PROPER LABELING OF HAZARDOUS MATERIALS IN INDUSTRY

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For many years the Manufacturing Chemists Association (MCA) has periodically published a revised edition of Manual L-1[1], *Guide to Precautionary Labeling Of Hazardous Chemicals*. The latest edition, the Seventh, was published in 1970. The first edition was published in 1945.

Manual L-1 has become the "Bible" for proper labeling of hazardous chemicals. Indeed, the labeling required by regulations promulgated under the authority of the Federal Hazardous Substances Act, which applies to hazardous household products, are largely patterned along the lines suggested by the MCA *Guide*. The American Petroleum Institute, in its *API Bulletin on Precautionary Labels*[2] also suggests a labeling system very similar to that recommended by MCA.

In recent years, there has been a proliferation of statutes and regulations at the state level. At this time, insofar as can be determined, at least twelve states have statutes on labeling industrial chemicals. Those of California, Oregon, New York, New Jersey, Illinois, Massachusetts, Kentucky, Minnesota, Nevada, and Colorado were discussed recently in an article by McCarl.[3] Since the publication of McCarl's article, Wisconsin and Tennessee have passed labeling laws.

One of the most comprehensive regulations is that published in California's *General Industry Safety Orders*.[4] California and the other states mentioned by McCarl follow the MCA Manual L-1 in general, and several refer to it as the guide which is to be used. We have no details as yet on the Tennessee and Wisconsin statutes.

Contrary to the opinion of many people, there is no Federal statute governing labeling of hazardous industrial chemicals. The Federal Hazardous Substances Act and regulations promulgated thereunder specifically cover hazardous substances intended or packaged in a form suitable for use in the household;[5] the Act does not apply to industrial situations or to industrial supplies taken into the home.

Sooner or later there may be a Federal statute on labeling industrial chemicals. It might supersede those of other governmental jurisdictions, thus attaining uniformity country-wide.

Importance of Proper Labels

In general, there are at least three broad reasons for labeling hazardous substances.

1. *Informs User.* A proper label informs safety engineers, supervisors, and other employees; safe handling procedures and preparation for emergencies can be devised.

2. *Lessens the Likelihood of Third Party Liability.* We are living in an age of consumerism. It is not at all uncommon for an individual to claim he has been injured by a product he uses. This extends beyond household products, and includes those used in industry. After all, an employee can collect compensation from his own employer only as awards are established by schedule in the various states. On the other hand, he can make the distributor or manufacturer (or both) party to a lawsuit. The amount of damages awarded depends on the court. Monetarily, awards often far exceed what can be recovered under workmen's compensation regulations.

3. *Prevent Overlabeling.* Overlabeling is probably worse than no labeling. It is like crying, "Wolf." Soon no one pays any attention to labels at all.

Overlabeling may cause problems in the factory. We know of an instance where workmen refused to use a chemical because of some statements on the label. Investigation of the toxic properties of the substance revealed a clear-cut case of overlabeling. The workmen would *not* accept reassurances that the hazards were not as severe as stated on the label; they did accept the manufacturer's label as authoritative, which it should have been.

It is the first reason—informing the user—which will comprise the balance of this discussion, and on which emphasis is placed.

The provisions of Manual L-1, if followed, result in labels which are proper and which are very informative to anyone who understands the principles involved. If you do not have a copy of the latest edition, it is strongly suggested that you acquire one and study it in detail. Having done so, you will be able to interpret to your employees what labels really mean. In recent years more and more manufacturers are labeling hazardous substances according to this manual, and it appears quite likely, in view of several state regulations already in effect and labeling presently required under the Federal Hazardous Substances Act, that should a Federal law be passed, regulations promulgated thereunder would closely follow the MCA recommendations.

Label Content

As stated previously, if you understand the principles involved, the degree of hazard and precautions which should be taken become clear. Good labels contain the following essential elements:

1. *Name of Product.* The name of the product is important information for the safety of handlers and users. It is preferable that the chemical name be used. If the product is a mixture, those components which contribute substantially to the hazard should be identified. A non-descriptive code designation or trade name should not be used as the only identification of a hazardous chemical. If the complete chemical name is not shown, the label should at least clearly state the type of chemical, e.g., "corrosive acid," "lead compound." In any case, identification should be adequate to permit selection of proper treatment in case of exposure.

2. *Signal Word.* The signal word is one of the most important elements of the label. It is intended to draw attention to the presence of hazard and to indicate the degree of severity. In the order of diminishing severity of hazard, the signal words recommended are: DANGER! WARNING! CAUTION! Degree of severity can be expressed only in relative terms. DANGER! is the strongest of the three words and indicates a severe hazard or hazards. CAUTION! is used for those compounds presenting the least serious hazards. WARNING! is intermediate between the others. The signal word is in capital letters of appropriate type size. A label contains only one of the three signal words. The one to be used is determined by the most severe hazard.

3. *Statement of Hazards.* This statement gives notice of the hazards that are present in connection with the customary or reasonably foreseeable handling or use of the product. Many chemical products will present more than one type of hazard. Appropriate statements for each significant one should be included on the label. In general, the most serious hazard should be stated first. For example: EXTREMELY FLAMMABLE. MAY BE FATAL IF SWALLOWED OR ABSORBED THROUGH THE SKIN. Note that the statement of hazards is also in capital letters of an appropriate size.

4. *Precautionary Measures.* These instructions are intended to supplement the statement of hazards by setting forth briefly the measures to be taken to avoid injury or damage from stated hazards, for example: "Keep away from heat, sparks, and open flame," and, "Avoid breathing dust." In some cases, the total hazard of a product, while justifying one or more precautionary measures, may be of such order as to require no statement of hazard on the label. For example, no statement of hazard is required because of the toxicity of butyl alcohol, but the precautionary measure, "Avoid prolonged or repeated breathing of vapor," is suggested.

5. *Instructions in Case of Contact or Exposure.* The primary purpose of precautionary labeling is to prevent injury or damage. However, instructions in case of contact or exposure may be included in those instances where the results of contact or exposure are severe and immediate treatment is highly desirable, and where simple remedial measures may be taken safely before medical assistance is available.

First aid instructions are limited to recognized procedures based on simple methods and commonly available materials. Instructions for strictly medical treatment should be included when specifically required by law or indicated by special circumstances.

Because of the serious and lasting effects that may result from eye injuries, a recommendation to get medical attention should accompany any specific instructions directed to treatment of the eyes. For example: "FIRST AID: In case of contact, immedi-

ately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before reuse. Discard contaminated shoes."

6. *Antidotes and Notes to Physicians.* Specific therapeutic measures which can be taken before the physician arrives may be presented under the heading "Antidote." Example for Cyanides— "Antidote: Always have on hand a cyanide first aid kit. Break an amyl nitrite pearl in a cloth and hold lightly under nose for 15 seconds. Repeat five times at 15-second intervals. Call a physician."

It may, in certain cases, be desirable to acquaint the physician with an antidote or with a specific form of medical management through a note to physicians on the label. Obviously, such information must be written by a physician for physicians. Example for Soluble Arsenic Compounds—"Note to Physicians: If swallowed, give gastric lavage followed by saline cathartic. Force fluids. In all cases, give dimercaprol (BAL) in recommended dosages."

7. *Instructions in Case of Fire, Spill, or Leak.* Accident instructions should be as simple and brief as possible and should advise the use of suitable materials for control. They should provide persons who handle containers during shipment and storage with appropriate instructions for confining and extinguishing fires and for cleaning up spills or leaks. This information on labels affixed to containers will insure reference and provide opportunity to plan for emergencies that might occur during storage and use of the product.

Such instructions may be used as separate labels or may be a part of the precautionary label text. Examples: "In case of fire, use water, dry chemical, or CO_2." "In case of fire, soak with water." "Flush spill area with water spray."

8. *Instructions for Container Handling and Storage.* Care should always be exercised in handling and storing containers of hazardous chemicals in metal drums, glass carboys, cylinders, fiber drums, aerosol containers, etc., and in removing the contents. Applicable phrases should be used. These may also be used either as separate labels or as a part of the precautionary label text. Examples: "Keep closure up to prevent leakage." "Replace closure after each withdrawal." "Do not drop onto, or slide across sharp objects." "Do not puncture or incinerate container."

Use of "Poison" and Skull & Crossbones

The use of the word "Poison" and the skull & crossbones on a label should be limited to those cases where the product is highly toxic as defined in Manual L-1, or where such use is prescribed by law. When used, this legend should *not* take the place of the signal word.

Summary

In conclusion, let's look at the label for an imaginary chemical synthesized for the purpose of this discussion. The chemical is benzoacetaminocarbonamide. You will see that it is a very hazardous chemical. The following are the eight elements of the label:

1. *Name*—Benzoacetaminocarbonamide.

2. *Signal Word*—DANGER!

3. *Statement of Hazards*—MAY BE FATAL IF INHALED, SWALLOWED, OR ABSORBED THROUGH THE SKIN. CAUSES EYE IRRITATION. COMBUSTIBLE.

4. *Precautionary Measures*—Do not breathe vapor. Keep container closed. Use only with adequate ventilation. Do not get in eyes, on skin, on clothing. Wash thoroughly after handling. Keep away from heat and open flame.

5. *Instructions in Case of Contact or Exposure*—POISON—Call a physician—FIRST AID: If inhaled, remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Discard contaminated shoes. If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salt water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person.

6. *Note to Physicians*—Warning symptoms are blurred vision, nausea, and abdominal cramps. There is no specific antidote. Never give tranquilizers. Treat symptomatically.

7. *Instructions in Case of Fire, Spill, or Leak*—In case of fire, use water, dry chemi-

cal or CO_2. In case of spill or leak, flush spill area with water spray.

8. *Instructions for Container Handling and Storage*—Keep closure up to prevent leakage. Do not drop or slide across sharp projection. Drum must not be washed out or used for other purposes.

REFERENCES

1. *Manual L-1.* Manufacturing Chemists Assoc., Washington, D. C.
2. *API Bulletin 2511.* 2nd Ed., March 1964. American Petroleum Institute. Division of Science & Technology. New York, N. Y.
3. McCarl, G. Warren; "Present Status of Labeling of Materials in Industry," *Amer. Ind. Hyg. Assoc. J. 30:510* (1960)
4. *General Industry Safety Orders,* California Administrative Code, Title 8, Industrial Relations, Sacramento, Calif.
5. 21 CFR 191.1(c), *Hazardous Substances.*

THE FEDERAL GOVERNMENT—PARTNER IN SAFETY

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The Federal government is currently more involved in safety activities in this country than you probably realize and, apparently, in the near future is going to be even more involved. We have had, for some time, some considerable interest in safety. We have had the Walsh-Healey Act since 1936. That is not very new. Safety requirements under that Act affect, at any given time, something like 75,000 plants. About 250,000 contracts are awarded annually. The contracts cover, at any given time about 27,000 employees in those 75,000 plants. We have also the McNamara-O'Hara Service Contract Act which applies to contracts for personal services to the government in excess of $2,500. That affects about 25,000 work locations and about 6,000,000 employees. We have the safety and health aspects of the Longshoremen's and Harbor Workers' Compensation Act which covers about 200,000 employees on the waterfront loading and unloading ships; building, repairing, and tearing down ships; and doing various types of construction work on the navigable waters. Since August 1969 we have had the Construction Safety Act, Public Law 91-54, which we estimate will apply at about 200,000 construction sites and protect about 2,300,000 employees. It applies to construction which is financed or assisted by the Federal government. We have the Vocational Rehabilitation Act which protects people in sheltered workshops who, for one reason or another, are learning a new trade or occupation in a non-commercial environment, and the Arts and Humanities Act which is to protect the casts and other people who work on performances financed or assisted by the Federal government. That one is unusual because we are trying to do something about the safety of the performers and stagehands and such. Prior to the Arts and Humanities Act we have had quite a lot of laws and rules and regulations all designed for the safety of the audience. As far as the backstage people were concerned, you dropped that asbestos curtain and let them take care of themselves as best they could.

We have an idea that if we make a regulation under any one of these Acts it should apply equally to the same subject matter when it is regulated by any of the others. In other words, we are going to try to make the regulation uniform and, at the present, the regulations under the Walsh-Healey, McNamara-O'Hara, Arts and Humanities, and Vocation Rehabilitation Acts are identical. The Longshoremen's and Harbor Workers' Act regulations are a little bit different because the enabling part of the law is written differently, but they will gradually be changed until they will eventually be substantially identical with those under the other Acts. We have no regulations yet under the Construction Safety Act. We are in the process of writing them.

There will, eventually, be regulations under a general Safety and Health Act, and