

Misconceptions of Laboratory Accident Investigation and Reporting

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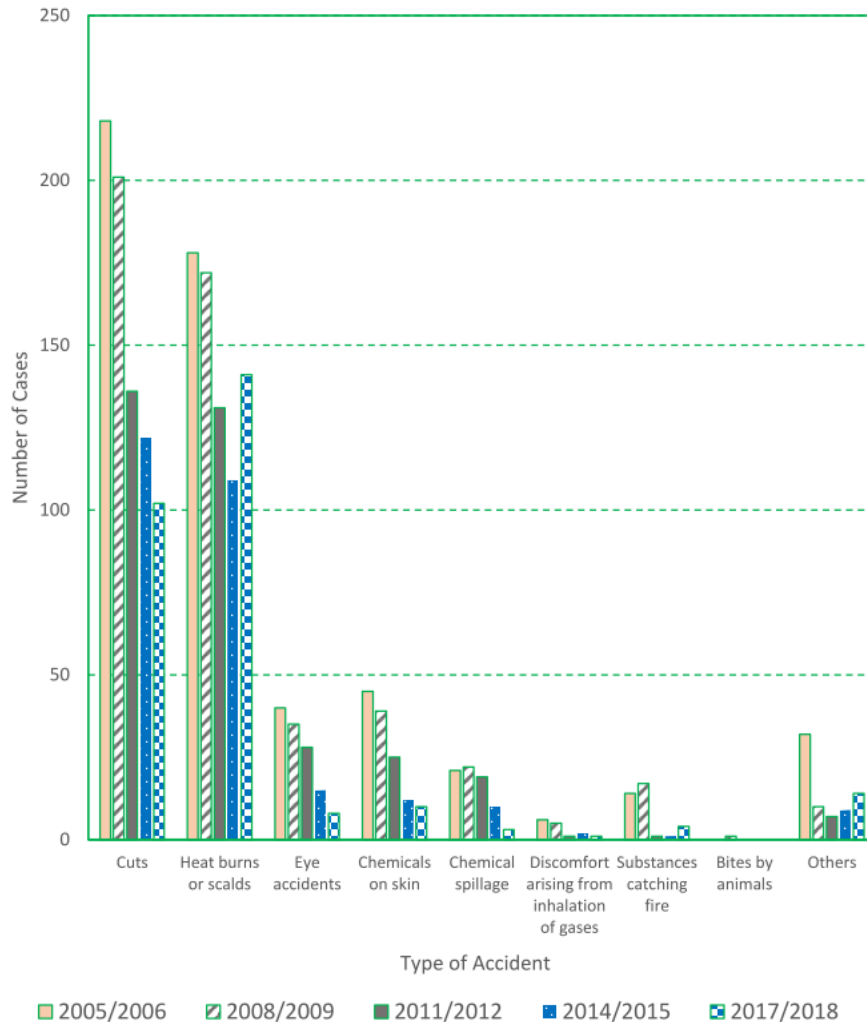
CIH, CSP, CChem, CSci, GradIOSH, RSO

Laboratory Accident

- is an unplanned and uncontrolled event in which the action or reaction of an object, substance, or person results in personal injury, illness or death

Laboratory Accidents

Survey on Laboratory Accidents in Secondary Schools
2005/2006 - 2017/2018 School Years



Type of accident	Number of cases	Percentage
Cuts	102	36.0
Heat burns or scalds	141	49.8
Eye accidents	8	2.8
Chemicals on skin	10	3.5
Chemical spillage	3	1.1
Discomfort arising from inhalation of gases	1	0.4
Substances catching fire	4	1.4
Bites by animals	0	0.0
Others	14	4.9
Total	283	

Subject	Number of cases	Percentage
Science (S1-3)	197	69.6
Biology	33	11.7
Chemistry	45	15.9
Physics	8	2.8
Integrated Science (S4-6)	0	0.0
Total	283	

Laboratory Incident

- includes undesired circumstances and near misses which have the potential to cause accidents; however, it involves no personal injury, illness or death

Laboratory Incident

- Near Miss
 - An event that, while not causing harm, has the potential to cause injury or ill health



Laboratory Incident

- Undesired circumstance
 - A set of conditions or circumstances that have the potential to cause injury or ill health



Battery charger without built-in safety feature which could not check the battery by counting its cells via a balance plugs



Test date in 2nd quarter of 2012 and expired in 3rd quarter 2017

Laboratory Incident

- Chemical spillage
 - All the cases were minor ones. In one case, mercury was spilled on the floor. Fortunately, no injury was reported in this case
- Substances catching fire
 - Only four cases were reported and no injury was involved. In one case, a rechargeable battery got overheated during charging and ignited

Reasons of report and investigate laboratory accidents and incidents

- Legal requirement ?
 - Part 7 “Workplace Accidents and Occupational Diseases” of Occupational Safety and Health Ordinance
 - Section 15 of Employees’ Compensation Ordinance

Reasons of report and investigate accidents and incidents

- EDB / school requirement ?
 - Safety Management System (Accident investigation / Safety Committee)
 - In-house Guidelines
 - Handbook on Safety in Science Laboratories (2013)
 - Guidelines on Measures to be taken in case of incidents involving odours of gas including those from unknown sources

Reasons of report and investigate accidents and incidents

- Insurance requirement ?
 - provide essential information for insurers in the event of a claim
- Best practice ?
 - General Duty
 - Safety Commitment

Report Accident
VS
Refuse to Report Accident

Barriers of Accident Reporting and Investigation

- Cultural barrier
 - Report only what is good while concealing what is bad
- Organizational barrier
 - Fault-free and blame culture of an organization
 - Unrealistic and non-achievable safety goal

Barriers of Accident Reporting and Investigation

- Individual barrier
 - The accident is not serious and do not want to be seen as careless or labeled as poor worker
 - Report accident = poor individual performance
 - Too time consuming and difficult to investigate accident and fill investigation form

Solutions

- Set safety goals by safe behavior rather than injury rates
- Develop a blame-free culture and emphasize aims of accident reporting and investigation is “fact findings” instead of “fault findings”

Solutions

- Provide clear guideline on what constitutes a reportable accident defined by the Education Bureau
- Develop a clear procedures for accident investigations and set criteria to helper teachers or technicians on the scale of the level of investigation

Safety in Science Laboratories



Education Bureau
2013

24 LABORATORY ACCIDENTS AND INSURANCE

When an accident involving injuries occurs in a laboratory, first aid should be administered to the injured as appropriate, and the school principal should be notified as soon as possible. In the event of any serious injury, or whenever in doubt, medical aid should be sought without delay. The most effective way of securing medical aid urgently is to make a 999 telephone call for an ambulance. All injuries to the eyes should be regarded as serious.

24.1 Accident and Incident Records

A laboratory accident is an unplanned and uncontrolled event in which the action or reaction of an object, substance, or person results in personal injury, illness or death.

A laboratory incident includes undesired circumstances and near misses which have the potential to cause accidents; however, it involves no personal injury, illness or death.

A record of all laboratory accidents (including minor accidents) / laboratory incidents in each science laboratory should be kept by the teacher-in-charge of the laboratory and the Coordinator of the Standing Committee on Laboratory Safety. Each entry should contain: names of persons involved (teachers/laboratory staff/students), place, date, time, nature of accident/incident, cause of accident/incident, experiment being performed, extent of injury and treatment given and corrective actions taken.

Following each serious laboratory accident (e.g. an accident in which medical advice has been sought), a detailed accident report, using the standard report form in Appendix X, should also be sent to schools' respective Regional Education Offices.

The safety management systems (e.g. the Standing Committee on Laboratory Safety) of schools should review the laboratory accident and incident records when monitoring the standard of laboratory safety in their schools. Appropriate preventive measures should then be taken to minimise the occurrence of laboratory accidents.

24.2 Common Laboratory Accidents Reported in Schools

As one of the ways to monitor the standard of safety in school science laboratories, the Education Bureau conducts surveys of laboratory accidents occurring in science laboratories on a triennial basis. The latest report of "Survey on School Laboratory Accidents" can be found on the EDB website at http://cd1.edb.hkedcity.net/cd/science/laboratory/content_survey.html. The information so obtained was analysed and the findings disseminated to all secondary schools, drawing their attention to accidents that are common in science laboratories, as well as preventive measures that can be taken.

Record of Laboratory Accidents and Incidents

- Name of person involved
- Date, time and place of accident, class and particulars of teacher
- Nature of accident / incident
- Particulars of the injured

Record of Laboratory Accidents and Incidents

- Information about the learning activities or experiments
- Cause of accident / incident (if known)
- Extent of injuries and treatment sought
- Corrective actions taken

Safety in Science Laboratories



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APPENDIX X

REPORT ON ACCIDENT / INCIDENT CONCERNING SCIENCE EXPERIMENTS OR FACILITIES IN SCHOOL

To: Regional Education Office (HK / Kln / NTE / NTW *)

** Please delete whichever is inappropriate*

1. Name of School : _____
Address : _____
Tel. No. : _____ Fax No. : _____
Name of Principal : _____
2. Occurrence of accident / incident
Date : _____ Time : _____
Place : _____
Class : _____ No. of students in class : _____
3. Nature of accident / incident (e.g. fire, explosion, heat burns/scalds, chemical burns, etc.)

4. Student(s) involved in the accident / incident
 - (i) Name : _____
Age : _____
Description of injury (if any) : _____
 - (ii) Name : _____
Age : _____
Description of injury (if any) : _____
5. Teacher(s)/laboratory staff(s) involved in the accident / incident
Name : _____
Description of injury (if any) : _____

6. Cause of the accident / incident (e.g. wrong procedure, or carelessness or malicious action of students or others, faulty equipment, etc.)

7. Title of the experiment performed when the accident / incident occurred (if applicable)

8. Distribution of students at time of accident / incident

(i) Group experiment :
Number of students in each group _____

(ii) Demonstration experiment :
Location of students _____

9. Location and activity of the teacher in charge of the class at time of accident / incident

10. First aid given (if any)

11. Was any of the following telephoned for help? Yes / No *

Put a "✓" as appropriate

Time notified

Time arrived

Police ☐ _____

Fire Services ☐ _____

Ambulance ☐ _____

Action taken by the above on arrival:

12. Was the Regional Education Office (HK / Kln / NTE / NTW *) notified of the accident / incident by telephone? Yes / No *

Date and time notified: _____

13. Was the parent(s) or guardian(s) of the injured student(s) notified of the accident / incident?

Yes / No*

14. Witness(es) to the accident / incident(if any)

Name : _____

Designation : _____

15. General remarks on the accident / incident (if any)

16. Particulars of the teacher in charge of the class at time of accident / incident (if applicable)

Name (Print) : _____

Qualifications : _____

Teaching experience (number of years) : _____

17. Particulars of the laboratory technician in charge of the laboratory where the accident / incident occurred (if applicable)

Name (Print) : _____

Qualifications (including professional qualifications) : _____

Working experience (number of years) : _____

18. Reporting person(s) (Put a "✓" as appropriate) :

☐ Teacher _____
(Name) (Signature)

☐ Laboratory technician _____
(Name) (Signature)

Signature of Principal: _____

Date : _____

Solutions

- Develop an accident reporting and investigation training package and provide training to new recruits and re-fresher training for teachers and technicians to raise awareness of the process

Main Stages of an Accident Investigation

- Secure the accident / incident scene
- Preparations before starting the investigation
- Gathering the information
- Analyzing the information
- Develop the sequence of events

Main Stages of an Accident Investigation

- Determine the causes
- Identifying preventive / risk control measures
- Implementation an action plan
- Completing the report

Hierarchy of Risk Control

- Elimination
- Substitution
- Changing work methods/patterns
- Engineering control
- Good housekeeping

Hierarchy of Risk Control

- Safe system of work
- Training and information
- Personal protective equipment
- Monitoring and supervision
- Review