WHY A SAFETY PROGRAM, Second Edition

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A FEW MONTHS ago the Chicago office of the American Oil Chemists' Society received a letter asking help about the storing of oil cake meal. The organization asking for information had been called on to help settle a claim resulting from a fire. One question was this: "Is oil meal subject to spontaneous combustion?". Answer that question either way you choose, yes or no. Are you prepared to defend your position? Let's look at it another way. If you can state some conditions, isn't it easier for you to defend your position? But do you think you can state enough conditions adequately to protect your stand before a mighty inquisitive lawyer? And further remember that your position, if successfully defended, will probably result in a financial benefit to your client. With it all some one must pay, and some one else must suffer a loss.

How much better it would have been, had you been able to instruct your superiors or client how to store the meal properly and avoid a loss. No one can doubt that makers, dealers, or users of oil meal must at some time store or warehouse the product. I have recently talked to people who have done work on causes of spontaneous combustion and learned that conditions can be set up to avoid it. A section of the Technical Safety Committee has this under study.

Do you see how what appears to be a problem of safety is in reality one of economics? It could result in something like this, that part of the manufacture would call for packing (bagging) at not more than 10% moisture and at not more than atmosphere temperature, storing at not more than 20 bags high and allowing aisles every eight feet for air circulation. That may seem over-simplified, but it pays to learn the influencing factors on storing oil meal by exchanging experiences or maybe setting up and conducting tests of your own, even sharing test work and the results.

IT IS NOT an easy job to keep safety modern and up to date. New products, new processes, new materials, and new methods pose new problems for safety. And no one can doubt the increasing number of these new things. The use of liquid ammonia as a fertilizer has so rapidly become widespread that many have no doubt been asked about some safety feature. Some have heard of an explosion from escaping ammonia fumes. There was one a few months ago. Ammonia refining likewise poses new problems in safety. Miscella refining requires that centrifugals be made vapor-tight and explosion-proof. A most helpful way to keep safety modern is to bring problems quickly to the front and to share experiences.

An example of helping fill the cash register as safety is improved came up as we studied N.F.P.A. Solvent-Extraction Plant Rules Number 36. Sharing in that study were not only operators but owners, builders, equipment designers, equipment suppliers, and insurance representatives. During that study many items of controversy were resolved so that, in designing, building, and operating, costly errors will be avoided.

Let us not pat ourselves on the back for some safety accomplishment when in reality we only did a much-needed maintenance and housekeeping correction. An oil leak causing a fall, even a broken bone, is primarily maintenance neglect. A fire from excess dust is primarily housekeeping. If the safety man is held responsible, has he been given authority? This is a touchy area and needs careful consideration.

On the subject of additives, under the Food and Drug Administration Act, three lists now exist, white, grey, and black so that purveyors, dealers, and users find themselves faced with new problems. As a result, not only safety but sanitation and health policemen have added responsibilities. Users of certain hormones must take a new look. Are suppliers correct in their claims and directions for use? also are users over-stepping their bounds when they deviate from recommended use? Insecticides, defoliants, and similarly classified materials have been forceably brought to the attention of all to use and approved methods?

People who deal in grain from the farmer to the processor know the attitude of Uncle Sam in regard to rats, mice, cockroaches, etc. Droppings and other evidence of their presence are considered contamination and, in extreme cases, can result in shut-down. The Technical Safety Committee is studying the over-all picture to see where it can help.

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ADDENDUM I

Test Your Safety I.Q. on Explosion Hazards

	True	False
1. Of all tramp material (steel, aluminum, stone, copper, concrete, etc.) we get in conveyors, hoppers, steel is the most hazardous from a sparking standpoint.	☐	☐
2. Low-moisture starches will explode more easily (lower ignition temperature) than high-moisture starches.	☐	☐
3. The particle size of dust has an important bearing on the ignition temperature and the pressure of the explosion.	☐	☐
4. The jet effect of steam escaping from a leak or dust escaping from a conveyor generates static electricity.	☐	☐
5. The basic difference between a flash fire and an explosion is that an explosion covers a larger area.	☐	☐
6. The critical temperature for most of our products that are considered explosive is around 715° F.	☐	☐
7. Static electricity is generated by friction.	☐	☐
8. Corn oil is not a spontaneous ignition-hazard.	☐	☐
9. Dust-proof light globes can sustain an explosion within the fixture.	☐	☐
10. A humid atmosphere lessens the chances of an explosion of a solvent air-mixture.	☐	☐
11. In pumping a nonconductive solvent from one tank to another, electrical bonding of all pieces of equipment is positive insurance against a static spark.	☐	☐
12. The best place to wipe static off a belt with a static brush is half way between the driven pulley and the drive pulley.	☐	☐
13. Steam cleaning can generate static electricity in the air.	☐	☐
14. It is easy to eliminate the generation of static but hard to eliminate the accumulation of it.	☐	☐
15. Explosion-proof electrical equipment is overdesigned; one screw, for example, in a panel box can be a little loose, and the fixture will nevertheless contain an explosion.	☐	☐

(See page 25 for answers)

ADDENDUM II

Safety Literature Available from National Safety Council, 425 N. Michigan Avenue, Chicago, Illinois

Administrative Material

Accident Prevention Manual
Handbook of Accident Prevention
Safety Instruction Cards
Safe Practices Pamphlets

Supervisor Training Material

Supervisor's Safety Manual
Psychology of Safety in Supervision Series
Five-Minute Safety Talks for Foremen
Industrial Supervision Magazine

Employee Training

The Safe Worker Pamphlet
Photoscripts Pamphlets
Safety Graphs

Other Available Material

Safety Management, by Simonds and Grimeldi
(Richard D. Irwin Inc., Homewood, Ill.)
Safety in the Chemical Laboratory
(Manufacturing Chemists' Association Inc., Washington, D.C.)
Chemical Safety Supervision, by Joseph Guelich
(Reinhold Publishing Corporation, New York)
Manual of Accident Prevention in Construction
(The Associated General Contractors of America Inc., Washington, D.C.)

Safety I.Q. Answers

1. False. Stone or concrete containing silica gives a hotter spark than steel.
2. False. Moisture content of starch has little bearing on its ignition temperature.
3. True. Fines can be suspended in air more readily. Fines mix in air more uniformly. Fines remain in suspension longer. Fines per unit weight have greater surface area, can absorb more oxygen, can develop a greater static charge. These result in lower ignition temperature, lower amount of electric energy to ignite and requires less, by weight, to make an explosive mixture.
4. True.
5. False. Pressure caused by confinement is the basic difference.
6. False. Starch feed or meal left lying in layers where it is continuously heated for a long time, 300° F., is all that is necessary to start a breakdown, and it will emberize especially if exposed to air. Most dryers, cookers, hot-bearing and other friction sources reach that temperature.
7. False. It is generated by separation of surfaces, like a belt from a pulley.
8. False. As with many similar products, spontaneous combustion will happen when corn oil is in contact with cellulose materials like rags, paper, sawdust, feed, meal, etc.
9. False. A tight dust-proof globe will prevent dust from entering. The purpose of the globe is to dissipate the heat of the light bulb to a safe temperature. An oversized bulb will defeat the purpose.
10. False. Ignition temperature of most materials is lower in a humid atmosphere.
11. False. Bonding is not enough, it should also be grounded.
12. False. The most effective place for the brush is 6 in. from the off-going side of each pulley.
13. True.
14. False. The opposite is true. Accumulation can easily be prevented by bonding and grounding.
15. False.

Fatty Acids

July production of fatty acids classified under Categories #1 to #12 totalled 27.0 million pounds, down seasonally from May by some 22.4 million pounds and down 6.3 million pounds from July 1959, according to the Fatty Acid Producers' Council, New York. Production of tall oil fatty acids as defined by Category #13 was 5.0 million pounds compared to 8.1 million pounds in June.

Disposition of all fatty acids, except Category #13, amounted to 30.5 million pounds compared to 47.2 million pounds in June 1960, and 38.0 million pounds in July last year. For Category #13 disposition totalled 6.5 million pounds. Disposition, as a total of all types now in the census, was 37.0 million pounds in July *versus* 54.7 million pounds the previous month.

Finished goods inventories for Categories #1 to #12 were 45.2 million pounds on July 31, down 1.9 million pounds from the June 30 level. Work-in-process stocks, as a total for all categories, was 18.3 million pounds, down 1.5 million pounds from the end of June.

Desmond J. New (1956), formerly with General Mills in Minneapolis, has gone to Durkee Famous Foods Inc. in Chicago, Ill.

Billy A. Presson (1957), formerly manager of C. and T. Refinery Inc., Charlotte, N. C., has gone to the C. F. Sauer Company, Richmond, Va.