MISCELLANEOUS REPORT NOR-Y-5

K. W. Backhaus and Y. P. Kalra (1972)

REPORT OF THE REGIONAL SAFETY COMMITTEE FOR THE PERIOD OCTOBER 1970 TO MARCH 1972.

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TABLE OF CONTENTS

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FOR THE PERIOD OCTOBER 1970 TO MARCH 1972

by

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and

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Edmonton, Alberta

The necessity of developing a safety program was realized soon after the Laboratory became operational here in 1970.

I. Chairman

Mr. K. W. Backhaus was appointed Safety Officer and Chairman of the Safety Committee, established in October 1970, by the Regional Director.

II. Members

In October 1970, the Director appointed the following members whose responsibilities for the safety program were divided as follows:

Mr. J. R. Gorman to cover field duties and motor vehicle operations.

Mr. Y. P. Kalra to cover laboratory operations.

Mr. G. L. Purcell to cover office safety.

Mr. K. W. Backhaus, in addition to being Chairman, to cover operation and maintenance of mechanical equipment.

In November 1971, Mr. P. Bihuniak was invited to become a member so that his experience with machine shop could be utilized for incorporating some of the ideas more efficiently.

The Fire Chief of the laboratory, Mr. P. Vogt, became a member of the Committee in January 1972.

The fact that Administration is very much interested in the work of the Committee is obvious from the fact that Dr. W. B. G. Denyer has been attending the meetings since January 1972.

III. Secretary

Mr. Purcell served as the Secretary from October 1970 to October 1971. Because of the overload of work in the purchasing department he resigned in this capacity. Mrs. M. Brown was requested to take notes of the November meeting. Since December 1971, a tape recorder is used so that all the details of the discussions in the meetings can be kept.

IV. Term of office

Due to their continued involvement in maintenance, Mr. Backhaus will be a permanent member of the Committee and Mr. Vogt will be the permanent Fire Chief.

Initially, other members were appointed for an indefinite period. Later, it was felt that more members should be involved and given a chance to improve the effectiveness of the Committee. Hence, it was decided that members be appointed for one fiscal year.

The Committee has decided that the outgoing members will suggest the names of 3 or 4 suitable candidates from their disciplines and then Dr. Denyer will appoint one member from each of the disciplines. However, since Mr. Bihuniak has been a member for less than a year, he will continue till the end of 1972-73 fiscal year. Therefore, at the March 6, 1972 meeting names were submitted to the Chairman. The following members were appointed by Dr. Denyer for the term 1972-73:

Dr. J. Baker to cover laboratory operations.

Mr. R. J. Lieskovsky to cover field duties and motor vehicle operations.

Mr. C. R. Stampe to cover office safety.

It was also decided that in April at the first meeting of the new fiscal year all the outgoing, incoming and permament members will be present. This was done on April 10, 1972 at the first meeting of 1972-73.

V. Duties

1. Investigating all accidents of the previous month.

2. Recommending suggestions to prevent recurrence of such accidents.

3. Reporting unsafe conditions and practices.

4. Receiving complaints about safety hazards and investigating and correcting them immediately.

5. Recommending suggestions and passing them on to Administration.

VI. Meetings

1. Frequency: In the beginning, the Chairman used to inform the mambers one week before the meeting about the date, time, and place of the upcoming meeting. However, this did not enable him to know in advance as to which of the members will be unable to attend. Therefore, from January 1972 it has been decided that the meetings will be held on the first Monday of each month at 1:00 p.m. in the conference room M093. One week before the meeting, a memorandum is sent to all the members by the Associate Director so that they can inform if they will be able to attend. In the event they can't attend, they are requested to supply suitable replacements preferably from their own sections.

   Special meetings at the discretion of the Chairman are also held.

2. Agenda: A typical agenda of the meeting is as follows:

   a - Call to order.

   b - Opening remarks by the Chairman.

   c - Roll call.

   d - Minutes of the last meeting: The Chairman informs the Committee about the comments received from Administration on the minutes of the last meeting. The members also give their comments before the minutes are accepted.

   e - Safety program.

f - Accident reports: The Committee discusses all types of accidents (1) lost time accidents, (2) accidents in which no time is lost, and (3) near accidents. (All major and minor accidents should be reported to the Committee.)

g - Report of hazards dealt with since previous meeting.

h - Report of new hazards.

i - First aid, fire emergency organization, safety films, etc.

j - Recommendations and suggestions.

k - Assignments for next meeting.

l - Adjournment.

3. Minutes: The minutes of the meeting are sent to Committee members, Program Managers, and Administration by the Chairman, generally within a week after the meeting.

   All the members of the Committee have been provided with binders to keep a continuous record of the minutes.

VII. Inspection

Laboratories, offices, electric shop, machine shop, carpenter shop, boiler room, greenhouses, growth chamber area, halls and corridors, stairs and stair landings, outside entrances, outside walkways, parking areas, elevators, areas of electric business machines, etc. are inspected to note hazardous conditions and unsafe practices. Also, complaints and recommendations from the staff in this respect are noted. They are requested to report known hazards to the Committee.

The check-list for regular inspection to determine that the following are in safe condition:

1. Sufficient illumination is availble in the working areas.
2. Fire escapes, fire extinguishers, etc. are adequate for the circumstances.
3. All machine guards are in position.
4. Tools are in safe condition.
5. Personnel are supplied with protective clothing, goggles, gloves, etc.

6. Stairways.

7. Cylinders of compressed air in the loading dock and other places are secured properly.

8. Aisles and exits are kept unobstructed.

9. Supplies in the First Aid room.

10. Any other unsafe work practices.

Laboratory safety devices (e.g. safety showers, eyewash fountains, etc.) are checked once a month. All the fumehoods are flushed at the same time.

The maintenance and inspection of the equipment of the shops is also done on a regular basis by the Engineering and Maintenance section.

Administration ensures that the fire extinguishers in the trailers and field stations are checked.

Engineering and Maintenance staff does a periodic check (once a month) of all safety devices: fire alarm, smoke detection, gas detection, sprinkler alarm, and fire fighting equipment. These systems are overhauled yearly by experts. The major safety valves such as for the boilers and compressed air systems are checked and overhauled yearly by a company specializing in this type of work.

VIII. Contacts

Contacts are maintained with several individuals and organizations, e.g. Fire Marshal, City of Edmonton;Mr. Krusche, Public Health, City of Edmonton; Director of Security, University of Alberta; Mr. J. Steppler, Division of Environmental Health Services, Alberta Department of Health; Radiation Protection Division, Ottawa and Mr. S. Scotch, Safety Consultant, Canada Department of Labour. Where possible, information is obtained from different contacts regarding the accidents at other places.

A special meeting of the Committee was arranged by the Chairman in December 1971 with Mr. T. Jackson, Shop and Service Superintendent, Vancouver, B.C. and Mr. C. Phillips, Chief Engineer, Victoria, B.C., so that ideas and procedures of safety could be discussed and compared. A problem that has been noticed in one laboratory could perhaps be the means of revealing a safety hazard or future problem in other laboratories.

IX. Report of hazards noted and action taken

The following hazards were noted (action taken is given in parentheses):

1970 (October to December):

Hazard No. 1/70 Ladder to the platform of domestic water tanks has no handrails above the platform level.

" " 2/70 Several holes in the floor of passageway to demineralizer and water still in penthouse. (The holes were filled.)

" " 3/70 No fixed ladders to get on top of boilers and no catwalk on top of boilers. (Installed.)

" " 4/70 No guard on pulleys of chiller and condenser water pumps. (Installed.)

" " 5/70 Require fire extinguisher for incinerator room. (Installed.)

" " 6/70 Linkages of hand operated vents in the greenhouses present a hazard for head injuries. (Linkages painted bright red.)

" " 7/70 Concrete mixer in the header house requires new pulley, operating switch located in an unsatisfactory position, and requires guard for drive belt. (Installed.)

" " 8/70 Soil sterilizer requires guard for protection against touching hot pipes. (Insulation provided.)

" " 9/70 Machine shop not equipped with adequate emergency lighting, ventilation, and a fire extinguisher. (Fire extinguisher installed; $150 is in the estimate for 1972-73 budget for a battery-operated emergency light unit with 2 lenses.)

" " 10/70 The service corridors require emergency lighting.

" " 11/70 In room B078 a cupboard covers the fire extinguisher making it inaccessible. (Fire extinguisher has been removed to a new location.)

" " 12/70 The side door of the loading dock is continuously left open. (Sign installed.)

" " 13/70 Chain operated valves required for water input on cooling towers. (Catwalk was installed to give easy access to valves.)

Hazard No. 14/70 Carpenter shop should be cleaned up - pieces of lumber with nails left on the floor. (Shop cleaned up. It is locked and the keys are held by an assigned member of the staff.)

" " 15/70 Gas cylinders in laboratories should be fastened securely in the following rooms:

M056	1 cylinder	Nitrogen
M054	1 cylinder	Oxygen
M054	1 cylinder	Compressed air
M054	1 cylinder	Acetylene
M043	1 cylinder	Nitrogen
M109	1 cylinder	Nitrogen
3036	1 cylinder	Oxygen

(Straps installed.)

" " 16/70 The exhaust fan in soil grinding room does not have sufficient capacity to eliminate the dust. (An 8" flexible duct and suitable canvas cover have been installed. However this has not proved satisfactory. Therefore, a fan with higher suction capacity will be installed.)

" " 17/70 Lobby floor is very slippery when waxed. (Modern Cleaners have been advised to strip wax from floor and in future damp mop only.)

" " 18/70 The drain of the deaerator safety valve and the drain line of the storage tank of the deaerator are tied together. This causes water to spray out of the safety valve by blowing down the safety tank. (The drain piping has been separated.)

" " 19/70 In the Fire Research Laboratory the flame throwers should be stored when not in use. (Now they are stored when not in use.)

1971 (January to December):

Hazard No. 1/71 Support bearings should be installed on the drive shaft of the dump truck. (Installed.)

Hazard No. 2/71 Linkages of hand operated vents that project into the hallway of the greenhouse have been painted red so that they are readily noticed. However, the Committee feels that this has not eliminated the hazard.

" " 3/71 Gasoline is being stored in unsafe containers in an insect laboratory. (Corrected.)

" " 4/71 Kjeldahl digestion and distillation unit in the Soils Laboratory requires a fume hood to prevent sulphur dioxide and other fumes from contaminating the laboratory and endangering the personnel working there. (Fume hood installed.)

" " 5/71 Safety shower required for the penthouse - personnel are handling chemicals for water treatment. (Safety shower was obtained and has been installed.)

" " 6/71 A survey was made and found that at least 15 refrigerators and deep freezers are being used for storing acetone and other extremely inflammable materials. This represents a potential danger due to the fact that thermostats, lights, etc. are components of the circuitry and even a little spark may cause an explosion. (Information on spark-proofing has been obtained from the Vancouver laboratory and the work is in progress.)

1972 (January to March):

Hazard No. 1/72 Cylinders in receiving dock are not secured. (Corrected.)

" " 2/72 One cylinder in M054 not secured to wall. (Corrected.)

" " 3/72 Removable guard needed at the pit of condensate received. (Corrected.)

" " 4/72 Big sign required for receiving dock - "Shut off engine". (Sign installed.)

" " 5/72 Switches for operation of winch have to be relocated on most vehicles equipped with same, from underneath the hood to winch. On most

Hazard No. 5/72 (Cont.) vehicles, the switches are located underneath the hood. With the hood open, the person to operate the winch is sitting on the fender which is a very dangerous practice. (One vehicle has been corrected and the others will be converted by our own staff before the field season starts.)

" " 6/72 Mechanical workshop and carpenter shop need emergency lighting. (It is being investigated if lights for above rooms can be converted to emergency power of lab.)

" " 7/72 Rubber treading, first floor in front of elevator doors is unsafe - tripping hazard. (It is under investigation what material could be used safely.)

NOTE: The hazards of 1970, '71 and '72 which have not been removed are being investigated and will be corrected shortly.

X. Safety file

In November 1970, a "Safety File" was established in the library. About 30 reports have been added to the file on topics such as "handling of perchloric acid", "manual of laboratory safety", "explosion hazard when decomposing organic matter with nitrates", and "working techniques and equipment for all forestry jobs".

Several contributions on laboratory safety have been brought to our attention by Dr. P. J. Rennie, Program Co-ordinator, CFS, Mr. J. Holden, Safety Officer, Canada Department of Labour, and other individuals. The literature received is circulated to those interested and then placed in this file. Contributions like this and others help in maintaining a wide variety of publications on safety.

XI. Safety bulletin board

A special notice board has been made available exclusively for safety publications. It is installed on the wall near the staff entrance of the building. The notices on this board make the employees aware of a safety training program because of operation procedures and/or possible new methods.

The use of this board helps all employees to know:

1. What the known hazards of the job are and how to protect themselves against them.

2. What protective equipment are available and how to use them properly.

3. The different tools required for specific jobs and how to use them safely.

4. To whom they should report unsafe practices and conditions.

5. All the accidents that happened in the previous year and relevant details (time loss, no-lost-time, cause of accidents). All accidents are reported anonymously.

XII. List of chemicals

Lists of chemicals used by the staff are compiled and submitted to the Committee which researches material available to ascertain their toxicity and/or fire hazard. This enables maintaining up-to-date data on the toxicological and other hazards of these chemicals and the background information on storage and disposal. It is suggested this information should be accessible to all and should be placed near the chemical shelves in individual laboratories.

XIII. Safety films

In November 1971, the showing of safety films was introduced. They are obtained from the National Film Board, Canadian Industries Ltd., Workmen's Compensation Board, etc. They are shown once a month - two films at one time.

A big poster is hung at the staff entrance door on the morning the show takes place so that everybody sees it when entering the building. Films on such topics as "safety in chemistry laboratory", "static current", etc., have been shown. Alberta Safety Council's "how to use chainsaw" and other films have been selected for next showings. The films are generally shown in the cafeteria at coffee time so that a large number of staff members can attend.

XIV. A safety reminder

Near the main exit, a small area next to the clock on the wall has been made available to the Committee to make the staff safety minded at all times. A safety slogan (e.g. "laboratory safety is up to you", "always avoid accidents", etc.) and information on the number of days since last accident are posted here.

XV. First aid

Two Standard First Aid courses given by the St. John Ambulance Organization were organized in January - March 1971 and January - February 1972 and were taken by 20 and 10 staff members, respectively. A staff member of the Centre has taken the First Aid Instructor course and will be conducting these courses in future.

A large "first aid" sign has been installed to indicate the location of the First Aid room (M067). A qualified First Aid man is responsible for looking after the supplies. Band-aids, aspirin, etc. are kept in an unlocked container. The first aid room has been brought up to standard. A list of individuals qualified in first aid is maintained in this room.

One "Cyanide antidote kit" was purchased for employees using cyanic compounds in their laboratories.

XVI. Training in safety to new employees and casual staff

Each employee is expected to take an active part in the work of protecting himself, his fellow workers, and the laboratory. Although he may be familiar with all the safety practices, just as a refresher, points such as given below are brought to his attention: locations of fire extinguisher, eye-wash fountain, safety shower, fire blanket and stretcher; need for adequate labelling of containers for chemicals; need for wearing safety goggles, face shields with plastic visors, neoprene gloves, (e.g. to reduce laboratory-acquired infection in microbiological laboratories) and laboratory apron; and disposal of broken glass in a separate clearly marked container.

XVII. Inflammable storage room

Special provision has been made for the storage of flammable liquids in Room M118. Rubber matting has been laid down in the middle to prevent sparking.

Petroleum ether and other volatile substances such as acetone should be stored in individual laboratories on a short-term basis - large quantities being stored in this room.

The need for such a room is obvious from the fact that highly inflammable materials and powerful oxidizing agents and materials react with air or moisture to evolve heat.

XVIII. Safety lock-outs

These are devices which are clamped on circuit breakers and people involved with the particular piece of equipment can put their lock on the safety device, e.g. it could be a lock from the maintenance craftsman, a lock from the electrician and a lock from the engineer, all having individual keys, thus ensuring that work is completed before that piece of equipment is started. Mr. Backhaus has a master key which can open all three locks in case the work is finished and a man in question cannot be found or is not in the laboratory.

The circuit breakers within the panels are locked and only Mr. Bihuniak, Mr. R. Frederick, Mr. J. J. Lewisch, engineers, and Mr. Backhaus have keys so that no unqualified person can tamper with the circuit breakers. To use the circuit breakers as switches will weaken the mechanical parts in the breakers due to creep stress on the springs, etc. causing the breakers to trip below design amperage.

XIX. Waste disposal

One of the research scientists approached the Committee to get information on disposing mercurous chloride. The Committee obtained this information from Mr. Holden of the Canada Department of Labour and made it available to him.

Several staff members need the information on disposal of toxic materials. Therefore, a "Laboratory waste disposal manual" published by the Manufacturing Chemists Association has been ordered and will be available to anyone wishing to obtain the procedure for waste disposal.

XX. Emergency breathing apparatus

A "Survivair Breathing Equipment" designed for short duration use of about 5 to 10 minutes has been obtained. This will be useful for rescuing casualties in areas such as the boiler room, service core, etc. It will be stored in the First Aid room.

XXI. Chainsaw demonstration

In the last week of March 1972, a demonstration was arranged for our staff by Mr. Gorman. Mr. G. Billstein of Kendall Equipment Ltd. and Mr. E. Orolosky, representative of Terry Industries (Pointe Claire, Que.) conducted the safety seminar. A film produced for "Homolite" on safe operation of chainsaws was shown. Several slides on operation and maintenance of the saws were also shown. Staff members who will be using them, also operated these saws under their guidance.

XXII. Recommendations for 1972-73

1. Radioisotopes: Dr. M. H. Etter is in charge of the radioisotope laboratory. Any work involving radioisotopes should be carried out upon consultation with him.

2. Fire emergency exits: A light seal and signs have been put on door to warn individuals to use the door only in an emergency. The seals may be broken on impact.

3. Perchloric acid: Because it is a rather unpredictable and potentially highly dangerous chemical it should be used in fume hoods especially made for it.

4. Winches: Any winches purchased for vehicles in the future should be installed properly as given in Hazard No. 5/72.

5. Inflammable storage room: A grounding cable should be installed along the wall with suitable jumper cables which are clamped to the metal drum while transferring the inflammable liquid.

A texas gate and grading to middle of the room should be constructed; the drainage to sanitary sewer should be disconnected and a removable bucket should be installed. Thus, no liquid can come out to the hallway from the space between door framing and the floor. The mechanical consultant has promised a design for this item.

6. "Safetainers": Twenty-six of the commonly used solvents, e.g. acetone, carbon tetrachloride, ether, hexane, toluene, xylene, etc. are now available in the new J.T. Baker Safetainers®. The twin-seal vapor-proof caps prevent seepage of vapors. They should be tried out.

7. A shed outside the building: It would be useful to have an extra storage shed with good ventilation for gasoline and oil storage. A shed like the one for the gardening tools would suffice.

There are many jerry cans filled with gasoline stored in the building. These too could be stored in the outside shed.

8. Storage of chainsaws: Chainsaws should be checked that no gasoline is in tank, before storing them. This is apparently difficult to enforce, since some staff members do not hand in their chainsaws to the stores because they feel that they might not get back the saws they are used to for the next field season. It is suggested that this problem could be overcome if the chainsaws are tagged, the storeman checks the saw for gasoline and with start of field season gives out the saw to the staff member whose name is on the label. Instructions to this effect have been issued by the Associate Director.

9. A communication system: There is a necessity of having a paging system to announce emergencies and to direct people as to what should be done. One speaker was tried out and found satisfactory. Enough speakers should be purchased and installed in the building.

10. Demonstrations: Following demonstrations be conducted:

a - Operation of 4-wheel drive vehicles.

b - Use of fire fighting equipment.

c - Chainsaw scabbard made by Mr. Bihuniak.

11. Fire drill: A fire drill be held.

12. Panes at staff entrance: There have been two accidents by bumping into the glass in the stationary middle section of the north staff entrance.

    A fluorescent tape should be put on this pane between the doors in order to make people aware of the glass.

    The south entrance has glass panes besides the door and these should be similarly marked. It is also suggested that a painted screen from stretched metal be installed.

13. Kjeldahl room: There is a need of a safety shower and eye-wash fountain in room M056.

14. Tunnel: An exit from the service tunnel (mechanical room to tower) should be constructed at the west end so that people can escape from the tunnel at both ends in case of emergency, breaking of pipe, explosion, etc.

15. Receiving room: An escape door be constructed to the receiving room (M122). This door can then also be used for getting long material (e.g. pipes) into the building.

XXIII. Conclusions

Each individual has a responsibility to learn the safety hazards of the chemicals, equipment, and techniques he will be using. The Committee encourages the staff for their suggestions to strengthen the safety program in any phase of its operation.

April, 1972.