

ANSWERING THE PUBLIC ISSUES ON LLW DISPOSAL

Eugene N. Cramer
Southern California Edison
P. O. Box 800
Rosemead, CA 91770

SUMMARY

Most of the past public communication has been on high-level radioactive waste, so that the considerable differences should be noted: including source, predictability, material, transport, hazard, and regulatory system. In California, state laws require a developer to be chosen by August 28, 1984 to begin the exploration and regulatory process. The California Radioactive Materials Management Forum, representing the producers of radioactive low-level waste, have scoped a multi-year public education program. As this begins, the public issues would appear to be: 1. Who needs this waste? Stop making it. 2. Radiation is so new and freaky, the least little bit will cause cancer! 3. What happens when some of this low-level waste is in a highway crash? 4. Won't it leak out of the burial ground and get into the drinking water? 5. Not in my backyard!!

Most of these issues are quite familiar, appearing in news media headlines and stories almost regardless of waste type.

DIFFERENCES BETWEEN HLW AND LLW

To the person only familiar with the past problems of resolving the regulatory and political aspects of nuclear power reactor high-level waste disposal, the world of low-level waste disposal is considerably different. Consider the following aspects.

Sources

HLW presently comes only as spent fuel assemblies from a limited number of nuclear power reactors. LLW comes from a wide range of hospitals, universities, individuals, research laboratories, medical clinics, industries, reactors and brokers.

Material

HLW is locked into a ceramic matrix which is neatly packaged in sealed metal tubes. LLW is found in and on plastics, fabrics, metals, liquids; it may be animal wastes and carcasses, and human fecal material. LLW may be mixed with hazardous chemicals and biological agents.

Predictability

HLW results from somewhat predictable electric power generation. LLW results from many different end uses highly dependent on product acceptance. New techniques supplant old uses. One or two facility cleanup campaigns may result in the equivalent of a year or two normal wastes.^a

Transport

HLW has the marvelous Sandia Crash Test movies. LLW is usually transported in ordinary trucks, packed in 55 gallon drums.

a. In a November 1983 Philadelphia Inquirer series on radioactive waste disposal, largely negative in tone, the reporters made much of the Federal Government's fairly accurate statistics on annual production of U.S. cigarettes, beer, apples, peanuts and wheat -- and castigated officials' inability to explain why LLW annual statistics were up and down.

This is a classic case of apples vs. oranges -- where a primary product (sometimes taxable) is compared to a residue. A fairer comparison would be with the annual amount of wheat left in the field, spilled in the bakery, discarded half-eaten in the home ...

Hazard

HLW is intensely radioactive for a few years. LLW is frequently created by good industrial hygienic practice rather than its own hazard; and thus may be more akin to the hazard of bulk hair (listed as hazardous by the U.S. Department of Transportation) or hair shampoos such as Selsun Blue (contains more than 1% of a selenium compound).

Regulatory

HLW is regulated by the Federal U.S. Nuclear Regulatory Commission according to national standards. LLW, in 37 states, results from activities regulated by that state. The individual or corporate entity wishing to dispose of LLW must also obtain a permit-to-dispose of LLW from the state in which disposal takes place. Unless such disposals take place frequently, the disposer may find it difficult to keep abreast of the requirements of two states, the U.S. Department of Transportation, etc.

THE CALIFORNIA SITUATION

According to the Low-Level Waste Policy Act of 1980, a state having a low-level waste disposal facility may refuse out-of-state LLW after January 1, 1986. The Act thus encouraged the formation of regional state groups, called compacts, to decide where a regional low-level waste disposal facility will be located. Under current California law, the California Department of Health Services is required:

- o By March 28, 1984, to promulgate regulations for the licensing and operation of a single LLW disposal facility to be sited in California;
- o By March 28, 1984, to identify criteria by which a single facility-developer will be chosen.
- o By March 28, 1984, to identify region(s) considered suitable^b for location of a facility;
- o By May 15, 1984, to receive all applications from potential site developers; and
- o By August 28, 1984, to choose an acceptable developer.

Thus, there is a period of up to 6 months wherein the region(s) have been identified, with only the regulator available to answer public inquiries.

The California Radioactive Materials Management Forum has coped a multi-year public education program, for a statewide effort. The Forum, a professional organization formed in 1982, is composed of education, research, medical and industrial interests concerned

b. State officials have consistently characterized the sought-for regions as arid, low population, with few natural resources, on Federal or State lands ...

with the safe management of radioactive materials. A statewide public education committee is based on representatives of professional societies such as: Health Physics Society, American Nuclear Society, California Society of Professional Engineers, American College of Nuclear Medicine, Association of Engineering Geologists and Society of Nuclear Medicine.

The program is statewide, to assure that the populated areas recognize that they are the primary recipients of the benefits of the use of radioactive materials -- which result in the low-level waste to be disposed of in a low populated area.

The program provides for:

- o A visit by statewide opinion leaders to LLW and HLW facilities in Nevada, timed for just before the State's (delayed) announcement on the region(s);
- o Stories about the beneficial uses of radioactive materials to be offered many local newspapers; and
- o Speakers to be made available in response to requests, a program continuing for some years.

Naturally, obtaining speaking engagements in the populated areas will take considerably more effort.

THE PUBLIC ISSUES

Based upon general observation of a wide range of waste disposal problems as reported in the news media, it would seem that there are at least five basic issues to be answered.

Who Needs Low-Level Waste? Stop Making the Stuff

Low-Level waste comes from a surprisingly large number of uses which benefit society greatly, which society accepts with hardly a thankyou. Some smoke detectors use radioactive materials. Color TV sets have high quality electronic components tested for leak tightness with radioactive materials. Highly efficient lighting rods incorporating radioactive materials protect vital and expensive radio and TV transmission equipment.

In medicine, these uses are astounding. A woman's pregnancy may be confirmed using only a drop of blood and a laboratory test using radioactivity. One of 1,400 newborn infants may have hypothyroidism -- which can be detected by a drop of blood and a laboratory test using radioactivity. The progress of some cancer treatments may be followed similarly, without the patient ever receiving radioactive without the patient ever receiving radioactive materials. These tests, called Radio-Immuno-Assay, earned the 1977 Nobel Prize in medicine for the inventor Rosalind Yallow, Ph.D.

Direct injection of a drug, lightly tagged with a radioactive tracer, allows a medical doctor to actually see the areas of a human heart damaged by a heart attack. Such better treatment of heart attack patients could prevent up to 100,000 early deaths year year.

Sterilization against bacterial growth of packaged medical products (such as the syringe, tubing and pads widely used in medical treatment) and some food components (for example spices and dried onions)

are now widely practiced. Such use of sterilized, disposable plastic avoids the high potential of unneeded infection by poorly steam-sterilized equipment.

In an agricultural state such as California, the radiation sterilization of agricultural products avoids the use of pesticides such as Ethylene-Di-Bromide (EDB) which leaves EDB residue -- yet the radiation sterilization leaves no radioactive residue since it uses only the radiation energy.

Radiation is New and Freaky; the Least Little Bit Causes Cancer

Radiation and radioactive materials are as natural as the earth we live on and have been naturally in and on the earth longer than has mankind. Scientists can measure the radiation which the human being receives from the environment and even from your own body. State and Federal allowable radiation limits are set so that there are no discernable health effects from these uses.

What Happens When Some of This Low-Level Waste is in a Highway Accident?

Even though most of the LLW is not dangerously radioactive, most is packed in the same kind of 55 gallon steel drums used for hazardous chemicals. Liquid waste must be prevented from leaking, either by being solidified in cement or by being packed in leak-adsorbent materials. The Federal government maintains special emergency response assistance for radioactive shipments, as do many of the states with large usage. The accident history of radioactive shipments is quite good.

Won't it Leak out of the Burial Grounds and Get into the Drinking Water?

Poorly discarded non-radioactive materials, even some from the last century, have become problems due to slow migration through the water table and into wells for drinking water. Plans are to have the California disposal facility located in an arid region well away from the major water resources. Properly located in an arid area using technical criteria, such a facility should not leak -- especially when the liquid is immobilized by a chemical process or an absorbent.

Some poor publicity given to past "leaks" of nuclear facilities has not been deserved. For example, 1973 headlines of one major U.S. daily said "RADIOACTIVE RIVER ... NUCLEAR WASTES SEEPING INTO COLUMBIA" during a continuing series of stories based upon a leak in Hanford Tank T-106, releasing a limited amount of high-level liquid waste into the ground. Core drilling around this tank confirmed in 1973 that the dry soil had adsorbed the radioactive material, immobilizing it. This immobilization was confirmed by additional measurement in 1979. Even then, access to the Columbia River was prevented by a yard-thick layer of caliche -- a ground water transit time of thousands of years would have further reduced any danger by allowing for radioactive decay.

Not in My Backyard

This symptom has become quite pronounced in American life, with opposition expressed for almost anything considered harmful or unusual or unexpected. No magical cures have been found, except patient explanation of the relatively low risks and large benefits to society.

COMMUNICATIONS TOOLS

There appears to be fewer materials available for low-level waste, than for high-level waste.

1. "Understanding Nuclear Waste" by Raymond L. Murray, 2nd Edition. Best general background book; understandable.
2. "Low-Level Radioactive Waste: A Manageable but Urgent Problem" 88-slide narrated presentation of the 1983 situation in Minnesota. Available through American Nuclear Society.
3. "Nuclear Medicine" and "Low-Level Waste" Slide sets with information for speakers. Available through the American College of Nuclear Physicians.
4. "Low-Level Waste Management" A series of 12 fact sheets available from USDOE or EG&G, Idaho Falls.

CONCLUSION

In many ways, "public" resistance to high-level radioactive waste disposal has been a proxy opposition to nuclear power reactors, compounded by the attempt to make the disposal safe for unusually long periods of time. Low-level waste disposal should be more acceptable to the public, based upon both a lesser hazard and the socially acceptable practices which result in this waste. It will be necessary to locate and to bring to public attention these benefits of the use of radiation and radioactive materials which were previously unrecognized.