

generating capacity is extremely small relative to the total national generating capacity. At the present time nuclear plants produce approximately 1/1500 of the total power generated by the steam-electric plants in this country. Thus, the growth rate when expressed as a percentage increase of previously installed capacity gives a large rate increase at this time. These percentages are of little or no meaning by themselves, in analyzing cooling water requirements. Such an analysis requires estimates of the amount of heat that must be "dumped". In this regard it is essential to note that the steam cycle requires heat removal regardless of the fuel used to produce the steam. Thus, approximately until the year 1995, based on current estimates, the combined cooling water requirements of all nuclear power plants will be less than the combined requirements of all fossil fuel plants.

A quantitative answer to the question is not possible at this time, although the AEC is supporting a demonstration of a technique for estimating cooling water availability. A computer program developed at Hanford for calculating temperature increases in the Columbia River downstream of the production reactor coolant discharge is being applied to the Upper Mississippi River basin. The program, if successful, should provide the capability for computing the generating capacity the river basin can support, without the use of cooling towers, in accord with established water quality control criteria. If the demonstration is successful, the technique may be applied to other river basins in the U.S. By using this technique, coupled with estimates of energy requirements by area of the U.S., it should be possible to estimate when alternate cooling methods, such as cooling towers, are required in each area.

As an alternative to the use of cooling towers for reducing the quantity of heat released to the environment, during recent months there have been reports of using heated effluents for beneficial purposes. For example, in western New York a utility company in cooperation with the State Conservation Department has announced plans to use condenser discharge water to hatch Coho salmon eggs in Lake Cayuga, New York. Also, the use of large cooling ponds for heated condenser waters followed by use of this water for agricultural irrigation purposes is receiving consideration in the planning of a thermal electric plant in the Pacific Northwest.

*Question 6. Please summarize for the record, as requested by Mr. Mosher, your experience in transporting radioactive materials. What is normally involved; what happened in the truck terminal incident; have casks containing the materials broken; what is the worst situation one might expect, and what is being done to guard against it?*

Answer. Regarding the question of what is normally involved in the shipment of significant quantities of radioactive materials, care must be taken to assure that in the event of an accident, the structural integrity of the cask is maintained such that its radioactive contents are not released to the environment thereby presenting a possible public hazard, and to ensure that there is adequate shielding to prevent a direct radiation hazard to personnel in the immediate vicinity of the cask.

Both the Atomic Energy Commission and the Department of Transportation have responsibilities for regulation of the transportation of radioactive materials. Over the past several years, these agencies have cooperated with each other and with the International Atomic Energy Agency, to develop improved packaging standards and requirements for the transportation of radioactive material. Substantial progress has been made, as reflected in the AEC's regulation 10 CFR Part 71, "Packaging of Radioactive Material for Transportation", effective August 22, 1966, and Notice of Proposed Rule Making, published by DOT on January 20, 1968, which would update DOT regulations in the area of safe transportation of radioactive materials and make them compatible with IAEA and AEC regulations.

As noted in our earlier statement, the shipping experience of AEC contractors and licensees has been exceptionally good. During the shipment of about a half million packages from 1957 through 1966, there were 99 transportation accidents involving AEC radioactive materials. Of these, 70 accidents caused damage to the vehicle or package but without releasing any radioactive material from the package. In the remaining 29 accidents the package was breached; however, in 18 of these cases the released radioactive material was confined to the vehicle. No accidents have occurred involving irradiated fuel shipments in which the shipping cask was breached. With one exception, the 11 times in which radioactive materials escaped beyond the confines of the vehicle, only very minor