

## TRANSPORTATION OF RADIOACTIVE MATERIALS - THE COMMERCIAL SITE

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### INTRODUCTION

The difference between the private and public side of the shipment and safe transportation of radioactive materials is highlighted by the general proliferation of governmental agencies that have only partial, but not primary responsibility as a regulatory body. Further fragmentation is producing a frustrating climate since the commercial side has the polarization between the private side that ship, or plan to ship, fuel from light water nuclear power plants to repositories, or possibly interim fuel storage sites, or even reprocessing plants, versus the private side that deals with the shipment and package designs of TRU shipping containers, which will ship the majority of the volume of waste which is in the form of defense waste, from present short term repositories to final geological storage.

In order to get this industry in tune with the increased emotional concerns of the general public, it will be necessary to attract the bright creative minds that have been drawn into the research and developmental fields of more lucrative and more challenging fields of technical development.

#### Bureaucratic Overlapping of Responsibility

In the last few months letters of understanding between the Atomic Energy Commission and the U. S. Department of Transportation were written to help in some of the problems that come about by lack of jurisdiction of overlapping of responsibility. Since 1974 the Nuclear Regulatory Commission and the Department of Transportation have had difficult times making a common interpretation on Low Specific Activity. This difference of opinion had led to much confusion in the shipment of low-level activity from light water reactors in which packages have total curie content of over three curies of certain isotopes.

Now the emotion of the shipment of radioactive materials and the political implications of setting up rules have led to be embargo of shipments of radioactive material in the boundaries of New York City and the "domino effect" of this action is spreading rapidly to other parts of our country. Even now, as the impact of the Department of Transportation rulemaking is being reviewed, the environmentalists have discovered the vulnerability of the transportation of shipment of radioactive materials. Through political action at the local small town politics level, small groups of activists are capable of stopping or severely frustrating the shipments of radioactive materials in many metropolitan areas.

Even during the meeting duration of this group in Tucson, other groups will be meeting with the city councils in North Carolina to prevent the shipment of spent fuel from two plants within the ownership of Duke Power in that state. The same is true of shipments in Northern Illinois by Commonwealth Edison. Recently shipments were made in South Carolina with governmental agreement at the state level and without great public concern or outcry. It is the hope that the Draft Regulations by the Department of Transportation that will be issued for public comment late in 1979 will prevent proliferation of the embargo of radioactive shipments sometime early in the next decade.

Legislation has been discussed in both the Senate and in the House of Representatives in Washington, D.C. to develop a "lead" agency in this area of radioactive shipments. Currently the agencies that have input in this vital subject include the following:

- Office of Management and the Budget
- Department of Transportation
- Department of Energy
- Nuclear Regulatory Commission
- The White House
- National Transportation Safety Board
- Environmental Protection Agency
- Council on Environmental Quality
- Interstate Commerce Commission
- U. S. Geological Survey

It is interesting to note that a visit to the Washington, D.C. area in the early part of this decade in the quest of

information on the subject of the transportation of radioactive materials resulted in a discussion with two personnel of the U. S. Government at the Branch Chief level. Currently the complete monitoring of all relatively involved personnel dealing with this emotionally charged, politically delicate subject would take the better part of one month to completely interview all interested parties.

### Spent Fuel and TRU Waste

In order to put the polarization of the private side into the proper perspective, it is important to make a very strong point from the onset that there are two basic forms of waste that are scheduled to be delivered to the Waste Isolation Pilot Project when it becomes a reality in Carlsbad, New Mexico, or possibly to additional alternative sites.

The first form of waste is the spent fuel from light water reactors in the United States and possibly the same form of waste from international sources. The disposal of this waste has been interrupted by the decision of the White House to delay the decision of reprocessing until the entire waste system can be reviewed and a government policy developed and implemented. The resulting delays have caused serious concerns to the firms that have heavy outlays of capital in the form of shipping cask inventory that is designed for the market that was scheduled to develop in this decade. Spent fuel will probably be shipped from the light water nuclear reactor sites in the United States to yet to be determined sites that have been designated Away From Reactor (AFR) Storage Sites. Since the estimated duration of storage at these sites will be much greater than the normal 180 days, spent fuel that is shipped from the light water reactor that generates the fuel, the stored spent fuel, which has been in the AFR storage site or sites, will be possibly five years old or even older. The radiation intensity and the heat generation of this spent fuel will be significantly reduced during that time to make the development of a new generation of AWR shipping casks both a practical and economically sound investment. With the problems that the private sector sees for the future and the lack of corporate risk taken to expand the inventory of the present generation of spent fuel shipping casks, it seems rather unlikely that corporate risk capital will be budgeted in the near future for the AWR spent fuel that

will be stored for five years. In light of this vacuum, the Federal government may want to expand into this market. In my judgement, this invasion of the private sector will promote further deterioration of the shipping cask industry, allowing the entire future to become defaulted into the public sector.

TRU Shipping containers, over a decade ago, were developed by a firm that I helped form with the onset of enabling legislation and regulations by the U. S. Department of Transportation and the U. S. Atomic Energy Commission. This regulatory date was February 28, 1969, almost ten years from the date of this meeting in Tucson, Arizona. With some humor, I would like to state that it happened without the eclipse of the sun, but even without this astronomical wonder, the legislation for the shipment of TRU waste in Type B overpacks gave rise to the development of a very simple spin off in the field of shock and thermal isolation from the space age, which was healthy ten years ago. The cross pollination of technology gave rise to the Paper Tiger and later, the Super Tiger, which in the early part of this decade were the principal packages for the shipment of TRU waste, both in the public sector and in the private sector.

The Federal government started a concentrated effort to remove TRU waste shipments from the private sector in 1974 and within the next two years were very successful in getting the majority of privately controlled shallow land radioactive disposal sites to outlaw the receiving of any waste that has detectable quantities of TRU waste. Actually the upper limit was set at 10 nanocuries, which is about the undetectable upper limit, even with very expensive equipment for on-site analysis. Due to the general emotional issue of plutonium, most private shipments to the burial sites in private hands were of low-level waste from the various aqueous flow streams from the light water reactors that were operating by both private and public utilities in the United States. Waste from the defense industries, which have taken on the newer term of defense waste in deference to the older "buzz word", weapons waste, were for the most part federalized. The result of this decision at the higher levels of government reduced instantly the usefulness of the inventory of Super Tigers except for some lesser applications of private corporations doing decommissioning activities. In the event that the Waste Isolation Pilot Project becomes a reality, it seems that the one source of TRU shipping containers that are currently available is the ATMX car that is government owned and operating under general agreement between the Department of Energy

and the Department of Transportation. In the same terms, the Super Tiger, which has the disadvantage of being designed to be highly flexible, for the sake of high utilization and therefore higher revenue development and resulting return on investment.

In the near future, the Department of Defense will be forced to fill the need for an entire TRU Waste Shipping System to offer an economical, intermodal shipping system. This should have heavy emphasis on public acceptance and cost effectiveness. Currently it is a matter of great concern on my part if the various agencies that have a responsibility for the second generation system for the shipment of TRU waste will either want or require private input from personnel that have experience in the design, fabrication and operation in the private sector. This shall be looked at closely and be a measure of sincerity that there is a working relationship between the private and public sectors in this new field of development. Currently it is interesting to note that more groups are working on the analysis of the Super Tiger, almost ten years after its conception, spending probably an order of magnitude of funds, more than were originally spent to develop and test this container. If my memory is sound, the total cost, in 1970 dollars was approximately \$65,000. As of this discussion, work is going on at Sandia Laboratories, Battelle North West Laboratories, Stanford Research Institute and Southwest Research Institute, just to name the primary groups. The thought, as one reviews this list, is that all of the above are laboratories with relatively few risk taking activities and little motivation to prove that the original design of the Super Tiger is adequate for the next decade.

From the standpoint of good money management, it would be more appropriate to spend money on a second generation TRU shipping system, getting the best thinking of the private and public sectors into the act. With proper motivation and encouragement, I'm certain that this type of outcome can be realized without the use of political or economic pressure tactics.

#### Need for Creative Input

As one who is past forty and a member of the over the hill designers group, I would like to be the first to ask the enlistment of bright young people to enter into the design competition of the second generation TRU shipping container. I cannot say that this would be the same case for the part of our commercial industry that makes shipping casks. They have gone through the Sandia open testing

program of crash testing, and the result has been a product that is much more readily accepted by the public. What will happen with the future market for casks that have lower radiation limits and lower heat generation from AWR storage sites is still a matter of industry conjecture.

It is interesting to note that the industry goals for the design and development of a second generation TRU shipping system do not need any significant technical "break thrus". Areas of cleverness are still needed with the input of less creative, and yet more experienced personnel, that perceive the multi-level disciplines that are required in the system conception. The interface on the internal containers, the material handling systems, the size of openings in civil layouts, the safety analysis, public perception, and public acceptance are all topics which must be dealt with openly. If this system does not use the combined output of the creative side of the private sector, the experience of the private sector, and the profit motivation, combined with the risk taking of the private sector, I'm certain that a public sector product will be less than acceptable to the market place.

The real question, as this discussion is about to terminate, is how and where does the creative talent come from and who guides the thinking? Is there true economic motivation for private capital?