

Dr. TAPE. Those are problems at each stage in the process, from the plant to chem processing plant, to intermediate storage, to permanent storage. But it is important to note that the way in which you handle this is through control, and because it is concentrated and packaged it can be controlled.

Mr. DADDARIO. The problem that has bothered me is that "permanent" sounds fierce enough from a problem point of view but when you go from "permanent" to "perpetual" that is really a little frightening.

Dr. TAPE. Perpetual burial doesn't frighten me when you consider how small a quantity you are talking about in the perpetual burial phase.

Dr. LIEBERMAN. I would like to comment on that point.

Mr. DADDARIO. Won't you come to that?

Dr. LIEBERMAN. Yes, I will.

I am taking more time in summary than I had proposed. I might skip some specific topics but if there are questions we can certainly discuss them.

Let me get to the long-term aspects since you have alluded to this point, Mr. Chairman, in handling and managing these high-activity wastes.

Up to this point these wastes have been evolved primarily at the Government-owned fuel reprocessing plants located at Hanford, Savannah River, and in Idaho. There is now commercially operating a relatively small reprocessing plant in New York and there is one proposed for construction by the General Electric Co. in the State of Illinois.

At these major AEC installations over the past 20 or 25 years the storage of these wastes in specially designed and located underground tanks has been satisfactory. There have been instances where wastes have had to be transferred from one tank to a standby tank, but I think in general one can fairly state that this operating experience has shown that the tank storage at these locations is a satisfactory way of handling these wastes.

However, because of the long-term implications involved, the nature of the radioactive materials included in these wastes, strontium, et cetera, which means that you have to be concerned about these materials for literally hundreds of years, it would lead us to at least an indication that there might well be some limitations to tank storage, even though from a practical engineering standpoint one can come up with a system that would include transfer from one tank to another.

This concept of having to do something "permanent" with these materials is not something that is new to us. I recall one of our early sessions in 1955 carried out under the sponsorship of the National Academy of Sciences under Dr. Harry Hess of Princeton in which we considered this problem of long-term handling of these wastes.

Out of this meeting, and in further subsequent discussions, the concept of solidifying these high-activity wastes, converting them into a form whose mobility was minimized, and then taking these materials and putting them into an environment that was essentially separated from the biosphere, if you will, seemed to be a reasonable and adequate long-term—and I might even say perpetual if you will allow me to define it in terms of geologic time—

Mr. DADDARIO. What is geologic time?