FOIA/PA NO: 2015-0125

GROUP: C

RECORDS BEING RELEASED IN-PART

The following types of information are being withheld:

Ex. 1: ☐ Records properly classified pursuant to Executive Order 13526
Ex. 2: ☐ Records regarding personnel rules and/or human capital administration
Ex. 3: ☐ Information about the design, manufacture, or utilization of nuclear weapons
☐ Information about the protection or security of reactors and nuclear materials
☐ Contractor proposals not incorporated into a final contract with the NRC
☐ Other_____
Ex. 4: ☒ Proprietary information provided by a submitter to the NRC
☐ Other_____
Ex. 5: ☐ Draft documents or other pre-decisional deliberative documents (D.P. Privilege)
☐ Records prepared by counsel in anticipation of litigation (A.W.P. Privilege)
☐ Privileged communications between counsel and a client (A.C. Privilege)
☐ Other_____
Ex. 6: ☐ Agency employee PII, including SSN, contact information, birthdates, etc.
☐ Third party PII, including names, phone numbers, or other personal information
Ex. 7(A): ☐ Copies of ongoing investigation case files, exhibits, notes, ROI's, etc.
☐ Records that reference or are related to a separate ongoing investigation(s)
Ex. 7(C): ☐ Special Agent or other law enforcement PII
☐ PII of third parties referenced in records compiled for law enforcement purposes
Ex. 7(D): ☐ Witnesses' and Allegers' PII in law enforcement records
☐ Confidential Informant or law enforcement information provided by other entity
Ex. 7(E): ☐ Law Enforcement Technique/Procedure used for criminal investigations
☐ Technique or procedure used for security or prevention of criminal activity
Ex. 7(F): ☐ Information that could aid a terrorist or compromise security

February 23, 1976 SECY-76- 108

For: The Commissioners

COMMISSIONER ACTION

From: Kenneth R. Chapman, Director, Office of Nuclear Material Safety and Safeguards

Thru: Executive Director for Operations

Subject: PROPOSED LETTER TO CONGRESSMAN MORRIS K. UDALL, UNITED STATES HOUSE OF REPRESENTATIVES

Purpose: Approval of a letter to Congressman Udall providing information and NRC comments on questions related to the export of high enriched uranium fuels.

Discussion: Congressman Udall has requested the views of the Nuclear Regulatory Commission on (1) the feasibility, from the safeguards standpoint, of restricting the export of research reactor and HTGR fuel to uranium not enriched to the point where it could be used in a nuclear explosive and (2) on the practicality of various schemes proposed for blending plutonium and uranium oxides to increase the difficulty of fabricating nuclear explosives. Also, he requested information on the export of significant quantities of enriched uranium over the past decade. Congressman Udall's letter is enclosed as Appendix A.

The proposed response to Congressman Udall is enclosed as Appendix B.

It is noted that some information requested by Congressman Udall is not readily available without extended, manual compilation of data. The accountability records on shipments abroad, showing the

Contact:
R. Neal Moore
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[redacted]

[redacted]

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destination, the intended use and the retransfers of material are maintained by ERDA. The Nuclear Material Information System in which materials accounting data are recorded extends back through Calendar Year 1969 and to some extent through 1968; most information for prior years is available only from manually kept records. Also, end-use information is not stored in the computer and to obtain this would require a manual search of the ERDA records. The staff has obtained machine records from the ERDA/NRC information system for Calendar Year 1969 through 1975 and has attempted to be as responsive to the Congressman's request as possible under the circumstances.

Recommendation: That the Commission:

Approve the proposed letter to Congressman Udall.

Coordination: The Office of the Executive Legal Director has no legal objection. OCA concurs.

Kenneth R. Chapman, Director
Office of Nuclear Material
Safety and Safeguards

Enclosures:
Appendix A - Ltr to Chairman Anders
fm Morris Udall dtd 1/16/76

Appendix B - Proposed ltr to
Congressman Udall

NOTE: Commission comments should be provided directly to the Office of the Secretary by c.o.b. Thursday, March 4, 1976.

DISTRIBUTION

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Secretariat

January 16, 1976

Mr. William Anders
Chairman, Nuclear Regulatory Commission
1717 H Street, N.W.
Washington, D.C. 20555

Dear Chairman Anders:

The January 14 Washington Post carried an article by Thomas O'Toole concerning export of research reactor and HGTR fuel. The article suggests there might be significant advantages from the safeguards standpoint if we restricted exports of such fuels to uranium not enriched to the point where it could be used in a nuclear explosive. I would appreciate your views on the feasibility of such restrictions.

Since it comes as something of a surprise that such materials have been exported to the extent implied in the article, I would also be grateful if you would indicate the annual quantities which have been exported over the past decade, the size of each shipment involving more than five kilograms, where the material has gone, what it is used for, and to what extent the NRC keeps track of it once it has left the United States.

The Subcommittee on Energy and the Environment is considering holding hearings concerning what might be done to increase the difficulty of fabricating nuclear explosives. I would therefore also welcome your views on the practicality of various schemes proposed for blending plutonium and uranium oxides.

Sincerely,

Morris K. Udall
Chairman, Subcommittee on
Energy and the Environment

Appendix A

DRAFT

Honorable Morris K. Udall
Chairman, Subcommittee on
Energy and the Environment
U.S. House of Representatives

Dear Chairman Udall:

I am pleased to respond to your letter of January 16, 1976, concerning the export of research reactor and HTGR fuel and related questions. You request the views of the Nuclear Regulatory Commission on the feasibility of restricting the export of such fuels to uranium not enriched to the point where it could be used in a nuclear explosive, and you request, also, our views on the practicality of increasing the difficulty of fabricating nuclear explosives through the blending of plutonium and uranium oxides. These two subjects are discussed in Enclosure 1.

In response to your request for information on the supply of highly enriched material abroad, we enclose two tables covering the years 1969 through 1975, one showing total exports by year and one showing exports of significant quantities of material by country of destination. This information was compiled from data made available to NRC through the automated Nuclear Material Information System maintained by the Energy Research and Development Administration, the agency which has the responsibility for accounting for all U.S. origin nuclear material abroad. Comparable information for the years prior to 1969 is not recorded in the automated system. This could be obtained from ERDA although it would require a detailed manual review of the records for prior years by that

Agency. The NRC automated data system does not contain the intended end-use for each individual material shipment, and thus this information is not readily available to NRC. The NRC does require that the ultimate consignee in a foreign country provide a statement of end-use before a license application will be approved but, up through 1975, there was no computerized link between individual shipments made pursuant to an export license and to the license itself. As discussed with your staff, the Energy Research and Development Administration does maintain this information and that agency could supply end-use data. Measures are being taken at this time to automate our recording of export license numbers associated with individual shipments which will simplify the correlation of future exports with their intended use.

The Nuclear Regulatory Commission does not keep track of U.S. supplied material once it has left the United States. This responsibility for accounting for the movement of U.S. supplied material, for maintaining the records of retransfers and for authorizing the retransfers from one nation to another, pursuant to the Agreements for Cooperation which the U.S. has with other nations, is exercised by the Energy Research and Development Administration.

I am hopeful that you will find this information useful. Please let us know if we may be of further assistance.

Sincerely,

William A. Anders
Chairman

(Enclosures listed on Page 3)

Enclosures:
1. Information concerning export of reactor material
2. Data on shipments of enriched uranium

DISCUSSIONS IN RESPONSE TO REQUESTS
FROM CONGRESSMAN MORRIS K. UDALL AS
PRESENTED IN HIS LETTER OF JANUARY 16, 1976

1. Please provide the NRC views from the Safeguards standpoint on the feasibility of restricting the export of uranium to an enrichment below the point where it could be used in a nuclear explosive.

Discussion:

It is noted, correctly, that there would be an advantage from the safeguards standpoint if exports of uranium were restricted to those fuels enriched to a point where they could not be used in a nuclear explosive. At the same time, research and test reactors do require highly enriched uranium to operate.

Nuclear reactor facilities operated for purposes other than the generation of heat and/or electrical power are utilized for either of the following primary purposes:

(1) As a source of neutrons produced in the fission process, or

(2) As a device for education and training in nuclear fundamentals.

In general, facilities operating primarily for the first-named purpose find it substantially advantageous to utilize highly enriched uranium to obtain neutron fluxes as high as possible relative to the heat necessarily generated in the fission process. The ultimate objectives in operating such neutron producing "machines" may be pure scientific or applied research, product or process development, materials testing, production of radioactive materials for sale (e.g., for use in radio-pharmaceutical products), or for use as an analytical tool, as in neutron activation analysis. If highly enriched uranium were not available for use in such facilities, their potential usefulness would be substantially decreased to the point where it would no longer be practical to use them for many applications.

For most purposes of education and training however, there appears to be no substantial advantage other than an economic one, to the use of highly enriched uranium. In fact, a substantial number of such facilities are in current use in the United States and around the World that utilize fuel enriched to less than 20 percent in U-235.

Exports of plutonium and highly enriched uranium are reviewed on a case-by-case basis. An important part of this review entails an analysis of physical protection measures employed by recipient countries for the express purpose of assuring that they are essentially equivalent to those employed in the United States. Recipients of U.S. supplied material are required by the terms of their Agreement for Cooperation with the United States to safeguard material in accordance with procedures acceptable to the U.S., which generally follow the IAEA procedures and recommendations.

2. Provide NRC views on the practicality of various schemes proposed for blending plutonium and uranium oxides to increase the difficulty of fabricating nuclear explosives.

Discussion:

The blending of plutonium and uranium oxides does increase the difficulty of fabricating nuclear explosives and this has safeguards advantages, as you noted. However, blended material can be chemically separated, although the lower the plutonium oxide concentration of any blend, the greater the difficulty of making a nuclear explosive becomes, both in terms of the quantity of material which must be acquired and in the processing which is necessary.

On the other hand, while blends with the least plutonium oxide result in the greatest impediments to the separation of the plutonium, these blends will generally result in greater extra expense and difficulty for the nuclear industry in the utilization of the plutonium. The Commission and its staff are actively investigating these offsetting factors along with other detailed questions, such as whether blends made by coprecipitation or by the mechanical mixing of oxides would be preferable.

SHIPMENTS OF ENRICHED
URANIUM

TABLE 1. ANNUAL ENRICHED URANIUM SHIPMENTS FOR PERIOD 1969 THROUGH 1975 - BY ENRICHMENT

TABLE 2. MAJOR SHIPMENTS OF SPECIAL NUCLEAR MATERIAL URANIUM ENRICHED TO 20% OR GREATER AND PLUTONIUM (5 KGS AND ABOVE)

TABLE 1
ANNUAL ENRICHED URANIUM SHIPMENTS
FOR PERIOD 1969 THROUGH 1975 - BY ENRICHMENT
(ROUNDED TO NEAREST KILOGRAM)

	Total		0 - 20%		20 - 70%		70 - 90%		90% or Greater	
Calendar Year	U**	U-235	U**	U-235	U**	U-235	U**	U-235	U**	U-235
1969	343,548	8,050	342,455	7,391	621	229	130	112	342	318
1970	323,820	8,625	322,771	7,857	340	118	44	35	665	615
1971	627,011	19,097	624,791	17,738	1,010	259	80	72	1,130	1,048
1972	648,824	16,992	647,941	16,199	66	40	192	172	625	581
1973	954,380	24,861	953,492	24,038	5	3	*	*	883	820
1974	812,687	21,809	811,134	20,587	320	74	2	1	1,231	1,147
1975	1,176,574	31,829	1,175,917	31,219	4	2	1	1	652	607

* Less than one kilogram

** Total Uranium column includes all isotopes of uranium.

TABLE 2

MAJOR SUPPLIERS OF SPECIAL NUCLEAR MATERIAL -

URANIUM ENRICHED TO 20% OR GREATER AND

PLUTONIUM - (5 KGS AND ABOVE)

SUMMARY 1/

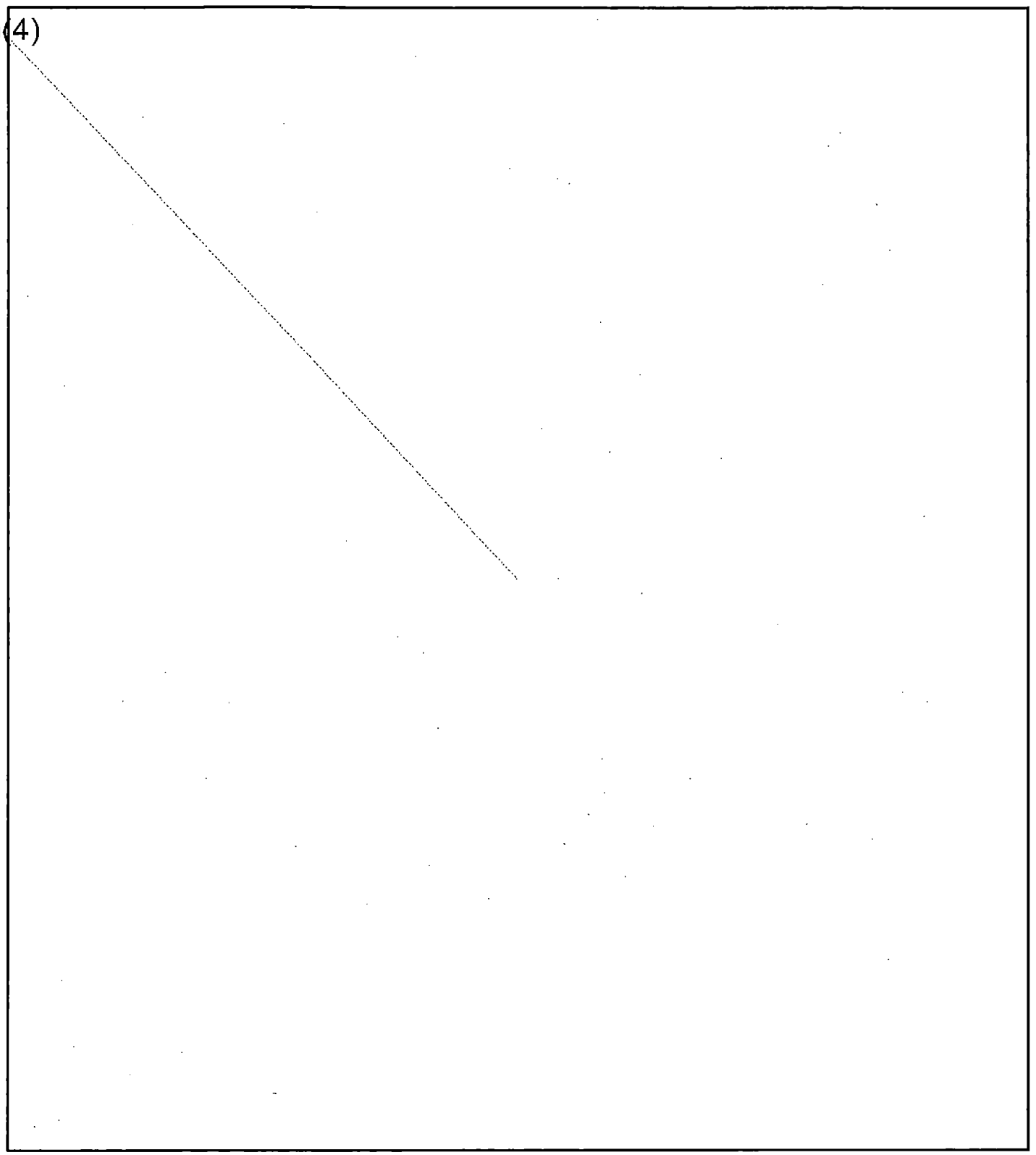
Country and Year		URANIUM No. of Shipments	URANIUM Element (Kgs)	URANIUM Isotope (Kgs)	PLUTONIUM No. of Shipment	PLUTONIUM Quantity Kgs.
Argentina						
	1971	2	20.0	18.0		
	1973	1	10.6	9.6		
	TOTAL	3	30.6	27.6	-	-
Canada						
	1970	1	11.0	10.2		
	1971	2	99.0	92.2		
	1972	2	66.9	62.3		
	1973	4	85.9	79.8		
	1974	2	10.0	9.3		
	1975	4	20.8	19.5		
	TOTAL	15	293.6	273.3		
France						
	1969	2	189.9	167.5		
	1970	8	483.1	374.7		
	1971	4	685.3	623.6		
	1972	7	159.3	126.6		
	1973	5	337.9	314.5		
	1974	3	128.6	119.8		
	1975	1	76.1	70.0		
	TOTAL	30	2060.2	1797.6		
Germany						
	1969	6	895.9	487.0		-
	1970	7	410.3	253.8	1	38.3
	1971	16	288.7	259.0	2	59.4
	1972	8	384.7	351.8	2	20.6
	1973	12	249.6	230.8		-
	1974	8	418.4	390.1	6	110.1
	1975	10	161.1	150.0		-
	TOTAL	67	2808.7	2122.5	11	228.4

1/ This summary reflects shipments for each country, by year, of total uranium (element) and its U-235 (isotope) content for material enriched to 20% and above. Individual shipments are detailed on pages 5 throygh 9 of this table.

TABLE 2 (Cont.)

Country and Year	URANIUM No. of Shipments	URANIUM Element (Kgs)	URANIUM Isotope (Kgs)	PLUTONIUM No. of Shipment	PLUTONIUM Quantity Kgs.
Italy					
1970	1	30.7	23.0/3.8		
1975	-	-	-	1	125.5
TOTAL	1	30.7	23.0 U-235 3.8 U-233	1	125.5
Japan					
1969	1	7.0	4.8	2	45.7
1970	2	26.4	23.8	3	44.8
1971	10	1083.0	326.7		-
1972	1	25.4	23.6		-
1973	6	74.6	69.5		-
1974	1	317.7	73.4		-
1975	1	16.4	15.3		-
TOTAL	22	1550.5	537.1	5	90.5
South Africa					
1975	1	5.0	4.6		
TOTAL	1	5.0	4.6		
Sweden					
1972	-	-	-	1	8.0
TOTAL	-	-	-	1	8.0
United Kingdom					
1970	2	82.0	76.3	1	9.8
1971	1	9.4	8.5		-
1972	5	227.5	212.0	1	10.0
1973	2	108.7	101.3		-
1974	2	647.5	603.2		-
1975	1	326.0	303.7		-
TOTAL	13	1401.1	1305.0	2	19.8
GRAND TOTALS	152	8180.4	6090.7	20	472.2

(b)(4)



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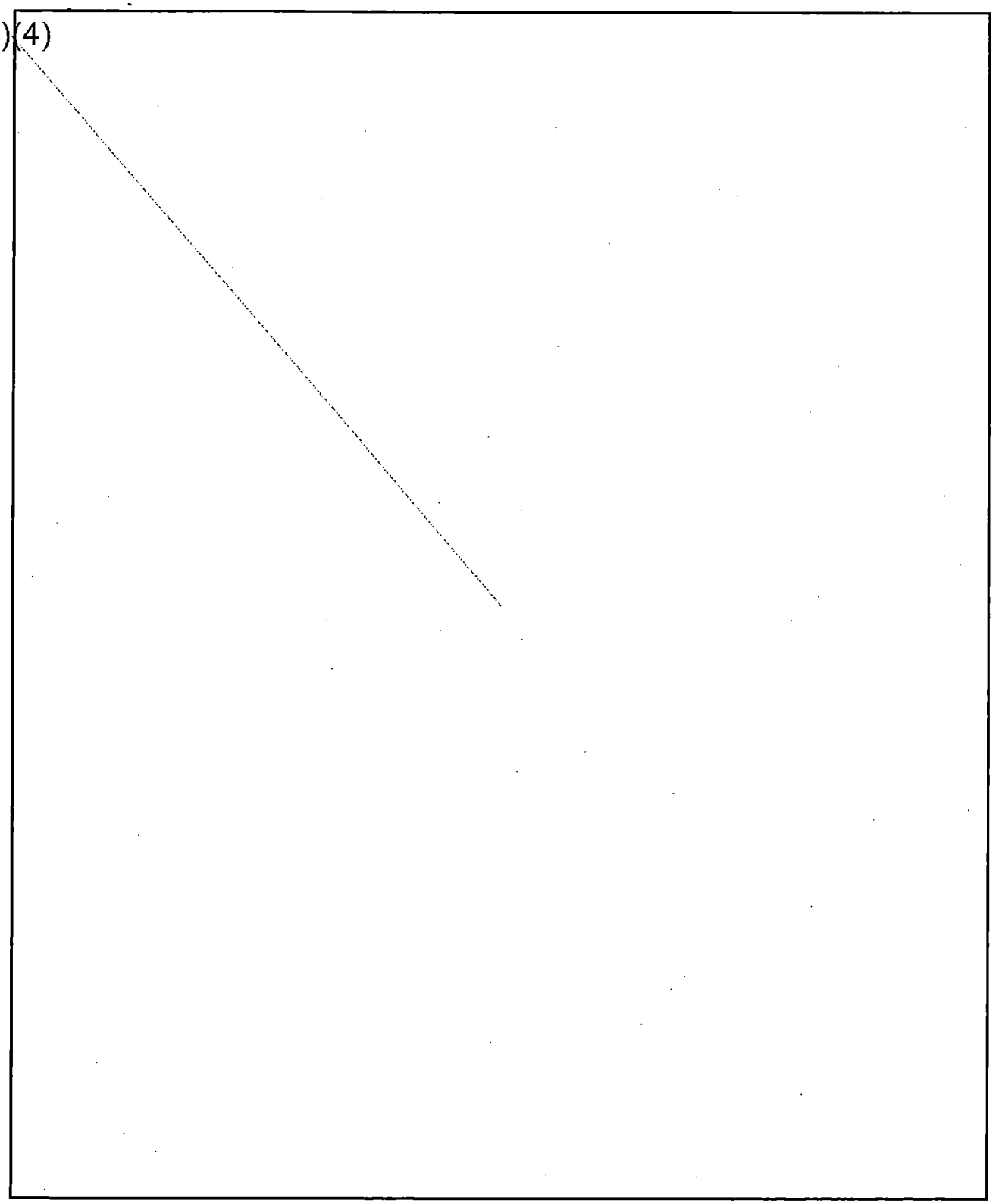

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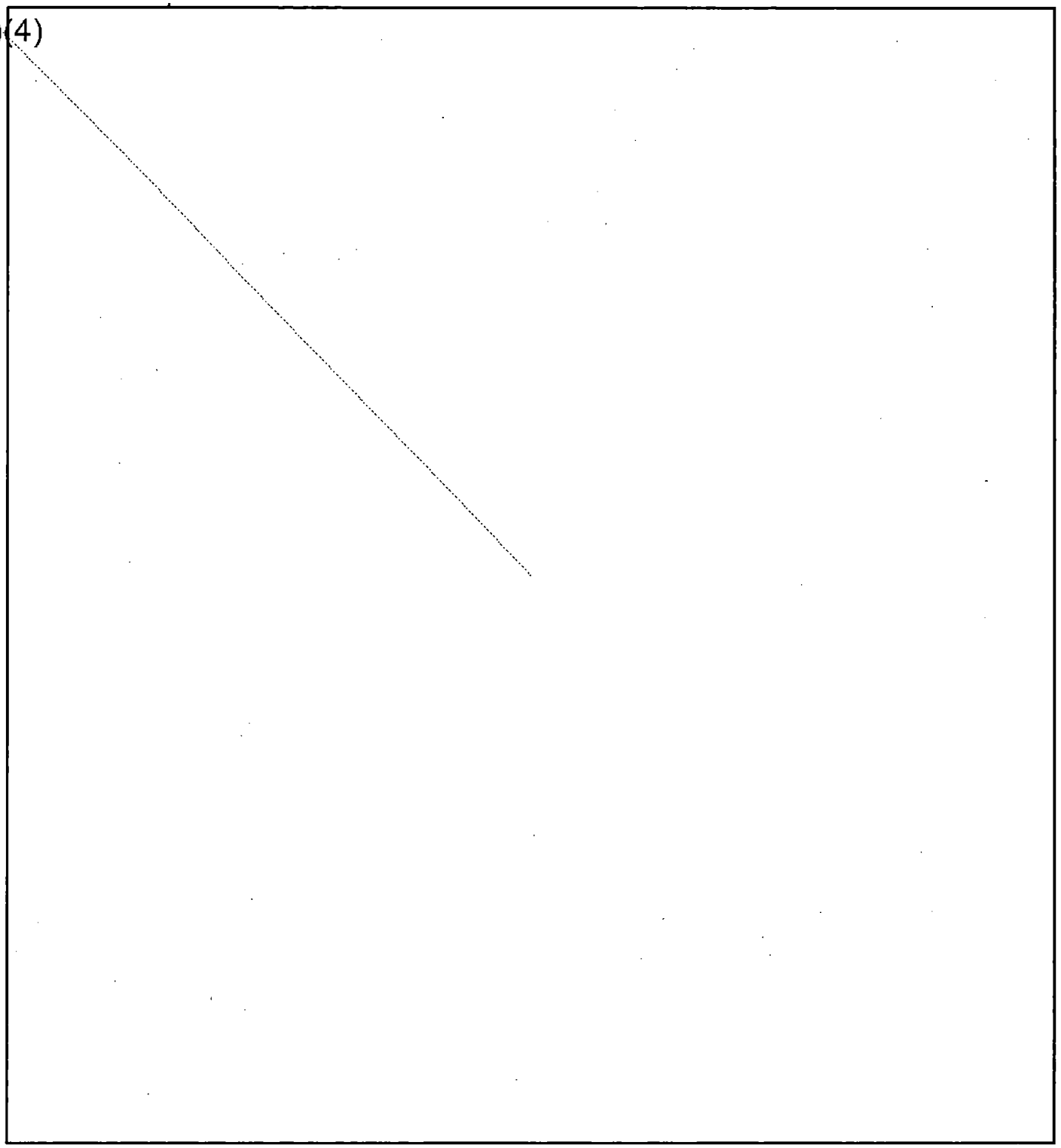

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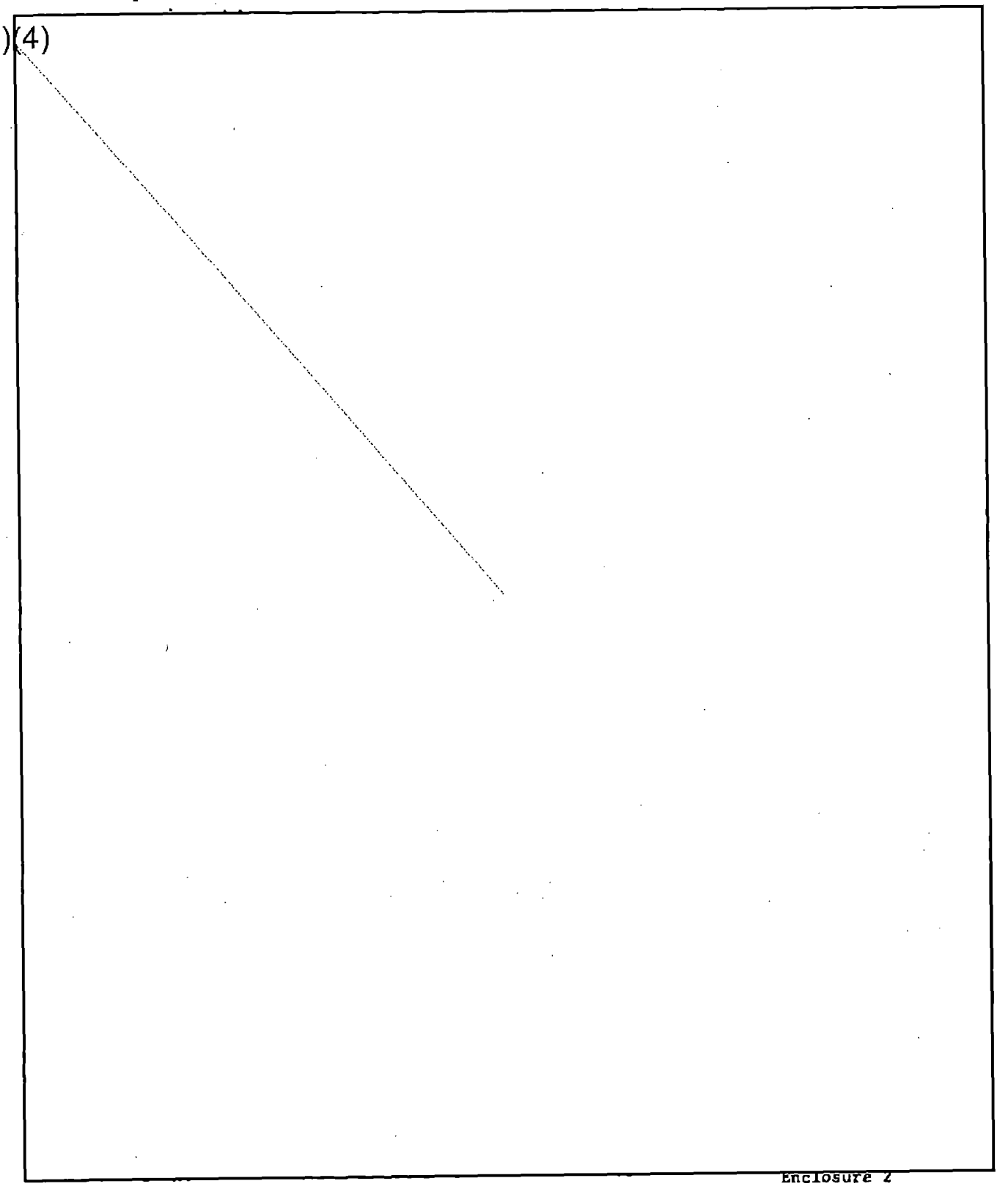

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