBJECT	**FORMAT**
Microscopy	(Lecture and Lab)
Dust Concentration Determinations and Particle Size Measurement	(Lecture and Lab)
Dust Identification	(Lecture and Lab)
Chemical Microscopy	(Lecture and Lab)
Spectroscopy	(Lecture and Demonstration)
Psychrometry	(Lecture and Lab)
Flowmeters and Air-Sampling Devices	
Determination of CO and CO2 in Air	(Lecture and Lab)
Determination of SO2 and H2S in Air	(Lecture and Lab)
Determination of Benzol in Air	(Lecture and Lab)
Determination of Chlorinated Hydrocarbons	(Lecture and Lab)
Determination of Lead in Air	(Lecture and Lab)
Determination of Lead in Urine	(Lecture and Lab)
Physical Methods of Analysis	(Lecture and Lab)
Respirator Cartridge Testing	(Lecture and Lab)
Respirator Filter Testing	(Lecture and Lab)
Airflow Measurements	(Lecture and Lab)
Collection of Industrial Dust	

During WW II, Dr. Drinker was a member of the National Research Council's Committee on Industrial Medicine, the National Defense Council's Committee on Industrial Medicine and Chief Health Consultant to the U.S. Maritime Commission. Interestingly, public awareness of Dr. Drinker's contributions were not based on his industrial hygiene work but rather his invention of the "iron lung".

It is also noteworthy that Dr. Drinker insisted that the Navy students be trained in class using Navy Personal Protective Equipment and took them to Navy Yards for field trips and on-the-job-training. On previous pages are outlines of the industrial hygiene curriculum at Harvard for the three-month training course.

As soon as IHOs became available, they were assigned to the larger naval industrial activities to design and equip appropriate laboratories and to organize an industrial health program into the existing scheme of operations. Laboratories, manned by IHOs, were outfitted to investigate and evaluate existing health hazards which in some cases ran the gamut of known toxic substances. The cost of equipping these laboratories would be defrayed from the one per cent of the pre-active labor payroll, which was authorized for such purposes.

List of Approved Equipment for the Shipyard IH Laboratory

1. **Microscope** (preferable with polarizing equipment, rotating, mechanical stage)
   - Objectives N.A. 0.20; 0.65; 1.25 (oil)
   - Eyepieces (5x; 10x; 20x - with net micrometer)
   - Lamp
   - Dark-field condenser
   - Slides and cover glasses
   - Dust-counting cells (Spencer bright line)
   - Veeder Root Counter
   - Stage Micrometer (0.01)
2. **Greenburg-Smith impinger with universal motor** (including sampling tubes, rubber hose, etc.)
3. **Midget impinger** (supplied with 9 impinger flasks and nozzles).
4. **Bausch & Lomb dust counter**
5. **Electrostatic precipitator** (supplied complete with sampling tubes)
6. **M.S.A. carbon monoxide indicator** (complete with battery and 5ft. sampling line)
7. **Pyrotannic CO detector**
8. **Combustible gas indicator**
9. **Oxygen deficiency indicator**
10. **M.S.A. benzol indicator**
11. **Chlorinated hydrocarbon apparatus**
12. **Activated charcoal absorption apparatus**
13. **Wet meter**
14. **Light meter**
15. **Gas collecting tubes**
16. **Fritted glass bubblers**
17. **Flowmeters, aspirators (several sizes) set of manometers**
18. **PH meter**
19. **Mercury vapor detector** (or Tri per analyzer)
20. **Colorimeter**
21. **Victoreen Minometer**
22. **Safe Practice Pamphlets** - National Safety Council
23. **Health Practices Pamphlets** - National Safety Council

LT Guido Rosati - IH Lab
Philadelphia Naval Shipyard
Dispensary 1945

And for the first time, civilian employees subjected to any occupational exposure and those in whom physical defects endangered the health of themselves or others were given physical exams at specified intervals. Medical surveillance was a major service offered and was usually determined by occupation or job classification vice industrial hygiene sampling data. A partial list of examinations included:

Medical Surveillance Examinations

Character Of Work	Examination Interval
Handling radium or radioactive luminous compounds	Complete medical and dental exam semiannually. Breath samples for Radon every 3 mos.
X-ray operators	Complete annual medical exam. Complete blood exam every 3 mos.
Cutting and welding on painted or coated materials	Basophilic aggregation test monthly.
Painters using lead pigmented paint	" "
Foundry workers (silica)	Chest x-ray semiannually.
Crane operators	Complete annual medical exam.
Locomotive engineers	" "
Enginemen (hoisting and portable)	" "
Benzol processes	Complete blood exam monthly.

In 1942, SECNAV issued yet another letter warning that certain Commandants, Production Managers and Senior Medical Officers regarded the industrial health program as unprofitable. He ordered that it be made workable to conserve the health of the nation's industrial worker. They were not to use the specially trained Industrial Health Physician for dispensary staff duties to the exclusion of his industrial health functions, his first and primary duty. Yard or station Medical Department duties were secondary. It is interesting to note that an annual Surgeon General Report at that time stated that …

> ***"The main purpose of the Industrial Health Division has been to keep as many men at as many machines as many days as possible."***

This office was placed in charge of a Medical Officer for Industrial Hygiene and Medicine, assisted by the Industrial Hygiene Officer, Technical. Sanitation also came under the province of the Industrial Hygiene Section in the yards. The IHOs performed chemical analysis of milk and water in the industrial hygiene laboratory, evaluated personal hygiene facilities, and controlled mosquitos and rodents.

These Laboratories were frequently called upon for toxicological studies by nearby Naval Hospitals and ships during their yard availability. In addition, Industrial Hygiene was called upon for special investigation of unpleasant working conditions engendered by inadequate ventilation, dampness, extremes of temperature and humidity, and obnoxious odors. It was also observed that at least one Navy IHO could be found waiting in a restroom to collect urine samples for analysis thus eliminating a time consuming trip to the dispensary by the worker.

At about this time, a report to the U.S. Employees Compensation Commission listed the top Navy occupational health hazards as:

Navy Occupational Health Hazards

Silicosis (foundry men, iron steel and brass)
Asbestosis (insulation workers)
Lead and lead compounds (brush and spray painters, lead putty workers, welders, lead azate (detonator in munitions) workers
Volatile organic solvents (lacquer spray painters, degreasers, benzene, toluol, xylol, trike)
X-ray (ndi), radium
Welding
Chromates (electroplaters)
Radium ingestion (luminous dials for instruments)
Nitro-explosives (TNT and tetryl)
Metallic dusts
Dermatitis (cutting oils)
Heat stress

Caisson disease
Carbon Monoxide
Phosgene

Asbestos

Although asbestos is listed here and was a known occupational disease, it was unfortunately dismissed as a relatively insignificant health hazard. Because the latency period was unknown at the time, shipyard health studies wrongly concluded that asbestos was a relatively safe material, so industrial hygiene efforts were directed toward more apparent hazards. A health survey of pipe covering operations in construction Naval vessels was made in 1945 for the purpose of appraising the potential health hazard of prolonged breathing of asbestos dust.

This study was conducted in two Navy shipyards and two Navy contract shipyards, and consisted of medical examinations of the workers, and a study of the nature and concentration of the contaminants in the air breathed. The incidence of asbestosis among the pipe covers in the shipyards studies was 3 cases out of 10% examined. These three cases had worked at pipe covering for more than 20 years. Among the conclusions drawn from this study is that pipe covering done in shipyards is not a dangerous occupation, and cannot be compared with other asbestos handling operations, such as in the asbestos textile industry. A full report was published in the *Journal of Industrial*

Anoxemia (confined spaces)

Hygiene and Toxicology, Vol. 16, No. 1, of January 1946.

Similarly, noise was also neglected in the wartime shipyard and no efforts were made to control or prevent hearing loss. In sharp contrast, sight conservation was a major effort as flash burns from welding and cutting and foreign objects in the eye numbered in the hundreds each month at every shipyard.

Industrial Vision Program

An Industrial Vision Program was instituted at several shipyards, notably Mare Island, Puget Sound, New York, and Norfolk. The extent of the program varied form yard to yard but in general consisted of visual acuity, color perception, depth perception, fitting of goggles, and prescription for corrective lens when indicated. Safety goggles were considered more satisfactory, and the wearing of eye protection more general when the needed correction was incorporated in the safety lens. The industrial vision program increased production in several ways. A survey at one shipyard revealed the 6% of all electricians employed were lacking in some phase of color perception. It was ascertained that these 6% were responsible for 80% of the errors made in electrical hook-ups. In addition to improving production, the accident prevention program is enhanced by placing employees in jobs that they are visually capable of handling adequately

and efficiently. The need for a more extensive Industrial Visual Program was realized, but was hampered due to lack of qualified personnel.

Welding - A Special Study

In addition to the routine surveys and investigations, special mention should be made of a survey done to study the effects of burning and welding fumes, gases, and vapors on Naval shipyard employees. This study was undertaken in nine Naval shipyards and the Naval Gun Factory during July and August 1944. A total of 4,949 employees were examined and more that 95% of this group had been working in their respective trade for more that two years.

Approximately one-half of the employees worked regularly outside of the shops and the remainder inside of the shops. On physical examination there were no abnormalities that could be correlated with exposure to burning and welding fumes, gases and vapors. A total of 4,891 reports of X-rays of the chest were analyzed. Of these reports 96.3% were reported to be normal. The percentage of reports classed as not normal was approximately the same in the various trades. There were no indications of lung disease that could be attributed to the inhalation of burning and welding fumes, gases or vapors. The incidence of active tuberculosis was 0.2% while the incidence of healed tuberculosis approximated that to be expected in the general population.

Blood level determinations did not indicate lead poisoning although 5-10% of the employees had a slight excess of lead in their blood indicative of lead absorption. Blood counts and urinalyses did not show any significant occupational differences. A history of metal fume fever was negative in 89% of the 4,949 employees; the highest incidence was among welders. It was concluded from this survey that exposure to burning, cutting and welding fumes, gases and vapors was not a source of any serious disability to employees of Naval shipyards. However, it was known that inadequate control of these exposures did lead to acute and chronic disabilities.

Shipyard Safety Organization

For the Navy's safety organization at the SECNAV level, there was a Navy Department Safety Engineer who served as the advisor to the Director of the Division of Shore Establishments. At the shipyard level, and using the New York Navy Yard as a typical example, the Safety Officer was a line officer responsible for the administration of the accident prevention program. Under the Industrial Department of the shipyard, there were typically 23 shops with force per shop at anywhere between 30 and 3,200. Total civilians numbered about 21,000. During WW II the combined industrial workforce of all Navy Yards was at 150,000. Add in the

industrial shore establishment workforce and it totaled 180,000.

Mishap Statistics

In July 1940 SECNAV had directed that a report of each accident and illness, both "lost-time" and "no lost-time" for civilian personnel be submitted to BUMED. The shop supervisor furnished accident cause information necessitating him to be familiar with accidents occurring in his department. Original copies of each occupational disability report were mailed to BUMED no later than 48 hours after the accident. At BUMED there was a tremendous amount of coding and editing to be done, and finally after months of trial, the system broke down due to lack of trained tabulator machine operators. As soon as the war broke out this was quickly abandoned. This was the first attempt at a centralized automated occupational safety and health data system. A simpler method evolved and was executed out of SECNAV's Shore Establishments Division which were mere summation of totals. Comparative safety scores for all Navy yards were published to increase competition.

Also, a monthly ***Industrial Health Report*** was submitted to BUMED from each Yard which included:

A. Occupational Health Exposures of Civilian or Enlisted Personnel (listed Occupational diseases - dermatitis, lead poisoning, etc)

B. Investigations of Occupational Health Exposures (Radium dial paint shop, paint spray booths, ventilation studies, etc)

C. Laboratory Examinations (CBC, Urine sulfate, Blood Leads, Urine Lead)

Pearl Harbor

Early in the war, the operational effectiveness of the industrial hygiene program of the Medical Department was demonstrated during the salvaging of our wrecked and sunken Navy as a result of the surprise attack on Pearl Harbor.

LT Roland Byrd, MSC (IHO) was stationed at Pearl Harbor Navy Shipyard where a large part of his work dealt with the health problems of workers salvaging sunken ships. Repairs had to be made to the ships before they could be floated and taken to dry-dock. The work had to be done underwater in the presence of many toxic chemicals and explosive gases. Carbon monoxide from the burning of the ships was trapped in the spaces as well as hydrogen sulfide. The men doing the burning and welding had to wear air-supplied respirators. When a sudden death occurred with multiple hospitalizations from a salvage operation on one of the battle ships, USS NEVADA, LT Byrd was involved in an investigation which paved the way for a protocol on safety and health for all salvage work done there.

Cooperation with the U.S. Maritime Commission

Not only were Navy IHOs involved in just strictly Navy matters, in the summer of contract yards where vessels were being built for the U.S. Maritime Commission, such as Liberty transport ships and landing assault crafts. There were 57 maritime contract yards where the number of workers had increased from 57,000 to 900,000! (It was the policy of the Navy to allot new naval construction on an equal basis to government and commercial yards.) Navy IHOs along with Dr. Philip Drinker from the Harvard School of Public Health (as noted earlier, he was the Chief Health Consultant to the US Maritime Commission) were requested to write a safety and health code for these shipyards which soon became the industry standard for all shipyards. That wasn't the end of it. The Navy was also called to provide assistance to implement these standards and 2 medical officers and 6 IHOs were assigned ADDU to inspect, report, and recommend on Navy and maritime contract shipyards. They were stationed at U.S. Maritime Commission regional construction offices at Philadelphia, Oakland, New Orleans and Chicago. The IHOs remained on duty with the Maritime Commission until the latter part of 1945 when the program was terminated.

By 1945 it was evident the Navy's Industrial Hygiene and Occupational Health Programs paid dividends in decreasing lost time due to illness, decreasing the incidence of accidents, decreasing compensation costs, increasing production and efficiency, 1942 a need was identified for health and safety standards at

and promoting and maintaining morale of employees. ***It is important to note that these programs played a leading wartime role which included superior practitioners who broke new ground for industrial hygiene as a distinct health related profession.***

Post War

At the end of the war, most IHOs were to be demobilized. BUMED recommended, and SECNAV concurred, that each Naval Shipyard and Naval Air Station was to continue its industrial health program and prior to releasing the IHOs, was to classify and establish one civilian industrial hygiene position. Funding for these would be charged to the appropriate Bureau with technical control by BUMED. With demobilization following 1945, a number of IHOs had obtained civil service appointments to the 11 Naval shipyards, the Naval Gun Factory and major Naval Air Stations. Uniformed IHOs continued to man a Naval Ammunition Depot, an Air Station, and the Western sea frontier.

Public Law 658 was enacted in 1946, authorizing health service programs for Federal civilian employees. As a result, the Navy inaugurated occupational health programs at Naval shore installations. This again meant growth of the program and, after a slow start by recruiting through universities and national organizations, the

Industrial Health Section of BUMED, in conjunction with the Civil Service Commission, was able to promulgate a national announcement for industrial hygienists in February 1949. While most billets had been filled by this time, the announcement served the dual purpose of allowing our civilian industrial hygienists to obtain permanent status, and of creating a large register from which future industrial hygienists could be drawn for any governmental agency.

Birth of the Medical Services Corps

Through the war years, the need for commissioned officers who were skilled medical administrators had been well documented and the experienced gained in WW II demonstrated the same need for equally skilled allied medical sciences. Consequently, for the first time, some 900 commissions in the Hospital Corps were granted and identified as Hospital Corps specialties. Temporary legislation that authorized this expanded officer end-strength was a stop-gap measure due to expire six months after cessation of hostilities, or as of July 31, 1948, whichever occurred first. The victory of 1945 did not bring a long-lasting peace. After the war, the Soviets began to take control of countries in Central and Eastern Europe recently freed from Nazi rule. The Soviets, undaunted, would continue their quest for dominance. These postwar tensions and our foreign policy required the support of a rather large naval force with overseas bases which drove up the responsibilities of the Medical Department.

As a result, the Medical Service Corps (MSC) was formally established by the Army-Navy Medical Service Corps Act of 1947. This Act became Public Law 337 of the 80th Congress when it was signed by President Truman on August 4, 1947.

There were 252 original MSC permanently commissioned officers in 1947 including ***4 IHO plank-owners***. Altogether, the MSC was established to be 20% of the regular end-strength of the Medical Department with 3 sections:

1) Pharmacy, Supply and Administration Section;
2) Optometry Section; and
3) Medical Allied Sciences Section.

IHOs were included in the latter section.

1950s

The 1950s were much quieter for the Navy's occupational health program compared to the previous decade with Drs. Otto Burton and Karl Sessions and IHOs Sidney Goren and George Lock Johnson, leading the program from

BUMED through much of the decade. After WW II, submarines took much of the burden of the Cold War, shouldering the Navy's share of the nuclear triad, with the development and Polaris, Poseidon and later the Trident ICBMs. From the early 1950's on, the submarine force became increasingly more nuclear allowing to become bolder, faster and able to deploy longer. So, in 1959, industrial hygiene was once again raised to division status at all shipyards. It was expanded to take care of radiological health problems associated with the building and conversion of nuclear-powered submarines at Mare Island and Portsmouth. Other shipyards also planned for industrial hygiene facilities to cope with health problems of repair and reactor exchange in these subs.

1960s - 1970s

During the 1960s the Occupational Health Division and Industrial Hygiene Branch at BUMED were ably managed by CAPT Norbert Rosenwinkel, Ph.D., MC, and CDR Charles J. "Joe" Jordan, MSC, respectively. They formed a center to disseminate information on occupational hazards, the Navy being occupationally oriented by assignment and rate. They produced a quarterly ***Occupational Health Hazards*** bulletin beginning in 1954 derived from monthly Industrial Health Reports. There were 44 issues altogether through 1965.

Although the 1950s and 60s was a period of gradual Federal involvement deployment of the

ENS Tom Hill, NPMU 5, aboard an AR foundry, San Diego, CA, 1963

in the environmental field, such as with the Clean Air Act in 1955 followed shortly by the Clean Water Act, it can still be considered a period of benign neglect of occupational safety and health. Fewer than one-third of the total work force in the United States received any industrial hygiene services except those provided by official agencies. Then a series of Federal acts passed in the late 1960s

changed the practice of industrial hygiene from a small cadre of technicians to a large number of practitioners.

In 1969, the Coal Mine Health and Safety Act was passed leading the way for successful passage of the **Occupational Safety and Health Act (OSHAct), Public Law 91-596, in 1970.** Section 6 of the OSHAct directed Federal agencies to establish and maintain comprehensive and effective occupational safety and health programs consistent with the standards issued under the Act. And, although the original OSHAct did not include Federal workers or the military, subsequent Executive Orders in 1971 (EO 11612) and in 1974 (EO 11807), stated that each Federal agency must comply with standards issued under the OSHAct. Thus, immediate preparation and formation

Of Navy directives was needed to promulgate the requirements for the Department of the Navy.

At BUMED, CAPT George Lawton, MC, USN had relieved CAPT Rosenwinkel as Director of the Occupational Health Division. LCDR Samuel H. Barboo, Jr., MSC moved over from the Environmental Health Branch at BUMED in July 1968 to relieve CDR Jordan (who retired) as Head of the Industrial Hygiene Branch, Code 732. Code 732 was responsible for evaluating and determining the industrial hygiene needs of the Navy. Code 732 also served to assist Navy management to deal constructively in health matters relating to the occupational health and processes within the Naval establishment. Three additional IHO billets were brought on line for Code 732. The industrial hygiene staff was now equipped to write the comprehensive directives that were to bring the Navy into compliance with Federal requirements of the new OSHAct. LCDR Douglas Rector, MSC assisted in the total rewrite of BUMED directives pertaining to occupational health, LT Joe Drozd, MSC rewrote the hearing conservation directives and developed the mobile van concept, and ENS Leigh Doptis, MSC did work related to Environmental Pollution.

Asbestos

well-being of military and civilian personnel and the quality of the environment of the surrounding community as affected by industrial

Another event which was to have a major impact on the Navy's occupational health program was a meeting which took place on August 29, 1968 at BUMED's Occupational Health Division. Dr. Irving Selikoff of the Mount Sinai School of Medicine, Mr. John P. O'Neill of the U.S. Department of Labor, and Dr. Muray C. Brown of the U. S. Public Health Service met with the BUMED staff to discuss the hazards of asbestos and some recent epidemiologic data

researched by Dr. Selikoff related to asbestos exposure and carcinoma of the lung. These data were inconclusive, in that there were insufficient numbers of non-smoker insulation workers to comprise a cohort as controls to those workers who both smoked and were exposed to airborne asbestos. Sometime after, unknown to members of the Occupational Health Division at BUMED, Dr. Selikoff held a press meeting with the Washington Post. The main theme of the resulting article characterized the U.S. Navy as not taking all precautions to protect shipyard workers form exposure to asbestos. The results of this article were to send the Navy to "general quarters" to upgrade the program to control exposure to asbestos.

LCDR Barboo began working with the Naval Ships Systems Command and the Naval Materiel Command to gradually replace asbestos containing materials during major overhauls, but much more needed to be done.

With the new OSHAct and concerns about asbestos hazards, the 1970's were an era of activity for the Navy's occupational health program with an accelerated effort to recruit military and civilian industrial hygienists. Civil service industrial hygienists were also strategically placed in the highest echelons of Office of the Chief of Naval Operations (CNO), SECNAV and the Department of Defense (DoD).

A few years earlier, in 1964, the Bureau of Weapons had identified a need for an occupational health program which would encompass all fleet readiness and training ordnance field activities. This led to broadening of the occupational health function of the Naval Ammunition Depot, Crane, Indiana, with the ultimate establishment of the Naval Ordnance Systems Command's Environmental Health Center in May 1967. This organization sponsored a series of Industrial Environmental Health Workshops with the cooperation of BUMED. This was the start of the present day Navy Occupational Health and Preventive Medicine Workshops. The Center became a Headquarters Detachment of the Naval Ordnance System Command (NAVORD) in Cincinnati, OH on July 1, 1970 and was renamed the Naval Ordnance Environmental Health Center (NOEHC) in Oct 1970.

NOEHC was brought under the aegis of BUMED on July 1, 1971 and renamed the Navy Industrial Environmental Health Center (NIEHC). CAPT George Lawton, MC was named the Officer In Charge and was ADDU to this position while still attached to BUMED. He was instrumental in providing the organizations' foundation and in nurturing its early development. NIEHC provided industrial hygiene information services and surveys for shore activities. These services were largely performed by civil service industrial hygienists. The goal was to have a fully operational NIEHC by July 1, 1972.

Concurrently, on July 1, 1971, the Navy Regional Medical Center (NRMC) Portsmouth, VA was established. The center was a shore activity of BUMED with immediate coordination by the Commandant Fifth Naval District. For the first time in Navy history, the majority of fixed ashore Navy medical facilities in a geographic area were under the command of a single Regional Director/Commander. Between this date and January 1, 1973, occupational health services were regionalized along with the rest of Navy medicine and those aspects of the program which belonged to Chief, Naval Material Command (CHNAVMAT) were executed by BUMED. In 1973, CDR Barboo was transferred to the NRMC, Portsmouth VA were he established the first industrial hygiene office that incorporated regional services to activities. For the first time, many shore commands were provided industrial hygiene surveys by request. Regionalization had been with us at the beginning; BUMED Bulletin # 22 (Jul - Sep 1959) states that *"ships and naval activities not having industrial hygienists attached can obtain the services of a qualified industrial hygienist for a periodic survey by requesting the CO of the nearest naval activity .. via the cognizant District Commandant."*

In Cincinnati, a number of IHOs and IHs came aboard NIEHC, many with prior line or enlisted service. While CAPT Lawton ran the unit from Washington, day-to-day industrial hygiene services were organized and planned by Mr. Art Johnston. The NIEHC had a limited budget and could provide field support if the serviced command was willing to pay expenses. Shipboard industrial hygiene services were generally provided by the military IHOs and mainly consisted of heat and noise surveys, primarily in support of Board of Inspection and Survey (INSURV) inspections of ships to be commissioned or evaluated for overhauls or decommissioning.

On July 1, 1974, the NIEHC changed its name to the Navy Environmental Health Center (NEHC) and became an echelon 3 command under BUMED. In August of 1974 CAPT Tom Markham, MC took over as Commanding Officer. And, it was in 1975 that the Navy's first female IHO, LTJG Noreen Considine, MSC reported for duty at NEHC.

By 1976, the Navy occupational safety and health program was being looked at closely. Congressional, General Accounting Office (GAO) and Defense Audit Service (IG) cited the Department of the Navy for deficiencies in the workplace environment.

Then, in 1977, NAVMAT directed all of his activities to identify actions necessary to upgrade and comply with the OSHAct. This began a major effort to get more dollars and people for their requests and an expansion in the occupational health mission. NEHC was housed in two old buildings on Naval Base Norfolk, Buildings X-353 and X-13, with the NEHC laboratory physically located down the street at Navy Environmental and Preventive Medicine Unit Number Two.

NOSHIP

In the middle of 1978, CAPT Barboo was assigned to the newly relocated NEHC at Norfolk to establish the Navy Occupational Safety and Health Inspection Program (NOSHIP). Under the Naval Inspector General (IG), the program sanctioned the first forthright enforcement of industrial hygiene and safety directives. CNO had approached NAVMAT to stand up a Navywide Occupational Safety and Health oversight group due to concern that Department of Labor inspectors with OSHA would come in to Navy activities. NAVMAT declined to do so, but BUMED agreed and received 3/4 million dollars to execute the program. CAPT Barboo convinced the Navy Surgeon General at the time, VADM Arenzten, not to give the NOSHIP Director job to a physician but rather someone trained and educated in industrial hygiene (an IHO). So, in 1979 NOSHIP stood up with CAPT Barboo as its first director. Although reporting program.

Beginning in 1978 and completed in 1979, NEHC moved to Norfolk in response to increased fleet support

to the IG, NOSHIP was administratively attached to NEHC
and was located in Norfolk, VA.

1980s - the Decade of Expansion

An OP45 developed CNO Policy Objective and POA&M was approved on July 21, 1980 for the Navy Occupational Safety and Health (NAVOSH) program and support was begun in POM 82 to have full Navy compliance with EO 12196, which required Federal agencies to comply with OSHA by 1986. This included development of Workplace Monitoring plans for shipyards, Naval Air Rework Facilities (NARFs) and other major shore industrial activities with a comparable program for military personnel. Again, occupational health and industrial hygiene people were being hired.

In March of 1981 the Navy Environmental and Preventive Medicine Units (NEPMUs) were reorganized under NEHC. Back in 1952 the mission of the U.S. Navy Epidemic Disease Control Units (EDCUs) had been changed from "preventing disease" to "preventing or controlling health problems of naval importance due to biological, physical, chemical or other causes." Subsequently, on 12 March 1953 the units were renamed U.S. Navy Preventive Medicine Units

(PMUs), a name they held until February 1971 when they were given their current designation of Navy Environmental and Preventive Medicine Units.

A couple of events occurred in the early 1980's that would further help increase the staffing and funding for the NAVOSH program. First, a Defense Audit Service (DAS) Report 81-112 of October 9, 1981 slammed the Navy for serious staffing shortages and gave the industrial hygiene program an UNSAT. They also cited a lack of industrial hygiene laboratory resources.

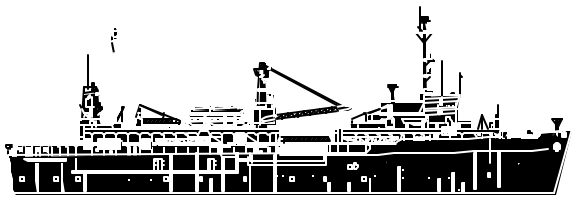
Following this report, the Deputy Secretary of Defense sent a memo on August 11, 1982 that contained a Program Decision Memorandum which directed the Department of the Navy to increase civilian end-strength for occupational health to +181 in FY 84, +362 in FY 85, and +547 in FY86. Also, OSHA re-evaluated the Department of the Navy, and Congressional hearings were held in September 1983 regarding the Navy's non-compliance with the OSHAct.

These problems led to the CNO (OP45), NEHC, and BUMED hiring JRB Associates to do a study on staffing levels and laboratory support. The study resulted in a doubling of civilian and military industrial hygiene billets, even though earlier realignment efforts to help compensate for identified staffing shortages had led to 10 IHO billets being given up in July 1982 as compensation for military audiologists.

Then in 1984, congress levied civilian end-strength reductions to freeze 1984 civilian personnel levels at the 1983 levels. The Medical Department intended to take its reductions out of the occupational health program until CNO (OP45) took aggressive action by intervening. As a result, no civilian personnel reductions were taken from the occupational health program.

Increased IH Support Afloat

Significant advancements in the NAVOSH program in the 1980s helped realize the assignment of IHOs to fleet type commands, ships, INSURV, and the staff of the Atlantic and Pacific Fleet Commanders, resulting in comprehensive occupational health coverage for the Naval establishment. Early in the 1980s, a CNO executive board prompted the development of a POA&M for the ***Afloat Safety Improvement Program*** to respond to highlighted serious industrial safety deficiencies onboard ships. The board called for IHOs to be assigned to large combatants, which eventually led to IHOs being assigned to tenders (ADs/ASs/ARs).



Line officer billets were given up in compensation for the new IHO positions on Tenders. The IHO was intended to serve as Head of the ship's Safety Department, although many found themselves being assigned as Division Heads under the Repair Department instead. Continued pressure from the type commands eventually corrected this problem. The first four IHOs selected for these positions were: LT Charlene Brassington, MSC, reporting to USS USS Yellowstone (AD 41) all by November.

By the end of 1987 there were 7 IHOs on tenders with the rest due by mid-1988. This pioneering effort coupled with the development and implementation of the CNO (N45) ***NAVOSH Afloat Navy Training Plan*** and the ***NAVOSH Program Manual for Forces Afloat*** (OPNAVINST 5100.19 series) represented major steps forward in upgrading shipboard occupational safety and health. To support the newly arriving IHOs, the Navy Sea Systems Engineering Support (NAVSSES) office began procuring industrial hygiene equipment in 1987. The list of items needed had been developed by NEHC. On the list were:

- OB Analyzer
- SLM/dosimeters
- polarizing light microscope
- air sampling pumps
- velometer
- Draeger pump kit and detector tubes
- incline manometer
- smoke tubes
- filter cassettes
- sorbent tubes/other consumable and minor equipment.

Shenandoah (AD 44) in August 1985, LT Gary Cheely, MSC going to USS Acadia (AD 42), LT William Stover, MSC going to USS Cape Cod (AD 43), and LT Ken Smith, MSC going to

Another milestone in the development of military positions occurred in 1985 when LT Linda Byrnes, MSC, was the first IHO to be assigned to a Marine Corps billet when she reported to the 2nd FSSG that year. Since then all Groups and Wings now have IHOs assigned. Headquarters Marine Corps gained an IHO, LCDR Jason Jackson in 1995.

1990s - Continuing to Break New Grounds

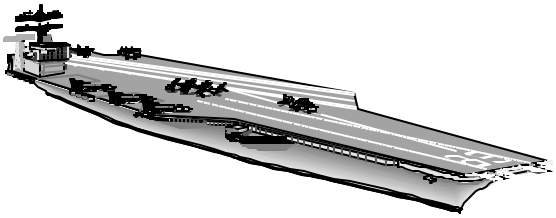
In 1989, after 10 years in Norfolk, NEHC moved to permanent quarters in a modern building off base in Norfolk. The same year, the Navy Inspector General stood up a Navy Environmental Inspection Team (NEIT) under the NOSHIP Director, CDR E. Lee Smith, MSC, an IHO.

In 1991, CAPT Charles Baker, MSC was made Officer-in-Charge of

NEPMU-5 in San Diego, becoming the first IHO to hold such a position.

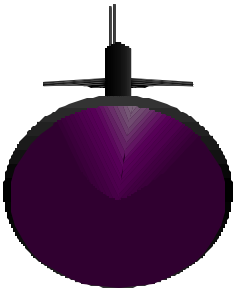
It was in 1992 that IHOs finally gained their first Commanding Officer position. CDR Ronald Ellis, MSC reported to the Navy Safety School in Norfolk in October of 1991 as its Director when the school moved from Bloomington, IN to Norfolk, VA. When the school was made an independent command in September 1992, CDR Ellis was named its first Commanding Officer. The Safety School also established

the first Executive Officer position for IHOs as LT Rachel Haltner assumed duty in that position in January 1994.



1992 also saw the first IHOs begin reporting for duty aboard CV/CVNs starting with LT Jim Letexier, MSC going to USS Nimitz (CVN 68). The first female IHO permanently assigned to an aircraft carrier was LT Ruth Leonhardt, MSC who reported to USS Enterprise (CVN 65) also in 1992. LT Haltner was the first female IHO to do extended TAD aboard a carrier when she did back to back assignments aboard USS America (CV 66) and USS Enterprise (CVN 65) in 1990-1991. Female IHOs were among the first women allowed permanent assignment to combatants by the U.S. Navy. Again, line officer billets were given up in compensation for the IHOs who were reporting aboard CV/CVNs as Assistant Safety Officers.

1994 also saw the line give compensation to create an IHO Instructor billet at the Submarine Training Facility, Norfolk filled by LT C. Morey.



In 1995 the line again gave up compensation to create two billets at Shore Intermediate Maintenance Activity (SIMA) Mayport and Norfolk which were filled by LT Joe Campisano and LT Gary Morris. Branch Medical Clinic Sasebo Japan also added an IHO billet filled by LTJG Allison McCurdy. Naval Hospital Keflavik added an IHO billet filled by LTJG Andrew Seal.

1995 Also saw an IHO, LT Stan Jossel, placed on the staff of CNO (N45), LCDR Dave Horn placed on the staff of the Naval Sea Systems Command and PRESINSURV add a second billet for Environmental Protection filled by CDR Bill Stover.

Navy IH Laboratories

The development of Navy industrial hygiene laboratories is a history that cannot be overlooked as part of the larger historical development of the Navy industrial hygiene program. The large expansion of the Navy industrial hygiene program and technical advances in chemical analysis methods made it impractical for industrial hygienists to run their own laboratories. In 1972, LTJG William M. Coleman III, MSC, a biochemist.
and Mr. Gerry Wright, analytical chemist, came to NIEHC to start the industrial hygiene laboratory program.

Mr. Wright and LTJG Coleman were the first two analytical chemists to be assigned chemists at NEHC.

In January of 1976, the analytical laboratory at NEHC, then in Cincinnati, received its first accreditation by the American Industrial Hygiene Association. The Laboratory Director at the time was CAPT Thomas Markham, MC, USN, who was NEHC's Commanding Officer with Mr. Wright, laboratory supervisor, running the day-to-day operations. Finally, in 1984, BUMED designated NEHC as the program manager for the oversight of all Navy industrial hygiene laboratories. Over the next ten years, the number of industrial hygiene samples sent to the laboratories increased from 53,000 to 103,000 per year.

In July of 1986, NEHC established the Consolidated Industrial Hygiene Laboratory (CIHL) Program and selected Mr. Gerry Wright as director. Four CIHLs were set up at Norfolk, Mare Island, San Diego and Pearl Harbor. In October of that year, NEHC discontinued all industrial hygiene laboratories Navy-wide except the current four CIHLs and the Norfolk Shipyard industrial hygiene laboratory. NEHC organizationally transferred its laboratory to NEPMU2, and in April of 1986 consolidated the NEPMU2 CIHL lab and the Norfolk Shipyard lab. In October of 1989, NEHC transferred the other three CIHLs to the NEPMUs (Pearl Harbor Clinic's industrial hygiene lab to NEPMU6, Mare Island and San Diego Clinic's lab to NEPMU5). All CIHL labs by that time were AIHA accredited. The number of chemists at NEHC/CIHL labs increased from 1972 to 1995 from 2 to 23 chemists with 22 chemists at the NEPMUs and one, Mr. Wright, at NEHC.

Roland Byrd

Navy industrial hygienists, looking back on their distinguished history, realized the need to recognize their outstanding leaders and, in 1992 established ***The Roland E. Byrd Award for Excellence in Navy Industrial Hygiene***. This award was to commemorate the contributions of Roland Byrd. Roland had been one of the initial IHOs in 1942 but left military service at the end of WWII. He was recalled to duty during the Korean War for his expertise in the aircraft rebuilding industry. He entered civil service in 1954 as an industrial hygienist at NAS Jacksonville and remained head of the program there until his retirement in 1982. He maintained his commission in the Naval Reserve until he made Captain. He passed away in 1985 after more than 35 years of naval service. His career was marked by innovative achievement, technical excellence, and dedication and commitment to his profession, his peers and the Navy. His impact on Navy industrial hygiene is a benchmark standard and the reason the Roland E. Byrd Award is presented to Navy military and civilian industrial hygienists for recognition of exceptional performance, special projects or sustained professional excellence in the field of industrial hygiene and

occupational health. This award is submitted via a Navy Industrial Hygiene Association (NIHA) member and is conferred by the NIHA Awards Committee at the annual NIHA meeting. The first recipient was **CDR Leighton Turner**, MSC who was presented the award in March 1993 during the NIHA meeting at the NEHC Workshop.

“OLD SALTS” - Spinning a yarn aboard ***USS MOHICAN*** in 1888