

Ammonia . . . Food . . . Safety

Two important factors: ammonia's essentiality in food production and essentiality of safety in ammonia production, emphasized by the author in remarks at 1975 Boston symposium

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Ammonia is *the* key to feeding this globe. With no real slowdown of new mouths to feed, with not only the growing hopes, indeed the *demand* for a better diet food and feed grain output must increase. It can hardly escape the thinking man that countries such as Russia or China now routinely turn to the outside for these necessities. In a central planned economy as recently as several years ago this would have been unheard of. Simplistically, the past has been explained, "They just tightened their belt." A wasp waist policy is no longer followed and thus the question, "Why?" First, unrest over a thin or very expensive diet could well trigger off an internal political holocaust.

Poland's change of leadership was brought on by this syndrome and the results *were* noticed in the Eastern Bloc. The expectations of these millions and millions of people of three meals a day give their leadership sleepless nights.

Within the Eastern Bloc but not yet in China the corollary of not just three meals a day but one of higher protein (not to mention palatability) is at hand. The Soviets, for example, are making a major effort to expand their livestock industry. It is axiomatic that they must have a steady, large supply of feedgrains to make this effort pay off.

Supplying food a moral obligation

I have not touched on the problems of India, Bangladesh—the so-called emerging nations. Here we are confronted with a flood tide of a growing population. Over the foreseeable future they will be dependent on others for food, feedgrains and fertilizer. Their future is bleak, but it would seem inconceivable that the rest of the world will turn its back on these unfortunates. We will feed them, in emergencies, from our developed nations' adequate supplies, with the taxpayer bearing the heavy burden.

The chemical industry is already feeling this surge of either need or rising expectation. Both Russia and China are embarking upon vast nitrogen plant expansions. So is the U.S.A. with tonnage scheduled to rise from the current 17.5 million tons to 24-25 million in 1978. Several ammonia plants are not yet definite due to indefinite feed stock supplies. An indecisive Congress and lack of national policy on natural gas is no help either, not only with these needed plants but with the U.S.A. farm role in exports as well.

Make no mistake. Regardless of one's personal feelings about "grain deals," *export we must*. As the United States grows more and more dependent upon imported raw materials—such as bauxite, iron ore, oil, and a growing list of necessities—we have to pay for them in a sound currency. No nation can even come close to matching our farm production—export ability. It isn't even a matter of our capitalizing on this inherent advantage—we have no alternative. Thus, our fertilizer producers face a known challenge with unknown input quantities.

Our ammonia plants of the future will be: 1) ever larger, 2) not too far removed from current techniques, and 3) more and more heat efficient. We are at least 10 years away from naphtha or coal feed stock barring a catastrophic drop in gas supply.

Changes will come in the environmental field. Whether it be called "safety" or "environmental" there is no stopping the inexorable advance of bureaucracy, regulations, rules, new laws, or the Sierra Club types within the Congress itself. The chemical engineer of the future will concern himself more and more with this aspect than in the design and operation of the facility. Already we see what is ahead in the area of "zero discharge" in the water. Undoubtedly we'll see that same goal some day in the emission field. It will be, "Damn the expense, full engineering ahead!"

Worker safety as important as environment

The newest area of concern is not just the environment overall, but the surroundings of the worker. Restated, the focus will be on a legal expression taken from the Railway Labor Act: namely, the employer has a legal obligation to provide the worker a "safe place in which to work."

Suffice it to say, there are thousands of legal cases over what constitutes a safe place. You can be sure that my fellow lawyers will continue to sue over that one. The present interpretation of Workmens Compensation and other safety laws are well nigh being construed to mean that an employer shall be absolutely liable under any circumstance in which the employee claims to have been injured.

This absolute liability means that the employer should have foreseen mishaps not otherwise visible than by Mt. Palomar's mighty telescope. A classic example of this situation is in the recent unfortunate polyvinyl chloride mishaps. As far as the then state of the arts was con-

cerned these plants were satisfactory; however, with hindsight, we know they were not.

Again, several bills are moving through the Congress relating to toxic substances and before the end of this Congress one will be enacted into law. Unless I miss my guess it will ultimately concern us all from the production side.

Everyone is going to become very involved once the dispute between the Environmental Protection Agency (EPA) and the Occupational Safety and Health Act (OSHA) enforcers is finally resolved. At issue is the question of sound levels. The fertilizer industry could probably live with OSHA's proposed 90-decibel level if exposure to that level was on a time-weighted average. Should EPA prevail on its proposed lower limit, then our ammonia plants are going to be in serious, and needlessly expensive, trouble.

It is the workers' health rather than trauma that is rapidly becoming a problem that will strain our best talents. Ladders, lighting, belt guards, and the like will remain important. However, very close scrutiny and tolerances are here now (or soon will be) on noise, air quality, internal leaks etc., that *could* cause harm to in-plant personnel.

Bureaucracy's methods rather less than useful

To give a preview of what we are about to face I should like to use the casebook method. This is a classic in bureaucratic fumbling. It is not, however, a laughing matter, because this is ahead of everyone concerned with ammonia production plant safety.

The ammonia industry, beginning about 1950, was well aware of the several accidents which had occurred in the field due to lack of proper safety procedures. A trade association was formed for the sole purpose of protecting this infant but growing industry. In 1953, the industry published its first ammonia safety standard—and let me emphasize, the standard specifically *precludes* production plants.

Even then it was recognized that the real need for safety lay beyond the point of production. In addition, it was recognized that all the safety standards in existence could not force an industry to be safe. Hence, a rigorous training program began which we will allude to later.

The safety standard, as first published in 1953, has been referenced by the early leaders in the industry as the key to industry's safety success. The standard was revised as technology within industry dictated. As time progressed, the need for regulations at the state level became clearly known. This standard was simply a guide for an industry which desired to become safe.

This was long before the Federal government ever dreamed of entering the safety business! Several states which adopted this safety standard as the background of their safety regulations have warded off the Federal program by taking measures within their own states, thus tenaciously adhering to that which has been most satisfactory. Several revisions of the original standard were published, keeping pace with the technological changes within the industry.

In 1968, the industry decided to seek the recognition of the American National Standards by means of ANSI's

consensus procedure. This "stamp of approval" was awarded in 1972—slightly too late for the proclamation which came forth by means of action within the Congress of the United States. The Secretary of Labor, bound by the acts of Congress, published, in many instances, obsolete American National Standards—one of which, alas, was anhydrous ammonia.

Since this promulgation on May 29, 1971, The Fertilizer Institute, its staff or committeemen, have met more than 50 times with representatives of the Federal government, pleading for updating of ammonia safety regulations. To date, no result. However, promises abound!

We can only surmise that the reason for "no action" is simply bureaucratic fumble fingers. The Fertilizer Institute and its member companies, in conjunction with its Ammonia Standards Committee, has presented before the Secretary of Labor a proven workable blueprint—yet, no action. This blueprint is in the form of an updated American National Standard for the Storage and Handling of Anhydrous Ammonia.

We, being more than familiar with Federal action (or inaction), understand the bureaucratic red tape, yet our patience grows short. Why does a matter of this significance go unresolved with the answer so clearly defined? Why has it not long since come to a conclusion?

Safe habits need to be learned, not forced

No amount of Federal or State regulations, in the opinion of the Institute, can cover the employee responsibility for it is the most important of all—*safety is a habit* and, thus, *training is a necessity*. Training not only is a necessity but it is *required* under the OSHA act, and needless to say, is the most difficult to get a firm grip on.

This area, we must admit, falls beyond the responsibility of the designing engineer. We say "you can make it safe, but you can't make it damn safe!" We have little or no advice for the designer, thinking in terms of the employee. With one possible exception—the oldtimers have said the efforts in the standards area are those that have made the industry what it is today.

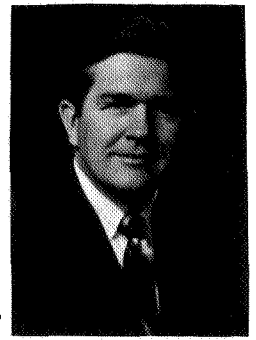
In other words, if anhydrous ammonia had been widely known as "trymetholterrible" with no cure, I would not now be discussing these problems. Cures were had. Problems were recognized. Solutions were devised. Hence, an industry through the efforts and thoughts of many people forced it to happen. The advice in this area is for engineers to participate in standards-writing activity, guiding industry regardless of how picayune the subjects may seem to be.

Management's responsibility is altogether a different proposition for the simple reason that, almost without exception, responsibility by federal, state and local law lays it on the owner/manager. Always, in a lawsuit, one of the major questions before the judicial is simple: "Was the employee properly informed of the hazards of his job?" Therefore, it is vital that the designing engineer and management be intimately familiar before ground is ever broken with all state, federal and local ordinances—simply for his own protection. He must know OSHA construction standard requirements and all of the many regulations dealing not only with safety, but particularly those of health. His knowledge can only re-

sult in benefiting the employee.

I have told you little about safety which you didn't know except that hopefully your thinking has been sharpened on the *must* proposition of plants being designed with the workers' health as well as safety.

It is well to remember that the long term future of our industry looks very bright. We will encounter problems on temporary over-production, gas supply problems, and fiendish challenges in air, water, health and safety design. But there is no doubt we'll solve these, vexatious though they may be. For we must. #



E.M. Wheeler

DISCUSSION

Q. I have a question for a lawyer since all our law makers are lawyers also. Do you think there's any possibility in your estimation, that we'll ever get a uniform energy program out of Congress, or how many years do we have to go or do we just have to go on the way we are right now?

WHEELER: We drafted some language about a year ago to put the whole energy package in the Federal Energy Administration's office. We thought it was stupid that the Federal Power Commission was restricting companies on the use of the fuel but had no authority to allocate different fuels to make up the difference. If the Federal Power Commission turns off the gas under a boiler,

they do not then have the authority to allocate that company oil, coal, or anything else.

And we couldn't see how you were going to have a unified energy policy in the country. What's even worse, and it's no secret in Washington, the Federal Power Commission and the Federal Energy Administration won't talk to one another because of the bureaucratic jealousy involved. But I do not see the Congress going ahead with a unified program; I think they are going to stay with the baling wire, bandaid situation we have right now, ludicrous as it may sound. Ludicrous does not necessarily bother the Congress of the United States. I think on the basis it takes one to know one.