

DOCKET NO. 70-1954
50-39
Private

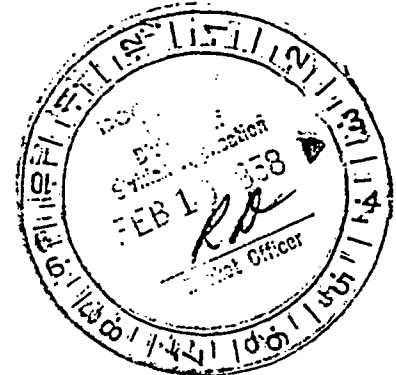
CURTISS-WRIGHT CORPORATION
RESEARCH DIVISION
QUEHANNA, PENNSYLVANIA
AMHERST 3-4711

February 8, 1953

United States Atomic Energy Commission
Division of Licensing and Regulation
Washington 25, D. C.

Attention: Mr. Kwall Jamison, Chief
Licensing Branch

Gentlemen:



Application for a special nuclear materials license is hereby made by Research Division, Curtiss-Wright Corporation to cover the activities enumerated below. For ease in future reference each activity is numbered individually as follows:

1. Application is made for a license to receive and store four and one-half (4.5) kilograms of U-235 as highly enriched uranium. This uranium is contained in thirty-two (32) modified MTR-type fuel elements for use in the Curtiss-Wright Research Reactor (CWRR).

The license is requested for a period of six months from its date of issuance. Prior to expiration of said license to store fuel elements, it is anticipated that Curtiss-Wright will receive, together with a class 10k facility license, a special nuclear materials license to use them in the Curtiss-Wright Research Reactor.

The fuel elements have been fabricated by the Sylvania-Corning Nuclear Corporation according to design drawings prepared by Curtiss-Wright. Details of this design are contained in report number CWRR-400-2 entitled "Hazards Evaluation Report, Curtiss-Wright Research Reactor." Copies of this report have already been submitted to the Division of Licensing and Regulations as part of our application for a facilities license. Table I attached hereto contains additional information regarding the fuel element inventory and the assignment of elements to storage containers.

The 4.5 kilograms of U-235 incorporated into 32 reactor fuel elements represents part of an allocation of highly enriched uranium granted to Curtiss-Wright under a construction permit dated May 29, 1957. A total of 6.0 kilograms of the original U-235 allocation was transferred to Sylcor from Union Carbide Nuclear Company (U-12 Plant) on September 20, 1957. The remaining 1.5 kilograms, less processing losses, will be returned to the Commission by Sylcor.

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The fuel elements were shipped and are being stored in six containers designed and manufactured by Sycor. As indicated by Table I, the elements are distributed five or six to a container. Each container is of heavy steel construction with a removable top. The top is secured by four keyed padlocks. Outside dimensions of these containers are approximately $15 \frac{1}{2}'' \times 19 \frac{1}{4}'' \times 66 \frac{1}{4}''$.

Within the container six elements are held closely together in a 2×3 array at the center of the container volume. This is accomplished by the use of a heavy wooden framework securely fastened to the outer container structure. With the containers stacked as close together as possible the maximum separation of one array of six from another adjacent array would be eight inches top to bottom, twelve inches side to side and thirty inches end to end.

The elements and their locked containers will be stored in an unused room in the Radioactive Materials Laboratory at Quehanna, Pennsylvania. The only door to this room is normally kept locked. There are no windows and only one exterior wall. There is a single key to all of the container locks and a single key to the door lock. Both of these keys are in the possession of Mr. H. T. Bean of this organization. When the Radioactive Materials Laboratory is unoccupied all outside doors to the building and gates through the security fence are locked. The keys to these locks are controlled by the Curtiss-Wright security force.

2. Application is made for a license to remove four fuel elements containing 102 grams of U-235 each from their place of storage described in item 1, above and store them in the grid plate near the bottom of the 26 foot deep pool which houses the reactor. These four elements are specially designed to accept the control rods. In order to properly align the control rod drives, connecting rods, and the control rods themselves, it is necessary to have these four fuel elements installed in the grid plate. All other fuel elements will remain in the storage containers in an area remote from the reactor proper.

3. Application is also made for a SNM license to transport twenty-four fuel elements in four of the storage containers described above to the Pennsylvania State University Reactor. The purpose of this would be to perform a critical experiment to determine the critical mass and to calibrate our control rods in our core before actually assembling them in the Curtiss-Wright Research Reactor. This would be done sometime between receipt of the license and February 28, 1958. The elements would remain at the PSU reactor a maximum of three days and three nights. Transportation would be via private automobile, two containers (twelve elements) per automobile. The round trip mileage is less than one hundred miles.

4. Finally, it is requested that a license be granted to perform a single partial loading of the Curtiss-Wright Research Reactor in the dry pool on February 3, 1958. The assembling of this partial core is to be photographed by personnel of the Lytle Engineering and Manufacturing Corporation for inclusion in the AEC sponsored film "Research Reactors -- USA" to be presented at the forthcoming Geneva Conference. The loading and photography will be under the direction of Dr. D. Glenn Boyer of the Division of Reactor Development, AEC.

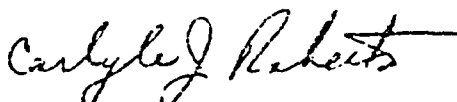
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Specifically, we request license to load 1.60 kg of U-235 contained in 15 fuel elements. This constitutes less than 60 per cent of the minimum, cold clean critical mass with a water moderator. The actual configuration to be loaded is shown in Figure I, attached. The arrangement of the 15 elements in the 3 x 5 array is indicated by Table II, also attached. The fuel element array will be surrounded by hollow aluminum cans to simulate graphite reflector elements canned in aluminum. During the time the fuel elements are in the pool both water inlet valves will be locked in the closed position.

In conclusion, it is requested that the latest date for completion of the Curtiss-Wright Research Reactor be advanced from January 31, 1958, which is the date appearing in the construction permit (CPR-11), to March 31, 1958. Additional details concerning any of the above requests can be furnished as you may require.

Very truly yours,

CURTISS-WRIGHT CORPORATION
RESEARCH DIVISION



Carlyle J. Roberts
Chief, Research Reactor Division
Nuclear Power Department

CJR:bb

Enclosed.

F. T. Fleming

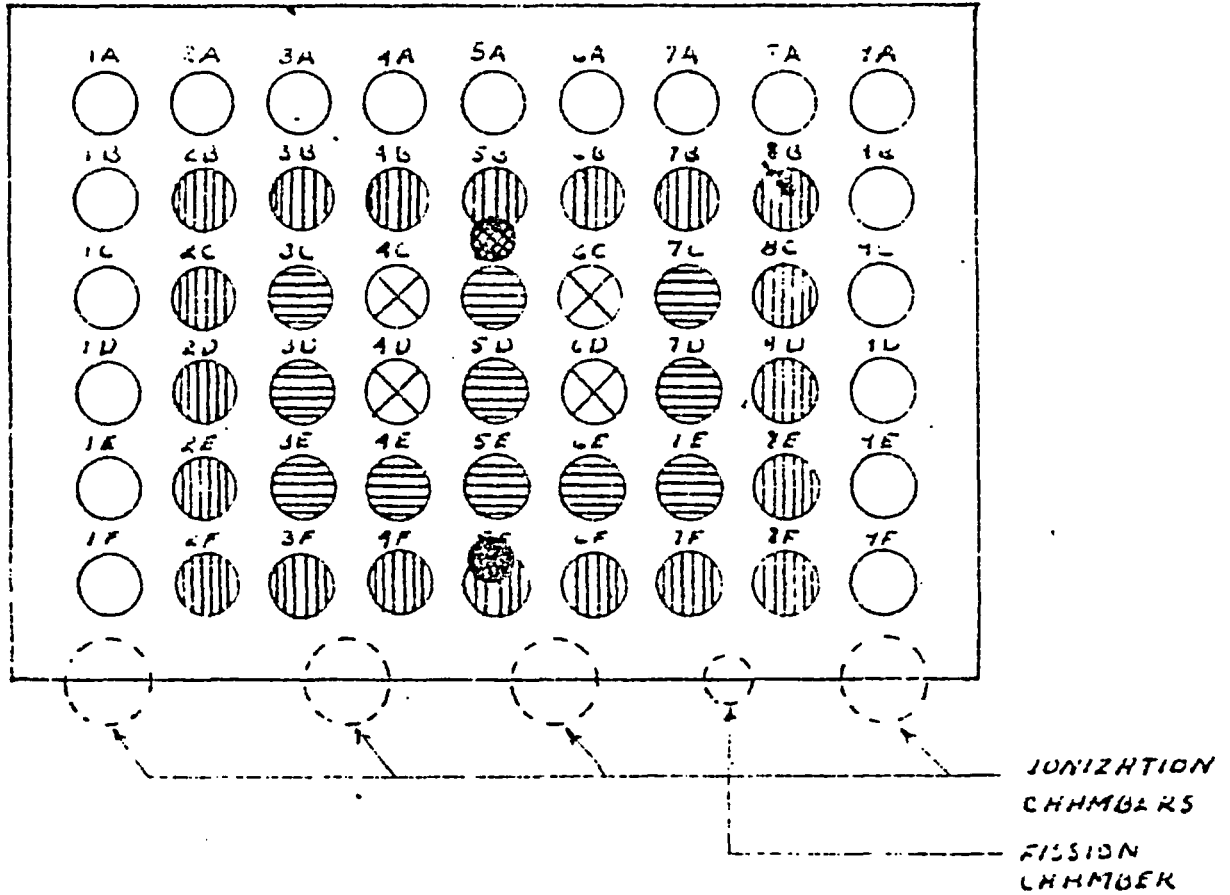
*Sworn before me this
6th day of February, 1958*








NOTARY PUBLIC
JULY 11, 1957, D. PA.

MY COMMISSION EXPIRES MAY 23, 1960

FIGURE I
 LOADING FOR FILM "RESEARCH REACTORS U.S.H."



-  SAFETY RODS
-  FUEL ELEMENTS
-  REFLECTOR ELEMENTS WITHOUT GRAPHITE
-  25 CURIE Po-Bc NEUTRON SOURCE
-  RCL TYPE MARK II - 202 METHANE COUNTER

DOC ID NO. 70-1954
 System of
 Civilian Application
 FEB 10 1958
 R. J. ...
 Chief of Center

TABLE I

Storage Container (Sylcor Designation)	Element Number	Type of Element	Grams Contained U-235
5-57-010	I-1	Full	166.97
5-57-006	I-2	"	169.34
5-57-006	I-3	"	169.78
5-57-006	I-4	"	159.69
5-57-006	I-5	"	169.88
5-57-006	I-6	"	166.95
5-57-001	I-7	"	167.64
5-57-010	I-8	"	168.51
5-57-001	I-9	"	167.21
5-57-001	I-10	"	169.18
5-57-001	I-11	"	168.96
5-57-006	I-12	"	166.97
5-57-010	I-13	"	166.80
5-57-001	I-14	"	166.50
5-57-003	I-15	"	167.98
5-57-001	I-16	"	167.45
5-57-003	I-17	"	167.11
5-57-010	I-18	"	167.28
5-57-010	I-19	"	167.07
5-57-004	I-20	"	166.59
5-57-003	II-1	Partial	135.42
5-57-003	III-1	"	136.15
5-57-003	IV-1	"	100.18
5-57-010	V-1	"	101.16
5-57-004	VI-1	"	67.10
5-57-004	VII-1	"	67.19
5-57-004	VIII-1	"	33.76
5-57-003	IX-1	"	33.74
5-57-007	X-1	Rod Element	100.37
5-57-007	X-2	"	100.16
5-57-007	X-3	"	100.34
5-57-007	X-4	"	100.61
	Total		<u>4434.04</u>



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TABLE II

Order of Elements to be Introduced
for Film "Research Reactors - U.S.A."

Order	Element Position	Element Serial Number	Grams of U-235 in Element
1	4D	X-2	102
2	4C	X-1	102
3	6D	X-3	102
4	6C	X-4	102
5	5D	IX-1	34
6	5C	VIII-1	34
7	5E	VI-1	68
8	6E	VII-1	68
9	4E	V-1	102
10	7D	IV-1 VI-1	102 68 EIT
11	3D	III-1	136
12	7C	II-1	136
13	3C	I-18	170
14	7E	I-6	170
15	3E	I-3	170

