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TRANSPORTATION COSTS FOR IRRADIATED
MTR FUEL ELEMENTS

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TRANSPORTATION COSTS FOR IRRADIATED MTR FUEL ELEMENTS

The attached information on the cost of shipping irradiated MTR fuel elements from the MTR site at Arco, Idaho, to the Argonne National Laboratory, at Lemont, Illinois, is being published in response to several requests. In making this information available, the following points must be emphasized:

1. Neither the container design nor the costs shown necessarily represent the optimum for the fuel being shipped, nor for other similar fuels. In particular, it is believed that the repetitive shipment of large quantities of irradiated fuel can be accomplished at considerably lower unit costs than indicated herein.

2. Security escorts are not required by AEC classification and security rules for the shipment of special nuclear material of the quantities involved in this illustration. Escorts were used for initial shipments, however, in order to check on the performance of the carrier and other conditions incident to the transfer. The costs of this escort service are shown for information purposes. The requirements for security of shipments made by licensees may be ascertained for any particular case by referring to 10 CFR part 95 of the Commission's regulation. Any questions concerning this should be addressed to the Director, Division of Civilian Application, U. S. Atomic Energy Commission, Washington 25, D. C.

3. The shipment of radioactive materials in interstate commerce is governed by regulations of the Interstate Commerce Commission. These regulations are covered in Title 49, Parts 71-78 of the Code of Federal Regulations. A convenient handbook of these and other regulations relating to shipment of radioactive materials, together with a brief discussion of them, entitled "Handbook of Federal Regulations Applying to Transportation of Radioactive Materials," is available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. (Price 25 cents.)

GENERAL INFORMATION

1. Four MTR fuel elements have been transported in each shipment.

2. Although the cask was designed for shipment of MTR elements 60 days old, elements cooled as little as 20 days can be shipped. At this age, the activity at the outer edge of the cooling fins was calculated to be 200 mr/hr.

3. The shipping container (see Figures 1 and 2) is a stainless steel, 26,000 pound vessel, lead interior shield, water filled for convection current cooling, with a pressure relief valve on lid. Cost of this container is about \$18,000.

4. The present method of transportation is rail freight, on a gondola or flat car as a carload. Only one container is in use currently. However, several containers may be loaded on a flat or gondola car, with consequent savings in costs.

5. The design of MTR fuel elements has been frequently published and is not repeated herein. Characteristics of irradiated MTR fuel elements are presented in IDO-16247, obtainable from the Office of Technical Services, Washington 25, D. C.

COST SUMMARY

The shipping cost for one container of four fuel elements from the Idaho Operations Office to the Argonne National Laboratory (and return of empty cask) is tabulated below:

a. Freight costs

Freight from ANL to IOO (if empty)	\$703.59
Freight from IOO to ANL (full)	<u>945.30</u>
Total Freight	\$1648.89

b. Escort Service*

3 1st class rail fares, one way (Chicago to IOO)	163.83
3 Pullman spaces, one way (Chicago to IOO)	43.50
3 coach fares while in caboose one way, (IOO to ANL)	123.42
Per diem for 3 men 7 days each (ANL to IOO and return)	252.00
Salary for 3 men for 5 days, 8 hours/day @\$2.25/hr.	270.00
Overtime for 3 men for 5 days, 8 o/t hrs/day @\$3.25/hr. (IOO to ANL)	390.00
Total security escorts	<u>1242.75</u>
Total Transportation	2891.64

* See comment on Page 1.

Figure 1

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Figure 2

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