



**TRANSNUCLEAR, INC.**

November 27, 1989

XSNM02491  
11004231

United States Nuclear  
Regulatory Commission  
One White Flint North  
Mail Stop 3-H-5  
Washington, DC 20555

Attn: Mr. R. Neal Moore

Re: Export License Application  
TNY Ref: NUK-502

Dear Neal:

Enclosed is an export license application, the end use statement and its reactor checklist, for your handling of the following:

35.783 Kgs Uranium-235, contained in 38.291 Kgs Uranium, in the form of metal, enriched to 93.45 w/o maximum.

The above figures include tolerances.

Please call me if you have any questions.

Very truly yours,

Patricia B. Quain  
Traffic Coordinator

PBQ  
Enclosures

TWO SKYLINE DRIVE • HAWTHORNE, NEW YORK 10532-2120  
TELEPHONE: 914-347-2345 • FAX: 914-347-2346 • TELEX: 681-8082

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PDR XPORT  
XSNM-2491 PNU

JOINT  
RESEARCH  
CENTRE



The Establishment Director

Petten Establishment

P.O. Box 2, 1755 ZG Petten, The Netherlands  
Tel. (02246) 5656 - Telex 57211 HEACP  
Teletax (31) 2246-1002

Contact person:  
Direct calling number: 02246-5 . . .

Petten, 14.11.1989

MRC/gp/89974

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To Whom It May Concern

**END USE STATEMENT**

The undersigned certifies that the following maximum quantities of material :

- 38.100 kg of uranium
- 93.30 w/o U-235 enriched
- 35.547 kg of U-235 content
- in the form of metal

furnished under the EURATOM/HEG-US/DOE Uranium Enrichment Services Contract, will be used as fuel in the European Communities High Flux Reactor at the Joint Research Centre, Petten, The Netherlands.

CERCA, Romans, France will fabricate the fuel elements.

We authorize Transnuclear, Inc., Hawthorne, N.Y., USA, to apply for the U.S. export license.

Date : 15.11.89

Signature :

E.D. HONDROS

For the Commission of the European Communities

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COMMISSION OF THE EUROPEAN COMMUNITIES  
JOINT RESEARCH CENTRE  
PETTEN ESTABLISHMENT

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HFR Division

Petten, 20.11.1989

MRC/gp/89998

XSNM

CHECKLIST FOR USE IN REVIEW OF REQUESTS FOR HEU  
TO DETERMINE TECHNICAL AND ECONOMIC JUSTIFICATION

1. Name of reactor and facility  
High flux materials testing reactor, HFR
2. Location  
CEC, Joint Research Centre Petten (The Netherlands)
3. Quantity of uranium requested  
38 kg  $U_{tot}$  as metal
4. Enrichment in the isotope U-235  
93,3%
5. Quantity of uranium requested  
35,45 kg  $^{235}U$
6. Type of fuel element and form of uranium  
Plate-type MTR element,  $UA1_x$
7. Current reactor power level  
45 MW

38,100

35,542

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- 8. Duty factor, average burn-up  
74% annual availability  
45 = 50% average burn-up
- 9a. Current core loading  
Typically: 12,5 kg <sup>235</sup>U
- 9b. Amount of fuel per element  
0,45 kg <sup>235</sup>U in a fresh standard fuel element  
0,31 kg <sup>235</sup>U in a fresh control rod follower
- 9c. Number of elements in core  
33 (plus 6 control rods)
- 9d. Average core life  
25,0 days
- 9e. Active core dimensions  
53 x 61 x 60 cm
- 9f. Neutron flux  
Thermal                    3 x 10<sup>14</sup>  
fast > 0,1 MeV        5 x 10<sup>14</sup> cm<sup>-2</sup> s<sup>-1</sup>
- 10. Annual fuel usage  
16 - 16,5 kg <sup>235</sup>U net
- 11. Annual spare fuel requirement, if any  
nil
- 12. Plans to increase, decrease reactor power level  
Studies for power increase to 55 MW suspended.
- 13. Estimated annual supply of current fuel request  
35,45 kg <sup>235</sup>U

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14. Required manufacturer's working stock, if any,  
included in this request  
5 kg <sup>235</sup>U at CERCA plant, Romans-sur-Isère, France

15. Fabrication loss, if any, included in this request  
1 kg <sup>235</sup>U

16. Name of fuel fabricator : CERCA

17. Location  
CERCA, Romans-sur-Isère, France

18. Inventory, as per 1 November, 1989

18a. Quantity of non-usable scrap  
0,5 kg <sup>235</sup>U

18b. Quantity of fabricated unirradiated stored fuel available  
2,99 kg <sup>235</sup>U in EFR vault  
0,29 kg <sup>235</sup>U at CERCA (one control rod to old specification)  
7,19 kg <sup>235</sup>U in transit CERCA to Petten

18c. Quantity of unirradiated non-fabricated stored fuel  
(which will be available for fabrication planned or  
in process)

CERCA	44,78 kg	<sup>235</sup> U	
COGEMA	16,9 kg	<sup>235</sup> U	(fabrication scraps from XSNM 2133 transferred from Nuken to COGEMA for recovery)
COGEMA	3,25 kg	<sup>235</sup> U	(XSNM 2445 material as UF <sub>6</sub> )

18d. Amount of spent fuel stored

partially burnt-up	12,38 kg	<sup>235</sup> U	)	
fully burnt-up	36,09 kg	<sup>235</sup> U	)	in EFR pond 58.

19. Date of which current inventory, including a, b, c,  
will be expanded  
November 1991

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- 20. Date current requested fuel will be needed for reactor operation  
October 1991
- 21. Date current requested fuel will be needed by fabricator  
October 1990
- 22a. Time taken for shipment from USA to fabricator  
2 to 3 months
- 22b. Lead time for ordering in USA  
6 to 12 months (exclusive export license processing)
- 23. Date at which current requested fuel will be expended  
(i.e. when a further HEU supply will be needed at reactor  
October 1992 (as fuel elements, delivery of HEU to fabricator  
in October 1991)
- 24. History and dates of previous HEU supplies by the U.S.  
See Annex I
- 25. Amount of fuel of U.S.-origin previously consumed during operation  
of the reactor  
about 355 kg <sup>235</sup>U
- 26. Status of LEU test programme
  - o CFRCA elements
 

Flux measurements and evaluation	Sept	Nov 1988
Irradiation	Jan 1989	May 1990
Post irradiation examination	Dec 1990	March 1991
  - o B & W elements
 

Remedial machining work, flow tests	to March 1989
Irradiation	April 1989 - July 1990
Post irradiation examination	Feb 1991 - July 1991

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## ANNEX I : HFR Uranium Supply history

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21/11/89

DATE	SOURCE	KG	ENRICH	CONTRACT	LICENCE	REMARKS
19/11/63	Union Carbide	25.999	89.810	EU/NL/1-18;AG/79	OR-0344	
14/08/64	Goodyear Atomic Corp.	1.830	89.974	EU/NL/3-15;AG/79	SED-0310	
14/08/64	Goodyear Atomic Corp.	27.024	89.974	EU/NL/3-19;AG/79	OR-0329	
20/01/65	Goodyear Atomic Corp.	24.685	89.840	EU/NL/3-23;AG/79	SED-0309	
06/06/66	Goodyear Atomic Corp.	16.800	89.850	EU/NL/3-53;AG/79-7	SED-0332	
13/07/66	Goodyear Atomic Corp.	0.300	89.850	EU/NL/3-53;AG/79-7	SED-0333	
23/09/66	Goodyear Atomic Corp.	14.653	89.900	EU/NL/3-58	SED-0442	
15/03/67	Goodyear Atomic Corp.	2.450	89.840	EU/NL/3-68	SED-0704	
13/05/68	Goodyear Atomic Corp.	14.492	89.960	EU/NL/3-98;AG/79-12	SED-0338	
27/09/68	Goodyear Atomic Corp.	4.500	89.870	EU/NL/3-10;AG/79-13	SED-0377	
19/03/69	Goodyear Atomic Corp.	23.922	89.850	EU/NL/3-12;AG/79-14	OR-0346	
22/12/69	Goodyear Atomic Corp.	3.000	90.050	EU/NL/3-14	SED-0343	
29/05/70	Goodyear Atomic Corp.	15.691	90.040	EU/NL/9-8;AG/79-16	SED-0344	
06/01/71	Goodyear Atomic Corp.	5.993	90.060	EU/NL/9-18;AG/79-19	SED-0349	
19/03/71	Goodyear Atomic Corp.	10.976	89.940	EU/NL/9-21;AG/79-20	SED-0351	
20/09/71	Goodyear Atomic Corp.	29.993	89.830	EU/NL/9-28	SED-0352	
08/02/72	Goodyear Atomic Corp.	3.501	89.930	EU/NL/9-33	SED-0799	
31/10/74	Goodyear, Piketon	14.950	93.190	AT(49-14)UES/EU/105;AGT/105		
07/08/75	Goodyear Atomic Corp.	33.107	93.110	AT(49-14)UES/EU/139;AGT/139	ISNH-0680	
16/10/75	Goodyear Atomic Corp.	4.893	93.110	AT(49-14)UES/EU/139;AGT/139		
05/12/75	Goodyear Atomic Corp.	16.014	93.090	E(49-14)UES/EU/142	XSHM-0756	
23/07/76	Goodyear, Piketon	36.000	93.230	E-(49-14)-UES/EU/144		
10/03/77	Goodyear, Piketon	3.800	93.100	E(49-14)UES/EU/144;AGT/144		
15/05/77	UNC Hood River Jct.	17.500	93.070	AG/1153		
28/02/79	Goodyear Atomic Corp.	20.924	93.160	E-(40-1)4724-DUE;AG/1362	XSNH-1129	
28/02/79	Goodyear Atomic Corp.	22.556	93.160	E-(40-1)4724-DUE;AG/1362	XSNH-1149	
01/06/79	UNC, Hood River Junction	18.003	92.900	AG/1282	XSNH 1212	
26/09/79	Goodyear Atomic Corp.	19.956	93.100	AT(40-1)4724-DUE;AG1042	XSNH-1230	
23/10/80	Goodyear Atomic Corp.	19.994	93.100	4725DUE;AG/1491	XSNH-1333	
23/10/80	United Nuclear Recovery	19.270	93.149	AG/1392/2	XSNH-1412	
10/12/81	Goodyear Atomic Corp.	15.761	93.140	AG/1597	XSNH-1632	
10/12/81	Goodyear Atomic Corp.	15.148	93.110	AG/1597	XSNH-1699	
10/12/81	Goodyear Atomic Corp.	24.951	93.130	AG/1597	XSNH-1495	
21/08/82	Goodyear Atomic Corp.	38.017	93.130		XSNH-1824	
22/05/84	B5A	18.000	93.140	AG/1693	XSNH 1975	Ex-GE material
18/01/85	Goodyear Atomic Corp.	19.957	93.100	AG/1709	XSNH-1975	
08/11/85	Goodyear Atomic Corp.	38.129	93.110	AG/2102	XSNH-2133	
06/10/88	Goodyear Atomic Corp.	37.861	93.167	AG/2102/1	XSNH 2352	
11/10/89	Goodyear Atomic Corp.	38.000	93.000	AG/2102/2	XSNH 2445	