CONGRATULATIONS

Bill White has been elected to the ASHE Board as Region 1 Representative. He is a past president and is Administrative Engineer, Framingham Union Hospital, Framingham, Mass.

FIRE PREVENTION/DETECTION CLASSES, AN APPROACH TO INSURE ATTENDANCE OF HOSPITAL EMPLOYEES

It is readily accepted that all hospital personnel should and must be trained in the procedures to be employed when and if a fire occurs in a health institution.

An approach instituted in the Bridgeport Hospital, approximately 6 years ago, appears to be one method for assuring attendance of the majority of personnel at a periodically scheduled training session.

All new employees are instructed in the basic concepts of fire detection, prevention and method of activating the fire alarm sequence, as outlined in the hospital’s Fire Plan, as a portion of the initial orientation classes held shortly after they are hired. It is expected that the various department heads will continue the “Drill” instructions as a portion of the new employees job-site orientation.

Many years ago it was determined that additional methods were required for assurance that the basic concepts were understood by all employees. The annual fire detection/protection lecture was established to fill the gaps and/or reinforce the procedures presented in the indoctrination period. The periodic fire “Drill” tests and subsequent critiques, required by JCAH, each shift, each quarter, indicated that not all employees were receiving the message.

A new approach was required. If the review program held once a year was not sufficient, then twice a year, with stricter control, would be employed. From this premise developed the current program which has been in effect for the past 6 years. Each year in October, and again in April, a series of training sessions are scheduled covering the three work shifts. The sessions, comprised of a lecture, equipment demonstration, and a film, are held, usually in the auditorium. However presentations are prepared and tailored to suit specific locations if requested by a department head, i.e., the business office, laboratory, cafeteria/kitchen, operating suite, etc. (Continued Page 3)

SPRING SEMINAR

For Tuesday, March 29th, our program Co-chairman, Charles Spalding, Physical Plant Engineer, New England Deaconess Hospital, has organized an outstanding program on the subject of computers as used by the plant engineer to increase his effectiveness. The program is printed on page 4 for you to bring to the meeting. This will save reprinting costs. Co-chairman, Andrew P. Thompson, Jr., Assistant Director of Plant Services, Boston Hospital for Women, is for the second year coordinating the support services at the Copley Plaza.

EQUIPOTENTIAL GROUNDS

A Life Safety Code inspection by the Public Safety Department of Mass. at the Lawrence Memorial Hospital of Medford indicated that a separate equipotential ground system would have to be installed in the four emergency rooms built in 1967 because none existed. Total cost for this work was estimated to be $15,000. Subsequent to this inspection, the Department of Health, Education and Welfare (HEW) published in the Federal Register June 24, 1975, paragraph 405.1022 amended standards as follows: “The hospital is equipped with a grounding system in conjunction with an isolation transformer in each anesthetizing location adequate to minimize the difference in potential which can occur between any conductive surfaces that the patient or a person touching the patient can contact. This difference in potential under conditions of the first fault between either isolated conductor and ground shall be less than 5 millivolts.”

Later HEW issued instructions that allowed existing ground systems if they were installed in such a way as to limit the voltage a patient might receive as a shock to 5 millivolts (.005 volts). A test must demonstrate that a continuous ground system exists, isolated power supplied to the space, and use of a sensitive volt meter with minimum impedance of 500 ohms at 60 hertz.

Using a Honeywell model 1071 wheatstone bridge capable of measuring to .0001 ohm, the resistance was recorded between the nearest metallic surface at the head of a bed in the emergency room and each metallic surface in the room. The values were close enough together to show that electric bonds in the floor and wall were installed. (Continued page 4)
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PRESIDENT'S MESSAGE

In thinking about my objectives for your Society for 1977, I can offer no more appropriate statements than those objectives stated in the By-Laws of the Society.

(1) To promote better patient care by taking advantage of the latest developments in design, operation and maintenance techniques available.

(2) To promote the mutual exchange of technical assistance, ideas and experiences.

(3) To promote the professional development of Hospital Engineers through continuous education.

"Better Patient Care" — I suggest that each one of us is in fact a member of the health care team of our particular institution and community, whether or not that responsibility is clearly defined. Perhaps we each need to take a little more time to better identify the decision making process of our particular employer and attempt to develop methods for providing timely, accurate, factual, input into the process. Casual, biased, or isolated opinion is not apt to be helpful therefore effective input may also require a lot of homework.

"Latest" — The rate of progress or change in health care technology and in our social systems has accelerated dramatically in recent years. It appears that that trend will continue in the foreseeable future. If we are to remain effective in our profession we must be constantly alert to impending change and flexible enough to adapt to the change.

"Mutual Exchange" — Hospital Engineering is a relatively new profession and it seems unlikely that there will soon be a "College of Hospital Engineers". Therefore actual experience is our best resource. I suggest that mutual sharing of experiences is often much more efficient than learning individually through trial and error.

"Development" — It is the intent of the Society to assist you in your professional development directly through its seminars and publications and indirectly through the communication of members with other national and regional health care and governmental agencies.

As your President, I encourage your thoughtful participation and action in our common objectives.

James M. Lawson
President — N.E.H.E.S.

MAINTENANCE DEPARTMENT:
PLEASE OBSERVE THE FOLLOWING:

1. KEEP WORK AREA CLEAN. Cluttered areas and benches invite accidents.

2. AVOID DANGEROUS ENVIRONMENT. Don't expose power tools to rain. Don't use power tools in damp or wet locations. Keep work area well lit.

3. KEEP VISITORS AWAY. All visitors should be kept a safe distance from work area.

4. STORE IDLE TOOLS. When not in use, tools should be stored in dry, high or locked up place — out of reach of children.

5. DON'T FORCE TOOL. It will do the job better and safer at the rate for which it was designed.

6. USE RIGHT TOOL. Don't force a small tool or attachment to do the job of a heavy tool.

7. WEAR PROPER APPAREL. No loose clothing or jewelry to get caught in moving parts. Rubber gloves and footwear are recommended when working outdoors.

8. USE SAFETY GLASSES. Use safety glasses with most tools. Also face or dust mask if cutting operation is dusty.

9. DON'T ABUSE CORD. Never carry tool by cord or yank it to disconnect from receptacle. Keep cord from heat, oil and sharp edges.

10. SECURE WORK. Use clamps or a vise to hold work. It's safer than using your hand and it frees both hands to operate tool.

11. DON'T OVERREACH. Keep proper footing and balance at all times.

12. MAINTAIN TOOLS WITH CARE. Keep tools sharp and clean for best and safe performance. Follow instructions for lubricating and changing accessories.

13. DISCONNECT TOOLS. When not in use, after servicing; when changing accessories such as blades, bits, cutters, etc.

14. REMOVE ADJUSTING KEYS AND WRENCHES. Form habit of checking to see that keys and wrenches are removed from tool before turning it on.

15. AVOID ACCIDENTAL STARTING. Don't carry plugged in tool with finger on switch. Be sure switch is off when plugging in.

16. OUTDOOR USE EXTENSION CORDS. When tool is used outdoors, use only extension cords marked "suitable for use with outdoor appliances — store indoors when not in use".

List of Officers: Contact your State Rep. and find out what smaller groups of NEHES engineers are doing. Also keep your State Rep. informed so he can relay news and developments to all of us.
VERMONT HOSPITAL ENGINEERS' SOCIETY

Albert H. Jones, director of engineering at Putnam Memorial Hospital, was elected chairman of the newly formed Vermont Hospital Engineering Society at a final organizational meeting held in Waterbury last month. Jones, also chairman of the ad hoc committee which worked six months to organize the new society, reported 32 engineers, representing all 17 hospitals in the state, were present at that meeting.

BETTER SKIN PREPARATION FOR ECG ELECTRODES

A recent presentation at the Annual Conference on Engineering in Medicine and Biology reported that sanding of the skin as part of the preparation for ECG electrode attachment reduced impedances at the electrode-skin interface by a factor of 100. No truly significant variations were found in impedance or offset potential among the different brands of electrodes. However, preparing the skin by lightly sanding four times in alternate directions with fine sandpaper (e.g., 3M type 220) and then wiping with alcohol showed remarkable reductions in impedance versus alcohol wipe only. This is significant in that a larger voltage signal will be presented to the monitor, and a better quality trace with less interference should result.

James H. Bernard
University of Vermont

CLINICAL ENGINEERING

The W.K. Kellogg Foundation helped to establish clinical engineering services in northern New England in November, 1973. Now 65 hospitals participate in shared services thru the universities in N.H., Vt., and Maine the program is a Division of The Maine Hospital Association. Services include routine clinical equipment inspection and repair thru engineering consultation, emphasizing JCAH mandated functional safety and sanitation standards.

CORRECTION

Dave Elwing who spoke at JCAH Meeting last summer in Boston, was misunderstood in saying only a Biomedical Engineer is qualified to make functional tests of sophisticated hospital electrical equipment. He meant that an electronic technician and contract service group that is qualified could make such tests.

FIRE DRILL TRAINING

Need a good example to convince your hospital employees the value of correct training?

The NFPA has a set of 30 slides and instructors' guide for $45.00. The Middle Mac Engineer group highly recommends it for an effective 15-20 min. training session.

FIRE DRILL TRAINING (Continued from page 1)

Attendance at the meetings is monitored. Various manual methods were employed for attendance control before the present method of utilizing data processing cards was developed. The cards were encoded with the employee's name and department, contain the schedule of sessions and are issued with the employee's pay check week before the training classes are scheduled. Only one card is accepted from each individual as they enter the meeting place. The data print-out, derived from the card method, assists the department head in determining who did and who did not attend the sessions. Special make-up classes are scheduled for those who did not attend the regular lectures.

The recent experience of the October 1976 sessions, of which 35 were scheduled, is an indication of the value of the program. 1849 of the 2200 personnel at the Bridgeport Hospital attended the lecture and film regarding fire safety and methods of coping with the problem if it should occur.

The approach has evolved as a better method of forcing attendance at the mandatory "Drill" programs. We believe that the initial employees indoctrination session is valuable, but the semi-annual review is absolutely necessary to maintain a high level of preparedness. This approach works at our hospital.

Donald J. Kohler
Bridgeport Hospital
Bridgeport, Connecticut

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John Crowley (St. John's Hospital, Lowell) is completing a research project which includes topics most engineers want discussed. They are: management, codes, energy conservation, safety, biomed, P.M. record keeping, electrical systems, plus many others.

NOTE: If you are writing a paper as a candidate for senior level of ASHE membership you can write an annotated bibliography of at least 20 references or any other type paper including bibliography of references used.

Past presidents Al Bender and Bill Doherty present "Presidents Plaque" to Andy Triano. Due to sudden illness Andy received this prior to the fall meeting in Hyannis.
**SOUTH SHORE ENGINEERS**

The South Shore Hospital Engineering Society elected officers for the coming year at their October meeting.

Edward Boyer, Engineer of Union-Truesdale Hospital in Fall River, was elected President and Kenneth Kiley, Engineer, Union-Truesdale Hospital in Fall River as Secretary-Treasurer.

Out-going President, George Dyer of Morton Hospital, in Taunton, was given a vote of thanks for a job well done during his term of office.

At the November meeting, a presentation by American Air Filter Company, Inc. generated a great deal of discussion pertaining to Specification Requirements and Independent Testing to insure compliance.

The December meeting was sponsored by Johnson Controls, Inc. A history of the company and its products was presented with special emphasis on planned expansion of service division. This was followed by a film showing and a discussion of Building Automation Systems for new facilities.

A discussion followed on the procedures involved in setting up Cost Control Programs. This is required where Federal Funds are involved in Capital Equipment purchases and may be a future requirement of the J.C.A.H.

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**EQUIPOTENTIAL GROUNDS**

*(Continued from page 1)*

Using a microguard model MG-2 voltmeter the voltage between these same points was measured on the 0-20 millivolt scale. No voltage exceeded .005 volts. A licensed electrician made the tests which were witnessed by an inspector from the Line Safety Code Office, Mass. Dept. of Public Safety. The existing wiring was then accepted.

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**PATIENT EXAMINING LIGHTING SYSTEM FOUND BY EARLY INVOLVEMENT OF PLANT ENGINEER**

This single example of finding the most effective patient exam light system for a 40 million dollar expansion project spanning 13 years, shows the value of early involvement of hospital personnel.

Portable exam lights create tripping hazards and clutter around patients, so alternatives were reviewed from wall lights to those with articulating arms. Feasibility of overhead lights was developed through a mock-up of a patient room, and extensive discussions with physicians and others. Lighting was needed to 100 ft. candles on the entire bed without hot spots.

Best results were found with two R38 incandescent lamps located in the ceiling 2 1/4" and 5 1/4" from the head wall on the main axis of the bed. General acceptance of the system was achieved knowing that in some instances supplemental lighting would be required, and it was used in a 305 bed development program. After occupancy the system was reevaluated and found so worthwhile that it is being incorporated in 190 more bed spaces and in all intensive care and recovery units.

David J. Kohler
Bridgeport Hospital
Bridgeport, Conn.