

Audits and Inspections



A Summary of Recommendations and Program Review Criteria

Including the Five - Diamond Recognition System
for Lab Safety Program Achievement

By James A. Kaufman , Ph.D.



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Introduction

During the past 35 years, I've been conducting audits and inspections in laboratories and other workplaces. There have been literally thousands of labs, storage rooms, classrooms, and numerous other areas (fire departments, artist studios, crime labs, jails, libraries, theaters, and more). In addition, I've been training folks in how to conduct these audits and inspections. While some prefer to use a checklist, most of what I do is just in my head.

From time to time, someone one will ask what I do and what I've seen. This is a summary of the recommendations contained in my audit and inspection reports over the past several years. In addition, some general lab safety recommendations have been added. It is intended to provide a broader overview of the types of issues and concerns raised during these consultations.

Having someone from the outside look at your place can be very helpful. As an outsider, I bring a different bias. Note that I'm not unbiased ... just differently biased. You get used to looking at your stuff and begin to take some things for granted. An outsider questions and compares in ways that insiders may not feel comfortable doing.

There's another issue. It's very difficult for insiders' voices to be heard. Colleagues often are unable or unwilling to hear the insider's voice. So, having someone from the outside singing the same song in what is perhaps a different octave can often be very helpful to getting the message across to colleagues and management or administration.

If you find that there are areas not covered in the summary that you would like to see included, please let me know (jim@labsafetyinstitute.org). We'll see if we can do something about that. ... Jim

Introduction to the 2011 Revision

In this revision, I've added the Laboratory Safety Program Review Form and some suggested criteria which can be used for evaluating each of the program elements. LSI uses this program review form to help organizations identify opportunities for improving their lab safety programs.

Several years ago, Fisher Science Education asked LSI to give a lab safety talk at their national sales meeting. I asked my friend and Fisher colleague Joan Heuel what might be of most interest and value to their sales and marketing representatives. Joan suggested discussing how to talk with science department heads about their lab safety program.

Joan's suggestion led me to start building a list of the essential components of a lab safety program. I came up with thirty-three. Over the past few years, the list has evolved into a system of evaluating lab safety programs either qualitatively or quantitatively.

If you would like to do it qualitatively, put a check mark in the appropriate column. Select either OK, Needs Additional Work (NAW), or Does Not Exist (DNE). If you would like to do it semi-quantitatively, count up the number of check marks in each column. And finally, for those of you with real courage, do it quantitatively. Give yourself three points for everything that's "OK", zero to three Diamonds for everything that's "NAW", and zero to three points for everything that's "DNE". Since there are currently (I think we'll find more) components, the maximum is 99 points. Add a one point bonus for "courage" and you've got a score out of 100.

I would like your help. Please send your suggestions for evaluation criteria for any of the components. Everyone submitting suggestions will receive a copy of the Program Review Form and current criteria.

Introduction to 2013 Revision

This newest edition of *Audits and Inspections* includes LSI's *Five-Diamond Recognition System for Lab Safety Program Achievement*. It can be used in conjunction with our *Lab Safety Program Review Checklist* and evaluation criteria to score and reward your progress in improving your lab safety program.

See page 27 for the full description. You can use it independently or with LSI's assistance. One of the benefits of becoming an LSI Organizational Member is that we work with you to perform the lab safety program assessment.

Summary of Audit/Inspection Recommendations

Biological and Animal Hazards:

1. Use dissecting specimens preserved with non-formaldehyde (formalin) preservatives.
2. Store scalpels all pointing away from you.
3. Store syringes in locked drawers or cabinets.
4. Ensure proper care for live specimens during vacations.
5. Seal specimen containers with vinyl electrical tape.
6. Dispose of surplus and used biological specimens.
7. Remove mold from refrigerators.
8. Maintain regular inspection schedule for Biosafety cabinets
9. Provide GFCI protected outlets for fish tanks.
10. Do not permit the preparation, consumption, or storage of food or beverages in areas where biologicals are handled or stored.

Chemical Disposal:

1. See if a rendering company will take biological specimens to make glue.
2. Some items (carbon disulfide, ammonium dichromate) should be returned to central storage or kept only with permission.
3. Collect hazardous wastes in clearly labeled containers which are kept sealed at all times except when waste is being introduced.
4. Keep waste containers closed except when waste is being introduced.

5. All waste collection containers should be labeled "Hazardous Waste", the identity of the contents, and the hazard.
6. Provide secondary containers for hazardous waste collection bottles.
7. Maintain 10% free space in waste collection containers.
8. Make sure the hazardous waste label faces forward.

Chemical Handling:

1. Do not permit the preparation and consumption of food or beverages in areas where chemicals are handled or stored.
2. Properly label all chemicals and containers.
3. Install additional fume hoods as noted.
4. Put warning labels on hazardous chemicals.
5. Resecure labels with wide, clear shipping tape.
6. Carry acids and flammables with suitable secondary containers such as safety carrier buckets.
7. Make sure spilled chemicals are cleaned up. Do it yourself immediately if it can be done without injury to yourself or others and if it is not an emergency and not likely to become an emergency. Otherwise, evacuate and call for a HAZMAT team to assist.
8. Use stearic acid instead of naphthalene or para-dichlorobenzene for melting point experiments.
9. Concentrated Formic Acid can decompose. Make sure caps have pressure relief feature.
10. Test peroxide formers (ethers, cyclohexene, isopropyl alcohol) regularly for peroxides.
10. If you use hydrofluoric acid, make sure the proper first aid materials and procedures are in place both on site and at the hospital for both skin and eye injury.

Chemical Storage:

1. Store oxidizing acids (nitric and perchloric) separately from other acids (formic, acetic and butyric acids are organic fuels).
2. Store corrosives and other hazardous chemicals below eye level.
3. Post "No Food Storage" signs on all chemical and biological storage refrigerators.
4. Store mercury in closed containers.
5. Store corrosives separately from other chemicals.
6. Store oxidizers separately from other chemicals.
7. Corroded storage cabinets need to be cleaned and repainted with epoxy paint.
8. Store flammables in approved flammables cabinets.
9. Establish a system-wide method for chemical arrangement.
10. Store chemicals separately from food or beverages.
11. Install acid cabinet handles on the outside of the cabinets.
12. Tape acid and organic liquid bottle caps with vinyl electrical tape to prevent evaporation, toxic vapors, and corrosion.
13. Store chemicals in locked storage cabinets or storerooms.
14. Provide chemical storage areas that are separate from equipment storage.
15. Observe NFPA Code 45 limits for quantities of flammables stored.
16. Provide a rolling stepladder with handrail for reaching upper shelves.
17. Keep the door to the storeroom locked when it is not attended.
18. If the flammables cabinets are vented mechanically, make sure the air flow is in the correct direction.

Compressed Gases:

1. All compressed gas cylinders should be chained to avoid falling over.
2. Transport liquid nitrogen in freight elevators or use passenger elevators as dumb-waiters.
3. Use a regulator to remove gas from cylinders when the pressure is above 30 psi.
4. Keep the protective cap in place at all times except when the gas cylinder is in use.
5. Check the hydrostatic test date on all incoming gas cylinders.
6. Regulators should be attached without the use of Teflon tape.
7. Transport gas cylinder on handtrucks and secure with a chain.

Electrical Hazards:

1. Repair faulty electrical receptacles and equipment as noted.
2. Eliminate the use of two-prong unpolarized plugs on all electrical devices.
3. Install additional receptacles as noted. Do not use extension cords for permanently installed equipment.
4. Upgrade circuit breakers to GFI circuit breakers.
5. Repair plugs with missing ground prongs.
6. Make sure that circuit breakers are clearly labeled and unobstructed.
7. Install Ground Fault Circuit Interrupters (GFIs) wherever water and electricity are being used.
8. Check all receptacles annually for correct wiring and tension.

9. Check all electrical equipment annually for voltage leaks. All Samsung TV sets in the district should be tested immediately.
10. Know which type of cylinder valve you are dealing with so that you can know how to use it properly.

Emergency Facilities:

1. Install eyewash fountains, safety showers, first aid kits and fire blankets as noted.
2. Provide signs to designate the location of emergency equipment and emergency facilities.
3. Make sure emergency equipment and facilities remain unobstructed.
4. Clean, tag and date eyewash facilities and safety showers regularly.
5. Make sure safety showers are useable (i.e. have chain attached).
6. Repair emergency facilities as noted.
7. Make sure fire extinguishers are inspected regularly. Visual inspection should be monthly and formal check made annually.
8. Use appropriate fire extinguishers for science labs.
9. During vacations, if eyewash stations and safety showers are shut off, post warning signs on these devices and do not allow chemicals to be used in these rooms.
10. Provide emergency phone numbers and directions on or near every phone or intercom.
11. Active eyewash fountains and safety showers at least weekly and test at least annually.

General Facilities:

1. Install guards on paper cutters and fans as noted.
2. Repair damaged facilities as noted.
3. Belt/pulley guards are required on all vacuum pumps.
4. Provide running water and electricity to labs as noted.
5. Turn off gas and electricity when not in use.
6. Clean and defrost refrigerators as noted.
7. Install alarm systems for computer room security.
8. Reduce overcrowding by assigning fewer students to science classes.
9. Add ADA compliant facilities to science labs and classrooms.
10. Provide a more adequate amount of storage space and working surfaces as noted.
11. Pencil sharpeners should be mounted well below eye level.
12. Increase/improve lighting in noted areas.
13. Provide hot water to lab sinks.
14. Use NSTA Facilities book, *Safe Laboratories* from Lewis Publishers, *Laboratory Design: Health and Safety Considerations* from John Wiley & Sons and TEA Standard and Planning book for design and renovation of lab facilities.
15. Make sure electric cords, cables, and telephone cords are not a tripping hazard in walking areas.
16. Keep doors locked when there is no one in the room.

Glassware:

1. Discard broken glassware in designated containers.
2. Store glassware below eye level.
3. If beakers and flasks must be stacked, use a sheet of corrugated cardboard between the layers.
4. All evacuated or pressurized glassware should be protected with shields, guards, or tape.
5. Avoid the use of chromic acid cleaning solution.

Housekeeping:

1. Provide general clean-up for the noted areas.
2. Store heavy objects on lower shelves.
3. Stored materials and equipment should not stick out from shelving.
4. Where electrical cords must run across walkways, provide covers to avoid tripping hazards.
5. Discard surplus and unused materials and equipment.
6. Pick up all materials on the floor in walking and working areas.
7. Have a "ruthless discard day."

Lasers:

1. Use the ANSI Z-136.1 Standard as the guide for laser safety.
2. Use only class IIA (caution) laser pointers.

Safety Equipment:

1. Use only chemical splash goggles in chemistry and biology laboratories.
2. Use impact goggles for physics and shop.
3. Use sanitizer cabinets between classes to disinfect goggles.
4. Encourage washing both hands and shared eye protection devices at the end of class.
5. Replace vents and lenses that are scratched and damaged in safety goggles.
6. Use face shields in addition to glasses or goggles to protect the rest of your face and throat.

Safety Program:

1. The school should have a written safety and health policy that is endorsed and supported by the principal and superintendent.
2. There should be assigned responsibility for the school's health and safety program. That person should report directly to the senior administrator.
3. There should be a written safety program describing the various activities that will go on to help insure that the policy in #1 is implemented.
4. These activities should include:
 - a. a safety committee
 - b. regular inspections
 - c. taking corrective actions
 - d. new employee safety orientation
 - e. recordkeeping and reporting
 - f. accident investigation and reporting

- g. safety meetings
 - h. written rules and regulations (like an emergency procedure for dealing with spills).
 - i. regular safety and health training as mandated by the state and federal laboratory standard, hazard communication standard, right-to-know and Workers Compensation Regulations.
 - j. emergency planning
 - k. rewards
 - l. enforcement
 - m. performance evaluation
 - n. student and staff rules agreements which include the four critical parts: read, understand, agree, and realize
5. Within your department there needs to be a clear understanding of the health and safety practices that are expected of both faculty and students.
- a. Eye protection must be worn at all times in all labs by everyone.
 - b. Lab aprons are required for students using corrosive chemicals and lab coats for staff.
 - c. A written plan for dealing with the six main types of lab accidents (fire, spill, electrical shock, burns, poisoning, bleeding).
 - d. A written safety manual
6. Make regular additions to each department's safety reference library.
7. Ask the most senior administrators to sign a cover letter for the science safety rules agreement outlining the discipline procedure for violations.

Ventilation:

1. Install additional fume hoods as noted.
2. Repair fume hoods as noted.
3. Make sure that all labs and storage rooms have proper ventilation.
4. Keep fume hoods clean of paper and other items.
5. Clean vents regularly.
6. Inspect hood sash cables and pulleys annually
7. Install a mesh covering over the lower baffle opening at the back rear of the hood.

Miscellaneous:

1. Secure file cabinets to wall to eliminate tip over hazard.
2. Do not store materials on the floor and in aisles or walkways or within 24 inches of the ceilings.
3. Make sure alcohol burners have caps.
4. Make sure sharp objects (knives, scissors, syringes etc.) are pointing away or stored.
5. Repair or discard cracked fish tanks.
6. Make sure that the location of eyewash shut off valves are known.
7. Make sure food or beverages are not consumed where chemicals are handled and stored.
8. Store equipment on large enough shelving.
9. Store such items as tubes, bike tires, etc., in appropriate areas.
10. Adjust offsets on grinders' platforms to correct distance.

Laboratory Safety Program Review Checklist

<u>Component</u>	<u>OK</u>	<u>NAW*</u>	<u>DNE*</u>
1. Accident Investigation			
2. Accident Reporting			
3. Awareness Posters			
4. Bulletin Board			
5. Chemical Hygiene Officer (CHO)			
6. Chemical Hygiene Plan (CHP)			
7. Chemical Hygiene Plan Review (at least annually)			
8. Chemical Inventory			
9. Condition of Employment			
10. Conduct Hazard Determination			
11. Emergency Equipment Testing			
12. Emergency Planning			
13. Fume Hood Testing			
14. Hazards Review Process			
15. Inspections			
16. Management Participation in Inspections			
17. Management Training Programs			
18. New Employee Orientation			
19. Newsletter			
20. Off-The-Job Safety			
21. Policy Statement			

* NAW = Needs Additional Work DNE = Does Not Exist

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	<u>Component</u>	<u>OK</u>	<u>NAW*</u>	<u>DNE*</u>
22.	Provide Personal Protective Equipment (PPE)			
23.	Reference Library			
24.	Regulatory Compliance			
25.	Reward Program			
26.	Rules Agreement			
27.	Safety Budget			
28.	Safety Committee			
29.	Safety Data Sheets (SDSs)			
30.	Safety Manual			
31.	Staff Training Programs			
32.	Vendor/Visitor/Contractor Safety			
33.	Waste Disposal Program			
34.				
35.				
36.				
37.				
38.				
39.				
40.				

* NAW = Needs Additional Work DNE = Does Not Exist

Prepared by: The Laboratory Safety Institute.

For assistance with any of these lab safety program components:
call LSI at **508-647-1900** or email **info@labsafetyinstitute.org**.

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Lab Safety Program Review Criteria

Accident Investigation

1. There is a written SOP for accident investigation.
2. Employees have been trained in the SOP procedure.
3. It is clear that the purpose is to understand what happened and determine what steps should be taken to make a reoccurrence less likely.
4. Summaries are posted on the lab safety bulletin board.
5. All accidents are investigated.
6. Investigation reports are maintained for future review.
7. Occurs immediately following the incident.
8. You have a kit filled with all the things you need to do the investigation ready to go.
9. The loop is closed to ensure that all are properly informed.

Accident Reporting

1. There is a written SOP for accident reporting
2. Employees have been trained in the SOP procedure.
3. It is clear that the purpose is to understand what happened and determine What steps should be taken to make a reoccurrence less likely.
4. All witnesses are expected to complete written statements at the time of the accident.
5. The penalty for not reporting is more severe that the penalty for having an accident.
6. Close calls and near misses are explicitly included in the process.
7. Summaries are posted on the lab safety bulletin board.
8. Accident records are maintained and reviewed annually for trends.
9. OSHA 300 Logs are maintained and posted as required.

Awareness Posters

1. Awareness posters are used to stimulate interest in health, safety and environmental issues.
2. Posters are changed monthly.
3. Employees are assigned responsibility for the posters for one year.

Bulletin Board

1. There is a centrally located lab safety bulletin board.
2. There are at least six discreet sections: Accident reports/stories, Off the Job Safety, MSDS (SDS) of the month, Emergency procedure review, CHP training/information review and Vocabulary.
3. Seek volunteers to help manage the sections of the bulletin board.

Chemical Hygiene Officer

1. The organization has a chemical hygiene officer (CHO).
2. The CHO is properly compensated.
3. The CHO's responsibilities are clearly defined in writing.
4. The CHO and the CHO's supervisor have the same understanding about the amount of time to be spent on these duties.

Chemical Hygiene Plan

1. The Chemical Hygiene Plan (CHP) exists.
2. The CHP is readily available.
3. The plan adequately addresses the eight required plan elements.
4. Employees receive training at the time of employment, whenever the nature of the hazards change, and refresher training at least every three years.
5. The training covers the nine required information and training topics.

Chemical Hygiene Plan (at least annually)

1. The CHP is reviewed and evaluated at least annually.
2. The CHP is updated as needed.
3. The plan review involves a group of plan users,
4. Students are included at academic institutions.
5. The reviewers receive a thank you note from a high ranking manager or administrator.
6. A different group of plan users conduct the review each year.
7. Plan language is reviewed whenever there is an accident, close call, or near miss.
8. Over a period of 5-10 years, all plan users are expected to participate in the plan review.

Chemical Inventory

1. There is a chemical inventory
2. The inventory is updated annually
3. Employees share the responsibility for updating the inventory
4. One of the fields on the inventory indicates who is responsible for that particular container.

Condition of Employment

1. Working in a safe, healthy and environmentally responsible manner is a condition of employment.
2. The policy is in writing.
3. The policy is in the personnel/safety manual.
4. The policy is endorsed by the president of the organization.

Here are some of the questions you should ask to determine if your disciplinary policy is appropriate:

1. Is the policy clearly written?
2. Is the policy fair?
3. Do you communicate the policy to your workers so that each person knows what's expected of them?
4. Do you implement the policy and impose discipline on workers who commit safety infractions?
5. Is the policy applied consistently throughout the company in all departments and by all supervisors?
6. Is discipline fair and appropriate to the offense?

Conduct Hazard Determination

1. The employer has designated in writing who is responsible for the completion of the hazard determination (29CFR1910.132).
2. This designation appears in someone's job description.
3. The hazard determination has been completed.
4. The hazard determination has been updated whenever the nature of the hazards change.
5. The written certification has been completed and is available
6. The required employee training has been completed.
7. Records are available documenting the completion of the required training.

Emergency Equipment Testing

1. The testing is completed at least annually.
2. The names of the individuals who are responsible for conducting the testing and their contact information is included in the safety manual.
3. Testing includes fire extinguishers, eyewash fountains, safety showers, first aid kits, alarm systems, detector systems, and chemical fume hoods

Emergency Planning

1. The organization has completed and implemented its emergency action plan (29CFR1910.38).
2. Employees discuss the types of foreseeable emergencies and the procedures for dealing with these emergencies at their staff or group meetings.
3. A written document (paper or online) is available describing these emergency situations and how to respond to them.
4. Drills are conducted regularly to practice responding to these emergency situations.

Hazards Review Process

1. There is a written policy concerning the completion of hazard reviews (hazard Determination)
2. Records are kept of the hazard review.
3. The hazard determination certification letter is available.
4. Employees receive training in the determined hazards.
5. Management participates in the process.
6. The hazard review is conducted whenever the nature of the hazard changes.

Inspections

1. They are conducted monthly.
2. Everyone in the organization participates on a rotating basis.
3. The inspection report includes the name of the individual responsible for the corrective action and the expected completion date.
4. Completed and uncompleted findings are tracked.
5. There is a written policy for the inspection process.
6. The area manager is responsible for the completion.

Management Participation in Inspections

1. Management representatives are regularly involved in the inspection process.
2. The written policy for the inspection process includes management involvement.

Management Training Programs

1. Management personnel receive appropriate safety training concerning their responsibilities in the safety program.
2. The safety manual identifies the required management training.
3. The training occurs at the time of employment and as often thereafter as the employer feels is needed.

New Employee Safety Orientation

1. Provided on the first day
2. Conducted by the immediate supervisor
3. This is in addition to anything that EHS or HR wants/needs to do.
4. There is a written form that both the supervisor and employee sign and date.
5. The form could be one that is a four-part carbonless one. The employee, the supervisor and HR all get copies. The fourth copy goes to the supervisor's boss. He or she is responsible for meeting and greeting the new employee in the first week to underscore the message that EHS matters here.
6. Boss talks with new employee about importance of safety in first week.
7. Policy is in writing.

Newsletter

1. Publish a monthly/quarterly lab safety newsletter.
2. Include reports about accidents, injuries, close calls/near misses.
3. Include something about off-the-job safety and some information resources that are available for free on request.
4. Invite the senior management/administrators to provide 50-100 words on why EHS is important to them and your organization.

Off-The-Job Safety

1. Include issues on off-the-job health and safety in your newsletter, bulletin board, and staff meetings.
2. Encourage employees
3. It's discussed in staff meetings.
4. Accidents, injuries, close calls, and near misses are reported and tracked.

Policy Statement

1. There is a written policy.
2. It's signed and dated by the current President/CEO.
3. It's framed and displayed prominently in the building(s) and safety manuals.
4. The document is enlarged to make an attractive poster for the entrance lobby.
5. Employees are invited to add their signatures to the poster.

Provide Personal Protective Equipment (PPE)

1. All necessary PPE is available.
2. Training is provided for proper use.
3. Use of PPE is enforced by supervisors.
4. All the provisions of 29CFR1910.132 are complied with.
5. PPE policies are in writing.

Reference Library

1. A collection of health and safety reference materials and publications has been developed and maintained.
2. Responsibility has been assigned for maintaining and developing the collection.
3. There's a bibliography showing the titles and locations of available reference materials.
4. The collection is expanded each year.

Regulatory Compliance

1. There's assigned responsibility.
2. There is an annual review to assess the degree of compliance.
3. Federal, state, county, local, professional standards, and best practices are included.

Reward Program

1. A program exists for rewarding good safety performance
2. The program is in writing
3. The program involves senior management
4. Supervisors say "Thank you" for good safety performance
5. The penalty for concealing an accident or injury outweighs the rewards in the program.

Rules Agreement

1. The rules are in writing.
2. Employees and students sign the rules agreement
3. The supervisor has the new employee sign the rules agreement as part of the new employee/student safety orientation.
4. The signature statement has the read, understood, agree, and realize components.
5. A copy of the rules agreement goes to the supervisor's supervisor to remind him or her to speak with the new employee about the importance of safety in the first week.
6. The agreement includes the most important policies that "must" be followed.

Safety Budget

1. Each department has a line item in its budget for safety items.
2. Management has a contingency fund for additional EHS needs.
3. The safety budgeting process is in writing

Safety Committee

1. There is a laboratory safety committee
2. The number of members is 10-20% of the lab employees.
3. There is an alternate for each member.
4. Members serve for one year and then the alternate takes over.
5. Alternates attend when the member is not available
6. The committee meets monthly.
7. Members terms are staggered throughout the year. If the committee had twelve members, one member would change each month.
8. Everyone takes a turn serving on the committee.
9. Academic institutions also include students
10. The committee is described in the safety manual including its responsibilities

Safety Data Sheets (SDSs)

1. MSDSs (SDSs) are readily available for all workplace chemicals.
2. They are the most current information.
3. MSDSs (SDSs) are reviewed prior to using hazardous chemicals.
4. A rank ordered list of the organizations most hazardous chemicals is prepared and the MSDS (SDS) of one of the top 10-15 is reviewed each month as part of a staff meeting.

Safety Manual

1. The manual is in writing.
2. It's easily accessible
3. It's reviewed and evaluated at least annually and updated as needed.
4. The review and evaluation process involves all the covered individuals on a rotating basis.

Staff Training Programs

1. Employees have regular training opportunities.
2. Training is both live and recorded.
3. Staff meetings contain safety training segments.
4. The training program is described in the safety manual and/or training SOP.
5. Training as mandated in state and federal regulations is provided as required.
6. Training is provided at the time of employment, whenever the nature of the hazards change.
7. Training records are retained.

Visitor, Vendor, Contractor Safety

1. There is a safety orientation for visitors, vendors, and contractors.
2. Steps are taken to ensure that visitors, vendors, and contractors do not harm employees.
3. Steps are taken to ensure that visitors, vendors, and contractors are not harmed by employees.
4. The procedures are in writing.
5. Employees receive training in these procedures.
6. Responsibility for supervising visitors, vendors , and contractors is clearly assigned.

Waste Disposal Program

1. Users of hazardous materials (chemical, biological, radioactive) are responsible for understanding and following proper disposal procedures.
2. The procedures are in writing
3. Employees receive training in the procedures.
4. Waste minimization procedures are developed and implemented.
5. There is a designated coordinator for the waste disposal program.

Laboratory Safety Institute's

Five-Diamond Recognition System for Laboratory Safety Programs

Background and Mission Statement

Many laboratories apply for and receive certification from, for example, the FDA, EPA, or NIOSH, to demonstrate that their laboratories follow established protocols and methodologies, and good laboratory practices (GLP). They wish to ensure that their results are as precise and accurate as the current technology permits.

In this same spirit, LSI has developed a process for auditing laboratory safety programs and will now provide recognition for the development and continuing improvement of those programs. Our Five-Diamond Recognition System will allow laboratories to receive both assistance and acknowledgement of achievement as they make progress with lab safety program development.

Our goal is simple:

We want to assist you in creating a more effective lab safety program

More effective safety programs ...

- Identify and control hazards
- Reduce risks
- Prevent accidents, injuries and damage to health and the environment
- Reduce laboratory wastes
- Lower costs of insurance
- Lower employee absences
- Increase morale and productivity
- Increase profits and return surpluses
- Grow a culture of safety

This Five-Diamond Recognition System will indicate that the particular laboratory is increasingly aware of and improving the implementation of safety guidelines recommended by the American Chemical Society, National Research Council, and National Sciences Teachers Association for high schools, colleges, and universities, consensus standards, and regulations established and enforced by OSHA and EPA. This Recognition System would be available to all laboratories world-wide. Participation in this program will indicate a commitment to health, safety and the environment.

Objectives

- Promote improved health, safety, and environmental awareness in all laboratories.
- Encourage compliance with all relevant state and federal regulations.
- Reduce the risk of laboratory accidents and illnesses.
- Promote networking within the participating laboratories and recognition of best practices.

Program Structure

There will be a one to five diamond recognition system. The number of diamonds received will depend on the degree of achievement in the development of the laboratory safety program. The LSI lab safety program review checklist consists of 33 program components and associated evaluation criteria.

One Diamond: The laboratory has become an organizational member of LSI, agreed to participate in the Five-Diamond Recognition System lab safety program evaluation process, and achieved a score of at least 25 out of 100 points.

Two Diamonds: In addition to continuing to meet the preceding criteria, the laboratory has completed its first lab safety program evaluation and achieved a score of at least 50 out of 100 points in their annual lab safety program review.

Three Diamonds: In addition to continuing to meet the preceding criteria, the laboratory has achieved a score of at least 70 out of 100 points.

Four Diamonds: In addition to continuing to meet the preceding criteria, the laboratory has achieved a score of at least 80 out of 100 points in their annual lab safety program review.

Five Diamonds: In addition to continuing to meet the preceding criteria, the laboratory has achieved a score of at least 90 out of 100 points in their annual lab safety program review.

Evaluation

As organizational members of LSI, members receive a 1-2 hour program review teleconference. For some members, this will be sufficient assistance for them to proceed with the program review.

Participating organizations wishing to receive LSI recognition certificates will submit a written report with supporting documentation for our review, evaluation and confirmation of program status. The fee for this review and evaluation will be \$795.00. Some organizations may wish to have on-site consultation assistance with the development of their lab safety programs. LSI's standard consultation fees would apply for these services.

Recognition

LSI will provide a certificate to organization participating in the Five-Diamond Recognition System acknowledging their level of achievement.

LSI will maintain a list of organizations that have achieved four and five diamond recognition. With their permission, the names of these organizations will be included on LSI's Lab Safety Program Honor Role on our website. The list will be updated regularly and publically announced at least once a year.

Getting Started

Order a copy of LSI's publication, Audits and Inspection, \$7.95 plus shipping and handling. It contains 30 years of lab inspection recommendations, the Audit Checklist and evaluation criteria. You can do it yourself. You can't argue it costs too much. If you want LSI's assistance, we recommend that your organization become an LSI Organizational Member. See above.

About the Author

Dr. James Kaufman is President of The Laboratory Safety Institute, President of Kaufman & Associates and former Professor of Chemistry at Curry College. He received his bachelor's degree in chemistry from Tufts University and his doctorate in organic chemistry from WPI.

After two years as a post-doctoral fellow in the WPI Chemical Engineering Department converting garbage into fuel oil, Dr. Kaufman joined the Dow Chemical Company's New England Research Laboratory as a Process Research Chemist. During his four years with Dow, he became increasingly involved in laboratory safety related activities. He authored "Laboratory Safety Guidelines". Originally distributed by Dow, now over two million copies of the widely requested and reprinted brochure are in circulation.

Dr. Kaufman is the founder and president of The Laboratory Safety Institute – an international, non-profit center for safety in science and science education. LSI's lectures and training programs, AV. lending library, and publications help academic institutions throughout the world. LSI is supported by grants from individuals, foundations, companies and professional societies.

LSI conducts seminars, short courses, audits and inspections for schools, colleges, and companies. They also provide advice on regulatory compliance, safety program development, facilities design and editorial commentary on laboratory texts.

Dr. Kaufman is a former, ten-year member of the American Chemical Society's (ACS) Council Committee on Chemical Safety and is past-chairman of the 2,500 member ACS Division of Chemical Health and Safety. He is the author-narrator of the ACS Audio Course on Laboratory Safety and editor of "Waste Disposal at Academic Institutions" from Lewis Publishers. He recorded and edited the "One-Day Laboratory Safety Audio Seminar" and "Two-day Lab Safety Video Course." Most recently, Dr. Kaufman co-edited LSI's publication, "Safety Is Elementary: the new standard for safety in the elementary science classroom" and edited a collection of his essays on lab safety, "Out of My Mind: Reflections on Laboratory Safety."

How You Can Help

The Laboratory Safety Institute gratefully acknowledges the generous support of our sponsors. Since 1978, our major benefactors have been:

ACS Council Committee on Chemical Safety, ACS Division of Chemical Health and Safety, Cabot Corporation Foundation, Carolina Biological Supply Company, Cow Chemical Company, ERLAB Group, Fisher Scientific-EMD, Fisher Safety, Flinn Scientific, HoneywellBull, Lab Safety Supply, National Safety Council Foundation for Safety and Health, Northeastern Section of ACS, Pfizer Corporation, Polaroid Foundation, Union Carbide, and VWR.

As we expand both the number and scope of our services, we need the voluntary support of those who enjoy and appreciate our efforts. Furthermore, it is vital that our professional and corporate supporters see their commitments to the Laboratory Safety Institute matched by the enthusiastic financial support of individuals. May we invite you to help by becoming a "Friend of the Laboratory Safety Institute?"

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About the Laboratory Safety Institute

The Laboratory Safety Institute is a non-profit organization whose mission is to make health and safety an integral and important part of science education, work, and life. LSI provides training, consultations, publications, audio-visual materials, and responds to requests for information.

LSI was founded in 1978 as The Laboratory Safety Workshop by James A. Kaufman, Ph.D. His experience working for the Dow Chemical Company convinced him that schools and colleges were not doing enough to encourage health and safety. Studies by LSI and others have shown the accident rate at schools and colleges to be 100 to 1000 times that of Dow and DuPont.

Since 1978, LSI 100,000 science educators and scientists. His brand of safety training is a unique blend of technical information, practical and inexpensive solutions, humor, and accounts of accidents drawn from a collection of over 5,000 examples.

LSI has produced two lab safety, training audio-visuals: "The One-Day Lab Safety Audio Course" (5.5 hours) and "The Two-day Lab Safety Video Short Course" (eight, 90-minute VHS Cassettes)

LSI publishes a newsletter: "Speaking of Safety".

LSI offers lectures, seminars, short courses, webinars, audit and inspections, and regulatory compliance and safety program development consultations throughout the world for academic, industrial, medical, and government laboratories.

LSI operates an Internet discussion list, LABSAFETY-L, and maintains an informative website (<http://www.labsafety.org>)

LSI is supported by corporate sponsors, agencies, associations, generous individuals, and its members. Members receive a newsletter subscription, use of the audio-visual lending library without rental fee, a 10% discount on most LSI publications, a 5% discount on training and consultation services, and use of the Toll Free, 24-hour Lab Safety Information Hotline. Organizational members also receive a lab safety program review consultation conference call.

The Journal of Chemical Education called The Laboratory Safety Institute "A national resource for safety conscious science teachers". If you would like to help support the efforts of The Laboratory Safety Institute: (1) Subscribe to "Speaking of Safety", (2) Become a member of LSI (partially tax deductible), and (3) Make a contribution (tax deductible).

Free copies of our "Laboratory Safety Guidelines", Publications List, Audio-Visual Lending Library List, and Introduction to The Laboratory Safety Institute (containing seminar schedule and membership information) are available on request. More than three million copies (in nine languages) have been distributed. It is recommended in the appendix "B" of the OSHA lab standard and included, in part, in appendix "A" of the newest revision of the regulation.

For more information about LSI, contact:

The Laboratory Safety Institute, 192 Worcester Street, Natick, MA 01760

Tel: 508-647-1900; Fax: 508-647-0062, Email: info@labsafetyinstitute.org

www.LabSafetyInstitute.org

World Safety Conference

WorldSafety is a conference that is ideal for anyone with an interest in laboratory and chemical safety. This is a chance to hear from leading speakers from around the world, to network with other safety professionals and contribute to an education discussion on how we can improve safety and ensure all take on a safety first culture. Each year this conference is held in a different country.

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To register or for more information contact:

The Laboratory Safety Institute

192 Worcester Street
Natick, MA 01760

Phone: (508) 647-1900

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The programs vary in length from one hour to several days. They can be customized to meet the needs of your organization. More than 50 topics are available.

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