

Plant Safety

EMPLOYEE BACKING ENSURES SUCCESS OF SAFETY PROGRAM AT ORENDA

By J. S. T. SWANSON*

THE STATEMENT that Orenda Engines Ltd.'s hospital staff has been able to give more than 4,000 anti-tetanus shots and 2,700 Salk vaccine injections points up the fact that it does not have to confine its activities to patching up after accidents. The company does have an outstanding safety record in its plants at Malton, near Toronto, and at Nobel, Ontario.

While prepared to cope with any industrial accident, the Orenda hospital facilities are not set up for the sole purpose of serving as a first aid post. The availability of the hospital personnel to embark upon a polio and tetanus preventive campaign of the above mentioned magnitude bears this out.

Rewarding Work: In the words of Dr. Bruce Macpherson, Orenda's Chief Medical Officer: "The preventive side of industrial health work is by far the most rewarding. We try to make this more of a general health centre than a hospital, and our staff is imbued with the public health approach. Such a type of operation would not be possible, however, in a plant that lacked an effective safety education program."

Key to the success of Orenda's safety record lies in the deeply held conviction that a safety program cannot achieve its highest degree of success until it has wholehearted, enthusiastic backing of every person in the company at every level. (It has long been a precept of safety engineers that no safety program can succeed without the sincere backing of top management; but this alone is not enough.)

With top management's determination to make installations and plant layouts mechanically safe for all employees plus a genuine interest in the personal welfare of each man and woman—as evidenced by the decision to provide anti-tetanus and polio shots, the corollary of the safety precept has proved true.

Three in Five: The backing of each and every person in Orenda's safety program has enabled Orenda people to work more than 1,000,000 man hours without a lost time accident

three times within five years. This is considered remarkable in a plant of some 5000 people.

Additional figures show that compensable injury frequency went down from 64 per cent of the average of all Ontario companies reporting to the IAPA in 1954, to 32 per cent in 1957. Expressing this in another way; during a period when the number of compensable accidents went up 21 per cent, Orenda's rate went down 40 per cent. Bucking the trend is never an easy business. To reverse completely the trend as Orenda has done is even more noteworthy.

Outstanding Record

OUT OF THE determination of a group of farseeing men that the enterprise they were establishing should be second to none in all respects, has grown one of the outstanding records of the Canadian aircraft industry. This record can be attributed directly to the emphasis in the safety program, and in the entire Orenda operation, on the dignity and initiative of the individual. It is this personal factor that makes this plant a safer-than-normal place to work.

Orenda believes sincerely that to prevent accidents in a manufacturing operation it is essential to design buildings for safety, to keep close control of processes, to avoid careless use of injurious materials and to guard all parts of machinery and equipment that might injure an unwary employee. These are the things that render working conditions "mechanically" safe.

Beyond all this, however, there lies something even more basic: the need to induce each individual person to think in terms of safe behavior. Orenda has found that this is not done simply. A liberal application of external stimuli such as warning signs, notices, posters, and horror pictures of other people's accidents is not sufficient to get everyone behaving safely. These things have their uses, but deep down there is a

more important angle which must be played. Man's need to participate, to be part of the group, to be on the inside. A man may not take the so called "sensible" approach, and avoid accidents so that he suffers no physical pain, but if an accident is a thing which is not acceptable to his group and results in him being put "on the outside", experience shows he will be more likely to be careful. This has been used with some success by Orenda to make its safety program more effective.

Good Housekeeping: Even before the staff function of Safety Engineer had been established, a small group of men formed a committee on "good housekeeping". This committee was set up at a time when a majority of the machine tools had yet to be installed, and the committee made sure that the installations lent themselves to clean and neat operations for the future.

Since good housekeeping is one of the essential ingredients of a workable safety program, the "Good Housekeeping Committee" bred a fundamentally safe plant environment. As production tempo increased, this was proven by the fact that Orenda people experienced a considerably lower accident rate than that experienced throughout industry. Despite this fact, it was felt that a still better record could be achieved if a full-time Safety Department were established.

It was at this point, near the latter part of 1952, that the writer, who had joined the firm in 1947 as an electrical engineer, came into the picture as the new Safety Engineer.

It offered quite a challenge. A safety Engineer with no previous safety experience faced with the job of bettering a record that was already considerably better than average.

Flexibility: Commencing with the original "Good Housekeeping Committee", and a "Union-Management Safety Committee," which had been set up prior to the Safety Department, a regular schedule of meetings was organized. There were no rigid rules of procedure laid down. Instead, rules

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were avoided. The committees felt they should be as flexible as possible to adapt to new problems as they arose. In the early days, with the company's first production effort on the Orenda engine for the CF-100 climbing toward higher peaks, new problems had a tendency to arise at short notice.

The "Good Housekeeping Committee" soon changed its name to the "Safety and Housekeeping Committee" and not long after split into two similar committees, one for the experimental plant and one for the manufacturing plant. This enables them to concentrate more closely on their own special problems. The membership of these two committees has slowly changed until they are now almost entirely made up of departmental superintendents.

This is perhaps because the superintendent is the middle man in the set-up and hence ideally suited for the additional job of making sure that accidents are kept to a minimum in his department. The Orenda superintendents have taken over this job quite cheerfully, and even eagerly, and the twin aims of avoiding accidents and producing efficiently have gradually come to be regarded as the one job of "producing safely". The superintendents have involved all their subordinates in this important task and communication on matters of safety take place frequently, freely and effectively in both directions.

Interested Parties: The Union-Management Safety Committee has also developed during this period. It establishes its own procedures to suit the needs of its activities and it has repeatedly demonstrated its value in the Safety program. A superintendent, the assistant plant engineer, the safety engineer and three appointed union representatives make up this committee.

This is in no sense a safety negotiating or bargaining group. All members decided long ago that safety is a matter of fact, not opinion, and the commonest argument that springs up is not whether a hazard exists, but how serious the hazard is and what needs to be done about it.

Orenda believes that accident prevention is a fluid, changing business and that lessons must be learned from others at all times. The company participates in the National Safety Council

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..... Industrial Accident Prevention

Industrial safety measures are easy to teach, simple to direct; but to make the machine or equipment operative really learn safety principles, he must be induced to practice them under proper supervision. This is the method adopted by most Canadian industrial safety organizations.

The biggest of these is the Industrial Accident Prevention Associations of Ontario. Incorporated by Provincial Charter in 1917, and set up under Section 115 of the Workmen's Compensation Act of Ontario, the IAPA is actually an amalgamation of nine safety organizations, representing sixteen separate classes of industry.

The IAPA is operated on a non-profit basis, and its directors are elected by the managements of companies within its membership. Funds, which come indirectly from employers, are paid to the Associations by the Workmen's Compensation Board in the form of an annual grant.

All member firms are an integral part of the IAPA, although some are more active than others. Much useful safety work is carried out by voluntary committees and organizations within plants, whose work is co-ordinated and directed by a nucleus of professional safety men, operating throughout Ontario and backed by the headquarters staff of Toronto.

These safety men are members of the IAPA's promotion or field survey staffs. Promotion men deal with top management. They suggest improvements in existing accident-prevention programs; or, where no such program exists, they will assist top management to devise one. They do useful work in arranging training courses for foremen and supervisors, and, if required to do so, will assist in the formation of safety committees.

Field survey men are more concerned with the practicalities of safety. They make periodic surveys of plants in their areas, take special note of any dangerous apparatus or unsafe work practice they may encounter, and make recommendations to the management concerned.

Such recommendations are not enforced; but should a company be unwilling to adopt reasonable safety precautions, this may attract the attention of inspectors employed by the Ontario's WCB or Department of Labor, both of which have compulsory powers.

Perhaps the most difficult task of the IAPA is to make the worker safety conscious. Promotion and field men do their share of this important work, and they are strongly supported by the headquarters staff, who pour out volumes of posters, pamphlets, pay-packet inserts and other safety literature. A well-stocked film-lending library is also maintained, and all member firms are able to obtain safety films suitable to their own classes of industry.

These visual aids have proved themselves of considerable value in the instruction of workmen in safety principles. One of the more obvious advantages of this medium is its facility in conveying ideas to polyglot staffs and communities.

The work of the IAPA reaches its zenith in October, when the entire organization takes part in an all-out safety drive. A special effort is made to achieve a completely accident-free month, and every possible means to this end is exploited.

The output of safety literature, much of it based on statistical information collected and recorded by headquarters staff, is intensified. Special meetings and rallies are held throughout the province, and newspapers, radio and TV help generously with publicity and special announcements and programs.

Another high spot in the IAPA's activities is its annual conference. Held in Toronto, in the spring, this event attracts safety men from all over the world. It provides an excellent opportunity for the dissemination of up-to-date safety practices and interchange of ideas, and is noted for its first class speeches and comprehensive displays of safety equipment.

The amount of work performed by the IAPA is a measure of the value set on human life and limb in Canada. The organization of the Associations' annual conference alone is a gargantuan task.

The concept of safety as a specialized profession may well puzzle the newcomer to industry. Why do people have to be taught self-protection? Is this not one of the basic instincts?

Man naturally fears, envies or admires. All of these are products either of instincts or combinations of instincts. So why does man have to be told, and constantly reminded, of the importance of protecting himself from physical injury?

The answer is that self-protection is often in conflict with other basic instincts and character traits, such as ambition, laziness, greed. Consequently accident hazards are ignored, underrated, and caution forgotten.

Obviously, it is in the employee's interest to avoid injury, as even the most reckless workman must agree, when held to the point. But it is also profitable for the employer to prevent industrial accidents, even at the cost of a full-scale plant safety program.

A plant accident causes upset and confusion, and lost time. It casts a gloom over the entire workshop. It is bad for morale. On the other hand, a company with a good safety record at once gives the impression of efficiency. No slap-dash firm could possibly remain accident-free for any considerable length of time. A good safety record is a good recommendation. Here is a place where things are done properly!

gator in RCAF history to serve as CO of a jet squadron. (CF-100's).

INSURANCE

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important business. As with almost every other commodity, the buyer gets just about what he pays for. Usually, it is the careless and safety-unwise operator who prefers to skim on the insurance. And it is almost always this operator who brings in the claims and bleats the loudest about the perfidy of insurance companies.

No Preventative: But insurance can't stop his accidents for him. Nor can it restore the life of a pilot killed flying his unsafe aircraft. Or buy back health to a passenger injured flying in that aircraft. Insurance is good for just one thing: to ward off financial ruin after an accident.

All aviation insurance companies are

deeply concerned about the rising accident rate in Canada. They can publicize safety; they can recommend safety practices; they can point out the fallacy of disregard for safety. But this is all they can do. Safety must start with the operator.

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and the Industrial Accident Prevention Associations activities in the U.S. and Ontario respectively.

All levels of supervision at Orenda are encouraged to learn more about safety, and each month a large group attends the safety dinner meetings held by the IAPA in Toronto. Each year Orenda people attend the IAPA Conference in Toronto and the NSC Congress in Chicago.

There is no question that an effective safety program pays for itself in

any industry. In the aircraft industry, as well as paying for itself by cutting down on accident costs, it also encourages greater interest by all in the safety of the product. In these days of extremely high speeds and fantastic performance figures, that is a factor no one can afford to overlook.

SURVIVAL GEAR

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dense bushland, the pin-pointing facility of such equipment as Sarah is invaluable. To ensure maximum life of the beacon batteries, the RCAF has drawn up two procedures which, it is hoped, will be adopted by civilian companies using Sarah. (1) When an aircraft is forced to land in the southern areas of Canada, the beacon should be activated continuously commencing one and one-half hours after the crew has become overdue at destination. (2) While in the sparsely settled areas, the beacon should be activated for four hours at a time, every day, between 9 a.m. and 1 p.m. local time, commencing the day following the initial emergency.

Automatic Beacon: The next step in electronic aids to search and rescue operations is the crash position indicator. This automatic system is designed to replace the manually-operated distress beacon. For the past three years, work has been underway by the National Research Council to develop a system which will survive an aircraft crash and provide a beacon for homing by search aircraft.

Packed in plastic foam, the compact unit weighs only six lbs. The transmitter impulse is on 243 mcs, the UHF distress frequency. The Sarah receiver equipment presently carried by RCAF S & R aircraft is also on this frequency. The batteries which power the CPI have a shelf life of 15 years; when activated by the impact of the aircraft crashing, the batteries are good for 4½ days at 70°F, or 3½ days at -40°F.

Sea Survival: So much for survival aids as they pertain to land. There has been a great deal of development work going on in the water-survival problem. Typical is that of Frankenstein & Sons Ltd., noted for its wide variety of protective suits, inflatable dinghies and lifejackets. One of the most widely-used items of flying apparel is the Constant Wear Immersion

CAI ASTRONAUTICS SECTION

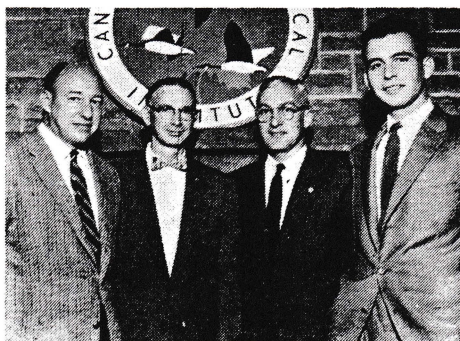
Dr. H. S. Ribner of the University of Toronto's Institute of Aerophysics has been elected first chairman of the recently-formed Astronautics Section of the Canadian Aeronautical Institute. Other officers of the Section, which held its inaugural meeting in Ottawa, Oct. 9, are: D. Bogdanoff of Canadair, vice chairman, and J. A. van der Blik of NRC, secretary-treasurer. W. F. Campbell, who had been chairman of the organizing committee, remains on the executive as acting past chairman to give continuity.

The main body of the Oct. 9 inaugural meeting comprised the presentation and discussion of three papers. The first, entitled "The Clock Paradox", was read by W. F. Campbell. The author outlined the paradox wherein if two clocks are separated and then brought together again, the one being in a fixed frame of reference and the other moving at a speed comparable to the speed of light, the elapsed time on the moving clock is less than on the fixed clock, whereas the reverse is not the case if the first is regarded as moved and the second as stationary. The three possible solutions of

this paradox were reviewed, and Mr. Campbell favoured taking into account the general theory of relativity, introducing the effect of changing gravitational potential on time. He suggested that the advent of artificial satellites offered an opportunity to settle this question experimentally once and for all.

The second paper, delivered by Dr. H. S. Ribner, dealt with "Propulsion Systems for Space Travel". The speaker reviewed the many possibilities, starting with chemical rockets and continuing through thermal systems, using solar or nuclear energy, ion propulsion, plasma propulsion, photon propulsion and the isotope sail, and he discussed the characteristics of each.

Finally D. Bogdanoff spoke on "Guidance and Control", dealing with guidance and control of missiles in the atmosphere and, as a second part, the guidance and control of ballistic missiles and satellite rockets travelling outside the atmosphere for a portion of their flight. The essentially different problems posed by these two sets of circumstances were explained.



CAI Astronautics Section executive, L to R, D. Bogdanoff, Dr. H. S. Ribner (chairman), W. F. Campbell and J. A. van der Blik.