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National Safety Congress Transactions

PUBLIC UTILITIES

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425 North Michigan Avenue
Chicago, IL 60611

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OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AS IT RELATES TO PUBLIC UTILITIES

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The Occupational Safety and Health Act has been described by some people as an "answer to a need" and by others as a "damaging infringement on private enterprise." However, OSHA (which I am using hereafter to include both the statute (Act) and the administration of the Act by the Department of Labor), as I view it, is neither of these extremes.

On the whole, the men who have been assigned the responsibility to administer the Act, from the Secretary of Labor, Mr. James D. Hodgson, and the Assistant Secretary for OSHA, Mr. George C. Guenther, on down to the individual Area Compliance Officers, in my opinion, have done a credible job under the statutory restrictions of direction and timing set forth by Congress. This does not imply that I agree with the present status of the Act or the standards, for I do not. I do believe, however, that generally there is an attitude of fairness and concern on the part of the OSHA people that can resolve inequities as they are identified and brought to the attention of the proper parties.

The few exceptions of "intransigents" in OSHA are being revealed and dealt with as "people" problems the same as in industry or any other place. It is essential that industry understand and exercise its responsibilities to properly inform OSHA of necessary facts and needed changes in the standards together with good reasons therefor.

Since this meeting involves gas, water, and communication utilities, as well as electric utilities, I will try to cover all of them as now affected by OSHA with a few special examples. To the extent that time permits, I will review and emphasize the special application of Subpart V - Power Transmission and Distribution and related sections in Part 1910 and Part 1926, which is the only so-called "vertical" industry standard which has gone through the due process procedures of Section 6(b) o the Act.

History

It might be well to review for a moment the chain of events and circumstances that have occurred up to this point. On December 29, 1970, the President signed into law the Occupational Safety and Health Act of 1970. The Act authorizes the Federal Government to set and enforce occupational safety and health standards applicable to businesses affecting interstate commerce. The Act became effective on April 28, 1971. There were 35 documents published in the Federal Register in 1971 which changed or added to the OSHA program. (The Federal Register is the official media for the dissemination of Federal regulations to all parties in interest.) This rate of approximately three documents a month for 1971 has increased with the issuance of 109 changes in the first 8 months of 1972. This number does not include the dozens of Proposed Rules presently being considered.

Some of these changes or proposed changes were only one column of one page of the Federal Register, however, each document required full review and analysis, particularly if future public comment was solicited in the publication. All of these releases are regulatory in nature and are issued under the statutory authority of the Act. The Act itself has not been altered since it was signed into law by President Nixon on December 29, 1970, although a number of proposed changes are pending in Congress.

The Act does not contain the detailed safety and health standards of OSHA. It only

provided for their promulgation. It does contain, however, the Section 5(a) General Duty clause which is the essence of this legislation. This clause reads as follows:

"5(a) Each Employer–

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

(2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct."

Standards

The first nine to ten months of 1971 were required to publish and bring some detailed safety and health standards into effect. In this interim period, OSHA inspections were being made and citations were being issued against employers alleging violation of the previously quoted General Duty clause. A few such "General Duty" citations are still being used where there is no specific standard covering a generally accepted unsafe exposure.

The Occupational Safety and Health Act of 1970 authorized three general methods to be used for standard-setting–

(1) The Secretary of Labor was required to promulgate as soon as possible, and within two years from the effective date of the Act, existing "national consensus standards" and "established Federal standards," unless he determines that those standards will not improve safety and health of employees (Sec. 6(a)). This means of issuing standards will expire April 28, 1973.

(2) At any time after the effective date of the Act, the Secretary may promulgate new standards, or modify or revoke any existing standards with the assistance of advisory committees by following a formal and lengthy procedure specified in the Act (Sec. 6(b)).

(3) The Secretary may also promulgate emergency temporary standards if he determines that employees are exposed to grave dangers from toxic or physically harmful agents or new hazards (Sec. 6(c)). Such an emergency standard must be replaced by a permanent standard developed through the (Sec. 6(b)) process within six months of its issuance. To date, this has been done only once - for Asbestos. The emergency standard covering Asbestos was issued on December 7, 1971, and the final standard was issued on June 7, 1972.

General Problems

Generalization is always dangerous, whether about individuals, or nations, or OSHA. To say that OSHA standards are all bad or all good is such a generalization. It has been estimated that there are more than ten thousand individual standards promulgated in Parts 1910 and 1926, plus untold thousands of related standards incorporated by reference, such as documents issued by such consensus organizations as the National Fire Protection Association (NFPA) and American National Standards Institute (ANSI).

Perhaps the most time-consuming and frustrating experience in reviewing the OSHA regulations to decide their applicability to a particular company or industry is the referencing in the standards of "consensus" and "Federal safety standards" such as ANSI, NFPA, Construction, Maritime, etc. There are in existence several thousand separate consensus standards varying from one or two pages to more than 100 pages each. Each of these may potentially become an OSHA-referenced standard. Failure to read one of these, which has been adopted by OSHA (assuming you have succeeded in securing an up-to-date copy), can make a 100 per cent difference in whether it is properly determined that a company or an industry is or is not covered.

To give just one example of the problem of "reference" standards, most utility line trucks use a hoist, crane, or derrick. At the present time, we have been advised that this lifting equipment brings these vehicles under the Crane and Derrick Subpart N sections of Part 1910 and 1926. In turn, these standards refer you to ANSI and Power Crane and Shovel Association Standards, as follows:

1926.550(b)(2) & 1910.180 - Truck Cranes - ANSI B30.5 (24 pages)

1926.550(c) & 1910.181 - Derricks - ANSI B30.6 (18 pages)

1926.550(a)(17) Cranes & Derricks - Power Crane and Shovel Association Mobile Hydraulic Crane Standard No. 2 (47 pages)

In reviewing these documents and a related ANSI B30.7 (19 pages) which is not referenced in OSHA but covers Hoists, there is an unobtrusive requirement that sets forth the minimum ratio that must be maintained between the hoist drum or sheave pitch diameter and the nominal rope diameter as 18:1 in most cases.

There are in service today, thousands of truck mounted hydraulic cranes and derricks which cannot meet this requirement but have been operated safely for many years with ratios of 9 and 10 to 1. Eighteen to one is good engineering design, but all it really does is provide *longer life* to the *cable.* Modification of many of these units could be fairly difficult, and would hamper operations by restricting the amount of rope that could be carried, and the pulling power of the winch.

What is needed is a standard for *Truck Mounted Cranes and Derricks of from 10 to 15 Ton Capacity.* Such a standard should be based on the existing equipment that has been field tested and proven to be of safe design for the type of work being performed.

This problem will require action on the part of the electric utilities particularly since Subpart V of 1926 as proposed brings Subpart N requirements into V and applies them to electric line trucks in 1926.952(c). This paragraph in Subpart V is titled, "Derrick trucks, cranes, and other lifting equipment." In 1926.952(c)(1)(ii), "Derrick trucks" are parenthetically defined as "electric line trucks."

Specific Problems

Part 1910 of Title 29 of the Code of Federal Regulations is referred to as the "General Industry Standards." This Part 1910 was published in the Federal Register on May 29, 1971, and was just brought up to date in the Federal Register of October 18, 1972. It provides, as amended from time to time, the basic set of Federal Safety or Health Regulations applicable to all employers. Cities and political subdivisions of the states are not covered per se but are to be covered in State OSHA Plans if state law so allows. Each investor-owned public utility is included in this general category of employers. All of the Part 1910 standards apply to such utilities except the inapplicable "vertical" or special industry standards, unless (and this is a very important *unless)* we are performing work that can be classified as "construction, alteration, and/or repair" AND there is a standard covering the issue in Part 1926 which is an applicable "vertical" construction standard.

To make this point in reverse, if we are doing construction work and a standard is published in Part 1926, it will prevail over any other similar standard in Part 1910. If we are doing construction work and there is no standard published in Part 1926, then any standard in Part 1910 that covers the issue will apply to that task or work situation. This is a restatement of Part 1910.5, page 10468, and seems reasonable until an attempt is made to separate normal utility work into "construction" and "nonconstruction"-type work.

For example, most utilities do welding of one type or another, such as gas pipelines, pipelines in steam or water plants, and equipment repair. Now, our question is, what standards apply to these jobs? The Department of Transportation (DOT), Office of Pipeline Safety (OPS), has primary jurisdiction over gas pipelines.

Other pipelines and other types of welding can be covered by the Subpart J standards of Part 1926 or the Subpart Q standards of Part 1910, both of which cover the subject of welding. I wish I could give you a clear answer to the question as to when Part 1910 or Part 1926 will control, but this is one area where we have been unable to secure a firm interpretation from OSHA.

Hydraulic Fluids

This becomes a very real and serious problem for electric utilities that will be working under Subpart V, which is a "vertical" standard for "construction" within a "vertical" standard covering "construction" in general.

As an example of this type of problem, proposed *Subpart V, 1926.950(i)*, requires the use of insulating-type hydraulic fluid in trucks doing electric transmission or distribution construction. This means that all the hydraulic hand tools used with such trucks must have compatible seals and connectors for this type of fluid. If this same truck should be used in gas construction or the construction and/or repair of power generation equipment (the latter tasks not being covered by Subpart V), the standard that would apply would be 1926.302(d)(1), which calls for fire resistant-type hydraulic fluid to be used. This fluid is highly corrosive and very hard on paint, seals, etc.

To follow the two requirements literally would result in insulating fluid being used in the truck hydraulic system in the morning when "used on or around energized lines . . . " [1926.950(i)]; but, in the afternoon when the truck would be used on gas construction, fire resistant fluid would have to be used [1926.302(d)(1)].

These two standards are inconsistent. This operating problem is being called to the attention of the OSHA standards people in Washington, D.C.

Standards Common to All Utilities

Some specific OSHA standards that are of interest to all utilities, either because of their impact on prior operating practices or because of their controversial nature, are:

Trenching and shoring.

Gasoline dispensing nozzles - latch open.

Fixed ladders in manholes and on microwave towers.

Manhole ventilation and testing.

Crane boom angle indicators.

Asbestos pipe and lagging.

OSHA's entrance into the health field has been very emphatic. There are many health standards included in OSHA regulations. Two of them involve many Company operations. One relates to noise levels and the other to handling and use of toxic and hazardous materials. We have been making a number of surveys of our properties in connection with these standards to assure compliance.

Gas Utilities

One of the unique problems that face the gas utility companies is the question of jurisdiction between OSHA and The Office of Pipeline Safety (OPS). Fortunately, this matter has received attention by both OSHA and OPS. The position of OPS was stated by Mr. Joseph C. Caldwell, Director of OPS in OPS Advisory Bulletin No. 72-6 dated June 1972 as follows:

"'The Occupational Safety and Health regulations apply to the safety of the worker. However, where safety in the transportation of gas demands regulations affecting work conditions of workers then the Department of Transportation assumes jurisdiction.' This second sentence expresses an exception to the sentence immediately preceding it. Any regulations developed by the Office of Pipeline Safety of the Department of Transportation affecting work conditions of workers would be based upon the need for safety in the transportation of gas.

"Section 4(b)(1) of the Occupational Safety and Health Act (29 U.S.C. 653(b)(1) delineates the regulatory interface between OSHA and OPS. This section states: 'Nothing in this chapter shall apply to working conditions of employees with respect to which other Federal agencies exercise statutory authority to prescribe or enforce standards or regulations affecting occupational safety or health.' Therefore, OSHA regulations will not conflict or overlap with regulations promulgated by the Office of Pipeline Safety."

The OSHA position has been stated in OSHA Program Directive 200-2 dated April 20, 1972 addressed to Regional Administrators, National Office Directors, Area Directors and District Supervisors. The key paragraph reads as follows:

"Upon receipt of any other complaint or other correspondence concerning working conditions in industries which are apparently the subject of regulation by another Federal Agency to some degree, the OSHA official who receives such correspondence shall transmit a copy of same to the Director, Office of Compliance.

"The Office of Compliance will then transmit such correspondence to the Associate Solicitor for Occupational Safety and Health, who will discuss any jurisdictional questions with any other Federal agency which may be involved."

It is clear that if OPS has specifically covered a subject, its rules will control. However, I find nothing that precludes OSHA standards from supplementing OPS rules when to do so enhances employee safety without conflict with such OPS rules. For example, OPS, in Part 192, sets forth welding certification requirements and requirements for testing welds. OSHA, in Part 1926.351(e), requires shielding of arc welding and cutting operations to protect employees and others in the vicinity from the direct rays of the arc. This is not inconsistent or in conflict with OPS rules and, in my opinion, both sets of rules can be enforced under these circumstances.

Electric Utilities - Subpart V

The set of rules identified as Subpart V of Part 1926 (formerly 1518) first appeared in its present context in the Federal Register Vol. 36, No. 22 - Tuesday, February 2, 1971, as part of a Notice of Proposed Rule Making issued by the Department of Labor, Bureau of Labor Standards under the authority of Section 107 of the Contract Work Hours and Safety Standards Act (86 Stat. 96; 40 U.S.C. 327), commonly known as the Construction Safety Act. The proposal was to add to 29CFR, Chapter XIII, a new Part 1518, titled Safety and Health Regulations for Construction. Within this *proposed* Part 1518 there was a Subpart V, titled Power Distribution and Transmission Lines. This Subpart consisted of two sections, *1518.950* - Power Distribution Lines and *1518.951* - Transmission Lines. It took up only three and one-fifth columns of print in the Federal Register, or the equivalent of just over one full page, and covered such items as minimum clearances for working voltages from 4-kv up to 500-kv. The standard also covered grounding and bonding, as well as the use of such equipment as aerial lifts and hot sticks.

This proposed text of Subpart V was not printed in the Notice of Rule Making when Part 1518 was published as a *final* regulation in the Federal Register Vol. 36, No. 75 - Saturday, April 17, 1971. The subject matter was left in Part 1518, however, by the retention of the title *"Power Distribution and Transmission Lines (Reserved)"* under the heading Subpart V.

As issued, Part 1518 only applied to "Federal and federally assisted advertised contracts" issued under the Construction Safety Act. As an "established Federal standard", however, this set of construction standards was blanketed into the Occupational Safety and Health set of General Industry Standards, Part 1910, issued a month later in the Federal Register Vol. 36, No. 105 - Saturday, May 29, 1971, under Sec. 6(a) of the Act covering *"national consensus standards"* and *"established Federal standards"*. Thus, under Section 1910.12 of Part 1910, the *reserved* Subpart V of Part 1518 became a part of OSHA along with the other Subparts of Part 1518 covering construction activity.

B. General

Since Subpart V had not been printed and issued as an "Existing Federal Standard" prior to OSHA, and since it was not based on an American National Standards Institute or National Fire Protection Association consensus-type standard, it was necessary for the Department of Labor to follow the formal Sec. 6(b) type of procedure to promulgate this standard. The Sec. 6(b) type procedure authorized the Department of Labor to appoint a special Construction Safety Act Standards Subcommittee on Subpart V to prepare and review with the industry representatives and associations a set of standards that would be applicable to Power Transmission and Distribution Lines. The procedure followed under the Construction Safety Act applicable to Subpart V is similar to the procedure for OSHA regulations under Sec. 6(b)(1).

The subcommittee activity, and the industry and union involvement in the deliberation process, culminated in an official version being published for public comment on May 10, 1972, in the Federal Register.

Many of the future OSHA standards and many of the desired changes in present stan-

dards will come into the Federal regulations through the consensus standards organizations such as ANSI and NFPA. This is where we need to place our efforts. We should have strong representation on the various standard setting committees to assure the recognition of our industry's position as it relates to the various standards being considered. Further, there should be vigorous industry association attention and *ACTION* on *ALL* existing and proposed OSHA regulations which raise any substantial question as to adequacy, justification, or applicability. When you make comments, don't limit yourself to objections. When the proposals are favorable or positive, let OSHA know that you approve of their action or proposed action. Similar action is needed on all proposed "State OSHA" Plans.

There is no shortcut or panacea to the assimilation of the thousands of OSHA regulations promulgated to date. The pertinent standards, as a very minimum, must be studied and applied by every employer. However, as a starting place, it is reasonable to assume that if an employer is practicing good safe work procedures and has a positive common sense and conscientious safety program he will be complying with most of the OSHA standards. The "thrust" of OSHA is to protect employees from injury or death.

The technical points of whether a toeboard should be 3 inches or 4 inches or whether a railing should be 40 or 42 inches is not of primary importance. The main "thrust" should be the taking of necessary and basic action to minimize possible injuries or deaths. OSHA representatives have stated that their primary objective is the reduction of injuries and deaths and not enforcement of technical requirements solely to exact compliance.

OSHA did not "invent" safety. OSHA could be scrapped or drastically curtailed at any time by an Act of Congress, but this would not eliminate the need for any of the present emphasis on safety in the work place. Safety must be our first concern and OSHA should be considered as a valuable tool to accomplish that end rather than as an end unto itself.

SAVE YOUR SIGHT—ON THE JOB OR OFF

By ELIZABETH R. VAUGHN, M.D.,
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I always welcome the opportunity to tell people about their own eyes, because so much blindness is needless and could be prevented if people were made aware of a few simple aspects of eye diseases. Let's start by discussing some common-sense type safety precautions and emergency procedures for eye injuries.

One common eye injury is getting some irritating substance in the eye, whether it be a strong acid or alkali, gasoline, deodorant, hair spray, or an endless list of commonly used items. The wisest course of action is to wash out the eye as quickly as possible with water. Copious amounts of water should be used immediately, either by cupping your hand and splashing it in your eye or by putting your head under a water faucet, or, as one of my patients did when he got insect spray in his eye, jump into a swimming pool and open your eyes under water. So, simply remember that any method you can devise to wash the irritant out quickly if the best possible thing to do. After you have washed out as much as possible, you should see your ophthalmologist right away. The majority of these injuries, with proper care, heal nicely without visual impairment.

Let's suppose you're on a long-awaited camping trip and you are stalking through the trees demonstrating your scouting technique by getting wood to build a warm fire for your family. Suddenly a tree limb snaps back unexpectedly and hits you in the eye, scratching your cornea. A bad scrape to your cornea can be one of the most painful injuries imaginable. You don't have to be in the woods to get your cornea scratched. A few months ago one of my patients confessed in a very embarrassed tone that he was drying himself with a bath towel and stuck his thumb in his own eye. Two days ago a lady came to see me with a bad corneal scratch from a tupperware cake pan which fell into her eye as she was reaching up on a kitchen shelf. So you see, potential danger lurks in the confines of your own safe home. If you ever get a corneal scratch or abrasion you will know it, because every time you blink it will feel like ground glass in your eye. The best thing to do is to patch the lid tightly shut over the eye and see your ophthalmologist as soon as possible. This is also the best course of action if you ever have a penetrating injury into the eye, as with a sharp object. Patch the eye shut until you get to the doctor.

Many men work with power tools, either on the job or at home. Power drills are especially bad about throwing off small pieces of material which frequently lodge in the eye. Even hammering on metal can hurl foreign particles into the eye. Also, working under a car or on overhead pipes or light fixtures is a perfect set-up for having a foreign particle fall into your eye. Several months ago, an employee of the telephone company came in to see me. He had opened an outside telephone installation and the Texas wind picked up many particles and blew them into his eye.

All of these situations will find a wise man wearing safety glasses for protection. It will take only one episode where it was "just too much trouble to dig out those glasses," and that may be the one time you get a flying piece of metal penetrating your eye. If you are lucky, it may lodge on the front surface of the eye and be removed with relative ease by an ophthalmologist. If you are not so lucky, it may go inside the eye and you may very well lose your vision completely. In this instance, the old saying that an ounce of prevention is worth a pound of cure is certainly true. So, please don't take a chance with the only two eyes you will ever have. Wear protective glasses.

Welders are usually made aware of the need for protective glasses while welding. Ul-

tra violet rays are emitted from the welding that damage the cornea of the eye. These rays are blocked by glasses, but if anyone without glasses is in close proximity to the welder he may get corneal burns. These burns are very painful; however, the cornea heals rapidly within 24 to 48 hours. Welding burns are similar to "snow-blindness." The only danger with these burns is the chance of an infection starting while the corneas are healing. The danger is greatly lessened if the patient is treated by an ophthalmologist who will, among other things, put an antibiotic in the eyes to prevent infection. The wrong thing to do is to put portocaine or butacaine or any other anesthetic in the eye. This is a common practice among welders because it deadens the eyes and makes them feel much better; however, it also retards healing and increases the chance of a corneal infection which could be a very serious problem threatening one's vision.

I have mentioned that you should go to an ophthalmologist if you sustain an eye injury. Judging by past experience, I suppose you are thinking, "Now, what in the world is an ophthalmologist?" An ophthalmologist is a medical doctor who, after completing college and four years of medical school, spends one year as an intern and then serves as a resident physician in ophthalmology for three years in a certified hospital. During these three years, he or she learns to recognize in the eye the manifestations of hundreds of medical diseases. In addition, they are trained to do eye surgery as well as fit glasses and contact lenses.

Glaucoma

There are two common eye diseases that cause blindness. Most of this blindness could be prevented if people were made aware of them. The first disease is glaucoma. Glaucoma is the leading cause of permanent blindness in America.

There are two kinds of glaucoma. One causes sudden pain, redness and loss of vision. The acute form is rare.

I am going to limit my discussion to chronic glaucoma which is, by far, the most common and most feared type of glaucoma. It is often referred to as the "thief in the night."

In chronic glaucoma there is an obstruction to the outflow of fluid from the eye. Since the fluid cannot get out as fast as it should, pressure slowly builds up inside the eye. This continual, slow increase in pressure causes no pain, no redness of the eye; in fact, it causes no symptoms at all, and this is where the danger lies. The patient never knows anything is wrong; yet the persistent high pressure causes damage to the optic nerve which results in progressive loss of vision (thus, the title, "thief in the night").

The patient does not notice this visual loss until it becomes quite advanced; therefore, if he waits until this symptom brings him to an ophthalmologist, the glaucoma is in a very late stage. The key to success in glaucoma therapy is early detection. If the patient is educated about glaucoma and comes to his ophthalmologist for yearly glaucoma checks, the disease may be detected in an early stage and treated successfully with drops. When detected early and treated properly, the patient can look forward to a life of good vision like any other person without glaucoma. There are rare cases where the pressure cannot be controlled with medications. In these unusual instances, surgery can be done to alleviate the glaucoma.

I hope this thumbnail sketch has gotten one point across: if you or your loved ones haven't had a glaucoma check in the last year, you should do so as soon as possible. At this moment, an estimated one million Americans over age 35 have glaucoma and do not know it. In large glaucoma screening programs, two out of every 100 persons screened have glaucoma. Every year about 4,000 more people in the United States *go blind* from glaucoma which could have been controlled by early discovery and faithful treatment. I know that each of you would feel more secure knowing that you were not needlessly going blind from a disease that can be so easily and effectively treated, so have your eyes checked for glaucoma soon.

Amblyopia: The "lazy eye"

Since television commercials are not attempting to educate the public concerning the lazy eye, I thought you might like to know more about what it is, why it develops,

and what can be done to treat it.

When a child has an eye that crosses in or turns outward or deviates in any direction, he has a subconscious choice between two alternatives. He can either see two of everything (because one eye is looking in one direction and the other eye is looking in a different direction) or he can suppress one eye and see one distinct image out of the other eye. Since no one can function seeing double, every person's brain automatically chooses the latter alternative; that is, his brain ignores the image received from the deviating eye.

Children under six years of age are in the process of developing visual patterns, and if they have a slightly deviated eye and do not use it, it does not have a chance to develop clear vision like the eye being used at all times. Thus, the "lazy eye" denotes this unused, underdeveloped eye. If this lazy eye or, to use the proper term, amblyopic eye, is not straightened and given a chance to become functional before the child is six years old, then the child will have a permanent loss of vision in that eye. By six years of age the development of visual patterns has been established, and if one eye has been excluded from the development it is doomed to poor vision forever.

In many instances, a child's eyes deviate so much that it is obvious to any parent. In these cases, medical attention is usually sought at an early age because the child looks strange and the parents want him to look like other normal children. A problem arises when there is a small deviation that goes undetected by the parents and even slips by the scrutiny of watchful grandparents. The child has no idea that he is using one eye all of the time and excluding the eye with the slight deviation. These small deviations cause just as severe a visual loss as the large deviations. They often are more devastating than the larger deviations because the visual loss is not detected until it is discovered by the school vision-screening test in first or second grade. By this time, the amblyopia is so deep-seated that it is very difficult and often impossible to treat. This presents a tragic situation where a six, seven or eight-year-old has no functional vision in one eye, and despite all the efforts of the ophthalmologist and parents, the condition is irreversible.

Now, let us discuss the more optimistic side of amblyopia. Suppose that the parents were educated to the dangers of an unsuspected deviating eye, so they brought their three, four or five-year-old child to an ophthalmologist for a complete eye examination. If amblyopia was discovered at this age it could be treated with success by patching the good eye and forcing the unused eye to begin to function. When the previously unused eye had attained a visual acuity equal to that of the good eye, then surgery could be performed or glasses given to straighten the eyes. With straight eyes, good vision should be maintained in both eyes.

Some of you with three-year-old children may be wondering how you can check the vision of a child that young, who doesn't know his ABC's and who won't sit still longer than two seconds at a time (that is, unless the Saturday morning cartoons are on TV). We try to make a game out of the whole examination. We have charts made up of "E's" pointed up, down, right or left. The average three-year-old catches on to this game quickly and can point with his fingers the same way the "E" points. The "E's" get smaller and smaller until they are too small for him to see well enough to point the correct direction. These charts give an accurate measurement of his vision, and he thinks he has been playing a game the whole time. The ophthalmologist can also dilate the child's eyes and check him objectively for the correct glasses without the child having to answer a single question.

A child's eyes grow as he grows. He may have normal vision one year and need corrective lenses the next. One out of every four school age children needs eye care; therefore, periodic regular examinations are a "must" for growing children.

The parents' role in assuring good vision for their children is critical. A child does not know how well he should see. He may have blurred vision or double vision, or may be using only one eye and still not complain because he doesn't know better. Youngsters must, therefore, rely on their parents to provide the opportunity for good eyesight.

A DAY WITH SAFETY

By GEORGE W. HIPP
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I suppose we can all easily *talk* about safety - the trick is to *do something* that will drive the message home and influence our people to work safely. I maintain that this can be easily accomplished, if our people firmly believe that we know what we are doing.

Any supervisor can *tell* his people to work safely, to wear insulating gloves or safety glasses. And I imagine that any one of us can tell them how to test manholes and to ventilate them while working in them. But it doesn't take a lot of brains to *tell* someone to be careful when climbing poles or driving a motor vehicle. The big question is, do we actually know the proper procedures ourselves? More importantly, do the supervisors of these people know the proper procedures? Are we experts on the subject?

Sure, we might know all the answers. Most likely, we know what a safety practice states. But, can the supervisors of our people actually *perform* the various operations? Can they demonstrate the proper way to do the job? Could *we* do it?

Think about that for a moment!

Could they, for example, perform the proper test to insure that a gas indicator is functioning properly? Could they demonstrate the proper method of placing a splicing platform on a strand—or a simple task of carrying an extension ladder? I'm sure you've found, as we have, that improper carrying of ladders causes many of our disabling injuries.

To be more exact, are we positive that our supervisors—those directly related to a specific job—have sufficient knowledge to recognize when any employee isn't working safely? How many who *aren't* directly related to a specific job would be able to recognize a safety hazard, *and do something about it?*

Not many, I'm afraid! Wouldn't it be great if every supervisor in our industry could recognize an unsafe act and do something about it right on the spot?

That's what our "Day with Safety" is all about. It is designed to develop management's ability to recognize safety deviations in the "complete job" through "hands-on" experience. In short, it develops a sense of responsibility.

This higher sense of responsibility is not only a practical necessity these days, with the birth of OSHA. It is our obligation and part of the price for the privilege of doing business. Yesterday's rule book and its related demands on safety knowledge are as outdated as short hair.

Giving the "best possible service to the customer at the lowest cost"—a phrase we've heard many times—doesn't mean the same to us today as it did yesterday. Today, we must "factor in" the cost of complete safety training and retraining of employees and supervisors. We must accept the fact that this requires time and money—accept it, then do it!

But, be smart about it. Make the most of the training dollar. We can't afford to rely on pieces of paper stating the "do's and don'ts" of safety to train our people. Train them with actual "hands-on" techniques.

Today, we live in a world of "instant" everything. Unfortunately, training doesn't fall in this category. It takes time and money to ensure the safety of our people. Don't train just "for the record". Train for "the big payoff"—an accident-free company. With a lot of work and concentration, this can be done!

How? Start by thoroughly training your supervisors. It's costly, but as the young lover said to his girlfriend, "Look at it as an opportunity, not as a proposition."

In C&P, we gave ourselves this opportunity with the implementation of "A Day with Safety". Coupled with this training we have a brand new Bell System "Accident Prevention Plan", used to test the safety knowledge and performance of our people through interviews and demonstrations. Here's how it works:

1. A site is selected for training, and training stations are established for selected work operations.
2. Knowledgeable training station instructors are chosen well in advance of the course, giving them time to review safety practices and prepare their presentations.
3. Actual equipment to be used in the demonstrations is assembled.
4. A time limit is established for each training station demonstration.
5. A schedule is prepared.
6. Advertise it—and *go*!

Trainees are supervisors at all levels of management, including our company Vice President.

Eight training stations were set up for demonstrations of selected work operations, as follows:

Training Station No. 1: Manholes

Testing of gas indicator
Testing for gas in manhole
Use of forced ventilation
Use of manhole ladder
Entry and exit of manhole

Training Station No. 2: Work Area Protection

Use of warning devices
Various work area protection plans
Positioning of vehicles and warning devices

Training Station No. 3: Poles

Pole test (pike, hammer, prod) inspection, markings
Climber cut-out inspection and test
Body belt and safety strap inspection and test
Drop wire (how to raise, carry up poles, cross streets)
Setting poles.

Training Station No. 4: Aerial Platforms

How to raise and secure platform
Examination of rigging
Proper method of lashing ladder to strand
Use of handlines.

Training Station No. 5: Power-aerial

Clearance
Voltage tester
Insulating gloves (use and test)
Insulating blanket (use and test)

Training Station No. 6: Ladders

Inspection and test
Use of ladder foot
Placement of ladder on building
Placement of ladder on strand
How to raise and lower
Carrying
Transporting

Training Station No. 7: Aerial Lifts

Operation and placement
Use of safety strap
Clearance
Use of insulating blanket

Training Station No. 8: Motor Vehicles

Inspection
Parking
Backing
Housekeeping
Seat belts
Safety knowledge

Keep in mind, there are no quick remedies that will prevent accidents over the long haul. Continual daily adherence to accepted safe principles and procedures, coupled with knowledgeable supervisors and employees, has proven to be most effective in our accident prevention efforts. A "Day with Safety" is one of our efforts. Try it—you'll like it.

INSULATE AND ISOLATE FOR SAFETY

By JAMES A. DUPUIS
Assistant Safety Supervisor, Public Service Company of New Hampshire

My subject is "Insulate and Isolate for Safety." These words serve as a slogan *for* and the keywords *to* the continuing effectiveness of the 15 K.V. Rubber Gloving Program that was initiated within our Company approximately five and one half years ago.

Like so many other companies, we too have been growing at a rather swift pace, and like it or not, over the years we have had to initiate many changes to meet the challenge of the times. One such challenge, presenting itself in the early to middle 60's as a result of the accelerated load growth of the 1950's, was one of changing a philosophy of some 25 years regarding existing procedures for maintaining overhead distribution lines operating in the 5 to 15 K.V. range.

At this time, more than 50 per cent of our distribution system was operating within that range and more would be coming. Also, existing Company Safety Rules and Operating Procedures would not permit gloving of voltages above 5 K.V. which meant that increased demands were being placed upon our line crews to perform more and more hot-line tool work; thus, creating a need for additional tools and equipment and a much more complex training program. On the job training, as had been the past practice, would no longer suffice.

Bucket trucks were also being integrated into the fleet and our ability to function with these ranged anywhere from the first, received in 1958 which was used primarily for street lighting patrol, trouble shooting and occasionally to assist in the accomplishment of an overhead line project; to the highly sophisticated and diversified aerial lift units of later years.

However, it wasn't until 1963, with the inception of the heavy duty units, that we really became determined to take the back work out of linework by using these units as a tool and developing them to their fullest capability as a means of increasing crew efficiency.

To accomplish this task, several units were assigned to selected crews who accepted the challenge of developing in field operating procedures directed at complete utilization of both man and machine. It was through the efforts of this group that it soon became obvious that a two-man crew, utilizing a fully equipped aerial lift unit as a tool, could in fact safely accomplish 80 per cent of job assignments. The remaining 20 per cent could be accomplished by teaming up with other crews.

Needless to say, a redeployment of manpower took place and, although effective, it wasn't long before we realized that even though equipment and manpower were being utilized more effectively, we were still faced with hot sticking as the sole means of maintaining our 15 K.V. distribution system and the new crew structure did not lend itself to that type of maintenance.

At that time no one in our Company had yet mentioned gloving voltages in the 5 to 15 K.V. range.

It was not until early in 1964 that one of our operating superintendents, knowing that by utilizing the dielectric value of the fiberglass in hot line tools for insulation and the length of the tools for isolation for man protection, a great degree of safety was being achieved, conceived the idea that since hot sticking is a major factor in high maintenance cost, "Why don't we put hot sticks on the lineman's feet instead of in his hands," by utilizing the dielectric value of the fiberglass and other components of the bucket truck booms and change the rules to permit gloving. This would not only increase crew efficiency, it would also create a safer work place for the men doing the work. And so the seed was sown.

In 1965 a committee was formed to study

the feasibility of gloving 15 K.V. and the question to be answered was not "Can we?" (we knew we could,) but rather the question concerning management was, "Should we glove 15 K.V.? Will it be safe for the man doing the work?"

With this question in mind, the work of the committee began and as it progressed, it was apparent that a major step in increased safety for the men working aloft could be achieved if we did as the field superintendent's idea suggested.

Isolate the workman from any source of ground potential by putting the hot sticks on his feet so to speak, and remove him from the pole by suspending him, at the end of an electrically tested bucket truck boom, making it necessary for two simultaneous contacts or errors to occur instead of only one before an electrical injury could take place.

As we all know, for the climbing lineman, contact Number One to a degree, occurs when his gaff first enters the pole, and rubber gloves, rubber sleeves, along with other personal protective cover-up equipment provide protection only from contact Number Two.

The development of a true INSULATE—ISOLATE procedure for gloving 15 K.V., or even lower voltages for that matter, could certainly enhance safety by increasing the odds against the possibility of injury. And, so realizing that the work could be done safely, the committee's recommendation was submitted to management and the decision was made to go ahead.

Given the green light, the safety department and the committee after consulting with the various departments involved, including engineering, produced a five-step program as a means of implementing the INSULATE and ISOLATE procedures for gloving 15 K.V.

While STEP No. 1 did not deal with training procedures directly, it did deal with some of the unseen mechanics of the program that must be accomplished before any actual training could take place. First off, existing safety rules had to be modified to permit gloving 15 K.V. A decision had to be made regarding just who would be permitted to glove. In our case, a crew compliment must consist of at least two first class linemen or one first class lineman and a working foreman with provisions for allowing linemen I learners to glove under the direct supervision of either of the other two classifications.

Rubber glove change-out from Class I to Class II, 15 K.V. also had to be accomplished prior to any training.

A practices and procedures bulletin, spelling out the guide lines for gloving had to be and was developed, to cover—in 14 specific points—everything from allowing gloving to be done only from periodically tested bucket trucks or fiberglass insulated platforms, to the penalties to be imposed for any violations of these procedures.

This bulletin was incorporated into the safety rule book by reference only. This was done as a means of eliminating some of the red tape usually required for updating or changing safety rules. If anyone would be interested in acquiring a copy of this bulletin, it is available through our office.

Our service area encompasses 80 per cent of New Hampshire; another 10 per cent is served indirectly through municipals, etc. The operating end of the Company is made up of six divisions, that are in turn divided into districts - 23 in all, all of which house line construction and maintenance personnel. Aside from the economics involved, geographically we were not situated in a way that would lend itself to a completely centralized training program. Therefore, portions of our program would be administered at locations throughout the state which meant that training priorities had to be established, coordinated, and scheduling completed well in advance.

Adequate tools and equipment play a vital role in crew efficiency. Before the training program could be field implemented, additional tools and equipment to update existing truck tool complements to permit gloving were required.

Since our crews would be deliberately depending upon the insulating value of the bucket truck booms to provide the isolation aspect of 15 K.V. gloving, it became necessary to develop an electrical testing program for buckets and booms as required by Item No. 1 of the Practices and Procedures Bulletin which states, in part that, "For nominal

phase-to-phase voltages above 7.2 K.V. to and including the 15 K.V. class, work with rubber gloves and rubber sleeves shall be permitted from an approved and periodically tested aerial lift bucket truck or fiberglass insulated platform." A ground-to-ground rubber glove and rubber sleeve rule shall be enforced. This testing program was originally and still is considered an essential part of safety in gloving 15 K.V.

I realize that methods for electrically testing aerial lift equipment and associated components are quite diversified and that to select a specific method certainly requires considerable thought regarding the desired end result. However, I'd like to spend the next few minutes sharing with you some of the details of our testing program.

First off, with approximately 100 units stationed strategically throughout New Hampshire, we were more or less compelled to equip ourselves with a portable test set to facilitate testing in the field to eliminate the need for shuttling units into a central facility for this purpose.

The test set is transported in a van which is equipped with a 3,000-watt, 115-volt generator which, of course, is capable of running the test set during field tests. Testing is scheduled in advance every six months in each of our Districts requiring that units arrive for testing at 30-minute intervals until all have been tested. All tests are conducted at 100 K.V. D.C., except for the basket which is tested at 35 K.V. Duration of tests is three minutes - except for the tool hose which is one minute.

Maximum allowable leakage on any test is 50 micro-amps. We know that considerably higher leakages could be tolerated, but since we have had no problems maintaining readings below 50 micro-amps, we will continue to use that figure as a shutoff.

During all tests grounds are attached to both the test van and unit under test and to eliminate picking up stray readings, the test set is positioned at least 6 feet away from either vehicle.

The actual boom test is conducted by attaching the high voltage lead to the metal mass at the upper end of the boom. This metal mass, plus the internal hydraulic hoses, control rods, etc. are bonded together internally, the ground lead is attached to the metal on the opposite end of the boom. Test voltage is applied for three minutes. Final readings are recorded upon completion of the test.

A component of the bucket truck that is designed specifically for material handling . . . we call it a jib boom . . . is tested by fully extending the boom, attaching the high voltage lead on the outer end, and grounding the butt end. Test voltage of 100 K.V. D.C. is applied for three minutes.

Hydraulic hoses are tested while being suspended in the air with the high voltage lead attached to the outer end and the ground attached to the opposite end. Test voltage is applied for one minute.

To test the basket, connections are made in the following manner. At a point above the basket support, a metallic braid is wrapped completely around the exterior of the basket and connected to the basket support which is in turn connected to the ground lead. At approximately 6 inches from the bottom of the basket another braid is fixed and connected to the high voltage lead. Test voltage is 35 K.V. D.C. applied for three minutes.

All test data is recorded on a master sheet by the test crew at the time of test. Copies of this are then forwarded to the division and safety department for filing. The test card stays with the unit. The only information recorded on this card is Date of Test, Component tested and "passed" or "failed."

One further aspect of our testing program covers the testing of polyethylene bucket liners which are used in addition to buckets and booms in our attempt to provide a final and definite means of isolation for the man working from the bucket.

Liner testing is quite different from bucket and boom testing in that instead of testing surface leakages between two points, liners receive a dielectric puncture test which is accomplished by immersing the liner in a tank of water. The liner is filled with water to within 4 inches of the top. The water level in the tank should also be brought to the same level. The tank is constructed of metal and is connected to a common ground as well as the ground side of the test set. A high-voltage

lead is then inserted into the water inside the liner and a three minute 35 K.V. A.C. test voltage is applied.

This is a Go-No Go type of test similar to that of a rubber glove *except* that with liner testing all failures show up as burn outs. Since we have not been successful in any attempt at patching liners, failures consitute the liners permanent removal from service.

Liners are shipped to the test lab at three month intervals for testing.

Step No. 2 involved several one-day meetings which were conducted to inform management and supervisory personnel, whether directly or indirectly involved, of the program and its content. This also included an actual 15 K.V. glove job being performed on a demonstrational basis by members of the safety department. A general discussion was held following each session, and many ideas that were brought out were actually incorporated into the program before it moved on to the next step.

Step No. 3, a three-day centralized training program, was conducted for instructors selected from each division who would be responsible for coordinating and administering the training program for their crews in the field. The three days involved one day of classroom indoctrination followed by two days of actual field work on 15 K.V. circuits. Working foremen who would assist in field training were included in this group.

Step No. 4 involved classroom and in-field training of line personnel which was accomplished through a series of one-day classroom sessions held for the purpose of discussing with all line personnel the details of the program in which they were to become involved.

In addition to this, the crews received on-the-job training which involved actual work on 15 K.V. circuits under the supervision of the division instructor and his pre-trained working foreman who acted as an assistant and would be working aloft with the so-called trainees. Also, a member of the safety department was present during each crew's initial involvement in field training. We were also available to provide additional assistance when required by the division instructor or even at the request of crews or individual crew members if they felt it necessary.

The district and/or crews were given the opportunity to work as many jobs with the instructors as necessary until the trainees as well, as the instructors, were satisfied that all of the principles of INSULATE-and-ISOLATE were thoroughly understood and were to be applied to every 15 K.V. gloving job.

Then and only then would crews be granted clearance by letter from the safety department to glove on a regular basis.

Because the actual work procedures for gloving voltages below 5 K.V. as well as above, closely paralleled one another, the lineman had only to adapt himself to the concept of isolation in addition to his already existing skill. Because of this, the entire program was accepted very readily by all involved personnel.

And I might add that this program in no way suggests phasing out hot line tools or hot line tool work on 15 K.V. circuits. Gloving is but another available means of accomplishing a given job. It is the foreman's prerogative to evaluate each job to determine which work method should be used to accomplish it. Some jobs, particularly the simple ones, lend themselves more to hot sticking than gloving; while others may be better accomplished through combined hot stick and gloving procedures.

With our program fully implemented, we were convinced that through work simplification and training, the factor of safety for the men working aloft had been increased tremendously.

We also felt that our crews were fully aware of the personal benefits to be derived by strict adherence to the rules of the program. However, like many other things we were concerned about the people who, after awhile, might consider the procedures "old hat" and gradually lay the groundwork for an accident by relaxing their guard . . . the old "familiarity breeds contempt" adage they call it.

Therefore, we felt that a continuing Step No. 5 was necessary if we were to maintain the program on a non-declining plane. This step would require that a periodic update and complete review of the program be conducted for all participating distribution line

personnel.

This has been done and appears to have been both beneficial and effective as a means of achieving our goal.

The development of this program has been very beneficial. Our customers (who happen to be the ultimate payer of the bills in our company anyway) benefit by the fact that their dollars are being well managed.

In addition to working under safer conditions, our employees benefit by the less demanding physical aspects of their jobs brought about through updated work procedures and increased utilization of bucket trucks and associated equipment. And in the end, the company benefits as well through increased operating efficiencies which amounts to dollar savings . . . dollars that can be put to use elsewhere in the operation.

What it amounts to is this, our 15 K.V. gloving program had but one motivating factor which is a factor that is absolutely essential to the existence of any commercial enterprise—production.

Production is a word that many of us would prefer to omit from our vocabulary because it doesn't seem to blend in with safety, which is a goal that is common to all of us in this room. However, omitted, disguised or just plain swept under the rug, production is a word that prevails.

In our company we periodically circulate a letter that defines for field operating supervisors, top management's interpretation of the word *production* and in closing I would like to share that interpretation with you. And it goes like this . . .

We feel that production is the most misunderstood word in a supervisor's vocabulary because of its connotation. Production definitely is not obtained by hurrying, running, *nor by applying the feeling of haste.*

To us, "production" is obtained, simply by the combined planning and efforts of all of us in assigning properly trained individuals (or crews) to the right job, at the right time, with the right tools, the right equipment, the right material, the right instructions and the right feeling of *responsibility.*

By putting all this together, individuals will inherently become more productive, and it will come without the feeling of being rushed or pushed, or that safety is in jeopardy. In fact, if all of these factors are brought together, the word "work" then has the wrong connotation, because it can and will become much more enjoyable to each individual.

Not only will we gain a more efficient and more productive work force, it is also inherent that safety will flourish.

With a philosophy such as this being applied to the INSULATE—ISOLATE concept for gloving 15 K.V., it is of little wonder that, even now five and one-half years later, we are still being complimented by the crews in the field for developing a program such as this to encompass safety and production so well.

The prevailing comment is "It's the best thing we ever did." And that is the way it is in New Hampshire.

SAFETY ASPECTS OF CHEMICAL SPRAYING ON RIGHTS-OF-WAY

By RICHARD McPHAIL
Forestry Coordinator, Ontario Hydro, Toronto, Ont., Canada

Ontario Hydro is a public utility whose function is to generate, transmit and distribute electrical energy in the province of Ontario.

It may be interesting to note that Ontario is approximately equal in size to the combined areas of the states of Ohio, New York, Pennsylvania, Vermont, and Texas. Throughout this rather large piece of real estate, which is populated by some 7 million people, Ontario Hydro maintains 20,000 miles of transmission lines and over 50,000 miles of distribution lines. Associated with this, are some 200,000 acres of right-of-way, where brush control programs must be carried out if we are to supply a safe and reliable supply of electrical energy to our customers.

Because of the fact that 90 varieties of trees, most of which are not compatible with overhead power lines, grow in the province, Ontario Hydro is forced to carry out vegetation management practices. One of these is the application of herbicides to control undesirable vegetation growing on our power line rights-of-way.

Prior to 1949, when our system was considerably smaller than it is at this time, the control of brush—brush being defined as undesirable, fast growing, woody vegetation—was done manually, using axes, brush hooks and the like. As our system rapidly expanded in the post-war periods, it was impossible to keep abreast of the brush situation using manual methods, and in 1949, we embarked on a program of using selective herbicides to control this vegetation. Since then, our program has grown from 100 acres to 40,000 acres per year. We use a variety of techniques, materials and equipment to carry out this work.

I would like to indicate the hazards that are associated with this work and what we have done in order to try to minimize a number of accidents we have while carrying out this program. Almost all of this work is done by our own crews, not by contractors.

Of the 40,000 acres treated annually, about 95 per cent is done by ground crews and five per cent by aerial application methods. Let's talk first about the ground application techniques.

When you talk about doing things from the ground, terrain becomes a very important factor as far as safety is concerned. Much of northern Ontario is in what is called a pre-Cambrian shield. Here the topography varies from rocky, rugged hills, and deep gorges, to areas of clay flats, populated by dense stands of spruce and balsam. While this area is fine for fishing and hunting, and the production of forest products, it makes for difficult access and difficult travel for brush control crews. The southern part of the province is generally more accommodating to ground crews, but still, travel through it requires a great caution.

Fortunately in Ontario, poisonous plants and poisonous snakes are very few in number and not found across the whole province. However, each year Hydro personnel do suffer from poison ivy infection. I am happy to report that venomous snake bites are a rarity. As part of our accident prevention program, crews working in areas where either of these two hazards exist are trained to take precautions to minimize these hazards.

The vehicles used for the ground application of herbicides may vary from conventional stake trucks to specifically designed off-road vehicles. We give driver training to the personnel that will be handling this equipment and, where necessary, modify the vehicles themselves or design the spray equipment in such a way as to improve the

safety aspects of this equipment. An example of this would be our articulated-frame rubber tire tractors. This equipment was originally designed for skidding logs, and is used extensively in the timber industry. We found that, if we loaded a conventional rectangular spray tank on a standard model timberjack or tree farmer, the center of gravity was too high for safe operation of this equipment on our rights-of-way. Consequently, both the frame of the tractor and the design of the spray equipment were modified to lower the center of gravity and thereby improve its handling characteristics. This has worked extremely well. The same type of vehicle is also used as transport for bucket equipment, which is used by our tree-trimming crews.

Another piece of equipment that is used in our spray operations is the portable mist blower. Aside from the hazards of having one of these units on your back while travelling rough terrain, operators can receive burns unless the hot metal parts are guarded and the operator is made aware of this hazard.

Each year we apply herbicides to about 3,000 acres of right-of-way using Hydro-owned and crewed helicopters. The use of such equipment calls for instruction as to safety practices that must be followed by personnel working around this equipment while it is on the ground. "Tailboard conferences" discuss smoking regulations, the need for high protection and the avoidance of the danger zones created by both the tail rotor and the main rotor blades.

The selective herbicides we use for brush-control work are low in toxicity, the most toxic of which has an acute oral LD 50 of between 350 and 500. At the concentrations specified, we do not believe that the use of these materials constitutes a hazard to the operator or to the environment. We stress the need for good personal hygiene habits and supply wash-up facilities on the trucks. There has been much in the press during the last few years about the health hazards associated with pesticides in general and herbicides in particular. The Canadian government has strict regulations governing the sale and use of these materials. We adhere to these regulations very strictly and will not use any pesticide that is not registered for use in Canada or one that has, in our opinion, unacceptable hazards, even though it may be registered. Two materials that were once used by Hydro in its vegetation and insect control programs, which are no longer used for this reason, are arsenic trioxide and DDT.

Hydro spends considerable time, effort and money in training its trades personnel regardless of the nature of their work. Those involved in the application of herbicides receive a formal training program which covers such things as development of spray techniques, the spray operator's responsibilities, accident prevention, herbicidal properties and formulations, weed and tree identification, etc. In addition to this, those responsible for the supervision of spraying operations must be licensed under our Provincial Pesticides Act.

Experience has shown that accidents resulting from chemical brush-control work falls into three categories:

1. *Slips, Trips and Falls*
   Because of the nature of the work and the terrain, it is inevitable that we have had employees suffer injuries of this nature. However, they are infrequent.
2. *Vehicles*
   We have tried to minimize accidents involving spray vehicles by driver education, design modifications, and by making them topics for safety meetings.
3. *Skin and Eye Irritations*
   Some of the herbicide mixtures used can cause skin irritation to some employees. Protective clothing and barrier creams are supplied. As well, the crew is made aware of any label precautions and other pertinent data relative to the safe use of these pesticides.

In summary, it has been our experience that a large program of chemical vegetation control can be carried out safely, provided that you are prepared to invest in training of your employees, the development of vehicles and equipment that are designed to meet the requirements of the job, and provided that great care is taken in the selection of the chemicals used.

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Respectfully,

Robert J. Marecek

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