NRC FORM 464 Part I
(6-1998)

U.S. NUCLEAR REGULATORY COMMISSION

RESPONSE TO FREEDOM OF INFORMATION ACT (FOIA) / PRIVACY ACT (PA) REQUEST

FOIA/PA	RESPONSE NUMBER
2000-0041	1

RESPONSE TYPE: FINAL √ PARTIAL

REQUESTER: Joseph P. Pohl III

DATE: JUN 15 2000

PART I. -- INFORMATION RELEASED

No additional agency records subject to the request have been located.

Requested records are available through another public distribution program. See Comments section.

APPENDICES — Agency records subject to the request that are identified in the listed appendices are already available for public inspection and copying at the NRC Public Document Room.

√ APPENDICES A — Agency records subject to the request that are identified in the listed appendices are being made available for public inspection and copying at the NRC Public Document Room.

Enclosed is information on how you may obtain access to and the charges for copying records located at the NRC Public Document Room, 2120 L Street, NW, Washington, DC.

√ APPENDICES A — Agency records subject to the request are enclosed.

Records subject to the request that contain information originated by or of interest to another Federal agency have been referred to that agency (see comments section) for a disclosure determination and direct response to you.

√ We are continuing to process your request.

See Comments.

PART I.A -- FEES

AMOUNT *

$

* See comments for details

You will be billed by NRC for the amount listed.

You will receive a refund for the amount listed.

None. Minimum fee threshold not met.

Fees waived.

PART I.B -- INFORMATION NOT LOCATED OR WITHHELD FROM DISCLOSURE

No agency records subject to the request have been located.

Certain information in the requested records is being withheld from disclosure pursuant to the exemptions described in and for the reasons stated in Part II.

This determination may be appealed within 30 days by writing to the FOIA/PA Officer, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Clearly state on the envelope and in the letter that it is a "FOIA/PA Appeal."

PART I.C COMMENTS (Use attached Comments continuation page if required)

SIGNATURE - FREEDOM OF INFORMATION ACT AND PRIVACY ACT OFFICER

Carol Ann Reed

NRC FORM 464 Part 1 (6-1998) PRINTED ON RECYCLED PAPER This form was designed using InForms

FOIA-2000-041

APPENDIX A
RECORDS BEING RELEASED IN THEIR ENTIRETY

NO	DATE	DESCRIPTION/(PAGE COUNT)
1.	06/12/59	Memo to ECase fm LJohnson re: review for adequacy of applicant's procedures to avoid a condition of accidental criticality (1 page)
2.	07/27/59	Memo to LJohnson fm CBeck re: review of information on instrument and alarm system (1 page)
3.	01/21/60	Memo to CBeck fm LJohnson re: review for the adequacy of the applicant's procedures to avoid a condition of accidental criticality (1 page)
4.	03/18/60	Memo to LJohnson fm CBeck re: approval of shipping procedures for uranium oxide pellets of various enrichments (2 pages)
5.	04/20/60	Telegram to JDelaney fm CWellers re: need 45 extension of provisional authorization to operate without two additional gamm alamonitron units (1 page)
6.	05/02/60	Ltr to CLuke fm LHackler re: approval of shipping container (2 pages)
7.	05/09/60	Memo to CBeck fm LJohnson re: review of adequacy of the applicant's procedures to avoid a condition of accidental criticality (1 page)
8.	05/13/60	Memo to CBeck fm LJohnson re: adequacy of applicant's procedures to avoid a condition of accidental criticality (1 page)
9.	05/16/60	Ltr to HMathias fm Bureau of Explosives re: opposing transportation certificate (1 page)
10.	06/15/60	Ltr to HAmtsberg fm TGeorge re: approval of containers for shipment (1 page)
11.	06/21/60	Ltr to HPrice fm HAmtsberg re: SNM-338 spare fuel containers (1 page)
12.	06/22/60	Ltr to HMathias fm WWagner re: transportation certificate (1 page)
13.	06/24/60	Ltr to HMathias fm Railway Express Agency re: transportation certificate (1 page)
14.	07/01/60	Memo to GDuke fm HMathias re: approaching the transportation industry on controlling shipments of nuclear materials (4 pages)

NO.	DATE	DESCRIPTION/PAGE COUNT
15.	07/11/60	Memo to CBeck fm LJohnson re: review for approval of shipping container (1 page)
16.	08/04/60	Memo to LJohnson fm CBeck re: approval of application for exclusive use shipments (1 page)
17.	10/06/60	Ltr to RPrice fm HAmtsberg re: application for allocation of UF_6 with 1959 annual report (40 pages)
18.	01/26/61	Ltr to JDelaney fm RLimerick re: request for concurrence to transfer 3700 gms of uranium (1 page)
19.	02/07/61	Memo to CLuke fm JDelaney re: adequacy of applicant's procedures to avoid a condition of accidental criticality (1 pages)
20.	03/06/61	Memo to CLuke fm JDelaney re: adequacy of the applicant's procedures to avoid a condition of accidental criticality (1 page)
21.	03/24/61	Memo to Traffic Mgmt files fm RKaye re: meeting with Associated Transit, Inc. to resolve 5000-pound minimum on LTL shipments of radioactive materials (5 pages)
22.	04/21/61	Telegram to RLimerick fm JDelaney re: SNM-338 date extension is granted (1 page)
23.	07/13/61	Ltr to RLowenstein fm TSainsbury re: radiation detectors in WAFD bldgs 5-A and 5-B (1 page)
24.	05/08/62	Ltr to DNussbaumer fm PMorrow re: additional information on the Health Physics manual WAFD-HP-103 (5 pages)
25.	05/11/62	Memo to files fm FDurkan re: discussion on new application submission for Yankee Core III (17 pages)
26.	06/01/62	Ltr to DNussbaumer fm LMeierkord re: 5/9/62 revised application for Yankee 3 (9 pages)
27.	06/20/62	Memo to DNussbaumer fm CLuke re: Yankee III fuel elements (2 pages)
28.	06/21/62	Telegram to DNussbaumer fm RLayfield re: SNM-338 amendment at Yankee-3 (2 pages)
29.	07/09/62	Ltr to DNussbaumer fm WKelley re: introducing himself as the Criticality Engineer (2 pages)
30.	07/31/62	Ltr to DNussbaumer fm WKelley re: waste material birdcage (9 pages)
31.	08/07/62	Telegram to DNussbaumer fm JMcAlduff re: need increase in financial limitation (2 pages)

NO.	DATE	DESCRIPTION/PAGE COUNT
32.	08/14/62	Memo to AAikens fm DNussbaumer re: structural integrity data of shipping package (1 pages)
33.	08/15/62	Ltr to WKelley fm DNussbaumer re: need for review W. D. Kelley's background in nuclear safety (1 page)
34.	09/04/62	Ltr. To DNussbaumer from Kelley re: results of drop test (11 pages)
35.	09/11/62	Telegram to DNussbaumer fm LMeierkord re: permission to store loaded and welded Yankee-3 fuel rods (4 pages)
36.	09/20/62	Ltr to LMeierkord fm DNussbaumer re: request to cancel application (1 page)
37.	09/20/62	Memo to CLuke fm DNussbaumer re: cancellation of amendment (1 page)
38.	09/26/62	Ltr to DNussbaumer fm LMeierkord re: SNM-338 application for manufacture of SPERT fuel plates for Phillips Petroleum Co. (20 pages)
39.	10/02/62	Ltr to DNussbaumer fm WKelley re: SNM-338 change in destination for encapsulated and sealed rods shipped (2 pages)
40.	10/02/62	Memo to CLuke fm DNussbaumer re: fabrication of SPERT fuel elements (1 page)
41.	10/09/62	Telegram to DNussbaumer fm WKelley re: supplemental data to change Yankee core (2 pages)
42.	10/09/62	Memo to files fm FDurkan re: storage of Yankee Core III rods (1 page)
43.	10/10/62	Memo to DNussbaumer fm CLuke re: Yankee Core III rod storage (1 page)
44.	10/17/62	Memo to files fm FDurkan re: fabrication, inspection, and packaging of SPERT fuel plates (2 pages)
45.	10/18/62	Ltr to DNussbaumer fm LMeierkord re: SNM-338 amendment for fabrication of Selni fuel assemblies (18 pages)
46.	10/25/62	Memo to CLuke fm DNussbaumer re: inspection and packaging of fuel assemblies for the SELNI core (1 page)
47.	11/21/62	Memo to DNussbaumer fm CLuke re: cover assembly of SELNI fuel elements (4 pages)
48.	11/23/62	Memo to DNussbaumer fm CBeck re: shipping procedure approve (SELNI) (1 page)

NO.	DATE	DESCRIPTION/PAGE COUNT
49.	11/27/62	Memo to files fm RLayfield re: application for authorization to assemble SELNI rods into fuel assemblies (1 page)
50.	12/04/62	Ltr to DNussbaumer fm WKelley re: SNM-338 additional information for Selni core "fuel assembly" (3 pages)
51.	12/11/62	Memo to CLuke fm DNussbaumer re: assembly of SELNI core (1 page)
52.	01/09/63	Ltr to LMeierkord fm DNussbaumer re: review of shipping procedures and containers need applicable information (1 page)
53.	02/07/63	Telegram to DNussbaumer fm HAmtsberg re: revised Selni fuel allocation (3 pages)
54.	03/27/63	Telegram to AEC fm WKelley re: approval to amend SNM-338 for Selni core, WAFD-L-102 (2 pages)
55.	03/28/63	Memo to DNussbaumer fm CLuke re: SELNI core (2 pages)
56.	06/13/63	Telegram to DNussbaumer fm HAmtsberg re: revised spent fuel allocation (3 pages)
57.	07/08/63	Telegram to FStone fm HMcAlduff re: 4^{th} quarter draft for 3.90 percent enriched UF six for SELNI (1 page)
58.	09/30/63	Ltr to DNussbaumer fm LMeierkord re: SNM-338 approved for birdcage shipping containers (2 pages)
59.	10/07/63	Memo to CBeck fm DNussbaumer re: birdcage shipping containers (1 page)
60.	10/07/63	Memo to CLuke fm DNussbaumer re: birdcage shipping containers (1 page)
61.	10/21/63	Memo to DNussbaumer fm CLuke re: processing waste shipping containers (1 page)
62.	10/31/63	Memo to DNussbaumer fm CBeck re: Birdcage shipping containers (1 page)
63.	12/23/63	Memo to DNussbaumer fm CLuke re: storage of SELNI control rod fuel follower assemblies (2 pages)
64.	01/17/64	Ltr to AEC fm HAmtsberg re: amendment of SNM-338 for fabrication of special power excursion reactor tests (SPERT) fuel rods (2 pages)
65.	02/11/64	Memo to DNussbaumer fm CLuke re: fabrication of SPERT rods application (2 pages)

NO.	DATE	DESCRIPTION/PAGE COUNT
66.	03/02/64	Ltr to RLowenstein fm CWeaver re: responsibility of administration of certain AEC licenses (3 pages)
67.	03/16/64	Memo to CLuke fm DNussbaumer re: assignment of responsibility for administration of certain AEC licenses to one person on Headquarters staff (1 page)
68.	05/20/64	Ltr to AEC fm CSkillern re: amendment of SNM-338 for fabrication of Consolidated Edison Indian Point Core II fuel rods and assemblies (2 pages)
69.	05/25/64	Ltr to AEC fm CSkillern re: shipping containers for SPERT fuel rods (2 pages)
70.	05/28/64	Memo to DNussbaumer fm CLuke re: shipping container for SPERT fuel rods (1 page)
71.	06/04/64	Memo to DNussbaumer fm CBeck re: SPERT fuel rods container (1 page)
72.	06/11/64	Telegram to RLayfield fm CSkillern re: spent rod shipping container (2 pages)
73.	06/11/64	Ltr to AEC fm HAmtsberg re: authorization to order SS material for Indian Point (3 pages)
74.	06/11/64	Telegram to LJohnson fm HAmtsberg re: authorization to order SS material for Indian Point (3 pages)
75.	06/15/64	Ltr to AEC fm CSkillern re: shipping containers for SPERT fuel rods (2 pages)
76.	06/15/64	Memo to CLuke fm DNussbaumer re: SPERT rod shipping container review (1 page)
77.	06/18/64	Telegram to Westinghouse Electric Corporation fm AEC re: authorized to ship spent fuel rods fm Cheswick, PA to Idaho Falls, ID (1 page)
78.	06/22/64	Memo to DNussbaumer fm CLuke re: fabrication of Consolidate Edison Indian Point core II (1 page)
79.	06/24/64	Memo to CLuke fm DNussbaumer re: shipping containers for SPERT fuel rods (1 page)
80.	06/24/64	Memo to files fm RStevenson re: telecon with CSkillern on Indian Point core II assembly shipment (1 page)
81.	06/26/64	Memo to DNussbaumer fm CBeck re: fuel shipping container (1 page)

NO.	DATE	DESCRIPTION/PAGE COUNT
82.	06/30/64	Telegram to RLayfield fm CSkillern re: Indian Point SNM-338 amendment (2 pages)
83.	07/06/64	Memo to DNussbaumer fm CLuke re: shipment of Consolidated Edison Indian Point core II asemblies (2 pages)
84.	07/16/64	Ltr to Westinghouse Electric Corporation fm DHarmon re: amended SNM-338 for the fabrication only of Indian Point fuel rods and assemblies (2 pages)
85.	08/10/64	Ltr to AEC fm CSkillern re: amendment of SNM-338, Indian Point (9 pages)
86.	08/19/64	Memo to DNussbaumer fm CLuke re: change in oxide pellet storage limit (1 page)
87.	09/04/64	Ltr to AEC fm HAmtsberg re: authorization to order additional SS material for Indian Point (2 pages)
88.	09/08/64	Ltr to Westinghouse Electric Corporation fm DNussbaumer re: amended SNM-338 for storage of pellets (1 page)
89.	09/11/64	Ltr to AEC fm H. Walchli re: authorization to order SS material for San Onofre (4 pages)
90.	10/06/64	Ltr to AEC fm CSkillern re: amendment to SNM-338, Docket 70-337, for a Saxton superheat fuel assembly shipping container (8 pages)
91.	10/07/64	Ltr to AEC fm HAmtsberg re: allocation for special nuclear materials to be used in fabrication of Saxton (31 pages)
92.	10/14/64	Ltr to AEC fm CSkillern re: amendment of special nuclear material license SNM-338, Docket 70-337, for fabrication of Yankee V-VI fuel rods and assemblies (18 pages)
93.	10/16/64	Memo to DNussbaumer fm CLuke re: shipment of one sueprheat fuel assembly (1 page)
94.	10/26/64	Ltr to AEC fm CSkillern re: amendment of special nuclear material license SNM-338, Docket 70-337, for fabrication of Saxton fuel rods and assemblies (18 pages)
95.	10/29/64	Telegram to RLayfield fm CSkillern re: Yankee V-Vi amendment to SNM-338 (2 pages)
96.	10/30/64	Memo to CLuke fm DNussbaumer re: application review (1 page)
97.	11/02/64	Memo to DNussbaumer fm DSmith re: chronologies of actions on timely renewal applications (4 pages)

NO.	DATE	DESCRIPTION/PAGE COUNT
98.	11/02/64	Memo to DNussbaumer fm CLuke re: fabrication and shipment of fuel rods for Yankee cores V and VI (1 page)
99.	11/05/64	Memo to DNussbaumer fm CLuke re: fabrication and shipment of fuel rods for Saxton reactor (1 page)
100.	11/09/64	Memo to CLuke fm DNussbaumer re: application review supplementing Item 9-A, shipping containers (1 page)
101.	11/19/64	Ltr to AEC fm HWalchli re: request for authorization to order SS material San Onofre Nuclear Generating Station, Unit 1, Docket 70-337, CPPR-13 (2 pages)
102.	11/19/64	Ltr to Westinghouse Electric Corporation fm DNussbaumer re: amended SNM-338 to authorize fabrication of fuel assemblies for Saxton (1 page)
103.	11/25/64	Ltr to Westinghouse Electric Corporation fm DNussbaumer re: amended SNM-338 to authorize farication and shipment of fuel rods to Yankee Atomic Electric Co (1 page)
104.	11/25/64	Ltr to AEC fm CSkillern re: amendment of special nuclear license SNM-338, Docket 70-337, for additional criticality controls in the engineering development laboratory (11 pages)
105.	12/01/64	Memo to CLuke fm DNussbaumer re: review of additional criticality controls in the engineering laboratory (1 page)
106.	12/08/64	Ltr to AEC fm CSkillern re: amendment of special nuclear license SNM-338, Docket 70-337, for fabrication of Southern California Edison fuel rods and assemblies (18 pages)
107.	12/21/64	Telegram to RLayfield fm CSkillern re: Southern California Edison amendment dtd 12/8/64, SNM-338 (2 pages)
108.	12/24/64	Memo to DNussbaumer fm CLuke re: additional criticality controls in the engineering laboratory (1 pages)
109.	12/29/64	Ltr to AEC fm CSkillern re: amendment to SNM-338, Docket 70-337, to provide for shipment of UO_2 fuel rods fully enriched in the Isotope U-235 (6 pages)
110.	12/29/64	Memo to DNussbaumer fm CLuke re: fabrication of Southern California Edison fuel rods and assemblies (1 page)
111.	01/06/65	Ltr to AEC fm CSkillern re: SNM-338 revision for Saxton fuel rods and assemblies (7 pages)
112.	01/06/65	Ltr to AEC fm HAmtsberg re: Authorization to order SS material for Indian Point (2 pages)

NO.	DATE	DESCRIPTION/PAGE COUNT
113.	01/20/65	Ltr to AEC fm CSkillern re: application for SNM-338 amendment for fabrication of Saxton fuel assemblies containing plutonium-bearing fuel rods (16 pages)
114.	01/22/65	Ltr to AEC fm CSkillern re: SNM-338 additional information for Consolidated Edison Indian Point Core II fuel rods and assemblies (9 pages)
115.	01/22/65	Memo to DNussbaumer fm CLuke re: shipment of Saxton fuel rods and scrap (1 pages)
116.	01/22/65	Memo to DNussbaumer fm CLuke re: shipment of fuel rods between Cheswick and Oak Ridge (1 page)
117.	01/28/65	Memo to DNussbaumer fm CLuke re: revised criticality controls in the engineering laboratory (1 page)
118.	01/28/65	Memo to CLuke fm DNussbaumer re: additional information on Indian Point Core II fuel rods and assemblies (1 page)
119.	02/01/65	Telegram to RLayfield fm CSkillern re: Indian Point core II rev. 3, SNM- 338 amendment (2 pages)
120.	02/01/65	Ltr to AEC fm HAmtsberg re: additional authorization to order SS material for Indian Point (3 pages)
121.	02/01/65	Memo to DNussbaumer fm CLuke re: fabrication of Saxton fuel assemblies containing plutonium-bearing fuel rods (1 page)
122.	02/03/65	Memo to DNussbaumer fm CLuke re: additional information on Indian Point Core II application (1 page)
123.	02/05/65	Ltr to CSkillern fm DNussbaumer re: SNM-338 authorized to receive, possess, store, use, transfer, and transport plutonium dioxide (1 page)
124.	03/17/65	Ltr to CSkillern fm LJohnson re: fabrication of Indian Point fuel rods and assemblies (2 pages)
125.	03/25/65	Ltr to AEC fm CSkillern re: SNM-338 revision for Saxton fuel rods and assemblies (8 pages & a drawing)
126.	03/25/65	Ltr to AEC fm CSkillern re: SNM-338 revision for fabrication of Saxton fuel assemblies containing plutonium-bearing fuel rods (6 pages)
127.	03/30/65	Memo to CLuke fm DNussbaumer re: review of fabrication of Saxton fuel assemblies (1 page)
128.	03/30/65	Memo to CLuke fm DNussbaumer re: application review for Saxton fuel rods and assemblies (1 page)

NO.	DATE	DESCRIPTION/PAGE COUNT
129.	04/01/65	Memo to DNussbaumer fm CLuke re: shipment of plutonium-bearing Saxton fuel rods (1 page)
130.	04/01/65	Memo to DNussbaumer fm CLuke re: shipment of UO_2 Saxton fuel assemblies (1 pages)
131.	04/07/65	Ltr to CSkillern fm DNussbaumer re: SNM-338 authorized to transport Saxton fuel assemblies containing plutonium-bearing fuel rods (1 page)
132.	04/07/65	Ltr to CSkillern fm DNussbaumer re: SNM-338 authorized to transport Saxton fuel rods and assemblies (1 page)
133.	04/14/65	Ltr to AEC fm CSkillern re: SNM-338 revision for fabrication of Saxton fuel assemblies containing plutonium-bearing fuel rods (14 pages)
134.	04/19/65	Memo to DNussbaumer fm CLuke re: modified shipping container for Pu-bearing Saxton assemblies (1 page)
135.	05/10/65	Ltr to AEC fm CSkillern re: SNM-338 amendment for fabrication of UO_2 pellets (4 pages)
136.	05/17/65	Ltr to AEC fm CSkillern re: SNM-338 amendment for shipment of uranium oxide powders, UO_2 pellets, or clad fuel rods (2 pages)
137.	05/19/65	Memo to DNussbaumer fm CLuke re: fabrication and shipment of low enriched oxide pellets (1 page)
138.	05/28/65	Ltr to AEC fm CSkillern re: revision to SNM-338 amendment for fabrication of Saxton fuel assemblies containing plutonium bearing fuel rods (14 pages)
139.	06/65	Westinghouse report--WAFD-HP-103, Rev. IV–Health Physics Manual on Cheswick Site (79 pages)
140.	06/03/65	Ltr to AEC fm KSchendel re: SNM-338 amendment for the use of plutonium pellets (42 pages)
141.	06/08/65	Memo to DNussbaumer fm CLuke re: shipment of low enriched uranium oxide (2 pages)
142.	06/10/65	Memo to DNussbaumer fm CBeck re: shipment of uranium oxide powders, UO_2 pellets, or fuel rods enriched to 5 w/o or less (4 pages)
143.	06/14/65	Memo to DNussbaumer fm CLuke re: shipment of 9 x 9 plutonium-bearing Saxton fuel assemblies (1 page)
144.	06/18/65	Ltr to CSkillern fm DNussbaumer re: SNM-338 authorized to transport uranium oxide powders or pellets, or fuel rods (1 page)

NO.	DATE	DESCRIPTION/PAGE COUNT
145.	07/08/65	Ltr to AEC fm CSkillern re: additional info on SNM-338 amendment for SENA fuel rods and assemblies (18 pages)
146.	07/10/65	Telegram to AEC fm CSkillern re: SNM-338 amendment for release of equipment to unlicensed individuals (3 pages)
147.	07/16/65	Memo to CBeck fm DNussbaumer re: shipment of Yankee fuel test assemblies (1 page)
148.	07/16/65	Memo to CLuke fm DNussbaumer re: shipment of Yankee fuel test assemblies (1 page)
149.	07/20/65	Memo to DNussbaumer fm CLuke re: shipment of Yankee fuel test assemblies (1 page)
150.	07/22/65	Memo to DNussbaumer fm CBeck re: shipment of Yankee fuel test assemblies (3 pages)
151.	07/26/65	Ltr to AEC fm CSkillern re: SNM-338 amendment for shipment of PWR-2 Seed-2 reactor modules (2 pages)
152.	07/26/65	Ltr to CSkillern fm RLayfield re: SNM-338 authorized to ship two Yankee fuel test assemblies (1 page)
153.	07/30/65	Ltr to AEC fm CSkillern re: revision of amendment to license SNM-338 for Saxton fuel rods and assemblies (9 pages)
154.	07/30/65	Memo to DNussbaumer fm CLuke re: shipment of PWR reactor modules (1 page)
155.	07/30/65	Memo to DNussbaumer fm CLuke re: SENA fuel fabrication (1 page)
156.	08/04/65	Ltr to AEC fm CSkillern re: amendment of SNM-338 for combined shipment of Yankee fuel test assemblies with Yankee fuel assemblies (3 pages)
157.	08/04/65	Ltr to AEC fm CSkillern re: revision of amendment request to SNM-338 for SENA fuel rods and assemblies (8 pages)
158.	08/06/65	Memo to DNussbaumer fm CLuke re: shipment of Saxton fuel assemblies (1 page)
159.	08/10/65	Memo to CLuke fm DNussbaumer re: combined shipment of Yankee fuel test assemblies with Yankee fuel assemblies (1 page)
160.	08/25/65	Ltr to AEC fm HWalchli re: authorization to order stainless steel material for San Onofre (2 pages)

NO.	DATE	DESCRIPTION/PAGE COUNT
161.	08/30/65	Ltr to AEC fm CSkillern re: revision of application for amendment to SNM-338 for Southern California Edison fuel rods and assemblies (14 pages)
162.	08/31/65	Ltr to Westinghouse Electric Corporation fm DNussbaumer re: amending SNM-338 to ship Saxton fuel rods and assemblies (1 page)
163.	08/31/65	Memo to CLuke fm DNussbaumer re: process scrap shipping container (1 page)
164.	08/31/65	Memo to Cbeck fm DNussbaumer re: process scrap shipping container (1 page)
165.	09/01/65	Ltr to AEC fm HWalchli re: SNM-338 to order special nuclear material for San Onofre (3 pages)
166.	09/03/65	Memo to DNussbaumer fm CLuke re: process scrap shipping container (1 page)
167.	09/07/65	Telegram to RLayfield fm CSkillern re: SNM-338 revised amendment for shipment of SENA fuel assemblies and fuel followers (2 pages)
168.	09/07/65	Telegram to DNussbaumer fm CSkillern re: SNM-338 amendment supplement to ship uranium scrap (2 pages)
169.	09/07/65	Ltr to HPrice fm CWeaver re: authorizing KSchendel to sign license applications, amendments, or related correspondence (3 pages)
170.	09/07/65	Memo to CBeck re: revision of amendment for Southern California Edison fuel rods and assemblies (1 page)
171.	09/07/65	Memo to CLuke re: revision of amendment for Southern California Edison fuel rods and assemblies (1 page)
172.	09/09/65	Memo to DNussbaumer fm CLuke re: fabrication of Southern California Edison fuel (1 page)
173.	09/14/65	Memo to DNussbaumer fm CLuke re: revised proposal for SENA fuel shipments (1 page)
174.	09/16/65	Memo to WRay fm re: Karl Schendel's appointment (1 page)
175.	09/16/65	Memo to CLuke fm re: Karl Schendel's appointment (1 page)
176.	09/16/65	Memo to CBeck fm re: Karl Schendel's appointment (1 page)
177.	09/27/65	Ltr to AEC fm KSchendel re: SNM-338 revised pages to amendment for SENA fuel rods and assemblies (5 pages)

NO.	DATE	DESCRIPTION/PAGE COUNT
178.	09/28/65	Ltr to AEC fm HWalchli re: SNM-338 request to order special nuclear material for San Onofre (2 pages).
179.	09/30/65	Memo to CLuke fm DNussbaumer re: SENA fuel rods and assemblies (1 page)
180.	10/01/65	Ltr to AEC fm KSchendel re: SNM-338 amendment for shipment of liquid scrap containing U-235 (8 pages)
181.	10/07/65	Ltr to AEC fm KSchendel re: SNM-338 revision for SENA fuel rods and assemblies (6 pages)
182.	10/13/65	Memo to DNussbaumer fm CLuke re: shipments of scrap solutions (1 page)
183.	10/13/65	Memo to CLuke fm DNussbaumer re: revision of SENA fuel rods and assemblies amendment (1 page)
184.	10/18/65	Ltr to KSchendel fm DNussbaumer re: SNM-338 authorized to transport scrap process liquids containing U-235 (1 page)
185.	11/17/65	Memo to DNussbaumer fm CLuke re: additional information on Pu scrap recovery facility (1 page)
186.	12/17/65	Ltr to AEC fm KSchendel re: SNM-338 amendment for fabrication of Connecticut Yankee fuel rods and assemblies (16 pages)
187.	12/23/65	Memo to CLuke fm DNussbaumer re: SNM-338 to fabricate Connecticut-Yankee fuel rods and assemblies (1 page)
188.	12/28/65	Memo to DNussbaumer fm CLuke re: SNM-338 to manufacture and the shipment of Connecticut-Yankee fuel assemblies (1 page)
189.	01/19/66	Memo to DNussbaumer fm CLuke re: SNM-338 revised proposal for RCC assembly shipping package (1 page)
190.	01/25/66	Memo to DNussbaumer fm CBeck re: SNM-338 revised proposal for RCC assembly shipping package (1 page)
191.	02/04/66	Ltr to KSchendel fm DNussbaumer re: SNM-338 authorized to use the RCC shipping package for transport of fuel assemblies for So. California Edison and Connecticut Yankee reactors (2 pages)
192.	04/01/66	Ltr to AEC fm KSchendel re: SNM-338 amendment for fabrication of Selni fuel rods and assemblies (15 pages)
193.	04/07/66	Memo to CLuke fm DNussbaumer re: review of SNM-338 to fabricate SELNI fuel rods and assemblies (1 page)

NO.	DATE	DESCRIPTION/PAGE COUNT
194.	04/13/66	Memo to DNussbaumer fm CLuke re: approval of SNM-338 to fabricate and ship SELNI fuel (1 page)
195.	06/08/66	Memo to CLuke fm DNussbaumer re: SNM-338 for the use of plutonium pellets (1 page)
196.	04/04/67	Memo to CLuke fm DNussbaumer re: corporate information for licenses with 1966 annual report (1 page)
197.	06/21/67	Ltr to RKirkman fm DPovejsil re: strengthen administrative procedures (3 pages)
198.	08/04/67	Ltr to DNussbaumer fm KSchendel re: SNM-338 application for fabrication of Indian Point #2 fuel rods and assemblies (14 pages)
199.	08/15/67	Memo to DNussbaumer fm CLuke re: fabrication of Indian Point No. 2 fuel rods and assemblies (1 page)
200.	11/14/67	Ltr to DNussbaumer fm KSchendel re: approval for transportation of a shipping package in intra-state commerce (3 pages)
201.	11/16/67	Memo to DNussbaumer fm CLuke re: Selni fuel rod shipping package (1 page)
202.	03/22/68	Memo to DNussbaumer fm CLuke re: NFD shipment of Selni assemblies in type CC packages (1 page)
203.	04/01/68	Ltr to DNussbaumer fm KSchendel re: SNM-338 amendment to authorize the processing of plutonium fuel (7 pages)
204.	04/08/68	Memo to DNussbaumer fm CLuke re: revised controls in plutonium processing (1 page)
205.	04/24/68	Ltr to DNussbaumer fm KSchendel re: SNM-338 amendment to authorize the processing of plutonium fuel (5 pages)
206.	05/23/68	Memo to DNussbaumer fm CLuke re: SNM-338 fabrication of up to 5 percent enriched oxide fuel assemblies (1 page)
207.	07/26/68	Ltr to KSchendel fm RWischow re: schedule of dates for submittal of fundamental material controls and safeguards procedures (1 page)
208.	08/12/68	Memo to DNussbaumer fm CLuke re: fabrication of Saxton fuel in materials systems laboratory and packaging for shipment (1 page)
209.	10/31/68	Memo to DNussbaumer fm CLuke re: SNM-338 to fabricate power reactor fuel (3 pages)

NO.	DATE	DESCRIPTION/PAGE COUNT
210.	02/24/69	Ltr to DNussbaumer fm KSchendel re: SNM-338 expiration date extended (3 pages)
211.	03/21/69	Ltr to DNussbaumer fm KSchendel re: SNM-338 amendment to authorize the processing of plutonium fuel (8 pages)
212.	03/28/69	Ltr to KSchendel fm DNussbaumer re: request they submit an abbreviated plant emergency plan (2 pages)
213.	10/27/69	Ltr to KSchendel fm RPage re: thank you during 10/23-24/69 visit (1 page)
214.	10/28/69	Ltr to KSchendel fm DNussbaumer re: notice of license expiration (1 page)
215.	12/01/69	Ltr to DNussbaumer fm KSchendel re: revision of expiration date to 3/31/70 (2 pages)
216.	03/26/70	Memo to files fm RStevenson re: shipment of mixed-oxide fuel in the RCC container (1 page)
217.	07/30/70	Ltr to AEC fm KSchendel re: change of corporate address (4 pages)
218.	08/31/70	Ltr to Wlorenz fm Bmills re: comments on being compliance with stack effluence (1 page)
219.	10/22/70	Memo to RPage fm RWeber re: international RIS for Westinghouse (1 page)
220.	10/26/70	Ltr to RTschiegg fm RPage re: assignment of holdings of nuclear material of Canadian origin (1 page)
221.	06/01/71	Ltr to KSchendel fm CThornton re: will begin inspecting for compliance with certain models of measuring UF_6 (1 page)
222.	08/27/71	Ltr to HPrice fm JRengel re: KSchendel and ASabo signatures are authorized to sign license applications (3 pages)
223.	09/28/71	Ltr to DNussbaumer fm KSchendel re: listing as user of generally licensed shipping package (2 pages)
224.	12/27/71	Ltr to KSchendel fm CThornton re: letter to all licensees authorized to receive uranium hexafluoride (3 pages)
225.	01/19/72	Ltr to CThornton fm KSchendel re: revised position of measurements required on UF_6 (3pages)
226.	01/20/72	Memo to Files fm RStevenson re: revised conditions for plutonium fuels development laboratory (PFDL) (2 pages)

NO.	DATE	DESCRIPTION/PAGE COUNT
227.	03/24/72	Ltr to KSchendel fm SSmiley re: importance of uniform methods to monitor effluents released to the environment from nuclear fuel processing and fabrication plants (2 pages)
228.	03/31/72	Ltr to KSchendel fm CThornton re: receipt measurements of uranium hexafluoride (6 pages)
229.	04/10/72	Ltr to unknown fm SSmiley re: determination of dose following a nuclear accident (2 pages)
230.	04/27/72	Memo to files fm RStevenson re: revised conditions for plutonium fuels development laboratory (PFDL) (1 page)
231.	06/07/72	Memo to files fm RStevenson re: surface density criterion for plutonium development laboratory (PPDL) dockets (1 page)
232.	04/25/73	Ltr to SSmiley fm KSchendel re: corporate information for licenses (6 pages)
233.	04/27/73	Ltr to KSchendel fm LRouse re: SNM-338 expiration date extended (1 page)
234.	11/26/73	Ltr to KSchendel fm RPage re: backfitting existing plants to meet new protection requirements (2 pages)
235.	02/06/74	Ltr to CAnthony fm JO'Reilly re: response to resolving problems in meeting Guidelines for Decontamination of Facilities and Equipment (1 page)

Edson G. Case, Acting Chief
Hazards Evaluation Branch

June 12, 1959

Lyall Johnson, Chief
Licensing Branch

WESTINGHOUSE ELECTRIC CORPORATION REQUEST DATED JUNE 2, 1959 FOR A SPECIAL NUCLEAR MATERIAL LICENSE - DOCKET NO. 70-337

SYMBOL: LRL:CPM

Please review the subject request for the adequacy of the applicant's procedures to avoid a condition of accidental criticality. The enclosed docket should be returned with your comments.

Enclosure:
Docket No. 70-337

DISTRIBUTION
Suppl.
L&R Reading
LRL Reading
C. P. McCallum, LRL

All

OFFICE ▶	LRL	LRL	LRL			
SURNAME ▶	CPMcCallum/ph	JCDelaney	LJohnson			
DATE ▶	6/12/59	6/12/59	6/16/59			

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

Project SNM-44

Docket 70-337
(70.24)

Lyall Johnson, Chief
Licensing Branch

Clifford K. Beck, Chief
Hazards Evaluation Branch

WESTINGHOUSE ELECTRIC CORPORATION

We have reviewed the Westinghouse application dated July ~~22~~ 17, 1959, submitting further information on the instrument and alarm system required by Section 70.24 and requested by our memorandum to you dated July 10, 1959.

We believe the plans proposed by Westinghouse are satisfactory.

Note - does not apply to this docket. See July 10 memo.
CDL

OFFICE ▶	HEB:DL&R	HEB:DL&R				
SURNAME ▶	CDL CDLuke;jwl	CKBeck CKB				
DATE ▶	7/24/59	7/27/59				

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

A12

C. K. Beck, Chief
Hazards Evaluation Branch

January 21, 1960

Lyall Johnson, Chief
Licensing Branch

WESTINGHOUSE ELECTRIC CORPORATION - ATOMIC POWER DEPARTMENT - REQUEST DATED JANUARY 6, 1960 FOR AMENDMENT TO THEIR SPECIAL NUCLEAR MATERIAL LICENSE SNM-338 - DOCKET NO. 70-337

SYMBOL: LRL:CPM

Please review the subject request for the adequacy of the applicant's procedures to avoid a condition of accidental criticality. The enclosed application should be returned with your comments. Docket No. 70-337 has been previously sent to you in connection with another application.

Enclosure:
Appli. dtd 1/6/60 (File cy sent)

DISTRIBUTION
Suppl.
L&R - LRL Readings
C. P. McCallum, LRL

A13

OFFICE ▶	LRL	LRL	LRL			
SURNAME ▶	CPMcCallum/rh	JCDelaney	LJohnson			
DATE ▶	1/21/60	1/21/60	1/21/60			

OPTIONAL FORM NO. 10

UNITED STATES GOVERNMENT

Memorandum

Delaney

TO : Lyall Johnson, Chief
Licensing Branch

CKB

DATE: MAR 18 1960

FROM : Clifford K. Beck, Chief
Hazards Evaluation Branch

SUBJECT: WESTINGHOUSE ELECTRIC CORP.

We have reviewed the Westinghouse application dated January 6, 1960, requesting approval of shipping procedures for uranium oxide pellets of various enrichments.

Westinghouse proposes to pack the pellets in cardboard or plastic packages in order to protect the pellets from abrasion. Each package will be placed in an inner container, 10.5" dia x 20" long. The actual diameter of the pellet package will depend on enrichment, varying from 10.25" for enrichments up to 5 w/o U-235 to 6" dia for 40 w/o enrichment and 2.5 dia at enrichments above 40%. The free space between the pellet package and inner container will be filled with foam rubber padding.

Safety of an individual shipping unit is to be insured by geometry control, i.e., diameter of the pellet package. The proposed dimensions for various enrichments are consistent with acceptable criteria. However, we are not satisfied, on the basis of information presented, that the proposed procedures will insure the necessary degree of safety in shipments of the type proposed. The issues that must be reconciled are detailed below:

1. The structure of the inner container is not described. The inner container should have the necessary mechanical integrity and a sufficient degree of water tightness, to insure against moderation and possible criticality in case of accident where several shipping units may be wetted and brought closer together than the spacing afforded by the 55 gallon drums.

2. The total solid angle subtended at a central unit in a planar array is greater than that permitted for shipments involving geometry control. Where geometry is the control parameter, it is permissible to assume a value of 0.8 for the multiplication constant. This value of k_{eff} permits a total subtended angle of one steradian whereas the total subtended solid angle for the Westinghouse shipments is 4.35 steradians. If the applicant believed that k_{eff} for this shipment will be less than 0.8, he should demonstrate that this is so and base the allowable solid angle on the actual value of k_{eff}.

(continued)

A14

3. Westinghouse claims a safety factor of 2.6 based on the ratio of U-235 density in a solid pellet to the superficial U-235 density in the pellet package. We request the applicant to explain the significance of this safety factor.

4. The method of shipment is not described. If shipment is to be made by common or contract carrier, Westinghouse should delineate arrangements with the carrier which will assure that other special nuclear material will not be combined on the same vehicle, and will not be assembled with the Westinghouse shipment at points of transshipment or delivery. Such arrangements should include procedures for preventing stacking of the containers. Stacking of these containers would appreciably increase the total solid angle. In the absence of positive assurances on these points, it will be necessary that Westinghouse revise its proposed procedures in order that its shipment will be safe in close proximity with other shipments of special nuclear material.

DOCKET NO.

File Cy.

RECEIVED

1960 APR 20 PM 1 44

WESTINGHOUSE ELEC. CORP.
1625 K STREET, N.W.
WASHINGTON 6, D.C.

DOCKETED
USAEC
Division of
Licensing & Regulation
APR 21 1960
Docket Officer

#
WG EC 4-20-60 1.25PM
J C DELANEY U S ATOMIC ENERGY COMMISSION DIVISION OF LICENSING
WASHINGTON 25 D C
WESTINGHOUSE ATOMIC FUEL DEPARTMENT REQUESTS 45 DAY EXTENSION OF PROVISIONAL AUTHORIZATION TO OPERATE WITHOUT TWO ADDITIONAL GAMMA ALARMONITRON UNITS INSTALLED. PROVISIONAL AUTHORIZATION TO OPERATE WITH THIS SYSTEM WAS ORIGINALLY GRANTED BY YOUR TELEGRAM, WUOO8 34 COLLECT DATED FEBRUARY 17 AT 5.10 P.M.
ADDITIONAL MONITRON UNITS HAVE BEEN PROCURED BUT NOT INSTALLED BECAUSE OF WESTINGHOUSE ATOMIC FUEL DEPARTMENT SHUT DOWN AND EXTENDED FURLOUGH OF LABOR FORCE. THE REQUEST FOR THIS 45 DAY EXTENSION WAS DISCUSSED WITH YOU VIA TELEPHONE ON APRIL 19, 1960.
C A W WELLERS ROLLS-ROYCE WESTINGHOUSE ATOMIC FUEL CHESWICK PA
MAO

FORM 24072

TELETY

A15

DOCKET NO. 70-337
File 4

Westinghouse

ELECTRIC CORPORATION

ATOMIC FUEL DEPARTMENT

PHONE: SPRINGDALE 1-300
PHONE: EMERSON 2-4400
CHESWICK, PENNSYLVANIA

May 2, 1960

United States Atomic Energy Commission
Division of Licensing and Regulations
Germantown District
Washington 25, D. C.

Attention: Dr. C. D. Luke

Ref: Request for an Approval of Westinghouse Atomic Fuel Department Shipping Container

Dear Sir:

Attached are three copies each of a request for a Bureau of Explosives number that Westinghouse Atomic Fuel Department has sent to the Bureau of Explosives. However, the approval of your office is needed before a Bureau of Explosives number can be obtained.

If there is any additional information needed, please feel free to call me.

Very truly yours,

L. P. Hackler

L. P. Hackler, Health Physicist
Administration

LPH:hsb

Enc. 3

DOCKETED
USAEC
Division of
Licensing & Regulation
JUL 8 1960
Docket Officer

A16

L F Hansler
Westinghouse Electric Corp
TO: Cheswick, Pa

USAEC

LTR.	MEMO:	PORT:	OTHER:
5/2/60		5/6/60	508-0

ORIG:	CC:	OTHER:
X	4/29/60	

REPLY NECESSARY ☐ DATE ANSWERED: BY:

NO REPLY NECESSARY ☐

CLASSIF: U

POST OFFICE

REG. NO:

FILE CODE:

DESCRIPTION: (MUST BE UNCLASSIFIED)

Req for an Approval of Westinghouse Atomic Fuel Dept Shipping Container
3 cys

ENCLOSURES:

REFERRED TO	DATE	RECEIVED BY	DATE
~~Dr Luke~~	~~5/6~~		
Central Files	7/8/60		

REMARKS:

Rec'd in LB 7/8 for docketing under 70-337
LD

U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC (3-52)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1959 J-528121

Reba

C. K. Beck, Chief
Hazards Evaluation Branch

May 9, 1960

Lyall Johnson, Chief
Licensing Branch

WESTINGHOUSE ELECTRIC CORPORATION - ATOMIC FUEL DEPARTMENT - REQUEST DATED MAY 5, 1960 FOR AMENDMENT TO THEIR SPECIAL NUCLEAR MATERIAL LICENSE NO. SNM-338 - DOCKET NO. 70-337

SYMBOL: LRL:JJL

Please review the subject request for the adequacy of the applicant's procedures to avoid a condition of accidental criticality. The enclosed Docket No. 70-337 should be returned with your comments.

Enclosure:
Docket No. 70-337

DISTRIBUTION
Suppl.
L&R Reading
LRL Reading
J. J. Lane, LRL

OFFICE ▶	LRL	LRL	LRL			
SURNAME ▶	JJLane/rh	[illegible]	LJohnson			
DATE ▶	5/9/60	5/9/60	5/9/60			

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

May 13, 1960

C. K. Beck, Chief
Hazards Evaluation Branch

Lyall Johnson, Chief
Licensing Branch

WESTINGHOUSE ELECTRIC CORPORATION REQUEST DATED MAY 2, 1960 FOR AMENDMENT TO THEIR SPECIAL NUCLEAR MATERIAL LICENSE NO. SNM-338 DOCKET NO. 70-337

SYMBOL: LRL:JJL

Please review the subject request for the adequacy of the applicant's procedures to avoid a condition of accidental criticality. The enclosed copy of the application may be retained for your files.

Enclosure:
Cy appli. dtd 5/2/60

DISTRIBUTION
Suppl.
L&R - LRL Readings
J. J. Lane, LRL

A18

OFFICE ▶	LRL	LRL	LRL		
SURNAME ▶	JJLane /rh	JCDelaney	LJohnson		
DATE ▶	5/13/60	5/16/60	5/16/60		

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

BUREAU OF EXPLOSIVES
ASSOCIATION OF AMERICAN RAILROADS
OFFICE OF CHIEF INSPECTOR
63 VESEY STREET
NEW YORK 7, N. Y.

T. C. GEORGE, CHIEF INSPECTOR

FILE NUMBER
25-16-174

W-D.

May 16, 1960

Westinghouse Electric Corp.
Atomic Fuel Dept.
Cheswick, Penna.

Gentlemen: Atten: H. A. Mathias, Jr.
Supervisory Buyer

Further reference is made to your letter of May 2 attaching a proposed affidavit which you plan to have transportation companies sign acknowledging that they will maintain certain spacing between shipping containers of your ownership.

We are opposed to the principle of the certification as in our opinion it imposes a restriction on the carrier with respect to loading of containers which would be most difficult to enforce.

We believe that containers must be of such design and contain the proper quantity of material so that under no condition of transportation, even in the presence of other shipping containers, would there be a problem of a nuclear incident.

Yours truly,

T. C. George

Chief Inspector

Copy to:
Inspector Hines

A19

NO. 70-337

File G.

BUREAU OF EXPLOSIVES

ASSOCIATION OF AMERICAN RAILROADS

OFFICE OF CHIEF INSPECTOR

63 VESEY STREET

NEW YORK 7, N. Y.

FILE NUMBER

25-16-174 BE #980

T. C. GEORGE, CHIEF INSPECTOR

W-D.

June 15, 1960

Westinghouse Electric Corp.
Atomic Power Department
P.O. Box 355
Pittsburgh 30, Penna.

Gentlemen: H. C. Amtsberg, Asst. ~~AG~~ Gen. Manager

This will acknowledge your letter of June 7 requesting approval of containers for shipment of reactive fuel consisting of an alloy of highly enriched uranium and zirconium completely closed in a bonded cladding of zirconium alloy.

Contingent on approval of the U.S. Atomic Energy Commission with respect to the proposed completed packages as they relate to criticality, this letter shall constitute Bureau of Explosives approval under provisions of section 73.393(f) for the containers as shown on drawings AFSK-0413 consisting of 3 sheets, AFSK-0425, of fuel elements packaged according to data outlined in procedure WSAP-E-2003, dated May 10, 1960, all of which have been made a part of this file.

For purpose of identification, this approval shall be designated "B.E. Permit No. 980" and this legend together with the words "radioactive Material" must be plainly marked on a clearly visible area of the shipping containers.

Bureau of Explosives approval is for the product shipping container only. It shall be the responsibility of the shipper to provide and maintain the shipping container in such condition that its original design and configuration will prevent assembly of a critical mass under any normal condition of transportation. The shipment herein approved also must be safe from criticality in the presence of other shipping containers of fissionable materials irrespective of design or quantity contained therein.

The issuance of this approval does not relieve the shipper or his agents of compliance with any requirement of I.C.C. Regulations pertaining to shipment of radioactive material.

As a matter of information, the outside plywood shipping box should not be marked as complying with ICC Spec. 15A as plywood is not an authorized component of that specification. The B.E. Permit Number and marking will suffice for this purpose.

Yours truly,

T.C. George.
Chief Inspector

Copies to:
Mr. C. W. Taylor, I.C.C.
Mr. Herbert Qualls, Bur. of Motor Carriers, I.C.C.
Commandant, U.S. Coast Guard
Washington, D.C.

DOC USAEC Division of Licensing & Regulation JUN 23 1960 Docket Officer

A110

DOCKET NO. 70-337
File Cy

Westinghouse

ELECTRIC CORPORATION

ATOMIC POWER DEPARTMENT

June 21, 1960

P.O. BOX 355
PITTSBURGH 30, PA.

U. S. Atomic Energy Commission
Division of Licensing & Regulation
Germantown District
Washington, D. C.

ATTENTION: Mr. H. L. Price,
Director

Gentlemen:

SUBJECT: Docket 70-337--License SNM-338,
Spare Fuel Containers

Attached are four (4) copies of B. E. Permit #980, issued to the Westinghouse Electric Corporation for the shipping container design as described in procedures dated June 7, 1960.

These copies are submitted for your information to aid in the final approval of our original request.

Very truly yours,

H. C. Amtsberg

H. C. Amtsberg
Assistant to General Manager

HCA/ret/jd

attachments

DOCKETED
USAEC
Division of
Licensing & Regulation
JUN 23 1960
Docket Officer

A 111

ASSOCIATED TRANSPORT
INC.

THE NATION'S LEADING MOTOR CARRIER SERVING THE NORTH AND SOUTH

EXECUTIVE OFFICES • 380 MADISON AVENUE • NEW YORK 17, N. Y.

TELEPHONE
URRAY HILL 7-8500

June 22, 1960

Mr. H. A. Mathias, Jr.
Supervisory Buyer
Atomic Fuel Department
Westinghouse Electric Corporation
Cheswick, Pennsylvania

Dear Mr. Mathias:

This refers to a personal visit made by Frank Schratz and myself at your office Monday, June 6th, which was in direct response to your letter of May 18th.

This letter will merely confirm for the record that while we desire in every way to cooperate with your Department, we find it a physical impossibility to be able to guarantee and sign the transportation certificate with the 12 foot restriction.

I believe we covered this quite adequately in our discussion, pointing out such things as relay, and the break terminals, passing vehicles on the road, making stops at diners and restaurants.

After returning to New York, our Safety Department spoke of other inquiries they received from shippers with pretty much the same problem.

While the exclusive use of vehicle principle, which I pointed out to you could be utilized to advantage, even there, you could not assure one truck passing another truck with 12 feet in between. At least, with exclusive use, however, there would be control at terminals and shipper and consignee facilities.

While we would very much like to say "yes", I mentioned to you at the time we would much rather be frank with you and assure the job being done right because after all, when we certify to something, we want to be sure that certification is at least capable of being physically handled.

A112

Yours very truly,
ASSOCIATED TRANSPORT, INC.

W. P. Wagner

W. P. Wagner
Assistant to Senior Vice President

cc: Mr. R. E. Bish

RAILWAY EXPRESS AGENCY
INCORPORATED
OPERATIONS DEPARTMENT
212 EAST 42ND STREET
NEW YORK 17, N. Y.

June 24, 1960

Mr. H. A. Mathias, Jr.
Supervisory Buyer
Westinghouse Electric Corporation
Atomic Fuel Department
Cheswick, Pennsylvania

Dear Mr. Mathias:

Referring to your letter of May 2 and supplementing mine of May 13.

Please excuse the delay in making our final response to this matter as we were desirous of fully exploring the situation before making our response.

I am sorry to advise that a certification as proposed would place us under certain restrictions and there would be occasion when it would be impossible for us to carry out the provisions of the certification, therefore, I sincerely regret we are not in a position to execute the proposed transportation certification.

It would be my suggestion that packing specifications be adopted that would permit us to safely handle these shipments under any and all conditions and thereby removing the necessity for the restrictions.

If I may be of further assistance in this or any other matters, please let me know.

Yours very truly,

J. J. Tuohy

Superintendent
Loss and Damage Prevention

A113

Atomic Fuel Department
Cheswick, Pennsylvania

July 1, 1960

ATOMIC POWER DEPARTMENT

G. L. Duke
Purchasing Agent

c.c.: R. J. Breitinger - Gateway
R. E. Bish - Cheswick

Recently it was necessary to approach the transportation industry concerning control of shipments of nuclear materials. I thought you would be interested in the results and comments from various transportation people, and I expect that you may be faced with this same problem or a similar one in the near future. Attached is a copy of my letter to the transportation companies outlining the problem and their replies.

H A Mathias, Jr.

H. A. Mathias, Jr.
Supervisory Buyer

HAM:cam
Enc.

A114

May 18, 1960

Associated Transport, Inc.
318 Haymaker Road
Monroeville, Pennsylvania

Gentlemen:

Recently the Atomic Energy Commission has imposed a regulation requiring Westinghouse, the Atomic Fuel Department, to exercise controls over special nuclear materials. It is intended that this control extend beyond the manufacturing area and include the methods of handling special nuclear materials while in transit. We feel that the only way to assure ourselves that controls are maintained is to have a signed affidavit from the transportation company handling our special nuclear materials shipments. The proposed affidavit is enclosed.

I would appreciate your reviewing this affidavit and advising me if your company would be willing to co-operate and certify the conditions specified.

I can foresee the use of this type of certification on each shipment. For any shipment made on a particular contract, an executed copy of the affidavit would be attached so that all personnel handling the shipment would be advised of the regulations as well as the concurrence of the company to uphold the regulation.

The Atomic Energy Commission is requiring this action as a part of a permit for which we have applied. I would

The Atomic Energy Commission is requiring this action as a part of a permit for which we have applied. I would appreciate your comments on this subject as soon as possible so that we may conclude our negotiations with the AEC for this permit. Please indicate whether your company would or would not be willing to offer a certification.

Yours very truly,

WESTINGHOUSE ELECTRIC CORPORATION

H. A. Mathias, Jr.
Supervisory Buyer

HAM:cam

Enclosure

No. __________

TRANSPORTATION CERTIFICATION

We the ____________________ hereby certify that we will assume full control of nuclear materials which we may contract to transport for the Westinghouse Atomic Fuel Department (WAFD). This control shall consist of the following minimum limitations:

1. No other shipment of nuclear material will be permitted to approach the WAFD shipment on the same carrier vehicle by closer than 12 feet.
2. No other shipment of nuclear material will be permitted to approach the WAFD shipment on any in-transit shipping dock by closer than 12 feet.
3. When so stated on the containers and the shipping way bill, no containers of material will be double stacked.

We warrant this control will be exercised at all times from point of embarkation to delivery point.

WITNESS

____________________________ Signing for ______________________

____________________________ Name ____________, Vice president
Address

Date ____________________________

C. K. Beck, Chief
Hazards Evaluation Branch

July 11, 1960

Lyall Johnson, Chief
Licensing Branch

WESTINGHOUSE ELECTRIC CORPORATION REQUEST DATED MAY 2, 1960, FOR APPROVAL OF SHIPPING CONTAINER - DOCKET 70-337

SYMBOL: LRL:JJL

Please review the subject request for the adequacy of the applicant's procedures to avoid a condition of accidental criticality. The enclosed copy of the application should be returned with your comments.

Enclosure:
Appl. dtd 5/2/60

Distribution:
Suppl.
LRL Rdg.
L&R Rdg.
JJLane:

JUL 13 1960

A115

OFFICE ▶	LRL	L&R	L&R			
SURNAME ▶	JJLane:sjs	[illegible]ey	LJohnson			
DATE ▶	7/11/60	7/12/60	7/ /60			

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

OPTIONAL FORM NO. 10

UNITED STATES GOVERNMENT

Memorandum

Delaney

TO	:	Lyall E. Johnson, Chief Licensing Branch	DATE: AUG 4 1960
FROM	:	Clifford K. Beck, Chief Hazards Evaluation Branch	CKB
SUBJECT:		WESTINGHOUSE ELECTRIC CORPORATION, DOCKET NO. 70-337 - PROJECT S-44	

We have reviewed the Westinghouse letter dated May 2, 1960, submitting designs for shipping containers for scrap and fuel rods.

The container for scrap is a 5" I.D. cylinder inside a 6" std. steel pipe with a welded bottom and capped top. The birdcage is constructed of 1" x 1" x 1/4" angle iron and is 18" square by 75" long.

The container for fuel rods is a 5" std. steel pipe with a welded bottom and capped top, in a birdcage similar to the above. The maximum U-235 per container will correspond to 1 kg U-235 per cubic foot of birdcage volume.

We agree with Westinghouse that the first container is geometrically safe for scrap solutions. A maximum of ten such containers per shipment would be safe from criticality due to interaction. The second container is safe for fuel rods containing a maximum of 12.5 kg U-235 (1 kg/cu ft) only for a maximum of ten containers shipped "exclusive use of vehicle."

We recommend approval of the application, for exclusive use shipments.

A116

DOCKET NO. 70-43

EXTRA

(This copy for 70-337 for info)

WESTINGHOUSE ELECTRIC CORPORATION
ATOMIC POWER DEPARTMENT
P. O. BOX 355
PITTSBURGH 30, PA.

October 6, 1960

U. S. Atomic Energy Commission
Division of Licensing & Regulation
Germantown District
Washington 25, D. C.

ATTENTION: H. L. Price, Director

Gentlemen:

SUBJECT: Application for SNM Fuel Allocation

The Westinghouse Electric Corporation, Atomic Power Department, (SNM-38, Docket 70-43) hereby makes application for allocation of 3,385 lbs. of UF_6 gas for the Saxton Reactor Project. The Atomic Power Department operates under the terms and conditions of SNM Lease Agreement 165.

The core will be fabricated at the Westinghouse Atomic Fuel Department, Cheswick, Pennsylvania. The Atomic Fuel Department operates under the terms and conditions of SNM-338, Docket 70-337 and SNM Lease Agreement 161.

The Atomic Power Department will not take possession of the special nuclear material. APD will only administer the allocation request.

SNM-38, valid at APD is good only for enrichments up to 5%. This allocation requests material enriched to 5.5%. Since APD will not physically possess these materials, we request a waiver from the need for amending SNM-38.

SNM-338, valid at AFD, is the license under which AFD will possess the special nuclear material.

The Saxton Nuclear Experimental Corporation was issued Construction Permit, CPPR-6, Docket 50-146, dated February 11, 1960.

A117

70-43

Information requested in 10 CFR 50, Section 50.60, is included in the attached application for allocation.

Very truly yours,

H. C. Amtsberg
Assistant to General Manager

HCA/ret/jd

attachment 1959 Annual Report

DOCKET NO. 70-43

APPLICATION FOR ALLOCATION

This application requests an allocation of Special Nuclear Materials for the Saxton Reactor Project, under the terms and conditions of Special Nuclear Materials License SNM-38 (Docket 70-43) and Lease Agreement Number 165. The allocation request is made pursuant to 10 CFR 70, entitled, "Special Nuclear Materials." However, information is furnished as requested in 10 CFR Part 50, Section 50.60, as outlined below:

(1) "Applicants financial qualifications to assume responsibility for payment of Commission charges for the materials, and to undertake and carry out the proposed use of special nuclear material for a reasonable period of time."

See attached copies of Annual Report, Westinghouse Electric Corporation, 1960. The Westinghouse Atomic Power Department operates under the terms and conditions of Special Nuclear Materials Lease Agreement Number 165.

(2) "The estimated date on which the applicant desires to receive the first shipment of special nuclear material and an estimated schedule by years, for subsequent receipts."

First shipments of UF_6 gas should begin no later than January 31, 1961 and deliveries should be completed no later than February 15, 1961.

Core I will require 3,385 lbs. of UF_6 gas.

		Enrichment
Assemblies and Subassemblies	2,975 lbs.	$5.5\% \pm .2$
Inserts and Followers	410 lbs.	$5.0\% \pm .5$
Total UF_6 requirements	3,385 lbs.	

This request is predicted upon a yield of 2,235 lbs. and 300 lbs. respectively for the conversion of UF_6 to UO_2 powder for the assemblies and subassemblies, inserts and followers.

The conversion from UO_2 powder to UO_2 pellets is predicted to yield 2,080 lbs. and 270 lbs. respectively for the assemblies and subassemblies, inserts and followers.

Approximately 2,034 lbs. of UO_2 pellets will be installed in the core in fuel assemblies and subassemblies, while 254 lbs. of UO_2 will be used for the inserts and fuel rod followers.

Core II will require a similar amount of fuel about May 1, 1963.

(3) "A schedule, by years, showing the estimated production, consumption and operating losses of special nuclear material;"

Core I is expected to operate from December, 1961 to May, 1964. During this period approximately 10.5kg. of U-235 will be consumed (final enrichment 1.14% less than initial) and 2.8 kg. of Pu produced. For the purpose of this estimate, consumption and production is linear in the interval.

Core II is expected to operate from June, 1964 to December, 1966. It is estimated consumption and production of special nuclear materials will be similar to the prediction for Core I.

(4) "An estimated schedule, by years, for the transfer of special nuclear material to the Commission or to other licensees;"

The UF_6 gas will be converted into UO_2 powder and subsequently into UO_2 pellets by one or more licensees. Unaccountable losses during the fabrication cycle should not exceed 3%. In addition, approximately 7% of the UO_2 will be returned as scrap, to the AEC in the form of U_3O_8. The conversion pelletization and loading processes should be completed between March, 1961 and September, 1961.

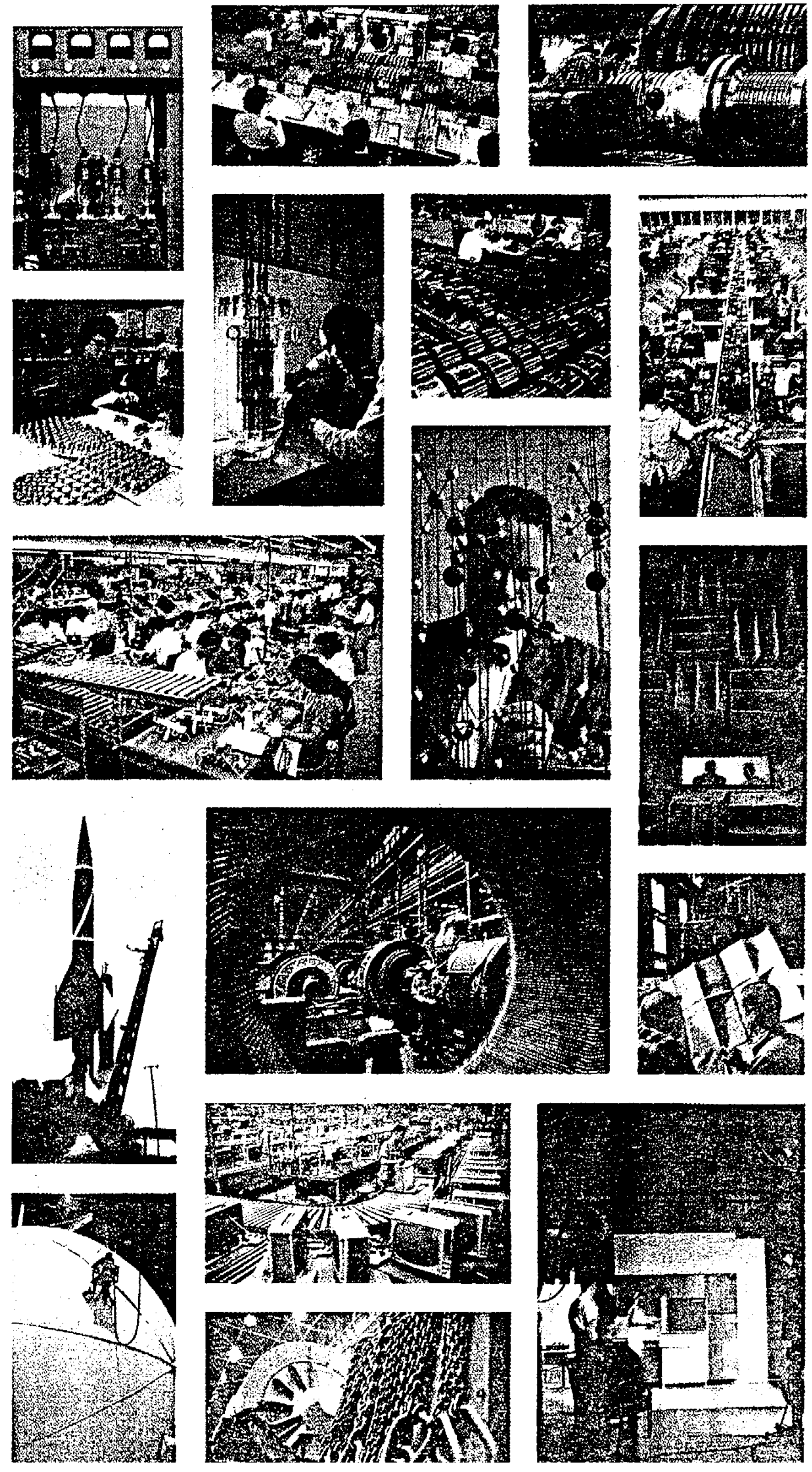
Core loading is scheduled to begin in October, 1961. First criticality is scheduled for late November, 1961.

Shipment of Core I to the AEC for reprocessing is scheduled for October, 1964, allowing for refueling time and a 90 day decay period. It is estimated Core II will be shipped for reprocessing about May, 1967.

The Saxton Nuclear Experimental Corporation has been issued Construction Permit, CPPR-6, Docket 50-146, dated February 11, 1960, by the AEC.

70-43
(Trans. w/ltr. 10-6-60)
(This copy for
70-337 for info.)

Westinghouse Electric Corporation · ANNUAL REPORT 1959



a westinghouse creed

WE BELIEVE that the most important asset of Westinghouse is its *people*—in every plant, office and community, wherever they work and live.

WE BELIEVE in the dignity of every employe in Westinghouse and the importance of his work.

WE BELIEVE that the well-being and security of employes are dependent upon the soundness and security of Westinghouse; that, to keep our Company sound and secure, the people of Westinghouse have an obligation to make the most effective use of their skill, effort and time on their jobs.

WE BELIEVE that all of the people of Westinghouse must recognize our joint responsibility to the owners of our Company, to the public we serve and to our nation as a whole.

IN RECOGNITION OF THESE BELIEFS, AND OF THE COMPANY'S RESPONSIBILITIES TO EMPLOYES, WE PLEDGE:

- That every employe will be treated fairly, with consideration and respect, and we expect all who supervise the work of others to treat those under their direction as they themselves would want to be treated.
- To pay wages and provide employe benefits that fairly reward employes for their skill, effort and time.
- To weigh all decisions with full regard for their effect on the well-being of employes.
- To try to provide stability of employment to the greatest practical extent.
- That the complaint of any employe, whether delivered directly by the employe or through a bargaining representative, will be listened to and handled with fairness and promptness.
- To provide employes every possible opportunity for self-improvement and advancement in the Company.
- To provide good working conditions—a safe, clean, friendly work-place and proper facilities to help the employe do his job effectively.

directors and officers

directors

DILLON ANDERSON
E. O. BOSHELL
MARK W. CRESAP, JR.
FRANK R. DENTON
THOMAS J. HARGRAVE
H. B. HIGGINS
JOHN K. HODNETTE
CHARLES R. HOOK
EDWARD HOPKINSON, JR.
E. V. HUGGINS
HOWARD S. KALTENBORN
JOHN J. McCLOY
ARTHUR W. PAGE
W. A. PATTERSON
GWILYM A. PRICE
JOHN W. REAVIS
A. W. ROBERTSON
JOHN M. SCHIFF
DONALD C. SWATLAND
REESE H. TAYLOR

staff officers and product group general managers

vice presidents

ROBERT D. BLASIER, *industrial relations*
ALBERT BOYD, *defense products*
D. C. BURNHAM, *manufacturing*
RONALD N. CAMPBELL, *air conditioning and residential heating*
S. W. HERWALD, *research*
J. A. HUTCHESON, *engineering*
J. H. JEWELL, *marketing*
HOWARD S. KALTENBORN, *assistant to president*
A. M. KENNEDY, JR., *purchases and traffic*
LESLIE E. LYNDE, *staff*
GEORGE G. MAIN, *finance*
DALE McFEATTERS, *information services*
A. C. MONTEITH, *apparatus products*
W. W. SPROUL, JR., *general products*
CHARLES H. WEAVER, *atomic power products*
CHRIS J. WITTING, *consumer products*

FRANCIS E. DALTON, *controller*
R. B. READ, *treasurer*
CARLISLE P. MYERS, *secretary and general counsel*

officers

MARK W. CRESAP, JR., *president*

GWILYM A. PRICE, *chairman of the board*

JOHN K. HODNETTE, *executive vice president*

E. V. HUGGINS, *vice president and chairman of the executive committee*

product divisions and sales regions

vice presidents

CHRIS H. BARTLETT
B. M. BROWN
JOHN H. CHILES, JR.
JOHN W. CRAIG
TOMLINSON FORT
THOMAS P. JONES
R. S. KERSH
W. E. KNOX
W. O. LIPPMAN
W. J. MAYTHAM, JR.
L. B. McCULLY
LAMAR W. McLEOD
JOHN E. PAYNE
O. O. RAE
CARROLL V. ROSEBERRY
W. C. ROWLAND
RICHARD J. SARGENT
CHARLES C. SHUTT
JOHN W. SIMPSON
F. M. SLOAN
W. WAITS SMITH
TOM TURNER
C. S. WEBER

WESTINGHOUSE ELECTRIC CORPORATION-3 Gateway Center, Pittsburgh 22, Pennsylvania

table of contents

Directors and Officers .... *inside front cover*

President's Letter 2

Facts in Brief 3

Financial Review 3

Story of the Year's Operations 5

Financial Statements 29

Accountants' Report 32

Notes to Financial Statements 32

Ten Year Highlights .... *inside back cover*

Plants and Products .... *inside back cover*

ANNUAL MEETING OF STOCKHOLDERS: The annual meeting of stockholders of Westinghouse Electric Corporation will be held at the California Masonic Memorial Temple, 1111 California Street, San Francisco, California, on Wednesday, April 6, 1960, at 10:00 a.m., Pacific Standard Time. Annual meetings are usually held at different locations each year to give stockholders in various regions of the country an opportunity to meet management and discuss the Company's affairs.

president's letter to the stockholders

The decision of the Board of Directors to increase the dividend and stockholders' approval of a two-for-one split of the common stock highlighted a profitable and eventful year for Westinghouse. The following summary of significant achievements is amplified in the full report.

The improvement in margins reported here a year ago gained impetus in 1959 on an increase of less than one per cent in net sales billed. The ratio of income before taxes to billings improved 18 per cent, from 6.8 per cent in 1958 to 8 per cent in 1959. These gains resulted from a decisive and aggressive management program to reduce costs and improve profits.

An Astronuclear Laboratory has been established to develop high-performance reactors for outer space applications ranging from nuclear propulsion plants for aerospace vehicles to nuclear power supplies for auxiliary equipment on space vehicles. Many of the scientists and engineers now working at the Laboratory have made important technical contributions to the Company's position of leadership in the field of atomic power.

Westinghouse scientists scored a major breakthrough in molecular electronics, and developed a method of growing germanium crystals which promises greatly improved reliability and substantial reductions in the size and weight of electronic equipment.

The Atomic Power Department scored another industry first by offering to build large nuclear plants at fixed prices and with guaranteed output and core life. These plants would be competitive with conventional power sources in high fuel cost areas of the United States. Company engineers introduced Powercasting, a method by which computers can accurately forecast the operating requirements of an electric utility system through 1979 and beyond.

The Company's operations during 1959 were threatened by strikes in the steel and copper industries. By judicious forward inventory planning and a coordinated procurement program, the divisions were able to operate at sustained high levels during the longest copper and steel strikes in history.

Manufacturing methods and equipment were upgraded to improve efficiency and increase production capacity. To implement this program, a substantial increase in capital expenditures is planned for this year.

A unique program designed to eliminate scientifically the unnecessary use of materials is under way.

The second in a planned series of nationwide distribution depots to give dealers and distributors faster delivery of Westinghouse products is in operation at Columbus, Ohio. Data processing equipment is used extensively to cut costs and provide for more efficient product distribution.

Spearheading an aggressive advertising program in 1960 will be the sponsorship of the complete Columbia Broadcasting System television and radio broadcasts of the political conventions, campaigns and election returns.

The public's interest in this most significant political event was recognized by Westinghouse in 1952 when it sponsored the first program. In 1956, the Westinghouse-CBS telecasts were viewed by more than 76,000,000 people. It is expected that this year, the political telecasts will attract even more attention and contribute greatly toward public interest in the campaign, as well as better understanding of the issues.

Achievements, progress and future growth are dependent on the thousands of loyal and able Westinghouse men and women, and we wish to acknowledge here our appreciation for their cooperation and performance.

MARK W. CRESAP, JR.
President

By order of the Board of Directors
January 27, 1960

GWILYM A. PRICE
Chairman of the Board

facts in brief

	1959	1958
Products and services sold	**$1,910,730,000**	$1,895,699,000
Net income:		
From operations	**78,751,000**	74,772,000
From special items	**7,196,000**	
Total	**85,947,000**	74,772,000
Net income per share:		
From operations	**4.44**	4.25
From special items	**.42**	
Total	**4.86**	4.25
Total dividends paid	**37,878,000**	35,792,000
Dividends paid per share of common stock	**2.10**	2.00
Common shares (at year end)		
Outstanding	**17,339,000**	17,180,000
Book value per share	**$ 50.76**	$ 47.93
Expenditures for new and improved facilities	**45,239,000**	54,998,000
Wear of facilities provided out of earnings — depreciation and amortization	**46,696,000**	47,729,000
Working capital (at year end)	**768,045,000**	729,721,000
Long term debt (at year end)	**320,995,000**	320,995,000

financial review

Net income in 1959 was $85,947,000, equal to $4.86 a share on 17,339,000 common shares outstanding at year end. Included was special income of $7,196,000, equal to 42 cents a share, described in Notes 6 and 7 to the financial statements (page 32).

For 1958, net income was $74,772,000, equal to $4.25 a share on 17,180,000 common shares outstanding at year end. Net income for 1958 reflected a $7,470,000 (43 cents a common share) Federal income tax reduction due to the merger of several subsidiaries into the Corporation.

Net sales billed were $1,910,730,000, an increase of .8 per cent above 1958.

The annual dividend rate on the common stock was raised from $2.00 to $2.40 a share by the Directors on October 28, 1959. Common stock owners received dividends of $2.10 a share in 1959 as compared with $2.00 in 1958. The preferred stock dividend remained unchanged at $3.80 a share. Dividend payments totaled $37,878,000, as compared with $35,792,000 in 1958.

Authorized common stock was increased from 18,000,000 shares to 25,000,000 shares at the annual meeting, April 1, 1959. Stockholders approved a two-for-one split of the common stock at a special meeting on January 4, 1960, as recommended by the Directors on October 28, 1959. As a result, authorized common stock was increased from 25,000,000 shares, par value $12.50 a share, to 50,000,000 shares, par value $6.25 a share, effective January 5, 1960.

During the year the Company listed its common stock on the Pacific Coast Stock Exchange and now has transfer agents and registrars in Chicago and San Francisco as well as New York.

Federal, state, local and foreign taxes paid and accrued were $125,977,000, equal to $7.27 a common share. Federal taxes amounted to $100,863,000.

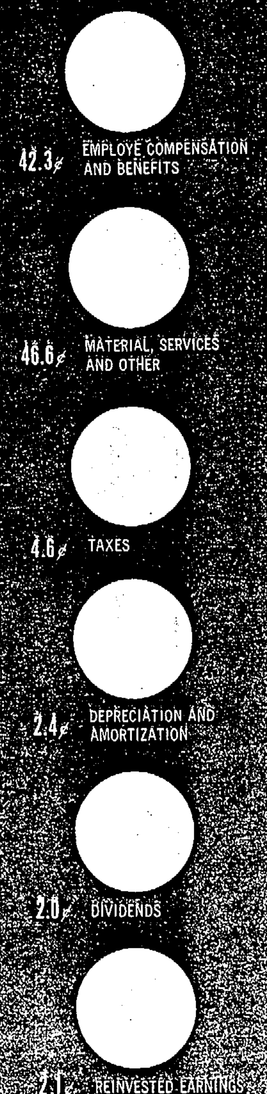
More than 80 per cent of the $45,239,000 expended in 1959 for new plant and facilities went to increase production and improve manufacturing efficiency in existing facilities. The remainder was applied to new plant construction.

The Company's investment in Westinghouse Credit Corporation at year end was $26,000,000. This wholly owned subsidiary expanded its volume of financing service to Westinghouse distributors, dealers and their customers to more than $90,000,000, an increase of 66 per cent above 1958.

During the year, the Company purchased and retired 26,600 shares of 3.80 per cent preferred stock, leaving 440,485 shares outstanding at year end.

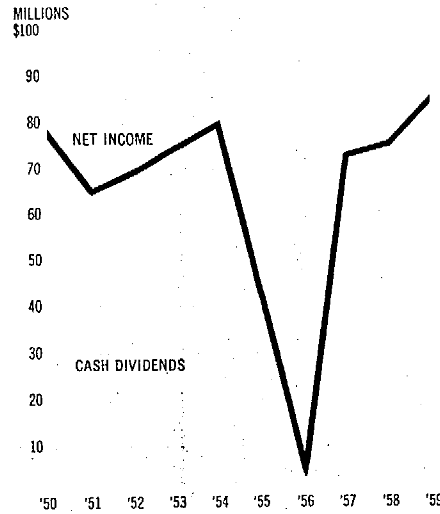
Sinking fund requirements for 1959 of the 2⅝ per cent debentures and the preferred stock were met by tender of previously purchased and retired debentures and preferred stock.

our 1959 income dollar was used for:

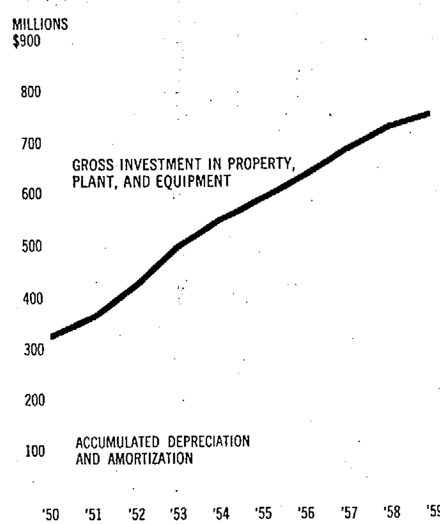


*Excludes special income and expense

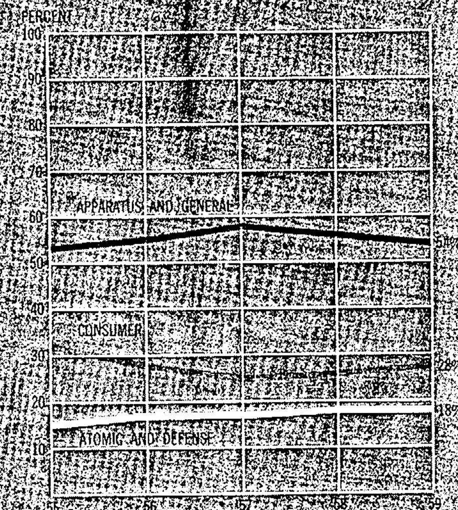
net income improves, cash dividends increase



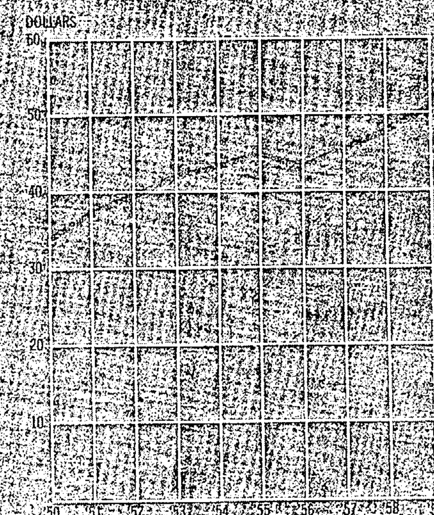
investment in facilities rises



sales billed by product markets



increase in book value per common share continues

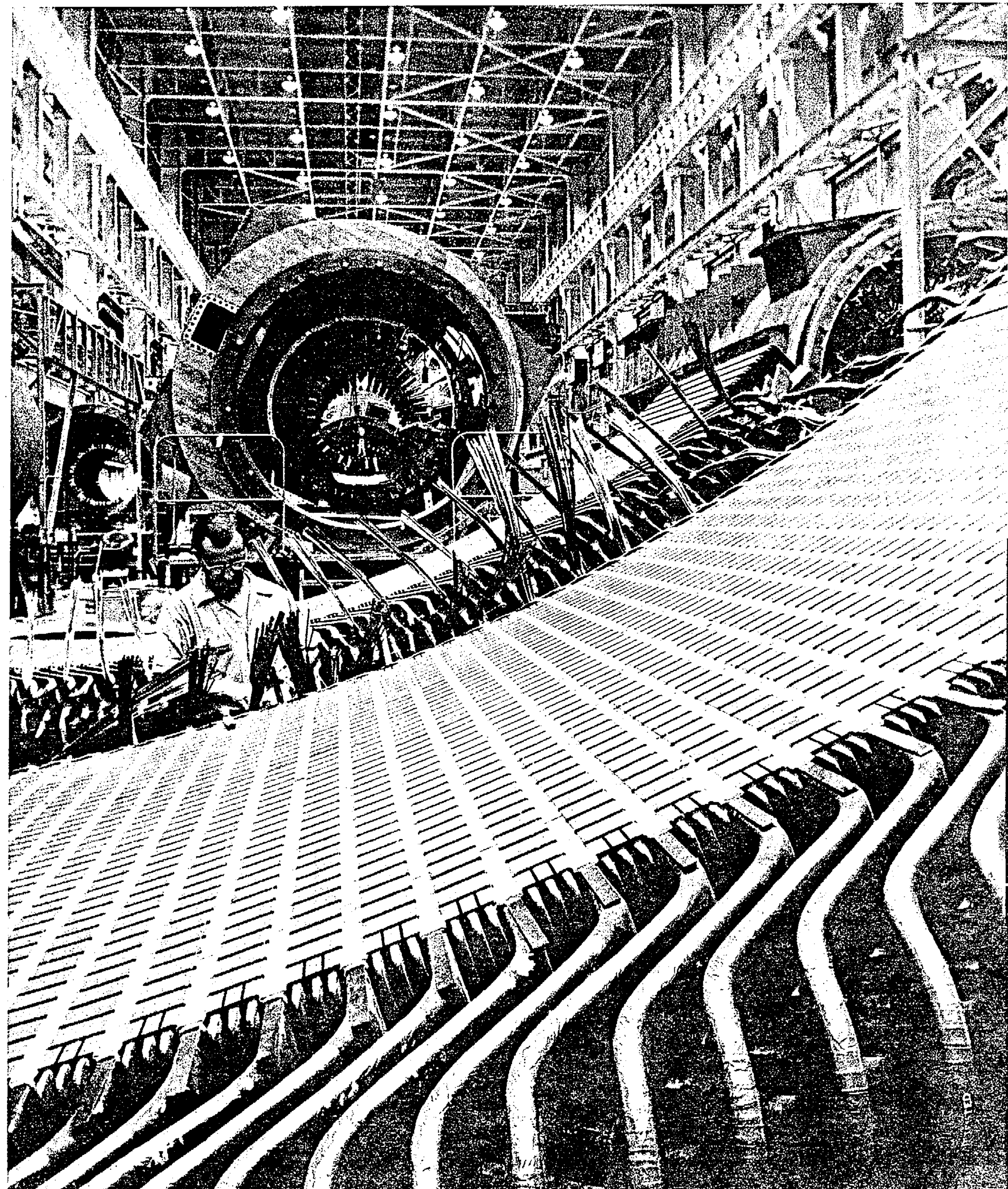


the story of the year's operations

.dvances in research, manufacturing, engi-
:ering and marketing accelerated the forward
.omentum of Westinghouse during 1959.

lvances in research

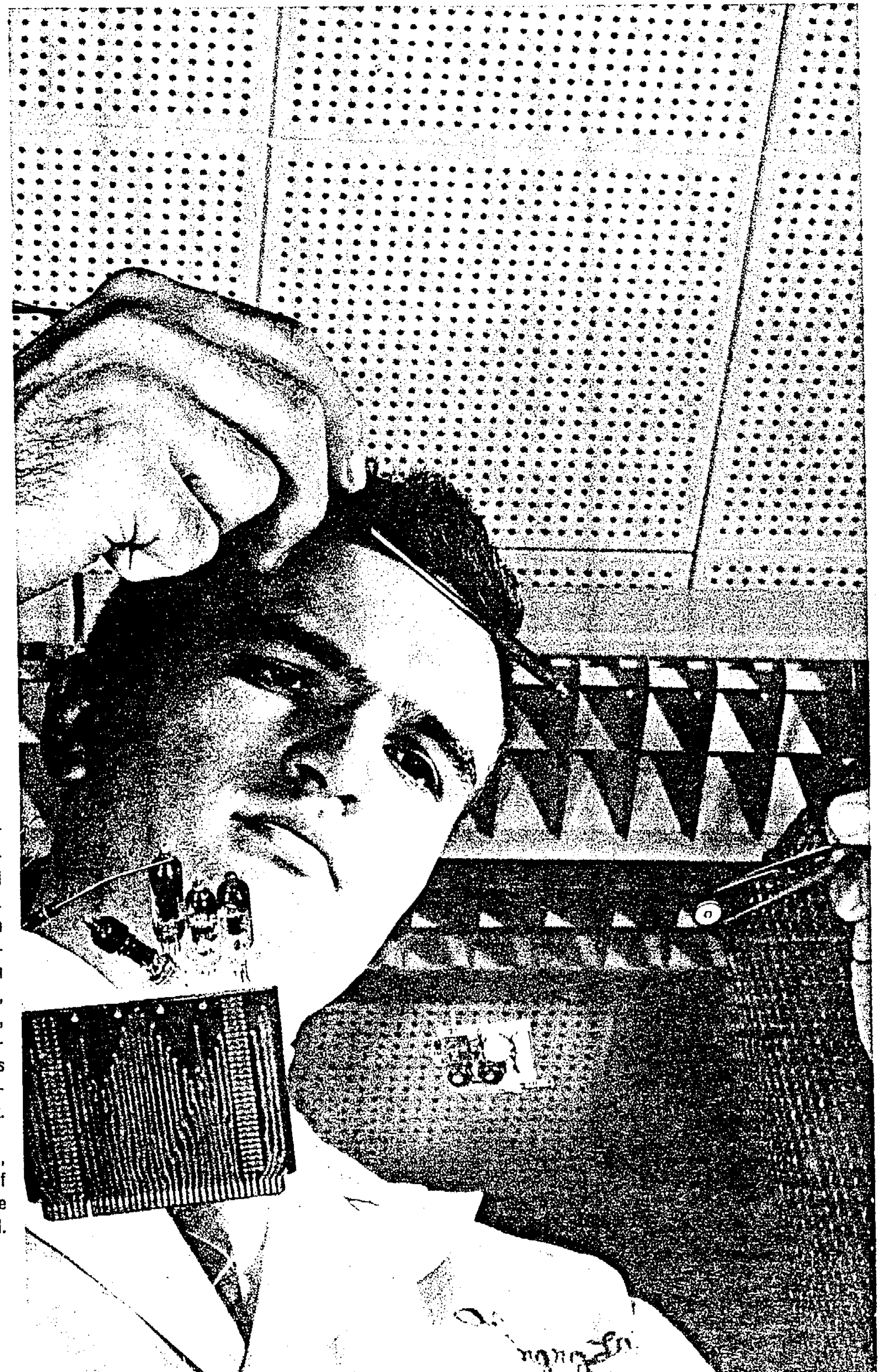
Westinghouse scientists scored a break-
rough in the fast-growing semiconductor
:ld with the development of a revolutionary
'ocess for growing germanium, and with a
:w concept known as molecular electronics.
Molecular electronics combines into a single
ystal of solid material the various electrical
nctions now performed by individual com-
ınents in electronic circuits. Westinghouse is
ıplying this concept under an Air Force con-
ıct for the development and manufacture of
w devices of high reliability in such fields as



Typical of the massive power generating equipment produced by Westinghouse is this stator (foreground) for a hydroelectric generator, and these large steam-turbine generators (background) being built at the Large Rotating Apparatus Department of the East Pittsburgh, Pa. plant. To meet the growing demand for this type of equipment, a major expansion and modernization program is now under way at plants in East Pittsburgh, Lester, Pa. and Sunnyvale, Calif.

RIGHT—The new concept of molecular electronics promises to improve reliability, reduce power requirements and reduce the size of electronic equipment. The light telemetry subsystems in the photograph show some of the improvements realized. At left is a subsystem employing conventional circuitry; center, one with transistorized circuitry; right, a molecular electronic subsystem. Westinghouse is applying molecular electronics techniques to a variety of military applications under an Air Force contract.

OPPOSITE PAGE—Mark W. Cresap, Jr., President (center) presides at meeting of Administration Committee, where matters of basic policy are decided.

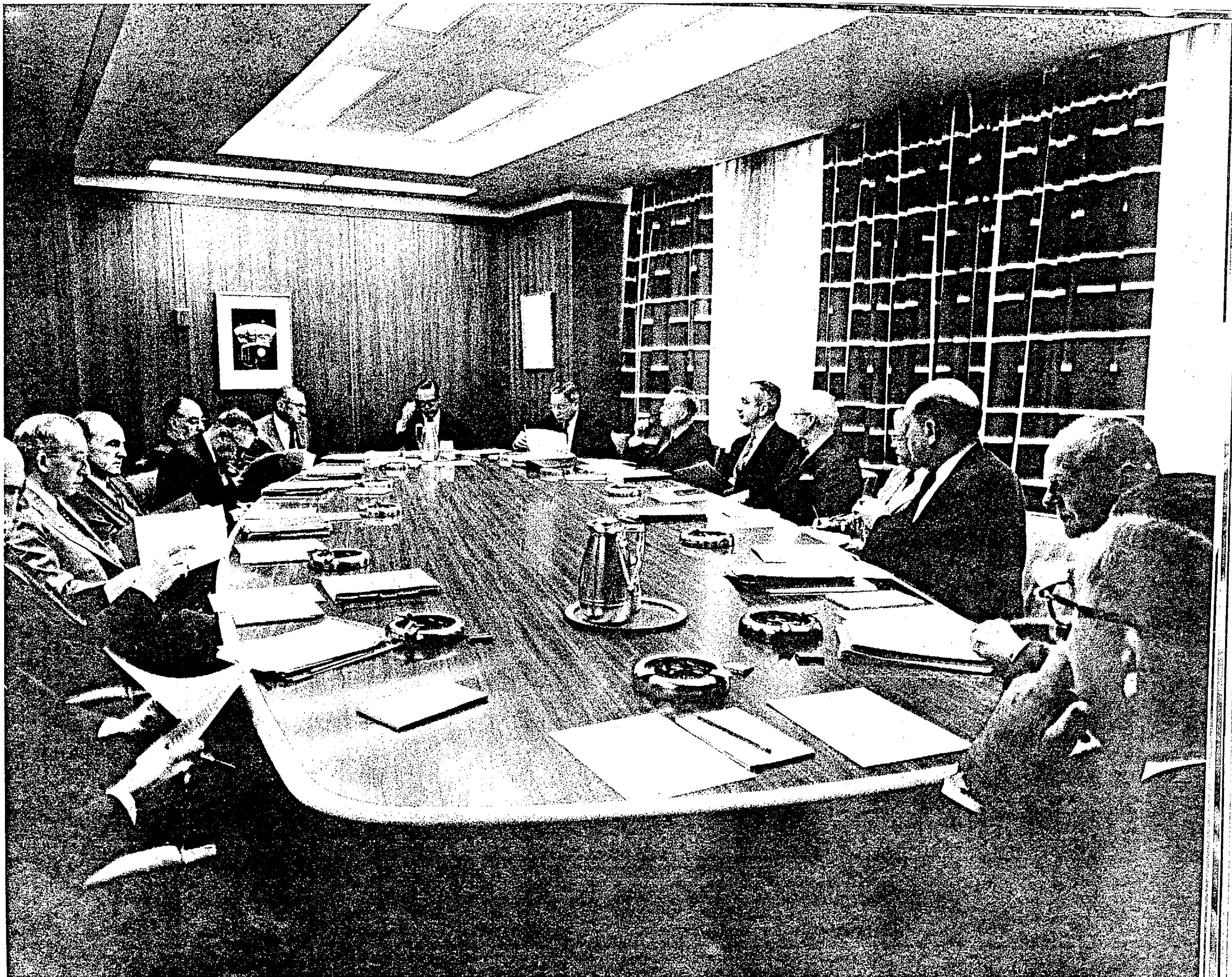


infrared, reconnaissance, communications, telemetry flight control and other military applications. It may eventually lead to development of outer space electronic equipment 1,000 times smaller and lighter than corresponding equipment now in existence, yet reduce power requirements and improve reliability.

An important step toward the development of solid state materials necessary to the practical realization of this concept was made by scientists at the Westinghouse Research Laboratories. They developed a revolutionary process for growing germanium as thin, flat, continuous strips—the exact form in which the material can be used directly in finished semiconductor devices. The process is also considered a significant step toward the automatic manufacture of transistors and other solid state devices.

Through its foresighted investment in thermoelectric research, the Company advanced its position of leadership in this field. Thermoelectricity is the direct conversion of heat into electricity for power generation, or the reverse use of the effect for refrigeration and heating. Westinghouse developed for the Air Research and Development Command a 100-watt thermoelectric generator capable of powering electronic installations in isolated areas of the world. The generator represents important progress in the search for compact power sources required for remote sites.

Another major thermoelectric project being undertaken by Company engineers is the design and construction of a 5,000-watt generator for the U. S. Navy Bureau of Ships. This unit is the first step in solving many problems

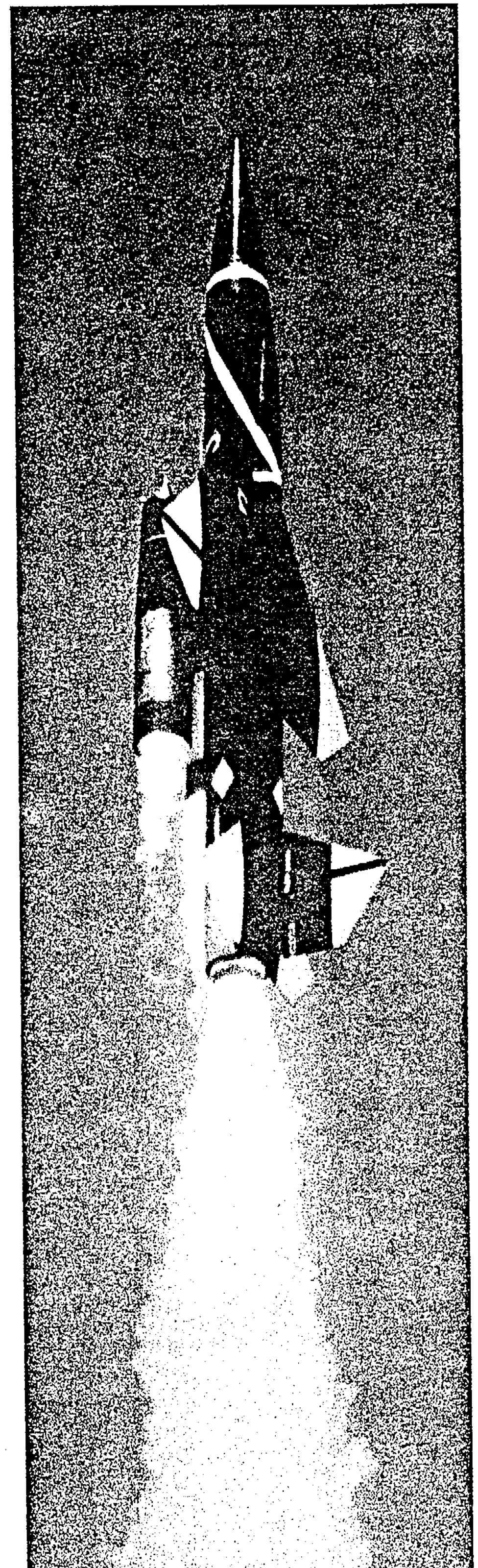


associated with the development of a large-scale thermoelectric power plant. The Company is developing for the Bureau of Ships an experimental three-purpose thermoelectric air conditioner, space heater and refrigerator to test the suitability of thermoelectricity for air conditioning and refrigeration on ships.

Long mission satellites and manned space vehicles of the future may tap the sun for their electric power. The Space Technology organization of the Aircraft Equipment Department, Lima, Ohio, developed with Boeing Airplane Company a thermoelectric generator which is capable of converting the energy of the sun's rays into enough electric power to operate a radio transmitter broadcasting a strong signal back to earth.

Research on metals by Company engineers has resulted in a process which makes possible for the first time the construction of large metal objects from tungsten, molybdenum and other super-strong, high-temperature, "space age" metals and alloys. Known as continuous powder compaction, the new process compresses metal powders as fine as flour into large, uniform metal bars. When baked, these bars can be fashioned into useful structures by standard metalworking procedures.

To facilitate the pursuit of new scientific knowledge and the rapid translation of new knowledge into products of the future, plans were announced for the creation of a centralized research and development center near Pittsburgh, Pa. The new center, which will bring together on a single site all the key personnel associated with the Company's broad program of basic and applied research, will be made up of the Westinghouse Research Laboratories, Materials Laboratories, New Products Laboratories, Manufacturing Planning and Control Laboratories and the Patent Department.



advances in manufacturing

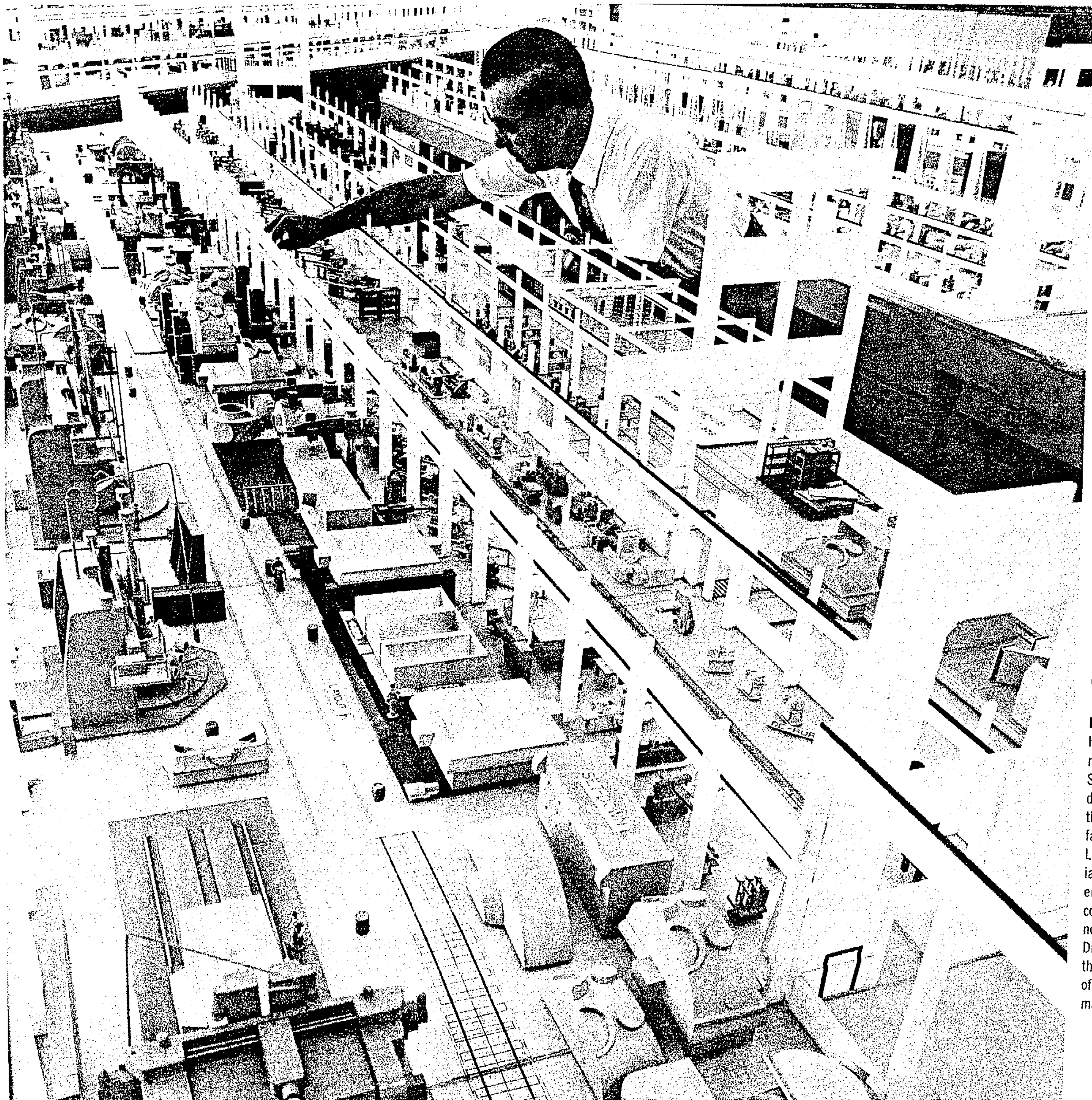
Westinghouse made rapid progress in expanding and modernizing production facilities. The Company emphasized the modernization and expansion of existing plants, augmented by a selective program of new plant construction to increase production capacity and improve manufacturing efficiency.

Under a plant-by-plant review of manufacturing facilities, less efficient equipment is being retired, and improved methods and processes are being put into effect. As part of the Company-wide program to upgrade equipment and manufacturing methods, tape-controlled machines are being used more extensively to reduce machining and tooling costs.

Typical of improvements in existing plants is a \$25 million modernization and expansion program for the manufacture of heavy power generating apparatus at plants in Lester, Pa., East Pittsburgh, Pa., and Sunnyvale, Calif.

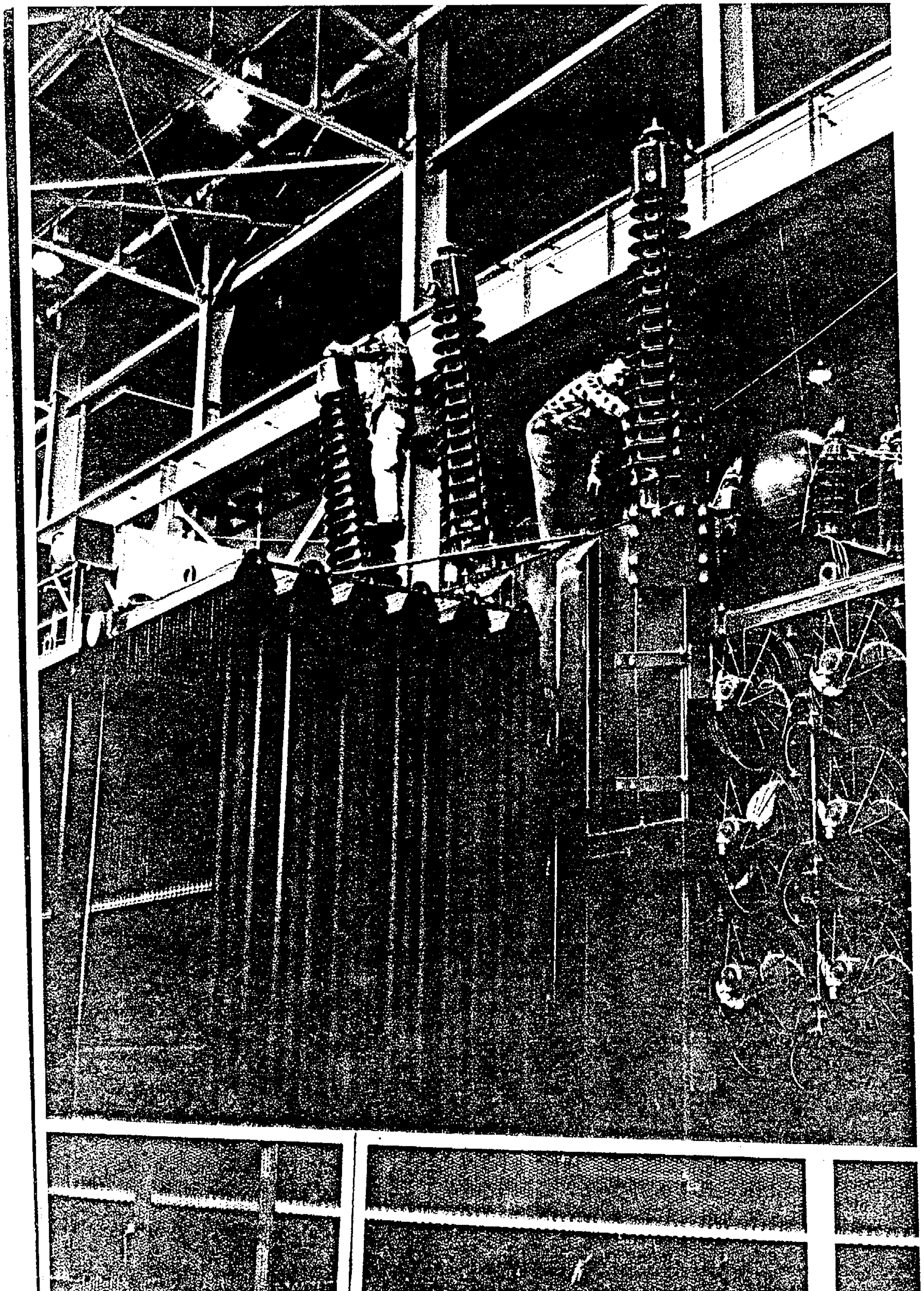
The largest and fastest lamp making equipment in the world went into operation at the Lamp Division in Bloomfield, N. J. This machine is capable of producing 32 million light bulbs per year.

A new multi-million dollar plant for the production of power circuit breakers went into operation at Trafford, Pa. The most modern and efficient facility in the industry for the production of power transformers is under construction at Muncie, Ind.



OPPOSITE PAGE - A *Bomarc* interceptor missile blasts off on a flight that could take it 250 miles from its launching pad. The *Bomarc* is designed to defend major population centers and industrial areas in the North American Defense Command against enemy bombers. The terminal guidance system for this missile is being built by the Air Arm Division, Baltimore, Md. An advanced version of the missile's target seeker developed by Air Arm is expected to make the *Bomarc* an even more effective defense weapon.

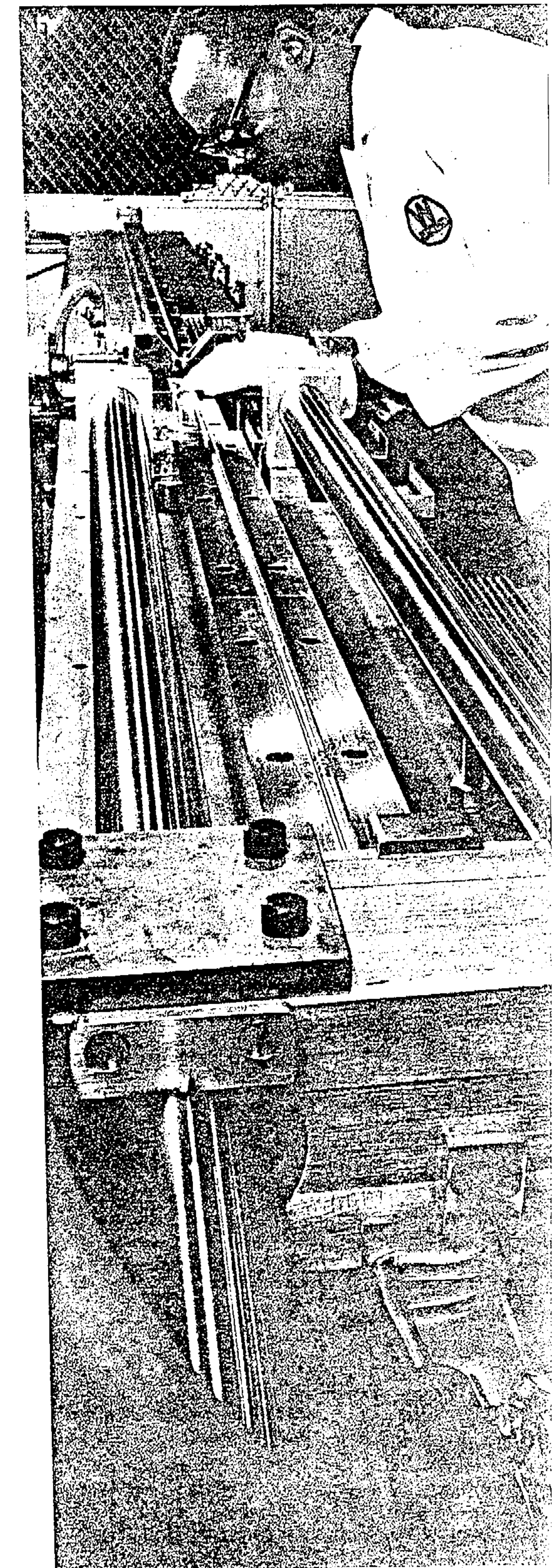
LEFT—This scale model plant is helping Company engineers to plan a major modernization program at the Steam Division, Lester, Pa. The model duplicates in miniature the more than 1.5 million square feet of manufacturing space being rearranged at the Lester plant. Thorough planning in miniature, such as this, eliminates costly errors in layout, material flow and construction. The modernization program now under way will increase the Steam Division's production capacity by one-third to help meet the growing needs of the electric utility and marine industries.



LEFT—Large power transformers such as this unit being prepared for test at the Sharon, Pa., plant of the Transformer Division, are capable of handling the power requirements of a city of 500,000 population. Transformers of this type built at the Sharon plant are tested in a modern, high-voltage test center before shipment to utility customers throughout the country.

RIGHT—Technician William Spencer of the Atomic Power Department is shown loading uranium oxide pellets into fuel element tubes destined for use in the nuclear core of Belgium's first atomic power plant now nearing completion. When completed, the core will consist of 3,536 of these fuel rods, arranged in 32 separate "bundles." Inside each tube are 91 uranium oxide pellets, the nuclear fuel for the reactor. The 11,500-kilowatt power plant is scheduled for operation in late 1960, at Mol, Belgium. Westinghouse designed and developed the reactor portion for the Centre d'Etude de l'Energie Nucleaire, a nonprofit organization formed by the Belgian Government and Belgian industry and universities.

OPPOSITE PAGE—Leonard R. Hart (left), Harry C. Moses (center), and Jack Braumiller are part of the Air Arm Division engineering team which designed and built the flight stability system for the X-15, North American Aviation's rocket-powered experimental aircraft which is designed to carry man higher and faster than he has ever flown before. Heart of the flight stability system is a group of gyroscopes which determine the rate of change of the X-15's flight path beyond that controlled by the pilot. The data is then used to assist the pilot by automatically moving the aircraft's controls to counteract the change.



As part of the drive to increase manufacturing efficiency and reduce production costs, a program called Materials Analysis Techniques (MATS) was initiated. MATS assures the most effective use of materials in manufacturing. Materials represent a very large segment of cost in a finished product, and this program to eliminate scientifically unnecessary use of materials is proving highly effective in reducing product costs and improving quality. Under the MATS program, the manufacturing, engineering and purchasing organizations work jointly to achieve these objectives.

dvances in engineering

Through ingenious approaches to the ever-resent problem of finding ways to make etter products that will serve Westinghouse istomers more efficiently, engineers at the anufacturing divisions are creating adınced design methods, new uses for comıters, and are developing vitally needed marials for new applications.

power generation

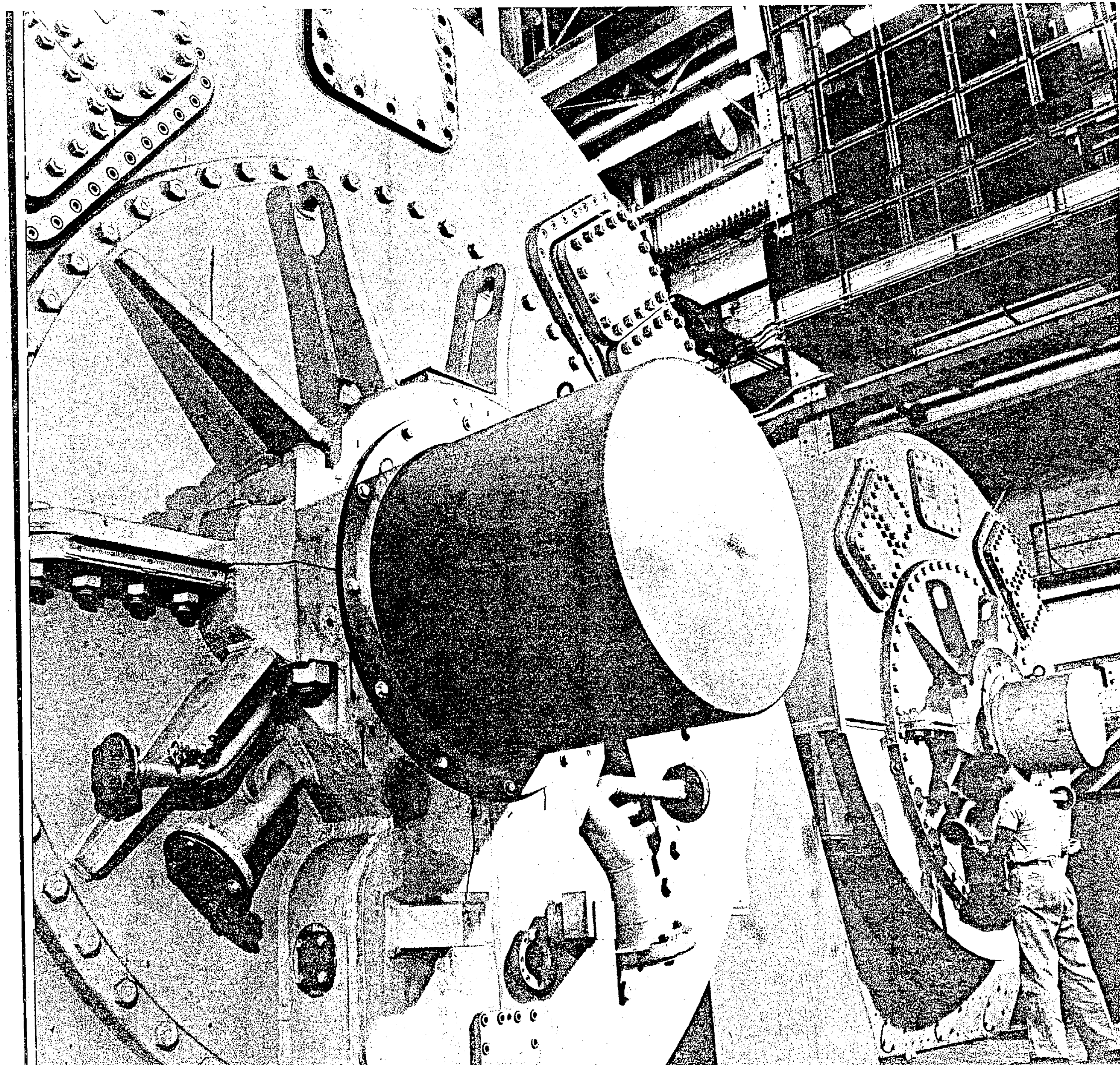
To meet the ever increasing demands for bine generators with higher capabilities, mpany engineers have developed pregineered basic components for steam turies that can be manufactured in many plicate sets and assembled like building cks in many combinations. This new cont has made it possible for Westinghouse to r to build an 800,000-kilowatt turbine erator, the largest such unit proposed. Use he new design, combined with the exten- modernization and rearrangement of facilities at the Steam Division, is expected to help offset the inflationary influences on costs of electric power generating equipment.

Westinghouse engineers pioneered a service to help electric utilities accurately forecast their long-range future needs. Called Powercasting, it uses high-speed computers to factor load forecasts, production costs, capital costs and equipment requirements into a master plan for future system expansion. Public Service Electric and Gas Company of New Jersey engineers have cooperated with Westinghouse in the development of Powercasting techniques.

Still another significant advance for the utility industry involves the automatic control of steam power plants. The generation of electricity in a steam power plant is a complex process requiring extreme reliability and efficiency. Company engineers are making rapid strides in the direction of a complete computer-controlled system for the automatic operation and control of a steam power plant.

During 1959, the first four units of the largest waterwheel generator order ever received by a domestic manufacturer were shipped from Westinghouse. This order for thirteen 167,000-kilovolt-ampere machines from the New York State Power Authority for the Niagara Power Project, is valued at more than $20 million. The remaining nine units will be completed during 1960 and 1961. The Niagara project will have the largest installed capacity of any hydroelectric installation in the United States.

The largest gas turbine ever ordered for



LEFT— Destined for operation at widely separated points, these generators are shown prior to shipment from the East Pittsburgh, Pa., plant. The generator in the foreground was built for the Merrimack Station of the Public Service Company of New Hampshire, in Bow, N. H. The other generator will produce power for the City of Springfield, Mo., as part of James River Power Station at Kissick, Mo.

RIGHT—Raymond H. Wilson, an Assembler at the Standard Control Division, Beaver, Pa., assembles 400-ampere, 240-volt safety switches. These switches, which are manually operated to connect or disconnect electrical current, find wide application throughout industry.

installation in the United States is being built for the Philadelphia Electric Company. Rated at 22,000 kilowatts, the unit will be utilized for "peak shaving"—supplying power for short periods when electrical system loads are unusually high.

for industry

The steel industry's first gas turbine blower for blast furnaces was delivered to United States Steel Corporation's South Works in Chicago. Compared to conventional methods of supplying air to blast furnaces, the gas turbine system designed by Westinghouse uses blast furnace exhaust gases as fuel. As a result, it offers lower initial cost, lower operating costs, and requires less space than steam equipment with boilerhouse facilities.

Outstanding progress is being made in steel mill controls through application of improved industrial computers. A new control computer will maintain continuous supervision over rolling mill operations to assure a finished plate with thickness accuracies never before attained in plate-rolling.

Westinghouse engineers at the Micarta Division, Hampton, S. C., have designed unique equipment for the continuous production of polyethylene plastic plate four feet wide and one inch thick. The plate is used for radiation shielding on nuclear reactors where weight and space limitations are primary considerations.

The first line of commercially available thermoelectric cooling devices for industrial and military applications was introduced during the year. The units can be used to cool electronic components in industrial equipment, and in control equipment for new aircraft and unmanned space vehicles.

advances in marketing

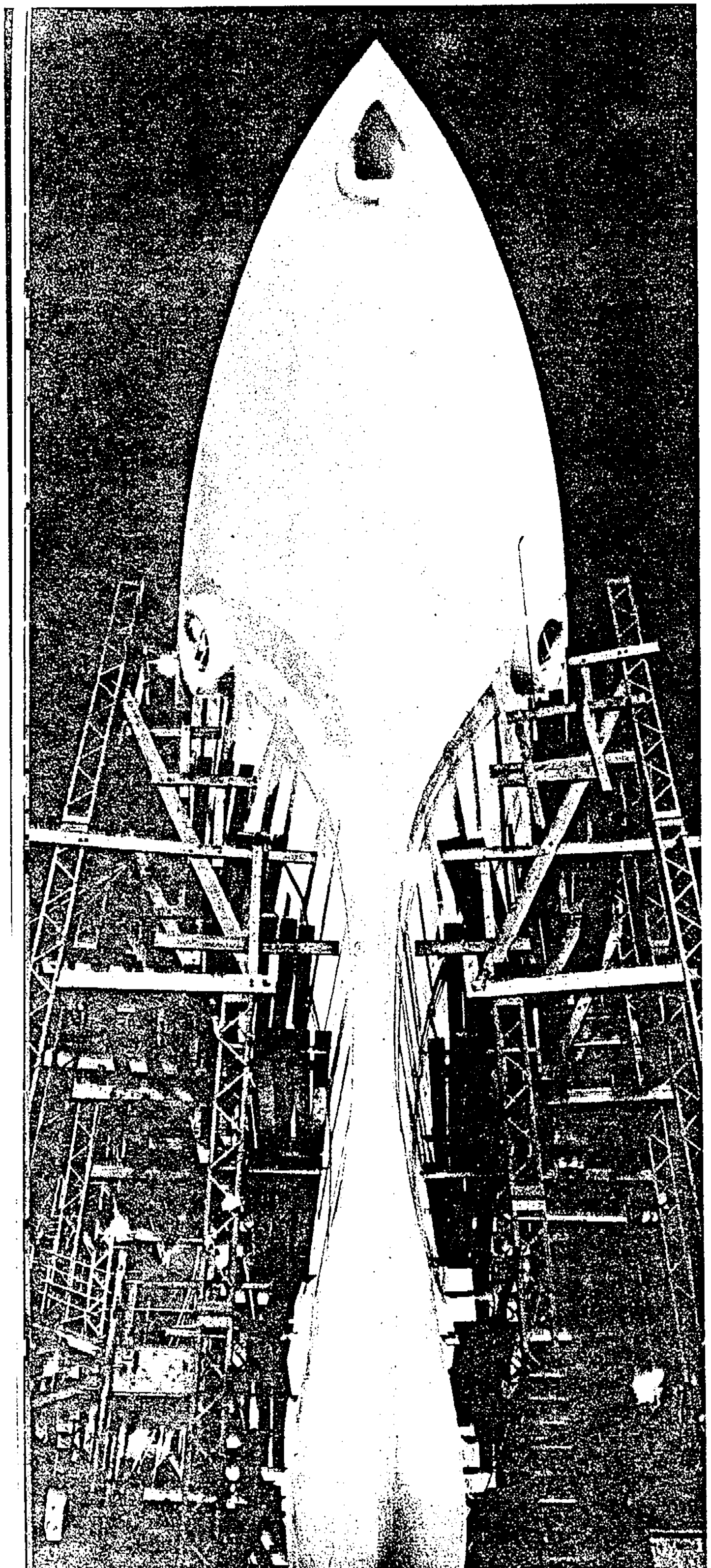
Further progress was made in realizing an advanced marketing concept which brings Westinghouse products to customers more rapidly and efficiently. Key to the concept is the supply depot, the second of which went into operation at Columbus, Ohio, this year. Depots receive single-product carload shipments from many plants and serve as a mixing point for reshipment of mixed carloads to satellite distribution centers which serve specific marketing areas. Five distribution centers are now in operation.

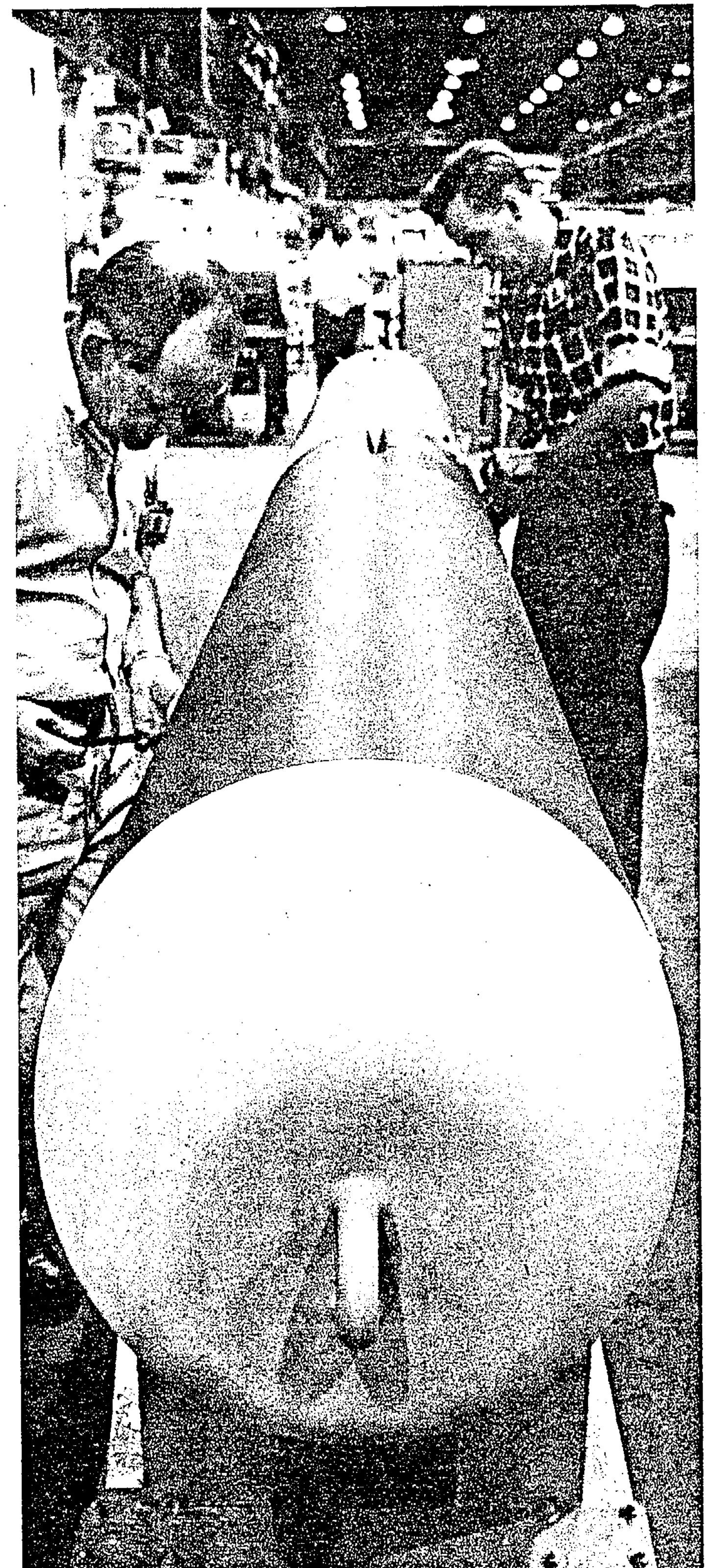
Advantages of this marketing system include better availability of products and quicker service to the dealer and through him to the customer. For example, when the operation was tested at the first supply depot at Ogden, Utah, product distribution time for West Coast dealers was cut from weeks to days.

advances in atomic power

Atomic power activities were expanded in July with the formation of the Astronuclear Laboratory to undertake the development of nuclear energy for outer space applications.

The Company took a significant step in the direction of economic commercial atomic power by announcing its readiness to build a large plant capable of producing competitive electric power in high fuel cost areas of the country. In making this proposal to the utility industry, Westinghouse scored another first by offering to build a 330,000-kilowatt





plant—at a fixed price, and to guarantee output and reactor fuel life.

The Bettis Atomic Power Laboratory, operated by Westinghouse for the Atomic Energy Commission, continued advanced development work on atomic power for naval applications and for the generation of electricity at the Shippingport Atomic Power Station. The Shippingport Station received its first refueling late in 1959, after almost two years of operation, during which 338 million kilowatthours of electricity were produced.

In the field of naval nuclear propulsion, the USS *Skipjack* established a new world's submerged speed and diving record during her maiden voyage in March. The world's first missile submarines, USS *Halibut* and *George Washington*, and the attack submarine, *Seadragon*, successfully completed their sea trials. Several other submarines, including the ballistic missile-firing ships *Patrick Henry*, *Theodore Roosevelt*, and *Robert E. Lee* were launched during the year.

USS *Nautilus*, after sailing over 150,000 miles, was refueled with a third Westinghouse-designed fuel core.

The guided-missile cruiser *Long Beach* was launched last July at Quincy, Mass.

The two-reactor A1W prototype nuclear power plant for the carrier *Enterprise*, and for the cruiser *Long Beach*, achieved full power last September at the Naval Reactors Facility, which the Bettis Atomic Power Laboratory operates in Idaho. This was the first time a single ship propeller shaft was powered by the energy from two separate reactors.

In March, Westinghouse was authorized to supply a nuclear propulsion plant to Rolls-Royce Limited of England for Great Britain's first atomic powered submarine, *Dreadnought*, under terms of an agreement between the Governments of the United States and the United Kingdom.

Recognition of Westinghouse leadership in atomic power was exemplified by the first Mamie Doud Eisenhower Award, presented to the Company by the Federal Maritime Board for outstanding service in the advancement of nuclear propulsion. The award was created by the New York Shipbuilding Corporation to commemorate the launching by Mrs. Eisenhower of the world's first nuclear merchant ship, N. S. *Savannah*.

Most of the nuclear steam generator components were shipped for the 11,500-kilowatt BR-3 plant being constructed at Mol, Belgium—the first nuclear power plant built in America for export. Operation of the plant is scheduled for the fall of 1960.

The research and development program has been completed for the 134,000-kilowatt Yankee Atomic Electric Company's plant at Rowe, Mass., and installation work is well advanced; design work is continuing on the reactor for the Saxton Experimental Corporation, which was formed to construct and operate a 5,000-kilowatt plant for the General Public Utilities System; long delivery components have been ordered and design work is on schedule for the 165,000-kilowatt plant being developed for SELNI, a group of Italian utilities; and research and development on the pressure tube reactor for Carolinas-Virginia Nuclear Power Associates is on schedule.

OPPOSITE PAGE, LEFT—The latest developments in reactor technology are incorporated in the two-reactor plant of the U. S. Navy's first atomic-powered surface ship, the cruiser ***Long Beach***, shown ready for launching at the Quincy, Mass., Shipyards of Bethlehem Shipbuilding Division of Bethlehem Steel Company. The ***Long Beach***, which was christened on July 14, 1959, will be powered by two reactors designed and developed by the Bettis Atomic Power Laboratory under the direction of and in technical cooperation with the Naval Reactors Branch of the U. S. Atomic Energy Commission. Westinghouse operates the Bettis Atomic Power Laboratory for the Atomic Energy Commission.

OPPOSITE PAGE, RIGHT—The *Astor* torpedo—a new submarine weapon designed to destroy submarines and surface vessels from great distances—is under development at the Westinghouse Ordnance Department, Baltimore, Md. Measuring almost 20 feet in length and weighing over one ton, the weapon incorporates new design features intended to make it one of the Navy's most reliable and effective defenses against enemy submarines. Here Abner K. McFarland (left), and Emery L. Burchett, Ordnance Manufacturing Department, make adjustments on an *Astor*.

LEFT—President Mark W. Cresap, Jr. (right), accepts the first Mamie Doud Eisenhower Award in recognition of Westinghouse achievements in atomic power from Edward L. Teale, President of New York Shipbuilding Company. Created by New York Shipbuilding, the award will be presented annually by the Federal Maritime Board to a person or organization making an outstanding contribution to nuclear propulsion.

In June, the Westinghouse Testing Reactor, designed to subject material and nuclear fuels to radiation conditions similar to those encountered in an operating power reactor, began operations at Waltz Mill, Pa.

An expansion program was undertaken which will enable the Westinghouse Reactor Evaluation Center, also located at Waltz Mill, to double its testing activities.

Shipments from the Atomic Fuel and Atomic Equipment Departments at Cheswick, Pa., were double those of the previous year.

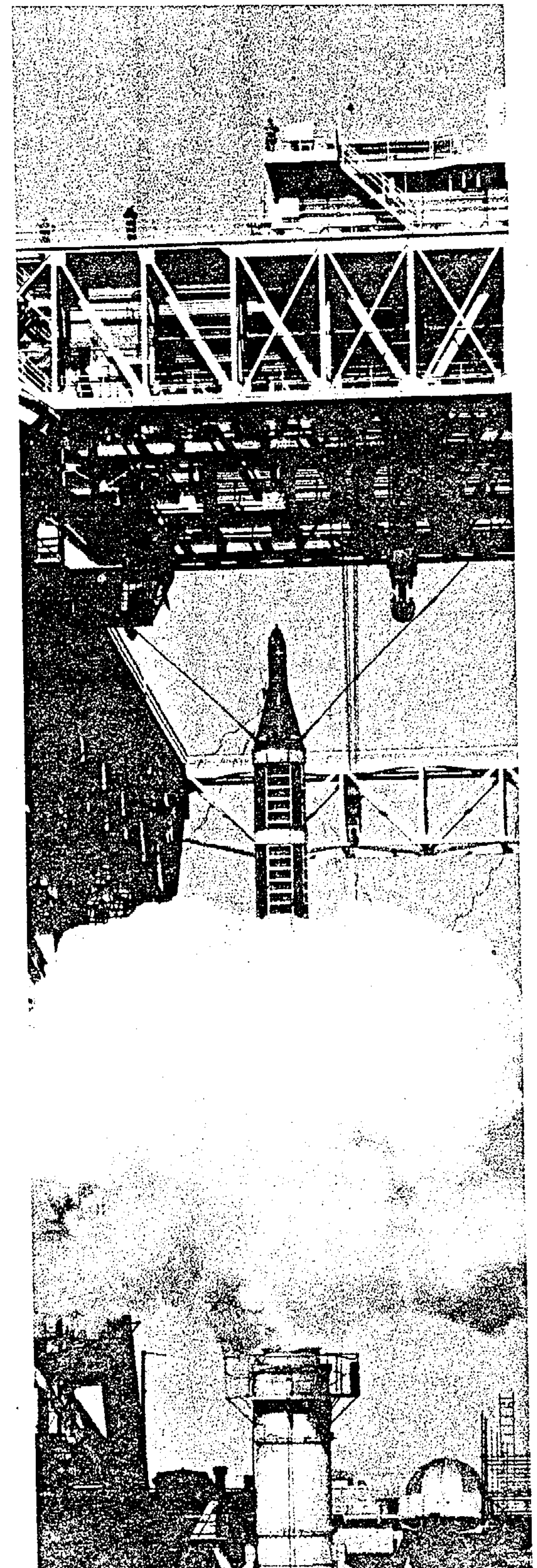
advances in defense

Greater utilization of the Company's scientific and production capabilities is leading to increased responsibility for Westinghouse in the nation's defense program.

The defense divisions in 1959 received contract awards for production quantities of heavy ground and shipboard radar gear, communications and missile guidance equipment.

Westinghouse commercial divisions are also increasing their participation in defense activities through the coordination of the Westinghouse Advanced Systems Planning Group (WASP). This group, which was organized to plan and coordinate the Company's total capabilities in the defense area, anticipates the needs of the military services years in the future.

The military services demand bold technological progress and high reliability in weapons development. To comply with these requirements, groups within the Company are conducting studies in such advanced areas as space guidance, nuclear propulsion, navigation, communications, radar, undersea warfare and interplanetary systems.



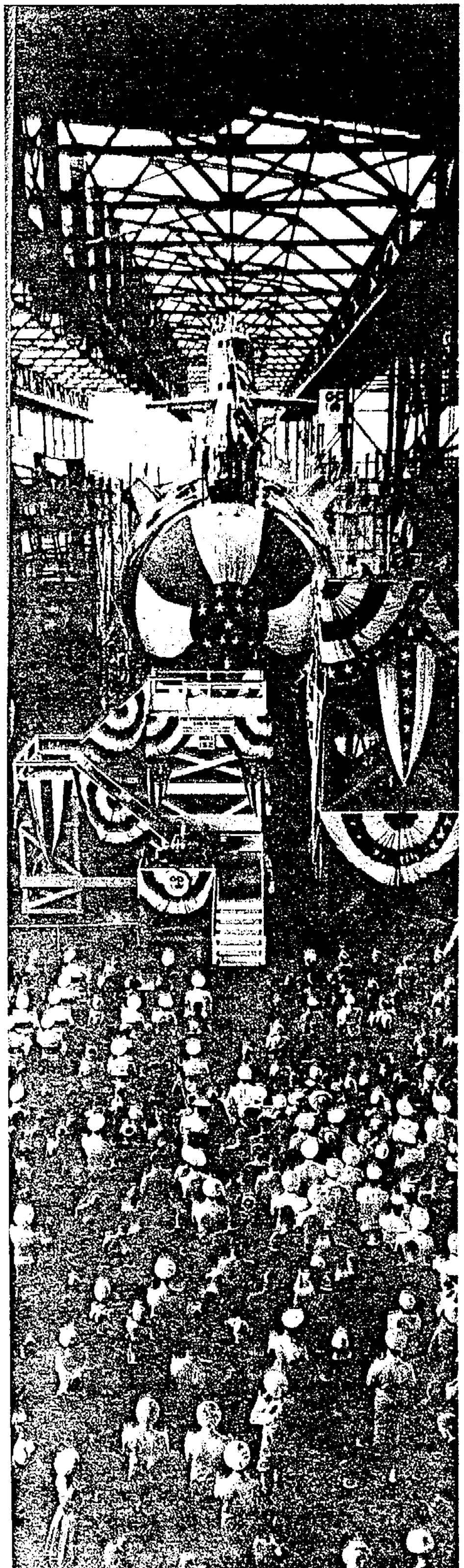
Closer to the equipment stage are developments in molecular electronics with revolutionary improvement in reliability, and the application of thermoelectric principles to space power systems and to the maintenance of comfortable temperatures in military clothing in any climate.

The Company is continuing work in building the launching equipment for the *Polaris*, a ballistic missile which will be fired from submerged atomic submarines. Substantial work is also being done in the construction of the guidance equipment for the *Bomarc* interceptor missile. The Aircraft Equipment Department of the Small Motor Division has developed and is producing the world's largest aircraft electric power system for the B-52H bomber. It also has the over-all responsibility for design and production of the complete alternating current power system for the Air Force's B-58 bomber.

In the field of advanced weapons systems for the Navy, the Electronics Division anticipates large scale production. Advanced shipboard fire control systems are being developed and production units are planned for the early 1960's. Included are radar, weapon direction equipment and computing equipment.

products for the home

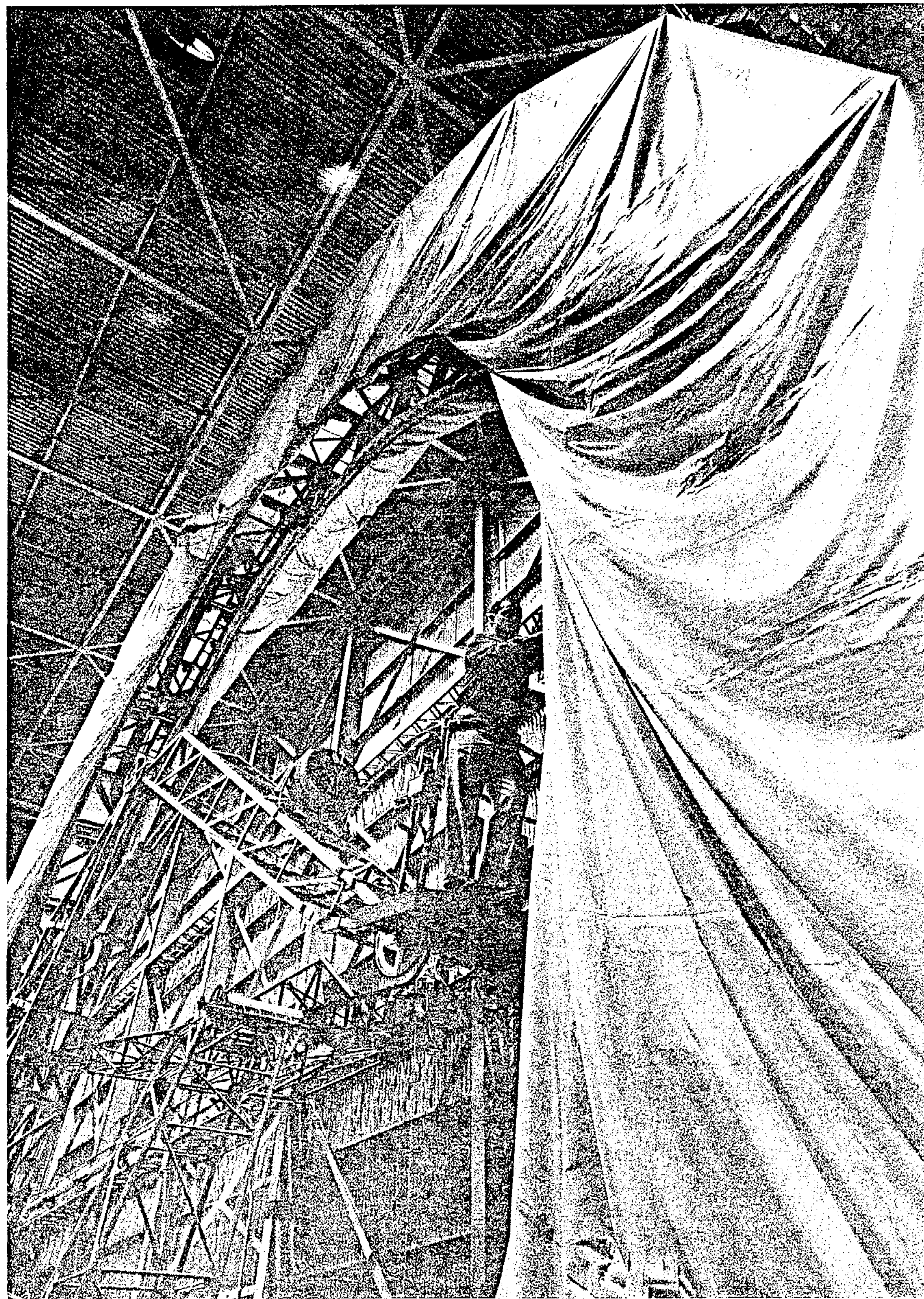
The Total Electric Home program, introduced early in 1959 to broaden the market for Westinghouse products, was presented to 150 of the nation's major electric utilities, most of which are participating in the program. In

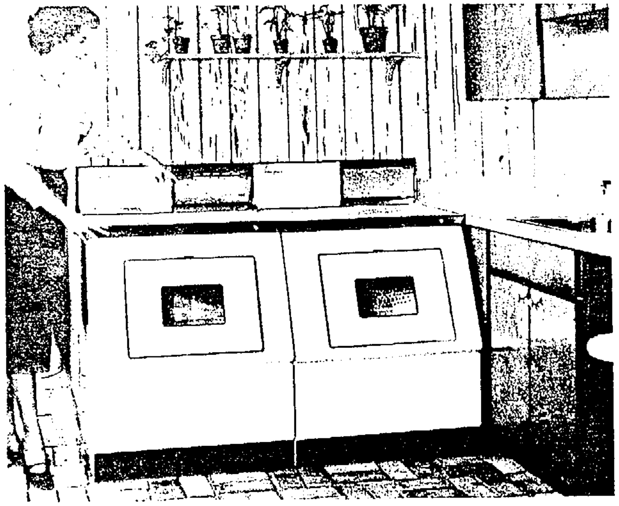


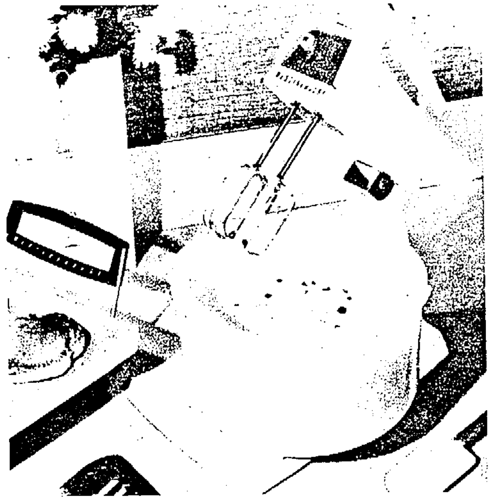
OPPOSITE PAGE—A dummy *Polaris* missile is blasted skyward, then quickly arrested by cables as part of "Operation Skycatch" at the San Francisco Naval Shipyard. In earlier tests, the dummy missiles were hurled into San Francisco Bay, then retrieved. Under the new method, a huge overhead assembly catches the multi-ton dummy in mid-air, simplifying the retrieving procedure and also permitting accurate study of the effects of launch stresses on dummy missiles which are structurally identical to an actual *Polaris*. The tests are being conducted by engineers from Westinghouse and the Lockheed Missiles and Space Division in conjunction with the U. S. Navy. Westinghouse is prime contractor for launching equipment, and Lockheed is *Polaris* missile system prime contractor and manager.

LEFT—The U.S.S. *George Washington,* first of the nation's nuclear submarines designed to fire the *Polaris* missile, is shown during launching ceremonies at Groton, Conn. Described as one of the "deadliest ships at sea," the vessel will carry 16 of the solid fuel missiles. The reactor for the *George Washington* was designed and developed by the Bettis Atomic Power Laboratory under the direction of and in technical cooperation with the Naval Reactors Branch, U. S. Atomic Energy Commission. Westinghouse operates the Bettis Laboratory for the AEC. The Company's Sunnyvale, Calif., Division designed and built the *Polaris* launching and handling equipment.

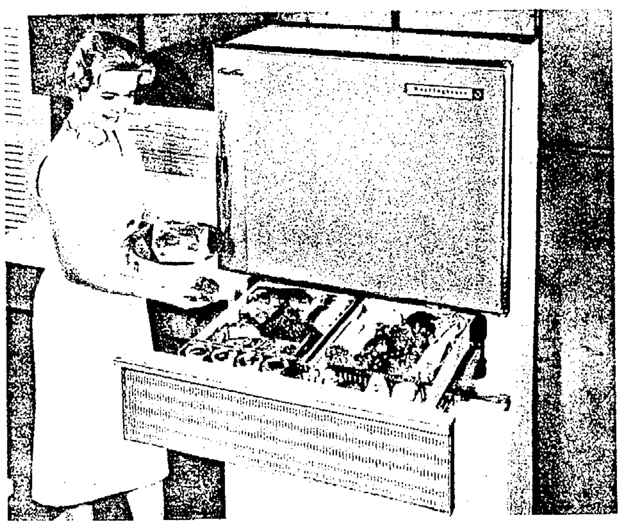
RIGHT—F. J. Womelsdorf, Electronics Division, Baltimore, Md., fits a Paraballoon radar antenna to its frame. The Paraballoon is a lightweight, air-inflated radar antenna which resembles a huge balloon. The unit is both collapsible and portable. Shown here is the tubular support for a fifty-foot Paraballoon, one of a quantity being manufactured for use with new radar equipment designed and developed for the Air Force.

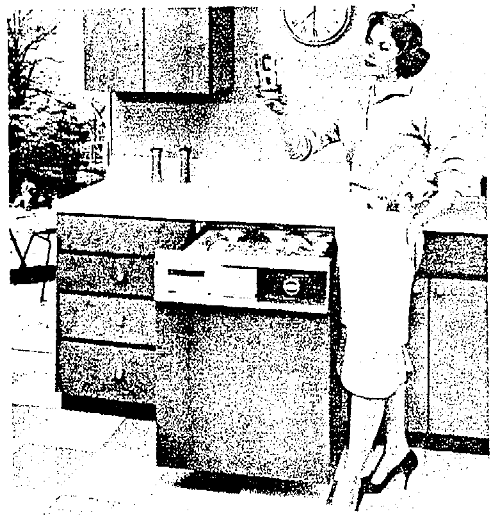


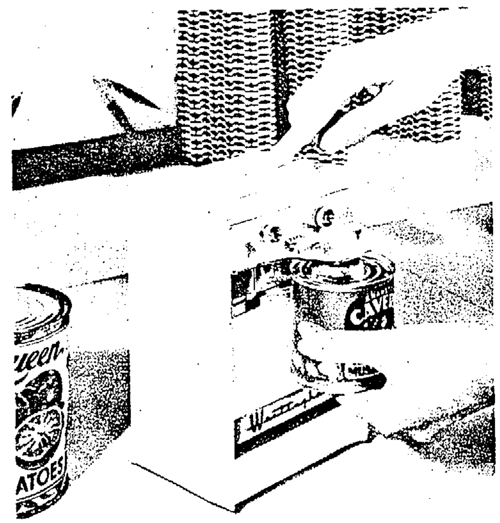




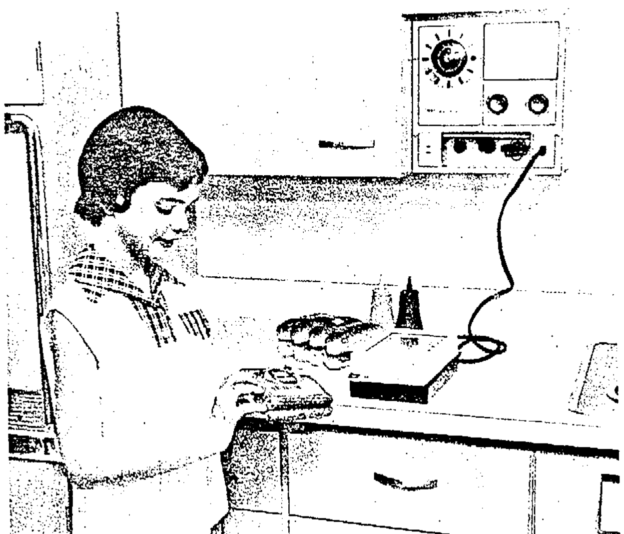
LEFT—These Westinghouse laundry "twins" offer pushbutton washing and drying. The L-1000 Laundromat has 11 pre-set wash programs automatically selected by a computer at the push of a button, and the D-1000 clothes dryer has eight pre-set drying programs.
CENTER—The Westinghouse portable mixer has been given added versatility with the addition of a "hand 'n stand" kit which makes the mixer a standard model when necessary.
RIGHT—This new deluxe roaster oven is designed to roast, bake or cook complete dinners. A broiler-grid is available as an accessory for broiling, grilling, frying, and baking.



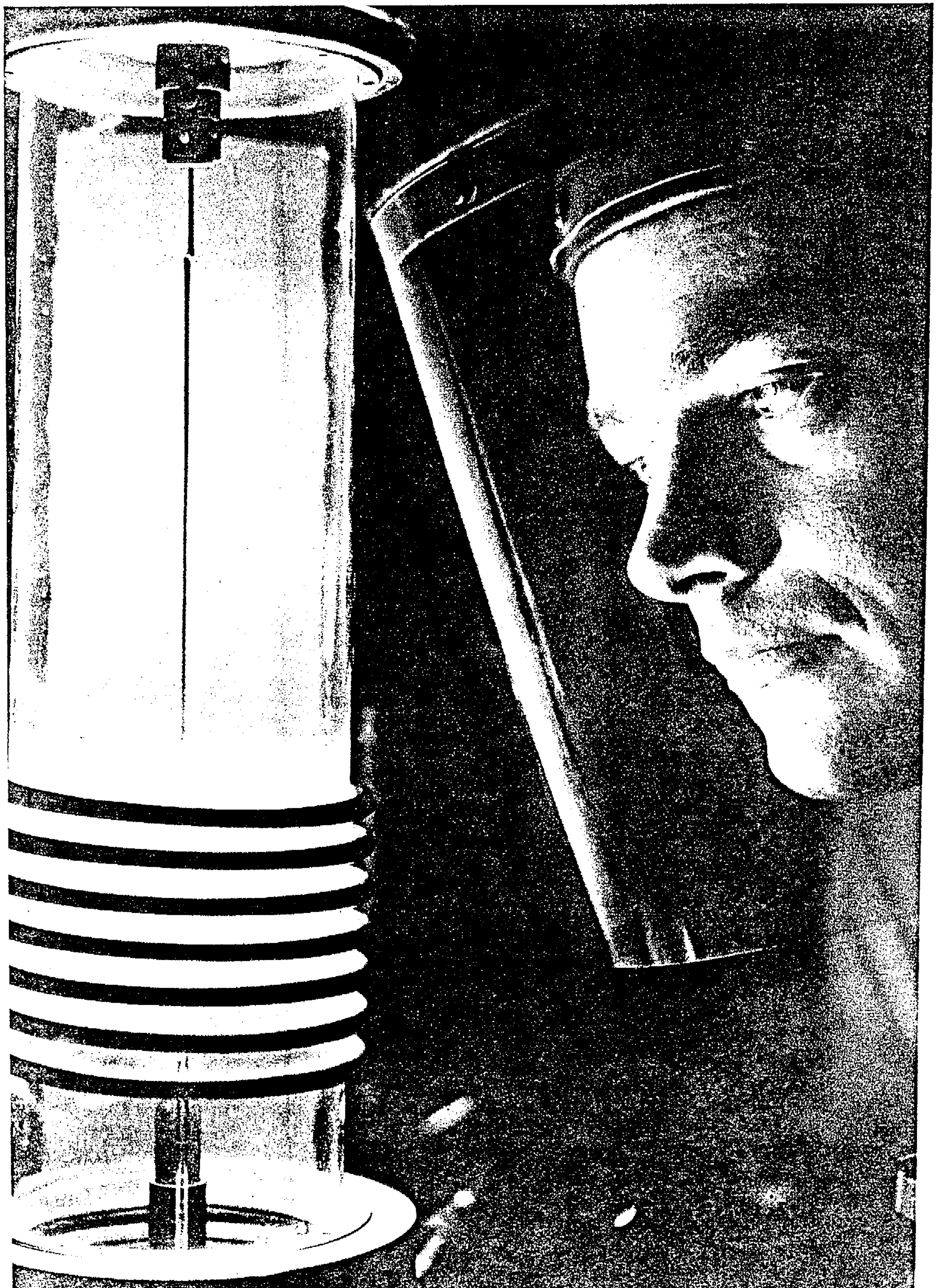




LEFT—This new Westinghouse center-drawer refrigerator provides a 21-pound capacity glide-out drawer to keep meat fresh and unfrozen for as long as seven days. Separate storage sections are provided in center drawer for meat and vegetables.
CENTER—Dishes are washed automatically and spotlessly dried in this Westinghouse "roll-out" dishwasher. A hot water booster raises water temperature to 140 degrees for both washing and rinsing.
RIGHT—Compactly designed new Westinghouse automatic can opener may be permanently installed or used as a portable unit. Convenient to operate, it starts only when the can is in position and stops automatically when the can is opened.



LEFT—The Dog-O-Matic hot dog cooker cooks six frankfurters in just 90 seconds. In the background is an Automatic Appliance Center which provides a central cooking point and eliminates blown fuses from overloaded circuits.
CENTER—A detachable control unit allows this 12-cup coffee maker to be completely immersed in water for cleaning. Special "hold" setting prevents percolating when coffee is reheated.
RIGHT—Deluxe 30-inch range has Serve Temp Roast Guard to automatically cut off oven heat when the roast is finished and hold roast at the proper heat without loss of flavor. Removable heating units and lift-off oven door make cleaning the range an easy task.

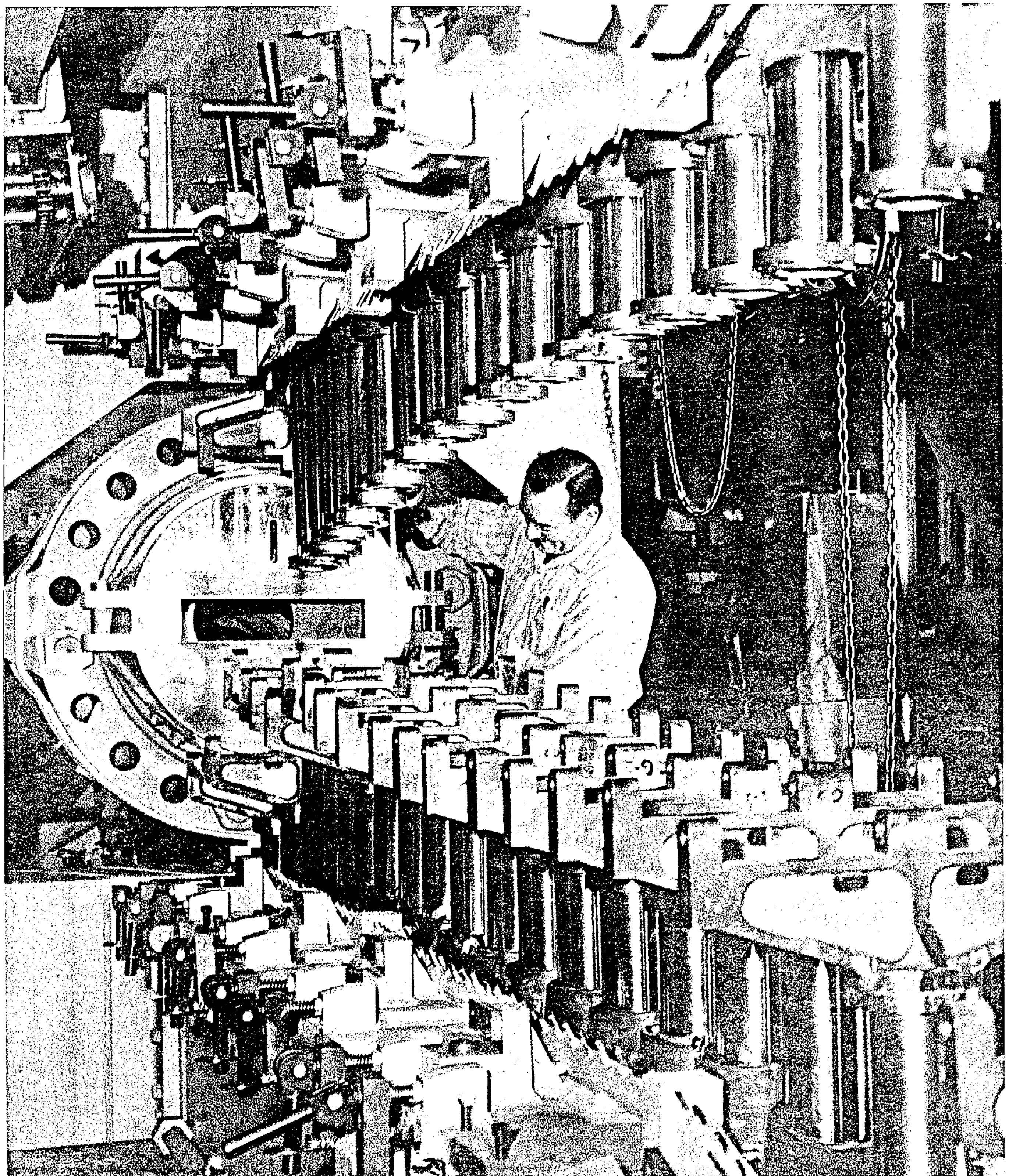


addition to including a wide variety of Westinghouse appliances, each of the model homes features heat pump or baseboard electric heating. In a pilot operation designed to test the effectiveness of this promotion in one city, it was found that sales of major Westinghouse appliances more than doubled over 1958.

One of the most significant design improvements in refrigerators in more than a decade—a glide-out center drawer which provides ideal storage conditions for meats and vegetables—is included in two 1960 models. Located between the refrigerator and the freezer, it operates independently of these two sections, and can keep meat fresh without freezing for as long as seven days.

Promotional efforts in support of the new Eye Saving light bulb—which incorporates the first change in the styling and design of standard light bulbs in more than 25 years—earned the Top Promotion Award of Food Publications, Inc., the first time a housewares product has received the award. The promotion was voted outstanding in sales results by food chains, wholesalers, supermarkets, and independent grocers. In addition, the American Institute of Decorators awarded the

LEFT—An experimental process for growing germanium as thin, flat, continuous strips has been developed by scientists at the Westinghouse Research Laboratories. Here, Technician J. J. Coleman observes a ribbon-like crystal of germanium rising out of a molten pool in a crystal growing furnace. Such thin, flat strips are the exact form in which germanium is used in making transistors and other semiconductor devices. The strips require none of the costly, time-consuming cutting and grinding that wastes up to 80 per cent of conventional ingots of germanium.



Company a special citation of merit for development of the new bulb.

The Company's 1960 television, radio and stereo-fidelity lines feature a new concept in styling. Authentic period furniture designed in Early American, Imperial Provincial, Custom Provincial and American Contemporary is offered throughout the entire line, in contrast to the widespread industry practice of emphasizing cabinet design only in higher-priced models.

television and radio broadcasting

Once again, Westinghouse Broadcasting Company demonstrated its leadership of independent broadcasting operations through expansion of its commercial and public service programming. In addition to acquiring important film libraries for television use, WBC enlarged the news departments of local stations, increased the Washington, D. C., news staff, and organized a foreign news bureau.

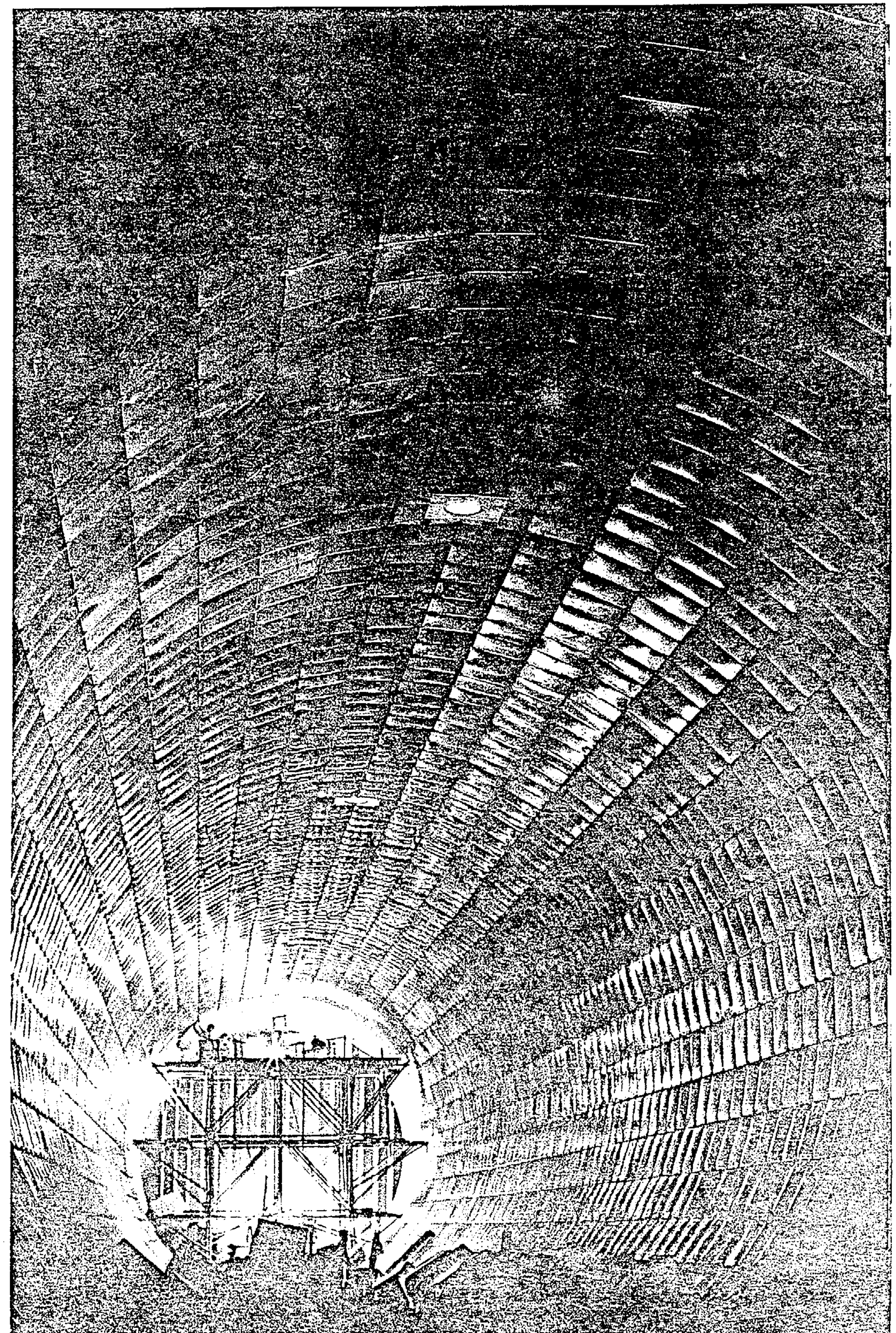
During 1959, all stations conducted a "Lamp of Knowledge" series as part of their program of educational service. In this series, special emphasis was placed on the teacher's role in society, science education, safety and mental health.

The use of television and radio to focus attention on situations requiring public action has been consistently advanced by WBC in the eight cities it serves. For their efforts in the field of public service programming, Westinghouse stations again received many citations and awards of national significance, including those of the Freedoms Foundation and the Heart Fund, Alfred P. Sloan Safety

OPPOSITE PAGE—This intricate assembly will play a leading role in the Space Age in testing scale models of missiles, projectiles and aircraft at simulated speeds up to 99 miles a minute. The test section was built at the Sunnyvale, Calif., plant for the Jet Propulsion Laboratory of California Institute of Technology.

LEFT—Laboratory Assistant Joseph Dettore (left), and Chemist Charles Page, of the Materials Manufacturing Department, Blairsville, Pa., employ a chemical testing process to determine the amount of uranium in a nuclear fuel element. The Blairsville plant serves as the Company's metallurgical development center. Here the needs of the designer and the discoveries of the researcher can be translated into pilot-plant production through the knowledge of the metals technologist. Primary metalworking processes are used to develop intricate castings, special alloys, nuclear fuel components and other metals for use in electrical and electronic equipment.

RIGHT—An inside view of the huge supersonic wind tunnel now nearing completion at the Arnold Engineering Development Center at Tullahoma, Tenn. This tunnel is a key facility for testing space vehicles, missiles, propulsion systems—and components—of the future. Speeds of approximately 3,000 miles per hour at simulated altitudes of more than 100,000 feet will be created within the tunnel by means of the largest rotating machine ever built. Supplying this vast amount of power will be two 83,000 horsepower motors, and two smaller "starting" motors of 25,000 horsepower each, built at the Westinghouse East Pittsburgh, Pa., plant. Compressors for the motor drive system were built by the Sunnyvale, Calif., Division. The scaffolding seen here supports workers who are installing the layer of patchwork-like insulation material which will absorb temperatures as high as 650 degrees Fahrenheit. Tunnel diameter at this point is about 55 feet.



Award and U. S. Army Outstanding Public Service Award.

For the third time in as many years WBC sponsored a conference for the discussion and review of local public service programming. This year the meeting—called the "San Francisco Conference"—was held on the campus of Stanford University in Palo Alto, Calif. It was attended by 350 broadcasters representing 263 of the nation's stations.

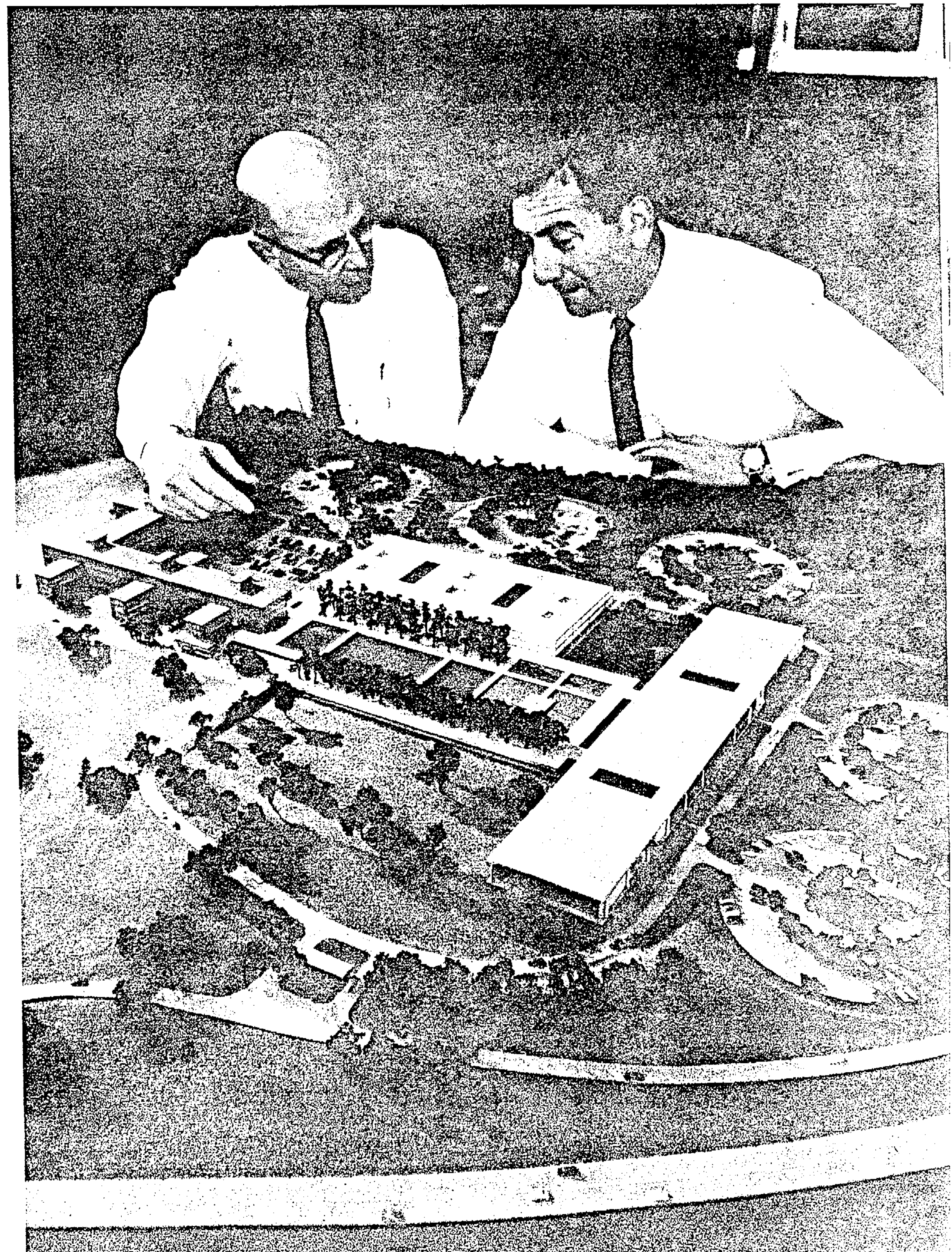
international operations

Westinghouse sales to world markets in 1959 increased over the previous year through the continued availability of United States Government support of new projects in underdeveloped and developing countries. Sales of consumer products, principally in South American markets, were maintained at the high level of 1958 despite the loss of major markets in Cuba.

Substantial orders were received for turbine generator plants in Spain, Taiwan, Venezuela and Indonesia, and for steel mill and other industrial equipment in Spain, Belgium, France, Turkey, Brazil and Argentina.

A development of 1959, following changes in U. S. foreign policy, was the opening of additional markets which resulted in significant sales of turbine generator, steel mill and transmission and distribution equipment.

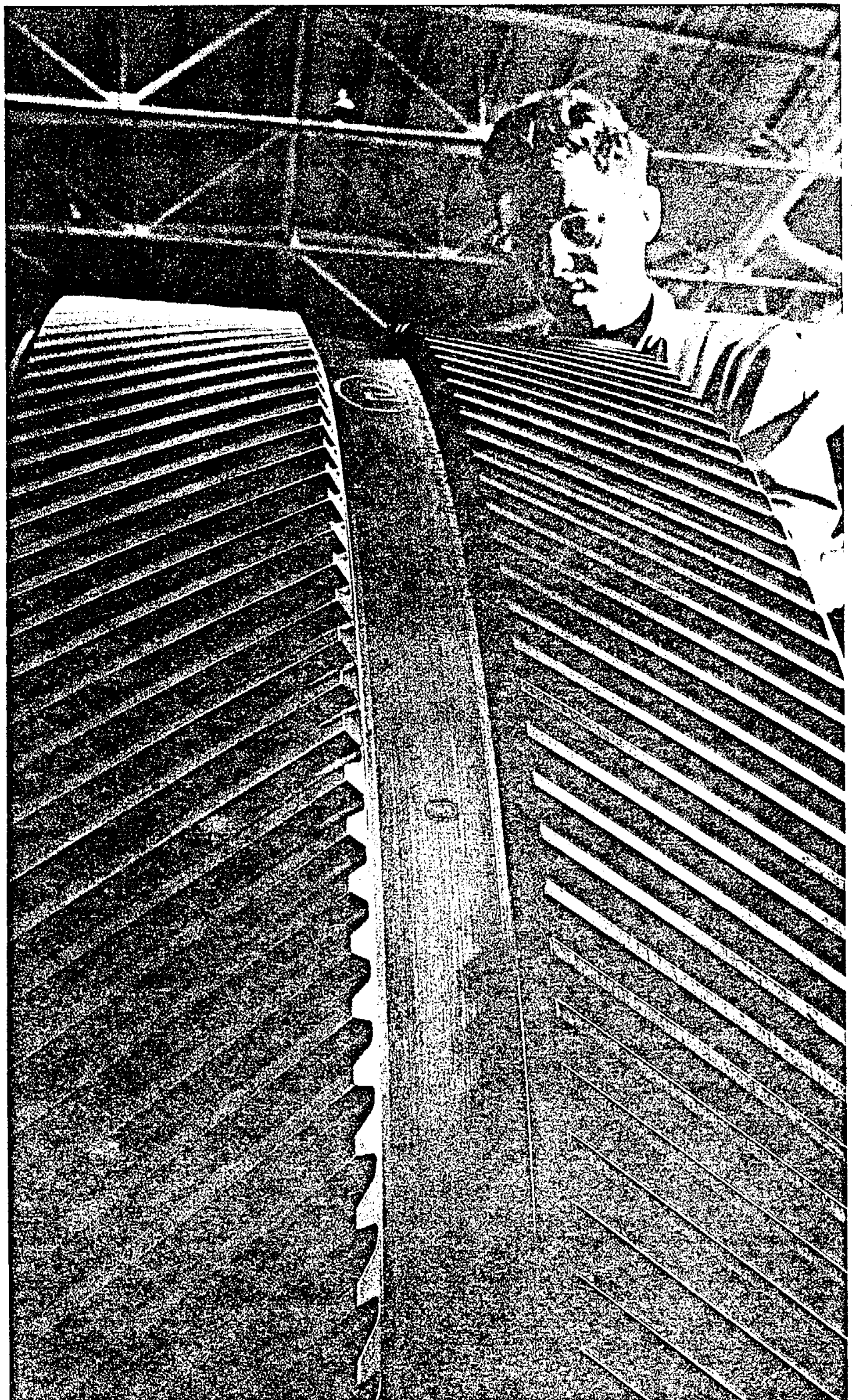
In the Western European market, where full market participation is prevented by import barriers, lower foreign prices and other factors, Westinghouse International is working with its foreign associates to supply equipment to customers on a coordinated

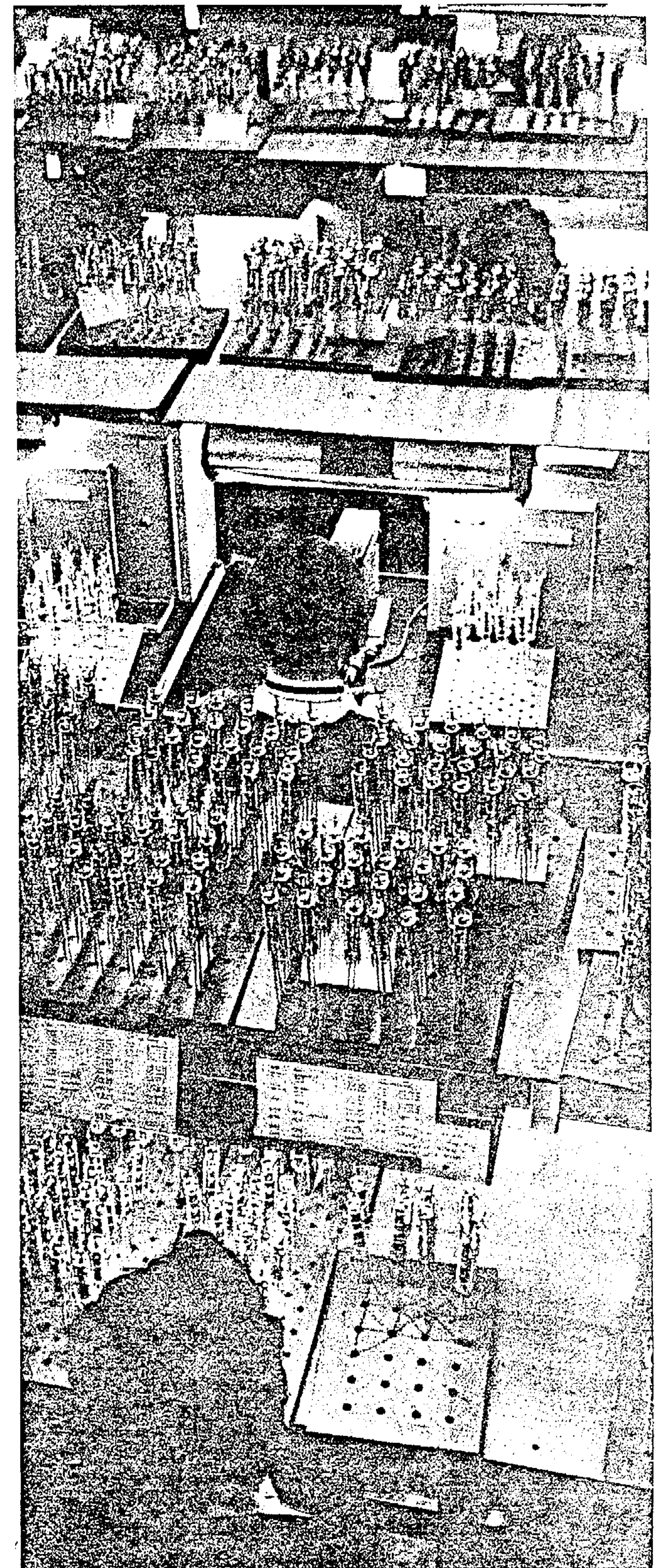


LEFT--Neil D. Cole, Administrative Assistant (left), and Dr. S. W. Herwald, Vice President, Research, examine a scale model of the new Research and Development Center to be built on the 100-acre site now partially occupied by the Westinghouse Research Laboratories. The Center will bring together all the key people associated with the Company's broad program of basic and applied research and will help speed the translation of new scientific knowledge into products of the future. Ground will be broken for the Center early in 1960, with full occupancy of the facilities scheduled for 1961.

CENTER--Dave Michener, Assembler at the Steam Division, removes rough edges from the teeth of a low-speed unit of a main reduction gear assembly for a Navy destroyer. The gear is coupled directly with the propeller shaft which drives the screw of the destroyer.

RIGHT--Filaments are inserted and welded in electron guns for cathode ray picture tubes at the Electronic Tube Division, Elmira, N. Y. The electron gun is the part of the television picture tube which emits and controls electrons to produce the picture. The room in which these operations are performed is air conditioned and pressurized. Uniform temperature and humidity conditions are maintained, and all air is filtered through a Westinghouse Precipitron air cleaner.





basis through sales of components and engineering assistance. Income from these sources increased in 1959. Twenty-six new licenses and technical assistance agreements negotiated during the year have brought the total of foreign associates to 130 in 30 countries including, for the first time, India and Egypt.

In order to facilitate the effectiveness of Westinghouse operations in the changing world markets and to reduce costs of foreign operations, the foreign field offices were organized into two new subsidiaries in 1959. One, with headquarters in San Juan, Puerto Rico, operates in the Americas; the other, headquartered at Geneva, Switzerland, operates in other areas of the world.

national honors

The John Fritz Medal, highest honor that engineers can bestow, was awarded to Chairman of the Board Gwilym A. Price, marking the first time in the 58-year history of the award that it has been granted to a man with a non-engineering background. The medal is awarded annually for notable scientific or industrial achievement. Representatives of four national engineering societies voted Mr. Price the award for his vision and leadership in the development of atomic power.

Dr. Clarence Zener, Director of the Westinghouse Research Laboratories, was elected to membership in the National Academy of Sciences. He received the John Price Wetherill Medal from the Franklin Institute for important contributions in the field of solid state physics, and was named to the Research Advisory Committee on Materials of the National Aeronautics and Space Administration.

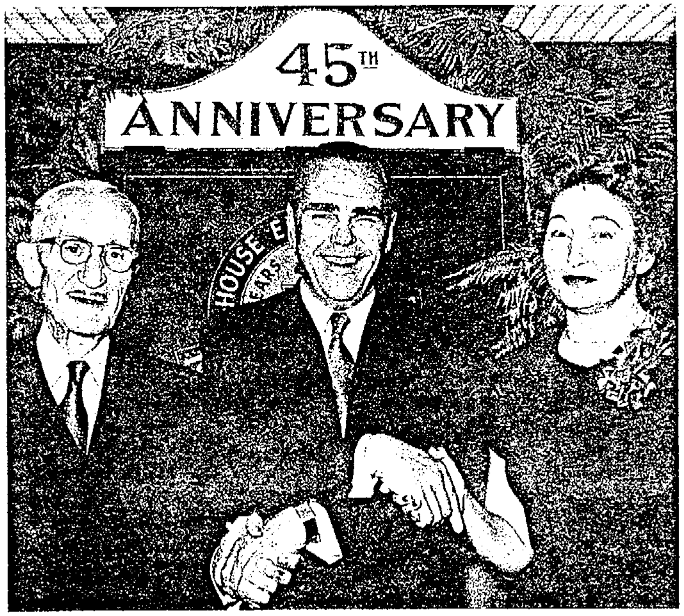
Dr. Edgar A. Sack, Jr., Manager of the Dielectric Devices Section of the Westinghouse Research Laboratories, was voted the Outstanding Young Electrical Engineer of 1959 by Eta Kappa Nu, national electrical engineering society.

management incentives

Under the Incentive Compensation Plan as approved by the stockholders at the annual meeting on April 1, 1959, a committee of the Board of Directors approved incentive compensation payments of up to $7,737,500 to not more than 9,209 members of management. Awards to certain officers will, subject to specified terms and conditions, be paid in common stock of the Company in annual installments after retirement or other termination of service.

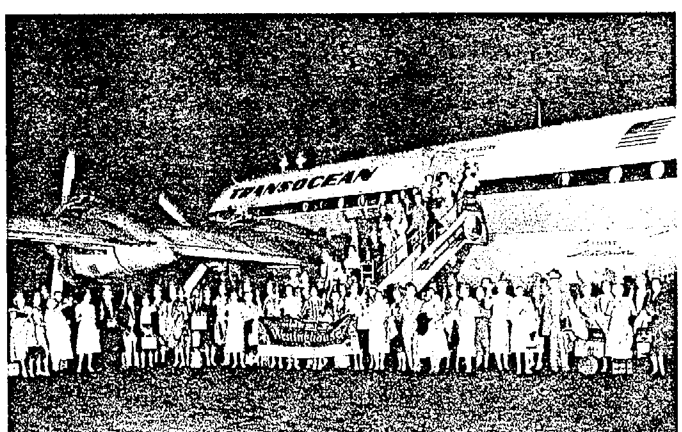
At the annual meeting the stockholders also approved a new Restricted Stock Option Plan under which 500,000 shares of common stock, $12.50 par value, plus any shares not purchased under the 1951 Stock Option Plan, were reserved for the purposes of the Plan. During 1959 options covering 285,970 shares were granted under the 1959 Plan, options covering 75,279 shares were exercised under the 1951 Plan and options covering 3,330 shares lapsed and became available for future

LEFT—All test equipment at the Air Arm Division, Baltimore, is regularly checked for reliability and accuracy. Here, Fred Stewart (foreground), and Paul Rigby, calibrate a precision voltmeter and a precision counter. These instruments must meet rigid specifications since they are used to test the highly complex airborne electronic equipment manufactured by the Air Arm Division for the military services.



LEFT—The "Westinghouse Atomic Electric Power Plant"—first scale model hobby kit of a typical atomic electric station—is examined by Dr. William E. Shoupp (left), Technical Director, Westinghouse Atomic Power Department, and George Gail, son of a Westinghouse employe.
CENTER—John Bonham (left) charter member, Westinghouse Veterans Association, and Miss Emma Wilds (right) newest member, are congratulated by President Mark W. Cresap, Jr., on Association's 45th anniversary.
RIGHT—Mrs. Edith Irons, Assembler, Standard Control Division, points to photo of Westinghouse radio phonograph she won for writing best "commercial" in contest sponsored by Westinghouse News. With Mrs. Irons are J. A. Butts (left), Division Manager, and Fred Martin, General Foreman, Control Department.

LEFT—William F. Ryan (left), Past President, American Society of Mechanical Engineers, presents John Fritz Medal to Board Chairman Gwilym A. Price for leadership in developing atomic power for national defense, first time that a man with a non-engineering background was selected for the outstanding honor.
CENTER—Executive Vice President John K. Hodnette presents Citizenship Awards to East Pittsburgh employes James Bailie, Charles Smith and Theodore Colinear.
RIGHT—Second father and son to win the Order of Merit—20 years apart—are Ira B. Stiefel (left), retired industrial relations executive, and son John, Manager of the Surface Ship Project, Bettis Atomic Power Laboratory.



LEFT—For achievements in public service broadcasting, Westinghouse Broadcasting Company won the George Foster Peabody Television Award. At the award ceremony are (left to right) Dean Drury, University of Georgia, WBC President Donald H. McGannon, and Bennett Cerf, Chairman, Peabody Awards.
CENTER—Eighty Lamp Division employes and members of their families prepare to depart for a two-week European vacation trip organized by Employes' Recreation Association.
RIGHT—James Duff (left), and Alex Talackine (right), East Pittsburgh Division, have high "batting averages" for successful suggestions. They have submitted total of 477 ideas of which 331 have been adopted.

options. At December 31, 1959, options covering 519,019 shares were outstanding under both Plans and 237,045 shares were available for future options under the 1959 Plan.

As a result of the two-for-one stock split approved by the stockholders on January 4, 1960, the number of shares in each of the foregoing categories was doubled.

employe achievements

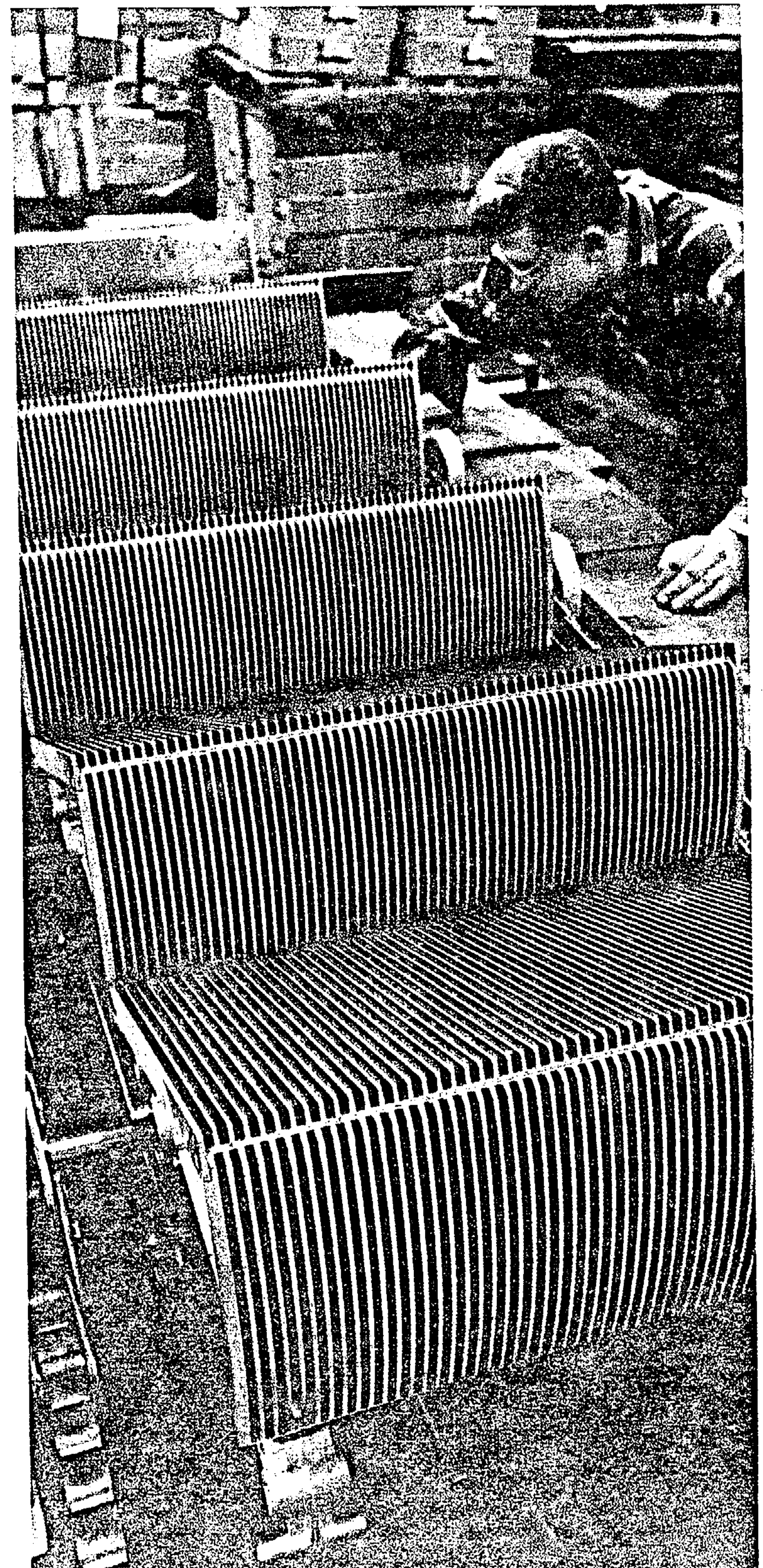
The progress recorded in 1959 resulted from the coordinated effort of thousands of Westinghouse employes.

Employes received $256,089 for 8,942 suggestions adopted under the Westinghouse Suggestion System, and $234,450 was paid in invention awards.

The extraordinary suggestion records compiled by four Westinghouse employes during their employment illustrate the continuing effectiveness of the Suggestion System. Alex Talackine, East Pittsburgh, Pa., Division; Gerald F. Anstett, Motor and Control Division, Buffalo, N. Y.; James A. Duff, East Pittsburgh Division; and Stephen Ligette, Transformer Division, Sharon, Pa., have the highest "batting averages" of all employes for submitting successful suggestions. These four men have submitted a total of 992 suggestions, of which 624 have been adopted.

For outstanding safety performance by individual plants, 71 awards were received from the National Safety Council, a new Company record for any one year.

The Westinghouse Order of Merit, the Company's highest award, was granted by the Board of Directors to 11 employes for



LEFT—Checking steps for an electric stairway at the Dover, N. J., plant of the Elevator Division, John L. More, Quality Control Department, makes a detailed inspection to assure that operating parts are in proper adjustment, thus insuring a safe, comfortable and quiet ride.

RIGHT—During 1959 Mark W. Cresap, Jr., President, and John K. Hodnette, Executive Vice President, traveled some 15,000 miles to tour production facilities and to discuss with plant management the Company's current progress and future objectives. Here Mr. Cresap, accompanied by Foreman Thomas Hensler, meets Mrs. Janet Ping (left) and Mrs. Frances Myers, who are assembling power fuses at the Switchgear Apparatus Department, Bloomington, Ind.

distinguished service. Exceptional service to their communities earned 37 employes the Westinghouse Citizenship Award.

Average employment in 1959 equaled 112,737, and total employe compensation and benefits amounted to $816,158,000. General wage and salary increases averaged approximately 5.5 per cent of 1955 base rates.

During 1959, through the Employe Stock Plan, employes purchased 158,515 shares of the Company's $12.50 par value common stock. More than 34,000, or 30 per cent of all employes, own stock purchased under this program.

education and training

Through the Company's comprehensive training and educational programs, Westinghouse men and women continued to improve their performance in their chosen fields of work and to prepare themselves for positions of higher responsibility. Development opportunities were provided at all levels of the organization through:

- Orientation and on-the-job training.
- Apprentice training to prepare employes for the skilled trades.
- Graduate Student Course which provided classroom training and work experience for 423 recent college graduates.
- Graduate Study Program affiliated with 25 universities and leading to Master's and Doctor's degrees with 1,350 enrollments.
- Continued education in engineering and business administration on an undergraduate level, under the Company's tuition refund plan for 550 employes.

Management training and development for

potential supervisors, new supervisors, and experienced managers consisted of a variety of programs totaling 13,114 enrollments.

Apart from the opportunities Westinghouse provides for its own people, the Westinghouse Educational Foundation, which is wholly supported by the Company, awarded $383,000 to universities and $1,143,000 for professorships, fellowships and scholarships at the nation's colleges.

Westinghouse, through its research engineers, contributed to an imaginative new concept which will make educational television available to five million students in 17,000 locations in the midwestern United States. Key to this new concept is Stratovision—the technique of broadcasting TV signals from a high-flying airplane—thus extending the range of the signals far beyond their normal reach. The Stratovision system was originated by Charles E. Nobles, Westinghouse electronics engineer, in 1944, and was proved technically feasible by more than three years of research and experimentation. Reuben Lee, Westinghouse engineer, suggested the use of the Stratovision system for educational television. The Midwest Council on Airborne Television Instruction plans to put the Stratovision system into operation on a pilot basis in 1960 or early 1961.

Motor frames with cores installed are cleaned and prepared for final assembly after having been varnish treated at the Motor and Control Division, Buffalo, N. Y. Raymond Klawitter, Foreman (left), examines frames while Joseph Weber (center) and Lawrence Considine (right) clean motor stators.

Years ended December 31,	1959	1958
Income:		
Products and services sold	**$1,910,730,252**	$1,895,699,358
From other sources	**23,271,575**	17,764,749
Total	**1,934,001,827**	1,913,464,107
Costs applicable to income:		
Employe compensation and benefits	**818,724,773**	783,435,187
Income taxes—Federal and foreign	**73,600,000**	54,200,000
Other taxes (*excludes Federal excise taxes*)	**15,594,562**	14,395,498
Materials and services from others	**889,584,720**	927,880,606
Interest on debentures	**11,051,119**	11,051,119
Wear of facilities (*depreciation and amortization*) (*Note 3*)	**46,696,000**	47,729,156
Total	**1,855,251,174**	1,838,691,566
Net income before special items	**78,750,653**	74,772,541
Special income net (*Note 6*)	**12,191,472**	
Special charges net (*Note 7*)	***4,994,766**	
Net income for the year	**85,947,359**	74,772,541
Dividends paid:		
On preferred stock	**1,721,438**	1,794,588
On common stock	**36,156,775**	33,998,241
Total	**37,878,213**	35,792,829
Income reinvested in the business:		
From current year's operations	**48,069,146**	38,979,712
From prior years' operations	**446,679,943**	408,811,814
	494,749,089	447,791,526
Other deductions (*Net*)	**1,343,599**	1,111,583
Total at end of year	**$ 493,405,490**	$ 446,679,943

*Deduction.

Years ended December 31,	1959	1958
Working capital at January 1	**$729,720,947**	$706,704,104
Additions:		
Net income—for the year	**85,947,359**	74,772,541
Wear of facilities (*depreciation and amortization*)	**46,696,000**	47,729,156
Sale of common stock to employes	**9,704,797**	13,063,337
Total additions	**142,348,156**	135,565,034
Deductions:		
Purchase of land, buildings and machinery	**45,239,495**	54,998,481
Dividends on preferred and common stocks	**37,878,213**	35,792,829
Par value of preferred stock purchased and retired	**2,660,000**	1,930,000
Increase in loans and investment, Westinghouse Credit Corporation (*a wholly owned non-consolidated subsidiary*)	****100,000**	11,100,000
Other	**18,345,964**	8,726,881
Total deductions	**104,023,672**	112,548,191
Working capital at December 31	**$768,045,431**	$729,720,947

**Contra.

The accompanying notes to financial statements on page 32 are an integral part of this statement.

The Companies own:	1959	1958
Cash	$ **60,901,799**	$ 57,394,568
U.S. Government and other marketable securities (*at lower of cost, less amortization of premium, or market*)	**317,559,216**	252,258,229
Amounts owed to the Companies by:		
Customers (*less allowance for doubtful accounts*)	**277,667,168**	272,521,937
Wholly and majority owned companies not consolidated	**1,227,336**	3,638,102
Materials, supplies, products in process of manufacture and finished products (*Note 2*)	**371,114,487**	381,329,905
Other amounts recoverable	**44,703,284**	32,133,936
Total	**1,073,173,290**	999,276,677
Less: Progress and advance billings, included above, on products not shipped	**73,913,144**	71,106,440
Total (*Current Assets*)	**999,260,146**	928,170,237
Investments:		
Wholly and majority owned companies not consolidated	**63,578,285**	62,486,692
Westinghouse Electric Corporation—common stock (*at less than market*)	**3,361,853**	534,129
Other securities (*at lower of cost or market*)	**12,490,579**	11,978,026
Land, buildings and machinery (*reduced for wear of facilities at December 31, 1959 by $416,550,603; 1958 by $387,913,020*)	**336,206,041**	340,681,561
Insurance premiums and other expenses paid in advance	**10,895,927**	10,053,497
Receivables not collectible within one year (*less allowance for doubtful accounts*)	**41,093,860**	25,940,284
Purchase price of going businesses acquired in excess of their net tangible assets	**28,604,326**	28,504,821
Other assets	**2,637,479**	3,158,359
Total owned by the Companies	**$1,498,128,496**	$1,411,507,606

The accompanying notes to financial statem

	1959	1958
The Companies owe:		
Wages and salaries	**$ 64,386,303**	$ 58,620,129
Suppliers of materials and services	**69,011,681**	57,143,719
Federal and foreign income taxes	**43,851,055**	37,968,381
Other taxes	**13,699,834**	10,748,188
Product guarantees	**18,282,419**	18,465,780
Miscellaneous	**21,983,423**	15,503,093
Total (*Current Liabilities*)	**231,214,715**	198,449,290
Amounts owed to the public:		
Debentures, 2⅝%—Due September 1, 1971	**20,995,000**	20,995,000
Debentures, 3½%—Due December 15, 1981	**300,000,000**	300,000,000
Other amounts owed, including product guarantees, beyond one year	**6,125,538**	6,337,949
Total owed by the Companies	**558,335,253**	525,782,239
Total owned—after deducting total owed	**939,793,243**	885,725,367
Less: Allowance for contingencies	**15,472,536**	15,405,969
Stockholders' Equity (*Net Worth*)	**$ 924,320,707**	$ 870,319,398
Stockholders' Equity evidenced by:		
Preferred stock, cumulative, par value $100 per share. Authorized 510,511 shares; 3.80% Series B, issued and outstanding (*at December 31, 1959*) 440,485 shares	**$ 44,048,500**	$ 46,708,500
Common stock, par value $12.50 per share. Authorized 25,000,000 shares; issued and outstanding (*at December 31, 1959*) 17,339,728 shares	**216,746,600**	214,750,350
Income reinvested in the business	**493,405,490**	446,679,943
Other (*Capital Surplus*)—Principally amount paid the Company for capital stock in excess of par value (*Note 4*)	**170,120,117**	162,180,605
Total Stockholders' Equity	**$ 924,320,707**	$ 870,319,398

n page 32 are an integral part of this statement.

MAIN AND COMPANY

CERTIFIED PUBLIC ACCOUNTANTS

PITTSBURGH 22, PA.

To the Stockholders,
Westinghouse Electric Corporation:

As independent accountants elected at the annual meeting of stockholders of Westinghouse Electric Corporation on April 1, 1959, we examined the consolidated statement of financial position of Westinghouse Electric Corporation and its subsidiaries as of December 31, 1959, and the consolidated statements of operations and income reinvested in the business for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. We made a similar examination for the year ended December 31, 1958.

In our opinion, the accompanying consolidated statement of financial position and the consolidated statements of operations and income reinvested in the business present fairly the financial position of Westinghouse Electric Corporation and its subsidiaries at December 31, 1959, and the results of their operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Main and Company

January 22, 1960 — CERTIFIED PUBLIC ACCOUNTANTS

note 1. PRINCIPLE OF CONSOLIDATION: Financial statements include wholly owned subsidiaries except Westinghouse Credit Corporation. The equity in the operating results of this subsidiary and majority owned companies operating in foreign countries is also included.

note 2. INVENTORIES: The LIFO (last-in, first-out) method of inventory valuation has been used since 1956. At December 31, 1959, the cost of over 94% of the inventories of the consolidated companies was determined by this method.

note 3. WEAR OF FACILITIES: In 1959 rapid amortization of $5,729,000 was charged to operations and exceeded normal depreciation by $3,692,000. Facilities covered by Government certificates of necessity written-off over a five-year period for tax purposes are being amortized in the same amount by the Corporation for financial accounting purposes.

note 4. CAPITAL SURPLUS: Increase due principally to sale of common stock under Employe Stock Plan and Restricted Stock Option Plan.

note 5. PENSIONS: Unfunded liability under the Corporation's pension plan, for past service, was estimated to be $81,318,000 at December 31, 1959.

note 6. SPECIAL INCOME (NET): Recovery of 1945 Federal income taxes, plus interest, arising from settlement in 1959 of a suit for refund involving adjustment of 1946 net operating loss carry-back.

note 7. SPECIAL CHARGES (NET): Extraordinary nonrecurring expense after Federal income tax effect, of moving major appliance lines from Springfield, Mass. to Columbus, Ohio, and the Gearing Division from Pittsburgh, Pa. to Buffalo, N.Y.

ten year highlights, 1950 to 1959 we

Except for per share figures, all dollar amounts are in thousands.

		1959	1958	1957	1956
For the year					
Products and services sold		**$1,910,730**	$1,895,699	$2,009,044	$1,525,376
Employe compensation and benefits (*expenditures*)		**816,158**	765,600	800,606	655,675
Taxes		**125,977**	101,145	118,630	45,050
Depreciation		**40,967**	37,287	34,546	31,024
Amortization		**5,729**	10,442	13,813	15,571
Interest paid		**11,051**	11,051	11,051	11,053
Net income	Amount	**85,947†**	74,773	72,653	3,492
	Per dollar of sales	**4.5¢**	3.9¢	3.6¢	0.2¢
	Per common share	**4.86†**	4.25	4.18	.10
Dividends paid	Preferred	**1,721**	1,795	1,875	1,888
	Common	**36,157**	33,998	33,564	33,274
	Per common share	**2.10**	2.00	2.00	2.00
Average number of employes		**112,737**	114,652	128,572	125,050
At the year end					
Working capital		**$ 768,045**	$ 729,721	$ 706,704	$ 687,243
Inventories		**371,114**	381,330	480,681	478,177
Land, buildings and machinery (*at cost*)		**752,757**	728,595	683,384	631,528
Stockholders		**150,909**	156,002	146,779	143,188
Shares outstanding	Preferred	**440,485**	467,085	486,385	495,785
	Common	**17,339,728**	17,180,028	16,943,337	16,743,713
Book value per common share		**$ 50.76**	$ 47.93	$ 45.60	$ 43.15

†Net income includes $7,196 and 42¢ per common share for special items.

s t i n g h o u s e   e l e c t r i c   c o r p o r a t i o n

	1955	1954	1953	1952	1951	1950
1	$1,440,977	$1,636,184	$1,582,047	$1,454,273	$1,240,801	$1,019,923
2	549,433	609,824	634,106	564,833	507,843	393,404
3	82,804	131,012	126,095	144,864	148,338	116,156
4	28,120	24,242	20,218	17,962	16,357	15,228
5	14,986	13,554	8,533	3,875	701	
6	11,110	11,126	10,784	6,788	838	1,917
7	42,803	79,922	74,323	68,582	64,578	77,923
8	3.0¢	4.9¢	4.7¢	4.7¢	5.2¢	7.6¢
9	2.46	4.78	4.53	4.23	4.03	5.36
10	1,900	1,900	1,900	1,900	1,900	1,900
11	32,879	40,471	31,738	31,321	30,361	27,512
12	2.00	2.50	2.00	2.00	2.00	2.00
13	115,857	117,143	122,729	112,582	108,654	98,279
14	$ 736,146	$ 687,440	$ 629,725	$ 553,212	$ 455,279	$ 455,873
15	398,631	420,361	497,454	412,847	387,648	274,090
16	587,587	549,243	498,745	421,721	362,016	323,028
17	119,086	111,107	111,424	108,627	102,912	89,970
18	500,000	500,000	500,000	500,000	500,000	500,000
19	16,644,341	16,332,195	15,985,262	15,764,426	15,549,697	14,190,654
20	$ 44.91	$ 43.27	$ 41.83	$ 39.45	$ 37.19	$ 33.71

ia

plants and products westinghouse electric corporation

apparatus products

EAST PITTSBURGH DIVISION, East Pittsburgh, Pa. Plants at East Pittsburgh, Derry, Trafford and Irwin, Pa.; and Bloomington, Ind. **Switchgear Apparatus Departments**—Switchboards and accessories; switchgear assemblies; circuit breakers; network protectors; outdoor substations; lightning arresters; capacitors; network calculators; porcelain insulators; microwave and power line carrier equipment. **Power Apparatus Departments**—Large generators; motors; **Ignitron** rectifiers; light traction motors; generators and controls; mica insulating products. **Component Products Department**—Supplies products and services to operating divisions. **Printing and Nameplate Department**—Printing and nameplate services.

GEARING DIVISION, Pittsburgh, Pa. Gearmotors; speed reducers; marine diesel propulsion gear units; high-speed gear units; industrial, mine locomotive and railway gearing; mine and pantograph trolleys; aircraft accessory gearing.

By mid-1960 the major products of this Division will be incorporated into the motor department of the Motor and Control Division at Buffalo.

MANUFACTURING & REPAIR DIVISION—42 plants handling repair of electrical apparatus and manufacture of electrical equipment.

SUNNYVALE MANUFACTURING DIVISION, Sunnyvale, Calif.—Steam turbines and related apparatus; power and distribution transformers; switchgear; power circuit breakers; industrial control; control centers; panelboards; motors; gearmotors; generators.

MATERIALS MANUFACTURING DEPARTMENT, Blairsville, Pa. Development and production of magnetic, high-temperature, and expansion alloys; precision and shell-mold castings; powder-metal parts; nuclear materials.

METER DIVISION, Newark, N. J. Plants at Newark, N. J.; and Raleigh, N. C.—Watthour meters to measure consumption of electric power; instruments for measuring and controlling electric power; protective relays for electric utilities and industries.

MOTOR & CONTROL DIVISION, Buffalo, N.Y. Plants at Buffalo and Attica, N. Y. **Motor Department**—Medium size a-c and d-c motors, generators; m-g sets; packaged adjustable speed drives; dynamometers. **Industrial Control Department**—Industrial a-c and d-c, Navy, marine and mill controls; **Magamp** and **Rototrol** regulators; analog and digital static control devices. **Copper Department**—Copper wire.

STEAM DIVISION, Lester, Pa. Steam turbines; gas turbines; reduction gears; steam condensers and auxiliaries; feed water heaters and evaporators; forced draft blowers; propulsion machinery for ships.

TRANSFORMER DIVISION, Sharon, Pa. Plants at Sharon and Greenville, Pa.; and Athens, Ga.—Distribution and power transformers; power regulators; step-type voltage regulators; current-limiting reactors; portable substations; specialty and dry-type transformers; oil and **Inerteen** dielectric filtering equipment; power centers.

general products

ELEVATOR DIVISION, Jersey City, N. J. Plants at Jersey City and Dover, N. J.—Electric passenger and freight elevators, electric stairways; marine elevators.

LIGHTING DIVISION, Cleveland, Ohio. Plants at Cleveland, Ohio; Vicksburg, Miss.; and San Lorenzo, Calif.—Commercial and industrial fluorescent and incandescent fixtures; fluorescent ballasts; flood, street, aviation and marine lighting equipment.

MICARTA DIVISION, Hampton, S. C. Plants at Hampton, S. C.; Trafford and Manor, Pa.—**Micarta** resinous plastics; laminated sheets and shapes; insulating materials; molded plastics; decorative **Micarta;** insulating varnishes; enamels; thinners.

SMALL MOTOR DIVISION, Lima, Ohio. Plants at Lima, Bellefontaine and Upper Sandusky, Ohio; and Union City, Ind. **Industrial Motor Department**—Small motors for domestic and commercial appliances, industrial purposes and land and marine transportation. **Aircraft Equipment Department**—Electric systems, generators, motors and control apparatus for military and commercial aircraft, missiles and spacecraft.

STANDARD CONTROL DIVISION, Beaver, Pa. Products for low-voltage distribution systems; molded-case **De-ion** circuit breakers; circuit devices including safety switches and AB-I breakers; a-c controls; bus duct.

STURTEVANT DIVISION, Boston, Mass. Plants at Hyde Park, Mass., and LaSalle, Ill. Fans and blowers for ventilating industry and power plants; heating and cooling coils; air distributing units; **Precipitron** electronic air cleaners; surface dehumidifiers.

WELDING DEPARTMENT, Buffalo, N. Y. Plants at Buffalo, N. Y.; and Montevallo, Ala.—A-c and d-c arc welding machines; automatic welding equipment; arc welding electrodes; brazing alloys.

X-RAY & INDUSTRIAL ELECTRONICS DIVISION, Baltimore, Md. Medical and industrial X-ray apparatus; high-power amplifiers; industrial electronic devices; induction heating equipment; ultrasonics.

THE BRYANT ELECTRIC COMPANY, Bridgeport, Conn. Wiring devices; molded plastic products.

consumer products

MAJOR APPLIANCE DIVISION, Mansfield, Ohio. Plants at Mansfield, Newark and Columbus, Ohio; and East Springfield, Mass.—Ranges; refrigerators; freezers; **Laundromat** clothes washers; **Wash 'N Dry** combinations; clothes dryers; dishwashers; window-type air conditioners; food waste disposer units; dehumidifiers; water heaters; water coolers; refrigeration units.

PORTABLE APPLIANCE DIVISION, Mansfield, Ohio. Plants at Mansfield and Newark, Ohio; and East Springfield, Mass.—Electric housewares; electric blankets and sheets; fans; vacuum cleaners; food mixers; and room heaters.

ELECTRONIC TUBE DIVISION, Elmira, N.Y. Plants at Elmira and Bath, N. Y.—Radio and television receiving tubes; television picture tubes; television camera tubes; gas and high-power vacuum tubes; miscellaneous special tubes.

LAMP DIVISION, Bloomfield, N. J. Plants at Bloomfield, Belleville and Trenton, N. J.; Fairmont, W. Va.; Little Rock, Ark.; Owensboro and Richmond, Ky.; Paris, Texas; and Reform, Ala.—Incandescent, fluorescent and **Rayescent** electroluminescent lamps; **Sterilamp** ultraviolet lamps; **Odorout** lamps; sun and infrared lamps; photoflash, projection and photoflood lamps; Christmas tree lamps; mercury vapor lamps; sealed beam headlamps; miniature lamps; flashlight lamps.

SEMICONDUCTOR DEPARTMENT, Youngwood, Pa. Transistors; power rectifiers; diodes for communication and industrial applications.

TELEVISION-RADIO DIVISION, Metuchen, N. J. Television receivers; home radio receivers; high-fidelity radio-phonograph combinations.

WESTINGHOUSE ELECTRIC SUPPLY COMPANY, Pittsburgh, Pa. Distributes the Company's products through 136 locations.

WESTINGHOUSE APPLIANCE SALES, Pittsburgh, Pa. Distributes the Company's consumer products through 36 locations.

defense products

AVIATION GAS TURBINE DIVISION, Kansas City, Mo. Aviation gas turbines for military aircraft.

BALTIMORE DIVISIONS, Baltimore, Md. Air Arm Plant at Friendship Airport near Baltimore produces aircraft armament systems and airborne systems for missiles. **Electronics Plant** at Friendship Airport produces electronic communication and radar equipment and missile ground control. **Ordnance Department** at Lansdowne, Md., produces torpedoes, mines and other underwater ordnance devices together with control for ground military armaments.

WESTINGHOUSE ADVANCED SYSTEMS PLANNING GROUP, Drexel Hill, Pa. Studies over-all requirements of future military activities and plans integrated approach to weapons systems.

atomic power products

BETTIS ATOMIC POWER LABORATORY, Pittsburgh, Pa. Facilities at West Mifflin Borough and Large, Pa.; and Idaho Falls, Idaho, for development of nuclear reactors for naval propulsion and power generation under contracts with the U. S. Government.

PLANT APPARATUS DEPARTMENT, Pittsburgh, Pa. Procurement of reactor plant equipment.

SPECIAL ATOMIC PROJECT, Pittsburgh, Pa. Procurement of reactor plant equipment for submarine *Dreadnought*.

ATOMIC POWER DEPARTMENT, Pittsburgh, Pa. Develops nuclear reactors for commercial application, and operates Reactor Evaluation Center at Waltz Mill, Pa.

ASTRONUCLEAR LABORATORY, Pittsburgh, Pa. Development of nuclear power for outer space.

ATOMIC EQUIPMENT DEPARTMENT, Cheswick, Pa. Produces apparatus for nuclear reactor plants.

ATOMIC FUEL DEPARTMENT, Cheswick, Pa. Produces nuclear reactor cores and core components.

WESTINGHOUSE TESTING REACTOR, Waltz Mill, Pa. Evaluates materials used in nuclear reactors.

air conditioning and residential heating

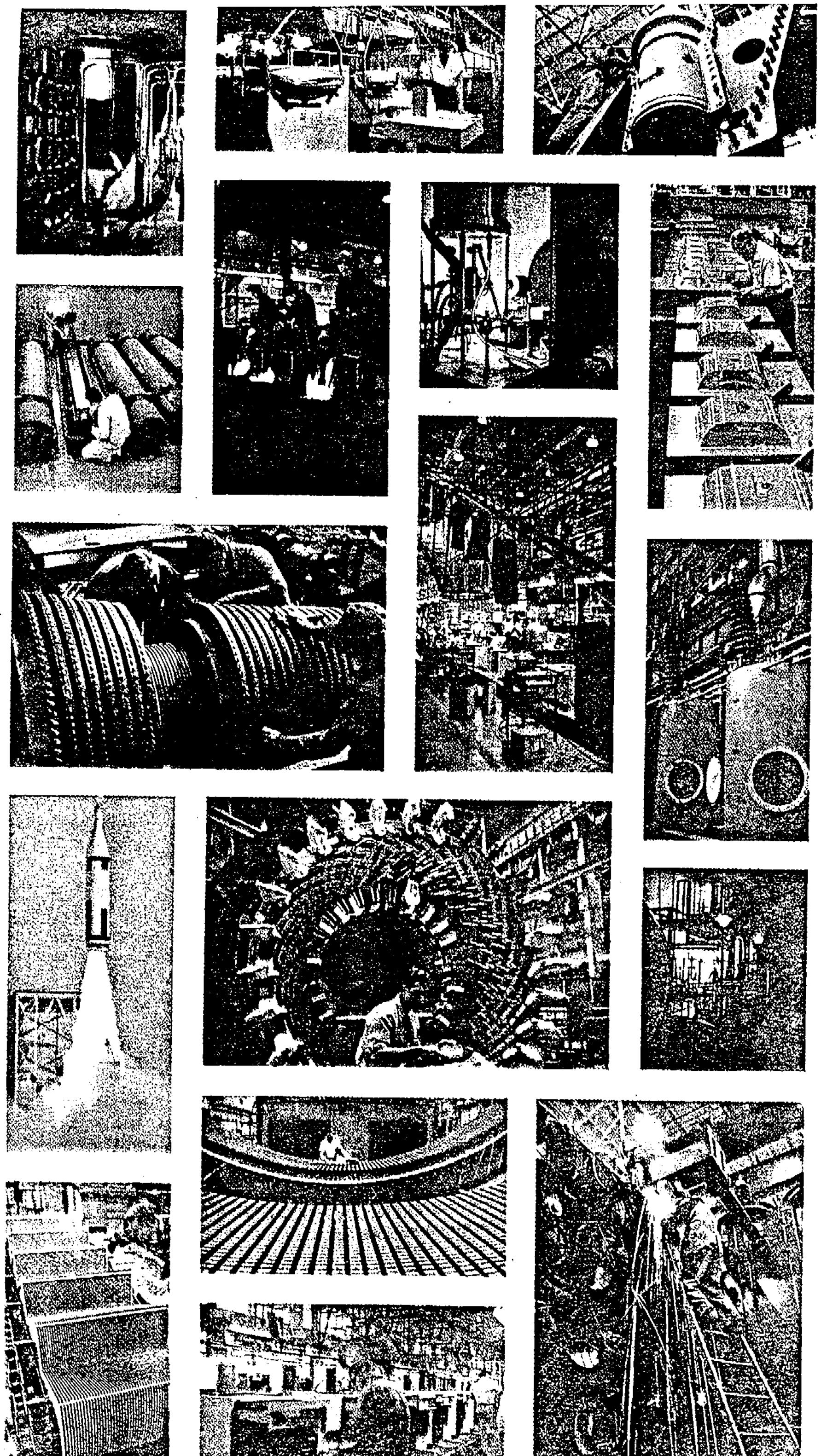
AIR CONDITIONING DIVISION, Staunton, Va. Packaged central air conditioning and heating equipment for residential, commercial and industrial applications; engineered air conditioning systems; heat pumps and electric heat systems for residential and commercial installation.

THE C. A. OLSEN MANUFACTURING COMPANY, Elyria, Ohio. Plants at Elyria and Medina, Ohio—Residential warm-air heating and air conditioning equipment.

WESTINGHOUSE ELECTRIC INTERNATIONAL COMPANY, New York, N. Y., WESTINGHOUSE ELECTRIC COMPANY S. A., San Juan, Puerto Rico, and WESTINGHOUSE ELECTRIC INTERNATIONAL S. A., Geneva, Switzerland. Distribute outside the United States products made by Westinghouse and its subsidiaries, and administer the license and technical assistance program with foreign manufacturers.

WESTINGHOUSE BROADCASTING COMPANY, INC. New York, N. Y. Owns and operates six radio and five television stations.

WESTINGHOUSE CREDIT CORPORATION, Pittsburgh, Pa. Provides for credit needs of Westinghouse dealers and their customers through 46 branch offices.



Westinghouse Electric Corporation 3 Gateway Center, Pittsburgh 22, Pennsylvania

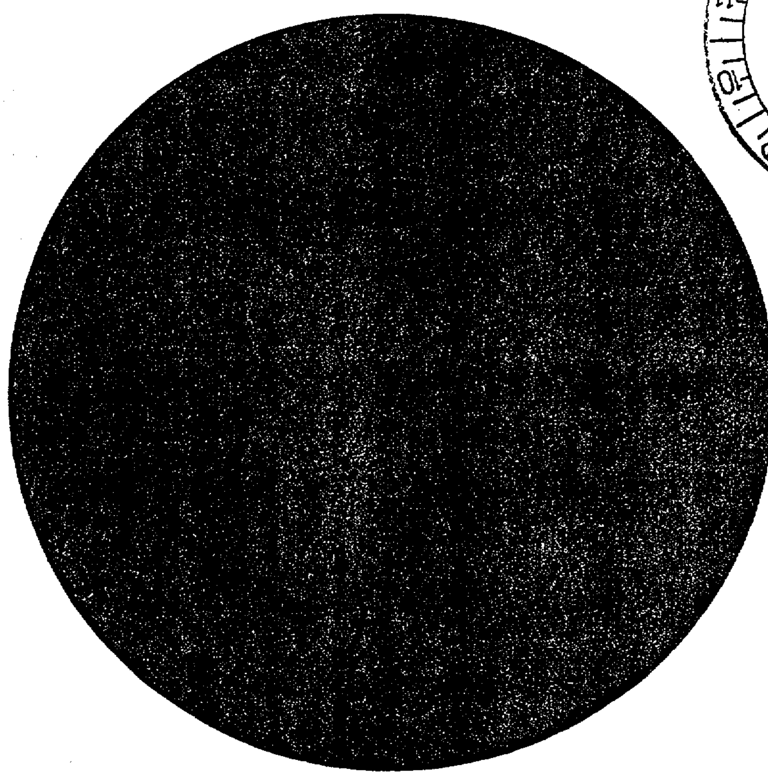
Westinghouse Electric Corporation · Annual Report 1963

DOCKET NO. 70-337

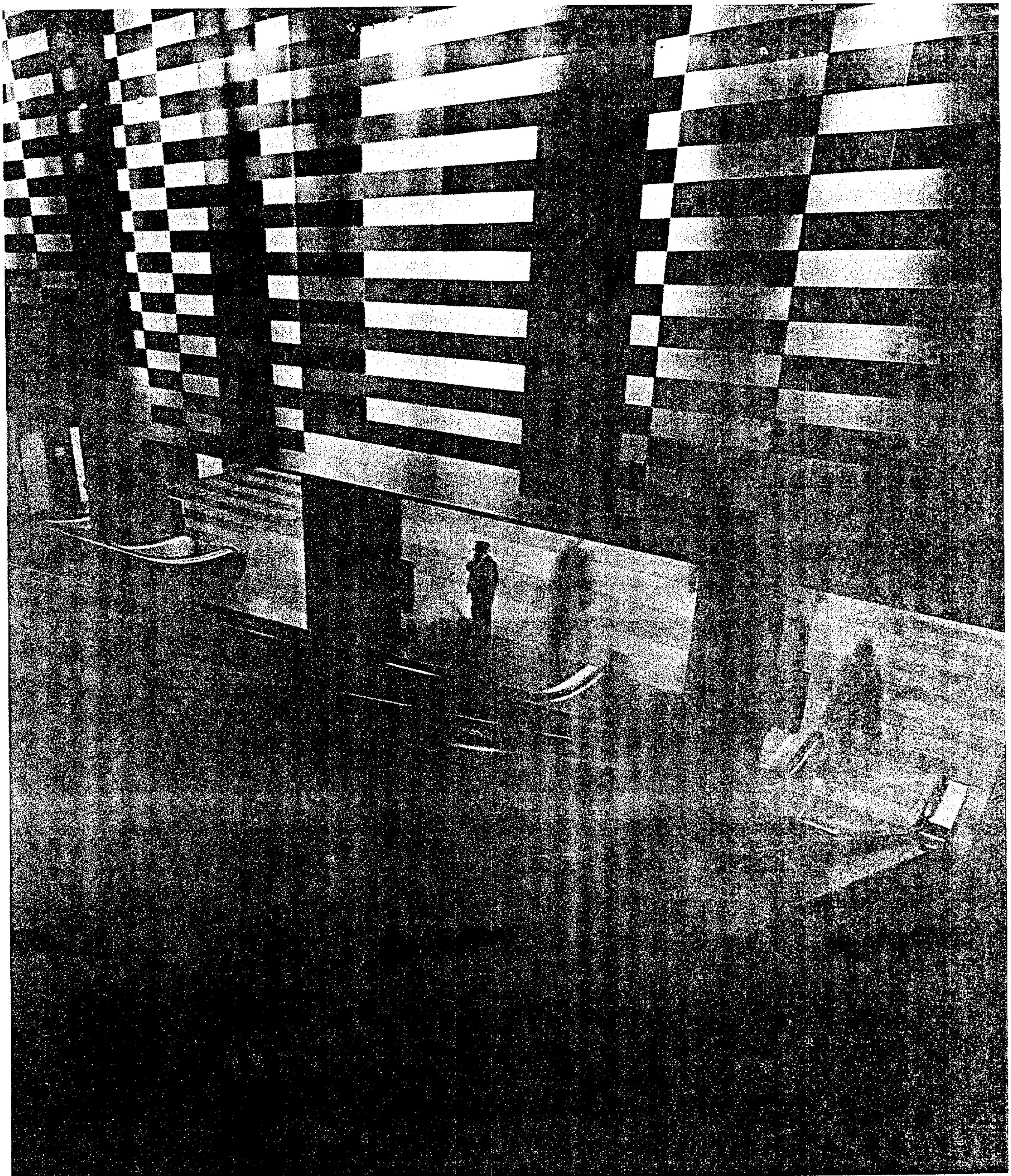
File Copy

trans. w/10-7-64 Ho.

DOCKETED
USAEC
OCT 9 1964
REGULATORY
MAIL SECTION
DOCKET CLERK



RECEIVED
1964 OCT 9 AM 11 4,
U. S. ATOMIC ENERGY COMM.
REGULATORY
MAIL SECTION



The Westinghouse elevators and electric stairways in New York City's Pan Am Building comprise the largest vertical transportation system to be installed in one structure, and will transport an estimated 150,000 people during an average business day. The stairways shown here pass beneath a massive mural of Westinghouse Micarta,® a material selected for its enduring beauty and versatility in construction applications.

Westinghouse Electric Corporation, 1963 Annual Report

Contents

Facts in Brief 1

President's Letter 2

The Year in Review 5

Financial Statements 19

Accountants' Report 22

Ten-Year Highlights 22

Directors and Officers 24

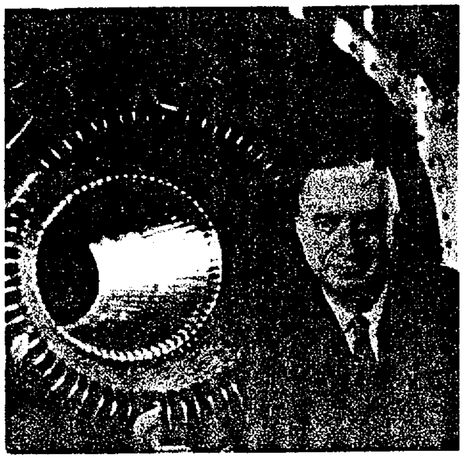
Facts in Brief

	1963	1962	1961
Net sales	$2,127,306,000	$1,954,479,000	$1,913,770,000
Net income	47,824,000	57,061,000	45,446,000
Net income per common share	1.28	1.56	1.23
Total dividends paid	44,438,000	44,077,000	43,765,000
Dividends paid per share of common stock	1.20	1.20	1.20
Common shares outstanding at year end	36,243,000	35,623,000	35,612,000
Expenditures for new and improved facilities	53,938,000	49,271,000	74,309,000
Total depreciation and amortization	59,649,000	56,091,000	47,378,000
Working capital at year end	734,972,000	713,925,000	715,309,000
Long term debt at year end	290,766,000	305,854,000	320,854,000

Sales by Product Categories

	1963	1962	1961
Apparatus	51%	51%	54%
Consumer	26%	28%	26%
Atomic, Defense and Space	23%	21%	20%

To the Stockholders of Westinghouse Electric Corporation


D. C. Burnham, *President*

This is my first annual report to you as President of your Company. I wish it were a better report as far as 1963 net earnings are concerned. I am sure the report at this time next year will be better.

Net income for the year was $47,824,000, or $1.28 a common share, compared to $57,061,000, or $1.56 a share in 1962.

While income did not measure up to expectations, our sales volume and new orders reached record levels.

Net sales billed in 1963 totaled $2,127,306,000, an all-time high, which topped the previous record year of 1957. All product groups participated in the increase.

Orders entered in 1963 likewise were a record, and unfilled orders on the books at the end of the year for commercial products advanced nearly 20 per cent over year end 1962.

Several events and circumstances combined to prevent profits from keeping pace with the gain in sales. In addition to the inevitable dislocations resulting from the untimely death of our President and Chief Executive, Mark W. Cresap, Jr., in mid-year, operations were affected by strikes lasting from a few days to 11 weeks at ten plants; by a loss in 1963 in our Electric Utility Group, reflecting shipments of heavy equipment booked at severely depressed prices; by continuing low prices in consumer products and extraordinary expenses incurred in the introduction of new models of appliances; and by heavy start-up costs when we completed a large new molecular electronics plant. Furthermore, extensive cost reduction efforts have not yet fully produced the savings that are anticipated.

Favoring the outlook in 1964, however, many of the problems which affected earnings in 1963 will no longer be with us or are being corrected.

Significant management changes have been made in our problem areas, and an aggressive organization is at work. We have established firm goals for 1964, and we are driving to achieve them.

Our new union contracts run for three years, and we foresee a period of uninterrupted operations and constructive relations with employes and with union leaders.

Cost control efforts are being intensified and programmed on a selective basis designed to yield maximum savings without jeopardizing future growth and at the same time improving product quality and service.

While further shipments of low-priced utility equipment will continue to affect profit performance for some months to come, there are encouraging indications that prices of heavy utility equipment and other important product lines are firming. We look for better price levels than have prevailed in recent years and which more fairly represent the values being received by customers.

Satisfactory progress was made during the year in negotiating agreements with many electric utility customers to dispose of claims arising from the electrical manufacturing industry antitrust cases of 1960. You will find more details on this subject in Note 4 to the financial statements in this report. We are working diligently to get these cases behind us so that the attention of management can be devoted full-time to improvement of the Company's operations.

Our Industrial and Construction Groups, Atomic, Defense and Space Group and the Westinghouse Broadcasting Company all performed well and profitably in 1963, as did certain product lines in the other Groups, and we expect continued improvement in their sales and earnings in 1964.

We are working harder in the international field, and we entered the year with a high backlog of orders booked by the Westinghouse Electric International Company, indicating good prospects abroad in 1964.

And, finally, we expect that a high level of sales volume will be maintained through 1964 and will be moderately above 1963, thus setting another record.

Of all the actions taken to improve the Company's capabilities, the most important was strengthening the management organization with certain key changes and realignments at high levels and in depth. Major staff functions have been coordinated and their efforts directed toward giving more effective support to the line operations in meeting their goals. At this point, I can express utmost confidence in this management organization, and in the future I expect to be able to point with pride to its achievements.

For all of the above reasons, although I do not expect a sudden turn-around in earnings, I feel I can say with some assurance that a better report will be submitted to you at this time next year.

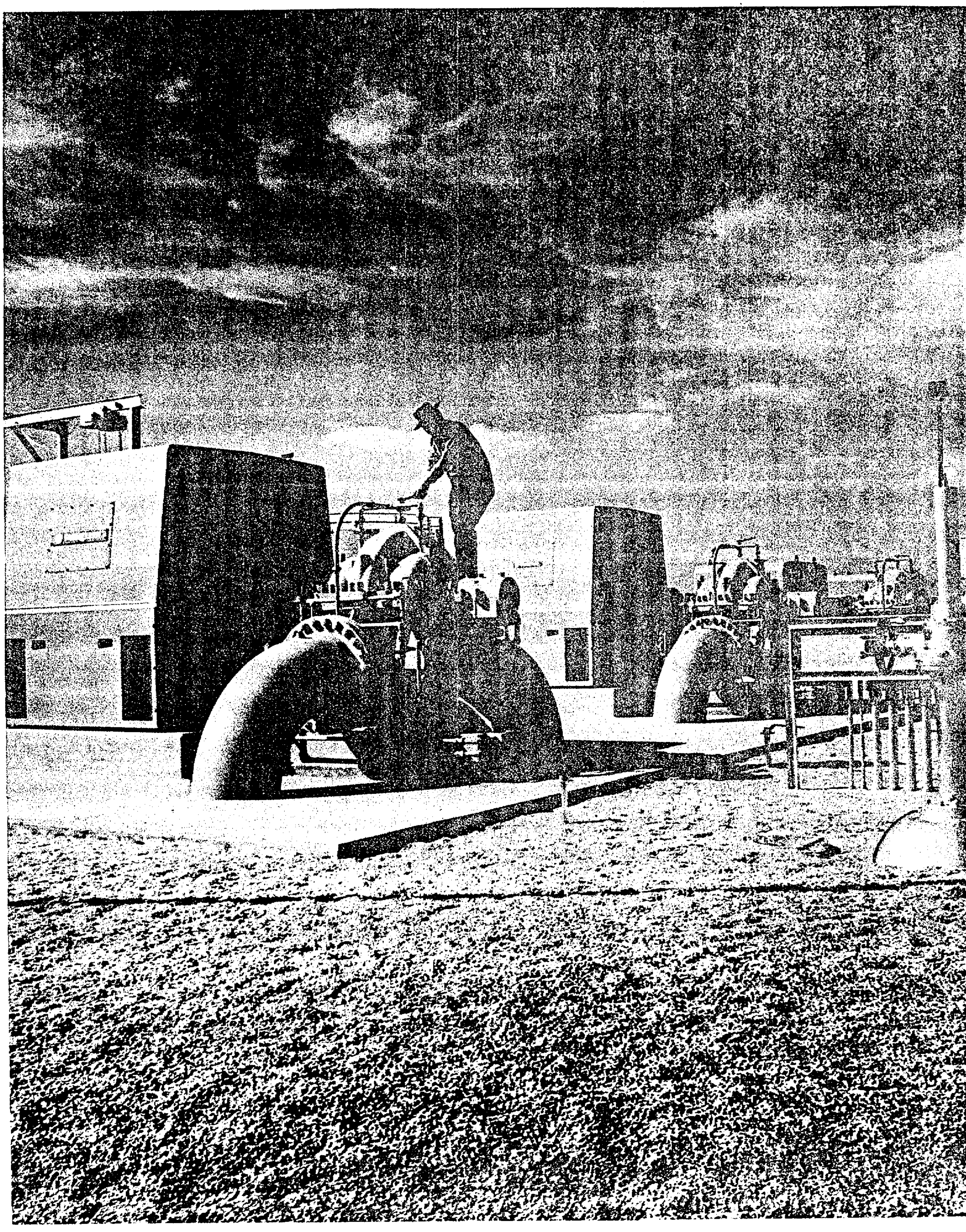
D C Burnham

D. C. Burnham, *President*

By order of the Board of Directors, January 29, 1964

Gwilym A. Price

Gwilym A. Price, *Chairman of the Board*



The Year in Review

Realignment of the Company's product groups to increase their effectiveness in serving specific markets, and reorientation of the marketing organization to increase selling effectiveness to these markets, produced a record volume of orders and sales billed in 1963.

The Company's marketing, scientific and engineering resources were directed more aggressively to large segments of the industrial, commercial, space and military markets, where advanced technology is essential. Efforts were intensified to explore customer needs and develop opportunities for new business in existing markets, and to capitalize on capabilities in entering new markets.

To improve operating effectiveness, seven major product groups were consolidated into six groups which report to President D. C. Burnham through two Executive Vice Presidents, George L. Wilcox and Ronald N. Campbell.

The Atomic, Defense and Space Group, the Electric Utility Group, and the Specialty Products Group report through Mr. Wilcox. The Construction, Consumer and Industrial Groups report through Mr. Campbell.

Industrial Systems

The number and diversity of industrial systems engineered, installed or ordered in 1963 reflect the continuing emphasis on development of complete systems to better meet customer needs. Westinghouse engineers have developed control systems for customers in the transportation, metals, glass, electric utility, cement, lumber, mining and paper industries. The big industrial market for the Company's products, which includes motors, controls, drives, and gearing and welding equipment, is even more important to Westinghouse now because of its expanding systems capabilities.

Pittsburgh area civic officials broke ground for a one-mile demonstration loop of the Westinghouse Transit Expressway system, a new concept to help solve the mass transit problem of crowded metropolitan areas. The experimental line will demonstrate the engineering and operating feasibility of the system. It uses lightweight, electrically driven vehicles traveling at speeds up to 50 miles an hour over elevated rights-of-way. The automatically controlled vehicles operate singly or in trains.

For the metals industry, Westinghouse systems are being engineered to control by computer a continuous aluminum hot-rolling mill and three hot-strip steel mills. These process control computer systems will insure a more uniform and higher product quality by monitoring and controlling the production of strip to extremely close tolerances.

Westinghouse will provide electrical drive and control equipment for the world's most powerful cold-rolled steel mill and will engineer the system for computer control. In other steel mills, computer systems will control operations of blast furnaces, and electrical drives and control equipment will be supplied for a tinning line and for rolling super-thin sheet steel.

For the glass industry, complete electrical systems will be supplied for two electrically heated furnaces, one being the industry's largest unit.

The Company's new engine-room computer systems will control two Coast and Geodetic Survey ships driven by Westinghouse propulsion machinery, and will also process oceanographic data.

These centralized engine-room systems also will control eight commercial cargo ships. The first order of its kind in the U.S. marine industry supplemented a previous order for the main turbine-propulsion equipment for these vessels.

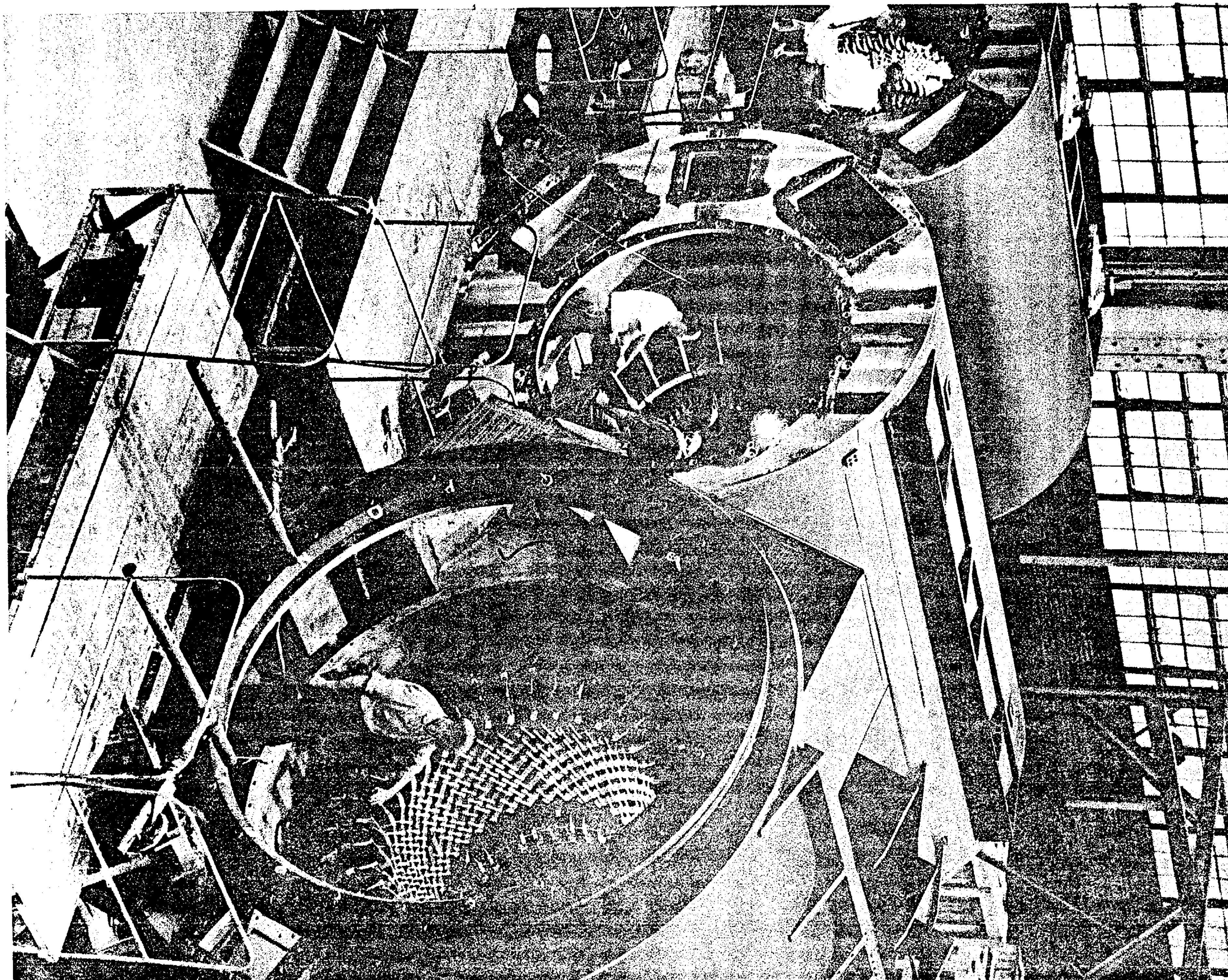
Other systems sold in 1963 were for: a central power plant for a lumber processing mill; a cement processing kiln, including the electrical drive and control systems; an electric utility dispatching system which automatically meets changing power demands on the system; and a number of control and monitoring installations for electric utility generating plants.

Serving the Construction Market

Westinghouse supplies the broadest line of products and services for the construction industry of any electrical manufacturer, ranging from lamps and wall switches to elevators and air conditioning. The Company concentrates its capabilities in this field through a coordinated marketing approach emphasizing complete systems.

Representative are the vertical transportation facilities in New York City's Pan Am Building. Westinghouse supplied 61 passenger elevators, five service elevators, four auto lifts, and 18 electric

Left: By mid-1964, these giant Westinghouse motors will help move more than 25 million gallons of petroleum products daily over the Colonial Pipeline System. These 5,000-horsepower motors are the largest ever used for pumping refined petroleum products.



stairways—the most massive vertical transportation system ever housed in one structure. Six passenger elevators serving the upper floors are the world's fastest, attaining a speed of 1,700 feet a minute. These elevators and electric stairways will carry an average of 150,000 persons a day.

To blend with today's modern architecture, the Elevator Division announced in September an electric stairway which features a new silhouette, glass balustrade panels and handrails in color. This new design has received outstanding acceptance among building owners and architects, and the first of the many units already sold will be installed in the second quarter of 1964.

Westinghouse is supplying all major electrical equipment including 1,800 lighting fixtures for the Chesapeake Bay Bridge-Tunnel project to be opened in 1964. The bridge-tunnel project comprises 19 miles of roadway that traverses Chesapeake Bay above and below the bay surface.

Consumer Line Has New Styling, Features

A number of new and improved products designed for personal convenience, comfort, health and entertainment highlight the restyled consumer line.

The 1964 laundry and kitchen equipment is the most diversified in the Company's history and includes the industry's first complete home laundry center available from one manufacturer. It combines all laundering functions in one convenient package with heavy-duty washers and dryers designed as free-standing units, as built-in equipment, or for stacking one unit above the other. Both the washer and dryer have increased capacity and improved performance, and the dryers have a new balanced airflow system that provides more uniform distribution of heated air.

A new all-transistor, battery-operated portable phonograph features an automatic four-speed record changer. This "Gadabout" unit will play up to 50 hours on six standard flashlight batteries or may be plugged into any alternating-current outlet.

Included in the portable appliance line are new electric toothbrushes which operate on long-life, rechargeable batteries; a new toaster which can be set to toast from one to four slices of bread; an "instant sweeper" for cleaning tasks too small for a regular vacuum; hair dryers with a spot hair-drying nozzle, perfumer, fingernail buffer and dryer; a combination knife and scissors sharpener; a "Steam 'N Sprinkle" iron with a tap water indicator that tells when refilling is necessary and with a fabric guide temperature setting; griddles, broiler-fry pans and waffle makers with permanent "non-stick" surfaces; and a self-starting electric can opener.

A new line of fluorescent lamps was introduced which produces two and one-half times as much light as standard fluorescents, and a new mercury lamp has been developed with a light output nearly twice that of present mercury lamps.

Electric Power Generation & Transmission

Technological progress in atomic power plants and extra-high-voltage transmission highlighted developments in the electric utility field during the year.

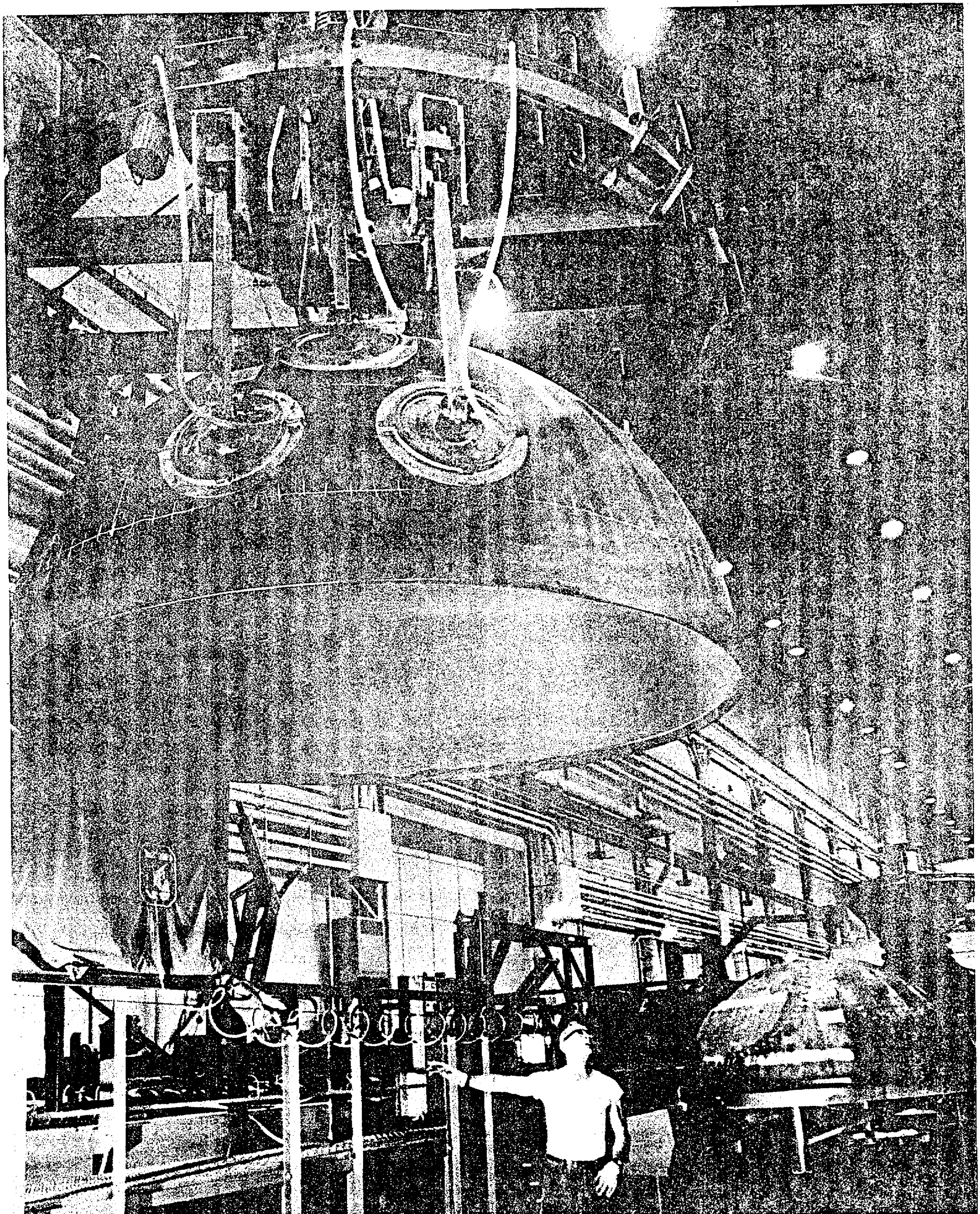
Nuclear fuel core technology is moving so rapidly that the nuclear power plants for Connecticut Yankee Atomic Power Company and the City of Los Angeles are being designed to permit future operation at power levels substantially above their initial design ratings of 490,000 kilowatts. The plants are scheduled for completion in 1967 and 1968, respectively.

The pacemaking Yankee Atomic Electric Company plant at Rowe, Mass., is operating on its third Westinghouse fuel core at a power level of 185,000 kilowatts, compared to its original generation of 120,000 kilowatts. The plant produced more than two and one-half billion kilowatt-hours of electricity from its first two fuel charges.

A new fuel core for Consolidated Edison's 275,000-kilowatt nuclear plant at Indian Point, N.Y., is being manufactured for delivery in 1965.

The nation's first full-scale atomic-electric generating station at Shippingport, Pa., will begin operating on its second Westinghouse seed-blanket fuel core in 1964. It will have a power capability of 150,000 kilowatts, compared to an original capacity of 68,000 kilowatts. To further exploit the potential of the seed and blanket core concept as a means of conserving fissionable fuel sources, Bettis Atomic Power Laboratory has begun development and design work on a 500,000-kilowatt, water-cooled reactor plant utilizing this core concept in a thorium fuel cycle. Preliminary results of this work have been most encouraging, indicating the possibility of achieving long core life—up to 10 years between refuelings—and high fuel conversion ratio, possibly even breeding. Realization of these goals would represent a significant advance in reactor technology.

Left: Generators like these three under construction at the East Pittsburgh plant meet the nation's growing need for electric power. The three units will have a generating capacity totaling 325,000 kilowatts.



receipt of a contract making it responsible for installing and testing equipment built for this ship by other companies.

Aerospace Activities Broadened

For the NERVA (Nuclear Engine for Rocket Vehicle Application) program, shock and vibration tests on a model reactor were initiated. The manufacture of fuel for the first core is well advanced, and preparations were made for test operation of the initial model of the reactor. The NERVA program is directed by the Space Nuclear Propulsion Office, a joint office of the AEC and the National Aeronautics and Space Administration (NASA).

The Company is building a unique new radar that will enable astronauts in the two-man *Gemini* spacecraft to guide their craft to a rendezvous with an *Agena* rocket while orbiting far out in space. Westinghouse is also making a "piggyback" satellite to be used by astronauts to practice rendezvous operations during early flights without the need to orbit an *Agena* companion. The radar-equipped "piggyback" unit will be carried into orbit by the *Gemini* spacecraft, then ejected and used as a target for perfecting orbital rendezvous techniques.

Broadened engineering capabilities plus manufacturing experience in massive, high-precision apparatus enabled Westinghouse to enter a new market in the aerospace business—fabrication of large solid-fuel rocket motor cases. For the *Titan III-C* launch vehicle, the motor cases will be 10 feet in diameter and approximately 75 feet long when assembled.

Westinghouse won a design study contract from the Army Engineers for a nuclear power plant for use on the moon. The power needs of a manned lunar base will be evaluated, and a nuclear generator that can be transported by rocket to its moon destination will be studied. Closely related is a second contract to select engine and fuel systems for use in the build-up of the lunar base and exploration of the lunar surface.

Westinghouse has developed and delivered to the Air Force solar cells 15 times larger than those now in use on orbiting satellites to convert sunlight directly into electricity. Larger cells offer greater reliability at lower cost.

Design and development work is under way on a special-purpose computing system of unprecedented capability for defense and space applications. Called SOLOMON, it will handle certain types of calculations up to 250 times faster than conventional units. It will have application in such areas as satellite surveillance, military command and control, ballistic missile defense and military intelligence data processing.

Westinghouse has supplied more electrical systems for airplanes than any other company, and three new commercial jet transports will use Westinghouse systems: the Boeing 727, Douglas DC-9 and the British Aircraft Corporation 111. The new F-111 Air Force-Navy tactical fighter plane also will be equipped with Westinghouse systems.

New Products, Technologies, Spurred by Research

Translation of research developments into new products and technologies means new markets and expanding sales.

Molecular electronics, a concept originated by Westinghouse in 1959, has developed into a growing product line being manufactured in Elkridge, Md., at the first industrial plant constructed solely for the production of such devices.

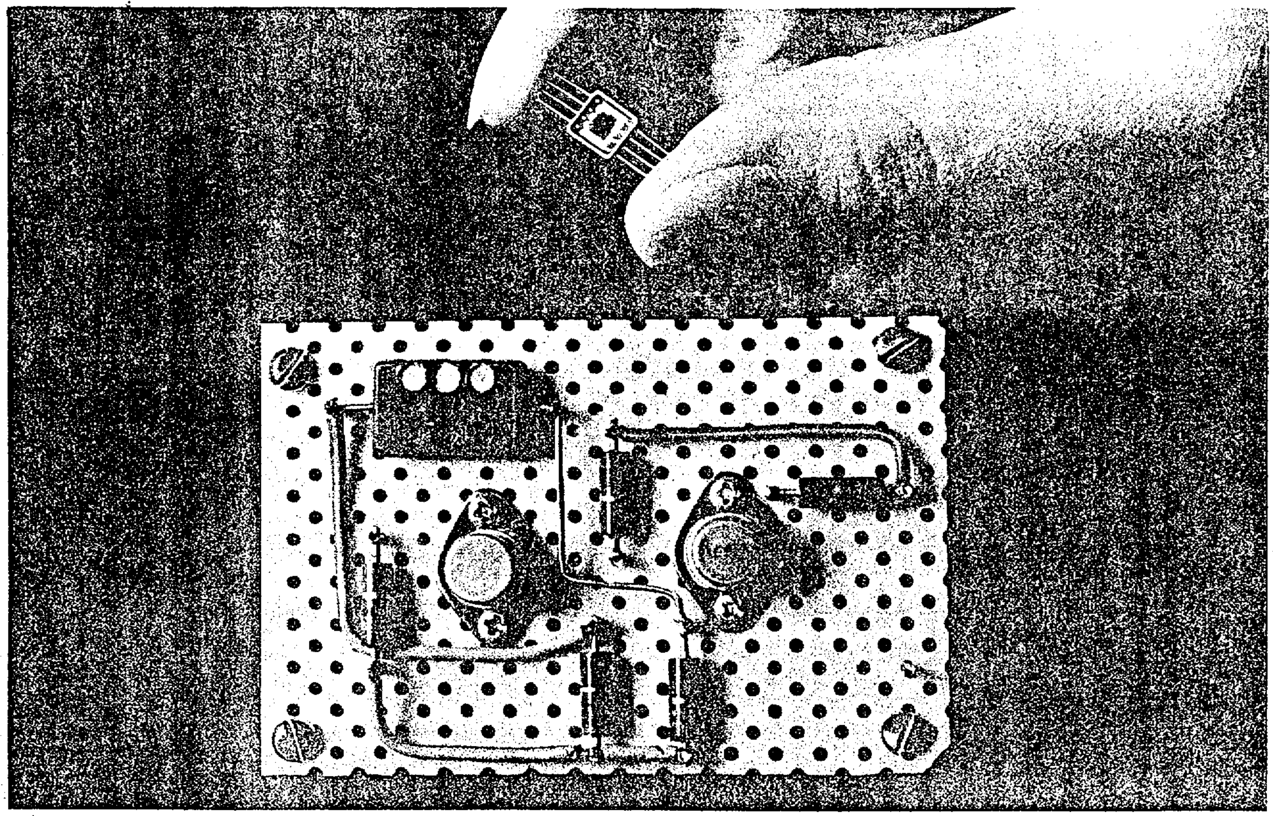
Sometimes called integrated circuits, molecular electronics integrates into tiny solid blocks of material the functions ordinarily performed by an entire assembly of electronic components. The blocks are smaller than the head of a match and thinner than a matchbook cover. Westinghouse molecular circuits were supplied for important missile and space programs in 1963, including the *Minuteman* and *Titan III* missiles, the F-111 aircraft, the Medium Range Ballistic Missile program and the *Apollo* program.

A new television tube and a tiny television camera were developed for use in space. The camera tube can "see" in the dark, tolerate wide extremes in brightness, and store a television image over a long period. An ultraviolet-sensitive version of the tube will be the electronic "eye" aboard NASA's Orbiting Astronomical Observatory.

The tiny television camera, weighing less than two pounds and about as long as an ordinary flashlight, is intended for lunar reconnaissance vehicles, satellite inspection and for observation of orbiting astronauts or equipment. The key to the camera's compactness and low power requirements is the use of Westinghouse molecular electronic circuitry.

Continued on page 15

Left: The forward closure of a 120-inch-diameter solid fuel rocket case moves along the production line at the Steam Division. This closure will be joined to five cylindrical sections and an after closure to form the 75-foot booster stage for the Air Force's *Titan III-C* space launch vehicle.



Top: The dramatic reduction in the size of electronic components through the new technique of molecular electronics is shown in this photograph of two Westinghouse television amplifiers. The tiny molecular electronic block, although only one-quarter-inch square, replaces all the wires and parts in the larger amplifier beneath it. Molecular electronic units also have much greater reliability than conventional components.

Bottom: Employes assemble molecular electronic components at the Westinghouse molecular electronics plant in Elkridge, Md., the first industrial plant constructed solely for the production of such devices.

Left: A high-temperature plasma radiation source developed at the Westinghouse Research Laboratories produces the world's most powerful continuous beam of light. The unit is shown burning through steel in seconds. The new product holds promise for high-intensity illumination and laser applications, and for industrial processes, such as welding and melting of metals and ceramics.

OMATER TORKTUMLARE DISKAUTOMATER KYLSKÅP FRYSSKÅP VATTENKYLAR
Westinghouse
HELAUTOMATISKA DISKMASKINER
helautomatisk och
med uppvärmning från kallt
vatten till 60
kr 2.100:-
inbyggnads
med
fast installation
kr 1.960:-
modell
kr 1.775:-
nyhet

Westinghouse research on advanced molecular electronic devices and techniques produced the nation's first scanning electron microscope. It produces images 1,000 times larger than the best optical microscope, traces on light-sensitive film the intricate master patterns from which molecular electronic components are made, and opens the way to improved methods of fabricating and inspecting these devices. Commercial versions of the new microscope will be marketed in 1964.

The problem of lubricating gears and bearings in outer space was solved by the first practical system for long-lasting dry lubrication. The materials in the bearings and gears act as the lubricant. The system will be used in a giant new Air Force space chamber under construction. The materials are being offered to commercial customers also.

Since developing the first superconducting magnet in 1961, Westinghouse has produced the major share of all superconducting magnets and superconducting magnet materials in service today. Now primarily a research tool, superconducting magnets are expected to find use in energy storage, space shielding, high-energy physics, magnetochemistry and biomagnetic applications. Through superconductivity, materials become perfect conductors of electricity at temperatures near absolute zero (−459.6 degrees Fahrenheit).

Expanding Markets Abroad

Increasing demand for electric power and rising standards of living around the world are expanding foreign markets for Westinghouse products.

For its success in highly competitive world markets and "for an outstanding contribution to the Export Expansion Program of the United States," the Westinghouse Electric International Company received the Presidential "E" Citation from Secretary of Commerce Luther H. Hodges.

Growing worldwide power requirements demand more powerful generating units. A Japanese utility put into operation a 325,000-kilowatt Westinghouse turbine-generator, and large turbine-generators are also being supplied for Brazil, the United Arab Republic, Spain and India, and hydroelectric generators for Peru.

Gas turbines are in demand for electric power generation and industrial purposes. Westinghouse installed 12,500-kilowatt units in Colombia, Guatemala and India and has signed contracts for 6,000-kilowatt power generation units with Colombia and the Ivory Coast. Seven 8,000-horsepower gas turbines supplied to Venezuela bring to 33 the number used for gas repressurization of an oil field underlying Lake Maracaibo.

There was a significant increase in the orders for transformers and switchgear in countries such as Thailand, Vietnam, India and Greece.

A combination plant to generate electricity and make sea water drinkable will be built by Westinghouse in the Canary Islands. The plant will produce 650,000 gallons of fresh water a day and will provide electricity from two 750-kilowatt turbine-generators.

The Company is also supplying a water desalting plant for an aluminum mill in the Virgin Islands. It will convert Caribbean sea water into fresh water at a daily rate of 750,000 gallons.

Deliveries of Westinghouse process control computer systems and associated equipment were made to the SELNI atomic power station in Italy, the Eregli steel mill in Turkey and to steel mills in France and other countries.

Sales of major appliances and air conditioning equipment continued to rise, particularly in the newly developing areas of Africa and southeast Asia. Laundromat commercial washers and automatic dry cleaning equipment sales rose substantially in Europe, Australia and other markets.

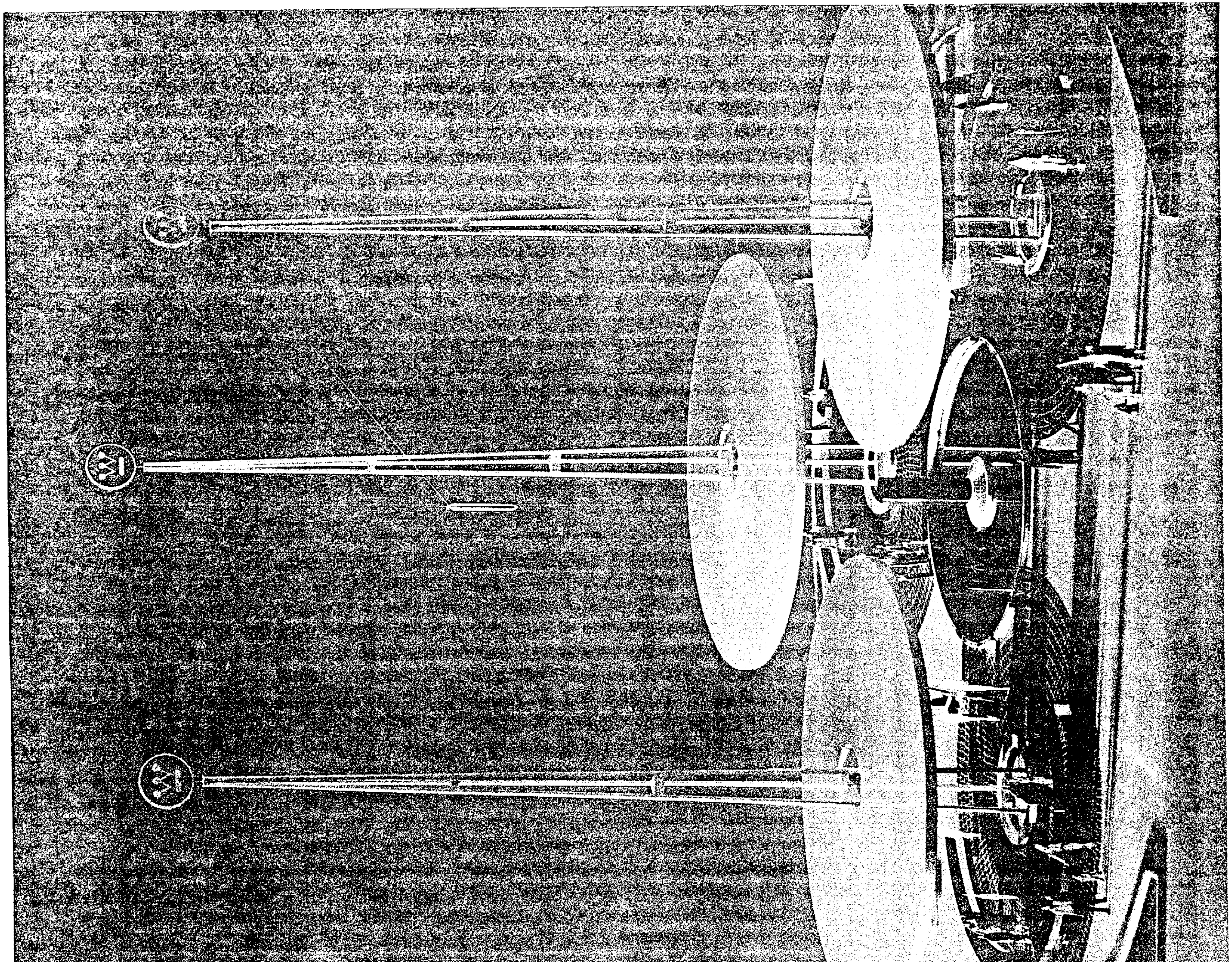
Broadcasting Operations

Westinghouse Broadcasting Company (Group W) broadened its local and regional news coverage, introduced an important daytime television program, continued its leadership in the public service programming field and increased its revenues.

Group W teams covered major domestic and foreign news events in 1963, including the orbital flight of U.S. Astronaut Major Gordon Cooper, the late President Kennedy's press conferences, domestic tours and Western European tour, significant news developments associated with the civil rights issue, the death of Pope John XXIII, and the coronation of Pope Paul VI.

Among the many awards received during the year were the Sigma Delta Chi Award, won by WINS, New York, for spot news coverage, and the Radio Television News Directors Association Award which was won by WIND, Chicago, for its news documentaries.

Left: Westinghouse Electric International Company actively participates in trade fairs and exhibits around the world to promote the sale of products. The universal appeal of these products is evident from the crowds which visited the Company's exhibit at the Goteborg Fair in Sweden.



The Westinghouse Broadcasting Company again won distinction for the quality, variety and volume of its public service programming. Among the many programs presented were "Challenge for Democracy," a series of 19 radio programs highlighting major problems facing democracy in the next decade; "Focus on the Soviet Challenge," a series of six half-hour programs featuring American authorities on the subject of the Soviet Union; and "Opening Night on Broadway," in which a television adaptation of a Broadway play was telecast from New York at the same time it was seen by the opening night audience.

The "Mike Douglas Show," originating on KYW-TV, Cleveland, was introduced as the daytime counterpart of the successful "Steve Allen Show," a nighttime program seen in 45 areas.

Westinghouse Broadcasting Company's Fifth Local Public Service Conference was held in Cleveland, Ohio, where 400 broadcasters from all parts of the country met to discuss the impact of radio and television communications on the community. Among the speakers were Secretary of State Dean Rusk, U.S. Commissioner of Education Francis Keppel and Federal Communications Commission Chairman E. William Henry.

"Focal Point" conference programs were presented in Pittsburgh, Pa., Fort Wayne, Ind., and for a second time in Baltimore, Md. The Focal Point programs bring together outstanding citizens from various fields to examine and discuss community problems with the objective of stimulating greater public understanding and action with respect to such problems. Focal Point participants have included, among others, Attorney General Robert Kennedy, United States Senators Hugh D. Scott and Vance Hartke, Governors William W. Scranton of Pennsylvania, J. Millard Tawes of Maryland, and Matthew Walsh of Indiana.

Employes

Contract negotiations were completed with unions representing the majority of union-represented employes as provided for in the reopening provisions of three-year agreements signed in 1960. The 1963 agreements meet the needs of employes as expressed in various surveys and in negotiating meetings, while at the same time main-

Westinghouse at the 1964 World's Fair

To preserve a record of twentieth-century civilization for mankind 5,000 years in the future, a new Time Capsule will be displayed at the Westinghouse pavilion (*photo of model, opposite page*) at the 1964-1965 New York World's Fair. On October 16, 1965, this Time Capsule II will be deposited beside the original Time Capsule buried by Westinghouse in 1938.

Three structural towers, or pylons, rising 100 feet above the fairgrounds, dominate the Westinghouse pavilion. Suspended 50 feet in the air between these pylons, the Time Capsule II will be directly above the spot where the original Capsule is buried. Its image, mirrored in a reflecting pool, will appear to be at the corresponding depth of the buried Capsule.

Duplicate contents of the original Capsule will be displayed in one of three open-roofed areas at the base of a pylon. Exhibits under other pylons will portray areas of man's achievement in the 25 years since the Time Capsule was buried and a calendar of significant events.

Time Capsule II will update the original, which does not contain information on such important recent events and achievements as atomic power, digital computers, man in space, polio vaccine, commercial television, jet aircraft, World War II, the United Nations and a host of other significant historical data necessary to adequately depict the twentieth century.

Selection of material for the new Capsule will be made by a distinguished committee of authorities in such diverse fields as science, industry and education. The Capsule itself will be made of Kromarc stainless steel, a new alloy developed by the Westinghouse Research Laboratories.

In addition to its open-air pavilion exhibit, Westinghouse is sponsoring Dorothy Draper's Westinghouse Dream Home, to be located in the Better Living Center at the Fair. It will feature every Westinghouse product for the home, including major appliances, portable appliances, lamps and lighting fixtures, television, radio and stereo high-fidelity units, wiring devices and switches, air conditioning equipment and Micarta plastic laminates for countertops, wall panels and shower enclosures, and cabinets.

For one of the large exhibits at the World's Fair, the Elevator Division developed a unique transportation system including electric stairways, electric walks and two chair rides. The chair rides will carry visitors on a tour of the exhibit area, and the electric walks and stairways will be used for transportation to the chair rides and other exhibit areas.

To light the World's Fair, Westinghouse supplied 1,200 multicolored lighting fixtures of a distinct design.

taining employment costs at competitive levels. Wage increases were provided for in 1963 and 1965, and improvements were agreed upon in pensions, insurance, vacations, and layoff income benefits. Agreements covering the benefit plans improved in the negotiations will be reopenable for bargaining in 1968; the agreements covering wages and other matters can be reopened for bargaining in 1966.

More than 29,000 employe suggestions were submitted under the Company's Suggestion System. Approximately 9,000 ideas were adopted, and awards totaling $267,000 were paid to the successful suggesters. More than $246,000 was paid employes under the Invention Award Plan, which encourages and rewards employe inventiveness that benefits Westinghouse, its customers and the inventor.

For outstanding performance in minimizing on-the-job accidents, Westinghouse received 102 awards from the National Safety Council.

Management Incentives

Although many individual managers and their organizations performed outstandingly in 1963, over-all corporate earnings did not warrant the payment of incentive compensation to management under the Incentive Compensation Plan.

Under the Restricted Stock Option Plan, options covering 228,350 shares of common stock were granted during 1963. Options covering 58,413 shares were exercised and options covering 85,350 shares lapsed and became available for future options. At December 31, 1963, options covering 1,217,825 shares were outstanding and 35,719 shares were available for future options and grants.

Organization

D. C. Burnham was elected President and Chief Executive Officer and a Director in July.

John K. Hodnette, formerly Executive Vice President, was elected Vice Chairman of the Board of Directors.

George L. Wilcox, who was formerly Deputy Executive Vice President, was elected Executive Vice President.

Ronald N. Campbell, formerly Vice President, Air Conditioning Group, was elected Executive Vice President.

Patrick Conley, Vice President and formerly General Manager, Industrial Systems Division, was appointed Executive Assistant, Industrial Group.

Marshall K. Evans, formerly Vice President, Management Services, was appointed to a new position, Vice President, Operations Services.

A. C. Monteith, who was formerly Vice President, Electric Utility Group, was elected Senior Vice President.

Douglas D. Danforth, formerly Vice President of the Industrial Group, was named Vice President, Consumer Group.

John W. Simpson, formerly Vice President, Engineering and Research, was appointed Vice President, Electric Utility Group.

T. P. Jones, who formerly served as Vice President, Atlantic Region, was appointed Vice President, Eastern Region, which includes the former Atlantic Region.

R. H. Wagner, formerly Vice President, Northeastern Region, was appointed Vice President and General Manager, Lamp Division.

A. M. Kennedy, Jr., formerly Vice President, Purchases and Traffic, was named Vice President and Divisions Manager of the Micarta, Materials Manufacturing and Industrial Ceramics Divisions.

Vice Presidents elected by the Board are:

Richard E. Austin, responsible for Management Services, who joined Westinghouse in 1937.

F. P. Cotter, who serves as representative of the Atomic, Defense and Space Group in Washington, D.C. He joined the Company in 1956.

W. J. Delaney, Jr., in charge of Control Divisions, who joined the Company in 1937.

Lawrence E. Hedrick, General Manager, Steam Divisions, with Westinghouse since 1941.

Robert E. Kirby, in charge of the Industrial Group. He joined the Company in 1946.

Edwin H. Seim, in charge of Manufacturing, with Westinghouse since 1945.

In Memoriam

The untimely death of Mark W. Cresap, Jr., on July 28 was a shock to his many friends and associates, both in Westinghouse and in the national business community. Mr. Cresap had been a Director since 1955, President of the Company since 1958, and its Chief Executive from April, 1959, until illness forced him to surrender his duties in July, 1963. His outstanding personal abilities and progressive management policies contributed much to Westinghouse.

The Directors of the Company also were saddened by the deaths of Charles R. Hook, who served as a Director for 18 years and a Director Emeritus since 1961, and Harry B. Higgins, also a Director for 18 years and a Director Emeritus since January, 1963. The broad business experience and personal capabilities of these men were of great value to Westinghouse.

Westinghouse Electric Corporation

Consolidated Statement of Operations and Income Reinvested in the Business

	Years ended December 31 1963	1962
INCOME		
Net sales	$2,127,306,622	$1,954,479,506
Other income	19,668,446	24,118,795
	2,146,975,068	1,978,598,301
COSTS AND EXPENSES		
Employe compensation and benefits (Note 2)	909,735,965	865,516,681
Materials, services and other costs	1,064,773,663	932,164,096
Depreciation and amortization (Note 3)	59,649,835	56,091,172
Interest on debentures	10,392,503	10,917,626
State, local and other taxes	16,498,770	15,246,911
	2,061,050,736	1,879,936,486
INCOME BEFORE FEDERAL AND FOREIGN INCOME TAXES	85,924,332	98,661,815
FEDERAL AND FOREIGN INCOME TAXES (Note 3)	38,100,000	41,600,000
NET INCOME FOR THE YEAR	47,824,332	57,061,815
DIVIDENDS PAID		
On preferred stock	1,547,843	1,547,843
On common stock	42,890,258	42,529,283
	44,438,101	44,077,126
INCOME REINVESTED IN THE BUSINESS		
From current year's operations	3,386,231	12,984,689
From prior years' operations	544,680,786	541,965,766
Price adjustments—antitrust claims (Note 4)	*25,000,000	
Other deductions	*383,189	*10,269,669
	$ 522,683,828	$ 544,680,786

* deduction

Note 1 PRINCIPLE OF CONSOLIDATION: Financial statements include wholly owned subsidiaries except Westinghouse Credit Corporation. The equity in the operating results of this subsidiary and majority owned companies is also included.

Note 2 PENSIONS: The estimated future earnings rate on Pension Plan assets used in the computation of liabilities to beneficiaries of the Plan was increased from 3% to 3½% for 1963. As a result of the revaluation of such liabilities on the basis of the adjusted future earnings rate, there was no requirement for payment to the pension trusts in 1963 to meet estimated current service costs. A payment in 1963 in respect of such costs in the amount of the payment made during 1962 for such purpose would have reduced net income for 1963 by approximately $6.6 million.

No payment was made during 1963 to the pension trusts to reduce the unfunded liability for past service since payments previously made exceeded requirements. Improvements in benefits under the Pension Plan effective January 1, 1964 increased this liability to an estimated $93 million as of that date.

Note 3 DEPRECIATION AND INVESTMENT CREDIT: The effect of the application of the Treasury Department's Depreciation Guidelines & Rules (Revenue Procedure 62-21) adopted in 1962 and continued in 1963 was to reduce 1963 net income by approximately $4,875,000 in comparison with depreciation methods used prior to 1962.

The permanent tax saving (48% of the credit provided under the Revenue Act of 1962 for investment in certain property, equal to $1,339,107) is reflected in income as a reduction of tax expense. The remaining 52% of the credit was deferred to subsequent accounting periods during which depreciation and rental allowances for tax purposes will be reduced.

Westinghouse Electric Corporation, Consolidated Statement of Financial Position, December

ASSETS	1963	1962
CURRENT ASSETS		
Cash	$ 58,218,536	$ 58,290,733
U.S. Government and other marketable securities (Note 5)	91,179,957	63,192,771
Receivables due from customers, less allowance for doubtful accounts	398,147,259	377,141,480
Inventories (Note 6)	500,116,618	465,625,256
Prepaid expense	7,674,018	7,809,906
Other current assets	15,137,310	31,608,857
	1,070,473,698	1,003,669,003
Less: Progress and advance billing on contracts	87,735,371	64,382,396
Total Current Assets	982,738,327	939,286,607
INVESTMENTS		
Wholly and majority owned companies not consolidated	63,543,494	56,735,906
Westinghouse Electric Corporation—common stock (Note 5)	7,791,854	6,947,353
Other securities (Note 5)	21,407,399	19,660,511
	92,742,747	83,343,770
PLANT AND EQUIPMENT		
Land, buildings and machinery at cost	895,601,781	869,217,640
Less: Allowance for depreciation and amortization	535,549,510	501,451,985
	360,052,271	367,765,655
OTHER ASSETS		
Purchase price of going businesses acquired in excess of their net tangible assets	35,903,658	35,903,658
Non-current receivables, less allowance for doubtful accounts	69,293,274	87,744,624
Miscellaneous	1,835,168	2,412,657
	107,032,100	126,060,939
Total Assets	$1,542,565,445	$1,516,456,971

Note 4 ANTITRUST CLAIMS: The Corporation has undertaken a price adjustment program to dispose of claims alleged under the antitrust laws by utility purchasers (including purchasers who had instituted suits for damages under such laws) of electrical equipment which the Corporation manufactured or sold and which was involved in the 1960 Philadelphia cases. Such program provides a uniform basis for determining price adjustments to be made to claimants and produces differences in aggregate dollar amounts depending not only upon the volume of sales involved but also upon the mixture of products purchased and the price paid by each claimant. While it is not possible to predict the total payments that may be made by the Corporation to dispose of all such claims, provision for price adjustments pursuant to the program has been made in the accounts of the Corporation by charging Income Reinvested in the Business in the amount of $25 million, which is net of estimated taxes based on income.

As of December 31, 1963, agreements reached with customers pursuant to such price adjustment program provide for payments by the Corporation, in certain instances in annual installments over a term of up to five years, in the aggregate amount of $10,205,000. Of such aggregate amount, $4,124,000 was paid during 1963 and the balance is payable in subsequent years. Payments made in 1963, net of estimated taxes based on income, were charged to the provision for such price adjustments established as aforesaid. At December 31, 1963, discussions with other purchasers pursuant to the program were continuing.

Note 5 SECURITIES: U.S. Government and Other Marketable Securities are stated at cost (market $91,478,733). Westinghouse Electric Corporation common stock is stated at cost (market $7,668,318). Other Securities are stated at cost or less, and in the aggregate not in excess of market.

LIABILITIES AND STOCKHOLDERS' EQUITY	1963	1962
CURRENT LIABILITIES		
Wages and salaries	$ 75,897,980	$ 68,512,125
Accounts payable	82,386,132	76,254,026
Federal and foreign income taxes	17,705,699	18,641,620
Other taxes	17,000,008	17,600,261
Product guarantees (Note 7)	7,880,750	7,567,792
Long term debt due within one year	15,000,000	15,000,000
Other current liabilities	31,894,878	21,784,856
Total Current Liabilities	247,765,447	225,360,680
DEFERRED TAXES—INVESTMENT CREDIT (Note 3)	2,119,371	980,636
PROVISION FOR PRICE ADJUSTMENTS (Note 4)	23,020,588	
LONG TERM DEBT		
Debentures 2⅝%—Due September 1, 1971 (Note 8)	20,766,000	20,854,000
Debentures 3½%—Due December 15, 1981 (Less current portion) (Note 8)	255,000,000	270,000,000
	275,766,000	290,854,000
ALLOWANCE FOR CONTINGENCIES	24,712,451	28,373,296
Total Liabilities	$ 573,383,857	$ 545,568,612
STOCKHOLDERS' EQUITY Evidenced by		
Preferred stock, cumulative, par value $100 per share. Authorized 477,353 shares; 3.80% Series B, issued and outstanding (at December 31, 1963) 407,327 shares	$ 40,732,700	$ 40,732,700
Common stock, par value $6.25 per share. Authorized 50,000,000 shares; issued and outstanding (at December 31, 1963) 36,243,921 shares	226,524,506	222,645,587
Other—Principally amount paid the Company for capital stock in excess of par value (Note 9)	179,240,554	162,829,286
Income reinvested in the business	522,683,828	544,680,786
Total Stockholders' Equity	$ 969,181,588	$ 970,888,359
Total Liabilities and Stockholders' Equity	$1,542,565,445	$1,516,456,971

Note 6 INVENTORIES: The LIFO (last-in, first-out) method of inventory valuation has been used since 1956. At December 31, 1963, the cost of 80 per cent of the inventories of the consolidated companies was determined by this method.

Note 7 PRODUCT GUARANTEES: Product Guarantees have been restated as of December 31, 1962 net of the effect of Federal income taxes and the resultant reduction was transferred to Allowance for Contingencies. The effect on 1963 net income of this method of stating Product Guarantees was immaterial.

Note 8 DEBENTURES AND PREFERRED STOCK: Sinking fund requirements for the 3½% debentures, aggregating $15 million annually to 1980, were met in 1963 by delivery of $15 million principal amount of said debentures which had been acquired by tender procedure under provisions of the indenture. Sinking fund requirements for 1963 of the 2⅝% debentures and the preferred stock were met by delivery of previously purchased and retired debentures and preferred stock.

Note 9 CAPITAL SURPLUS: Increase due principally to issue of common stock under the Employe Stock Plan and the Restricted Stock Option Plans ($12,639,517) and in connection with the acquisition of assets transferred to a consolidated subsidiary ($3,911,816).

Note 10 CONTINGENCIES: At December 31, 1963, the Corporation had contingent liabilities of $25,046,861 on account of customers' notes sold to banks, guaranteed loans, etc., for which no provision has been made in the Corporation's accounts.

Westinghouse Credit Corporation

Statement of Financial Position December 31, 1963 and 1962

	1963	1962
ASSETS		
Cash and marketable securities	$ 2,998,942	$ 3,864,396
Receivables, includes installments due after one year	140,596,394	109,955,641
Less: Unearned finance charges	14,636,503	10,646,411
Provision for losses	2,191,455	1,566,585
Net receivables	123,768,436	97,742,645
Other assets	736,140	651,498
Total Assets	$127,503,518	$102,258,539
LIABILITIES		
Notes payable	98,998,500	79,000,000
Other liabilities	3,611,784	3,482,023
Subordinated indebtedness due Westinghouse Electric Corporation	12,500,000	9,500,000
Total Liabilities	$115,110,284	$ 91,982,023
STOCKHOLDER'S EQUITY Evidenced by		
Common stock	8,500,000	7,500,000
Income reinvested in the business	3,893,234	2,776,516
Total Stockholder's Equity	$ 12,393,234	$ 10,276,516

Statement of Operations

	Years ended December 31 1963	1962
Volume of inventory and retail financing	$164,628,669	$147,962,735
Finance charges earned	$ 14,178,536	$ 11,889,490
Operating and administrative expenses	8,094,975	7,588,855
Interest	3,581,843	2,375,986
Federal income taxes	1,385,000	978,000
Net Income for the year	$ 1,116,718	$ 946,649
INCOME REINVESTED IN THE BUSINESS		
From current year's operations	1,116,718	946,649
From prior years' operations	2,776,516	1,829,867
Total income reinvested in the business	$ 3,893,234	$ 2,776,516

Westinghouse Electric Corporation;

For the year:

Net sales
Employe compensation and benefits
Taxes

Depreciation and amortization
Interest paid

Net income: Amount; Per dollar of sales; Per common share††

Dividends paid: Preferred; Common; Per common share††

Average number of employes
At the year end:
Working capital
Inventories
Land, buildings and machinery (at cost)

Stockholders
Shares outstanding Preferred
Common††
Book value per common share††

Accountants' Report

MAIN, LAFRENTZ & CO.
CERTIFIED PUBLIC ACCOUNTANTS
PITTSBURGH, PENNSYLVANIA 15222

January 22, 1964

To the Stockholders, Westinghouse Electric Corporation:

We have examined the consolidated statement of financial position of Westinghouse Electric Corporation and that of its wholly owned subsidiary, Westinghouse Credit Corporation, as of December 31, 1963, and the related statements of operations and income reinvested in the business for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, subject to any adjustments which may result from final determination of the antitrust claims referred to in Note 4 to the financial statements, the accompanying statements of financial position and statements of operations and income reinvested in the business present fairly the financial positions of Westinghouse Electric Corporation and Westinghouse Credit Corporation at December 31, 1963, and the results of their operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Main, Lafrentz & Co.
Certified Public Accountants

Ten Year Highlights 1954-1963

1963	1962	1961	1960	1959	1958	1957	1956	1955	1954
$2,127,306	$1,954,479	$1,913,770	$1,955,731	$1,910,730	$1,895,699	$2,009,044	$1,525,376	$1,440,977	$1,636,184
909,735	865,516	840,765	859,324	816,158	765,600	800,606	655,675	549,433	609,824
109,517	107,863	103,571	127,622	125,977	101,145	118,630	45,050	82,804	131,012
59,649	56,091	47,378	47,429	46,696	47,729	48,359	46,595	43,106	37,796
10,392	10,917	11,049	11,051	11,051	11,051	11,051	11,053	11,110	11,126
47,824	57,061	45,446	79,057	85,947†	74,773	72,653	3,492	42,803	79,922
2.2¢	2.9¢	2.4¢	4.0¢	4.5¢	3.9¢	3.6¢	0.2¢	3.0¢	4.9¢
1.28	1.56	1.23	2.22	2.43†	2.12	2.09	.05	1.23	2.39
1,548	1,548	1,560	1,630	1,721	1,795	1,875	1,888	1,900	1,900
42,890	42,529	42,205	41,483	36,157	33,998	33,564	33,274	32,879	40,471
1.20	1.20	1.20	1.20	1.05	1.00	1.00	1.00	1.00	1.25
115,170	109,966	109,394	114,842	112,737	114,652	128,572	125,050	115,857	117,143
$ 734,972	$ 713,925	$ 715,309	$ 774,285	$ 771,400	$ 729,721	$ 706,704	$ 687,243	$ 736,146	$ 687,440
500,116	465,625	404,612	433,890	398,533	381,330	480,681	478,177	398,631	420,361
895,601	869,217	848,137	802,717	752,757	728,595	683,384	631,528	587,587	549,243
186,644	187,214	172,172	158,823	150,909	156,002	146,779	143,188	119,086	111,107
407,327	407,327	407,327	419,800	440,485	467,085	486,385	495,785	500,000	500,000
36,243,921	35,623,294	35,612,003	34,813,842	34,679,456	34,360,056	33,886,674	33,487,426	33,288,682	32,664,390
$ 25.61	$ 26.11	$ 26.13	$ 26.48	$ 25.38	$ 23.97	$ 22.80	$ 21.58	$ 22.46	$ 21.64

Except for per share figures, all dollar amounts are in thousands.

†Net income includes $7,196 and 21¢ per common share for special items.
††Based on common stock having a par value of $6.25 per share.

Directors

Gwilym A. Price,
Chairman of the Board
John K. Hodnette,
Vice Chairman of the Board
Dillon Anderson
Karl R. Bendetsen
E. O. Boshell
Ernest D. Brockett
D. C. Burnham
Frank R. Denton
Edward Hopkinson, Jr.
Alfred W. Jones
Howard S. Kaltenborn
George G. Main
John J. McCloy
Roger Milliken
W. A. Patterson
Theodore S. Petersen
John W. Reavis
John M. Schiff

Director Emeritus
A. W. Robertson

Executive offices
3 Gateway Center, Pittsburgh, Pa.

Transfer agents
Chemical Bank New York Trust Company,
New York, N. Y.

Continental Illinois
National Bank and Trust Company of Chicago,
Chicago, Ill.

Crocker-Citizens National Bank,
San Francisco, Calif.

Registrars
The Chase Manhattan Bank,
New York, N. Y.

The Northern Trust Company,
Chicago, Ill.

Pacific National Bank of San Francisco,
San Francisco, Calif.

Stock exchange listings
New York, Pittsburgh, Boston,
Midwest and Pacific Coast Stock Exchanges

Officers

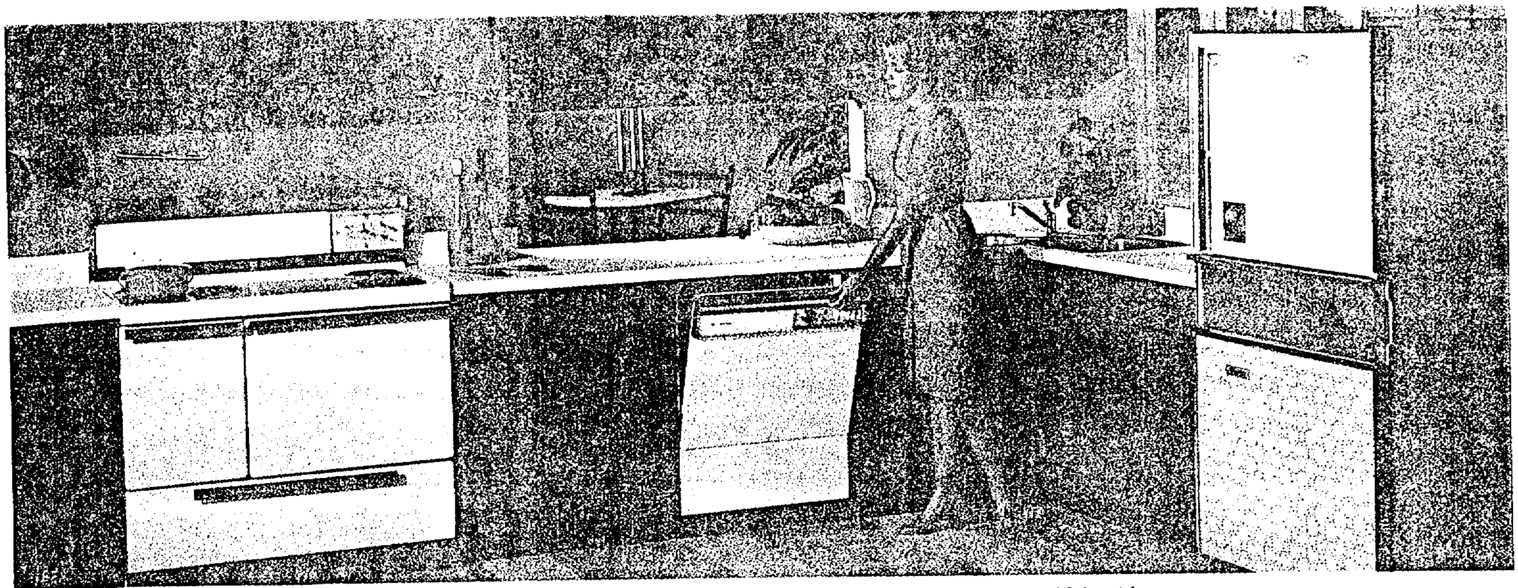
D. C. Burnham, *President*
Ronald N. Campbell, *Executive Vice President*
George L. Wilcox, *Executive Vice President*
Marshall K. Evans, *Vice President, Operations Services*
Howard S. Kaltenborn, *Vice President, Personnel and Public Affairs*
George G. Main, *Vice President, Finance*
A. C. Monteith, *Senior Vice President*
Carlisle P. Myers, *Vice President, General Counsel and Secretary*

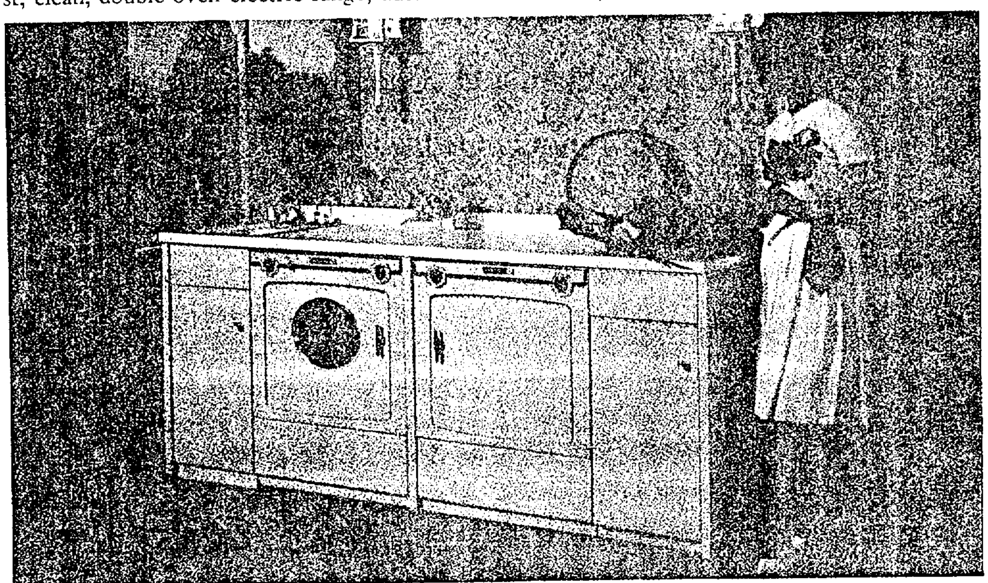
Group Vice Presidents
Douglas D. Danforth, *Consumer*
S. W. Herwald, *Electronic Components and Specialty Products*
Robert E. Kirby, *Industrial*
John W. Simpson, *Electric Utility*
W. W. Sproul, Jr., *Construction*
Charles H. Weaver, *Atomic, Defense and Space*

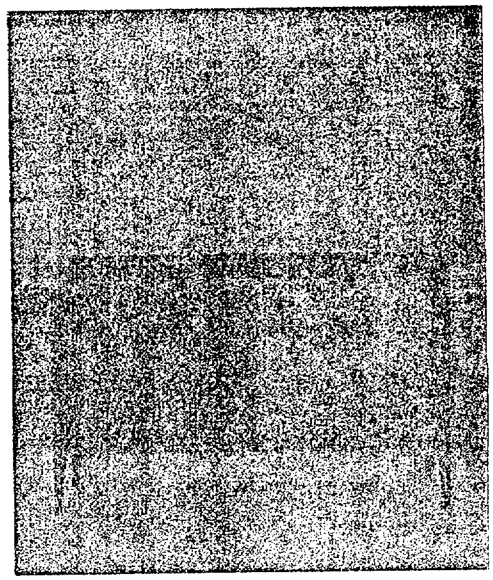
Vice Presidents
Richard E. Austin, *Management Services*
Robert D. Blasier, *Industrial Relations*
Buford M. Brown, *Westinghouse Defense and Space Center*
John H. Chiles, Jr., *Sunnyvale Divisions*
Patrick Conley, *Executive Assistant, Industrial Group*
F. P. Cotter, *Washington Office, Atomic, Defense and Space Group*
W. J. Delaney, Jr., *Control Divisions*
Tomlinson Fort, *Marketing, Electric Utility Group*
L. E. Hedrick, *Steam Divisions*
J. A. Hutcheson, *Planning, Atomic Defense and Space Group*
J. H. Jewell, *Marketing*
J. Emmet Judge, *Marketing Services*
A. M. Kennedy, Jr., *Materials Divisions*
W. E. Knox, *Westinghouse Electric International Company*
Sidney Krasik, *Astronuclear Laboratory*
Dale McFeatters, *Information Services*
Philip N. Ross, *Bettis Atomic Power Laboratory*
E. H. Seim, *Manufacturing*
W. E. Shoupp, *Research*
Charles C. Shutt, *Motor Divisions*
J. W. Stirling, Jr., *Transformer Divisions*
R. H. Wagner, *Lamp Division*

Francis E. Dalton, *Controller*
R. B. Read, *Treasurer*

Regional Vice Presidents
Chris H. Bartlett, *Southeastern Region*
Thomas P. Jones, *Eastern Region*
W. J. Maytham, Jr., *Pacific Coast Region*
Lamar W. McLeod, *Southwestern Region*
John E. Payne, *Central Region*
Carroll V. Roseberry, *Midwestern Region*
C. S. Weber, *Washington Office*

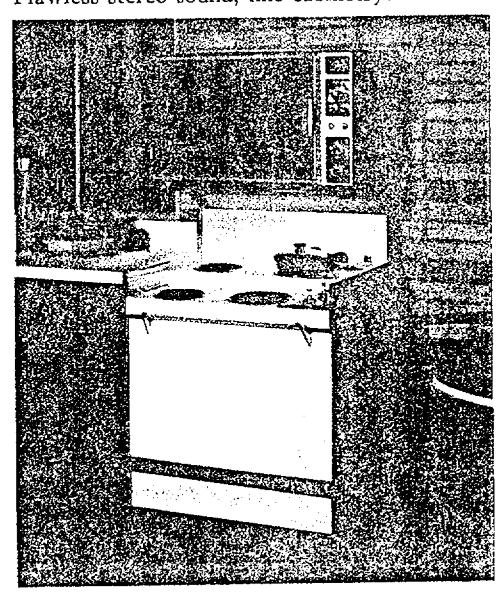

st, clean, double-oven electric range, automatic dishwasher, exclusive center-drawer refrigerator, beautiful cabinets.


ıly from Westinghouse: complete home laundry center with attractive Micarta® counter.

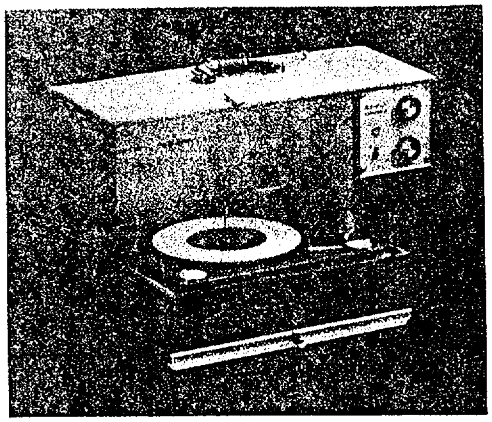

Flawless stereo sound, fine cabinetry.


r conditioner with an Early American look.

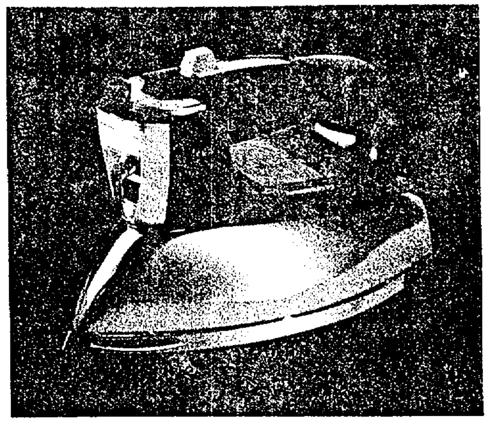

Flick the switch . . . instant picture and sound.


Terrace-Top® cooking platform. New, practical.

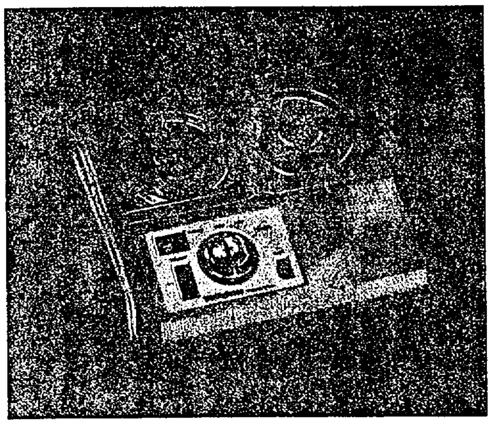
any of today's most important electrical product designs were created at Westinghouse. Each appliance on this page offers you the ality, dependability and advanced features that make Westinghouse products outstanding values.



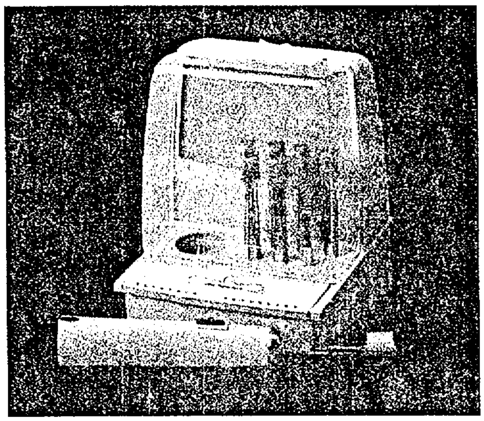
Battery-operated, all-transistor phonograph.



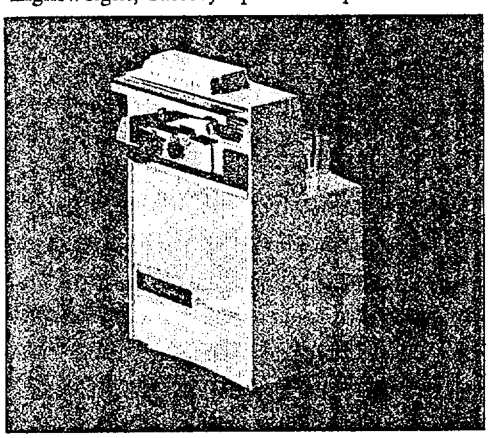
Steam 'N Sprinkle iron for stubborn wrinkles.



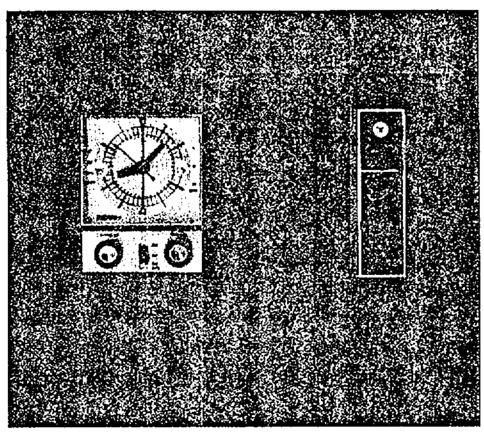
Lightweight, battery-operated tape recorder.



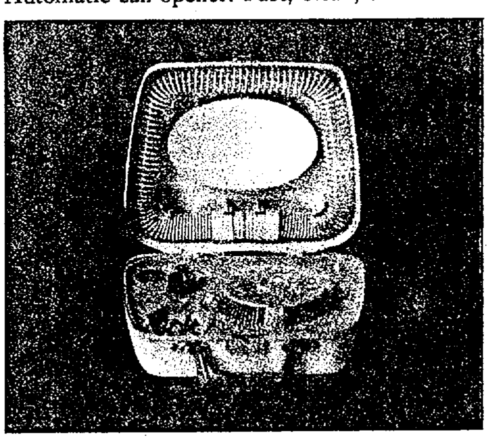
New . . . effective dental care for the family.



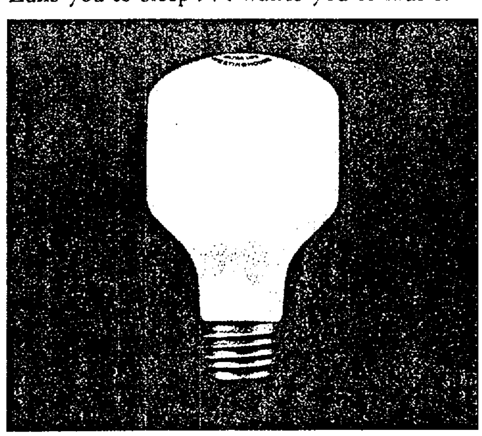
Automatic can opener. Fast, clean, convenient.



Lulls you to sleep . . . wakes you to music.



A beauty salon in a handy travel case.



New extra life, Eye-Saving bulb.

From light bulbs to clock radios, hair dryers to electric toothbrushes, there's a quality Westinghouse product to serve you dependably and economically.

Westinghouse Electric Corporation
3 Gateway Center
Box 2278, Pittsburgh, Pa. 15230
1963 Annual Report

You can be sure if it's Westinghouse

DOCKET NO. 70-337

Westinghouse

ELECTRIC CORPORATION

ATOMIC FUEL DEPARTMENT

PHONE: SPRINGDALE 1-300
PHONE: EMERSON 2-4400
CHESWICK, PENNSYLVANIA

WAFD-(RR)-1800

January 26, 1961

DOCKETED MAR 3 1961 Licensing Branch of Licensing & Regulation Docket Officer

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

Subject: REQUEST FOR CONCURRENCE

Attention: Mr. J. C. Delaney
Chief, Nuclear Materials Section

WAFD requests the concurrence of the Licensing Branch to transfer approximately 3,700 grams of uranium contained in surplus recyclable scrap in the form of completed fuel elements from Accountability stock to our license account. The elements will be used in an S5W Type 2 core being manufactured for Rolls-Royce under our license SNM 338.

The Pittsburgh Naval Operations Office agrees that WAFD may carry out this transfer with the permission of the Licensing Branch, (confirmed in the attached PNROO letter to Mr. I. G. Fox dated January 23, 1961). WAFD, therefore, respectfully requests your permission to make the transfer.

Very truly yours,

R. A. Limerick
Contract Administrator
Rolls-Royce Project

;jmd

Attachment

A118

OPTIONAL FORM NO. 10

UNITED STATES GOVERNMENT

Memorandum

TO : Charles Luke,
Chief, Criticality Evaluation Branch

DATE: February 7, 1961

FROM : J. C. Delaney,
Chief, Nuclear Materials Branch

SUBJECT: WESTINGHOUSE ELECTRIC CORPORATION APPLICATION DATED JANUARY 31, 1961 - DOCKET NO. 70-337

L&R:JJL

Please review the subject request for the adequacy of the applicant's procedures to avoid a condition of accidental criticality. Please return the enclosed docket No. 70-337 with your comments.

This information is in answer to the questions raised in your memo of October 28, 1960.

Enclosure:
Docket No. 70-337

A119

Charles Luke, Chief
Criticality Evaluation Branch

March 6, 1961

J. C. Delaney, Chief
Nuclear Materials Branch

WESTINGHOUSE ELECTRIC CORPORATION APPLICATION DATED MARCH 1, 1961 - DOCKET NO. 70-337

L&R:JJL

Please review the subject request for the adequacy of the applicant's procedures to avoid a condition of accidental criticality. Please return the enclosed copy of the application with your comments.

Enclosure:
Cy appl. dtd 3-1-61

Distribution:
Suppl.Div.
Br. &/Rdgs.
J. J. Lane

A120

OFFICE ▶	L&R					
SURNAME ▶	JJLane:sjs					
DATE ▶	3-6-61					

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

70-337

Traffic Management Files March 24, 1961

Robert A. Kaye, Chief
Traffic Management Section

MEETING WITH ASSOCIATED TRANSPORT INC. TO RESOLVE 5000-POUND MINIMUM ON LTL SHIPMENTS OF RADIOACTIVE MATERIALS

CSMP:RAK

We coordinated a meeting at Headquarters on March 22, 1961 with representatives of the motor carrier industry, Westinghouse Electric Corporation (licensee) and interested Headquarters divisions, for the purpose of resolving the motor carriers' 5000-pound minimum weight provision on LTL shipments of radioactive material. The following persons were in attendance:

Mr. William P. Wagner, Assistant to Senior Vice President, Associated Transport Inc., New York;
Mr. John A. Buckley, Safety & Investigation Department, Associated Transport Inc., New York;
Mr. Robert J. Breitinger, Traffic Manager-Rates, Headquarters Traffic, Westinghouse Electric Corporation, Pittsburgh;
Mr. Lyall E. Johnson, Assistant Director for Facilities and Materials Licensing, Division of L&R;
Dr. Charles D. Luke, Chief, Criticality Evaluation Branch, Division of L&R;
Mr. Donald A. Nussbaumer, Radiological Physicist, Division of L&R; and
Robert A. Kaye, Division of C&S, Coordinator and Chairman.

Background. In January, we learned that various motor carrier rate conferences were proposing to provide a rule in their tariffs to establish a minimum on LTL and AQ radioactive material rates based on 5000 pounds at the LTL or AQ rate applying to the highest rated radioactive material in the shipment. In this connection, Headquarters telegrams of protest were transmitted to the Southern Motor Carriers Rate Conference, Inc.; Central States Motor Freight Bureau, Inc.; and Eastern Central Motor Carriers Association, Inc. In addition, with the assistance of certain operations offices traffic personnel and the cooperation of industrial traffic associations, the proposals were defeated or action indefinitely postponed.

A124

In view of the action on the part of the carriers associations not to place the 5000-pound minimum rule in effect, one motor carrier, viz., Association Transport Inc., filed independent action with the various carrier associations providing that "When via Associated Transport Inc. on traffic handled direct and on joint line traffic, the minimum charge on any LTL or AQ shipment consisting of or containing radioactive materials, moving under the rates named in this tariff, will be the charge for 5000 pounds at the LTL or AQ rate applying to the highest rated radioactive material in the shipment." The above independent action was extended to four Eastern and Southern motor carrier rate conferences.

As a result of this action, we were of the opinion that should one motor carrier place a minimum on radioactive materials, it would only be a short period of time before others would follow suit. In view of the above, we requested a meeting with Associated Transport Inc. at Headquarters in an effort to persuade them to withdraw their independent action and thereby minimize the possibility of other motor carriers initiating similar independent actions. Such a meeting was held on March 22, 1961.

Highlights of Meeting. Mr. Wagner informed us that pending the outcome of this meeting, Associated Transport effectively stopped publication of the 5000-pound minimum in the Eastern Central Motor Carriers Association until April 28; the Middle Atlantic Conference until March 31; the New England Tariff Bureau until March 28; and the Southern Motor Carriers Conference until April 28. He did state that the minimum weight became effective in Middle Atlantic States Conference Overland Tariff 15-J on March 13, but that the minimum would not become effective in the Middle Atlantic Tariff 10-O until March 31. The proposal was not involved in the Central States Motor Freight Bureau.

Mr. Wagner indicated that the Associated Transport's problem was generated by a request by Westinghouse that the carrier establish a 5000-pound minimum on SNM in lieu of exclusive use of vehicle. The shipper, in attempting to comply with AEC requirements, was desirous of obtaining a 5000-pound minimum to compensate the carrier for the required 12-foot separation on shipments of SNM rather than to ship small SNM shipments by exclusive use of vehicle. It was pointed out to Mr. Wagner and the Westinghouse representative that the 5000-pound rule as written applied to any and all categories of radioactive materials and, as such, was placing an unreasonable burden on shippers of radioactive materials (other than SNM) which required no special handling.

Mr. Breitinger confirmed that his interest was primarily one of transportation economics, and in an effort to comply with AEC alternatives, he had selected the 12-foot separation requirement as being the feasible way in which to handle the Westinghouse shipments of SNM.

Dr. Luke pointed out that in shipments by LCL or LTL, there should be only one shipment of special nuclear material in each vehicle. At points of transshipment or delivery, each shipment of special nuclear material should be separated from other special nuclear material by, whichever is larger, (a) 12 feet or (b) the largest dimension of either array. He further stated that the 12-foot rule did not apply to trucks passing one another on the highway, since the AEC criteria allowed for this condition. Dr. Luke further stated that even though a shipment of SNM was double-batched and two such trucks passed one another on a highway, there would still be no reason for concern regarding criticality. The concern would be where double-batched trucks were involved in an accident, with the result that the containers would collapse and become submerged in water, that a criticality incident would be created.

For the purposes of clarification, Mr. Johnson defined special nuclear material and stated that the definition was set forth in Part 71, section 71.3, paragraph g. Mr. Wagner felt that all motor carriers should understand what special nuclear material is, and asked that the carrier associations be placed on the mailing list to receive copies of AEC regulations pertaining to licensees. It was mentioned that such changes in AEC licensee requirements were published in the Federal Register and were available for all to review and comment on. Notwithstanding the notice in the Federal Register, Mr. Wagner felt there was a need for special notification to the motor carrier industry. In this connection, he contemplates requesting the Division of L&R to place various motor carrier conferences on the mailing list to receive this information in the future. Mr. Johnson agreed that this could be done upon receipt of Mr. Wagner's formal request.

Dr. Luke discussed the problem of accidental criticality, stating that the first problem is the safety of the individual unit or container. He pointed out that this depends on enrichment, physical form of material, potential moderation, type of container and geometry. A safety factor of 2.3 is considered in connection with the safety of the individual container. A second problem, Dr. Luke pointed out, was spacing and limiting the number of individual units per shipment. This, he stated, requires birdcages. In this connection, a safety factor of approximately 2 is considered for birdcage shipments. A safety factor assumes, of course, the worst that could happen.

Mr. Buckley stated that insofar as Associated Transport was concerned, all shipments of radioactive materials had to be approved by his office. In accepting LTL shipments of radioactive materials, the drivers and terminals were advised of these shipments. They felt, however, that they should take it upon themselves to inform the Associated Transport personnel connected with handling these shipments of the importance of segregating SNM material -- in fact, all radioactive material shipments. He also cited several instances where the shipper was unable to identify a particular shipment other than furnish a code number. It was suggested that Associated Transport insist that the shipper furnish sufficient information in order to provide the carrier with basic knowledge of the nature of the radioactive materials being shipped.

Mr. Wagner discussed the multiplicity of problems that their company is faced with concerning the handling of LTL shipments, in that they did receive small shipments from many cities which would be consolidated with other freight at some of their terminals. In effect, many combinations of freight are set up throughout their territory, which embraces 65 terminals. After explaining the details of their operations, it was clear that the handling of SNM material, other than exclusive use of vehicle, could create co-mingling problems.

Mr. Breitinger stated that he was not aware of the many potential health and safety problems that could be involved by insisting that the motor carrier accept Westinghouse's SNM in other than exclusive use of vehicle, and further pointed out their volume of SNM was rather minimal in the long run. The problem was further complicated with interline arrangements with other motor carriers, which clearly compounded the co-mingling problem on LTL shipments.

Conclusion. After considerable exchange of ideas on the problem of 5000-pound minimum weight, Mr. Wagner agreed that Associated Transport was in error in penalizing many LTL shippers of non-hazardous radioactive material and that they would withdraw and cancel their independent actions filed with the several motor carrier freight bureaus. It was further agreed that Westinghouse would use exclusive use of vehicle on their shipments of SNM, which is the generally accepted manner of shipping by other licensees at the present time.

not my statement

Mr. Wagner assured us that he would initiate Associated Transport's withdrawal action immediately and would formally advise us of their cancellation notices. This action successfully concludes the problem raised on the increased minimum weight on radioactive material shipments.

cc: Lyall E. Johnson, L&R
Dr. Charles D. Luke, L&R
Donald A. Nussbaumer, L&R

Dir. RF
Asst. Dir. RF
Branch RF
Section RF

CSMP
Kaye:sms
3/24/61

J. C. DELANEY
SOURCE AND SPECIAL NUCLEAR
MATERIALS BRANCH
DIVISION OF LICENSING & REGULATION
USAEC - GERMANTOWN, MARYLAND

WESTINGHOUSE ELECTRIC CORPORATION
ATOMIC FUEL DEPARTMENT
CHESWICK, PENNSYLVANIA
ATTENTION: MR. R. A. LIMERICK
CONTRACT ADMINISTRATOR

ROUTINE - COLLECT

APRIL 21, 1961

IN ACCORDANCE WITH THE REQUEST CONTAINED IN YOUR LETTER OF APRIL 19, 1961, THE AUTHORIZATION PROVIDED IN OUR TELETYPE OF APRIL 11, 1961, REGARDING THE SHIPMENT OF A NUCLEAR CORE, IS HEREBY EXTENDED TO SEPTEMBER 1, 1961. REF. DOCKET 70-337

Distribution:
H. J. McAlduff, Jr., OROO
D. George, ~~M&M, w/encl.~~
S. R. Gustavson, L&R,
H. Steele, L&R
D. A. Nussbaumer, L&R
J. J. Lane, L&R
Doc. Rm.
Formal
Compl., w/cy ltr dtd 4-19-61
S/Health, Lic. only
Suppl.

APR 2 [illegible]

A/22

OFFICE ▶	L&R	L&R				
SURNAME ▶	JJLane:sjs	JCDelaney				
DATE ▶	4-21-61	4-24-61				

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

70-337

File Cy.

Westinghouse Electric Corporation

Atomic Fuel Department

Cheswick, Penna.
Telephones: BRoad 4-6300
EMerson 2-4400

July 13, 1961

UNITED STATES ATOMIC ENERGY COMMISSION
Division of Licensing and Regulation
Washington 25, D.C.

Attention: Mr. R. Lowenstein, Acting Director

Subject: RADIATION DETECTORS IN WAFD BUILDINGS 5-A and 5-B

Dear Sir:

All Radiation Detectors in Westinghouse Atomic Fuel Department's Buildings 5-A and 5-B have not been installed as of July 13, 1961. However, these Radiation Detectors are on order and the contract awarded for their installation as per Figure II in WAFD Revision to SNM 338 dated July 10, 1961. It is anticipated that all Radiation Detectors will be installed and tested by September 1, 1961.

Very truly yours,

T. Sainsbury
Manager of Manufacturing Controls

jk

/enclosures (3)

DOCKETED
USAEC
Division of
Licensing & Regulation
JUL 17 1961
Docket Officer

RECEIVED
JUL 17 1961
U. S. Atomic Energy Commission
Division of
Licensing & Regulation

A/23

DOCKET NO. 70-337

Westinghouse Electric Corporation

Atomic Fuel Department

Cheswick, Penna.

Telephones: BRoad 4-6300

EMerson 2-4400

L&R File Copy

May 8, 1962

DOCKETED USAEC Division of Licensing & Regulation MAY 10 1962 Docket Office

United States Atomic Energy Commission
Division of Licensing & Regulations
Washington 25, D. C.

Attention: Mr. D. A. Nussbamer, Chief
Special Nuclear Materials Branch

Gentlemen:

Reference is made to the telephone conversation between Mr. R. Lacefield and Mr. L. P. Hackler on May 4, 1962 in which additional information was requested on the Health Physics Manual WAFD-HP-103 dated March 1, 1962.

Comment 1: Page 5: The use of respirators to control the exposure of individuals exposed to airborne radioactivity which exceeds the permissible levels in 10 CFR 20, Appendix B, Table 1, requires that an application for respirator use under such circumstances be submitted in accordance with Section 20.103 (3).

Reply: Respirators (MSA, Comfo, Ultra Filter) will only be worn by employes when air samples indicate that a potential exposure is possible. If the operation produces airborne activity above the MPCa (220 dpm/m^3), then it is stopped immediately. The cause is then determined and corrected before the operation is permitted to start up.

Comment 2: Page 8, Part C: Please be more specific about the locations and frequency of WAFD's Contamination Surveys.

Reply: The following table gives a breakdown of smears taken at WAFD.

Location	Daily	Weekly	Monthly
Controlled Areas (CA)	X	X	X
Uncontrolled Areas (UA)	X	X	X
Exits Leading from CA	X		

RECEIVED MAY 10 1962 U. S. A. E. C. Division of Licensing and Regulation

Copy Supplied Public Document Room 5/10/62 RRL
Div. of Compliance 5/10/62

6/28/62

A124

4647

Location	Daily	Weekly	Monthly
Exits Leading to Navy Assembly		X	
Navy Assembly Area			X
Chem. Lab.		X	
Met. Lab.		X	
Core Assembly Room		X	
Offices		X	

Comment 3: Page 9: Please give more information about the Personnel Monitoring Program at WAFD.

Reply: One LCRM-1 (Log Count Rate Meter), also known as a Personnel Monitor, is placed in the clean locker room of each facility where protective clothing is worn. All employes can monitor themselves before leaving the plant. An audible alarm is activated if the radiation exceeds 300 cpm beta gamma. This instrument (see Page 7, Part V A6) is checked daily by Health Physics.

Comment 4: Page 9, Part VF: Environment Sampling. A minimum sampling frequently of once every quarter for air exhausted to the environment would not appear to be adequate for assurance that above permissible levels of radioactivity are not being discharged to the environment. The basis for choosing such a frequency should be explained in the procedures.

Reply: Please note that air from exhaust systems is sampled after each change of filters and are taken according to the type of system.

Several exhaust systems at WAFD are connected to only one or two hoods such as the Met. Lab. or the Engineering Development Lab. Since the radioactive work in these hoods is limited, weekly monitoring by Health Physics is not necessary. From past experience, it is felt that this type of exhaust system needs to be monitored once every quarter. This is indicated by the fact that hoods of this type have been operated for as long as one year without loss of filtering effectiveness or release of radioactive material to the effluent. All past air samples show that the MPCa (9 dpm/m3) is not exceeded.

On the other hand, exhaust systems which are used constantly, such as the powder processing operations, are monitored more frequently, usually every ten days.

The statement that "a minimum sampling frequency of once every quarter for air exhausted to the environment" was made so that Health Physics could use their discretion on which exhaust system should be monitored and the frequency of monitoring.

Comment 5: Please list all dust producing operations and describe the type of hood used.

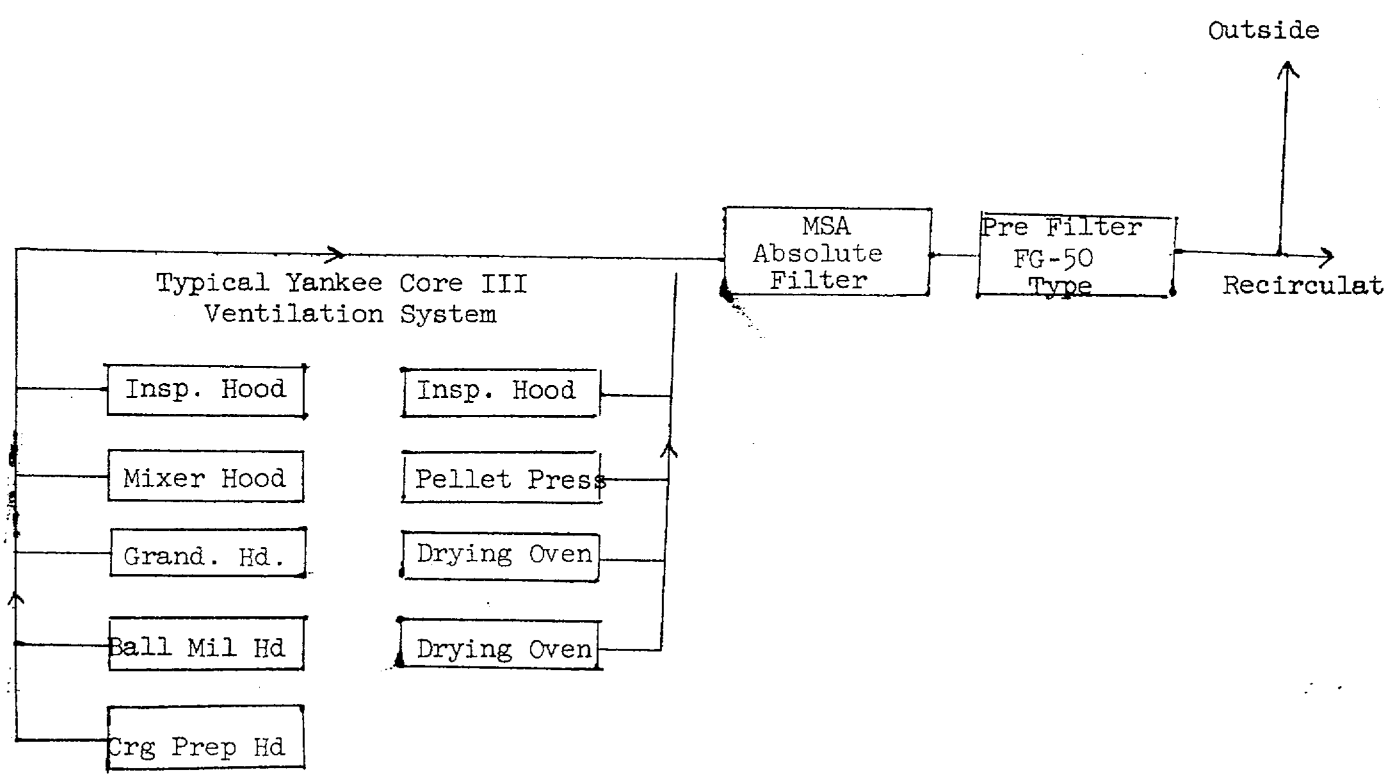
Reply: a. Types of hoods

1. All hoods are made of stainless steel or clear plexiglass.

2. Loading operations are performed inside of a chemistry-type hood which has a sliding door. All doors are provided with hand port holes.

3. Machinery which produces high airborne radioactivity are enclosed and ventilated.

b. Dust Producing Operations - Ventilation Systems



Comment 6: Please state WAFD's fixed contamination limits for both controlled and uncontrolled areas. Also give the type of instrument used to measure fixed contamination.

Reply:

a. Fixed Contamination Alpha Limits:

Controlled Areas - 0-9,000 dpm/61 cm^2
Uncontrolled Areas - 0-900 dpm/61 cm^2

b. Instrument Used to Measure Fixed Contamination

Portable Gas Proportional Alpha Counter

The Model PAC-3G alpha survey meter (Eberline) is a portable, battery operated instrument for measuring alpha radiation only. The three sensitivity ranges are 1,000, 10,000, and 100,000 cpm (2π geometry). The detector is an external gas flow proportional counter probe (approximately 61 cm^2 of fuce area), window of 0.85 mg/cm^2 aluminized myler.

Very truly yours,

P. K. Morrow, Supervisor
Accountability, Criticality, &
Health Physics

FROM: Westinghouse Electric Corporation
Cheswick, Pa.

DATE OF DOCUMENT: see below

DATE RECEIVED: 5-10-62

NO.: 1647

LTR.: see below

MEMO.:

REPORT.:

OTHER.:

TO: Nussbaumer

ORIG.:

CC.:

OTHER.:

ACTION NECESSARY XX

NO ACTION NECESSARY ☐

CONCURRENCE ☐

COMMENT ☐

DATE ANSWERED:

BY:

CLASSIF.: U

POST OFFICE

REG. NO.:

FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)
(1) ltr 4-25 req SNM-338 be amended to include fab'n of components for ATR (4 cys)
(2) Ltr 5-8 furnishing addtl info on the WAPD-HP-103, dtd 3-1-62. (3 cys)
(3) Ltr. 5-9-62 trans: (4 cys rec'd)

ENCLOSURES:
WAPD-L-101, dtd 5-10, a revised appl for amend. to SNM-338 for manuf. of fuel components for Yankee Core III.

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer:	5-10		
w/file cy, f/each item			
cy for Compliance			
cy for PDR			

REMARKS: M R Distribution: 1 - H. Steele

U. S. ATOMIC ENERGY COMMISSION

☆ U. S. GOVERNMENT PRINTING OFFICE: 1961 — 613958

MAIL CONTROL FORM FORM AEC-326S (8-60)

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Files

DATE: 5/11/62

Frances K. Durkan

FROM : Frances K. Durkan
Criticality Evaluation Br.

SUBJECT: MAY 10, 1962 MEETING WITH MR. MEIERKORD OF WESTINGHOUSE ELECTRIC CORPORATION TO DISCUSS NEW APPLICATION SUBMISSION FOR AMENDMENT TO LICENSE SNM-338 FOR YANKEE CORE III, (WAFD-L-101), DOCKET 70-337

At this meeting Mr. Meierkord presented a completely new application for amendment to License SNM-338 for Yankee Core III to. R. Layfield for docketing.

We reviewed the new application dated May 10, 1962, in the light of a problem area outline based on the previous application which is now superseded by the new. The problem area outline is attached.

The major changes incorporated into the new submission are two:

1. The wire mesh 3" slab container has been replaced by open-sided corrugated trays in Vaults 1B and 1C. Tray safety is to be based on Figure 16, TID-7016, Rev. 1.

2. Criticality control in the assembly area is to be by maintenance of a 2 1/2" slab for all movement and storage, and for all operations except leak-check and final packaging where a 5" maximum diameter cylinder control is used. This control rescinds the surface density (150 grams U-235 per square foot of floor area) criterion formerly submitted.

All problem areas indicated in the attached outline have been resolved in this new submission (WAFD-L-101) with the following exceptions:

1) Shipping procedures to include (a) the maximum number of containers permissible in a shipment with appropriate nuclear safety justification and, (b) the procedures to be followed to prevent commingling with other special nuclear shipments.

2) Detailed description of all the in-process containment vessels and intermediate containers employed.

3) Criticality control for mixing operation.

4. Specification of control limit for air filters and an outline of administrative control procedures in this regard.

A/25

5) Storage justification to assure safety from interaction between units and arrays.

Mr. Meierkord agreed to supply us with the information necessary to resolve these still outstanding problem areas.

Attachment: Drft dtd 5/9/62

DRAFT
FKDurkan
5/9/62

Subj: WESTINGHOUSE CORP. - DOCKET 70-337 - APPLICATION FOR AMENDMENT TO SNM-338 YANKEE CORE III

We have reviewed the subject application dated April 25, 1962. Some of the problems exposed in this cursory examination were relayed to Mr. Meierkord of Westinghouse on his May 2 visit. This memo is intended to outline all the problem areas as disclosed to date in the subject application.

Page 1: Introduction. The statement is made that all Yankee Core III UO_2 pellets will be fabricated and inserted into tubes in lines 1 and 2 of Building 5B. Are any areas other than lines 1 and 2 of Bldg. 5B pertinent to this application? Statement to this effect is requested.

The statement is included that a total of 55,000 lbs. of UO_2 is required for the fabrication of the Yankee III Core. Therefore, it should be noted a quantity increase must be authorized under the present license which would result in a 22,000 kg Uranium possession limit.

Page 2: Process and Flow of Work. The statement is made that the Yankee powder as received in 5-gallon containers will be stored in Vaults 1A and 2A. Are these 5-gallon containers AEC licensed approved? Reference to approved application which will describe the shipping container and verify the nuclear safety of this container is requested. Will any other special nuclear materials other than the subject materials be stored in the same vaults? A statement in this regard is requested and additional analysis will be required if the answer is in the affirmative.

Should the storage of the incoming fuel in the shipping containers prove undesirable (i.e., receipt of defective shipments), a separate course of action must be employed. In this regard we request that you outline appropriate procedures for this case in addition to submission of your usual receiving procedures.

The statement is made that powder is removed from the vaults to the charge preparation room where a 52 lb. UO_2 batch is weighed and put into the system. Your procedures for accomplishing this transferral from the charge preparation area are required. The maximum quantity which will be permitted in the charge preparation room at any one time should be set and justified, e.g. administrative control; 52 lbs. in, 52 lbs. out.

Page 3: Nuclear Safety. Batch size for the UO_2 powder has been determined using information given in Figure 13. Since Figure 13 yields the mass limits for water reflected uranium rods in light water, this justification basis is not exactly appropriate in this initial fabrication stage. However, it is the lower limit, .85 kg U-235, as opposed to approximately .91 kg which would be obtained by employing Figures 1 and 21. Since the .85 kg U-235 limit corresponding to 52 lbs. of uranium dioxide is applicable for the whole production system, I see no objection to accepting this limit. However, batch sizes are lowered as process progresses - but they want the flexibility of a 52 lb. limit.

Criticality zones and controls and types of controls in each zone are outlined. This method of presentation would be complete if corresponding control limits were also stated and fully justified for each control limit set by specific references to reliable data, nuclear safety guides, or by calculation.

The means of maintaining the degree of safety associated with the above criteria should also be included. These means should include design provisions for container rigidity where leak-tightness is claimed, physical barrier to prevent improper placement of materials, administrative safeguards and other guarantees.

Material and equipment flow sheets presenting information regarding the quantities of materials, significant equipment dimensions (particularly the dimensions of vessels in which special nuclear material is contained), and plant layout including separation distances between operations are extremely clear and helpful for evaluation purposes.

It is noted that batch sizes of 52 lbs. UO_2 convert to boat size batches (~20 lbs.) at the sintering stage, and to 25 tubes/troughs at the tube processing stage. A detailed description of the 52 lb. batch container is necessary, as well as a detailed description of boat container for the 20 lb. green pellet batch and the through container for the finished tubes.

Page 4: Waste disposal and control. The statement is made that contaminated water generated by grinding the pellets is first filtered by Delpark filter paper before being recycled to the grinder. Your procedures for this waste disposal and control are requested.

Page 4: Storage. The solid angle calculations submitted in the original application are to be superseded by a new submission. We reviewed a draft of this new submission at the May 2 meeting mentioned above, and find the technique suitable.

Page 5: Vault 1B. No analysis to guarantee nuclear safety is included in this section of the application. The applicant has agreed to furnish us with this information as well as to supply us with pictures of the storage in this vault.

Page 5: Vault 1C. Analysis submitted as justification of Vault 1B will be applicable to this storage area which contains only one array of the three slab-type rack.

Page 6: General. A statement is made that combustible materials or materials capable of spontaneous combustion are not stored in any vault. This statement is sufficient for the subject application. However, for a general type application the following statement made by Westinghouse that 'such' is established practice would not be sufficient, rather, detailed procedures describing where and how this combustible material is stored would be necessary.

Page 6: Assembly Area. WAFD will use a limit of 150 grams U-235 per square foot of floor area. Is the limit of 150 grams U-235 per square foot feasible? Using Yankee Core I data and dimensions and substituting Yankee Core III enrichment of 4.1% in lieu of Core I, 3.4% enrichment, a rough estimate of the surface density with 25 tubes laid horizontally in the movecart results in a limit that exceeds the one proposed. The statement is made that this surface density limit will be maintained by the quantity of fuel permitted on each movecart. Your administrative control procedures in this regard are requested.

Page 8: Radiation Detectors. A statement is made that radiation detectors are periodically tested (usually every six months) using a low level radiation source. It is further stated that this particular type of testing involves a functional type inspection of the entire system from the radiation detector to the alarm signal. We require the over-all control alarm system be tested with sounding of the alarm at the time of each practice evacuation drill and that such drill be conducted at least once in every three month period.

Since it is our understanding that certain steps in the process flow will result in an accumulation of residue scrap, we require the applicant submit his procedures for collecting same and analysis to assure nuclear safety.

As regards shipping procedures, we require the applicant submit detailed procedures for assuring safety from criticality in shipment. Loading procedures are also requested.

DOCKET NO. 70-337

L&R File Copy

Westinghouse Electric Corporation

Atomic Fuel Department

Cheswick, Penna.
Telephones: BRoad 4-6300
EMerson 2-4400

June 1, 1962

Mr. D. A. Nussbaumer, Chief
Special Nuclear Materials Branch
United States Atomic Energy Commission
Division of Licensing & Regulations
Washington 25, D. C.

Dear Mr. Nussbaumer:

On May 9, 1962, Westinghouse Atomic Fuel Division transmitted a revised application for Amendment for License SNM 338 for manufacture by Westinghouse of nuclear fuel for Yankee III. Discussions of this amendment now require that a revision to this submission be made.

Transmitted herewith are three copies of a new Page 8 which is to be substituted for the old page in our last submittal. Also transmitted is an addendum to the License Amendment which is to be added to the other addenda. A new layout of vaults 1-A and 1-B is also transmitted to replace the layout in the submission that you have presently. These three changes then will update the amendment request to a current and, we hope, satisfactory status.

Two other questions were asked by Dr. Luke and his staff regarding our requested license amendment. The first question related to the bird cages used for shipping finished rods to the Westinghouse Atomic Power Department, Forest Hills, Pennsylvania. Be advised that the pipe used for the central 5" diameter cylinder in the bird cage is schedule 40 pipe or actually pipe of a thicker wall than schedule 40. Such shipments of bird cages loaded with finished rods are made by a Westinghouse truck, exclusive use service, and only four bird cages are transported at one time.

The second question asked by Dr. Luke's organization related to dimensions of containers used for transporting pellets within the manufacturing building. Four sizes of trays are used: 21" x 13" x 2 1/2" -- 9" x 6" x 2" -- 16 1/2" x 12" x 1" -- 23" x 15 1/2" x 3/4". Several sizes of boats are used in addition to the trays: 8" x 8" x 2" -- 12 1/2" x 9" x 2 1/2" -- 13" x 9" x 2 1/2" -- 9" x 6" x 2". In all cases where boats or trays are

RECEIVED
JUN 4 - 1962
U. S. A. E. C.
Division of Licensing and Regulation

Copy Supplied
Public Document Room 7/19/62
Div. of Compliance 7/19/62

5234

A126

used for transporting pellets, the fuel thickness is kept at a safe dimension of 2 1/2". The only one exception is a process vessel used which is not a safe geometry vessel. This vessel is the mixing bowl for a mixer which is an integral part of the powder preparation operations. This bowl is stainless steel and is 19" high with a 22" diameter spherical radius bottom. In other words, it is a 22" diameter hemisphere with an 8" right cylinder section added to a total height of 19". The top is open. The mixer is its own criticality area and control is achieved by allowing only one safe batch of 52 pounds of material in the mixer at one time. The mixer criticality area is separated by a minimum of 12" from all other criticality areas.

In summary, we sincerely hope that we have answered all questions regarding this amendment and we look forward to hearing from you.

Very truly yours,

WESTINGHOUSE ELECTRIC CORPORATION
Atomic Fuel Division

L. A. Meierkord, Jr.
Manager of Marketing

:ajb

Attach.

cc: Mr. R. E. Tschiegg, WAPD SS Representative

WESTINGHOUSE ATOMIC POWER DEPARTMENT EVALUATION OF
WAFD VAULT 1-B

I. Safety Analysis

Calculations have been performed to demonstrate the safety of a storage system in which infinite 2.5 inch slabs of 4.1 w/o pellets are separated by 12 inches of open space. The pellets are stored in trays which cannot hold water unless the entire area is flooded. That is, they will drain as the water recedes. Therefore at any time that a moderating material (water) exists between the pellets, there is an isolating shield of 12 inches of water between pellets. Under these circumstances a 2.5 inch slab is safe /1 . Because the pellets to be stored are unsintered, however, they can soak up moisture which would be retained as the water is drained away. The problem is to demonstrate that, with the possible water retention, five (5) such infinite planes remain subcritical.

5 planes

The pellets contain approximately 65% fuel, 20% organic filler, and 15% void. For the purpose of this evaluation all non-fuel portions of the pellet are assumed to be filled with water (35%) to assure a high degree of conservatism. This results in an H/U-235 ratio of 35.5. Because the pellets are water soaked, the calculation of the neutron multiplication is based upon the assumption of a homogeneous mixture of water and fuel material. It is the fact that the mixture is homogeneous plus the fact that they are undermoderated in this case which results in the five interacting planes remaining subcritical. Each of these two factors acts to increase the critical slab thickness. Because the effect of undermoderation was considered, the values obtained here will not be in agreement with the standard safety manuals because the values quoted assume optimum moderation .

limited moderation assumed

5234

The calculation was performed by the standard WAPD design techniques. The calculation assumed that one infinite slab 12.5 inches thick (5 x 2.5) was totally filled with the fuel water mixture. Thus, no account was taken for fact that the water soaked pellets were randomly packed and contain a substantial void volume between pellets which would materially increase the leakage from the 12.5 inch slab. Also no account is taken of the 12 inch space between each tray. This space would not be effective if there was an infinite plane of trays; however, because the array is finite, there is additional conservatism from this consideration. ~ 32 cm

The computed neutron multiplication for this 12.5 inch slab is 0.85 if no reflector is assumed and 0.98 if an infinite water reflector is assumed. Certainly it is not consistent to assume an infinite water reflector and not assume water in the 12 inch space between trays. However, there is some reflection from structure and, possibly, a small amount of water laying on the floor. A reasonable assumption might be to assume semi infinite water reflection (infinite reflector on one side) which would result in a neutron multiplication of about 0.92. With the several conservative assumptions imposed upon this evaluation, this value contains adequate margin for safety and the system of storage is demonstrated to be safe.

II. Verification of Calculational Procedure

Because the WAPD design system has been developed for a heterogeneous system, it is necessary to check its validity when it is applied to homogeneous mixtures. Its validity as a function of enrichment and moderating ratio has been tested extensively /2. Data have been taken for /3

4.9 w/o fuel because it is close to that enrichment which is being evaluated for storage. Two cases were studied. First, an assembly with an air reflector and then, one with a water reflector were selected. The experimentally determined critical dimensions were employed in a neutron multiplication calculation. A successful calculation should yield unity. The unreflected critical calculation resulted in a neutron multiplication of 0.99 whereas the reflected case resulted in a value of 1.00. There is no doubt that this agreement is somewhat fortuitous because exact details of the experimental configurations were not available for this calculation. It is reasonable to assume, however, that there is not more than two to three percent error in the storage evaluation. On this basis the safety of the storage procedure has been demonstrated.

Prepared by:

R. J. French
(W) Atomic Power Dept.

REFERENCES

1. Nuclear Safety Guide, TID 7016 (rev.), 1961
   (APD Calculations yield 2.7 inches as being safe)

2. Application for Amendment, License Number SNM-38 (Docket 70-40) USAEC.

3. H. F. Henry, A. J. Mallet, andC. E. Newlon, "Basic Critical Mass Information", K-1019 (rev. 4), 1958.

DOCKET NO. 70-337

2. Vault 1-B

This vault is used to store the freshly pressed (green) UO_2 pellets prior to sintering.

Metal containers are used exclusively for containment of all material in this vault. The metal containers are stored in slab array, with fuel thickness of $2\frac{1}{2}$" maximum used as the control. The metal racks accommodate 5 slabs of $2\frac{1}{2}$" thickness each, with a minimum separation between slabs of 12". This separation is sufficient to provide nuclear isolation in the event of water flooding. The individual arrays are nuclearly safe under moderated and reflected conditions as demonstrated in paragraph V-B. Therefore, the vault will be nuclearly safe when completely water flooded.

In the extremely unlikely event of complete water flooding, followed by draining, nuclear safety is still maintained. The containers used for storing the green pellets are of two general types, the first being simply an open-sided corrugated metal tray on which pellets are stacked end-to-end, and the second being metal five-sided open top boxes of $2\frac{1}{2}$" maximum depth, with holes in the sides at the junction of the bottom and the sides, and in which pellets are replaced at random. Neither of these containers will hold water. A separate safety analysis of these containers and Vault 1-B has been made by the Westinghouse Atomic Power Department, Forest Hills, Pennsylvania, and is appended to this document. This analysis demonstrates the nuclear safety of Vault 1-B.

Under normally dry conditions the vault is known to be nuclearly safe since a chain reaction cannot be attained with U-235 enrichments below 5 per cent unmoderated.

Accidental dropping of a tray or container of pellets would not result in an unsafe condition since a maximum of 52 pounds of pellets is contained in any one boat or tray, and this safe batch weight includes a 2.3 double batch allowance. Thus, dropping of a tray of pellets, combined with any one other coincident occurrence will not result in criticality.

A photograph of Vault 1-B is appended.

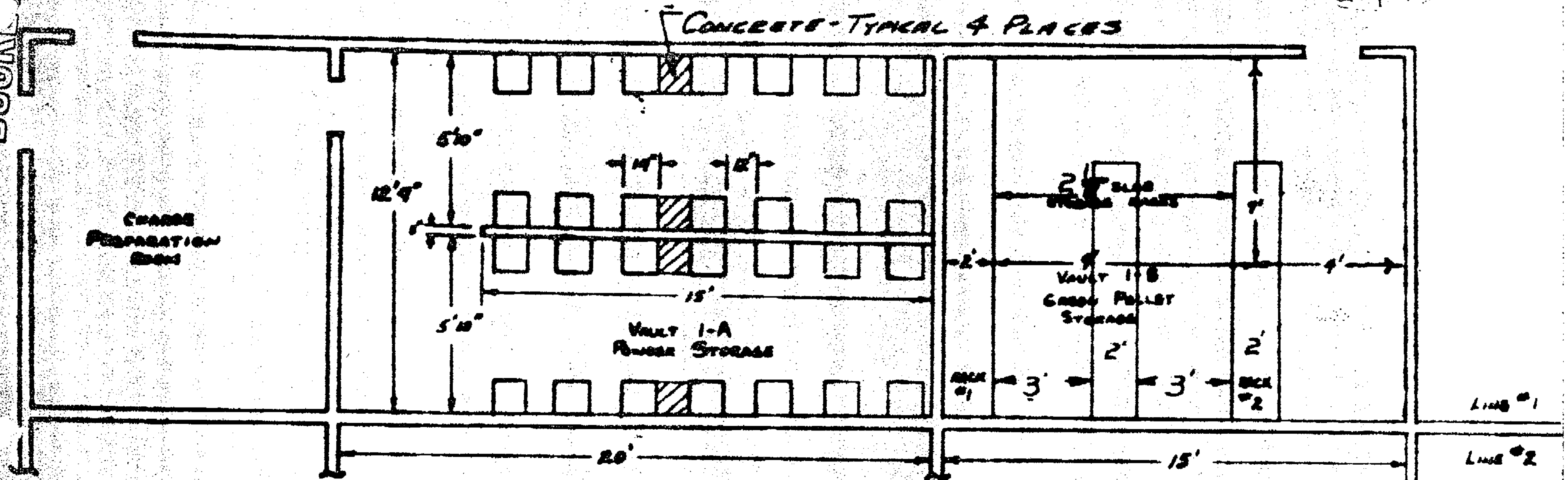
3. Vault 1-C

This vault is used to store the same type of material as stored in vault 1-B. The material is stored in identical containers in $2\frac{1}{2}$" thick slabs.

RECEIVED
JUN 4 1962
U. S. A. E. C.
Division of Licensing

5234

VAULTS 1-A & 1-B
(TYPICAL OF LINES 1, 2 & 3)



NOTE: ALL WALLS IN VAULTS ARE 8" SOLID CONCRETE

FROM:	DATE OF DOCUMENT:	DATE RECEIVED	NO.:
[illegible] Electric Corp. [illegible] [illegible], Jr. D. A. Nussbaumer	6/3/62	6/4/62	5234

LTR.:	MEMO:	REPORT:	OTHER:
1			

ORIG.:	CC:	OTHER:
1	1	

ACTION NECESSARY ☐ NO ACTION NECESSARY ☐	CONCURRENCE ☐ COMMENT ☐	DATE ANSWERED: BY:

CLASSIF.: U   POST OFFICE

REG. NO.:

FILE CODE: 70-33 7

DESCRIPTION: (Must Be Unclassified)

Ltr. Re: ltr. dtd 5/9/62 trans. a revised appl. for Amend. for Lic. SNM-338 for manuf. by Westinghouse of nuclear fuel for Yankee III. Disc. of this amend. now require that a revision of this submission be made.

ENCLOSURES:

1. SAFD Vault 1-3 (3)
2. Page 8 (3)
3. References (3)
4. Vaults 1-A & 1-B(3)

REMARKS:

Mail Room Distribution:
Helen Steele

REFERRED TO	DATE	RECEIVED BY	DATE
D. A. Nussbaumer	6/4		
w/file cy			
Public Document Rm.			
cy for Compl.			
(folder not in files)			

U. S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM   FORM AEC-326S (8-60)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1961 — 613958

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

Layfield

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Br.

DATE: JUN 20 1962

FROM : Charles D. Luke, Chief
Criticality Evaluation Br. CDL

SUBJECT: WESTINGHOUSE ELECTRIC CORPORATION'S MANUFACTURE OF YANKEE III FUEL ELEMENTS - JUNE 1, 1962 - DOCKET 70-337

Ref: DLR:FKD

References:
(1) Report, WAFD-L-101, dtd May 10, 1962
(2) Meeting, Meierkord with USAEC-DLR, May 10, 1962 (see CEB memo to Files dtd May 11, 1962)
(3) Telecon from Meierkord to Durkan, May 15, 1962 (see CEB memo to Files dtd May 15, 1962)
(4) Memo, Luke to Nussbaumer, dtd May 15, 1962
(5) Ltr, Westinghouse to USAEC-DLR, dtd June 1, 1962 (Supplementary information and correction to Report WAFD-L-101)

In response to your memorandum of June 5, 1962, we have reviewed the latest submission which supplies additional information supporting the May 10, 1962 application (reference 1).

The remaining outstanding problem areas as exposed by our memorandum (reference 3) included:

a. Shipping procedures to APD.

b. In-process container description.

c. In-process criticality control.

d. Waste Accumulation control procedures in the absolute air filters.

e. Green pellet storage justification in Vaults 1B and 1C.

Solutions to these problems as offered by reference 3 and the latest submission (reference 5) are as follows:

The 5" diameter inner container for shipping finished rods to WAPD is Schedule 40 pipe. Four such containers with 12" separation as spaced by the outer birdcage will be shipped by exclusive-use truck.

A127

All in-process containers are a maximum of 2 1/2" in depth. This is a safe slab thickness for UO_2 powder at 4.1% enrichment under optimumly moderated and fully reflected conditions according to Figures 4 and 21 of TID-7016, Rev. 1.

In-process criticality control is based on safe slab (2 1/2") or safe diameter or safe mass batch of less than 52 pounds UO_2.

A mass control limit of 52 pounds UO_2 is imposed as the waste accumulation control limit on the absolute air filter. Accumulation will be determined by checking the pressure drop which is calibrated to accumulation weight.

With regard to the storage of green pellets (Vaults 1B and 1C) in pans having a maximum depth of 2.5", the applicant has employed a somewhat unconventional rationale in judging the storage arrangement to be safe. After considerable study and an independent analysis of the proposed storage arrangement, we agree with Westinghouse that the storage plans are acceptable. We do not see how accidental criticality could occur.

In conclusion, we recommend approval of Westinghouse's application for amendment to manufacture Yankee III fuel, dated May 10, 1962, as amended by telecon record (reference 3) and latest submission (reference 5). In order to complete our written record, after the fact, we suggest that you ask Westinghouse to confirm the information Mr. Meierkord supplied verbally (3rd par. above) relative to controlling the accumulation of UO_2 on the air filter.

There are still pending the applications relating to the general license request of Westinghouse. I'm sure that you appreciate the mixed-up state of those applications. It would be most expeditious if Westinghouse would resubmit these proposals in a new application. I am sure that both AEC and Westinghouse would save time and effort over and above that which would be required to piece together all of the outstanding loose ends. If you agree, please so inform Westinghouse.

TWX INCOMING

DOCKET NO. C-0538 70-338

WESTINGHOUSE ATOMIC FUEL SPDA 621 6-21-62 APD-11

LAR File Copy
1962 JUN 21 PM 4 13
U.S. ATOMIC ENERGY COMM.
TWX UNIT

TO MR. D. NUSSBAUMER, U.S. ATOMIC ENERGY COMMISSION
DIVISION OF LICENSING & REGULATION
WASHINGTON 25, D.C.

DOCKETED USAEC Division of Licensing & Regulation JUN 21 1962 Docket Officer

ATTN MR. R. L. LAYFIELD

REFERENCE YANKEE - 3 AMENDMENT FOR SNM 338, BE ADVISED THAT A SAFE MASS LIMIT OF 52 POUNDS UO-2 WILL BE APPLIED FOR AIR FILTERS. FILTERS WILL BE CHANGED IF AIR FLOWS /I.E. PRESSURE DROPS/ REQUIRE IT. NORMALLY WHEN AIR FLOW DECREASE REQUIRES FILTER CHANGE, ONLY 5-10 POUNDS TOTAL FILTER WEIGHT INCREASE IS EXPERIENCED.

FROM L. A. MEIERKORD, JR.
MANAGER OF MARKETING
WESTINGHOUSE ATOMIC FUEL DIVISION
CHESWICK, PA.

MSG SENT 4.05 END DONA
ACK TU DH

RECEIVED JUN 21 1962 U.S.A.E.C. Division of Licensing and Regulation

Ack. Compl. 6-22-62

TWX INCOMING

A128

.5799

FROM: [illegible] Fuel Div., [illegible], Inc. [illegible], Jr.	DATE OF DOCUMENT: 6-21-62	DATE RECEIVED: 6-21-62	NO.: 5172
	LTR.:	MEMO.: REPORT.:	OTHER: "Telegram"

TO:	ORIG.:	CC.:	OTHER:
Nussbaumer	X		

ACTION NECESSARY ☒	CONCURRENCE ☐	DATE ANSWERED:	
NO ACTION NECESSARY ☐	COMMENT ☐	BY:	

CLASSIF.: U

POST OFFICE

REG. NO.:

FILE CODE: ~~280~~- 70-337

DESCRIPTION: (Must Be Unclassified)
Tel advising that a safe mass limit of 52 lbs UO2 will be applied for air filters, in ref to amendment of SNM-338 for Yankee Core III

ENCLOSURES:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer:	6-21		
w/file cy.			
cy for Compliance			
Layfield	6/22		

REMARKS: M R Distribution: 1 - AEC PDR
1 - H. Steele

U. S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM FORM AEC-326S (8-60)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1961 — 613958

70-337

L&R File Copy

Westinghouse Electric Corporation

Atomic Fuel Department

Cheswick, Penna.
Telephones: BRoad 4-6300
EMerson 2-4400

July 9, 1962

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

Attention: Mr. D. A. Nussbaumer, Chief
Special Nuclear Materials Branch

Sir:

I have accepted the position of Criticality Engineer at Cheswick, formerly held by Howard W. King, and would like to take this opportunity to introduce myself to you.

The Atomic Fuel Division wants to up-date its Nuclear Safety information sources, manuals, and procedures, and would appreciate any information or help you can give. We also want to facilitate the approval of our "Criticality Control Procedures" and would appreciate receiving any guides or comments you may have that would help us achieve this end.

Thank you for your help and information.

Very truly yours,

WESTINGHOUSE ELECTRIC CORPORATION
Atomic Fuel Division

W. D. Kelley

W. D. Kelley
Criticality Engineer

L. A. Meuerhard told me that Mr. Kelley was really inquiring about [illegible] info on nuclear safety. RHG

:ajb

Copy Supplied
~~Public Document Room~~
Div. of Compliance 7/19/62 - RHG

RECEIVED JUL 18 1962 U.S. Atomic Energy Commission Licensing & Regulation

A/29

7534

FROM: [illegible]

DATE OF DOCUMENT: [illegible]

DATE RECEIVED: [illegible]

NO.: 7534

LTR.: x

MEMO:

REPORT:

OTHER:

TO: Nussbaumer

ORIG.: x

CC: 2

OTHER:

ACTION NECESSARY ☐

NO ACTION NECESSARY ☐

CONCURRENCE ☐

COMMENT ☐

DATE ANSWERED:

BY:

CLASSIF.: U

POST OFFICE

REG. NO.:

FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)

Ltr advising that he have accepted the position of Criticality Engineer at Cheswick.

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer:	7-18		
w/file cy. (file not in) cy for Compliance			
Layfield	7/18		

ENCLOSURES:

REMARKS: N R Distribution: 1 - AEC PDR (Thru H. Steele)

U. S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM FORM AEC-326S (8-60)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1961 — 613988

70-337

Copy

Westinghouse Electric Corporation

Atomic Fuel Department

Cheswick, Penna.
Telephones: BRoad 4-6300
EMerson 2-4400

July 31, 1962

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

Attention: Mr. D. A. Nussbaumer, Chief
Special Nuclear Materials Branch

Dear Sir:

Reference is made to the telephone conversation between Mr. R. Layfield and Mr. L. A. Meierkord, Jr. on June 24, 1962, in which the waste material birdcage, Bureau of Explosives Permit No. 1405, was discussed. The discussion was relative to "Amendment to License SNM-338 for SELNI Core", WAFD-L-102, dated July 10, 1962.

The birdcage under discussion is to be used to ship wastes to a licensed recovery plant. Exclusive use service of either a Westinghouse or a recovery plant's truck will probably be used. The structural rigidity and the high degree of physical protection afforded the central containers by the birdcage structure is explained and shown in the accompanying sets of attachments.

We feel that the birdcages are structurally sound and the controls used will preserve their integrity and assure nuclear safety.

After reading the attachments please call us collect with your comments.

Thank you for your cooperation.

Very truly yours,

WESTINGHOUSE ELECTRIC CORPORATION
Atomic Fuel Division

W. D. Kelley /jmm

W. D. Kelley
Criticality Engineer

/jmm

Attachments

A/30

55

DOCKET NO. 70-337

L&R File Copy

The birdcage used to ship wastes to a licensed recovery plant is described on Drawings 10-C-080 and 10-B-057 and is shown in the photographs. The birdcage is constructed of heavy steel piping, 1/4 inch thick steel plate, and heavy cyclone fencing. The steel plates and four steel pipes provide the inner structure. Eight outer steel pipes provide the outer structure and give a twelve inch separation of material from the outer surface. Heavy cyclone fencing is welded to the outside of the [illegible]. The [illegible] top [illegible] stacking one birdcage on the top of another. The birdcage is sealed after loading.

The birdcage is used in the following manner. The material to be shipped is placed in [illegible] polyethylene bottle [illegible]. The bottle is placed [illegible] metal container with [illegible] friction, or metal strap, [illegible]. These metal containers are placed four (4) high on top of each other and are held in place by threading four (4) studs into the tapped [illegible] of the birdcage (Drawing 10-C-080, top view of birdcage) thereby placing the [illegible] containers in compression.

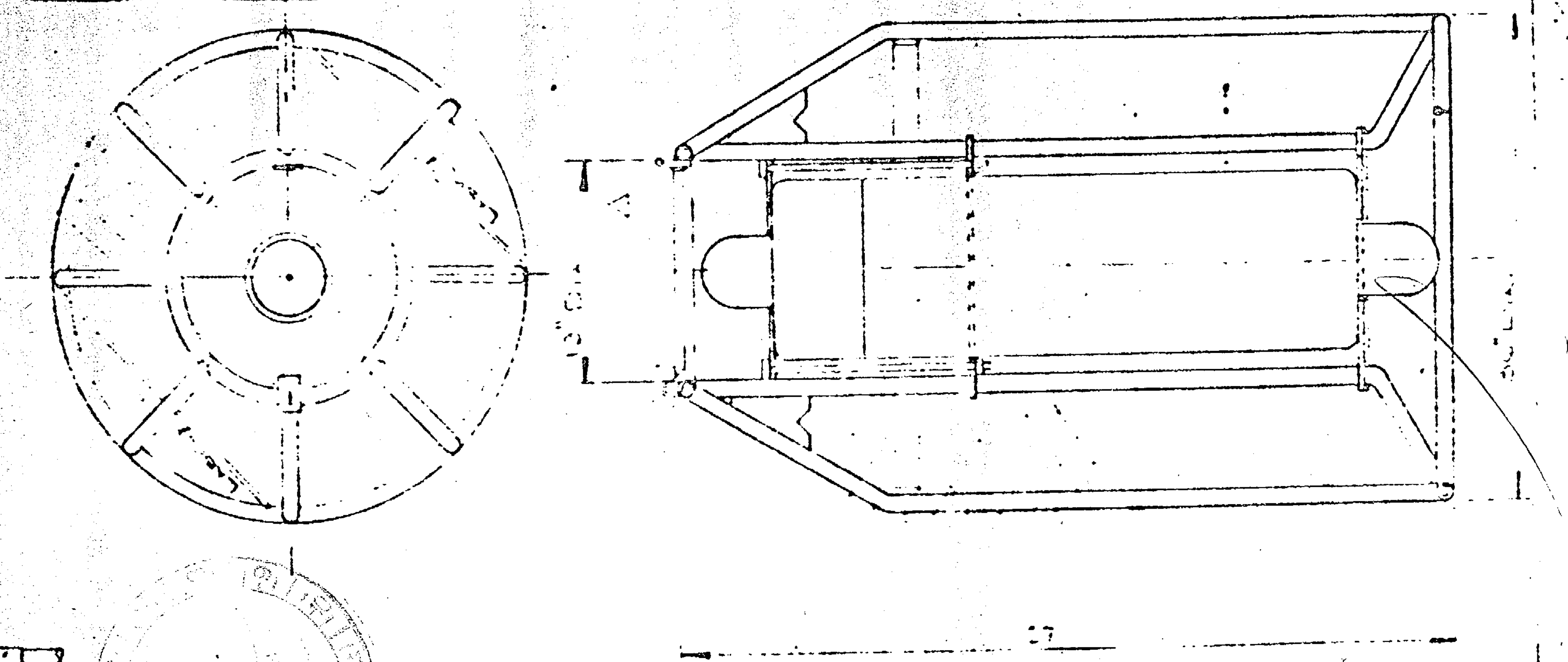
The [illegible] is 10 inches, which is within the diameter of ([illegible]) (2.2) enrichment allowance factor) = 11.25" allowed by TID-7016, in Figures 1 and 2. When these birdcages are used for shipping liquid wastes, the liquid will be packed in a 5" diameter polyethylene bottle with a tight threaded cap, to a maximum U-235 content of 350 grams. These bottles will be centered in a metal container as described above and packed with an absorbent material. These metal containers will then be placed in a birdcage.

As can be seen from the drawings and photographs, a high degree of physical protection is afforded the central containers by the birdcage structure. The Bureau of Explosives Permit Number is 1405.

DOCKETED USAEC Division of Licensing & Regulation AUG 1962

RECEIVED AUG 6 - 1962 U.S. Atomic Energy Commission

8055



NOTES.

SHIPPING CONTAINER TO BE TOTALLY ENCLOSED WITH CYCLONE FENCE WIRE.

SHIPPING CONTAINER

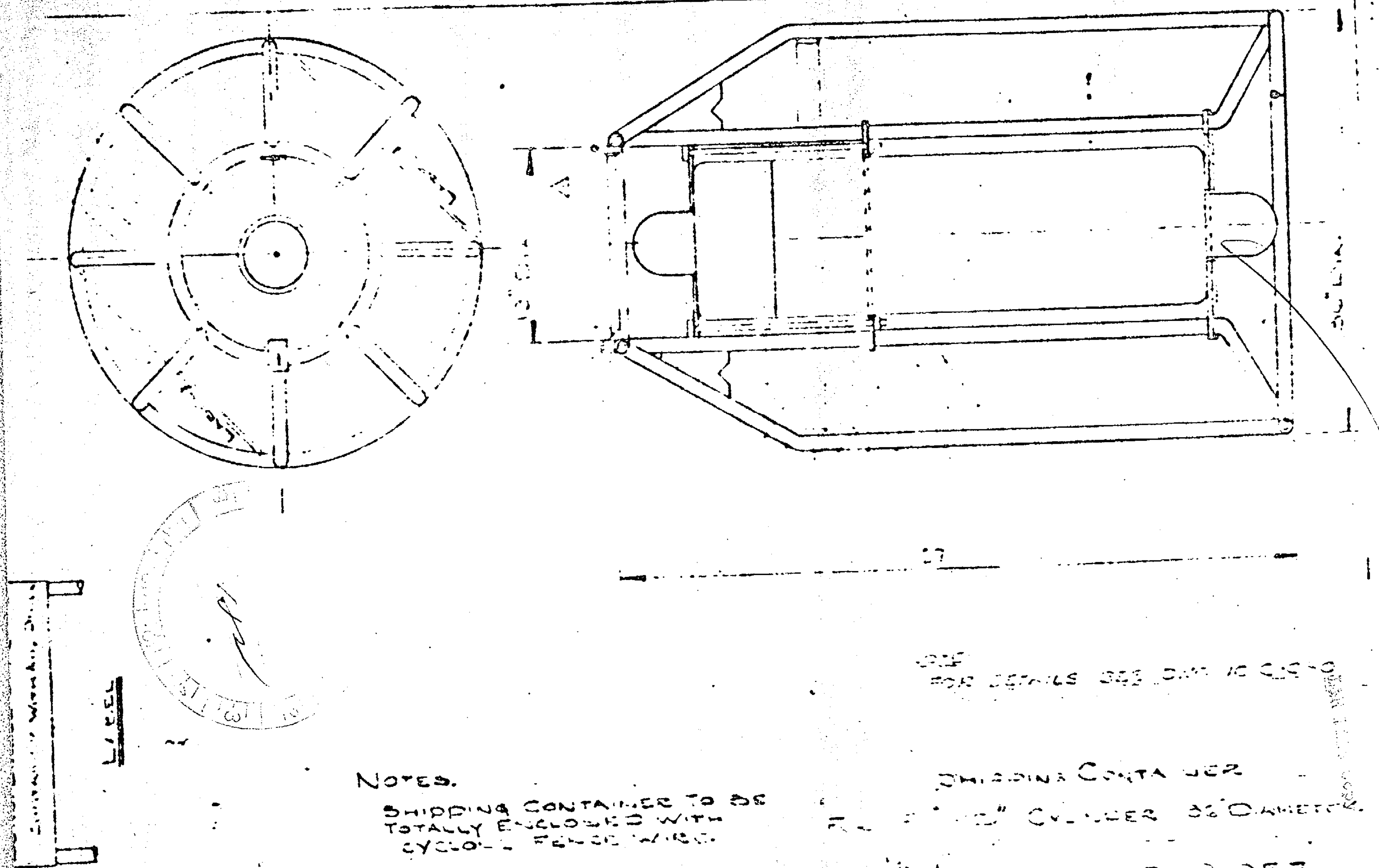
FOR "D" CYLINDER 36" DIAMETER

10-3057

△ ADDED TOP COVER

Bureau of Explosives Permit #1405

337



NOTES.
SHIPPING CONTAINER TO BE TOTALLY ENCLOSED WITH CYCLONE FENCE WIRE.

FOR DETAILS SEE DWG 10-C5-0

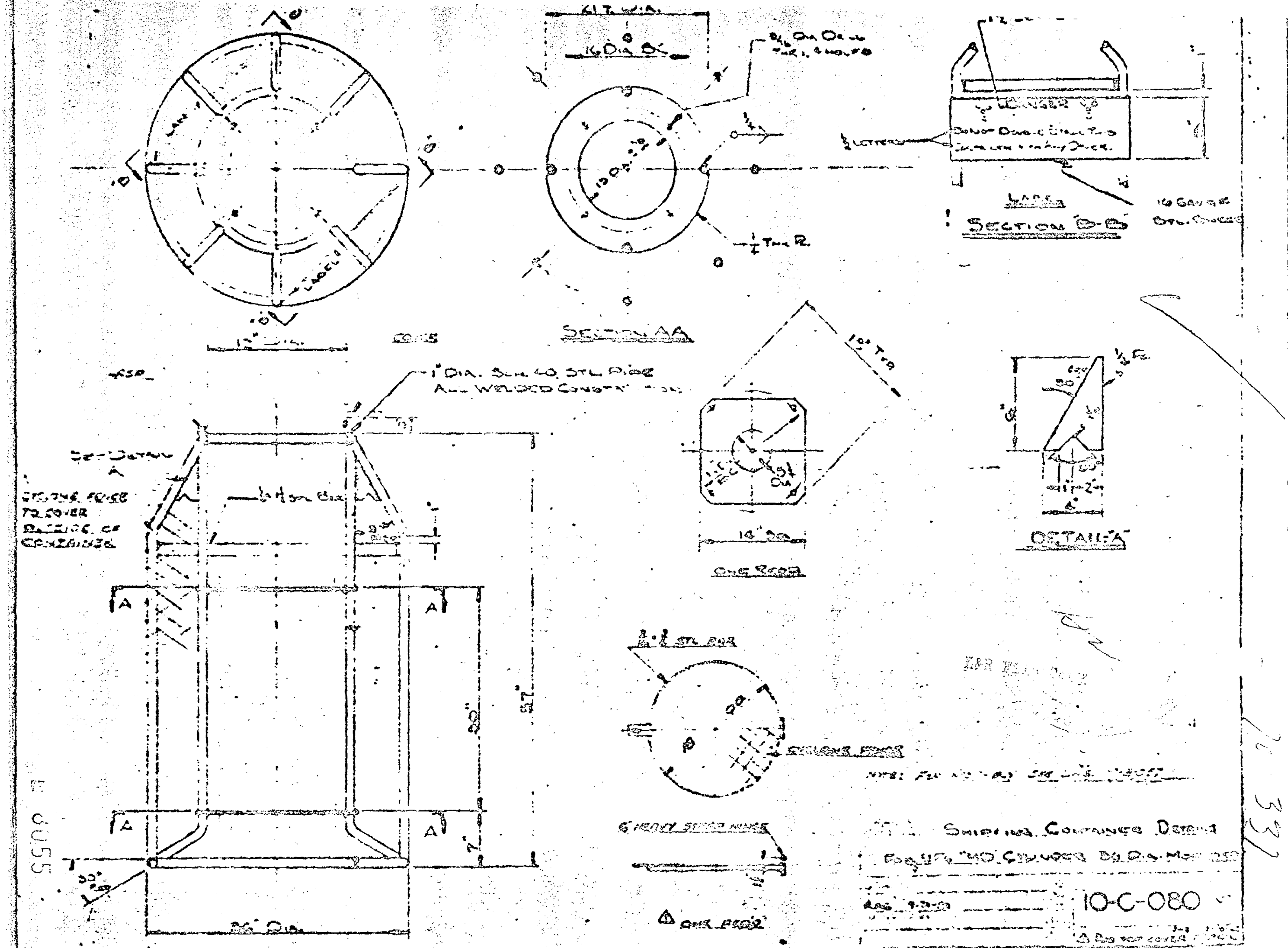
SHIPPING CONTAINER
" CYLINDER 36" DIAMETER

10-B057

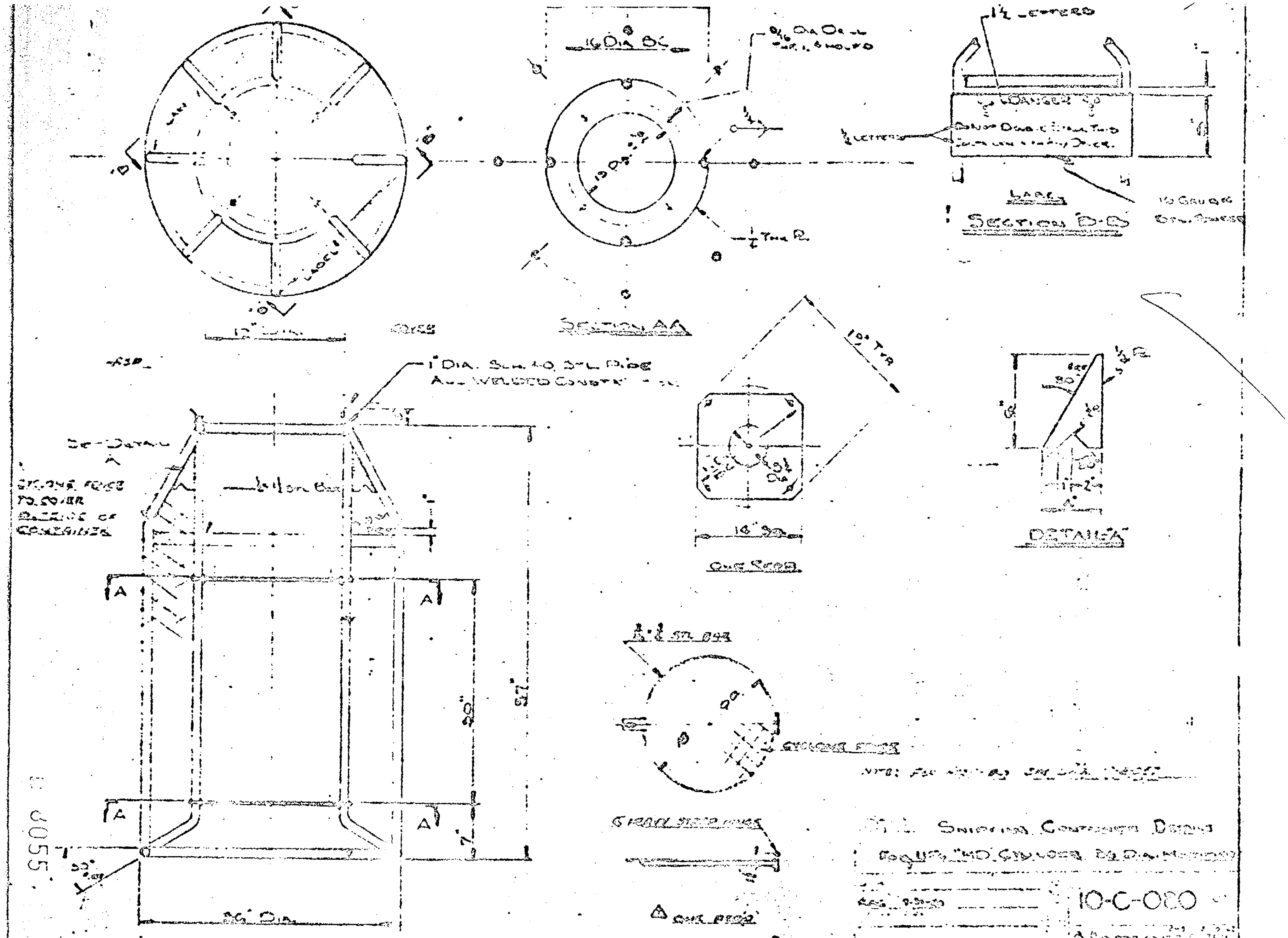
Δ ADDED TOP COVER

8055

Bureau of Explosives Permit #1405



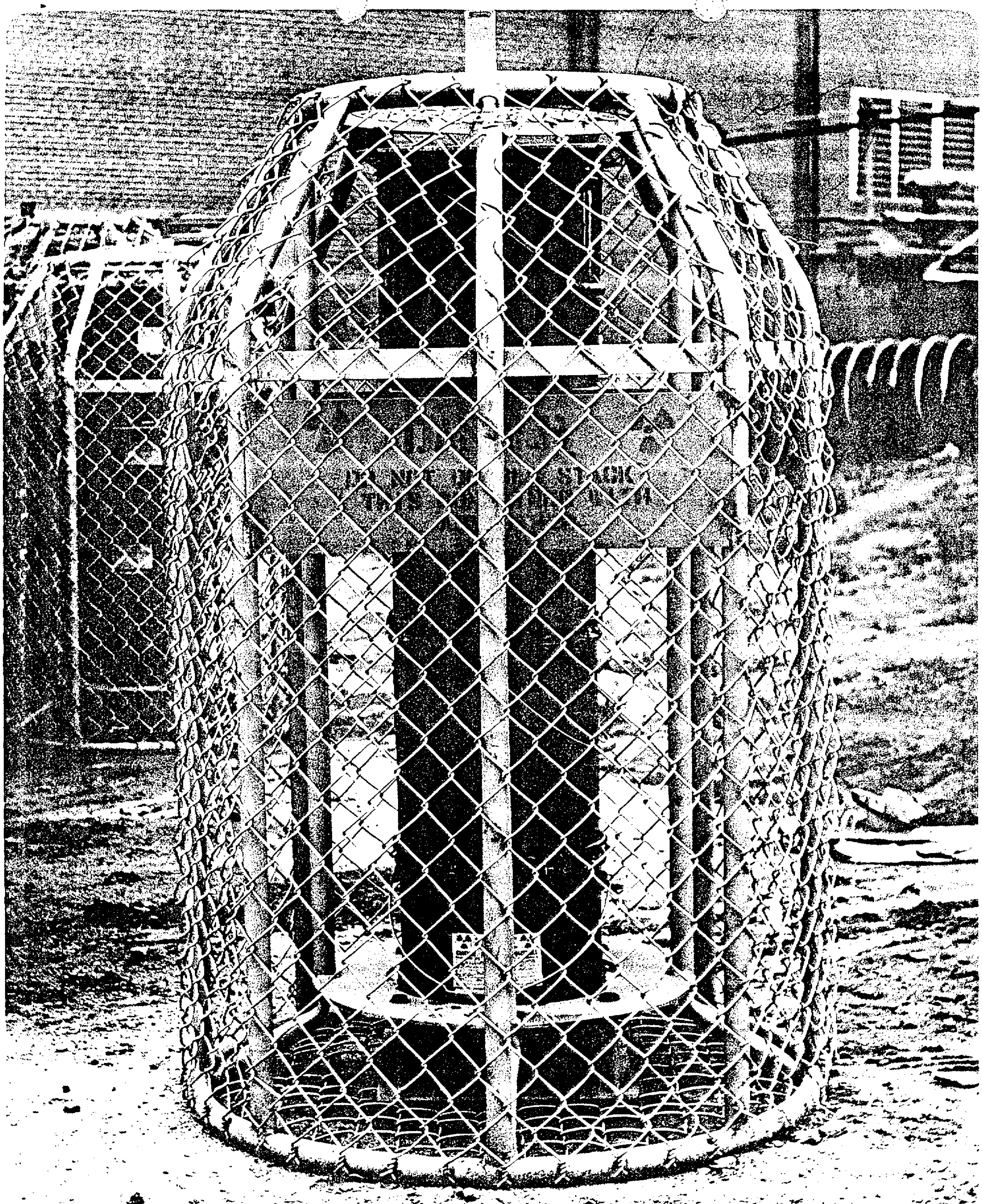
Bureau of Explosives Permit #1405



Bureau of Explosives Permit #1405


76-357

20-3337



FROM: [illegible]inghouse Electric Corporation
[illegible]c, Penna.
[illegible] D. Kelley

DATE OF DOCUMENT:	DATE RECEIVED:	NO.:
[illegible]-31-62	8-7-62	8085

LTR.: X MEMO: REPORT: OTHER:

ORIG.: X CC: 2 OTHER:

ACTION NECESSARY ☒ NO ACTION NECESSARY ☐
CONCURRENCE ☐ COMMENT ☐
DATE ANSWERED:
BY:

TO:
Nussbaumer

CLASSIF.: U
POST OFFICE
REG. NO.:

FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)
Ltr furnishing following info in ref to telcon between and Mr. Meierkord, on [illegible]-24-62 relative to Amendment to Lic SNM-338 for SELNI Core:

ENCLOSURES: (3 cys rec'd)
1--Data on the Birdcage
Bureau of Explosives Permit # 1405
two photos

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer	8-7		
w/file cy.			
~~cy for PER (Thru H. Steele)~~			
cy for Compliance			

REMARKS:

8085

U. S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM FORM AEC-326S (8-60)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1961 — 613958

C-058

U.S ATOMIC ENERGY COMM.
TWX UNIT

1962 AUG 7 AM 10 42

216

BCA020CBA057

RR RUEPAE

DE RUCBOE 04

70-337

L&R File Copy

ZNR

R 061600Z

FM H J MCALDUFF JR USAEC OAKRIDGE TENN

TO DONALD A NUSSBAUMER USAEC WASHDC

AEC GRNC

BT

UNCLAS. NEED INCREASE IN FINANCIAL LIMITATION FOR WESTINGHOUSE ELECTRIC CORPORATION. PRESENT ORDER FOR SELNI MATERIAL AMOUNTS TO 12.4 MILLION. BALANCE OF 4.8 MILLION ON BOOKS. NEED INCREASE OF 7.6 MILLION REF OPO ODS 61

BT

CFN 12.4 4.8 7.6 OPO ODS 61

06/2010Z

RECEIVED
AUG 7 - 1962
U.S. Atomic Energy Commission
DIVISION OF
LICENSING & REGULATION

3080

A/31

MAIL CONTROL FORM

FROM: [illegible]

DATE OF DOCUMENT: 6-7-62

DATE RECEIVED: 6-7-62

NO.: 4080

LTR. MEMO. REPORT. OTHER: "Telegram"

TO: Nussbaumer

ORIG.: X CC. OTHER.

ACTION NECESSARY ☒ NO ACTION NECESSARY ☐

CONCURRENCE ☐ COMMENT ☐

DATE ANSWERED:

BY:

CLASSIF.: U

POST OFFICE

REG. NO.:

FILE CODE: 70 33577

DESCRIPTION: (Must Be Unclassified)

Tel req increase in financial limitation for Westinghouse Electric Corp in conn. with SELNI

ENCLOSURES:

REMARKS:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer: w/file cy.	6-7		
[illegible]	6/7		

U. S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM FORM AEC-326S (8-60)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1961 — 613958

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Alexander E. Aikens, Jr., Chief
Process Evaluation Branch

DATE: AUG 1 4 1962

FROM : Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch

SUBJECT: WESTINGHOUSE (CHESWICK) LETTER OF JULY 31, 1962, PROVIDING STRUCTURAL INTEGRITY DATA OF SHIPPING PACKAGE (70-337)

LR:JCD

The subject letter is transmitted for your review. Please return it with your comments regarding the structural integrity of the package.

Attachment:
as stated

A/32

DLR:RLL
70-337

AUG 15 1962

Westinghouse Electric Corporation
Atomic Fuel Department
Cheswick, Pennsylvania

Attention: Mr. W. D. Kelley

Gentlemen:

This refers to your letter dated July 9, 1962, informing us that Mr. W. D. Kelley has assumed the position of Nuclear Safety Engineer, formerly held by Mr. H. W. King. Please submit a description of Mr. Kelley's training and experience in nuclear safety.

In response to your request for information concerning nuclear safety, reports TID-7016 (Rev. 1) and TID-7019 are most commonly used. If you desire more specific information, we will be happy to assist you wherever possible.

Very truly yours,

Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch
Division of Licensing and Regulation

Distribution:
Formal
Doc. Rm.
Suppl.
Br. and Div. rfs
Compl.
RLLayfield, LR

A/33

OFFICE ▶	LR	LR				
SURNAME ▶	RLLayfield:rl	DN DANussbaumer				
DATE ▶	8/8/62	8/15/62				

DOCKET NO. 70-337

L&R File Copy

Westinghouse Electric Corporation

Atomic Fuel Division Cheswick, Penna.
area code 412 Telephones: 274-6300
362-4400

September 4, 1962

DOCKETED USAEC Division of Licensing & Regulation SEP 6 - 1962 asc Docket Officer

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

Attention: Mr. D. A. Nussbaumer, Chief
Special Nuclear Materials Branch

Dear Sir:

Reference is made to Docket 70-337 in which the waste product birdcage for the "Amendment to License SNM-338 for Selni Core", WAFD-L-102, dated July 10, 1962, is being reviewed.

Per my discussion with Mr. R. Layfield of your office a drop test was performed on a loaded birdcage. The results are attached.

The proposed modification to the birdcage assures that under no circumstances will a metal can or polyethylene jar get out of the central region of the birdcage. The structural integrity of the birdcage has been proved by the drop test.

If there are any questions, please call us collect.

Thank you for your cooperation.

Very truly yours,

WESTINGHOUSE ATOMIC FUEL DIVISION

W. D. Kelley
W. D. Kelley
Criticality Engineer

Copy Supplied
Public Document Room 9/7/62
Div. of Compliance 9/7/62 RKR

:ajb

Attach.

cc: Mr. R. E. Tschiegg, WAPD

RECEIVED SEP 6 1962 U.S. Atomic Energy Commission DIVISION OF LICENSING & REGULATION

A/34

8762

DOCKET NO. 70-337

L&R File Copy

Docket 70-337

On August 28, 1962, WAFD conducted a drop test on the waste shipping container, Bureau of Explosives Permit #1405. The birdcage was loaded with dirt to simulate actual uranium oxide powder loadings. There was a total load of 140 lbs. in the four polyethylene screw cap jars. The jars were loaded into 5-gallon metal cans and securely fastened in the birdcage in the normal manner.

The birdcage was dropped onto the concrete floor of the WAFD Shipping Dock. This was the greatest drop available at WAFD. The birdcage was raised to a height of 27 feet (top of the birdcage) above the floor. A Release-A-Matic quick release hook was used to instantaneously drop the loaded birdcage. The birdcage was examined after the drop.

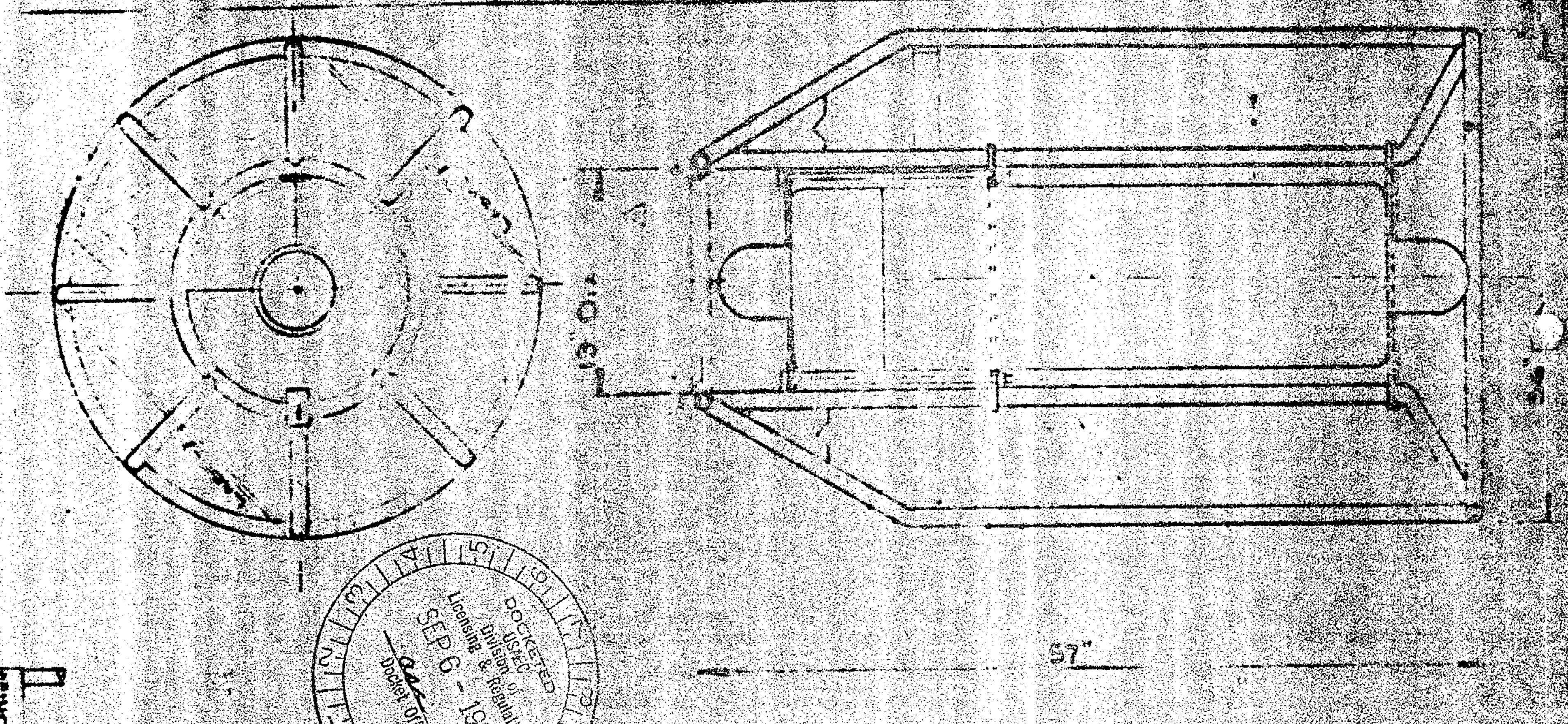
23' to bottom

There was no apparent damage to the birdcage structure resulting from the drop. A comparison of the attached photographs will show this. It is believed that the results of this drop test validate the structural rigidity and integrity of the birdcage structure.

There was a compression of the 5-gallon metal cans upon impact. The damage is shown by the photographs. The metal cans took most of the shock delivered to the central portion of the birdcage. The nature of the cans actually provided additional protection to the polyethylene jars by absorbing the shock.

The polyethylene jars inside the cans were not ruptured nor did they lose any material. Only the jar in the bottom 5-gallon can was deformed at all. The top was pushed down about 3/4 inch but no powder was lost.

WAFD will modify the birdcages such that four (4) bars will be inserted around the central area periphery equidistant between the present four (4) bars so that under no circumstances would the cans or jars be able to approach the outside of the wire covered birdcage.

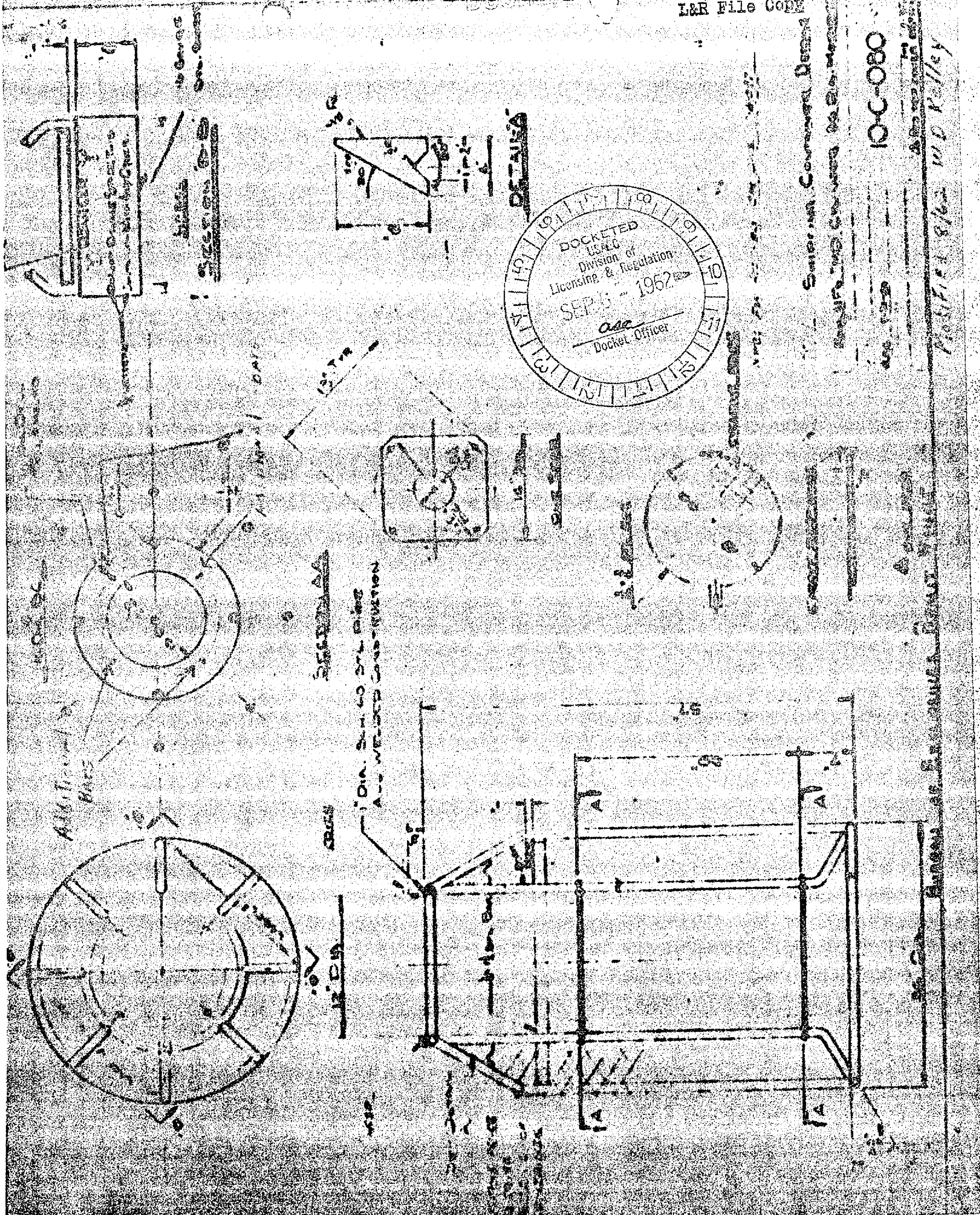


NOTE:
FOR DETAILS SEE DWG 10C 690

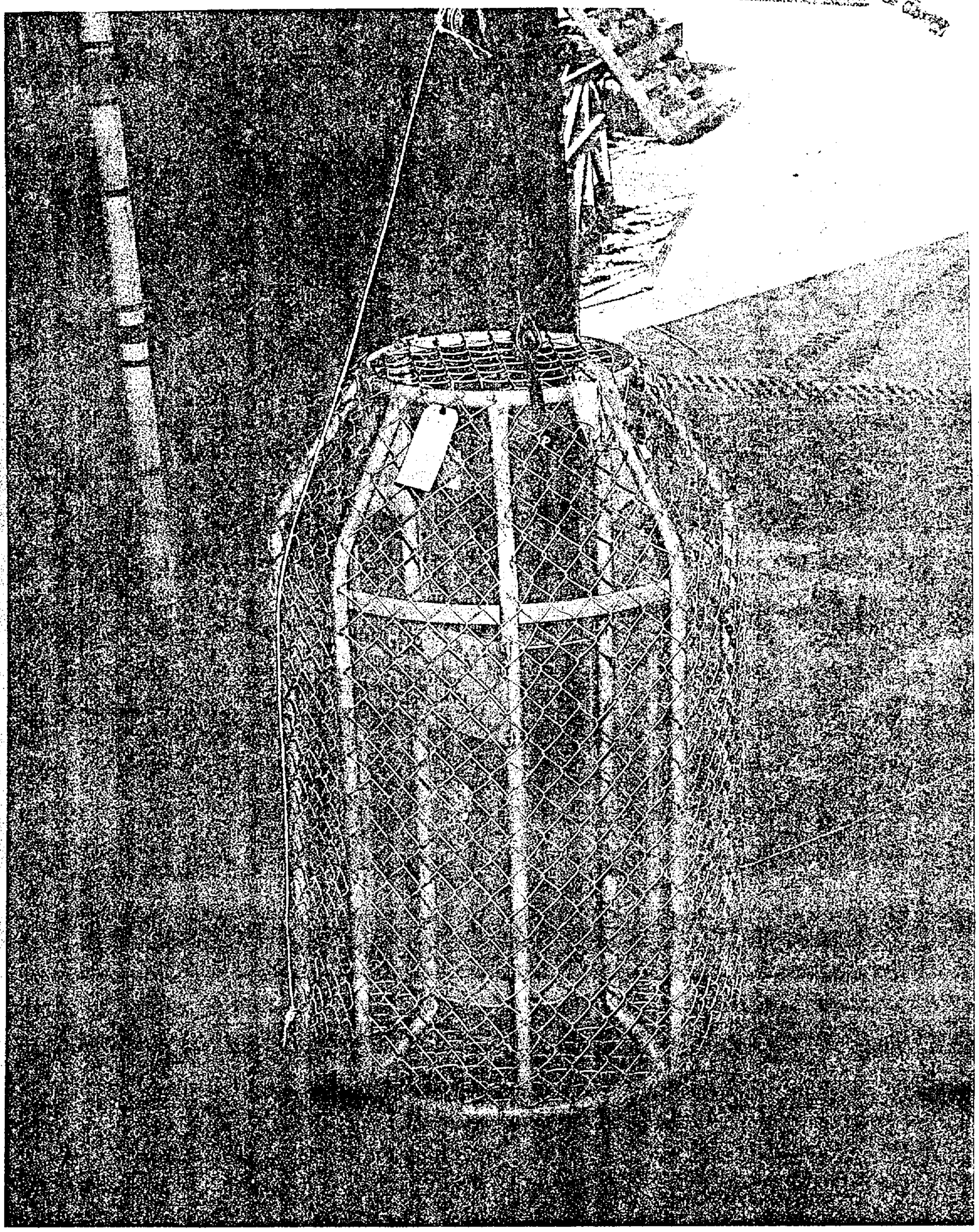
NOTES:
SHIPPING CONTAINER TO BE
TOTALLY ENCLOSED WITH
CYCLONE FENCE WIRE.

SHIPPING CONTAINER
FOR UF6 "HD" CYLINDER 12" DIAMETER

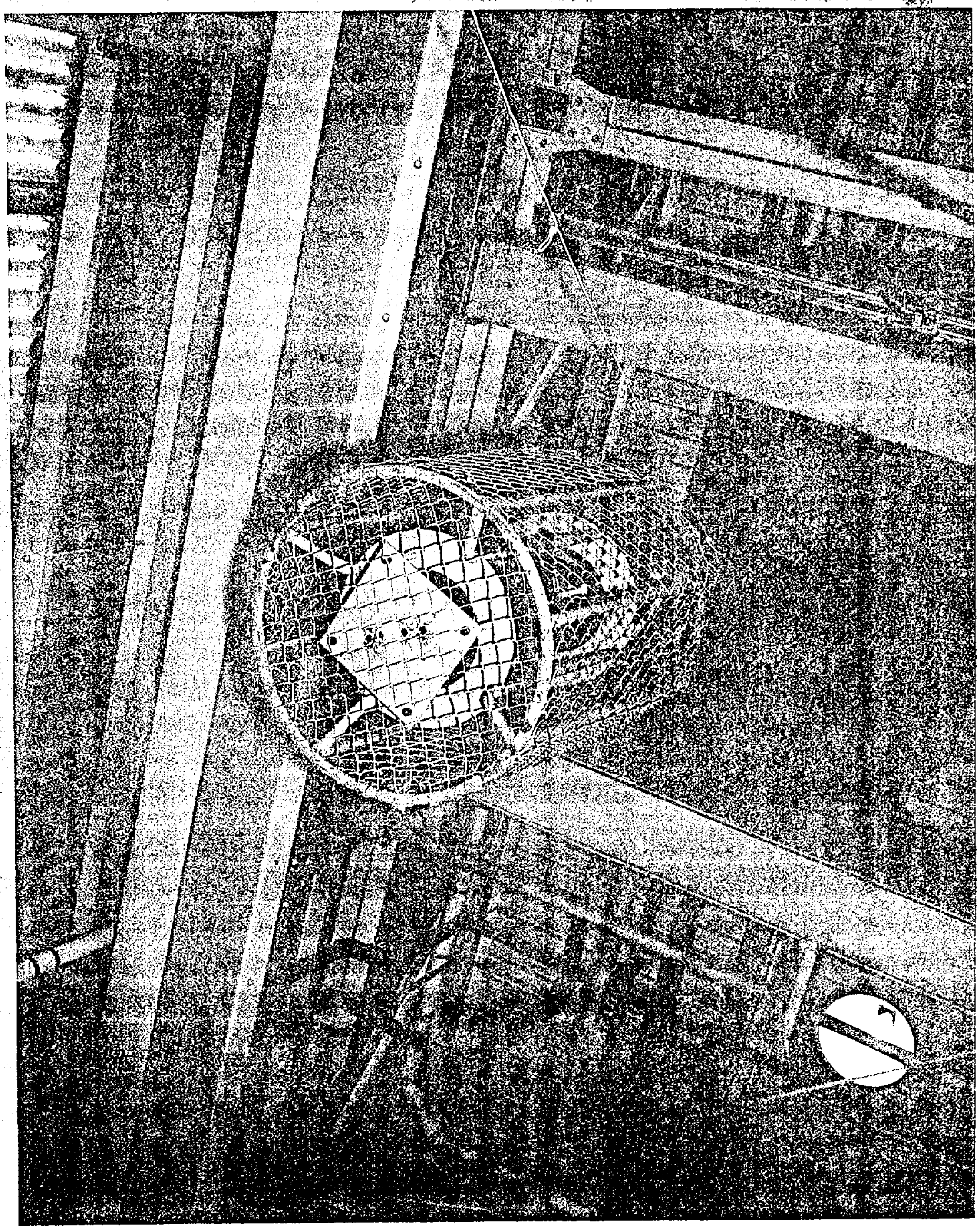
10-B-057


10-C-080

DOCKET NO. [illegible] 1

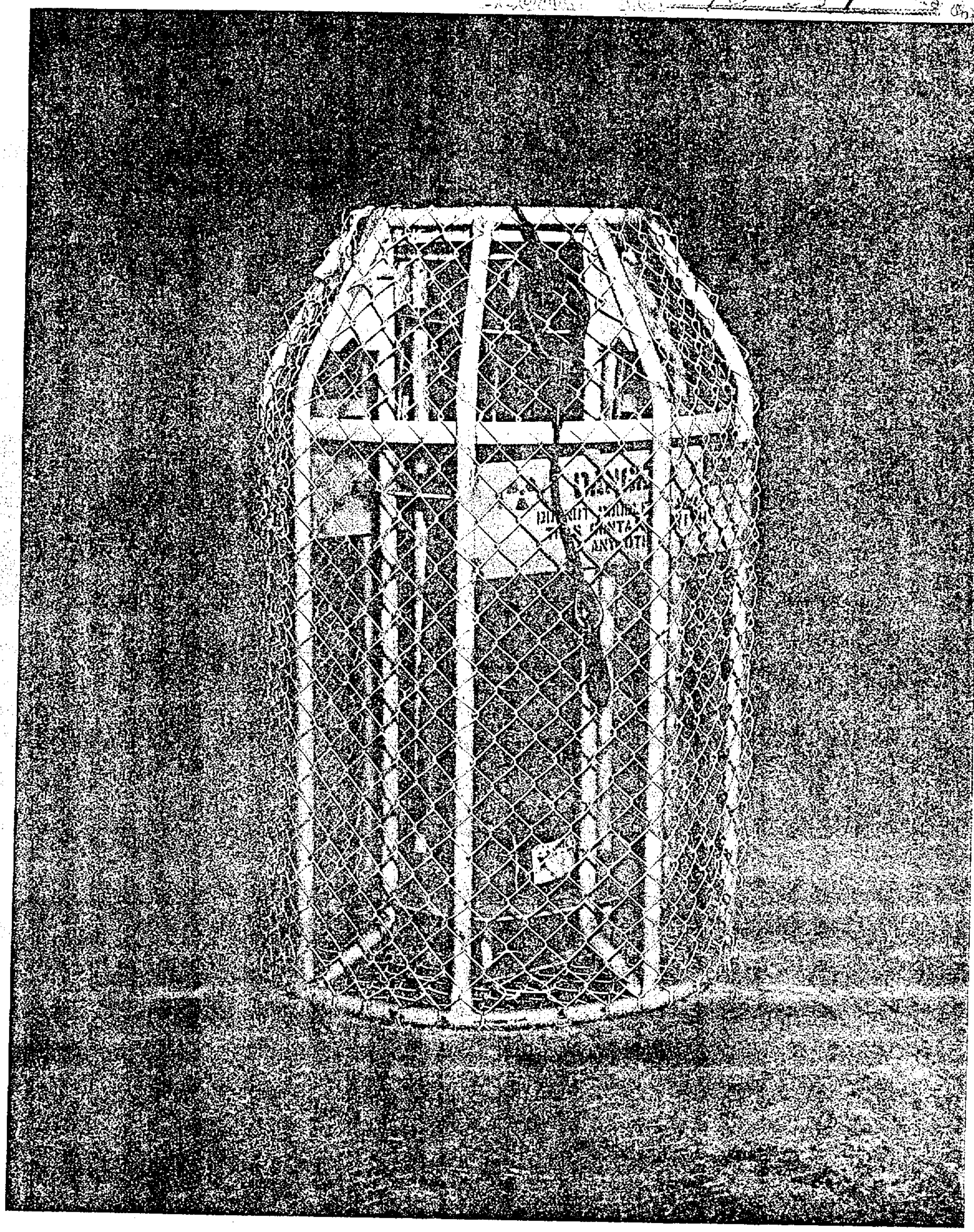


DOCKET NO. 70-337 LRR File Copy 2



876

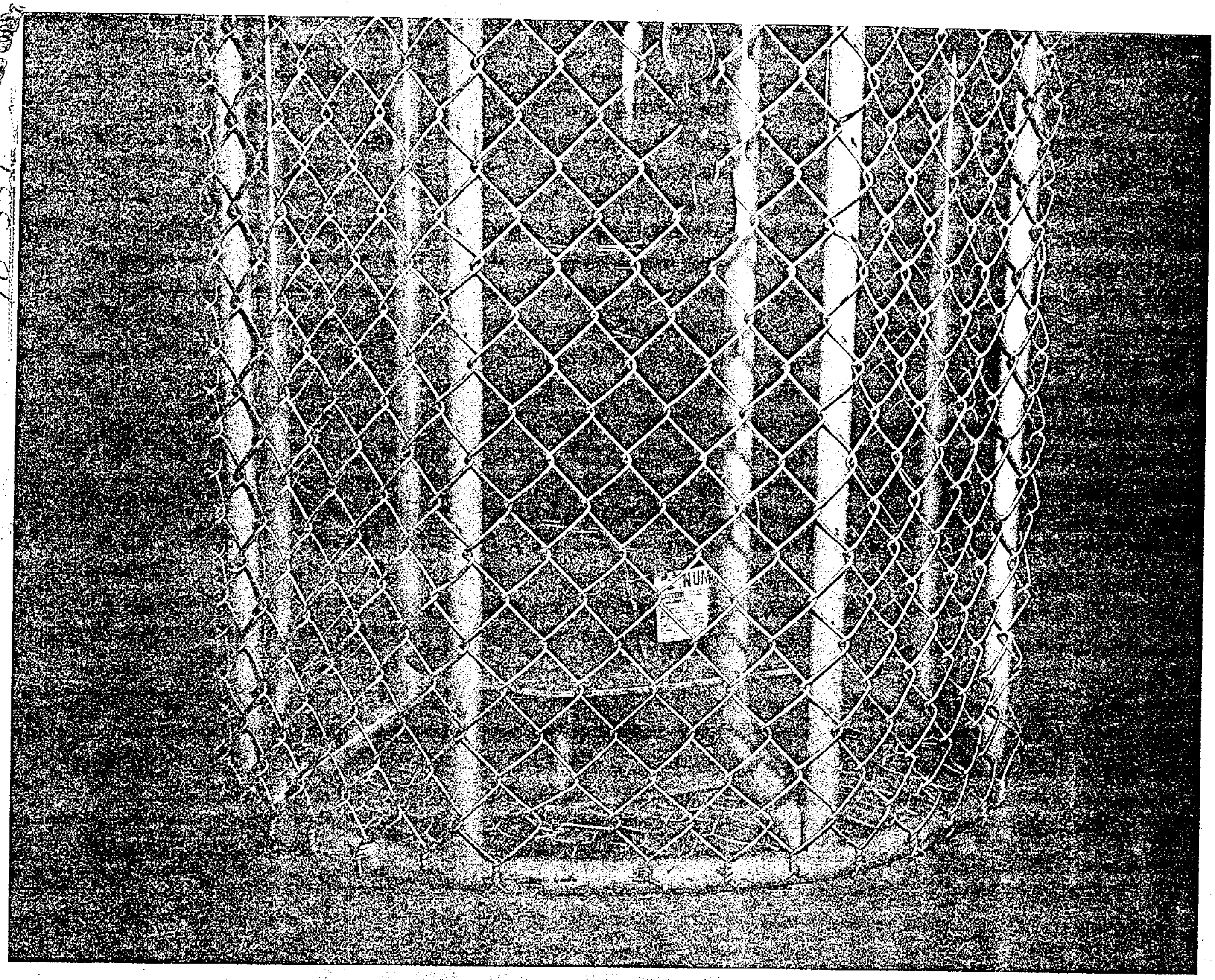
10-237



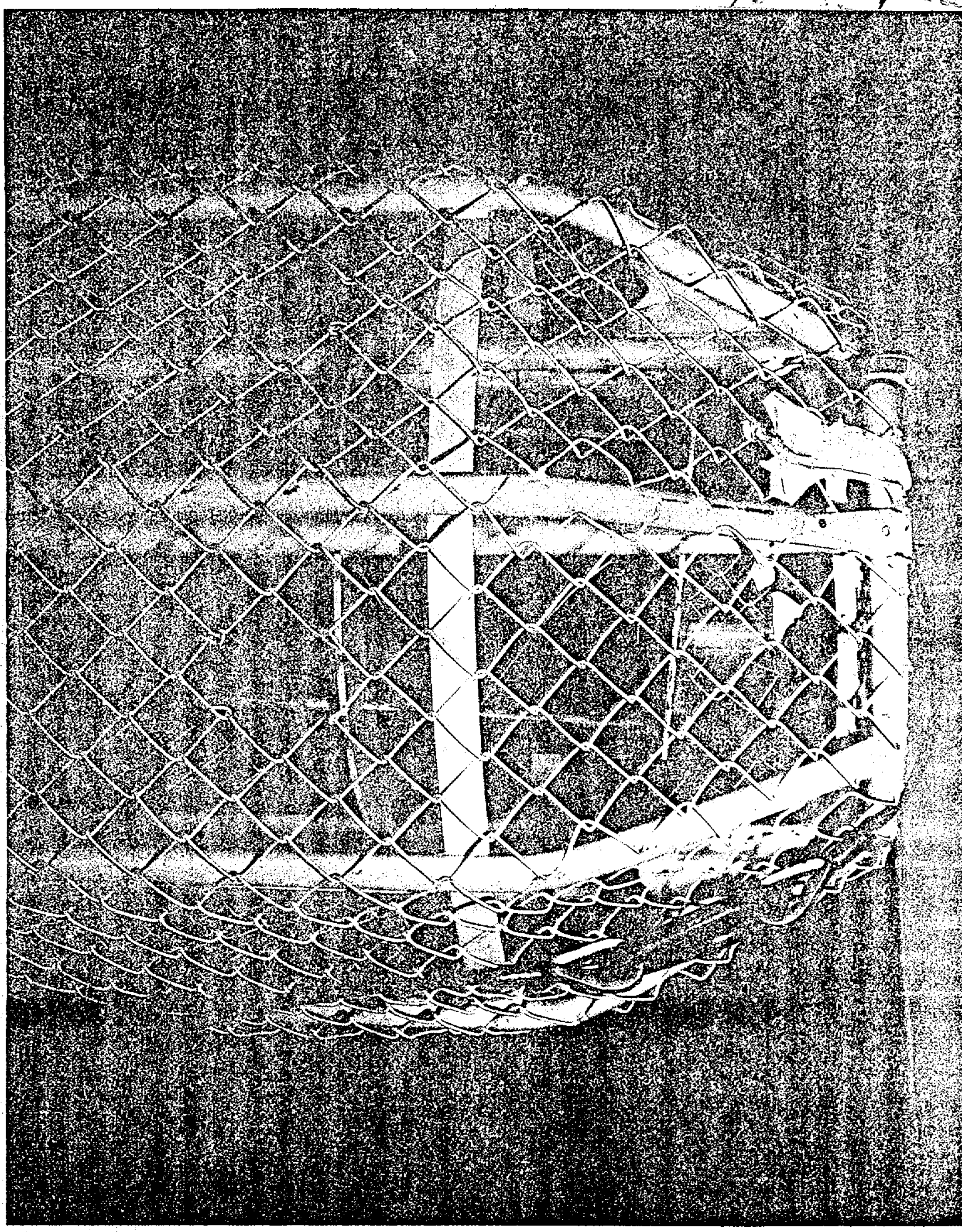
8762

70-337

4

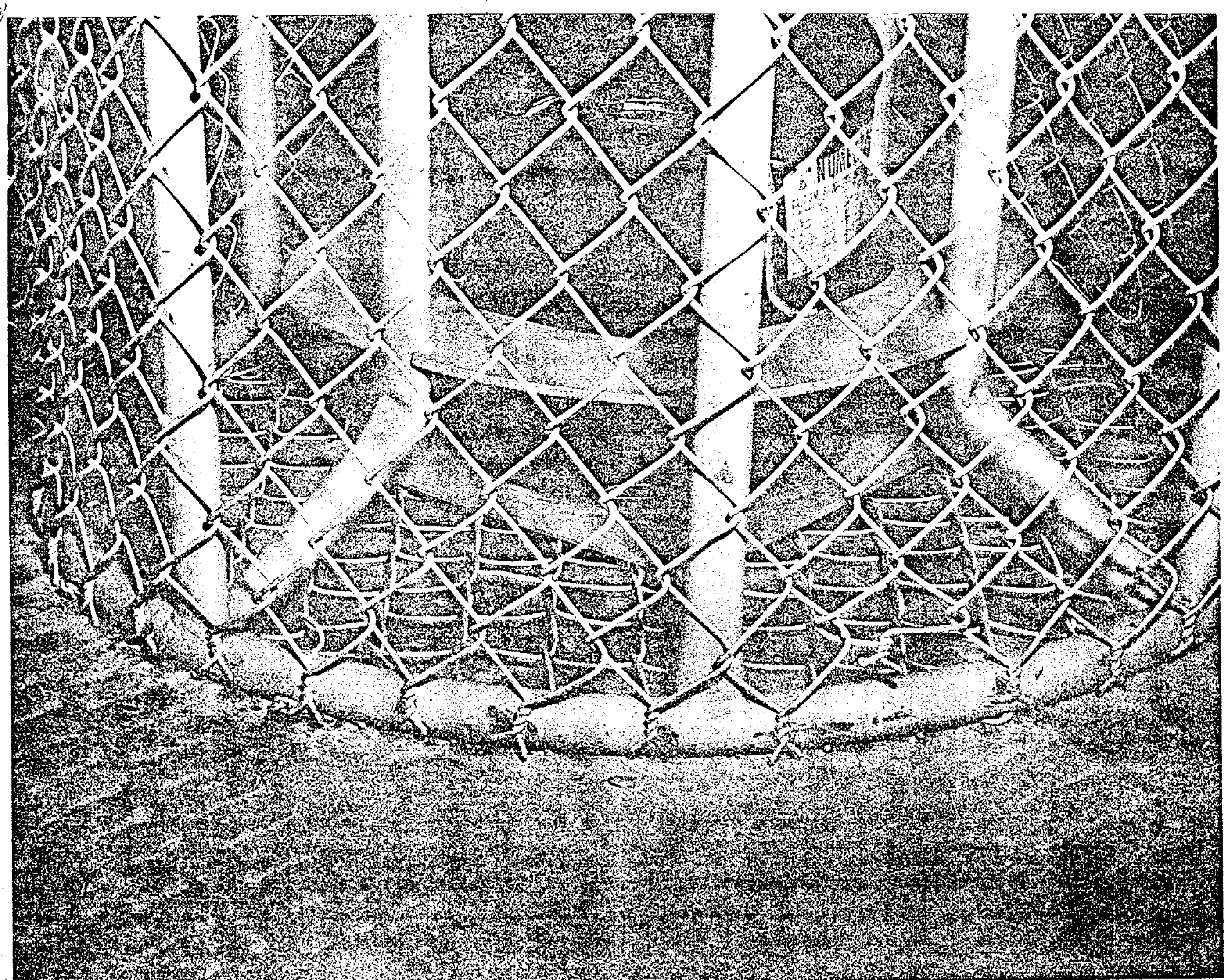


71-227 D&R File Copy



F 8700

70-337



FROM:	DATE OF DOCUMENT:	DATE RECEIVED	NO.:
Westinghouse Electric Corporation Cheswick, Pennsylvania	9-4-62	9-6-62	8762

LTR. MEMO. REPORT. OTHER:
x & encls.

TO: D. Nussbaumer
Div. of L&R

ORIG.: x CC: 2 OTHER:

ACTION NECESSARY ☐ CONCURRENCE ☐ DATE ANSWERED:
NO ACTION NECESSARY ☐ COMMENT ☐ BY:

CLASSIF.: U
POST OFFICE
REG. NO.:
FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)
Ltr. 9-4-62 submitting results of drop test which was performed on a loaded ~~xkxx~~ birdcage. Attached;

ENCLOSURES: (3 cys. of each rec'd)
Sheet stating the results of test
Sketch 10-S-057 of Shipping Container
Sketch 10-C-080 of Shipping Container Details
Enclosures No. 1 thru 6 of Birdcage during the drop test.

REMARKS: Mail Room Distribution:
1-H. Steele w/returned PDR

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer: w/file cy. 1-compliance cy. 1-PDR Copy	9-6-62		
(File folder not in)			
Longfield	9/6		

ACKNOWLEDGED

U. S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM FORM AEC-326S (8-60)

WESTINGHOUSE ATOMIC FUEL 412 274-5650 SEPTEMBER 11, 1962

AFL-3

TWX INCOMING

C-05-8

DOCKET NO. 70-33?

TO MR D NUSSBAUMER

DIVISION OF LICENSING

WASHINGTON, D.C.

DOCKETED USAEC Division of Licensing & Regulation SEP 11 1962 Docket Officer

1962 SEP 11 PM 3 47

LAB File Copy

U.S. ATOMIC ENERGY COMM. TWX UNIT

PERMISSION IS REQUESTED TO STORE LOADED AND WELDED YANKEE-3 FUEL RODS MANUFACTURED UNDER AMENDMENT 70-337 TO LICENSE SNM-338 UNDER STORAGE CONDITIONS APPROVED BY AMENDMENT 70-337 /SAFE ~~SCAB~~ SLAB THICKNESS OF 2 1/2" MAX., 12 " MIN. SEPARATION OF SCABS/ BUT IN AN AREA TEMPORARILY NOT COVERED BY GAMMA ~~ACARMUS~~ ALARMS. SPECIAL CONDITIONS TO ASSURE SAFE STORAGE ARE.......

1. STORAGE WILL BE IN A LOCKED ROOM WITH INGRESS AND EGRESS AND LIMITED CONTROCCED.

RECEIVED SEP 11 1962 U.S. ATOMIC ENERGY COMMISSION Division of Licensing & Regulation

2. THE ROOM IS IN THE DEVELOPMENT LABORATORY BUILDING WHICH IS ONLY PARTIALLY OCCUPIED AND WHICH ITSELF IS THEREFORE A LIMITED ACCESS BUILDING. THIS BUILDING IS SEPARATED FROM ALL MANUFACTURING BUILDINGS.

3. USE OF THIS ROOM WILL BE LIMITED TO STORAGE OF YANKEE-3 FUEL RODS ONLY.

ACKNOWLEDGED

ACKNOWLEDGED

8923

Compliance Copy sent 9/12/62 E.Y.

4. GAMMA ALARMS WILL BE INSTALLED IN THIS AREA BY OCT. 29, 1962.

A135

5. CRITICALITY AUDITS OF THIS ROOM WILL BE MADE DAILY.

YOUR EARLY ATTENTION TO THIS REQUEST IS RESPECTFULLY REQUESTED AND WILL BE SINCERELY APPRECIATED.

FM L A MEIERKORD, JR,
MANAGER OF MARKETING
WESTINGHOUSE ATOMIC FUEL DIVISION
CHESWICK, PENNA.

ONE CORRECTINONE CORRECTION FIRST PARAGRAPH FIFTH LINE FIFTH WORD SHOULD
B

XXXX ALARMS NOT ACARMUS

MSG SENT 3.50 END
RECD ONE MSG TU OUT LHG 0

RECEIVED
SEP 11 1962
U.S. Atomic Energy Commission
DIVISION OF
LICENSING & REGULATION

TWX INCOMING

8923

1962 SEP 11 PM 4 23

WESTINGHOUSE ATOMIC FUEL DIVISION CHESWICK, PENNA.

U.S. ATOMIC ENERGY COMM.
TWX UNIT

ON WAFD -3 TWX SENT AT 3.50 TODAY THERE WAS A CORRECTION IN THE FIRST PARAGRAPH THIRD LINE EIGHTH WORD SHOULD HAVE BEEN SLAB NOT SCAB.

MSG SENT S4.25 END

TU LHG 0

FROM: Westinghouse Cheswick Forms	DATE OF DOCUMENT: 9-11-62	DATE RECEIVED: 9-11-62	NO.: 8923
	LTR.	MEMO: REPORT:	OTHER: Telegram
TO: Nussbaumer	ORIG.: x	CC:	OTHER: 4 verifaxed cys.
	ACTION NECESSARY x ☐ / NO ACTION NECESSARY ☐	CONCURRENCE ☐ / COMMENT ☐	DATE ANSWERED: / BY:
CLASSIF.: U — POST OFFICE REG. NO.:	FILE CODE: 70-337		

DESCRIPTION: (Must Be Unclassified)
Tel req permission to store loaded and welded Yankee-3 Fuel rods mfg. under Amendment to SNM-338.
(Including Correction to Tel)

ENCLOSURES:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer	9-12		
w/file cy (file not in) cy for Compliance 1 Extra			
ACKNOWLEDGED		8923	

REMARKS: M R Distribution: 1 - AEC PDR
1 - H. Steele

U. S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM FORM AEC-326S (8-60)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1961 — 613958

LR:JCD
70-337

SEP 20 1962

Westinghouse Electric Corporation
Cheswick, Pennsylvania

Attention: Mr. L. A. Meierkord, Jr.

Gentlemen:

As requested by your teletype of September 19, 1962, we will consider your request of August 29, 1962, for license amendment cancelled.

Your cooperation in advising us that this amendment is no longer required is appreciated.

Very truly yours,

Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch
Division of Licensing and Regulation

Distribution:
Compliance (Hdqrs) 2 copies w/cy twx dtd 9/19/62
Formal
Doc. Rm.
Suppl.
Br & Div Rfs

A/36

OFFICE ▶	LR	LR				
SURNAME ▶	JCDelaney Delaney	DANussbaumer DN				
DATE ▶	9/20/62	9/20/62				

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

SEP 20 1962

Charles D. Luke, Chief
Criticality Evaluation Branch

Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch

WESTINGHOUSE REQUEST OF AUGUST 29, 1962, FOR LICENSE AMENDMENT
(70-337)

LR:JCD

Reference is made to our memorandum, subject as above, dated
August 29, 1962.

By teletype dated September 19, 1962, Westinghouse has
cancelled their August 29, 1962, request. Accordingly, you
need take no action on it.

A/37

OFFICE ▶	LR	LR				
SURNAME ▶	Delaney JCDelaney/ey	DANussbaumer				
DATE ▶	9/20/62	9/ /62				

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

70-337

L&R File Copy

Westinghouse Electric Corporation

Atomic Fuel Division

Cheswick, Penna.
Telephones: 274-6300
362-4400

September 26, 1962

DOCKETED
USAEC
Division of
Licensing & Regulation
SEP 28 1962
Docket Officer

Mr. D. A. Nussbaumer
Division of Licensing & Regulation
United States Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Nussbaumer:

Transmitted herewith is a license amendment for License SNM-338 for manufacture of SPERT fuel plates for Phillips Petroleum Co., Idaho Falls, Idaho. The SPERT fuel plates are needed by Phillips in the very near future, and your early review of this amendment is most respectfully requested.

Schedular commitments would be facilitated by approval by October 12, 1962.

Very truly yours,

WESTINGHOUSE ATOMIC FUEL DIVISION

L A Meierkord Jr

L. A. Meierkord, Jr.
Manager of Marketing

Copy Supplied
Public Document Room 10/1/62
Div. of Compliance 10/1/62
RRR

:ajb

Attach.

cc: Mr. R. E. Tschiegg, WAPD

A138

DOCKET NO. 70-337

L&R File Copy

Amendment to License SNM-338

For

SPERT Core

WAFD-L-104

DOCKETED
USAEC
Division of
Licensing & Regulation
SEP 2 1962
Docket Officer

Submitted by

Westinghouse Electric Corporation
Atomic Fuel Division
Cheswick, Pennsylvania

Prepared by:

W. D. Kelley

W. D. Kelley
Nuclear Safety Engineer

Approved by:

L. A. Meierkord, Jr.

L. A. Meierkord, Jr.
Manager of Marketing

9372

TABLE OF CONTENTS

I	Introduction
II	Personnel and Organization
III	Process and Flow of Work
IV	Nuclear Safety Limits and Storage
V	Health Physics Control
VI	Radiation Detectors
VII	Exposure Determination

I. INTRODUCTION

The Westinghouse Electric Corporation, Cheswick Divisions, Atomic Fuel Division, Cheswick, Pennsylvania, submits the following information in request to fabricate, inspect and package plates for the SPERT Core under the Phillips Petroleum Company specification SPT-1032 and SPT-1029, Revision 1.

SPERT fuel plates consist of highly (93%) enriched 24 weight percent uranium, 76 weight percent aluminum and 13 weight percent uranium, 87 weight percent aluminum, completely enclosed in aluminum cladding. The plates will contain (14) grams or seven (7) grams of U-235. The plates are 25-1/8 inches by 2.7 inches by .060 inches.

The plate fabrication will be done in Line 4 of Building 5-B. The final fabrication steps, inspection, and preparation for shipment of these components will be performed in the Assembly Area of Building 5-B. A diagram of Building 5-B is included in Appendix I.

Since there are two loadings involved, the heaviest loading is assumed for nuclear safety considerations and all material will be handled accordingly.

Less than 45 kgs. of U-235 will be required for fabrication.

A process outline is included in the Appendix.

II. PERSONNEL AND ORGANIZATION

The responsible personnel concerned with activities proposed under this report are:

A. Mr. W. R. Ellis
General Manager, Atomic Fuel Division

B. S. - Electrical Engineering
Missouri School of Mines
19 years with Westinghouse

B. Mr. L. A. Meierkord, Jr.
Manager of Marketing, AFD

B. S. - Industrial Engineering
Iowa State University
4 years - Los Alamos Scientific Laboratory
5 years - Rocky Flats Plant
5 years - Atomic Fuel Division

C. Mr. R. E. Bish
Manager of Commercial Manufacturing

B. S., M. S. - Metallurgical Engineering
Carnegie Institute of Technology
10 years - Westinghouse Engineering
6 years - Westinghouse Atomic Fuel Division

D. Mr. P. J. Koppel
General Foreman, Commercial

B. S. - Electrical Engineering
Missouri School of Mines

E. Mr. F. Cellier
Supervisor of Manufacturing Engineering

B. S. - Natural Science
Rutgers University

F. Mr. B. J. Bossick
Supervisor of Production Planning

20 years - Westinghouse Electric Corporation

II. PERSONNEL AND ORGANIZATION (CONT.)

G. Mr. R. H. Vogt
SPERT Project Engineer

B. S. - Metallurgical Engineering
Carnegie Institute of Technology
1-1/2 years - Westinghouse Atomic Fuel Division

H. Mr. P. K. Morrow
Supervisor of Accountability

B. S. - Lebanon Valley College
10 years - Materials Control, Monsanto Chemical Company
5 years - Materials Control, Westinghouse Electric Corporation

J. Mr. L. P. Hackler
Health Physicist

B. S. - Western Kentucky State College
Vanderbilt University
(AEC Radiological Physics Fellowship - 1958 - 1959)
1-1/2 years - Westinghouse Atomic Fuel Division

K. Mr. W. D. Kelley
Nuclear Safety Engineer

A. B. - Villa Madonna College
M. S. - University of Cincinnati
6 years - National Lead Company of Ohio
(AEC Feed Materials Production Center)

L. Mr. J. J. Groch, Jr.
Nuclear Materials Control Administrator

B. S. - Elmhurst College
M. S. - Loyola University
5 years - Argonne National Laboratory

Other Westinghouse personnel, located at nearby sites will provide consulting services:

A. Mr. E. C. Barnes
Manger, Radiation Protection

B. S. - Pennsylvania State University
2 years - Westinghouse Engineering
16 years - Westinghouse Headquarters Industrial Hygiene
11 years - Manager, Industrial Hygiene, Bettis Atomic Power Laboratory
Presently - Manager, Radiation Protection, Atomic Power Group

II. PERSONNEL AND ORGANIZATION (CONT.)

B. Mr. H. W. Speicher
Administrator, Industrial Hygiene

M. S. - Ohio State University
10 years - Industrial Hygiene Engineer
13 years - Administrator, Westinghouse Headquarters Industrial Hygiene

III. PROCESS AND FLOW OF WORK

A. Process

The uranium (fully enriched) is shipped to WAFD in birdcages which assure 12 inches separation. The birdcages are received at the WAFD Receiving Area where they are inspected for shipment damage. The incoming material is weighed after unpacking before it is stored in Vault 4-A. This weight assures that the proper quantity of uranium is present and that no extraneous material such as water has been inadvertently added to the container. The material is stored in the Highly Enriched storage racks of Vault 4-A. (See Appendix)

At the start of processing, uranium is moved from the Vault to the Charge Preparation Room (adjacent to the vault) where no more than one batch will be weighed for introduction into the manufacturing system. No other special nuclear material will be allowed in the Charge Preparation Room.

The uranium is hand carried in a 2-1/2 inch I.D. cylinder to the melting area for alloying with the aluminum. The aluminum is melted in a five inch I.D. crucible.

The alloy is cast into a six inch by 13-1/2 inch by 1-1/8 inch ingot. It is rolled to a dimension of six inches by 88 inches by 1/4 inch. About the top 15 inches is cropped off prior to rolling. The ingots in the heavy duty furnace are isolated from each other. All subsequent manufacturing operations are performed in safe batch sizes or less. The safe batch size calculation is contained in Section IV.

B. Fuel Movements

All fuel material will be moved on movecarts in safe batch size quantities or less. A minimum of six (6) inches of separation from the fuel to the outside of the movecart will be used to provide isolation from an adjacent movecart for the contingency of flooding.

C. Shipping

Completed fuel plates will be packed in approved shipping containers supplied by Phillips Petroleum Company. WAFD will not ship the plates.

III. PROCESS AND FLOW OF WORK (CONT.)

D. Process Wastes

Waste streams consist of grinding sludge, floor sweepings, filters, chemistry laboratory residues, combustible wastes, and non-combustible wastes. In all instances, either mass control or geometry control is utilized.

Contaminated water generated by grinding or machining is filtered or centrifuged to remove fines before recirculation to the machine. The residues of filtration or centrifugation are collected and packaged in five inch I.D. cans for shipment for reprocessing.

Floor sweepings are collected and packaged in five inch I.D. cans for shipment for reprocessing.

Filters are weighed before and after use, and safe mass control is used to limit packing in a drum for either recovery or burial.

Chemistry laboratory liquid wastes are collected in five inch diameter cylinders and shipped in safe geometry containers, or batched to a 350 gram U-235 maximum and shipped as safe mass. Solid wastes are packaged in five inch I.D. cans for shipment for reprocessing.

Combustible wastes are collected in metal drums and are stored outside the building on a concrete pad. These drums are shipped to a licensed incinerator for disposal.

Non-combustible solid waste is packaged in metal drums to such a weight that the U-235 does not exceed 350 grams. This limit is not approached since this waste consists mostly of contaminated hardware.

The birdcage used to ship the process wastes will consist of a central five inch I.D. Schedule 40 or heavier pipe and a birdcage structure covered with wire that will assure 12 inches separation. The shipping container is covered by Bureau of Explosives Permit No. 963. A diagram of the shipping container is included in the Appendix. When these birdcages are used for shipping liquid wastes, the liquid will be packed in a polyethylene bottle with a tight threaded cap, to a maximum U-235 content of 350 grams. These bottles will be centered in a metal container and packed with an absorbent material. These metal containers will then be placed in the five inch I.D. birdcage pipe.

III. PROCESS AND FLOW OF WORK (CONT.)

E. Scrap Accumulation and Recovery

All scrap will be collected after each batch is melted and after each shearing operation. The alloy scrap will be collected in five inch diameter cylinders and stored in Vault 4-A. If the scrap is in the form of a plate, it will be stored in a 1.5 inch slab rack located in Vault 4-A. All reclamation operations will be conducted in safe batch size quantities or less.

IV. NUCLEAR SAFETY LIMITS AND STORAGE

A. Batch Size Determination

The safe batch size for the uranium aluminum alloy is given below.

After alloying, the reduced density of the U-235 allows a factor of six to be applied to the mass limit (TID-7016, Revision 1, Page 23, fractional density of 0.044).

Safe batch size is 350 grams X 6 = 2,100 grams of U-235.

B. Ingot, Core and Plate Batch Size

1. For ingot - one ingot will be considered a safe batch size. An ingot will contain a maximum of 1400 grams of U-235.
2. For fillers and plates - the calculation is given below.

$$2100 \text{ grams} \div 14 \text{ grams} = 150 \text{ Cores or Plates}$$

C. Cylinder Determination

For solutions and residues, a maximum safe cylinder diameter of five inches is specified. This value was obtained from TID-7016, Revision 1, Figure 3, Safe Diameters of Isolated Cylinders of Homogenous Water Moderated Uranium (93.5% U-235), and assumes full reflector conditions. Use of this value is also confirmed by K-1019, Criticality Data and Nuclear Safety Guide Applicable to the Oak Ridge Gaseous Diffusion Plant, Table XIII, Dependence of Nuclearly Safe Geometric Variables Upon U-235 Enrichment.

D. Batch Size for Solution Work

A limit of 350 grams of U-235 is specified for all work involving corrosive liquids. Therefore, the safe batch size for plates or fillers is specified as 25.

E. Storage

Storage of all material will be in Vault 4-A. The solid angle calculations on Vault 4-A were submitted as part of amendment to License SNM-338 for the ATR Project dated April 25, 1962 and June 13, 1962. The vault will remain the same as specified with the exception that 2.5 inch horizontal columns will be replaced with racks of 1.5 inch slab geometry. The solid angle calculations for these configurations are included in the Appendix.

V. HEALTH PHYSICS CONTROL

Reference is made to the manual: Westinghouse Electric Corporation, Atomic Fuel Division, Cheswick, Pennsylvania, Health Physics Manual WAFD-HP-103, Revision 3, March 1, 1962. [In addition, the commitments made for the ATR License Amendment will be adhered to for this project.]

VI. RADIATION DETECTORS

The radiation detectors are connected in a multiple series circuit to obtain a coincidence feature that will necessitate two radiation detectors sensing the gamma radiation before the evacuation signal can be activated. This in no way impairs the speed or effectiveness of the system. It does, however, provide protection against false alarms.

Calculations show the compatibility and adequacy of the radiation detector locations with the coincidence features. A nuclear incident which will generate a radiation level of 300 rem. per hour at one foot from source at the incident was assumed in the final location and the number of radiation detectors needed. This is in accordance with 10CFR 70.24 (1). 10 to 20 mr. per hour has been set as the alarm level.

The radiation detectors used by Westinghouse Atomic Fuel Division are Model GA-2 designed and furnished by Nuclear Measurement Corporation of Indianapolis, Indiana. The following are some of the features of the Model GA-2 radiation detector.

A. The GA-2 is designed specifically to satisfy the requirements of Part 70.24.

B. The GA-2 scale goes from 0.05 to 50 mr./hr.

C. The response time of the Model GA-2 is less than 1/2 second.

D. The GA-2 cannot jam at high field intensities, short of melt down.

E. The Model GA-2 radiation detector is supplied with a small gamma source attached to the detector. The GA-2 indicates with this source approximately 0.08 mr./hr.

F. If a component failure occurs, the indicating meter will strike the lower contact, closing a relay which will light the amber light on the unit itself and at the monitor control panel located in the Atomic Fuel lobby. The amber light indicates a failure in either the component itself or a power failure.

G. A bell and red lamp indicate alarm level. The siren is connected to this same relay switch.

   In addition to the siren being activated automatically, they can also be activated manually. There is a manual control switch for each facility that can be operated from the Atomic Fuel Division lobby. To operate the signal, simply break the glass with the small hammer attached to the signal box. The siren will then sound automatically.

VI. RADIATION DETECTORS (CONT.)

The Appendix shows the locations of the radiation detectors. Complete coverage of all areas in which special nuclear materials are handled, processed or stored is provided by the monitoring alarms.

The radiation detectors are tested every three months using a low level radiation source. This testing involves a functional check of the entire system from the radiation detector up to and including the alarm signal.

VII. EXPOSURE DETERMINATION

All employees have a 0.010" X 0.25" X 1" strip of indium foil in their identification badge. Thus if a nuclear incident occurs, these strips of indium foil will become radioactive by neutron bombardment. The Assembly Point Control Team will survey these identification badges and if they read above 0.5 mr./hr. then the employee will be sent to the Medical Point at once.

Since most of the employees are not required to wear film badges, they (film badges) are placed at each exit and will be picked up by certain designated personnel and analyzed as soon as possible.

NOTE: The time and the intensity (mr./hr.) that the indium foil was found to be radioactive must be recorded. Also, the time that the film badges were picked up must be recorded.

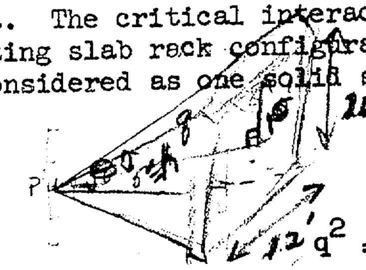
The following process outline is believed to be that which will be used for the routine manufacturing operations. The Nuclear Safety principles and controls already specified will be followed in all Inspection operations, reclamation of material and minor modifications in the manufacturing process outline. Should there be any major modifications, approval will be obtained.

1. Prepare Melt Charge
2. Melt and Cast Ingot
3. Hot Roll Ingot
4. Punch Fuel Cores
5. Clean Fuel Cores (Vapor Degrease)
6. Assemble Packets
7. Weld Packet
8. Hot Roll Packet
9. Blister Anneal
10. Surface Preparation (Pickle)
11. Rough Shear
12. Cold Roll and Level Roll
13. Fluoroscope
14. Decamber
15. Punch Holes
16. Shear Width and Length, and Corners and Deburr.
17. Inspection
18. Pack for Shipment

APPENDIX

VAULT 4-A

The same type 1.5 inch slab racks as specified in License to Amendment SNM-338 dated April 25, 1962, and June 13, 1962, will be used on both walls to store alloyed fuel material for the SPERT Contract. The critical interaction on this side will be on a central point of the existing slab rack configuration. For the calculation the opposite wall will be considered as one solid slab covering the entire wall.



$$\Omega = \frac{ab \cos \theta}{q^2}$$

$a = 20'$

$b = 12'$

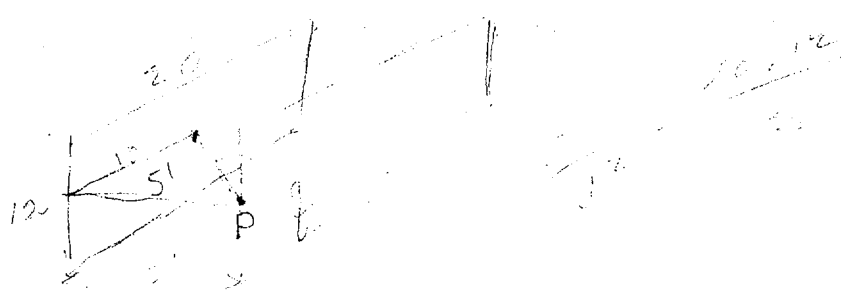
$q = \sqrt{(10)^2 + (5)^2} = 11.1$

$q^2 = 125$

$\cos \theta = \frac{5}{11.1} = 0.45$

$$\Omega = \frac{(20)\,(12)\,(.45)}{125} = 0.864$$

The interaction is less than one (1) steradian.



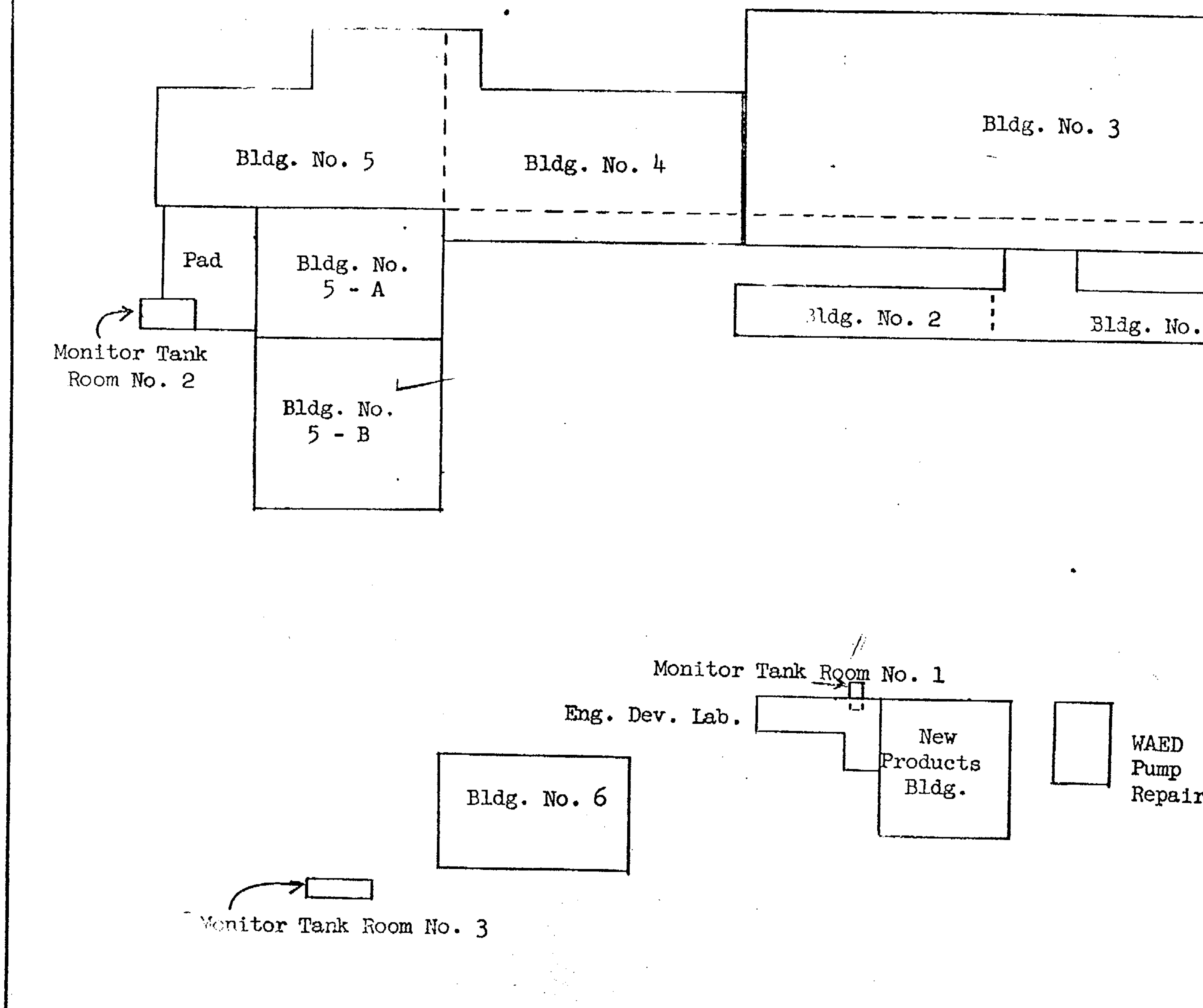


Figure 1
Layout of WAED - WAFD
Scale: 1" = 150'

2-26-62

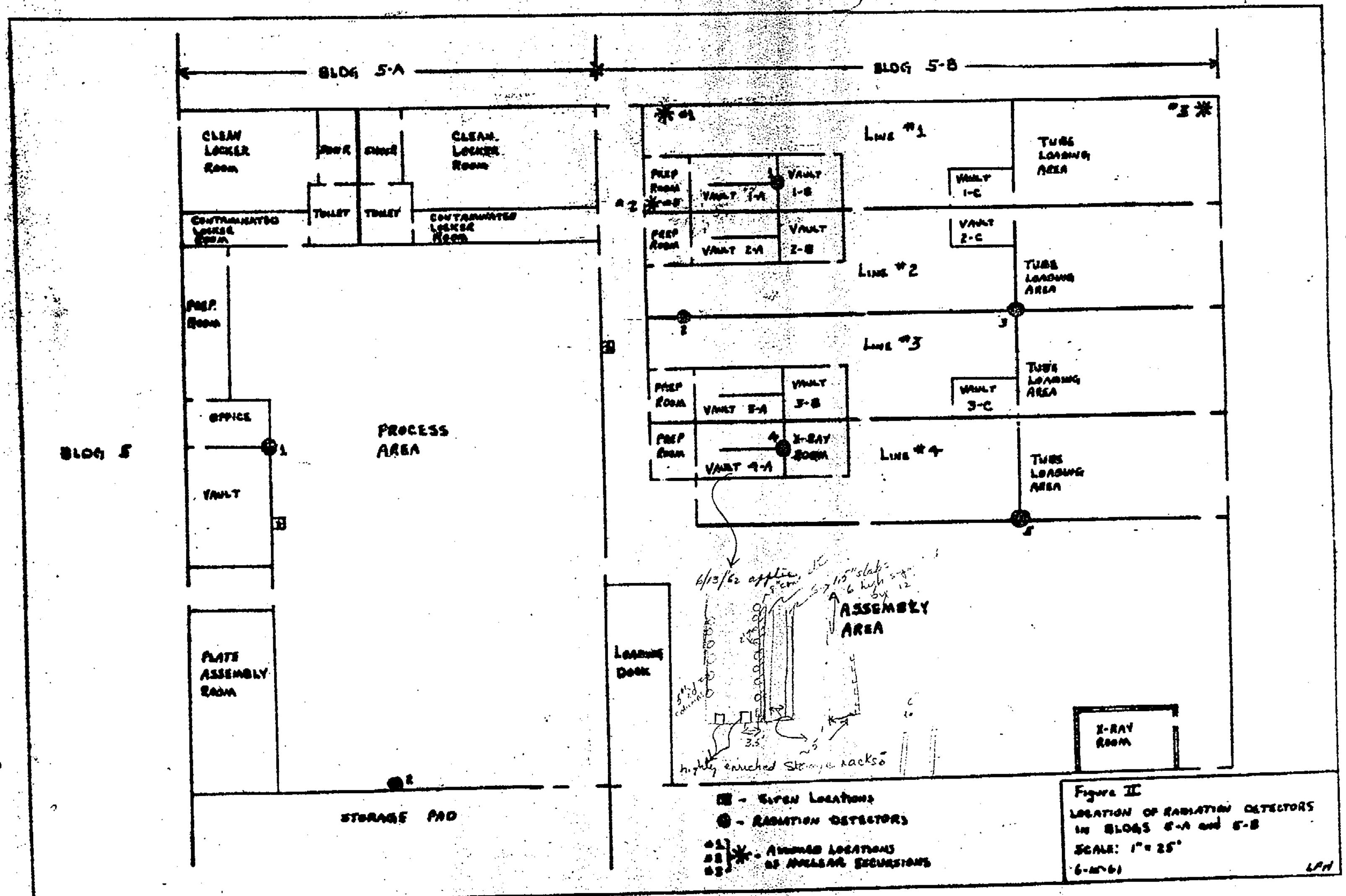


Figure II
LOCATION OF RADIATION DETECTORS IN BLDGS 5-A and 5-B
SCALE: 1" = 25'
6-[illegible]-61
LFH

FROM: Westinghouse Electric Company
Chemwick, Penna.
L. A. Meierkord, Jr.

DATE OF DOCUMENT: 9-26-62

DATE RECEIVED: 9-28-62

NO.: 9332

LTR: x | MEMO: | REPORT: | OTHER:

TO: Nussbaumer

ORIG.: x | CC: 2 | OTHER:

ACTION NECESSARY ☒ | NO ACTION NECESSARY ☐ | CONCURRENCE ☐ | COMMENT ☐ | DATE ANSWERED: | BY:

CLASSIF.: U

POST OFFICE REG. NO.:

FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)

Ltr trans:

ENCLOSURES: (3 cys rec'd)

WAPD-L-104, "Amendment to Lic SNM-338 For SPERT Cor," which furnishes info in req to fabricate, inspect and package plates for the SPERT Core under the Phillips Petroleum Co spec'n SPT-1032 and SPT-1029, Rev.

REMARKS:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer:	9-28		
w/file cy (file not in)			
cy for FDR (Thru E. Steele)			
cy for Compliance			

ACKNOWLEDGED

U. S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM FORM AEC-326S (8-60)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1961 — 613958

DOCKET NO. 70-337
L&R File Copy

Westinghouse Electric Corporation

Atomic Fuel Division
Cheswick, Penna.
Telephones: 274-6300
362-4400

DOCKETED
USAEC
Division of Licensing & Regulation
OCT 4 1962
Docket Officer

October 2, 1962

Mr. D. A. Nussbaumer
Division of Licensing & Regulation
United States Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Nussbaumer:

This letter is to advise you of a change in destination for encapsulated and sealed rods shipped under amendment to License SNM-338 for SELNI Core, WAFD-L-102, July 10, 1962.

The SELNI rods were to be shipped to Westinghouse Atomic Power Division, Forest Hills, Pennsylvania, on a Westinghouse vehicle, exclusive use service. The rods will now be shipped to L & S Machine Co., Latrobe, Pennsylvania.

There will be no change in shipping arrangements or shipping containers.

Thank you for your cooperation.

Very truly yours,

WESTINGHOUSE ATOMIC FUEL DIVISION

William D. Kelley

W. D. Kelley
Criticality Engineer

:ajb

Copy Sent
~~Public Document Room~~
Div. of Compliance 10/4/62 - RKK

RECEIVED
OCT 4 1962
U.S. Atomic Energy Commission
DIVISION OF LICENSING & REGULATION

ACKNOWLEDGED

A/39

9468

FROM: Westinghouse Electric Corporation
Cheswick, Penna.
W. O. Kelley

DATE OF DOCUMENT: 10-2-62
DATE RECEIVED: 10-4-62
NO.: 9468

LTR.	MEMO:	REPORT:	OTHER:
x			

ORIG.:	CC:	OTHER:
x	2	

TO: Nussbaumer

ACTION NECESSARY ☒
NO ACTION NECESSARY ☐
CONCURRENCE ☐
COMMENT ☐
DATE ANSWERED:
BY:

CLASSIF.: U
POST OFFICE
REG. NO.:
FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)
Ltr advising that the encapsulated and sealed rods shipped under amendment to SNM-338 for SNAP Core will ~~xx~~ now be shipped to L & S Machine Co., Latrobe, Pa.

ENCLOSURES:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer	10-4		
w/file cy (file not in) cy for Compliance			
ACKNOWLEDGED			

REMARKS: M R Distribution: 1 - AEC PHR (Thru H. Steele)

U. S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM FORM AEC-326S (8-60)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1961 — 613958

OCT 2 1962

C. D. Luke, Chief
Criticality Evaluation Branch, DL&R

Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, DL&R

WESTINGHOUSE ELECTRIC COMPANY, ATOMIC FUEL DIVISION: REQUEST FOR AMENDMENT OF SPECIAL NUCLEAR MATERIAL LICENSE NO. SNM-338 TO ALLOW FABRICATION OF SPERT FUEL ELEMENTS - DOCKET NO. 70-337

SYMBOL: DLR:RLL

Please review the subject application from the standpoint of nuclear safety.

Attachment:
Westinghouse Electric Company ltr. dtd
September 26, 1962

Distribution:
Suppl.
L&R reading
S&SNM reading
R. L. Layfield

A/40

OFFICE ▶	DL&R	DL&R				
SURNAME ▶	RRR Layfield:bar	RRR for DANussbaumer				
DATE ▶	10/1/62	10/1 /62				

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

C-036

TWX INCOMING

MSG TWO

1962 OCT 9 PM 3 05

WESTINGHOUSE ATOMIC FUEL 412-274-5650 OCTOBER 9, 1962

U.S. ATOMIC ENERGY COMM.
TWX UNIT

AFD-5

DOCKET NO. 70-337

L&R File Copy

TO D A NUSSBAUMER
DIVISION OF LICENSING AND REGULATION
USAEC, WASHINGTON, D. C.

DOCKETED
USAEC
Division of
Licensing & Regulation
OCT 9 1962
Docket Officer

FROM W D KELLEY
CRITICALITY ENGINEER

SUPPLEMENTAL DATA FOR REQUEST OF SEPTEMBER 21, 1962 TO CHANGE YANKEE CORE III INFINITE SLAB THICKNESS TO 4.0 INCHES FOLLOWS.

THE SEALED RODS WILL BE STORED IN THE ASSEMBLY AREA OF BLDG. 5-B /FIGURE II OF WAFD-L-102 JULY 10, 1962/.

THE RACK CONSISTS OF FOUR QUARTER INCH FLAT STEEL SHELVES AND STEEL FRAMEWORK THAT WILL NOT RETAIN WATER. TWELVE INCH ISOLATION DISTANCE BETWEEN FUEL ON SHELVES WILL BE MAINTAINED.

THE YANKEE FUEL WILL BE ISOLATED FROM OTHER SNM MATERIAL BY A 12 FOOT SEPARATION.

TELEGRAPHIC REQUEST OF SEPTEMBER 21 SUPPLANTS TELEGRAPHIC REQUEST OF SEPTEMBER 11, 1962.

MSGS SENT 3.00 PM

Copy Supplied
~~Public Document Room~~
Div. of Compliance 10/9/62-RRR

TED PLS AGT

RECEIVED
OCT 9 1962
U.S. Atomic Energy Commission
DIVISION OF LICENSING & REGULATION

TWX INCOMING

RCD OK TKS TNT

ACKNOWLEDGED

8587

A141

FROM: Westinghouse Electric Corporation
Cheswick, Pa.
W. D. Kelley

DATE OF DOCUMENT: 10-9-62
DATE RECEIVED: 10-9-62
NO.: 9587

LTR. | MEMO. | REPORT. | OTHER: Telegram

TO: Nussbaumer

ORIG.: X | CC. | OTHER:

ACTION NECESSARY ☒
NO ACTION NECESSARY ☐
CONCURRENCE ☐
COMMENT ☐
DATE ANSWERED:
BY:

CLASSIF.: U
POST OFFICE
REG. NO.:
FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)
Tel furnishing supplemental data for req of 9-21-62 to change Yankee Core III infinite slab thickness to 4.0" follows.

ENCLOSURES:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer:	10-9		
w/file cy.	(file not in)		
cy for Compliance			

REMARKS: M R Distribution: 1 - AEC PDR
1 - H. Steele

ACKNOWLEDGED

9587

U. S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM FORM AEC-326S (8-60)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1961 — 613958

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Files

DATE: 10/9/62

Frances K. Durkan

FROM : Frances K. Durkan
Criticality Evaluation Br.

SUBJECT: TELECON OF OCTOBER 9, 1962 WITH W. D. KELLEY, CRITICALITY ENGINEER, WESTINGHOUSE ELECTRIC CORP. RE STORAGE OF YANKEE CORE III RODS - DOCKET 70-337

Upon review of the September 21, 1962 application, requesting amendment to License SNM-338 to use a 4" infinite slab for loaded and welded Yankee Core III rod storage, the subject telecon was made and the following confirmations were requested:

1. Storage will be in the inspection area of Bldg. 5B. (The designated area will be described by specific reference to previous application).

2. The tray-shelf arrangement will not permit water retention between unflooded subject rods.

3. The storage arrangement proposed is identical to that described by Westinghouse Atomic Power Division in its application for amendment, License SNM-38 - Docket 70-43, dated May 18, 1962.

4. The subject special nuclear material, with a maximum storage dimension of 9', will be isolated from all other SNM (viz, the EGCR rods at 2.46% enrichment) in the inspection area by 12' minimum separation distance.

5. The initial application dated September 11, 1962 is superseded by application dated September 21, 1962.

A142

Layfield

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Br.

DATE: October 10, 1962

FROM : Charles D. Luke, Chief CDL
Criticality Evaluation Br.

SUBJECT: WESTINGHOUSE ELECTRIC CORP. OCTOBER 9, 1962 TWX SUPPLEMENTING SEPTEMBER 21, 1962 APPLICATION - DOCKET 70-337

Ref: DLR:FKD

We have reviewed the subject supplemental data which supports the September 21, 1962 application requesting amendment to License SNM-338 to use a 4" infinite slab for loaded and welded Yankee Core III rod storage.

The subject TWX satisfactorily resolves all the outstanding issues.

In conclusion, we recommend approval of the subject application, as supplemented by the subject TWX, but request that you incorporate the following proviso from Section 70.57 of 10 CFR 70, as proposed, in your confirming correspondence to the applicant:

> "An array of special nuclear material shall be considered isolated from another array of special nuclear material if the separation is greater than the larger of the following distances:
>
> a. twelve feet, or
>
> b. the greatest distance across an orthographic projection of either array on a plane perpendicular to a line joining their centers."

Attachment:
TWX fm WEC dtd 10/9/62

CC: R. Layfield

A143

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Files

DATE: October 17, 1962

Frances K Durkan

FROM : Frances K. Durkan
Criticality Evaluation Br.

SUBJECT: WESTINGHOUSE ELECTRIC CORP. TELECON OF OCTOBER 17, 1962 WITH W.D. KELLEY, CRITICALITY ENGINEER, REGARDING APPLICATION DATED SEPTEMBER 26, 1962 - DOCKET 70-337

By license application dated September 26, 1962, Westinghouse has requested amendment to License SNM-338 to allow fabrication, inspection and packaging of SPERT fuel plates for Phillips Petroleum Co. SPERT fuel plates consist of highly enriched (93%) 24 w/o uranium, 76 w/o aluminum and 13 w/o uranium, 87 w/o aluminum, completely enclosed in aluminum cladding. Each plate will contain 7 to 14 grams U-235 and will measure 25 1/8" x 2.7" x .06". A total of less than 45 kg. U-235 will be required for the plate fabrication which will be done in Line 4 and the Assembly Area of Bldg. 5-B.

By the subject telecon we have requested the applicant to confirm the following:

1. The subject special nuclear material will be isolated from other SNM or proven to be nuclearly safe in the presence of other SNM (viz, SELNI low enriched oxide) in the Assembly Area.

2. At the start of processing, uranium is moved from the highly enriched storage racks of Vault 4A to the Charge Preparation Room in a safe diameter (2.5" I.D.) container. No more than one weigh~~t~~ed-out batch contained in the safe diameter container will be introduced into the manufacturing system.

3. Nuclear safety of the highly enriched storage in Vault 4A is based on safe diameter (2.5" I.D. containers) which is safe from interaction with the 5" I.D. scrap cylinders (see application dated June 13, 1962).

4. Ingots (1.4 kg U-235) are isolated in the case of flooding in the heavy duty furnace. No more than two ingots will be present in the oven at any one time.

A144

5. The amount of U-235 in the form of clad plates or cores when added to the U-235 in any solution bath will not exceed 350 grams U-235 total.

6. Solid angle calculations for plate storage in Vault 4A, considering each 1.5" thick slab as a unit, results in a total solid angle of less than one steradian.

If approval for the process waste 5" I.D. container enclosed in a wire mesh-covered birdcage (Bureau of Explosive Permit No. 963) is requested under this license amendment, we would request shipping procedures.

DOCKET NO. 70-337

Westinghouse Electric Corporation

L&R File Copy

Atomic Fuel Division

Cheswick, Penna.
Telephones: 274-6300
362-4400

RECEIVED
OCT 22 1962
U.S. Atomic Energy Commission
DIVISION OF
LICENSING & REGULATION

October 18, 1962

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

Dear Mr. Nussbaumer:

Transmitted herewith is a license amendment for License SNM-338 for the fabrication of SELNI Fuel Assemblies.

As you know, Mr. W. D. Kelley has recently joined our staff as Nuclear Safety Engineer from National Lead Company of Ohio. I feel it desirable for your staff and Mr. Kelley to become better acquainted so that he may more fully understand and fulfill your requirements. If any questions should arise on this License Amendment request, please feel free to call me and I will arrange for Mr. Kelley to go to Washington to meet with you and/or your staff at your earliest convenience.

Due to schedular commitments, approval is respectfully requested by November 20, 1962.

DOCKETED
USAEC
Division of
Licensing & Regulation
OCT 22 1962
asc
Docket Officer

Very truly yours,

WESTINGHOUSE ATOMIC FUEL DIVISION

L A Meierkord

L. A. Meierkord, Jr.
Manager of Marketing

:ajb

Attach.

cc: Mr. R. E. Tschiegg, WAPD

Copy Supplied
Public Document Room
Div. of Compliance
10/23/62 - RXE

A145

ACKNOWLEDGED

9883

Amendment to License SNM-338
For
Selni Core "Fuel Assembly"

WAFD-L-105

DOCKET NO. 70-337

L&R File Copy

Submitted by

Westinghouse Electric Corporation
Atomic Fuel Division
Cheswick, Pennsylvania

RECEIVED
OCT 22 1962
U.S. Atomic Energy Commission
LICENSING & REGULATION

DOCKETED
USAEC
Division of
Licensing & Regulation
OCT 22 1962
asc
Docket Officer

Prepared by

W. D. Kelley

W. D. Kelley
Nuclear Safety Engineer

Approved by

L. A. Meierkord, Jr.
Manager of Marketing

9883

TABLE OF CONTENTS

I	Introduction
II	Personnel and Organization
III	Process and Flow of Work
IV	Nuclear Safety Limits
V	Health Physics Control
VI	Radiation Detectors
VII	Exposure Determination

I. INTRODUCTION

The Westinghouse Electric Corporation, Cheswick Divisions, Atomic Fuel Division, Cheswick, Pennsylvania, submits the following information in request to fabricate, inspect, and package the Selni Core "Fuel Assemblies".

The work to be carried out under this Amendment to License SNM-338 request will consist of the fabrication, inspection and packaging of the Fuel Assemlbies from rods manufactured under Amendment to License SNM-338 for Selni Core, WAFD-L-102, dated July 10, 1962, Docket 70-337.

The work will be done in the Commercial High Bay Manufacturing Facility. Diagrams of the plant layout and of the Commercial High Bay Manufacturing Facility in the New Products Building are included in the Appendix.

The Selni Fuel Assembly consists of 208 fuel rods mechanically fastened into a frame. The overall dimensions of the Fuel Assembly are 8 inches by 8 inches by 126 inches. The fuel rods are 109 inches in length by 0.390 inches in diameter. The weight of the Fuel Assembly is about 1500 pounds.

II. PERSONNEL AND ORGANIZATION

Mr. R. K. McDevitt
General Manager, Cheswick Divisions and Atomic Fuel Division

27 years - Westinghouse Management
2 years - Cheswick Divisions

Mr. W. R. Ellis
Manager, Atomic Fuel Division, Commercial

B. S. - Electrical Engineering
Missouri School of Mines
19 years with Westinghouse

Mr. L. A. Meierkord, Jr.
Manager of Marketing

B. S. - Industrial Engineering
Iowa State University
4 years - Los Alamos Scientific Laboratory
5 years - Rocky Flats Plant
5 years - Westinghouse Atomic Fuel Division

Mr. R. E. Bish
Manager of Commercial Manufacturing

B. S., M. S. - Metallurgical Engineering
Carnegie Institute of Technology
10 years in Westinghouse Engineering
6 years - Westinghouse Atomic Fuel Division

Mr. P. J. Koppel
General Foreman, Commercial

B. S. - Electrical Engineering
Missouri School of Mines

Mr. F. Cellier
Supervisor of Manufacturing Engineering

B. S. - Rutgers University

Mr. B. J. Bossick
Supervisor of Production Planning

20 years with Westinghouse Electric Corporation

II. PERSONNEL AND ORGANIZATION (CONT.)

Mr. P. K. Morrow
Supervisor of Accountability, Health Physics and Nuclear Safety

B. S. - Lebanon Valley College
10 years - Materials Control, Monsanto Chemical Company
5 years - Materials Control, Westinghouse Electric Corporation

Mr. W. D. Kelley
Nuclear Safety Engineer

A. B. - Villa Madonna College
M. S. - University of Cincinnati
6 years - National Lead Company of Ohio
(AEC Feed Materials Production Center)

Mr. W. D. Kelley
Interim Health Physicist

Mr. E. C. Barnes
Health Physics Consultant

Mr. J. J. Groch
Nuclear Materials Control Administrator

B. S. - Elmhurst College
M. S. - Loyola University
5 years - Argonne National Laboratory

Other Westinghouse personnel, located at near-by sites will provide consulting services:

Mr. E. C. Barnes
Manager, Radiation Protection

B. S. - Pennsylvania State University
2 years in Westinghouse Engineering
16 years - Westinghouse Headquarters Industrial Hygiene
11 years - Manager, Industrial Hygiene, Bettis Atomic Power Laboratory
Presently - Manager, Radiation Protection, Atomic Power Group

Mr. H. W. Speicher
Administrator, Industrial Hygiene

M. S. - Ohio State University
10 years - Industiral Hygiene Engineer
13 years - Administrator, Westinghouse Headquarters Industrial Hygiene

III. PROCESS AND FLOW OF WORK

Fuel Rod Transfer

Fuel rods will be moved from Building 5-B after fabrication and inspection to the High Bay Commercial Manufacturing Facility, a distance of about 1000 feet. The transfer will be made using the Selni Transfer Box (see Appendix). The two slabs of the transfer box will each be restricted to two (2) inches in height and 1200 pounds combined weight. The on site transfer will be made by the exclusive use of a Westinghouse vehicle.

Rod Storage and Handling

The fuel rods will be stored in a safe slab geometry in the Fuel Rod Storage Area. All rod storage and handling operations will use the safe slab geometry as the nuclear safety control.

Fuel Assembly Fabrication

The Fuel Assembly fixture holds the assembly in a fixed horizontal position. Rods will be individually loaded from either end. The rods that are to be loaded into the Assembly fixture will be kept one (1) foot away from the Fuel Assembly. Fuel Assemblies, comprising 208 rods, will be put together one at a time.

Fuel Assembly Operations and Movements

After the Fuel Assembly is completed, it is moved into a vertical position by a crane. The Fuel Assembly will be retained in the vertical position for all subsequent operations and inspections.

All Fuel Assembly movements will be made by crane. The Fuel Assemblies can not be moved over any other fuel material as there is insufficient clearance to move the Fuel Assembly over another Fuel Assembly or the rod storage racks. All Fuel Assemblies will be separated by at least 12 inches. The weight of the Fuel Assembly (about 1500 pounds) makes movements by crane a necessity as there will be no wheeled vehicles available.

All assembly, inspection and repair operations will be done dry. Cleaning will be done in water solutions. Only one (1) Fuel Assembly will be in the cleaning operation at one time. The Fuel Assembly will be supported by a crane and the crane can support only one (1) Fuel Assembly so there is no chance of overloading any single tank or loading adjacent tanks. Fuel rods are leak tested and inspected for integrity, so it is very unlikely that there would be any defective rods for water to enter.

III. PROCESS AND FLOW OF WORK (CONT.)

Completed Fuel Assembly Storage

The Fuel Assemblies will be stored in the Assembly Storage Area in the vertical position. A separation of one (1) foot will be maintained between Fuel Assemblies. linear or square array

Shipping

The Fuel Assemblies will be loaded individually into approved shipping containers provided by Westinghouse Atomic Power Division, Forest Hills, Pennsylvania. Shipments will be made according to the approved instructions of the Atomic Power Division. approv

Process Wastes

Since there will be no exposed fuel in any of the operations, there should be no uranium bearing process wastes. If any contaminated waste should develop, it will be handled according to the requirements of Amendment to License SNM-338 for Selni Core, dated July 10, 1962, Docket 70-337.

IV. NUCLEAR SAFETY LIMITS

Fast Criticality Control

The highest enrichement in the Selni Core is 3.90 w/o U-235. A fast reaction is not possible with this or lower enrichments.

Slab Determination

A safe slab thickness of 3.5 inches has been specified. This value for the sealed fuel rods is taken from TID-7016, Revision 1, Page 21. The 3.5 inch slab is used for the Selni sealed rod operations in Building 5-B. This value was approved for Amendment to License SNM-338 for Selni Core, WAFD-L-102, dated July 10, 1962.

Fuel Assembly

Westinghouse Atomic Power Division, Forest Hills, Pennsylvania, has performed a safety analysis for the manufactured Fuel Assembly. (RD-NE-1019). The multiplication factor of the fully loaded assembly has been determined to be 0.78 for a fully moderated and reflected system. A copy of the safety analysis certification is included in the Appendix. The analysis was performed using the standard WAPD design techniques as approved for use in their Amendment to License SNM-38 for Yankee Core III, dated May 18, 1962, Docket 70-43.

Slow Neutron Isolation

All Fuel Assemblies, and rod slab configurations will be separated by 12 inches to insure isolation in case of flooding. In the liquid cleaning tanks only one assembly will be in the area at a time so interaction will not be a problem.

V. HEALTH PHYSICS CONTROL

Reference is made to the manual:

Westinghouse Electric Corporation

Atomic Fuel Division

Cheswick, Pennsylvania

Health Physics Manual WAFD-HP-103

Revision 3, March 1, 1962

Provisions of the Health Physics Manual will apply to and be extended to cover the Commercial High Bay Manufacturing Facility in which the Fuel Assembly fabrication will be performed.

VI. RADIATION DETECTORS

The radiation detectors are connected in a multiple series circuit to obtain a coincidence feature that will necessitate two radiation detectors sensing the gamma radiation before the evacuation signal can be activated. This in no way impairs the speed or effectiveness of the system. It does, however, provide protection against <u>false alarms</u>.

are there 2 monitors within 120' of a given SNM location

Calculations show the compatibility and adequacy of the radiation detector locations with the coincidence features. A nuclear incident which will generate a radiation level of 300 rem. per hour at one foot from source at the incident was assumed in the final location and the number of radiation detectors needed. This is in accordance with 10CFR 70.24 (1). 10 to 20 mr. per hour has been set as the alarm level.

Where located

have they made allowance for concrete etc in the 120' rad?

The radiation detectors used by Westinghouse Atomic Fuel Division are Model GA-2 designed and furnished by Nuclear Measurement Corporation of Indianapolis, Indiana. The following are some of the features of the Model GA-2 radiation detector.

A. The GA-2 is designed specifically to satisfy the requirements of Part 70.24.

B. The GA-2 scale goes from 0.05 to 50 mr./hr.

C. The response time of the Model GA-2 is less than 1/2 second. to what γ's

D. The GA-2 cannot jam at high field intensities, short of melt down.

E. The Model GA-2 radiation detector is supplied with a small gamma source attached to the detector. The GA-2 indicates with this source approximately 0.08 mr./hr.

F. If a component failure occurs, the indicating meter will strike the lower contact, closing a relay which will light the amber light on the unit itself and at the monitor control panel located in the Atomic Fuel lobby. The amber light indicates a failure in either the component itself or a power failure.

G. A bell and red lamp indicate alarm level. The siren is connected to this same relay switch.

In addition to the siren being activated automatically, they can also be activated manually. There is a manual control switch for each facility that can be operated from the Atomic Fuel Division lobby. To operate the signal, simply break the glass with the small hammer attached to the signal box. The siren will then sound automatically.

VI. RADIATION DETECTORS (CONT.)

The Appendix shows the locations No of the radiation detectors. Complete coverage of all areas in which special nuclear materials are handled, processed or stored is provided by the monitoring alarms.

The radiation detectors are tested every three months using a low level radiation source. This testing involves a functional check of the entire system from the radiation detector up to and including the alarm signal.

VII. EXPOSURE DETERMINATION

All employees have a 0.010" X 0.25" X 1" strip of indium foil in their identification badge. Thus if a nuclear incident occurs, these strips of indium foil will become radioactive by neutron bombardment. The Assembly Point Control Team will survey these identification badges and if they read above 0.5 mr./hr., then the employee will be sent to the Medical Point at once.

Since most of the employees are not required to wear film badges, they (film badges) are placed at each exit and will be picked up by certain designated personnel and analyzed as soon as possible.

NOTE: The time and the intensity (mr./hr.) that the indium foil was found to be radioactive must be recorded. Also, the time that the film badges were picked up must be recorded.

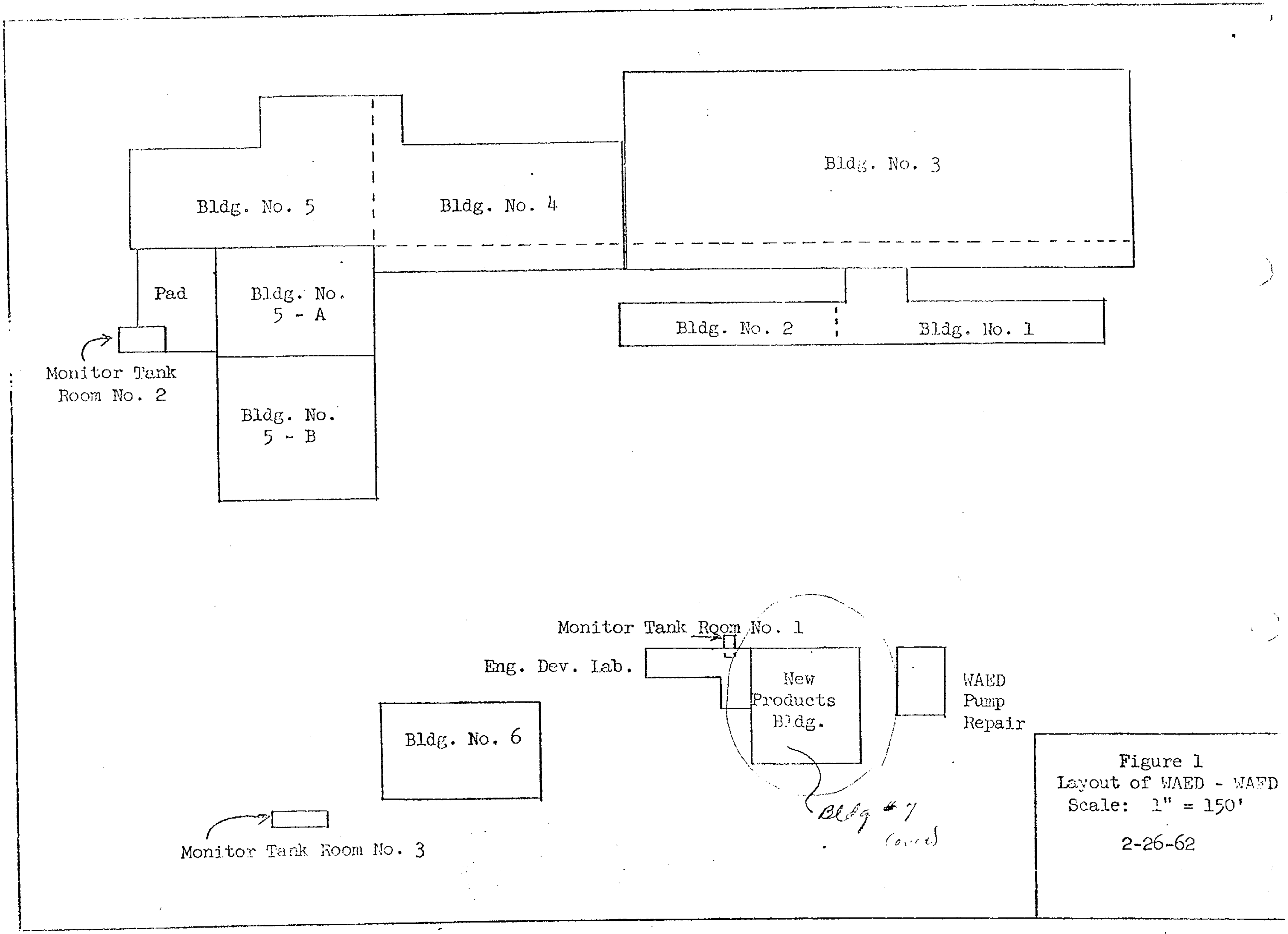
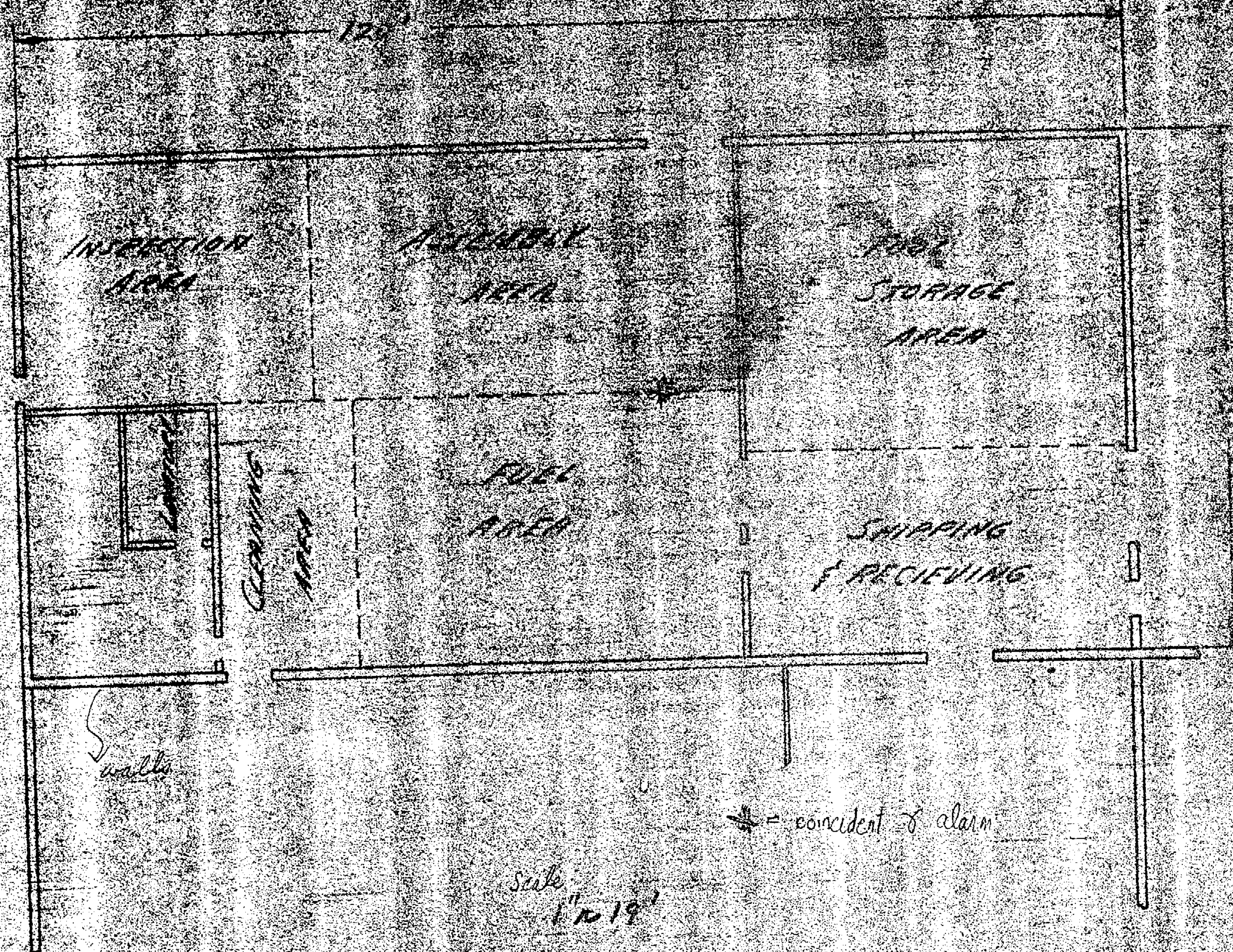
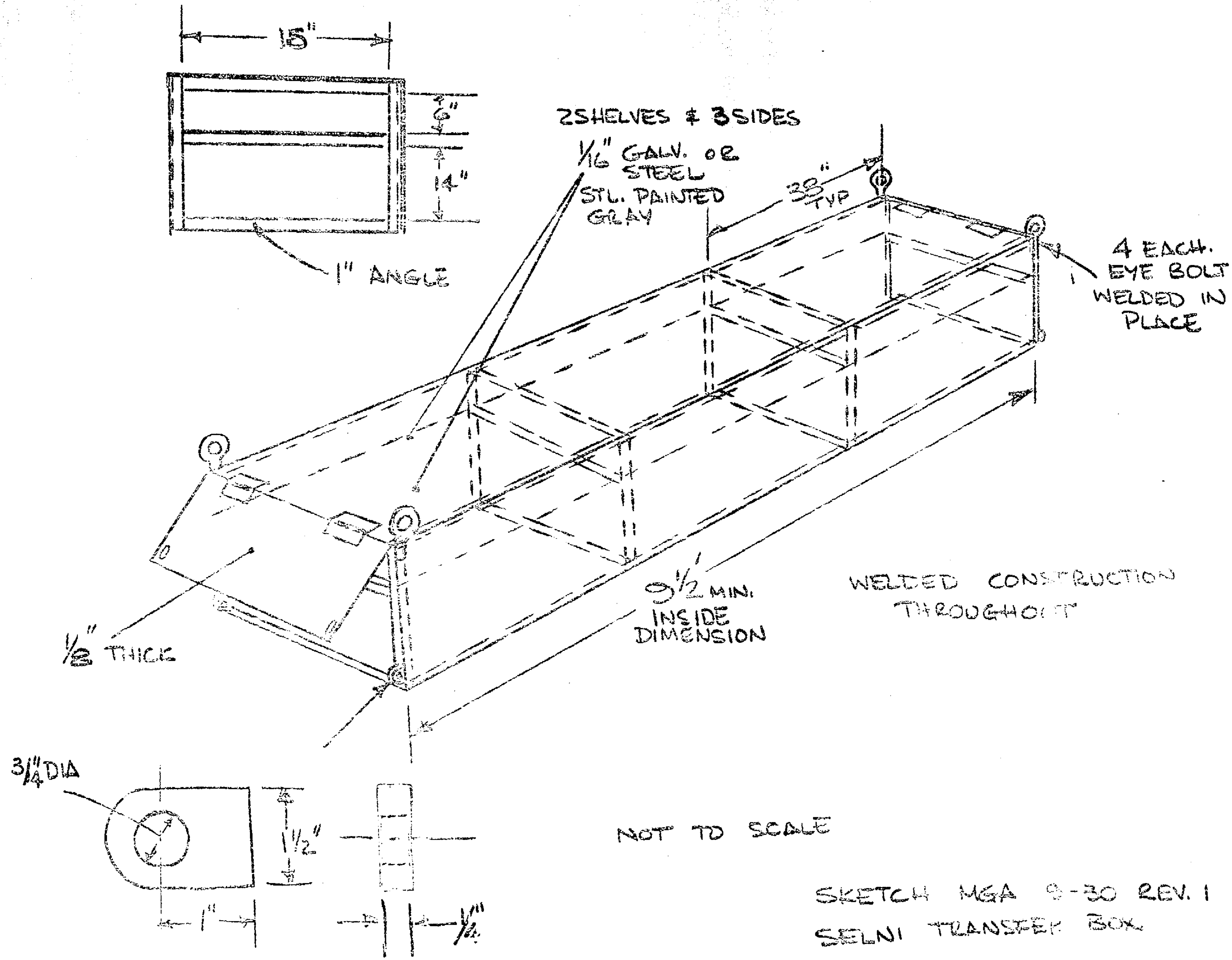


Figure 1
Layout of WAED - WAFD
Scale: 1" = 150'

2-26-62



BUILDING #7 SEMI ASSEMBLY LAYOUT



SKETCH MGA 9-30 REV. 1
SELNI TRANSFER BOX

RD-NE-1019

ATOMIC FUEL DEPARTMENT

L. A. Meierkord, Manager
Marketing

cc - R. J. Creagan
W. E. Abbott
H. L. Russo
R. J. French

From: Atomic Power Division

Date: October 5, 1962

Subject: Criticality for One Selni Fuel Assembly

In order to determine the criticality of one Selni fuel assembly placed in water, a calculation has been performed using the two-dimensional distribution analysis presently employed at WAPD. The highest enrichment of the Selni first core (3.90 w/o) was used and the assembly was completely surrounded by water. The neutron multiplication was found to be 0.78.

It has been demonstrated on the basis of comparison with experiment that this method of computing the neutron multiplication is accurate to within ~ 1%. There is sufficient margin between the computed value of multiplication for a single assembly and criticality to ensure safety for any single Selni fuel assembly placed in water.

APD - Reactor Development - PWR Nuclear Design Group
Nuclear Engineering Sec. - D. L. Miller

D. L. Miller

Approved: R. J. French

R. J. French, Supervisor
PWR Nuclear Design Group
Nuclear Engineering Sec.

FROM: Westinghouse Electric Corp.
Cheswick, Pennsylvania

DATE OF DOCUMENT: 10-18-62

DATE RECEIVED: 10-22-62

NO.: 9883

LTR.: x & encl. MEMO: REPORT: OTHER:

ORIG.: x CC: 2 OTHER:

ACTION NECESSARY ☐ CONCURRENCE ☐ DATE ANSWERED:

NO ACTION NECESSARY ☐ COMMENT ☐ BY:

TO: D. Nussbaumer
Div. of L&R

CLASSIF.: U

POST OFFICE

REG. NO:

FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)
Ltr. trans:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer:	10-22-62		
w/file cy.			
1-PDR Copy			
2-compliance cys.			
		ACKNOWLEDGED	

ENCLOSURES:

License amendment for lic. SNM-338 for the fabrication of SELNI Fuel Assemblies.

REMARKS: Mail Room Distribution:
~~[illegible]~~
1-Helen Steele

U. S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM

FORM AEC-326S (8-60)

☆ U. S. Government Printing Office: 1962 - 637308

5-44

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Charles E. Luke, Chief
Criticality Evaluation Branch

DATE: OCT 25 1962

FROM : Donald A. Nussbaumer, Chief DN
Source & Special Nuclear Materials Branch

SUBJECT: WESTINGHOUSE ELECTRIC CORPORATION'S APPLICATION DATED OCTOBER 18, 1962, FOR FABRICATION, INSPECTION AND PACKAGING OF FUEL ASSEMBLIES FOR THE SELNI CORE - DOCKET NO. 70-337

L&R:RLL

Please review this application from the standpoint of nuclear safety and return the application with your comments to this office.

Attachment:
Appl. dtd 10-18-62, w/o docket

A146

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

Layfield

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Br.

DATE: November 21, 1962

FROM : Charles D. Luke, Chief
Criticality Evaluation Br. CDL

SUBJECT: WESTINGHOUSE ELECTRIC CORP. (AFD) OCTOBER 18, 1962 APPLICATION REQUESTING AMENDMENT TO LICENSE SNM-338 TO COVER ASSEMBLY OF SELNI FUEL ELEMENTS - DOCKET 70-337

Ref: DLR:FKD

Westinghouse requests amendment to License SNM-338 to cover transfer of the SELNI fuel rods from Building 5B after fabrication and inspection to the High Bay Commercial Manufacturing Facility (Bldg. 7), where the fuel rods will be loaded into assembly fixtures.

The highest enrichment in the SELNI core is 3.9 w/o U-235. Each assembly consists of 208 fuel rods mechanically fastened into a frame. The calculated multiplication constant for the fully moderated and reflected assemby has been determined to be 0.78, using the standard WAPD two-dimensional, distributional analysis technique. We believe the calculative method is reliable.

In view of the fact that a fast reaction is not possible for enrichments of less than 5%, we are in agreement with the applicant that during receipt, assembling and storage, the 12 inch separation distance provided between all fuel assemblies and the 2 inch safe slab rod configurations assures nuclear isolation in case of flooding.

However, we require further information, as follows:

1. Radiation Detectors. Plan view showing the location of two coincidence radiation detectors in relation to each special nuclear material location, together with a demonstration that the gamma attenuation by concrete and other intervening shielding has been taken into consideration in locating the monitors.

A147

2. Scrap Packaging and Shipping Procedures. Approval of the applicant's July 11, 1962 request was made subject to reconciliation of the problems associated with their scrap packaging and shipping procedures (CEB memo dated July 17, 1962). No response has been received to date.

3. Mingling. If any special nuclear material other than the subject material will be present in Bldg. 7, additional information will be required, to include area identification and demonstrate compliance with our isolation criteria.

4. Mode of Transport to APD. No mention is made in APD application dated 11/15/62 regarding the transfer procedures from AFD to APD. We have recommended approval of the fuel assembly shipping containers (CEB memo dated 11/21/62).

Attachment:
Ltr fm WEC dtd 10/18/62

Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch, DL&R
Attention: John Lane

November 23, 1962

70-337

Christian Beck, Staff Engineer - Structural
Fuels Processing Branch, DL&R

WESTINGHOUSE APPLICATION OF NOVEMBER 15, 1962, FOR SHIPPING PROCEDURE APPROVAL (SELNI)

I have reviewed the data presented regarding structural integrity of subject design, and offer the following comments for your consideration:

a. No data have been presented, and apparently no attempt has been made, regarding compliance with proposed Part 71 (in this case, Class III). However, conversation on this date with the Criticality Evaluation group revealed that strict structural compliance with Part 71 is not required in subject case.

b. According to my calculations the Fuel Assembly container shell does not meet the puncture requirement of Part 71; however, the Fuel Follower container shell shows the satisfactory puncture strength. The shock loadings designed against, viz., 6 G's and 11 G's for the two container types, would not take care of the 30' drop test on an unyielding surface, as prescribed in Part 71 for Class III shipments.

OFFICE ▶	DLR:FPB					A/48
SURNAME ▶	CBeck:fwn					
DATE ▶	11/23/62					

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Files

DATE: NOV 27 1962

R. L. Layfield

FROM : R. L. Layfield
Source and Special Nuclear Materials Branch
Division of Licensing and Regulation

SUBJECT: WESTINGHOUSE ELECTRIC CORPORATION LETTER DATED OCTOBER 18, 1962-APPLICATION FOR AUTHORIZATION TO ASSEMBLE SELNI RODS INTO FUEL ASSEMBLIES - REFERENCE: DLR:RLL 70-337

DLR:RLL

A call was made to W. D. Kelley and L. A. Meierkord of W. E. C. on November 26, requesting the information deemed as outstanding in C. E. B. memo dated November 21, 1962 for completion of the review of this amendment.

A/49

DOCKET NO. 70-337

L&R File Copy

Westinghouse Electric Corporation

Atomic Fuel Department
Cheswick, Penna.
Telephones: BRoad 4-6300
EMerson 2-4400

December 4, 1962

DOCKETED USAEC Division of Licensing & Regulation DEC 6 - 1962 asc Docket Officer

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

Attention: Mr. D. A. Nussbaumer, Chief
Special Nuclear Materials Branch

Dear Sir:

The following supplementary information is provided for the Amendment to License SNM-338 for SELNI Core "Fuel Assembly" request. Per my conversation with Mr. R. Layfield of your office, the following points are clarified:

1. Where are the gamma alarms located?

   The gamma alarms are located at the intersection of the Assembly Area and the Fuel Area within ten (10) feet of the wall separating these areas from the Tool Storage Area. The gamma alarms are suspended from a rafter about sixteen (16) feet above the floor level. The wall pictured in the "Building #7 SELNI Assembly Layout" is composition board. There are no physical barriers between the Assembly Area, Fuel Area, Inspection Area, and Cleaning Area.

2. How will shipping of scrap be handled?

   It is not expected that any uranium bearing process waste will be generated in these operations. However, should any such process waste occur, it will be packaged and shipped in a shipping container that will be approved by your office in a forthcoming Addendum to Amendment to License SNM-338 for SELNI Core, dated July 10, 1962, Docket 70-337. No packaging or shipping will be done until approval is received.

12/10/62 RKK

RECEIVED DEC 6 - 1962 U.S. Atomic Energy Commission DIVISION OF LICENSING & REGULATION

A/50

ACKNOWLEDGED

3. Will other Special Nuclear Material be in Building #7, SELNI Assembly Area, during the duration of this project?

   It is expected that there will be no other Special Nuclear Material in Building #7, SELNI Assembly Area, during the duration of this project. If the need should arise for other Special Nuclear Material to be in the area, it will be kept nuclear isolated from the SELNI material. The criteria to be used is:

   An array of Special Nuclear Material shall be considered isolated from another array of Special Nuclear Material if the separation is greater than the larger of the following distances:

   A. Twelve feet; or

   B. The greatest distance across an orthographic projection of either array on a plane perpendicular to a line joining their centers.

4. Will WAFD ship the Fuel Assemblies to Westinghouse Atomic Power Division, Forest Hills, Pennsylvania?

   WAFD will ship the Fuel Assemblies in approved shipping containers directly to Italy with no stop at WAPD, Forest Hills, Pennsylvania. The shipment procedure and container was submitted for approval by WAPD as "Application for Approval Shipping Container Designs and Transportation Procedures (License SNM-38, Docket 70-43)".

If there are any other questions on the License Amendment request, please feel free to call.

Thank you for your consideration.

Very truly yours,

WESTINGHOUSE ATOMIC FUEL DIVISION

W. D. Kelley

W. D. Kelley
Nuclear Safety Engineer

:ajb

97

FROM: Westinghouse Electric Corp. Pittsburgh, Pennsylvania	DATE OF DOCUMENT: 12-4-62
	DATE RECEIVED: 12-6-62
	NO.: 11031
	LTR.: x · MEMO: · REPORT: · OTHER:
TO: AEC DL&R	ORIG.: x · CC: 2 · OTHER:
	ACTION NECESSARY ☐ · NO ACTION NECESSARY ☐ · CONCURRENCE ☐ · COMMENT ☐ · DATE ANSWERED: · BY:
CLASSIF.: U · POST OFFICE REG. NO:	FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)
Ltr. ref. telecon w/Layfield and submitting addtl. info regarding their amendment req. to lic. SNM-338 for SELNI Core "Fuel Assembly".

ENCLOSURES:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer:	12-6-62		
w/file cy.			
2-compliance cys.			
1-PDR Cy.			

REMARKS: Mail Room Distribution:
1-Helen Steele

ACKNOWLEDGED
11

U. S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM FORM AEC-326S (8-60)

☆ U. S. Government Printing Office: 1962 - 637308

DEC 1 1 1962

C. D. Luke, Chief
Criticality Evaluation Branch, DL&R

Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, DL&R

WESTINGHOUSE ELECTRIC CORPORATION - DOCKET NO. 70-337 -
AMENDMENT TO SNM-339 FOR ASSEMBLY OF SELNI CORE

SYMBOL: DLR:RLL

Attached are the replies to the questions posed in your memo dated November 21, 1962. Please review.

Attachment:
As indicated

Distribution:
Suppl.
L&R reading
S&SNM reading
R. L. Layfield

A/81

OFFICE ▶	DL&R	DL&R				
SURNAME ▶	RLL Layfield:bar	RLL for DANussbaumer				
DATE ▶	12/11/62	12/11/62				

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—82761-3

Distribution:
Compl., 2 cy Hdqtrs w/o inc.
Doc. Room
Formal
Suppl.
L&R reading
S&SNM reading
R. L. Layfield

DLR:RLL
70-337

JAN 9 1963

Westinghouse Electric Corporation
Atomic Fuel Division
Cheswick, Pennsylvania

Attention: Mr. L. A. Meierkord, Jr.
Manager of Marketing

Gentlemen:

This refers to the portions of your applications dated July 11, September 28 and October 18, 1962, pertaining to the shipment of wastes resulting from the processing of special nuclear materials.

In order to continue the review of your shipping procedures and containers, we require the applicable information outlined in Items IV and V of the enclosure.

Very truly yours,

Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch
Division of Licensing and Regulation

Enclosure:
As indicated

A/52

OFFICE ▶	DL&R	DL&R				
SURNAME ▶	RLL Layfield:bar	DN DANussbaumer				
DATE ▶	1/8/63	1/9/63				

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

DOCKET NO. 70-43 + 70-337

1963 FEB 7 PM 3 17

LAB File Copy

U.S. ATOMIC ENERGY COMM.
TWX UNIT

THIS IS WESTINGHOUSE ATM PWR DIV 412-372-83/// 412-372-8931

DOCKETED
USAEC
Division of
Licensing & Regulation
FEB 7 1963
Docket Officer

FEB 7 1963

FEBRUARY 7, 1963

USAEC

DIV OF LICENSING AND REGULATION

GERMANTOWN DISTRICT

WASHINGTON 25, D C

ATTN MR D A NUSSBAUMER, CHIEF SOURCE AND SPL NUCLEAR MATLS BRANCH

SUBJECT REVISED SELNI FUEL ALLOCATION REQUEST

DOCKET 70-43 -REF. LTR. DATED JUNE 29, 1962-

GENTLEMEN

WITH REFERENCE TO A TELEPHONE CONVERSATION BETWEEN MR LAYFIELD, DLR, AND MR TSCHIEGG, WESTINGHOUSE, ON FEB 7, 1963, THE FOLLOWING INFORMATION IS PRESENTED FOR AEC REVIEW AND APPROVAL

THE WESTINGHOUSE ELECTRIC CORPORATION HEREBY APPLIES FOR A REVISION OF THE SPECIAL NUCLEAR MATERIAL FUEL ALLOCATION REQUESTED ON JUNE 29 AND AUTHORIZED ON JULY 31, 1962, TO ALLOCATE FUEL TO BE PROCESSED AND FABRICATED FOR THE FIRST CORE OF THE REACTOR WHICH REACTOR IS THE SUBJECT OF EXPORT LICENSE XR-44--DOCKET 50-196.

PLEASE REFERENCE APPENDIX A, ATTACHED TO THE LETTER OF APPLICATION DATED JUNE 29, 1962. UNDER 3. RANGE OF ENRICHMENTS, ENRICHMENT 1 -- 2.73 W/P

XXX

2.73 W/O, 36,000 LBS SHOULD BE CHANGED TO READ 37,000 LBS. THE GRAND TOTAL UNDER 3. WOULD THEN BE 98,000 LBS OF U IN UF6 INSTEAD OF 97,800 LBS.

A/S3

WESTINGHOUSE"S REVISED RRQUIREMENTS OF SUCH SPEC [illegible] NUCLEAR MATERIAL IS NECESSITATED BY VIRTUE OF THE ADDITION OF FOUR -4- CONTROL ROD FUEL FOLLOWER ASSEMBLIES TO HXXX THE ORDER AND BE CAUSE FUEL YIELDS TO DATE HAVE BEEN LOWER THAN THOSE ANTICIPATED.

THE ADDITIONAL SPECIAL NUCLEAR MATERIAL TO BE ALLOCATED WOULD BE LOXXX LICENSED UNDER LICENSE NO SNM-338 ISSUED TO WESTINGHOUSE WITH RESPECT TO ITS ATOMIC FUEL DIVISION IN CHESWICK, PENNSYLVANIA, LICENSE NO SNM-38 WITH RESPECT TO ITS ATOMIC POWER DIVISION IN FOREST HILLS, PENNSYLVANIA AND UNDER APPROPRIATE LICENSES GRANTED TO SUCH FUEL PROCESSOR OR PROCESSORS AS MAY BE SELECTED BY WESTINGHOUSE FOR THE CONVERSION OF THE UF6 GAS INTO UO2 POWDER. ANY NECESSARY APPLICATIONS FOR AMENDMENTS TO EXISTING LICENSES WILL BE FILED PROMPTLY.

ALL OFXXX OTHER CONDITIONS OF THE APPLICATION FOR ALLOCATION AND THE APPROVED AEC FUEL ALLOCATION REMAIN UNCHANGED.

FORM OR-640 HAS BEEN FORWARDED TO OAK RIDGE IN ANTICIPATION OF THE APPROVAL OF THIS REQUEST FOR REVISION. WE WOULD GREATLY APPRECIATE THE EXPEDITIOUS PROCESSING OF THE REQUEST TXXX AND THE NOTIFICATINXXX NOTIFICATION OF APPROVAL TO THE LEASING OFFICER AT OAK RIDGE.

VERY TRYLXXX TRULY YOURS,

WESTINGHOUSE ELECTRIC CORPORATION

H C AMTSBERG, MANAGER

ADMINISTRATIVE SERVICES

END OR CAPLS

07/2019Z ACK UR MSG TNKS RP

FROM: Westinghouse Electric Corp.
Pittsburgh, Pennsylvania

TO: AEC

DATE OF DOCUMENT: 2-7-63
DATE RECEIVED: 2-7-63
NO.: 991

LTR. MEMO: REPORT: OTHER: TWX

ORIG.: X CC: OTHER:

ACTION NECESSARY ☐ CONCURRENCE ☐ DATE ANSWERED:
NO ACTION NECESSARY ☐ COMMENT ☐ BY:

CLASSIF.: U
POST OFFICE
REG. NO:

FILE CODE: 70-43 & 70-337

DESCRIPTION: (Must Be Unclassified)
TWX req. a revision of SNM fuel allocation req. on 6-29-62 & authorized on 7-31-62 to allocate fuel to be processed, etc...Change in req. for Appendix A.

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer: w/file cy. 2-compliance cy. 1-PDR Copy	2-7-63		

ENCLOSURES:

REMARKS:

U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326B (8-60)

☆ U. S. Government Printing Office: 1962 - 637308

TWX INCOMING

C-0582

1963 MAR 27 AM 11 49
U.S. ATOMIC ENERGY COMM.
TWX UNIT

WESTG ATM FUEL DIV 412 274-5650 CHESWICK, PA.

MARCH 27, 1963 AFD-1

TO DIVISION OF LICENSING & REGUALATION

USAEC

WASHINGTON, DC

DOCKETED
USAEC
Division of
Licensing & Regulation
MAR 27 1963
Docket Officer

ATTN... OFFICE OF DR. LUKE

MISS FRANCES DIRKIN

REQ APPROVAL TO AMEND DOCKET NO 70-337 AMENDMENT TO LICENDR D SNM-338 FOR SELNI CORE, WAFD-L-102, DTD JULY 10, 1962 AS FOLLOWS.

USE FIG 21 TID-7016 REV 1 IN PLACE OF FIG 13, PG21 TO COMPUTE BATCH SIZE. THE NEW BATCH SIZES ARE /1/ ~~74~~ 58 (confirmed by Bill Kelley of WAFD) LBS FOR 3.90 WT PERCENT, /2/ 95 LBS FOR 3.12 WT PERCENT AND /3/ 120 LBS FOR 2.73 WT PERCENT URANIUM DIOXIDE POWDER.

RECEIVED
MAR 27 1963
U.S. Atomic Energy Commission
DIVISION OF
LICENSING & REGULATION

FROM W D KELLEY

NUCLEAR SAFETY ENGINEER

WESTG ATM FUEL DIV

CORRECTION... FIRST PARA LAST WORD IN FIRST SENTENCE SHOULD BE LICENSE ALSO ELIMINATE THE D

Copy Supplied
~~Public Document Room~~
Div. of Compliance 3/28/63 - RRR
2 copies

MSG SENT 11.50 END DJC

D

R 1 TNX PWS END

A/54

TWX INCOMING

FROM: Westinghouse Electric Corp. Cheswick, Pa.	DATE OF DOCUMENT: 3-27-63		DATE RECEIVED: 3-27-63	NO.: 2662
	LTR.	MEMO:	REPORT:	OTHER: TWX
TO: AEC	ORIG.: X	CC:	OTHER:	
	ACTION NECESSARY ☐		CONCURRENCE ☐	DATE ANSWERED:
	NO ACTION NECESSARY ☐		COMMENT ☐	BY:
CLASSIF.: U POST OFFICE REG. NO:	FILE CODE: 70-337			

DESCRIPTION: (Must Be Unclassified)
TWX req. approval to amendment their 7-10-62 req. for amendment to SNM-338 for Selni Core, WAPD-L-102 .

ENCLOSURES:

REMARKS: Mail Room Distribution:
1-PDR Copy

REFERRED TO	DATE	RECEIVED BY	DATE
Hasshammer	3-27-63		
w/file cy. 2-compliance cys.			
		2661	

U. S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM FORM AEC-326B (8-60)

☆ U. S. Government Printing Office: 1962 - 637308

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Br., DLR

DATE: March 28, 1963

FROM : Francis K Dunkin for:
Charles D. Luke, Chief
Criticality Evaluation Br., DLR

SUBJECT: WESTINGHOUSE (WAFD) AMENDMENT TO LICENSE SNM-338 FOR SELNI CORE, WAFD-L-102, DATED JULY 10, 1962, DOCKET 70-337, AMENDMENT TWX DATED MARCH 27, 1963

DLR:FKD

The applicant has requested amendment to License SNM-338 for the SELNI core to allow an increase in the UO_2 powder batch size from the limits set on page 6 of document WAFD-L-102 dated July 10, 1962. The new batch limits proposed are in accordance with figures 1 and 21 of TID-7016, Rev. 1.

We recommend approval of the subject amendment to License SNM-338 for the SELNI core. However, due to a significant typographical error in the subject application, we suggest you formally condition the license as follows:

> The subject license is amended to permit the following safe batch sizes to be used for processing the SELNI core UO_2 powder:

	Enrichment	Safe mass batch
1)	3.90 w/o U-235	58 lbs. UO_2
2)	3.12 w/o U-235	95 lbs. UO_2
3)	2.73 w/o U-235	120 lbs. UO_2

Attachment:
Docket 70-337, 1 of 2
(w/TWX dtd 3/27/63,
(WAFD-L-102, dtd 7/10/62)

A/55

DOCKETED
USAEC
Division of
Licensing & Regulation
JUN 13 1963
Docket Officer

THIS IS WESTINGHOUSE ATOMIC POWER DIV FOREST HILLS PA 412-372-5931 CLG

6/13/63 855 AM

70-43 +

70-337

USAEC

L&R File Copy

DIV OF LICENSING AND REGULATION

ATTN MR D A NUSSBAUMER, CHIEF - SOURCE AND SPECIAL NUCLEAR MATE

RIALS BRANCH

SUBJ REVISED SELNI FUEL ALLOCATION REQUEST /DOCKETS 70-43 AND 70-337/., REF. LETTER DATED JUNE 29, 1962 AND TWX DATED FEBRUARY 7, 1963

THE WESTINGHOUSE ELECTRIC CORPORATION ATOMIC POWER DIVISION HEREBY APPLIES FOR A REVISION TO THE SPECIAL NUCLEAR MATERIAL FUEL ALLOCATION REQUESTED ON JUNE 29 AND AUTHORIZED ON JULY 31, 1962, AND SUBSECQUENTLY REVISED ON FEBRUARY 15, 1963, TO ALLOCATE FUEL TO BE PROCESSED AND FABRICATED FOR THE FIRST CORE OF THE REACTOR WHICH IS THE SUBJECT OF EXPORT LICENSE XR-44/DOCKET 50-196/. PLEASE REFERENCE APPENDIX A, ATTACHED TO THE LETTER OF APPLICATION DATED JUNE 29, 1962. UNDER PARAGRAPH 3, "RANGE OF ENRICHMENTS," ENRICHMENT NO. 3, 3.90 W/O, 30,900 LBS., SHOULD BE CHANGED TO READ 33,976 LBS OF U IN UF6. THE GRAND TOTAL OF U IN UF6 WOULD THEN BE CHANGED FROM 98,800 LBS TO 101,876 LBS. WESTINGHOUSE,S REVISED REQUIREMENTS OF SPECIAL NUCLEAR MATERIAL IS NECESSITATED BY VIRTUE OF AN ADDITIONAL ORDER FOR SPARE FUEL ASSEMBLIES BY THE CUSTOMER THE ADDITIONAL SPECIAL NUCLEAR MATERIAL TO BE ALLOCATED WOULD BE LICENSED UNDER LICENSE NUMBER SNM-338, DOCKET 70-337, ISSUED TO THE WESTINGHOUSE ELECTRIC CORPORAT

A156

CHESWICK PENNSYLVANIA, LICENSE NUMBER \. ~~XXXX~~ SNM-38, DOCKET 70-43, WITH RESPECT TO ITS ATOMIC POWER DIVISION FOREST HILLS PENNSYLVANIA AND UNDER APPROPRIATE LICENSES GRANTED TO SUCH FUEL PROCESSOR OR PROCESSORS AS MAY BE ~~XXX~~ SELECTED BY WESTINGHOUSE FOR THE CONVERSION OF THE UF6 GAS INTO UO2 POWDER. ANY NECESSARY APPLICATIONS FOR AMENDMENTS TO EXISTING LICENSES WILL BE FILED PROMPTLY. ALL OTHER CONDITIONS OF ~~TEXXX~~ THE ORIGINAL AND REVISED APPLICATION FOR ALLOCATION AND THE APPROVED AEC ALLOCATION, AS AMENDED, REMAIN UN-CHANGED. FORM OR-640 HAS BEEN FORWARDED TO THE OAK RIDGE MATERIALS LEASING OFFICER IN ANTICIPATION OF THE APPROVAL OF THIS REQUEST FOR REVISION. WE WOULD GREATLY APPRECIATE THE EXPEDITIOUS PROCESSING OF THIS REQUEST AND THE ~~NOTIFCXXXX~~ NOTIFICATION OF APPROVAL TO THE LEASING OFFICER AT OAK RIDGE. THE COMMISSION IS AUTHORIZED TO TELEPHONE, COLLECT, AT THE TIME THE ALLOCATION AMENDMENT IS APPROVED. /PITTSBURGH - 391-2800 EXT. C-412. MR TSCHIEGG./

W C AMTSBERG

MANAGER

ADMINISTRATIVE SERVICES

END OR GA PLS

REC 1 CLR TWX CC

DOCKETED
USAEC
Division of
Licensing & Regulation
JUN 13 1963
Docket Officer

RECEIVED
JUN 13 1963
U S ATOMIC ENERGY COMMISSION
Division of
Licensing & Regulation

TWX INCOMING

FROM: Westinghouse Electric Corp.
Cheswick, Pa.

TO: D. Nussbaumer
DL&R

CLASSIF.: U

POST OFFICE
REG. NO:

DATE OF DOCUMENT:	DATE RECEIVED:	NO.:
6-13-63	6-13-63	4259

LTR. MEMO: REPORT: OTHER: Telegram

ORIG.: X CC: OTHER:

ACTION NECESSARY ☐ CONCURRENCE ☐ DATE ANSWERED:
NO ACTION NECESSARY ☐ COMMENT ☐ BY:

FILE CODE: 70-43 & -337

DESCRIPTION: (Must Be Unclassified)

TWX ref. ltr. dtd. 6-29-62 & twx. 2-27-63 and req. revision to SNM fuel allocation to allocate Selni fuel to be processed and fabricated for the first core of the reactor which is the subject of Export Lic. XR-44. Appendix A, under paragraph 3 should be changed to read 33,976 lbs. of U- in UF6 instead of 30,900 lbs., etc...

ENCLOSURES:

REMARKS:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer	6-13-63		
w/file cys & folder(70-337's)			
2-compliance cys.			
2-PDR Cys. (for review)			

U. S. GOVERNMENT PRINTING OFFICE: 1962—661390

U.S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM FORM AEC-326S (8-60)

Layfield

TWX INCOMING BETH

016

PL-01

FM H J MCALDUFF JR USAEC OAKRIDGE TENN 63 JUL 082100Z

TO FRANK STONE USAEC GERMANTOWN MD

INFO D E GEORGE USAEC GERMANTOWN MD

~~D A NUSSBAUMER USAEC~~ GERMANTOWN MD

RE FOURTH QUARTER DRAFT 071-SNM-338-32A/7/ FOR 3.90 PERCENT ENRICHED UF SIX FOR SELNI. A TOTAL OF 212,416 GRAMS U-235 SHIPPED THROUGH JUNE 30. REQUEST REPLACEMENT DRAFT TO COVER THE BALANCE FOR SHIPMENT IN THE FIRST QUARTER FY 1964. NEXT SHIPMENT SCHEDULED FOR THIRD WEEK IN JULY REF OPO/ODS PL-01

63 JUL 08/2142Z

TWX INCOMING

JUL 9 1963

RCD VIA TIDLINE TNT

T

A/57

70-337

DOCKETED USAEC Division of Licensing & Regulation OCT 2 1963 Docket Officer

Westinghouse Electric Corporation File Copy

Atomic Fuel Division
P. O. Box 217
Cheswick, Pennsylvania

September 30, 1963

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

Taken from Bound Report. See Reports File for other portion. HS

Attention: Mr. Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch

Subject: Application for Approval of Birdcage Shipping Containers

Gentlemen:

The Westinghouse Electric Corporation, Atomic Fuel Division, Cheswick, Pennsylvania, hereby applies for an amendment to our license SNM 338, Docket 70-337, to authorize the use of a modified birdcage container for shipping slightly enriched uranium oxide process waste.

If you have any questions, please write or phone collect to L. A. Meierkord, Westinghouse Electric Corporation, Atomic Fuel Division, P. O. Box 217, Cheswick, Pennsylvania, telephone 412-362-4400.

Very truly yours,

L. A. Meierkord, Jr.

L. A. Meierkord, Jr.
Assistant to General Manager

Attachments

RECEIVED OCT 2 1963 U. S. Atomic Energy Commission Division of Licensing & Regulation

ACKNOWLEDGED

A/58

6644

no signed orig. recd. HS

FROM: WESTINGHOUSE ELECTRIC CORPORATION
Cheswick, Pa.
L. A. MEIDRKORD, JR.

DATE OF DOCUMENT: 9-30-63
DATE RECEIVED: 10-2-63
NO.:

LTR.: x
MEMO:
REPORT:
OTHER:

TO: Nussbaumer

Whenever amend see Report file

ORIG.:
CC:
OTHER: 6 cys bearing reproduced signatures (BOUND REPORT)

ACTION NECESSARY XX
NO ACTION NECESSARY ☐
CONCURRENCE ☐
COMMENT ☐
DATE ANSWERED:
BY:

CLASSIF.: U
POST OFFICE
REG. NO.:

FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)
Ltr Appl (Bound Report) requesting that Lic. SNM-338 be amended to authorize the use of a modified birdcage container for shipping slightly enriched uranium oxide process waste.

ENCLOSURES: Included therein:

Dwg. C-1160459 — Shipping Container Details for UO2 and U3O8.

REMARKS:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer:	10-3		
w/file cy & file			
cy for AEC PDR			
2 for Compliance			
2 Extras			
ACKNOWLEDGED		6644	

U. S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM FORM AEC-326S (8-60)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1962—661390

Chris Beck
Fuels Processing Branch

OCT 7 1963

Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch

WESTINGHOUSE APPLICATION FOR AMENDMENT TO LICENSE SNM-338 FOR BIRDCAGE SHIPPING CONTAINERS. (DOCKET 70-337: 9/30/63)

DLR:DAN

Please review the licensee's application for amendment. The extra copy may be retained for your files.

Attachment:
Extra copy

A/59

OFFICE ▶	LR					
SURNAME ▶	DN DNussbaumer/js					
DATE ▶	10/ 7 /63					

OCT 7 1963

Charles D. Luke, Chief
Criticality Evaluation Branch

Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch

WESTINGHOUSE APPLICATION FOR AMENDMENT TO LICENSE SNM-338 FOR BIRDCAGE SHIPPING CONTAINERS. (DOCKET 70-337; 9/30/63)

DLR:DAN

Please review the licensee's application from the standpoint of criticality control. The extra copy may be retained for your files.

Attachment:
Extra copy

A/60

OFFICE ▶	LR DN					
SURNAME ▶	DNussbaumer/js					
DATE ▶	10/7/63					

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, DLR

DATE: October 21, 1963

FROM : Charles D. Luke, Chief
Criticality Evaluation Branch, DLR CDL

SUBJECT: WESTINGHOUSE (WAFD) - PROCESSING WASTE SHIPPING CONTAINER - DOCKET NO. 70-337, SEPTEMBER 30, 1963

SYMBOL: DLR:FKD

The applicant requests amendment to License No. SNM-338 to authorize the use of BE #1405 modified birdcage containers for shipping slightly enriched uranium oxide process waste, viz., powdered U_3O_8 at 3.9 w/o U^{235} (Selni) and 2.46 w/o U^{235} (EGCR).

The subject shipping container consists of a column of four 5-gallon buckets centered within an enclosed birdcage of vertical rods of unspecified dimension. The applicant bases the nuclear safety of this container on the safe diameter criterion of Figures 3 and 21 of TID-7016, Rev. 1. A maximum of 12 packages in any one shipment with transport by common carrier is proposed.

We suggest you incorporate the following in your immediate reply to the applicant:

"BE #1405 birdcage container as originally described in your Yankee Core III application dated May 10, 1962, for shipment of solid and liquid wastes and presently described in modified form for shipment of Selni and EGCR process wastes has not been demonstrated to meet the shipping criteria of the proposed 10 CFR 71. Furthermore, shipments such as you describe must be transported under your control in order to guard against commingling of your shipment with other special nuclear material shipments during transport. Attached are interim criteria for Class III packaging as well as copies of 10 CFR Parts 70 and 71, proposed, to assist you in modifying the subject process waste container so as to comply with our current requirements. Since the publication of the proposed amendments to 10 CFR Part 71, the attached interim criteria for Class III packaging have been developed which provide a greater degree of flexibility in design of containers. If you so desire, the interim criteria may be used as an alternate to those specified in the proposed 10 CFR 71, Section 71.65, provided, however, they must be used in their entirety and not in combination with requirements of Section 71.65."

A161

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief, Source and Special Nuclear Materials Branch, LR
ATTN: R. L. Layfield

DATE: October 31, 1963

FROM : Christian Beck, Staff Engineer - Structural CB
Fuels Processing Branch, LR

SUBJECT: WESTINGHOUSE APPLICATION FOR AMENDMENT TO LICENSE SNM-338 FOR BIRDCAGE SHIPPING CONTAINERS (DOCKET 70-337 - 9/30/63)

I have reviewed the structural integrity of subject birdcage type shipping containers and have the following comments:

a. The data submitted with their application are inadequate, lacking any analysis or test data for compliance with the criteria in Part 71, and furnishes incomplete information on the design details of the container.

b. Incomplete test data were submitted previously showing results of drop tests from a height of approximately 23 feet. The inner containers, as indicated in their previous submittal, were supposed to be 5 gallon cans, which does not comply with the schedule 40 steel pipe requirement for Class III containers.

c. My analysis of the birdcage design shows inadequate strength to comply with the 30' drop requirement of Part 71.

A162

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch

DATE: December 23, 1963

FROM : Charles D. Luke, Chief
Criticality Evaluation Branch, DLR

CDL

SUBJECT: WESTINGHOUSE (AFD) STORAGE OF SELNI CONTROL ROD FUEL FOLLOWER ASSEMBLIES - APPLICATION DATED NOVEMBER 26, 1963 - DOCKET NO. 70-337

SYMBOL: DLR:FKD

Prior to export, the SELNI control rod fuel follower assemblies will be stored on 20" centers in a 5 x 8 array. The assemblies are enriched to 2.73% in the isotope U-235. The total U-235 per fuel follower = $\sim$ 1.1 kg. Critical mass studies on UO_2 indicate at optimum moderation and reflection, minimum critical mass = 11 kg U-235.

We have no objection to the proposed storage arrangement since no amount of material at less than 5% U-235 enrichment will go fast critical while in the event of flooding, the 12" open space in all directions provides isolation between the fuel followers. Moderation in the absence of shielding water is not possible due to the rack design. The monitor alarm system coverage of the storage configuration which is isolated from all other special nuclear material by 12', is in compliance with requirements of 10 CFR 70.34.

A163

DOCKET NO. 70-337

L&R File Copy

RECEIVED JAN 21 1964 U. S. Atomic Energy Commission Division of Licensing & Regulation

Westinghouse Electric Corporation

Atomic Power Division Box 355, Pittsburgh 30, Pa

January 17, 1964

U. S. Atomic Energy Commission
Division of Licensing and Regulation
Washington 25, D. C.

Attention: Mr. Robert W. Lowenstein, Director

Subject: Amendment of Special Nuclear Materials License SNM-338 - Docket 70-337 - For Fabrication of Special Power Excursion Reactor Tests (SPERT) Fuel Rods

Gentlemen:

The Westinghouse Electric Corporation hereby applies for an amendment to the Special Nuclear Materials License SNM-338, Docket 70-337. Six copies of the amendment application are submitted herewith. This application will provide for receipt, possession, use, storage and transfer of UO_2 that will be fabricated into special SPERT fuel rods. This will be done at the Westinghouse Cheswick Plant.

According to our production schedule, we desire to receive fuel on or about February 22, 1964, so your prompt action on this amendment would be appreciated.

It should be noted that a change in organization has taken place within Westinghouse, and the management of the Commercial Fuel Facility has been transferred from the Atomic Fuel Division to the Atomic Power Division. All future correspondence about this license should be directed to this office.

If you have any questions, please write or phone, collect, Mr. H. C. Amtsberg, Westinghouse Electric Corporation, Atomic Power Division, P. O. Box 355, Pittsburgh, Pa. (15230).

Copy Supplied Public Document Room Div. of Compliance CEB

1/28/64

Very truly yours,

H C Amtsberg

H. C. Amtsberg, Manager
Administrative Services

ACKNOWLEDGED

Attachments - See Reports File for Original + Attachments

A1/64

FROM: Westinghouse Electric Corp.
Cheswick, Pennsylvania

DATE OF DOCUMENT: 1-27-64

DATE RECEIVED: [illegible]

NO.: [illegible] 309

LTR.: x & encls. MEMO: REPORT: OTHER:

TO: R. Lowenstein
DL&R

ORIG.: no signed original CC: OTHER: 6 reproduced cys

ACTION NECESSARY ☐ CONCURRENCE ☐ DATE ANSWERED:

NO ACTION NECESSARY ☐ COMMENT ☐ BY:

CLASSIF.: U

POST OFFICE REG. NO.:

FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)

Ltr. (in bound report) trans:

ENCLOSURES: (6 cys. ea)

Appl. 1-17-64 for amendment to SNM-338 to cover receipt, possession....of UO2 for fabrication of fuel rods......

WCAP-3742 dtd. 9-63

REMARKS:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer:	1-22		
w/file cy. & file			
1-PIR Cy. (for review)			
2-compliance cys.			
2-extras			
See Rpts. File For Original			
		ACKNOWLEDGED	
		309	

U. S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM FORM AEC-326S (8-60)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1963—708-809

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, DLR

DATE: February 11, 1964

FROM : Charles D. Luke, Chief
Criticality Evaluation Branch, DLR

CDL

SUBJECT: WESTINGHOUSE (WAPD CHESWICK) FABRICATION OF SPERT RODS (4.8 w/o U-235) APPLICATION DATED JANUARY 17, 1964 AND TELECON OF FEBRUARY 7, 1964, DOCKET NO. 70-337

SYMBOL: DLR:FKD

By the subject amendment to Special Nuclear Material License No. SNM-338, WAPD requests authorization to receive, store, process and ship UO_2 enriched to 4.8 w/o. The special nuclear material will be received as UO_2 powder and formed into pellets which will be encapsulated in stainless steel tubes of .426" diameter x 36" length.

We had no objection to the proposed control limits specified by the applicant but requested establishment of a control limit on the powder generated during the pellet grinding operation. By telecon of 2-7-64, Mr. Ron Tshiegg of Westinghouse stated that this particular grinding operation, contrary to centerless grinding, was a dry operation with all generated powder being collected on a filter located 12" beneath the 2.5" slab tray containing the pellets. At an accumulation of less than 1/30th safe slab thickness (approximately two-hour operating run) the filter is no longer efficient and is removed.

The applicant was informed that shipment by Railway Express specified in the application for finished fuel rods was not acceptable protection against commingling with other special nuclear material during transport. By telecon, the applicant informed us that shipment will be by exclusive use of common carrier.

The finished fuel rods will be shipped in a 5" diameter x 108" length carbon steel cylinder braced within a 20-gauge expanded metal birdcage which provides a minimum 12" edge-to-edge separation between birdcages. A maximum of 150 rods containing 5.25 kg U-235 will be shipped per birdcage. Using Strawbridge's method (ref: WCAP-3742) the applicant has calculated the k_∞ of an infinite lattice of these rods at optimum moderation (water to metal volume ratio = 6 for optimum buckling and water to metal volume ratio = 10 for mass). The above referenced report demonstrates the accuracy

A165

of Strawbridge's method for these low enriched UO_2 rods to be within 1% of experimental critical data. By buckling conversion to an infinite 5" diameter cylinder containing these rods, the applicant has calculated a k_{eff} = 0.35 and determined the safe interaction angle to be 5.5 steradians from Figure 26 of TID-7016, Rev. 1. A maximum of 15 birdcages will comprise a single shipment and be safe in any arrangement. Process waste will be loaded in 4.5" diameter metal cans and then stacked within the same 5" diameter pipe birdcage used for shipping the finished rods. Each birdcage will contain less than 200 pounds of oxide (3.84 kg U-235). Using Strawbridge's method, which conservatively assumed the powder to be lumped in the form of pellets, the applicant has calculated the k_{eff} for an infinite 5" diameter cylinder of waste powder to be 0.4 resulting in an allowable solid angle of 5 steradians whereby 10 birdcages would be a safe number per shipment in any arrangement. Exclusive use of common carrier is specified. As regards the structural integrity of this shipping container (RE #963), we suggest this container design be referred to Christian Beck for review in the light of our current requirements. Since the nuclear safety of a multiple container shipment is based on solid angle criteria, spacing must be maintained and, therefore, the 30' drop test requirement is pertinent.

The applicant has agreed to confirm by TWX the supplementary information supplied by telephone. Subject to receipt of this confirmation, we recommend the applicant be authorized to receive, store and process the subject material. Shipping approval is recommended subject to Christian Beck's structural integrity evaluation.

cc: L. R. Rogers, DLR
C. Beck, DLR

DOCKET NO. 70-43, -48, -337, -534, -698, -761, -793, -826

L&R File Copy 40-3413
-4739

Westinghouse Electric Corporation
3 Gateway Center
Box 2278, Pittsburgh, Pa. 15230

50-22
-34
-87

Charles H. Weaver
Group Vice President
Atomic, Defense & Space Group

DOCKETED
LICENSING & REGULATION
MAR 3 1964
DOCKET OFFICER

March 2, 1964

RECEIVED
MAR 3 1964
U. S. Atomic Energy Commission
Division of
Licensing & Regulation

Mr. R. W. Lowenstein, Director
Division of Licensing and Regulation
U. S. Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. Lowenstein:

We are assigning responsibility for administration of certain AEC licenses to one person on our headquarters staff. In the future, this person will transmit all license applications or amendment requests for those Westinghouse operations which are located in the Pittsburgh area. At the end of this letter is a list of the current licenses involved and we would appreciate your directing all future correspondence about these licenses to him. Mr. C. P. Skillern has been appointed License Administrator, reporting to Mr. E. C. Barnes, Director, Radiation Protection. The signature of Mr. Skillern, or as an alternate Mr. Barnes, is authorized on Westinghouse license applications, amendment requests or related correspondence. Their address is Westinghouse Electric Corporation, P. O. Box 2278, Pittsburgh, Pennsylvania, 15230.

When it becomes desirable to have discussions of technical matters in these licenses, arrangements will be made by the License Administrator for these to be held between the cognizant members of your staff and appropriate Westinghouse personnel. Please note that this

A/66

does not involve any change in handling the licensing activities related to nuclear power plants being designed or sold by Westinghouse.

Very truly yours,

Charles H. Weaver

List of Licenses:

Atomic Power Division:	SNM 38, 338, 576, 738, 770; CX-6, 11; 37-497-9, SMB-152; STB-255, TR-2, SNM Application Docket 70-826.
Atomic Fuel Division:	SMB-355
Atomic Equipment Division:	37-5809-1, 37-5809-2
Research Laboratories:	37-497-2, 37-497-6, 37-497-10; SNM-47, 697
East Pittsburgh Division:	37-497-8, 37-497-13
Astronuclear Laboratory:	37-5809-3, 37-9442-1, 37-9442-2
Semi-Conductor Division:	37-7934-1

FROM: Westinghouse Electric Corp. Pittsburgh, Pa.

DATE OF DOCUMENT: [illegible]

DATE RECEIVED: [illegible]

NO.: 1129

LTR.: X

MEMO:

REPORT:

OTHER:

TO: R. Lowenstein

ORIG.: x(35 --all bearing reproduced signatures)

CC:

OTHER:

ACTION NECESSARY ☐

NO ACTION NECESSARY ☐

CONCURRENCE ☐

COMMENT ☐

DATE ANSWERED:

BY:

CLASSIF.: U

POST OFFICE

REG. NO:

FILE CODE: 70-43, -48, -337, -534, -678, -761, -793, -[illegible] -826; 50-22, -34, & -67; 40-341 & -479

DESCRIPTION: (Must Be Unclassified)
Ltr. advising of address at which future correspondence is to be sent in connection w/licenses as set forth in this ltr.....

ENCLOSURES:

REFERRED TO	DATE	RECEIVED BY	DATE
Rauchenberg: w/file cy. (for 70-43) 2-compliance cys. 3-extras	3-5		
Levine: w/file cy. (for info--50-22)	3-5		
Bryan: w/file cy. (for info--50-34)	3-5		

1129

REMARKS: Mail Room Distribution:
10-cys. to [illegible]
13-PDR Copys
File cys. for ea. docket
1-R. Steele

☆ U. S. GOVERNMENT PRINTING OFFICE: 1963--708-809

U. S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM FORM AEC-326S (8-60)

C. D. Luke, Chief
Criticality Evaluation Branch

March 16, 1964

Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch

ASSIGNMENT OF RESPONSIBILITY FOR ADMINISTRATION OF CERTAIN AEC LICENSES TO ONE PERSON ON HEADQUARTERS STAFF, DOCKET NOS. 70-43, -48, -337, -534, -698, -761, -793, -826, 40-3413, -439, 50-22, -34, -87. MARCH 2, 1964.

DLR:RLL

Please review from the standpoint of criticality control. The extra copy may be retained for your files.

Attachment:
Extra copy

A/67

OFFICE ▶	RLL DLR					
SURNAME ▶	RLayfield/jc					
DATE ▶	3/16 /64					

Form AEC-318 (Rev. 9-53)

DOCKETED
USAEC
LICENSING & REGULATION
MAY 25 1964
DOCKET OFFICER

DOCKET NO. 70-337

Westinghouse Electric Corporation

3 Gateway Center
Box 2278, Pittsburgh, Pa. 15230

May 20, 1964

U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D. C. 20545

Attention: Mr. Lyall Johnson, Acting Director

Subject: Amendment of Special Nuclear Materials License SNM-338 - Docket 70-337 - For Fabrication of Consolidated Edison Indian Point Core II Fuel Rods and Assemblies

Gentlemen:

The Westinghouse Electric Corporation hereby applies for an amendment to the Special Nuclear Materials License SNM-338, Docket 70-337. Six copies of the amendment application are submitted herewith. This application will provide for receipt, possession, use, storage and transfer of UO_2 that will be fabricated into fuel rods and assemblies for the Consolidated Edison Indian Point Reactor Core II. This work will be done at the Westinghouse Cheswick Plant. A proprietary folder is also submitted.

If you have any questions, please write to the above address or phone collect C. P. Skillern, Westinghouse Electric Corporation, 412-391-2800, Extension 3449, Pittsburgh, Pennsylvania.

RECEIVED
MAY 25 1964

Very truly yours,

C. P. Skillern

C. P. Skillern
License Administrator

A/68

Attachment

See P. ... file for Approval & Enclosures

2799

FROM: Westinghouse Electric Corp.
Pittsburgh, Pa.

TO:

Lyall Johnson

CLASSIF.: U

POST OFFICE

REG. NO:

DESCRIPTION: (Must Be Unclassified)

Ltr. (in bound rpt.) trans:

ENCLOSURES: (6 cys. ea)

Appl. For Amendment to SNM-338 to cover receipt, possession, use, storage & transfer of UO2 that will be fabricated into fuel rods & assemblies for Con. Ed. Indian Point Reactor Core II........

Folder which includes "PROPRIETARY INFO" in relation to this amendment request.

REMARKS: Mail Room Distribution:
PROPRIETARY SECTION W/HELD PENDING REVIEW

See Separate Classified (Company Conf.) File

DATE OF DOCUMENT: [illegible]

DATE RECEIVED: [illegible]

NO.: 2799

LTR.: x(in bound rpt.)

MEMO:

REPORT:

OTHER:

ORIG.: x

CC:

OTHER: 5 repro'd cys.

ACTION NECESSARY ☐

NO ACTION NECESSARY ☐

CONCURRENCE ☐

COMMENT ☐

DATE ANSWERED:

BY:

FILE CODE: 70-337

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer:	5-26		
w/file cy. &			
~~2-compliance cys.~~		Destroyed 12-29-67 (AEC)	
~~2-extras~~			
1-PDR Cy. w/out PROPRIETARY SECTION			

granted per 3-17-65 ltr.

Nussbaumer: PLEASE ADVISE AS TO WHETHER "PROP. MARKED" SECTION OF APPLICATION AMENDMENT SHOULD BE WITHHELD IN ACCORD. W/SECTION 2.810.

ACKNOWLEDGED
2799

U. S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM FORM AEC-326S (8-60)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1963—708-809

DOCKETED
USAEC
LICENSING & REGULATION
MAY 26 1964
DOCKET OFFICER

Westinghouse Electric Corporation

3 Gateway Center
Box 2278, Pittsburgh, Pa. 15230

May 25, 1964

U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D. C., 20545

MAY 26 1964
LICENSING & REGUL...

Attention: Mr. Lyall Johnson, Acting Director

Subject: Shipping Containers for SPERT Fuel Rods
SNM-338, Docket 70-337
Ref: CLN, DLR, CLN, RLL, 70-337

File Copy

Gentlemen:

Westinghouse Electric Corporation submits herewith additional information regarding shipping containers to ship SPERT fuel rods between Cheswick, Pennsylvania, and Idaho Falls, Idaho. The SPERT Amendment was submitted January 17, 1964, and was approved February 12, 1964, with the exception of the shipping containers. We would appreciate having you expedite the analysis of this container as we must ship these fuel rods on or about June 15, 1964, to meet the commitments of our contract.

If you have any questions, please write to the above address or call collect, Westinghouse, c/o C. P. Skillern, Pittsburgh, Pa., 412-391-2800, Extension 3449.

Very truly yours,

Copy Supplied
Public Document Room
Div. of Compliance 2
CEB

5/29/64-RRC

C. P. Skillern

A169

C. P. Skillern
License Administrator

Attachment

CB 6/1/64

See Rpts File for Original + Enclosure

ACKNOWLEDGED

FROM: Westinghouse Electric Corp.
Pittsburgh, Pa.

TO: Lyall Johnson

CLASSIF.: U

POST OFFICE

REG. NO:

DESCRIPTION: (Must Be Unclassified)

Ltr.(in bound rpt.) trans:

ENCLOSURES:

(6 cys.)

"Supplemental Shipping Container Info for the SPERT Amendment to SNM-338" dtd. 5-25-64

REMARKS:

DATE OF DOCUMENT:	DATE RECEIVED:	NO.:
5-25-64	5-26-64	2849

LTR.: x(in bound rpt.) MEMO: REPORT: OTHER:

ORIG.: x(6--all bearing reproduced sig'ns.) CC: OTHER:

ACTION NECESSARY ☐ NO ACTION NECESSARY ☐ CONCURRENCE ☐ COMMENT ☐ DATE ANSWERED: BY:

FILE CODE: 70-337

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer: w/file cy. & file 2-compliance cys. 1-PDR Copy 2-extras	5-27		
		ACKNOWLEDGED	

☆ U. S. GOVERNMENT PRINTING OFFICE: 1963--708-809

U. S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM FORM AEC-326S (8-60)

OPTIONAL FORM NO. 10
5010-104

COPY

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, DML

DATE: May 28, 1964

FROM : Charles D. Luke, Chief
Criticality Branch, DML CDL

SUBJECT: WESTINGHOUSE SHIPPING CONTAINER FOR SPERT FUEL RODS, DOCKET NO. 70-337, MAY 25, 1964

We have reviewed the subject application which requests approval of a change in the birdcage for the package to be used for shipment of SPERT fuel rods. A maximum of 15 packages will comprise a shipment to be made by exclusive use of vehicle between cheswick and Idaho Falls.

We see no objection to your approval of the proposed change in so far as nuclear safety is concerned, assuming that Mr. Christian Beck will confirm the findings of the applicant as regards the structural integrity of the package. The package is, in fact, a better design than the original proposal upon which we commented in detail in our memorandum of February 11, 1964.

cc: Christian Beck, ML

A/70

COPY

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief, Source and Special Nuclear Materials Branch, DML

DATE: June 4, 1964

FROM : Christian Beck, Staff Engineer - Structural Irradiated Fuels Branch, DML CB

SUBJECT: WESTINGHOUSE SPERT FUEL RODS CONTAINER, DOCKET NO. 70-337

I have reviewed the data submitted with letter dated May 25, 1964 and have the following comments regarding structural integrity of subject shipping container:

a. It is suggested that the 2" x $\frac{1}{2}$" bands (item 5 in Fig. 1) be spotwelded to the inside of the drum.

b. The neoprene gasket is expected to deteriorate at a relatively low temperature. Therefore, leak-tightness cannot be assured in case of a one-hour fire situation, but possibly after the first ten minutes of the standard one-hour fire.

c. Otherwise the design shows satisfactory compliance with structural requirements of Part 71.

cc: Dr. Charles Luke, DML

This is a suggestion, not a requirement -
6/9/64 CB

A/71

WESTERN UNION INCOMING

BETH-016

1964 JUN 11 AM 11 16

U.S. ATOMIC ENERGY COMM.
TWX UNIT

DOCKET NO. 70-337

File Copy

ACA002 1114A EDT JUN 11 64 PC042

P PGA267 PD 2 EXTRA WUX PITTSBURGH PENN 11 1039A EDT

ROBERT LAYFIELD, M S ATOMIC ENERGY COMMISSION

WASHDC

SUBJECT SPERT ROD SHIPPING CONTAINER, SNM338 DOCKET 70-337.

IN ACCORDANCE WITH OUR DISCUSSION OF JUNE 9 1964 WE WILL TACK

WELD THE SPACER RING TO TY OUTSIDE SHEEL OF THE SHIPPING CONTAINER.

WILL CONFIRM BY LETTER

C P SKILLERN WESTINGHOUSE ELEC CORP GATEWAY CENTER

SNM338 70-337 9 -1964

(00).

DOCKETED
USAEC
LICENSING & REGULATION
JUN 11 1964
Asc
DOCKET OFFICER

RECEIVED
64 JUN 11 PM 1 50
U.S. ATOMIC ENERGY COMM.
DIVISION OF
LICENSING & REGULATION

Copy Supplied
~~Public Document Room~~
Div. of Compliance (2)
CEB
CB
6/12/64-RRL

A72

WESTERN UNION INCOMING

3177

FROM: Westinghouse Electric Corp.,
Pittsburgh, Pa.
(C. F. Skillern)

DATE OF DOCUMENT: 6-11-64

DATE RECEIVED: 6-11-64

NO.: 3377

LTR. | MEMO: | REPORT: | OTHER: Telegram

TO: Layfield

ORIG.: X | CC: | OTHER:

ACTION NECESSARY ☐ | CONCURRENCE ☐ | DATE ANSWERED:
NO ACTION NECESSARY ☐ | COMMENT ☐ | BY:

CLASSIF.: U

POST OFFICE REG. NO.:

FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)

TWX ref. recent discussion of 6-9-64 and advising that they will tack weld the spacer ring to outside shell of the shipping container......

ENCLOSURES:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer:	6-11		
w/file cy.			
2-compliance cys.			
2-extras			

REMARKS: Mail Room Distribution;
1-PDR Copy

3377

U. S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM FORM AEC-326
(8-60)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1963—708-809

DOCKET No. 70-337

File Copy

Westinghouse Electric Corporation

Atomic Power Division   Box 355, Pittsburgh 30, Pa.

DOCKETED USAEC LICENSING & REGULATION JUN 15 1964 DOCKET OFFICER

June 11, 1964

U.S. Atomic Energy Commission
Division of Materials Licensing
St. Elmo and Norfolk Avenues
Bethesda, Maryland

Attn: Mr. Lyall Johnson, Acting Director

RECEIVED JUN 15 1964 U.S. Atomic Energy Commission DIVISION OF LICENSING & REGULATION

cc: Mr. H. J. McAlduff, Leasing Officer
Production Div.
U.S. Atomic Energy Commission
Oak Ridge, Tenn.

Subject: Request for Authorization to order SS Material -- Indian Point Core B

Gentlemen:

The Westinghouse Electric Corporation, Atomic Power Division, requests the issuance of the required allocation and/or nuclear materials draft which will permit Westinghouse to order special nuclear material in the amounts and specifications listed below. This material should be charged against the allocation previously issued to Consolidated Edison, License No. DPR-5. Westinghouse will use the SS material under License No. SNM-338, as amended, and Lease Agreement No. 245.

Fiscal Year	U^{235} Isotope	Enrichment	Delivery Kg U^{235} In Form of UF6
1964	75,000 gm	2.86 W/O	75 kg - June 22, 1964
1965	190,000 gm	2.86 W/O	60 kg - July 6, 1964 and alternate weeks

A/78

(2) 6/16/64-RRC

3/85-A

Thank you for your assistance in this matter.

Very truly yours,

H. C. Amtsberg, Manager
Administrative Services

FROM: Westinghouse Electric Corp.
Pittsburgh, Pa.

DATE OF DOCUMENT: 6-11-64

DATE RECEIVED: 6-15-64

NO.: 3185-A

LTR.: X | MEMO: | REPORT: | OTHER:

TO: Lyall Johnson

ORIG.: X | CC: | OTHER:

ACTION NECESSARY ☐ | CONCURRENCE ☐ | DATE ANSWERED:

NO ACTION NECESSARY ☐ | COMMENT ☐ | BY:

CLASSIF.: U

POST OFFICE REG. NO.:

FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)

Ltr. req. issuance of the required allocation and/or nuclear matls. draft which will permit them to order snm to be charged against lic. DPR-5, for use under SNM-338.

ENCLOSURES:

REMARKS:

REFERRED TO	DATE	RECEIVED BY	DATE
L. Johnson: w/file cy. 2-compliance cys. 2-extras	6-15		

U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

TWX INCOMING

015

1964 JUN 11 PM 2 49

U.S. ATOMIC ENERGY COMM.
TWX UNIT

THIS IS WESTINGHOUSE ATOMIC POWER DIVISION

FORREST HILLS PA TWX 412-372-8931

6/11/64 245 PM

DOCKET NO. 70-337

File Copy

MR LYALL JOHNSON, ACTING DIRECTOR

U S ATOMIC ENERGY COMMISSION, DIVISION OF MATERIALS LICENSING

GERMANTOWN, MD

CC - MR H J MC ALDUFF , LEASING OFFICER, PRODUCTION DIVISION
U S AEC OAK RIDGE TENNESSEE

SUBJECT- REQUEST FOR AUTHORIZATION TO ORDER SS MATERIAL -
INDIAN POINT CON B

RECEIVED
1964 JUN 11 PM 4 22
U.S. ATOMIC ENERGY COMM.
DIVISION OF
LICENSING & REGULATION

DOCKETED
USAEC
LICENSING & REGULATION
JUN 11 1964
DOCKET OFFICER

Copy Supplied
Public Document Room
Div. of Compliance (2) } 6/12/64-RRR

GENTLEMEN-

THE WESTINGHOUSE ELECTRIC CORPORATION, ATOMIC POWER DIVISION, REQUESTS THE ISSUANCE OF THE REQUIRED ALLOCATION AND/OR NUCLEAR MATERIALS DRAFT WHICH WILL PERMIT WESTINGHOUSE TO ORDER SPECIAL NUCLEAR MATERIAAL IN THE AMOUNTS AND SPECIFICATIONS LISTED BELOW. THIS MATERIAL SHOULD BE CHARGED AGAINST THE ALLOCATION PREVIOUSLY ISSUED TO CONSOLIDATED EDISON, LICENSE NO. DPR-5. WESTINGHOUSE WILL USE THE SS MATERIAL UNDER LICENSE NO. SNM-338, AS AMENDED, AND LEASE AGREEMENT NO. [illegible].

A174

FISCAL YEAR	U235 ISOTOPE	ENRICHMENT	DELIVERY KG U235 IN FORM OF UF6
1964	75,000 GM	2.86 W/O	75 KG - JUNE 22,1964
1965	190,000 GM	2.86 W/O	60 KG - JULY 6,1964 AND ALTERNATE WEEKS

THANK YOU FOR YOUR ASSISTANCE IN THIS MATTER.

VERY TRULY YOURS,

H. C. AMTSBERG, MANAGER

ADMINISTRATIVE SERVICES

END OR GA PLS

END TKS DI

TWX INCOMING

3185

U. S. GOVERNMENT PRINTING OFFICE: 1964 — 730-839

FROM: Westinghouse Electric Corp. Forest Hills, Pa.	DATE OF DOCUMENT: 6-11-64	DATE RECEIVED: 6-11-64	NO.: 3165
	LTR.: MEMO: REPORT:		OTHER: Telegram
TO: Lyall Johnson	ORIG.: X	CC:	OTHER:
	ACTION NECESSARY ☐ NO ACTION NECESSARY ☐	CONCURRENCE ☐ COMMENT ☐	DATE ANSWERED: BY:
CLASSIF.: U POST OFFICE REG. NO.	FILE CODE: 70-337		

DESCRIPTION: (Must Be Unclassified)
TWX req. issuance of required allocation and/or nuclear matls. draft which will permit them to order snm as set forth in this twx.....for use under SNM-338.....

ENCLOSURES:

REFERRED TO	DATE	RECEIVED BY	DATE
L. Johnson: w/file cy. 2-compliance cys. 2-extras 1-PDR Copy	6-12		

REMARKS: Mail Room Distribution:
1-file cy. for 50-3--(Thru Boyd)

U. S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM FORM AEC-326S (8-60)

Westinghouse Electric Corporation

3 Gateway Center
Box 2278, Pittsburgh, Pa. 15230

June 15, 1964

U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D. C., 20545

Attention: Mr. Robert Layfield, Source and Special Nuclear Materials Branch

Subject: Shipping Containers for SPERT Fuel Rods
SNM-338, Docket 70-337
Ref: CLN, DLR, CLN, RLL, 70-337

Gentlemen:

File Copy

Confirming our telegram of June 11, 1964, and as per the suggestion in our discussion of June 9, 1964, we will tack weld the upper Spacer Ring to the outside shell of the shipping container. This shipping container was described in the amendment request of May 25, 1964, under License SNM-338, Docket 70-337. The container is displayed on the drawing designated SK-FC-10, 5/22/64, in the amendment request.

If you desire any additional information, please write to the above address or call me collect, 412-391-2800, Extension 3449.

Very truly yours,

C. P. Skillern

C. P. Skillern
License Administrator

RECEIVED
JUN 17 1964

DOCKETED
USAEC
LICENSING & REGULATION
JUN 17 1964
DOCKET OFFICER

A/75

ACKNOWLEDGED

3/7 7A

GOVERNMENT PRINTING OFFICE: 1964 — 720-0

FROM: Westinghouse Electric Corp. Pittsburgh, Pa.	DATE OF DOCUMENT: 6-15-64 / DATE RECEIVED: 6-17-64 / NO.: 3177-A
	LTR.: x / MEMO: / REPORT: / OTHER:
TO: Mayfield	ORIG.: x(6 cys. bearing reproduced sig'ns) / CC: / OTHER:
	ACTION NECESSARY ☐ / NO ACTION NECESSARY ☐ / CONCURRENCE ☐ / COMMENT ☐ / DATE ANSWERED: / BY:
CLASSIF.: U / POST OFFICE / REG. NO.	FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)

Ltr. confirming their 6-11-64 twx.

ENCLOSURES:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer: w/file cy. 2-compliance cys. 2-extras	6-18		
		ACKNOWLEDGED	

REMARKS: Mail Room Distribution:
1-PDR Copy

U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

JUN 15 1964

C. Luke, Chief
Criticality Branch

Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch, DML

WESTINGHOUSE - SPERT ROD SHIPPING CONTAINER. JUNE 11, 1964.
DOCKET NO. 70-337.

DML:RLL

Please review from the standpoint of criticality control.

The extra copy may be retained for your files.

Attachment:
Extra copy

A/76

OFFICE ▶	ML					
SURNAME ▶	RLayfield/jc					
DATE ▶	6/15/64					

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

XX C O L L E C T

JUN 1 8 1964

USAEC, GERMANTOWN, MARYLAND
DONALD A. NUSSBAUMER, CHIEF
SOURCE AND SPECIAL NUCLEAR MATERIALS BR.
DIVISION OF MATERIALS LICENSING

WESTINGHOUSE ELECTRIC CORPORATION
3 GATEWAY CENTER
BOX 2278
PITTSBURGH, PENNSYLVANIA

ATTENTION: MR. C. F. SKILLERN
LICENSE ADMINISTRATOR

PURSUANT TO 10 CFR 71, THE WESTINGHOUSE ELECTRIC CORPORATION IS HEREBY AUTHORIZED UNDER LICENSE SNM-338 TO SHIP SPERT FUEL RODS FROM CHESWICK PENNSYLVANIA, TO IDAHO FALLS, IDAHO IN ACCORDANCE WITH THE PROCEDURES DESCRIBED IN WEC APPLICATION DATED MAY 25, 1964, AND SUPPLEMENT DATED ~~JUNE~~ JUNE 11, 1964. ALL OTHER CONDITIONS OF THIS LICENSE SHALL REMAIN THE SAME.

REFERENCE DML:RLL 70-337

DISTRIBUTION:
Doc. Rm.
Br. & Div. rfs
Compliance
Suppl.
H. J. McAlduff, OROO
D. George, NMM
N. Doulos, ML
D. Nussbaumer, ML
State Health

RLayfield/jc
Rm. 414
7457

A/77

OFFICE ▶	ML	ML			
SURNAME ▶	RLayfield/jc	DN DNussbaumer			
DATE ▶	6/ /64	6/18/64			

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, ML

DATE: June 22, 1964

FROM : Charles D. Luke, Chief
Criticality Branch, ML

SUBJECT: WESTINGHOUSE ELECTRIC CORPORATION, FABRICATION OF CONSOLIDATED EDISON INDIAN POINT CORE II, DOCKET NO. 70-337, MAY 20, 1964

SYMBOL: ML:RLS

The Westinghouse amendment application concerning manufacture of the second core of the Indian Point reactor was reviewed as to the nuclear safety aspects of all proposed manufacturing operations. We have not completed review of the containers and procedures for shipment of the finished fuel elements.

Although the proposed process controls define safe conditions, two inconsistencies in the application were noted:

1. The control for the Power Tray Cleaning Cart is quoted as a volume limit of one gallon (page 10 of application) whereas this limit applies to one component of the cart only and actually should be 1.2 gallons for that one component.

2. The critical dimension for the tray in Drawing SK-GA-3 as shown in the expanded view does not agree with that in the assembly elevation. The dimensions shown in the assembly elevation view are acceptable.

It is our understanding that Westinghouse will correct these inconsistencies in the application. After such written corrections are made, we see no objection from the nuclear safety viewpoint to your issuance of a license amendment that approves the manufacturing operations but does not permit shipment of the finished elements. Our appraisal of the containers and procedures for shipment of the finished elements will be presented in a second memorandum.

A178

JUN 24 1964

C. Luke, Chief
Criticality Branch, DML

Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch, DML

SHIPPING CONTAINERS FOR SPERT FUEL RODS - WESTINGHOUSE LETTER DATED JUNE 15, 1964. DOCKET NO. 70-337.

DML:RLL

Attached for your information and files is a copy of Westinghouse letter dated June 15, 1964.

Attachment:
Extra copy

A179

OFFICE ▶	ML					
SURNAME ▶	RLayfield/jc					
DATE ▶	6/24/64					

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Files DATE: June 24, 1964

FROM : Robert L. Stevenson R. L. Stevenson
Criticality Branch
Division of Materials Licensing

SUBJECT: TELECON WITH C. P. SKILLERN, WESTINGHOUSE ELECTRIC CORPORATION, DOCKET NO. 70-337 - CONCERNING INDIAN POINT CORE II ASSEMBLY SHIPMENT

R. L. Layfield and R. L. Stevenson discussed two questions about the proposed method of shipping the finished Core II assemblies with C. P. Skillern on June 24:

1. If a shipment suffers impact and immersion in water, will the canister and assembly drain when the water drains off?

2. What are the conditions of spacing and moderation implied by the statement on page 16 of the application: "When loaded in these containers at this spacing, an infinite array of these containers would have a k_{eff} of less than 1"?

Regarding question 1, Skillern stated that he will send a wire confirming that all water will drain, including moderating water from between the elements, when the containers are drained. Skillern was not positive about the use of plastic bags around the assemblies but did not believe any bags would be used.

Regarding question 2, Skillern stated that the k_{eff} of less than 1 applies to an infinite, fully flooded array of assemblies in the spacing defined by the undamaged fuel canisters.

cc: D. A. Nussbaumer, ML

A180

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : D. A. Nussbaumer, Chief, Source and Special Nuclear Materials Branch, DML

DATE: JUN 26 1964

FROM : Christian Beck, Staff Engineer - Structural Irradiated Fuels Branch, DML CB

SUBJECT: WESTINGHOUSE FUEL SHIPPING CONTAINER - Docket No. 70-337, Core 2 of Cons. Edison, Indian Point Reactor

I have reviewed the data submitted regarding structural integrity of subject shipping container, and have the following comments:

a. The top half of the outer container is expected to fail when subjected to a 30' drop on the top. This 14 ga. hemispherical shaped plate is expected to buckle and be pushed against the inner containers, but not to the extent of causing any serious damage to these fuel element containers.

b. If the cask is dropped on the 6" diameter piston, the piston will shear through the 14 ga. outer container, but is not expected to puncture the inner container wall.

cc: Dr. C. D. Luke

A/81

DOCKET NO. 70-337

File Copy

Beth 016

TWX INCOMING

1964 JUN 30 PM 3 56

U.S. ATOMIC ENERGY COMM.
TWX UNIT

ROBERT LAYFIELD U. S. ATOMIC ENERGY COMMISSION,

DIVISION OF MATERIALS LICENSING

WASHINGTON , D C

6-30-64 351PM

SUBJECT INDIAN POINT AMENDMENT, DATED MAY 20, 1964, SNM-338, DOCKET 70-337. SUPPLEMENTING THE SUBJECT AMENDMENT REQUEST, THERE ARE NO ENCLOSURES AROUND THE FUEL ASSEMBLIES INSIDE THE QUOTE FUEL ASSEMBLY SHIPPING CONTAINER UNQUOTE DRAWINGS 10410, 10536, 10538, 10541, THAT WOULD RETAIN WATER IN THE UNLIKELY EVENT OF FLOODING BY WATER AND SUBSEQUENT DRAINAGE OF THE CONTAINER. A THIN PLASTIC SLEEVE, OPEN ON BOTH ENDS, IS USED TO PROTECT THE ASSEMBLIES FROM DUST.

C P SKILLERN WESTINGHOUSE ELEC CORP GATEWAY CENTER PITTSBURGH PA

Luke - 7/1/64

BL

RECEIVED
1964 JUL 1 AM 10 13
U.S. ATOMIC ENERGY COMM.
REGULATORY
MAIL SECTION

Copy Supplied
Public Document Room - 7/6/64
Div. of Compliance (2)
Luke 7/1/64
RRP

TWX INCOMING

A82

END

3514

FROM: Westinghouse Electric Corp.
Pittsburgh, Pa.

DATE OF DOCUMENT: 6-30-64

DATE RECEIVED: 7-2-64

NO.: 3514

LTR. MEMO: REPORT: OTHER: TWX

TO: Layfield

ORIG.: X CC: OTHER:

ACTION NECESSARY ☐	CONCURRENCE ☐	DATE ANSWERED:
NO ACTION NECESSARY ☐	COMMENT ☐	BY:

CLASSIF.: U

POST OFFICE

REG. NO:

FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)

TWX supplementing their 5-20-64 amendment req. to SNM-338 and advising that there are no encls. around the fuel ass'ys inside the shipping container, etc....

ENCLOSURES:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer:	7-2		
w/file cy. 2-compliance cys. 2-extras 1-PDR Copy			
		3514	

REMARKS:

U.S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1962—661390

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, ML

DATE: July 6, 1964

FROM : Charles D. Luke, Chief
Criticality Branch, ML

CDL

SUBJECT: WESTINGHOUSE ELECTRIC CORPORATION, SHIPMENT OF CONSOLIDATED EDISON INDIAN POINT CORE II ASSEMBLIES, DOCKET NO. 70-337, MAY 20, 1964

SYMBOL: ML:RLS

The container and procedures for shipment of the finished fuel assemblies for the Indian Point Core II were reviewed for nuclear safety. The container to be used was formerly approved for shipments of Selni fuel and the reference drawings are Champion Company drawings 10410, 10536-Sheet 1, 10538-Sheet 1, and 10541. A total of no more than 16 fuel assemblies in eight containers will be shipped at one time via common carrier with exclusive use of the vehicle. The container design provides an isolating thickness of water between assemblies in different containers in the event of water flooding. We have confirmed that k_{eff} of the single container is below 0.9, even if flooded with water. There is no problem of criticality for an array of unmoderated assemblies at the maximum (4.2 percent) enrichment. By wire of June 30, the applicant has confirmed that, in the event of flooding, the water within the assemblies will drain whenever the water within the containers drains. Thus, there is no criticality hazard from single containers or from interaction between normally spaced units of an eight-container array.

Based on Mr. Christian Beck's structural integrity analysis (DAN from C. Beck 6/26/64) the top half of the outer container would buckle when subjected to the 30-foot drop test. We suggest that Westinghouse be requested to demonstrate the safety of arrays of the damaged containers as follows:

> "To conclude the review of the proposed shipping procedures for the Indian Point Core II assemblies, you should provide calculations or experimental data to demonstrate that a flooded array of containers as damaged by the 30-foot drop test, would be subcritical in the most reactive configuration. You should consider the case where two damaged containers would come together, top-to-top under water, which would result in a rather compact array of four elements."

A/83

JUL 16 1964

DML:RLL
70-337

Westinghouse Electric Corporation
Box 2278
Pittsburgh, Pennsylvania 15230

Attention: Mr. C. P. Skillern
License Administrator

Gentlemen:

Pursuant to your application dated May 20, 1964, as supplemented June 22, June 23, and June 30, 1964, Special Nuclear Material License No. SNM-338 is hereby amended to authorize the receipt, possession and use of uranium oxide at U-235 enrichments of 2.81, 3.22 and 4.02 weight percent for the fabrication only of Indian Point Reactor Core II fuel rods and assemblies.

You will note that shipment of these fuel rods and assemblies is not authorized. In order to continue our review of your procedures for shipment of these reactor fuel components, we require that you provide calculations or experimental data to demonstrate the nuclear safety of such shipments under conditions of complete flooding of containers as damaged by the thirty (30) foot drop test. To this extent, you should consider the condition whereby two damaged containers would be abutted top-to-top under water.

Our review of your request in the application dated May 20, 1964, that Drawings C773D407, C116C495, C116C491, SK-FC-5 and SK-GA-3, Sub. 1, and the narrative description thereof be withheld from public disclosure pursuant to Section 2.790(b), 10 CFR 2, "Rules of Practice," has not been completed at this time. We shall contact you in the near future regarding this matter.

In regard to the request in your letter dated June 22, 1964, the title page, narrative description and Drawing SK-GA-3 submitted in your application dated May 20, 1964, have been replaced with the revised title page, narrative description and Drawing SK-GA-3, Sub. 1,

OFFICE ▶						A/84
SURNAME ▶						
DATE ▶						

as discussed in telephone conversation between your Mr. C. P. Skillern and Mr. R. L. Layfield of this branch. Five copies of the superseded pages and drawing will be returned to you in the near future. One copy of each of these submissions will be retained in our files.

FOR THE ATOMIC ENERGY COMMISSION

Don F. Harmon, Acting Chief
Source and Special Nuclear Materials Branch
Division of Materials Licensing

DISTRIBUTION:
Doc. Rm.
Br. & Div. rfs
Compliance
Suppl.
Br. & Div. rfs
Compliance
State Health
H. J. McAlduff, OROO
D. George, NMM
N. Doulos, ML
D. Nussbaumer, ML
R. Layfield, ML
C. Luke, ML

OFFICE ▶	ML	ML	ML	ML		
SURNAME ▶	RLayfield/jc	CLuke	LJohnson	DHarmon		
DATE ▶		7/16/64	7-16-64	7/16/64		

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

RECEIVED AUG 11 1964 U.S. ATOMIC ENERGY COMMISSION Regulatory Mail Section

Westinghouse Electric Corporation

3 Gateway Center
Box 2278, Pittsburgh, Pa. 15230

August 10, 1964

U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D. C., 20545

Attention: Mr. Donald A. Nussbaumer, Chief,
Source and Special Nuclear Materials Branch

Subject: Amendment of SNM-338, Docket 70-337,
Indian Point Core II File Copy

Gentlemen:

Westinghouse Electric Corporation hereby applies for an amendment to the subject license, issued on July 16, 1964. This amendment will revise the information transmitted to you on May 20, 1964, and revisions transmitted on 6/22/64, 6/23/64 and 6/30/64. We desire to make a revision in the provisions for pellet storage.

Revisions of the original application have been made on the attached sheets, which can be inserted in the binder and the old pages removed.

If you have any questions, please write to me at the above address or phone me collect, 412-391-2800, Extension 3449.

Very truly yours,

C. P. Skillern

C. P. Skillern
License Administrator

A/85

DOCKETED USAEC AUG 12 1964 REGULATORY MAIL SECTION DOCKET CLERK

Attachment

4133

SNM-338
Indian Point
Core II
8/10/64

FILING INSTRUCTIONS

The new cover letter dated August 10, 1964, should be inserted in the binder in front of the revision letter dated June 22, 1964.

The new Revision Record designated as page 2.2 should be inserted following page 2.1.

The Revision Record can be used as a guide for location of pages to be replaced. Remove the existing pages 1, 9, 10 and 12 and insert the new pages 1, 9, 10 and 12. Insert the new page 9.1 following page 9.

REVISION RECORD

Revision No.	Date of Revision	Pages Revised	Revision Reason
2	8/10/64	1	Table of Contents - page 9.1 added.
2	8/10/64	9	Pellet Storage Rack criticality analysis revised.
2	8/10/64	10	Sintered pellet storage - slab thickness revised for the various enrichments.
2	8/10/64	12	Limits for UO_2 pellet slab thicknesses revised for the various enrichments.

INDIAN POINT AMENDMENT

TABLE OF CONTENTS

		Page No.
	Revision Record	2.1
1.	Introduction	3
2.	Correspondence - Return Address	4
3.	Materials, Amounts and Specifications	4
4.	Equipment and Facilities for Radiation Protection	5
5.	Receipt of Material	5
6.	Powder Storage - Description and Criticality Controls	
	A. Bottle Storage Rack Description	5
	1. Bottle Storage Rack - Criticality Determinations	6
	B. Belt Conveyer	8
7.	Pellet Storage	
	A. Pellet Conveyer Storage in Process	8
	B. Sintered Pellet Storage After Grinding	9
8.	General Information About Processing and Criticality Control	9.1
	A. New Equipment	
	1. Press Feed Hopper (Proprietary Information)	11
	2. Powder Tray Cleaning Cart (Proprietary Information)	11
	B. Criticality Determinations	
	1. Batch Size Determinations	11

7\. A. (continued)

the boats, thus assuring a 2.5 inch slab. These boats will be stored on a conveyer as shown on drawing C116C495.* The criticality limits are given under "Criticality Determinations, Slab Determination UO_2 Pellets." A stop bar is located at the end of the conveyer and the boats will not be stacked by means of administrative control.

B. Sintered Pellet Storage After Grinding

The pellet storage, after leaving the centerless grinder, will be on flat trays one pellet layer thick. These trays will be stored on conveyers as shown on Drawing C116C491.* A stop bar is located at the end of the conveyer and the trays will not be stacked by means of administrative control. At the end of this conveyer, pellets will be stored in racks similar to those used in the B and C storage vaults described in the Yankee III, SELNI and SPERT amendments. These racks have a vertical opening just greater than the maximum permissible slab thickness for the enrichment stored, such that the slab thickness is always maintained. The shelf spacing assures a minimum of 12 inches spacing between the stored slabs. There are five shelves in one rack. There will be eight of these racks at the end of the conveyer. Thus, if the storage rack were flooded, each slab would be isolated by at least 12 inches of water. If the water drained away, the water will also drain from the stacked trays, thus assuring unmoderated slabs. Only one enrichment will be processed at one time. If pellets of a certain enrichment are left after production is complete, these will be stored separately in one rack which will be properly identified.

*Proprietary Folder

8. General Information About Processing and Criticality Control

This section describes a flow scheme of the material used in the fabrication process and lists the criticality control used for each step.

Process Step	Control
1. Powder Preparation Weighing, Mixing, Granulating, etc.	Mass - 4.02 = 59 lbs/batch Mass - 3.22 = 86 lbs/batch Mass - 2.81 = 117 lbs/batch
2. Powder Conveyer (storage)	Slab = 2.5 inches
3. Powder Tray Cleaning Cart*	Component A; Volume < 4.8 liters Component B; Slab 4.5 inches
4. Pellet Pressing	
(a) Feed Hopper	Mass - 4.02 = 59 lbs/batch Mass - 3.22 = 86 lbs/batch Mass - 2.81 = 117 lbs/batch
(b) Conveyer*	< 70 in^2 Conveyer) < equivalent < 25 in^2 at Tee) diameter of 10.2 inches
5. Pellet Conveyer Storage	Slab 2.5 inches
6. Sintering Furnace	Slab 2.5 inches
7. Centerless Grinder	Slab 2.5 inches
(a) Waste Collection	Volume < 4.8 liters; Slab < 4.5 in.
8. Sintered Pellet Storage	Slab 3.4 inches - 4.02 w/o 4.0 inches - 3.22 w/o 4.2 inches - 2.81 w/o
9. Rod Loading, Process & Storage	Slab 3.5 inches
10. Leak Testing	Cylinder 6.6 inches
11. Fabrication of Fuel Assemblies Assumes sequential loading for any partially loaded assembly	$K_{eff} < 0.74$

*Proprietary Information (see Proprietary Folder)

2. Slab Determinations

a. UO_2 Pellet Slab

A maximum permissible slab thickness has been set at 3.4 inches for 4.02 w/o, 4.0 inches for 3.22 w/o and 4.2 inches for 2.81 w/o enrichments of UO_2. These slab thickness are within the limits given in TID-7016, Rev. 1, Figure 16, page 21.

b. Powder Slab

A maximum permissible slab thickness of 4.5 inches has been set for 4.02 w/o UO_2 powder. This is within the permissible limit for 6 w/o shown in K-1019, Rev. 5, Table XIII, page 21.

3. Cylinder Determinations

The maximum permissible cylinder diameter for leak testing of the rods will be 6.6 inches in which the maximum enrichment is 4.02%. This is more conservative than the maximum permissible cylinder diameter of 8 inches shown in TID-7016, Rev. 1, page 21, Fig. 15.

4. Volume Determination

The maximum permissible volume for solutions of UO_2 at 4.02 w/o has been set at 4.8 liters. This is the always safe volume of 4.8 liters (1.27 gal.) as shown in TID-7016, Rev. 1, Table I, page 10.

GOVERNMENT PRINTING OFFICE: 1964 — 725-0

FROM: Westinghouse Electric Corp. Pittsburgh, Pa.	DATE OF DOCUMENT: 8-10-64 · DATE RECEIVED: 8-12-64 · NO.: 1133
	LTR.: x & pages · MEMO: · REPORT: · OTHER:
TO: Nussbaumer	ORIG.: · CC: · OTHER: (6 cys.—all bearing reproduced signatures)
	ACTION NECESSARY ☐ · NO ACTION NECESSARY ☐ · CONCURRENCE ☐ · COMMENT ☐ · DATE ANSWERED: · BY:
CLASSIF.: U · POST OFFICE REG. NO.:	FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)

Ltr. req. amendment to SNM-338 to make a revision in regard to their provision for pellet storage.....Included:

ENCLOSURES: (6 cys. ea)

Revisions to original appl. which consists of revised pages 1, 9, 10, 12 & new page 9.1, for insertion therein..

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer: w/file cy. 2-compliance cys. 2-extras 1-PDR Copy	8-12		

REMARKS:

ACKNOWLEDGED

U. S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM FORM AEC-326S (8-60)

Layfield

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, ML

DATE: August 19, 1964

FROM : Charles D. Luke, Chief
Criticality Branch, ML

SUBJECT: WESTINGHOUSE ELECTRIC CORPORATION, CHANGE IN OXIDE PELLET STORAGE LIMIT, DOCKET NO. 70-337, AUGUST 10, 1964

SYMBOL: ML:RLS

The proposed change in the slab thickness for the storage of sintered oxide pellets involves an increase from a slab depth limit of 2.5 inches to three specific values corresponding to three enrichments. The new limits accord with the customary safety margins and thus we have no objection based on nuclear safety to your approval of the proposed amendment.

A/86

DOCKET NO. 70-337

DOCKETED USAEC SEP 8 1964 REGULATORY MAIL SECTION DOCKET CLERK

File Copy
WESTINGHOUSE ELECTRIC CORPORATION

Atomic Power Division

Box 355, Pittsburgh 30, Pa.

September 4, 1964

RECEIVED 1964 SEP 8 PM 12 04 U.S. ATOMIC ENERGY COMM. REGULATORY MAIL SECTION

U.S. Atomic Energy Commission
Division of Materials Licensing
St. Elmo and Norfolk Avenues
Bethesda, Maryland

Attn: Mr. Lyall Johnson, Acting Director
Request for Authorization to Order
Additional SS Material --
Indian Point Core B

Gentlemen:

The Westinghouse Electric Corporation, Atomic Power Division, requests an amendment to the fuel allocation for the Indian Point Core B fuel assemblies dated June 18, 1964. The original application for allocation dated June 11, 1964, Docket 70-337, requested 190,000 gm U-235 to be drawn down in fiscal 1965. As the result of an order for spare fuel assemblies an additional 7,700 gm U-235 is requested to be drawin down against the Consolidated Edison Co. of New York, Inc. allocation. The enrichment of the UF_6 is 2.86 w/o in the U-235 isotope.

A Form OR-640 for the additional special nuclear material has been prepared and will be submitted to the Leasing Officer, Oak Ridge, Tennessee.

Thank you for your assistance in this matter.

Very truly yours,

H C Amtsberg

H. C. Amtsberg, Manager
Administrative Services

cc: E. B. Thomas, General Counsel
LeBoeuf, Lamb and Leiby
1821 Jefferson Place, N.W.
Washington 6, D.C.

cc: Consolidated Edison Co. of New York, Inc.
H. W. Dierman, Chief Mechanical Engr.

Mr. W. J. Cahill, Jr., Nuclear and Turbine Engr.

cc: Mr. H. J. McAlduff, Leasing Officer
Oak Ridge, Tennessee

Copy Supplied
~~Public Document Room~~
Div. of Compliance (2) 9/11/64-RRR

4475

ACKNOWLEDGED

U.S. GOVERNMENT PRINTING OFFICE: 1964 — 72 ... 0

FROM:	DATE OF DOCUMENT:	DATE RECEIVED:	NO.:
Westinghouse Electric Corp. Pittsburgh, Pa.	9-4-64	9-8-64	4475

LTR.	MEMO:	REPORT:	OTHER:
x			

TO: Lyall Johnson

ORIG.: CC: OTHER: (6 orig. signed verifaxed cys.)

ACTION NECESSARY ☐ NO ACTION NECESSARY ☐ CONCURRENCE ☐ COMMENT ☐ DATE ANSWERED: BY:

CLASSIF.: U

POST OFFICE REG. NO.

FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)

Ltr. req. amendment to fuel allocation for the Indian Point Core B fuel assemblies dtd. 6-18-64 to allow for an additional 7,700 grams of U-235......

ENCLOSURES:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer: w/file cy. 2-compliance cys. 2-extras	9-9		
		ACKNOWLEDGED	

REMARKS: Mail Room Distribution: 1-PDR Copy

U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

DML:RDS
70-337

SEP 8 1964

Westinghouse Electric Corporation
3 Gateway Center
Box 2278
Pittsburgh, Pennsylvania 15230

Attention: Mr. C. P. Skillern
License Administrator

Gentlemen:

As requested in your application dated August 10, 1964, Special Nuclear Material License No. SNM-338 is hereby amended to authorize the storage of pellets in accordance with the procedures outlined in the application dated August 10, 1964. All other conditions of the license shall remain the same.

Very truly yours,

Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch
Division of Materials Licensing

DISTRIBUTION:
Doc. Rm.
Br. & Div. rfs
Compliance
Suppl.
H. J. McAlduff, OROO
D. George, NMM
N. Doulos, ML
D. Nusbaumer, ML
R. Smith, ML
State Health

A/88

OFFICE ▶	ML	ML				
SURNAME ▶	RSmith/jc	DNussbaumer				
DATE ▶	2 Sep 64	9/4/64				

Westinghouse Electric Corporation

Atomic Power Division Box 355, Pittsburgh 30, Pa.

70-337

September 11, 1964

File Copy

FS-896

RECEIVED USAEC SEP 15 1964 REGULATORY MAIL SECTION DOCKET CLERK

United States Atomic Energy Commission
Division of Materials Licensing
St. Elmo and Norfolk Avenue
Bethesda, Maryland

Attention: Mr. Lyall Johnson
Acting Director

Gentlemen:

Subject: Request for Authorization to Order SS Material
San Onofre Nuclear Generating Station, Unit 1
Docket ~~50-206~~, CPPR-13
File Copy

By letter dated July 27, 1964 the Southern California Edison Company (EDISON) and the San Diego Gas and Electric Company (SAN DIEGO) notified the Commission that on or about September 1, 1964 the applicants would inform the Commission of the needs for special nuclear material for fiscal 1965.

In accordance with that letter, Westinghouse Electric Corporation, Atomic Power Division requests issuance of the required allocation and/or nuclear materials draft to permit special nuclear material to be ordered in the amounts and form listed below. This material is a part of the 781 Kg U^{235} specified in Exhibit A, to Amendment No. 6, Docket 50-206 as being required in fiscal 1965.

On or about November 1, 1964, Westinghouse, acting in behalf of EDISON-SAN DIEGO, will issue Form OR-640 requesting the exact quantity of special nuclear material and specifying the exact enrichment desired. This material is to be furnished to EDISON-SAN DIEGO under a lease agreement to be executed between them and the AEC prior to November 1, 1964.

A189

4542

ACKNOWLEDGED

U^{235} Isotope	Enrichment	Delivery Kg U^{235} in UF_6
713,000* gm	3.0 ± 0.2%	128 Kg on alternate weeks beginning November 6, 1964

*-based on enrichment of 3.2%

Notification of additional quantities of special nuclear material required in fiscal 1965 will be issued promptly as needs are established.

Very truly yours,

H. E. Walchli
Fuel Service Manager
(Acting in behalf of
EDISON-SAN DIEGO)

HEW/bm

cc: W. R. Gould, Vice President
Southern California Edison Company

W. A. Zitlow, Executive Vice President
San Diego Gas and Electric Company

D. Barry, Assistant Counsel
Southern California Edison Company

H. J. McAlduff, Leasing Officer
U.S. AEC, Oak Ridge, Tennessee

U.S. GOVERNMENT PRINTING OFFICE: 1964 — 725-839

FROM:	WESTINGHOUSE ELECTRIC CORPORATION H. E. Walchli Pittsburgh 30, Pa.
DATE OF DOCUMENT:	9-11-64
DATE RECEIVED	9-15-64
NO.:	4542
LTR.:	x
MEMO.:	
REPORT:	
OTHER:	
TO:	L. Johnson
ORIG.:	x
CC:	
OTHER:	
ACTION NECESSARY	XX
NO ACTION NECESSARY	☐
CONCURRENCE	☐
COMMENT	☐
DATE ANSWERED:	
BY:	
CLASSIF.:	U
POST OFFICE REG. NO.	
FILE CODE:	Docket 70-337
DESCRIPTION: (Must Be Unclassified)	Ltr. requesting issuance of the required allocation and/or nuclear materials draft to permit erm to be ordered in the amounts of 713,000 gm U-235 isotope (120 kg on alternate weeks beginning 11-6-64) for
ENCLOSURES:	San Onofre.
REMARKS:	Distribution: 1 - AEC PDR 2 - Compliance (Hdqtrs)

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer:	9-18		
w/orig file cy--FOR ACTION 3 extras			
(RETYPE)			

ACKNOWLEDGED 4/5/4

U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

U. S. GOVERNMENT PRINTING OFFICE: 1964 — 725-83

FROM: WESTINGHOUSE ELECTRIC CORPORATION H. E. Walchli Pittsburgh 30, Pa.	DATE OF DOCUMENT: 9-1?-64	DATE RECEIVED 9-15-64	NO.: 4542
	LTR.: X	MEMO: REPORT:	OTHER:
TO: Johnson	ORIG.: X	CC: OTHER:	
	ACTION NECESSARY X NO ACTION NECESSARY ☐	CONCURRENCE ☐ COMMENT ☐	DATE ANSWERED: BY:
CLASSIF.: U POST OFFICE REG. NO.	FILE CODE: Docket 50-206		

DESCRIPTION: (Must Be Unclassified)

Ltr. requesting issuance of the required allocation and/or nuclear materials draft to permit snm to be order in the amounts of 713,000 gm U-235 isotope (120 kg on alternate weeks beginning 11-6-64) for

ENCLOSURES:

SAN ONOFRE

REMARKS: Distribution:
Muller (1) cy.
1 - OGC
1 - Dr. Fine, OA
1 - H. Steele
1 - formal file
1 - suppl file
1 - HQ PDR
1 - SAN PDR
1 - LA PDR
2 - Compliance

REFERRED TO	DATE	RECEIVED BY	DATE
Boyd: w/9 cys--FOR ACTION	9-16		
L. Johnson (w/info cy)			
Dr. Doan (w/info cy)			
~~Steele~~			
Nussbaumer 9-18-64			

U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

DOCKETED
USAEC
OCT 7 1964
REGULATORY
MAIL SECTION
DOCKET CLERK

Westinghouse Electric Corporation

3 Gateway Center
Box 2278, Pittsburgh, Pa. 15230

October 6, 1964

U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D. C., 20545

Attention: Mr. Lyall E. Johnson, Acting Director

Subject: Amendment to SNM-338, Docket 70-337, For a Saxton Superheat Fuel Assembly Shipping Container

File Copy

Gentlemen:

Westinghouse Electric Corporation hereby applies for an amendment to the subject license to provide for a shipping container that will be used to ship a Saxton Reactor Superheat Fuel Assembly between Cheswick, Forest Hills or Waltz Mill, Pennsylvania, and Saxton, Pennsylvania. This fuel assembly will be used in Westinghouse's continuous program for testing new reactor components at the Saxton Reactor. This material will be shipped on or about November 30, 1964.

A Bureau of Explosives permit is in the process of being requested.

If you have any questions, please write to me at the above address or call me collect 412-391-2800, Extension 3449.

Copy supplied ... 10/5/64 - KLK

Very truly yours,

C. P. Skillern

C. P. Skillern
License Administrator

Attachment:
6 copies transmitted

A/8990

4801

WESTINGHOUSE ELECTRIC CORPORATION

APPLICATION FOR AMENDMENT TO

SNM-338

FOR A SAXTON SUPERHEAT FUEL ASSEMBLY

SHIPPING CONTAINER

October 6, 1964

U.S. ATOMIC ENERGY COMMISSION

DOCKET 70-337

SAXTON SUPERHEAT FUEL ASSEMBLY

SHIPPING CONTAINER

October 6, 1964

The Saxton Superheat Fuel Assembly will be transported between Cheswick, Forest Hills, or Waltz Mill, Pennsylvania, and the Saxton Reactor at Saxton, Pennsylvania, in the container shown on the attached drawing (EDSK-313297-C). Only one fuel assembly at a time will be shipped using "Exclusive Use of Vehicle."

Shipping Container Specification

The fuel assembly will be shipped in the container along with another component (Pressure Tube Assembly which does not contain special nuclear material), as illustrated in drawing EDSK-313297-C. The shipping container was designed and fabricated by The Champion Company per Westinghouse specifications to provide protection to the fuel assembly from damage due to shipping and handling by the carrier. It is a re-usable metal container manufactured from No. 14 gage, .074 inch thick carbon steel painted inside and out and weighs approximately 2000 pounds. It has a removable top that is bolted to the bottom portion of the container; and lifting provisions for hand, crane or fork lift truck handling are provided. Other important design features are leak tightness, humidity control, and shock and vibration isolation of the special nuclear material

Shipping Container Specification (continued)

package. The fuel assembly is secured to a rigid frame by a bolted clamping device. This frame is shock-mounted to the sides of the container through four Lord Manufacturing Company shock mounts to protect the fuel assembly against the following shock and vibration conditions for a temperature range of 20°F to 150°F during handling and shipping:

a) Vertical and horizontal accelerations perpendicular to the longitudinal axis not exceeding 10 g's.

b) Horizontal acceleration parallel to the longitudinal axis not exceeding 15 g's.

c) Satisfactory amplitudes and accelerations of the vibration when the container has been subjected to frequencies of vibration at 2.5 to 7.5 cps caused by the transport carrier.

The shipping container is approximately 32-5/8 inches high by 29-1/2 inches wide by 242 inches long.

Fuel Assembly Description

This fuel assembly contains 7 fuel rods, stainless steel clad, containing UO_2 pellets at an enrichment of 21 w/o. The fuel rods are 0.45 inches in diameter with a fuel column 36 inches long. The rods are grouped in a triangular lattice with a center-to-center pitch of 0.5 inches and are supported by grid plates at each end. The grid plates and fuel rods are contained within three form-fitting hexagonal baffles, two of which are

Fuel Assembly Description (continued)

.012 inches thick and one of which is .021 inches thick. This portion of the assembly in turn is contained within a series of three concentric cylindrical steel baffles which are bolted to the fuel rod lower grid plate. The baffles are .012, .012, and .033 inches thick. The outermost baffle has an O.D. of 2 inches. Additional hardware is attached to the baffle and fuel rod grid plates resulting in an assembly about 210 inches long with the fuel rod cluster located near one end.

Criticality Determinations

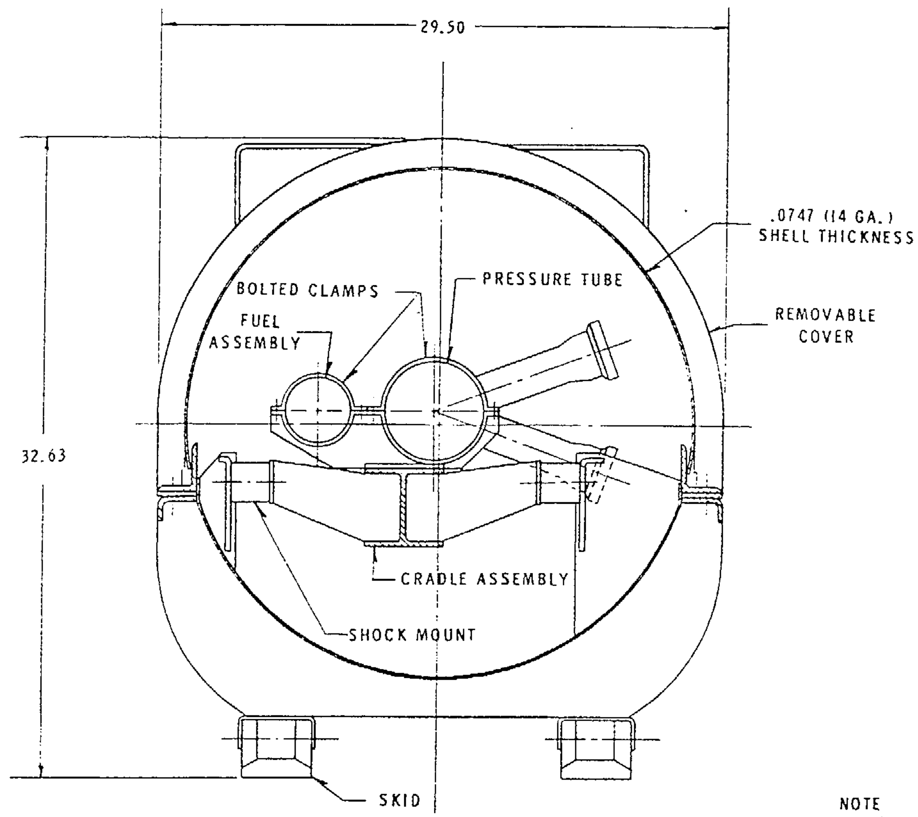
A total of 6.15 Kg of UO_2, about 1.1 Kg of U-235, is contained in one fuel assembly. The seven fuel rods in the assembly are held in a close-packed bundle having an effective diameter of 1.8 inches. This is considerably smaller than the safe diameter (for an infinitely long cylinder) of 5 inches given in Table I on page 10 of TID-7016, Rev. I, Nuclear Safety Guide, that applies to fully enriched material. Thus no criticality problem can arise because of the safe geometric configuration of the assembly under normal shipping conditions.

A mass of 1.1 Kg of U-235 would be just critical if the material were to be formed into a sphere with optimum moderation and reflection as given in Table I, page 10, used with Figure 21, page 25, of TID-7016, Rev. I. Westinghouse believes that it is incredible that under accident conditions all of the stainless steel tubes would rupture and release all of the UO_2 pellets to form a spherical shape containing uniformly dispersed UO_2

Criticality Determinations (continued)

optimumly moderated and reflected. Additional safety is assured as the assembly is made of stainless steel and if a rupture occurred, the assembly structure would intermix with the pellets resulting in parasitic absorption of the neutrons. Also, under accident conditions, the shock mounts attached to the fuel assembly holding frame would absorb much of the energy transmitted to the frame, probably in excess of the 15 G rating. This would further assure the fuel rods remaining in the elongated safe arrangement and prevent any rupture of the fuel rods. Thus, under severe accident conditions, assuming rupture and flooding of the shipping container, criticality would not occur.

DWG. E. D. SK. 313297-C



NOTE
242.25" OVERALL LENGTH
231" INSIDE LENGTH

DFTM. J ROBINSON	WESTINGHOUSE ELECTRIC CORPORATION
CHKR.	ATOMIC POWER DIV., PITTSBURGH, PA., U.S.A.
DES. ENG. H. W. Keller	TITLE SHR SUPERCRITICAL FUEL ASSEMBLY AND PRESSURE TUBE SHIPPING CONTAINER ARRANGEMENT
MFG. ENG.	
MTLS. ENG.	
APP.	SCALE 1:4
APP.	DIMENSIONS IN INCHES — E. D. SK. 313297-C
DFTG. SUPV.	DO NOT SCALE — SUB 1

CHANGE

SNM-338
Saxton Superheat
Shipping Containers

U. S. GOVERNMENT PRINTING OFFICE: 1964 ... 830

FROM: Westinghouse Electric Corp. Pittsburgh, Pa.	DATE OF DOCUMENT: 10-6-64	DATE RECEIVED: 10-7-64	NO.: 4001
	LTR.: X	MEMO:	REPORT: / OTHER:
TO: Johnson	ORIG.: X	CC: 5	OTHER:
	ACTION NECESSARY ☐ / NO ACTION NECESSARY ☐	CONCURRENCE ☐ / COMMENT ☐	DATE ANSWERED: / BY:
CLASSIF.: U	POST OFFICE REG. NO.:	FILE CODE: 70-337	

DESCRIPTION: (Must Be Unclassified)

Ltr. req amend to lic SNM-338 for a Saxton Superheat Assembly Shipping Container

ENCLOSURES:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer w/file cy & file	10-8		
2-Compliance			
2-Extras			
		ACKNOWLEDGED	
		4001	

REMARKS:

Mail Room Dist.
1-PDR cy

U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

DOCKET NO. 70-337

File Copy

Westinghouse Electric Corporation

Atomic Power Division Box 355, Pittsburgh 30, Pa.

RECEIVED 1964 OCT 9 AM 11 40 U. S. ATOMIC ENERGY COMM. REGULATORY MAIL SECTION

DOCKETED USAEC OCT 9 1964 REGULATORY MAIL SECTION DOCKET CLERK

October 7, 1964

U. S. Atomic Energy Commission
Division of Materials Licensing
Norfolk and St. Elmo Streets
Bethesda, Maryland

Attention: Mr. D. A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch

Gentlemen:

The Westinghouse Electric Corporation, Atomic Power Division, requests an allocation for special nuclear materials amounting to 360 kg of U in UF_6 to be made available for pick-up at Oak Ridge on or about November 5, 1964. The enrichment has been set at 5.7 w/o in the U-235 isotope to the normal AEC tolerances. The SNM will be used in the fabrication of Saxton Core II fuel assemblies.

Following conversion of the UF_6 into UO_2 powder, the SNM will be shipped to Cheswick, Pennsylvania for the pelletizing, rod loading and fuel assembly fabrication operations. The work at Cheswick will be performed under the terms and conditions of License No. SNM-338, as amended, Lease Agreement No. 245.

Docket 70-337

Very truly yours,

H. C. Amtsberg, Manager
Administrative Services

Attachment

A/91

APPLICATION FOR FUEL ALLOCATION

This application requests an allocation of Special Nuclear Materials for the Saxton Reactor Project, Core II under the terms and conditions of Special Nuclear Materials License SNM-338 (Docket 70-33) and Lease Agreement Number 245. The allocation request is made pursuant to 10 CFR 70, entitled, "Special Nuclear Materials." However, information is furnished as requested in 10 CFR Part 50, Section 50.60, as outlined below:

(1) "Applicants financial qualifications to assume responsibility for payment of Commission charges for the materials, and to undertake and carry out the proposed use of special nuclear material for a reasonable period of time."

See attached copies of Annual Report, Westinghouse Electric Corporation, 1963. The Westinghouse Atomic Power Division operates under the terms and conditions of Special Nuclear Materials Lease Agreement Number 245.

(2) "The estimated date on which the applicant desires to receive the first shipment of special nuclear material and an estimated schedule by years, for subsequent receipts." UF_6 gas should be available for pick-up no later than November 5, 1964.

(3) "A schedule, by years, showing the estimated production, consumption and operating losses of special nuclear material;"

Core II is expected to operate from July, 1965 to July, 1967. During this period approximately 8 kg of U-235 will be consumed (final enrichment 1.4% less than initial) and 1.5 kg of Pu produced. For the purpose of this estimate, consumption and production is linear in the interval.

(4) "An estimated schedule, by years, for the transfer of special nuclear material to the Commission or to other Licensees;"

The UF_6 gas will be converted into UO_2 powder and subsequently into UO_2 pellets by one or more licensees. Unaccountable losses during the fabrication cycle should not exceed 3%. In addition, approximately 17% of the UO_2 will be returned as scrap to the AEC in the form of U_3O_8. The conversion, pelletization and loading processes should be completed between November 5, 1964 and June 15, 1965. Core Loading is scheduled to begin in July, 1965. First criticality for Core II is scheduled for July, 1965. Shipment of Core II to the AEC for reprocessing is scheduled for November, 1967 allowing for refueling time and a 90 day decay period.

The Saxton Nuclear Experimental Corporation has been issued Facility License DPR-4, (Docket 50-146), dated February 11, 1960, as amended.

FROM: Westinghouse Electric Corp.
Pittsburgh, Pa.

TO: D. Nussbaumer

DATE OF DOCUMENT: [illegible]

DATE RECEIVED: 10-5-64

NO.: [illegible]

LTR.: x & encls.

MEMO:

REPORT:

OTHER:

ORIG.: x

CC.: 3

OTHER:

ACTION NECESSARY ☐

NO ACTION NECESSARY ☐

CONCURRENCE ☐

COMMENT ☐

DATE ANSWERED:

BY:

CLASSIF.: U

POST OFFICE

REG. NO.

FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)

Ltr. req. allocation of 360 kg. of U in UF6 under SNM-338 prior to 11-5-64...

Attached:

ENCLOSURES:

Application for Fuel Allocation (4 cys.)

1963 Annual Report (4 cys.)

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer:	10-12		
w/file cy.			
2-compliance cys. w/o Report			
2-extras cys.			

REMARKS: Mail Room Distribution:
1-PDR Copy

U. S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM

FORM AEC-326S
(8-60)

DOCKET NO. 70-337

File Copy

Westinghouse Electric Corporation

3 Gateway Center
Box 2278, Pittsburgh, Pa. 15230

October 14, 1964

U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D. C., 20545

Attention: Mr. Lyall E. Johnson, Acting Director

Subject: Amendment of Special Nuclear License SNM-338, Docket 70-337, for Fabrication of Yankee V-VI Fuel Rods and Assemblies

Gentlemen:

The Westinghouse Electric Corporation hereby applies for an amendment to the Special Nuclear Materials License SNM-338, Docket 70-337. Six copies of the amendment application are submitted herewith. This application will provide for receipt, possession, use, storage, and transfer of UO_2 that will be fabricated into fuel rods and assemblies for the Yankee Atomic Electric Company Reactor, Cores V and VI. This work will be done at the Cheswick Plant.

If you have any questions, please write to me at the above address or phone me collect, 412-391-2800, Extension 3449.

Very truly yours,

C P Skillern

C. P. Skillern
License Administrator

A/92

Attachment:
6 copies transmitted

10/15/64 4914

WESTINGHOUSE ELECTRIC CORPORATION

APPLICATION FOR AMENDMENT TO

LICENSE SNM-338

FOR YANKEE CORES V AND VI FUEL RODS

AND ASSEMBLIES

Oct. 14, 1964

U. S. ATOMIC ENERGY COMMISSION

DOCKET 70-337

YANKEE V-VI AMENDMENT

TABLE OF CONTENTS

		Page No.
	Revision Record	3
1.	Introduction	4
2.	Correspondence - Return Address	5
3.	Materials, Amounts and Specifications	5
4.	Equipment and Facilities for Radiation Protection	5
5.	Receipt of Material	6
6.	Powder Storage - Description and Criticality Controls	
	A. Bottle Storage Rack Description	6
	1. Bottle Storage Rack - Criticality Determinations	6-7-8
	B. Belt Conveyer	8
7.	Pellet Storage	
	A. Pellet Conveyer Storage in Process	9
	B. Sintered Pellet Storage After Grinding	9
8.	General Information About Processing and Criticality Control	
	A. Flow Scheme	10
	B. Criticality Determinations	11
	1. Batch Size Determinations	11
	2. Slab Determinations	11
	a. Pellets	11
	b. Powder	12
	c. Clad Rods	12

TABLE OF CONTENTS (continued)

	Page No.
8. B. (continued)	
3. Cylinder Determination	12
4. Volume Determination	12
5. Fuel Assembly Criticality Limits	13
9. Shipping Containers	
A. Assemblies	13-14
B. Scrap	15

REVISION RECORD

Revision No.	Date of Revision	Pages Revised	Revision Reason

APPLICATION FOR AN AMENDMENT TO LICENSE SNM-338 FOR FABRICATION OF THE YANKEE CORES V-VI FUEL RODS AND ASSEMBLIES

1. Introduction

An amendment to License SNM-338 is hereby requested to provide for the receipt, possession, storage, use and transfer of UO_2 at an enrichment of 4.94 ± .05 w/o. This material will be used to fabricate Yankee Core V and Yankee Core VI fuel rods and assemblies at the Cheswick Plant. These fuel assemblies will be installed as fuel in the Power Reactor of the Yankee Atomic Electric Company, Rowe, Mass.

The production equipment and general procedures for making fuel rods and assemblies have been adequately described and were approved in previous amendments of this license. Information presented in this application will reflect any significant changes. The basic storage, manufacturing, shop locations, and criticality controls remain the same as described in prior amendments approved by the Division of Materials Licensing in the Indian Point Core II amendment; license amendment application to SNM-338 for the Indian Point Core II was transmitted on May 20, 1964, with the approval given on July 16, 1964.

Fuel assembly fabrication and storage will be at the same location as given in the SELNI amendment, October 18, 1962, and later referenced in the Indian Point amendment application.

2. Correspondence - Return Address

The license amendment and any associated correspondence should be sent to C. P. Skillern, Westinghouse Electric Corporation, Box 2278, Pittsburgh, Pa. (15230).

3. Materials, Amounts, and Specifications

It is requested that Westinghouse be authorized to receive, possess, store, use, and transfer up to 30,000 kg of UO_2 at an enrichment of 4.94% $\pm$ .05 for the manufacture of Yankee V-VI fuel rods and assemblies. The UO_2 will be formed into pellets and encapsulated in stainless steel tubes, having a wall thickness of 0.021 inches. These resulting rods will be 0.340 inches in diameter and about 92 inches long. Transfer will be made in accordance with contractual and license arrangements. No production, consumption or significant loss of special nuclear material is anticipated. Receipt of the first shipment may occur on or about November 1, 1964.

4. Equipment and Facilities for Radiation Protection

The procedures outlined in the Westinghouse Electric Corporation Health Physics Manual, WAFD-HP-103, Rev. III, March 1962, as previously submitted in the July 11, 1962 transmittal and revised in the January 17, 1964 transmittal, will be used.

5. Receipt of Material

The material is received from a licensed processor in plastic bottles in licensed shipping containers. These shipping containers are visually inspected upon receipt to assure proper loading and spacing. Material weights in each bottle are verified by reweighing before storage, thus assuring no extraneous foreign material, viz. water, from entering the storage area. The weight of powder in each bottle will not exceed the maximum permissible batch size indicated in "Criticality Determinations." The bottles are heavy walled polyethylene with a threaded cap.

6. Powder Storage - Description and Criticality Controls

A. Bottle Storage Rack - Description

The powder will be stored in the plastic bottles in which they are received on the conveyer that was described in the Indian Point Core II amendment application dated May 20, 1964. This conveyer is described on pages 5 and 6 of Indian Point Application and displayed in the Indian Point Application Proprietary Folder on Drawing C773D407.

1. Bottle Storage Rack - Criticality Determination
Solutions or liquids will not be stored in this rack and the enrichment of the uranium oxide powder will not exceed 4.94 $\pm$ 0.05 w/o for the Yankee Core V-VI material stored in this storage rack. Under normal storage conditions, an

6. A. 1. (continued)

unlimited quantity of uranium oxide powder, having an enrichment of less than 5%, could be stored in this storage rack. This limit is based upon the fact that the uranium oxide powder is unmoderated and, when unmoderated, uranium oxide powders having an enrichment of less than 5% will not become critical in unlimited quantities.

Various types of accident conditions were evaluated on page 7 in the Indian Point amendment application that was transmitted on May 20, 1964, and these evaluations are also valid for this application as the storage facility remains the same.

a. Each bottle will contain no more than a maximum permissible batch of UO_2 powder as shown in "Criticality Determinations." Thus, the amount of powder in a single bottle is safe under conditions of ideal geometry, full reflection and optimum moderation.

b. The row of bottles in each section of the rack can be considered a cylinder. When considered individually, each cylinder would be safe under conditions of full reflection and optimum moderation. The inside diameter of the bottles is 9.75 inches (cylinder diameter), and data from

6. A. 1. (continued)

K-1019, Rev. 5, Table III, page 21, indicates a permissible diameter of 10.2 inches for UO_2 of 5 w/o enrichment. The enrichment of UO_2 powder to be stored in this rack will always be less than 4.94 $\pm$ 0.05 w/o. If this rack were flooded with water, isolation of the cylinders would be assured due to their 12" separation. Thus, there would be no moderation of the UO_2 in the bottles when there would not be isolation of the cylinders by a fully flooded condition. These bottles were tested for leakage of water as described in the Indian Point amendment application on page 8 and no leakage was found. The added safety feature of taping the cap of each bottle with flexible plastic tape will be continued.

B. Belt Conveyer

A conveyer will be used to transfer the large plastic bottles from the storage rack to the Pelletizing Area. This is the same conveyer approved and used for the Indian Point Core II fabrication of UO_2 fuel and described on page 8 of the Indian Point application. However, this conveyer will have two rows of bottles instead of one and the rows of bottles will be separated by 12 inches of floodable space.

7. Pellet Storage

A. Pellet Conveyer Storage in Process

Green pellets will be stored as described in the previous applications in 2.5 inch deep boats. The depth of the pellets will be limited to the depth of the boats, thus assuring a 2.5 inch slab. These boats will be stored using the same methods described on page 9 in the Indian Point Amendment application.

B. Sintered Pellet Storage After Grinding

Sintered pellet storage, after leaving the centerless grinder, will be the same as described in the Indian Point amendment application on page 9, except that additional shelves may be added using the same spacing criteria. The pellets will be stored in these racks with a vertical opening just greater than the maximum permissible slab thickness for the enrichment stored such that the slab thickness is always maintained. These storage racks are constructed so that 12 inches spacing is assured between stored slabs of fuel. Thus if the storage rack were flooded, each slab would be isolated by at least 12 inches of water. If the water would drain away, the water also drains away from the trays, thus assuring unmoderated slabs. Only the one enrichment will be processed at one time. Other enrichments left over from other production will be stored separately in a rack properly identified in accordance with the storage criteria previously established for those materials.

8. General Information About Processing and Criticality Control

A. Flow Scheme

This section describes a flow scheme of the material used in the fabrication process and lists the criticality control used for each step. The equipment to be used has been described in the prior Indian Point Core II amendment.

	Process Step	Control
1.	Powder Preparation Weighing, mixing, granulating, etc.	Mass = 40 lbs.
2.	Powder Conveyer (storage)	Slab = 4.5 inches
3.	Powder Tray Cleaning Cart	
	Component A	Volume < 4.8 liters
	Component B	Slab 4.5 inches
4.	Pellet Pressing	
	(a) Feed Hopper	Mass = 40 lbs.
	(b) Conveyer	< 70 in^2 conveyer) 25 in^2 at Tee) = equivalent diameter of 10.2 inches
5.	Green Pellet Conveyer Storage	Slab 2.5 inches
6.	Sintering Furnace	Slab 2.5 inches
7.	Centerless Grinder	Slab 2.5 inches
	(a) Feed Hopper	Mass = 40 lbs.
	(b) Waste Collection	Volume < 4.8 liters Slab 4.5 inches
8.	Sintered Pellet Storage	Slab = 3.1 inches

8. (continued)

Process Step	Control
9. Rod Loading and Storage	Slab = 3.5 inches
10. Leak Testing	Cylinder = 6.6 inches
11. Fabrication of Fuel Assemblies Assumes sequential loading for any partially loaded assemblies	$K_{eff} = < 0.76$
12. Fuel Assembly Storage Assembly Cleaning (isolated)	12 inch separation $K_{eff} = < 0.76$

B. Criticality Determinations

1. Batch Size Determinations

The maximum permissible batch size to be used for the powder during processing operations is determined using the information given in Table XIII, page 22, K-1019, Rev. 5:

$$\text{4.94 w/o enrichment} \quad \frac{0.8 \text{ Kg } U^{235}}{(0.88)\ (.0494)} = 18 \text{ Kg} = 40 \text{ lbs.}$$

2. Slab Determination

a. UO_2 Pellet Slab

A maximum permissible slab thickness has been set at 3.1 inches for 4.94 w/o enrichment of UO_2. This slab thickness is within the limits given in TID 7016, Rev. 1, Figure 16, page 21.

8. (continued)

2. b. Powder Slab

A maximum powder slab thickness has been set at 4.5 inches for powder at 4.94 w/o. This is within the permissible limit for 6 w/o shown in K-1019, Rev. 5, Table XIII, page 21.

c. Clad Rod Slab

After the fuel has been encapsulated, a maximum permissible slab thickness of 3.5 inches is used. This value is less than the limit given in TID 7016, Rev. 1, Figure 16, page 21. The parasitic absorption of neutrons by the cladding results in an added safety factor.

3. Cylinder Determinations

The maximum permissible cylinder diameter for leak testing of rods will be 6.6 inches in which the maximum enrichment is 4.94 w/o. This is more conservative than the maximum permissible cylinder diameter of 8 inches shown in TID 7016, Rev. 1, page 21, Figure 15.

4. Volume Determination

The maximum permissible volume for slurries of UO_2 at 4.94 w/o has been set at 4.8 liters. This is the always safe volume of 4.8 liters (1.27 gal.) as shown in TID 7016, Rev. 1, Table I, page 10.

8. (continued)

5. Fuel Assembly Criticality Limits

The neutron multiplication (K_{eff}) for the Yankee V-VI assembly is $<$ 0.76 for one isolated assembly immersed in water. The method of determining the K_{eff} was the same as described on pages 14 and 15 of the Indian Point Amendment Application, transmitted May 20, 1964. When the fuel assembly is being loaded sequentially with fuel rods and the fuel rods that have not been inserted into the assembly are located at a distance of about 3 ft. from the assembly, the K_{eff} of the partially loaded assembly is less than 0.76 when immersed in water. This is assured by the fuel rods being loaded sequentially.

9. Shipping Containers - Completed Fuel Assemblies

A. The completed fuel assemblies will be shipped between the Yankee Electric Power Reactor, Rowe, Mass., and the Westinghouse Cheswick Site. Not more than 15 fuel assemblies, one per container, will be shipped via common or private carrier using exclusive use of vehicle. A description of the shipping container that will be used has been previously submitted and was approved for and used in the shipment of Yankee Cores I, II and III. The Yankee III fuel shipments were approved in the telegram of November 26, 1962, from Johnson to Amtsberg.

9. A. (continued)

Information about the container was submitted in the September 4, 1962 application for amendment of License SNM-38, Docket 70-43. These containers are shown on The Champion Company Drawings 08335, 08508, 08501 - Sheet 1, and 08561 on an attachment in the letter dated July 29, 1959, from H. C. Amtsberg to H. L. Price. This container had Bureau of Explosives' Permit #BE 851.

The K_{eff} of the Yankee V-VI assembly when loaded in the container, fully moderated and reflected, will be less than 0.76, as determined using the methods described in the Indian Point Amendment Application. When loaded in these containers at this spacing, an infinite array of these containers would have a K_{eff} of less than 1. An array of 15 containers, if flooded, would be isolated and if the water were to drain, the K_{eff} would be < 0.76. There are no enclosures around the fuel assemblies inside these shipping containers that would retain water in the highly unlikely event of flooding with water and subsequent drainage of the container.

Westinghouse has reviewed the container design and concludes that it is incredible under hypothesized accident conditions that containers could be deformed in such a manner as to cause two or more assemblies to come into close proximity to each other. Even assuming a severe deformation, a minimum spacing would be provided by the

9. A. (continued)

10/29/64

structural materials of the container. Two of the described fuel assemblies fully moderated and reflected with optimum geometry and with no intervening materials would have a K_{eff} of less than 0.87. When such fuel is within containers assumed to have maximum deformation, the parasitic absorption of the neutrons due to the container steel would further decrease the K_{eff}. In normal transport, the shipping containers are blocked and braced within the carrying vehicle in such manner that the possibility of mechanical damage is minimized. Westinghouse, therefore, concludes that this fuel can be shipped as described without undue hazard to the health and safety of the public.

B. Shipment of Scrap

Westinghouse will submit a shipping container and criticality analysis at a later time for shipment of scrap, as a new container is being designed for shipment of scrap.

GOVERNMENT PRINTING OFFICE: 1964 — 725-8

FROM: Westinghouse Electric Corp. Pittsburgh, Pa.	DATE OF DOCUMENT: 10-14-64	DATE RECEIVED: 10-15-64	NO.: 4914
	LTR.: x & encl.	MEMO: REPORT:	OTHER:
TO: Lyall Johnson	ORIG.: x	CC: 5	OTHER:
	ACTION NECESSARY ☐ NO ACTION NECESSARY ☐	CONCURRENCE ☐ COMMENT ☐	DATE ANSWERED: BY:
CLASSIF.: U POST OFFICE REG. NO.	FILE CODE: 70-337		

DESCRIPTION: (Must Be Unclassified)

Ltr. (in bound rpt.) trans:

ENCLOSURES:

(6 copies)

Appl. for Amendment to SNM-338 dtd. 10-14-64 for fabrication of Yankee Reactor Core V-VI Fuel Rods & Assemblies...

REMARKS:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer: w/file cy. 1-PDR Copy 2-compliance cys. 2-extras	10-16		

ACKNOWLEDGED

U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, DML

October 16, 1964

Charles D. Luke, Chief
Criticality Branch, DML

WESTINGHOUSE ELECTRIC CORPORATION, SHIPMENT OF ONE SUPERHEAT FUEL ASSEMBLY
DOCKET NO. 70-337, OCTOBER 6, 1964

SYMBOL: DML:RLS

Westinghouse proposes to ship single fuel assemblies between Cheswick, Forest Hills, or Waltz Mill, Pennsylvania, and the Saxton Reactor at Saxton, Pennsylvania. Each assembly contains seven, stainless steel clad uranium oxide rods of 21 w/o U-235 enrichment. The total uranium-235 content is 1.1 kg per assembly and the assembly has an effective diameter of only 1.8 inches. The fuel column is 36 inches long. Only one fuel assembly at a time will be shipped with exclusive use of the vehicle. We recommend approval of the shipping procedure.

A/93

OFFICE ▶	DML	DML				
SURNAME ▶	RLS Stevenson:bar	RLS for CDLuke				
DATE ▶	10/16/64	10/16/64				

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

DOCKET NO. 70-337

File Copy

Westinghouse Electric Corporation

3 Gateway Center
Box 2278, Pittsburgh, Pa. 15230

October 26, 1964

* U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D. C., 20545

Attention: Mr. Lyall E. Johnson, Acting Director

Subject: Amendment of Special Nuclear License SNM-338, Docket 70-337, for Fabrication of Saxton Fuel Rods and Assemblies

RECEIVED 1964

Gentlemen:

The Westinghouse Electric Corporation hereby applies for an amendment to the Special Nuclear Materials License SNM-338, Docket 70-337. Six copies of the amendment application are submitted herewith. This application will provide for receipt, possession, use, storage, and transfer of UO_2 that will be fabricated into fuel rods and replacement assemblies for the Saxton Reactor. This work will be done at the Cheswick Plant.

If you have any questions, please write to me at the above address or phone me collect, 412-391-2800, Extension 3449.

Very truly yours,

C.P. Skillern

C. P. Skillern
License Administrator

Copy Supplied
... Document Room
... Compliance (2)
Luke

10/26/64-
KRR

DOCKETED
USAEC
OCT 26 1964
REGULATORY
MAIL SECTION
DOCKET CLERK

A/94

ACKNOWLEDGED

Attachment:
6 copies transmitted

REMOVED FROM BOUND REPORT

5022

WESTINGHOUSE ELECTRIC CORPORATION

APPLICATION FOR AMENDMENT TO

LICENSE SNM-338

FOR SAXTON FUEL RODS AND ASSEMBLIES

Oct. 26, 1964

DOCKETED USAEC OCT 26 1964 REGULATORY MAIL SECTION DOCKET CLERK

U. S. ATOMIC ENERGY COMMISSION

DOCKET 70-337

File Copy

SAXTON AMENDMENT

TABLE OF CONTENTS

		Page No.
	Revision Record	3
1.	Introduction	4
2.	Correspondence - Return Address	5
3.	Materials, Amounts and Specifications	5
4.	Equipment and Facilities for Radiation Protection	5
5.	Receipt of Material	6
6.	Powder Storage - Description and Criticality Controls	
	A. Bottle Storage Rack Description	6
	1. Bottle Storage Rack - Criticality Determinations	6-7-8-9
	B. Belt Conveyer	9
7.	Pellet Storage	
	A. Pellet Conveyer Storage in Process	9
	B. Sintered Pellet Storage After Grinding	10
8.	General Information About Processing and Criticality Control	
	A. Flow Scheme	11-12
	B. Criticality Determinations	13
	1. Batch Size Determinations	13
	2. Slab Determinations	13
	a. Pellets and Clad Rods	13
	b. Powder	14

TABLE OF CONTENTS (continued)

		Page No.
8. B. (continued)		
	3. Cylinder Determination	14
	4. Volume Determination	14
	5. Fuel Assembly Criticality Limits	14
9. Shipment of Scrap		15

REVISION RECORD

Revision No.	Date of Revision	Pages Revised	Revision Reason

APPLICATION FOR AN AMENDMENT TO LICENSE SNM-338 FOR FABRICATION OF THE SAXTON FUEL RODS AND ASSEMBLIES

1. Introduction

An amendment to License SNM-338 is hereby requested to provide for the receipt, possession, storage, use and transfer of UO_2 at an enrichment of 5.7 w/o. This material will be used to fabricate Saxton fuel rods and assemblies at the Cheswick Plant. These fuel assemblies will be installed as fuel in the Power Reactor at Saxton, Pennsylvania.

The production equipment and general procedures for making fuel rods and assemblies have been adequately described and were approved in previous amendments of this license. Information presented in this application will reflect any significant changes. The basic storage, manufacturing, shop locations, and criticality controls remain the same as described in prior amendments approved by the Division of Materials Licensing in the Indian Point Core II amendment; license amendment application to SNM-338 for the Indian Point Core II was transmitted on May 20, 1964, with the approval given on July 16, 1964.

Fuel assembly fabrication and storage will be at the same location as given in the SELNI amendment, October 18, 1962, and later referenced in the Indian Point amendment application.

2. <u>Correspondence - Return Address</u>

The license amendment and any associated correspondence should be sent to C. P. Skillern, Westinghouse Electric Corporation, Box 2278, Pittsburgh, Pa. (15230).

3. <u>Materials, Amounts, and Specifications</u>

It is requested that Westinghouse be authorized to receive, possess, store, use, and transfer up to 390 Kg of UO_2 at an enrichment of 5.7 w/o for the manufacture of Saxton fuel rods and assemblies. The UO_2 will be formed into pellets and encapsulated in stainless steel tubes, having a wall thickness of $\sim$.08 times the pellet diameter. These resulting rods will be $<$ 0.50 inches in diameter and about 42 inches long. Drawings of Saxton fuel assemblies were transmitted in the letter of April 18, 1961, SNM-38, Docket 70-43. Transfer will be made in accordance with contractual and license arrangements. No production, consumption or significant loss of special nuclear material is anticipated. Receipt of the first shipment may occur on or about November 20, 1964.

4. <u>Equipment and Facilities for Radiation Protection</u>

The procedures outlined in the Westinghouse Electric Corporation Health Physics Manual, WAFD-HP-103, Rev. III, March 1962, as previously submitted in the July 11, 1962 transmittal and revised in the January 17, 1964 transmittal, will be used.

5. <u>Receipt of Material</u>

The material is received from a licensed processor in plastic bottles in licensed shipping containers. These shipping containers are visually inspected upon receipt to assure proper loading and spacing. Material weights in each bottle are verified by reweighing before storage, thus assuring no extraneous foreign material, viz. water, from entering the storage area. The weight of powder in each bottle will not exceed the maximum permissible batch size indicated in "Criticality Determinations." The bottles are heavy walled polyethylene with a threaded cap.

6. <u>Powder Storage - Description and Criticality Controls</u>

A. <u>Bottle Storage Rack - Description</u>

The powder will be stored in the plastic bottles, in which they are received, on the conveyer that was described in the Indian Point Core II amendment application dated May 20, 1964. This conveyer is described on pages 5 and 6 of Indian Point Application and displayed in the Indian Point Application Proprietary Folder on Drawing C773D407.

1. Bottle Storage Rack - Criticality Determination

Solutions or liquids will not be stored in this rack and the average enrichment of the total quantity of uranium oxide powder stored in this rack will not exceed 5%. Under normal storage conditions, an unlimited quantity of uranium oxide powder, having an enrichment of less than 5%, could

6. A. 1. (continued)

be stored in this storage rack. This limit is based upon the fact that the uranium oxide powder is unmoderated and, when unmoderated, uranium oxide powders having an enrichment of less than 5% will not become critical in unlimited quantities.

Westinghouse proposes that storage of the incoming Saxton UO_2 powder be authorized for this storage rack for the following reasons: The average enrichment of material stored on this rack will not exceed 5 w/o. This will be assured as material such as Indian Point Region I that is presently stored in the rack has an enrichment of 2.81 w/o and will depress the average percentage. There could only be a maximum of 27 bottles of Saxton material in the rack at one time. The total amount of U-235 at the Saxton enrichment of 5.7 w/o will be about 17.2 Kg which is much less than a critical mass for a fast neutron reaction. According to TID-7016, using the allowance factor in Fig. 20, page 24, and the values in Table I, page 10, a total of 550 Kg of U-235 could be stored in this rack. The capacity of this storage rack is currently limited to 400 Kg U-235 in UO_2 at 5 w/o enrichment. For these reasons, Westinghouse feels that this limited quantity of the dry 5.7 w/o material can be safely stored in this rack.

Various types of accident conditions were evaluated on page 7 in the Indian Point amendment application

6. A. 1. (continued)

that was transmitted on May 20, 1964, and these evaluations are also valid for this application as the storage facility remains the same.

a. Each bottle will contain no more than a maximum permissible batch of UO_2 powder as shown in "Criticality Determinations." Thus, the amount of powder in a single bottle is safe under conditions of ideal geometry, full reflection and optimum moderation.

b. The row of bottles in each section of the rack can be considered a cylinder. When considered individually, each cylinder would be safe under conditions of full reflection and optimum moderation. The inside diameter of the bottles is 9.75 inches (cylinder diameter), and data from K-1019, Rev. 5, Table III, page 21, indicates a permissible diameter of 9.8 inches for UO_2 of 5.7 w/o enrichment. The average enrichment of UO_2 powder to be stored in this rack will always be less than 5.0 w/o. This will be assured by administrative control. If this rack were flooded with water, isolation of the cylinders would be assured due to their 12" separation. There would be no moderation of the UO_2 in the bottles when there would not be isolation of the cylinders by a fully flooded condition.

6. A. 1. (continued)

b. (continued)

These bottles were tested for leakage of water as described in the Indian Point amendment application on page 8 and no leakage was found. The added safety feature of taping the cap of each bottle with flexible plastic tape will be continued.

B. Belt Conveyer

A conveyer will be used to transfer the large plastic bottles from the storage rack to the Pelletizing Area. This is the same conveyer approved and used for the Indian Point Core II fabrication of UO_2 fuel and described on page 8 of the Indian Point application. However, this conveyer will have two rows of bottles instead of one and the rows of bottles will be separated by 12 inches of floodable space. The quantity of UO_2 at 5.7 w/o enrichment that will be stored on the belt conveyer will be much less than the limit of 550 Kg U-235 given in Table I, page 10, used with the allowance factor in Fig. 20, page 24, of TID-7016.

7. Pellet Storage

A. Pellet Conveyer Storage in Process

Green pellets will be stored as described in the previous applications in 2.5 inch deep boats. The depth of the pellets will be limited to the depth of the boats, thus assuring a 2.5 inch slab. These boats will be stored

7. A. (continued)

using the same methods described on page 9 in the Indian Point Amendment application.

B. <u>Sintered Pellet Storage After Grinding</u>

Sintered pellet storage, after leaving the centerless grinder, will be the same as described in the Indian Point amendment application on page 9, except that additional shelves may be added using the same spacing criteria. The pellets will be stored in these racks with a vertical opening just greater than the maximum permissible slab thickness for the enrichment stored such that the slab thickness is always maintained. These storage racks are constructed so that 12 inches spacing is assured between stored slabs of fuel. Thus if the storage rack were flooded, each slab would be isolated by at least 12 inches of water. If the water would drain away, the water also drains away from the trays, thus assuring unmoderated slabs. Only the one enrichment will be processed at one time. Other enrichments left over from other production will be stored separately in a rack properly identified in accordance with the storage criteria previously established for those materials.

The Saxton pellets can be safely stored in this rack as the critical mass for a fast neutron reaction is 22.8 Kg of U-235 and a recommended limit is 10 Kg according to TID-7016, Table I, page 10. Applying the allowance factor in Figure 20, TID-7016, page 24, the total amount of U-235 that would be safe is 550 Kg of U-235 at an enrichment of

7. B. (continued)

5.7 w/o. The total amount of U-235 at 5.7 w/o that will be in the whole production area will be 17.4 Kg. For this reason, Westinghouse feels storage of these pellets will be safe as only a small portion (1/4 of the total) of the 17.4 Kg of U-235 material will be present in this rack at one time.

8. General Information About Processing and Criticality Control

A. Flow Scheme

This section describes a flow scheme of the material used in the fabrication process and lists the criticality control used for each step. The equipment to be used has been described in the prior Indian Point Core II amendment.

	Process Step	Control
1.	Powder Preparation Weighing, mixing, granulating, etc.	Mass = 33 lbs.
2.	Powder Conveyer (storage)	Slab = 4.5 inches
3.	Powder Tray Cleaning Cart Component A Component B	Volume < 4.8 liters Slab 4.5 inches
4.	Pellet Pressing (a) Feed Hopper (b) Conveyer	Mass = 33 lbs. < 70 in^2 conveyer) = equivalent diameter is < 9.8 inches 25 in^2 at Tee)
5.	Green Pellet Conveyer Storage	Slab 2.5 inches

8. A. (continued)

	Process Step	Control
6.	Sintering Furnace	Slab 2.5 inches
7.	Centerless Grinder	Slab 2.5 inches
	(a) Feed Hopper	Mass = 31 lbs.
	(b) Waste Collection	Volume < 4.8 liters Slab 4.5 inches
8.	Sintered Pellet Storage	Slab = 2.8 inches
9.	Rod Loading and Storage	Slab = 3.0 inches
10.	Leak Testing	Cylinder = 6.6 inches
11.	Fabrication of Fuel Assemblies Assumes sequential loading for any partially loaded assemblies	$K_{eff} = < 0.80$
12.	Fuel Assembly Storage Assembly Cleaning (isolated)	12 inch separation $K_{eff} = < 0.80$

8. (continued)

B. Criticality Determinations

1. Batch Size Determinations

The maximum permissible batch size to be used for the powder during processing operations is determined using the information given in Table XIII, page 22, K-1019, Rev. 5:

5.7 w/o enrichment $\dfrac{0.755 \text{ Kg U-235}}{(0.88)\ (.057)} = 15 \text{ Kg} = 33^{*} \text{ lbs.}$

*Note - the batch size for pellets is 31 lbs. which is more conservative. The batch limit for pellets was determined using Westinghouse methods. /1

2. Slab Determination

a. UO_2 Pellet Slab and Clad Rod Slab

A maximum permissible slab thickness has been set at 2.8 inches for 5.7 w/o enrichment of UO_2. This slab thickness was determined using Westinghouse method described by Strawbridge. /1

A maximum slab thickness for the clad rods has been set at 3.0 inches. The slab thickness for the clad rods is conservative because of the parasitic absorption by the steel cladding, and is also in agreement if the curve in Figure 16, page 21, of TID-7016 is extrapolated to 5.7 w/o.

/1 L. E. Strawbridge, "Calculation of Lattice Parameters and Criticality for Uniform Water Moderated Lattices," WCAP-3742. See the SPERT amendments transmittals dated Jan. 17, 1964, and Feb. 9, 1964, SNM-338, Docket 70-337, for this document and additional information.

8. 2. (continued)

b. Powder Slab

A maximum powder slab thickness has been set at 4.5 inches for powder at 5.7 w/o. This is within the permissible limit for 6 w/o shown in K-1019, Rev. 5, Table XIII, page 21.

3. Cylinder Determinations

The maximum permissible cylinder diameter for leak testing of rods will be 6.6 inches in which the maximum enrichment is 5.7 w/o. This is more conservative than the maximum permissible cylinder diameter of 9.8 inches shown in K-1019, Rev. 5, page 21.

4. Volume Determination

The maximum permissible volume for slurries of UO_2 at 5.7 w/o has been set at 4.8 liters. This is the always safe volume of 4.8 liters (1.27 gal.) as shown in TID-7016, Rev. 1, Table I, page 10.

5. Fuel Assembly Criticality Limits

The neutron multiplication (K_{eff}) for the Saxton assembly is $<$ 0.80 for one isolated assembly immersed in water. The method of determining the K_{eff} was the same as described on pages 14 and 15 of the Indian Point Amendment Application, transmitted May 20, 1964. When the fuel assembly is being loaded sequentially with fuel rods and the fuel rods that have not been inserted into the assembly are located at a distance

8. 5. (continued)

of about 3 ft. from the assembly, the K_{eff} of the partially loaded assembly is less than 0.80 when immersed in water. This is assured by the fuel rods being loaded sequentially.

9. Shipment of Scrap

Westinghouse will submit a shipping container and criticality analysis at a later time for shipment of scrap, as a new container is being designed for shipment of scrap.

GOVERNMENT PRINTING OFFICE: 1964 — 735-83

FROM: Westinghouse Electric Corp. Pittsburgh, Pa.	DATE OF DOCUMENT: 10-26-64	DATE RECEIVED: 10-26-64	NO.: 5022
	LTR.: x & appl.	MEMO:	REPORT: / OTHER:
TO: Lyall Johnson	ORIG.:	CC:	OTHER: 6 conformed cys.
	ACTION NECESSARY ☐ / NO ACTION NECESSARY ☐	CONCURRENCE ☐ / COMMENT ☐	DATE ANSWERED: / BY:
CLASSIF.: U / POST OFFICE / REG. NO.	FILE CODE: 70-337		

DESCRIPTION: (Must Be Unclassified)

Ltr.(in bound rpt) trans:

ENCLOSURES: (6 cys.)

Appl. for Amendment to SNM-338 dtd. 10-26-64 to cover receipt, possession, use, storage, and transfer of UO_2 ... that will be fabricated into fuel rods and replacement ass'ys for Saxton Reactor....

REMARKS:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer:	10-26		
w/file cy. (removed from bound rpt.)			
1-PDR Copy			
2-compliance cys.			
2-extras			
		ACKNOWLEDGED	
		5022	

U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

BETH 016

TWX INCOMING

1964 OCT 29 PM 4 46
U.S. ATOMIC ENERGY COMM.
TWX UNIT

ROBERT LAYFIELD
DIVISION OF AMATERIALS LICENSING
U. S. ATOMIC ENERGY COMMISSION
WASHINGTON D. C.
10-29-64 440PM

DOCKET NO. 70-337

File Copy

SUBJECT YANKEE V-VI AMENDMENT, TRANSMITTAL OCTOBER 14, 1964, SNM-338, DOCKET 70-337.

SUPPLEMENTING ITEM 9-A, SHIPPING CONTAINERS -, PAGE 15 THE WORDS QUOTE AND REFLECTED UNQUOTE SHOULD BE INSERTED BETWEEN MODERATED WITH IN THE SECOND SENTENCE

C P SKILLERN LICENSE ADMINISTRATOR WESTINGHOUSE ELEC CORP GATEWAY CENTER PITTSBURGH PA

DOCKETED USAEC OCT 30 1964 REGULATORY MAIL SECTION DOCKET CLERK

RECEIVED
1964 OCT 30 AM 10 24
U.S. ATOMIC ENERGY COMM
REGULATORY MAIL SECTION

END
29/2147Z OCT DV

Compliance copies(2) 11/3/64
Lake - 11/3/64 } RLG

A195

TWX INCOMING

5090

U. S. GOVERNMENT PRINTING OFFICE: 1964 — 725

FROM:	DATE OF DOCUMENT:	DATE RECEIVED	NO.:
Westinghouse Electric Corp. Pittsburgh, Pa.	10-29-64	10-30-64	5090

LTR.:	MEMO:	REPORT:	OTHER:
			TWX

TO:	ORIG.:	CC:	OTHER:
R. Layfield	X		

ACTION NECESSARY ☐	CONCURRENCE ☐	DATE ANSWERED:
NO ACTION NECESSARY ☐	COMMENT ☐	BY:

CLASSIF.:	POST OFFICE	FILE CODE:
U	REG. NO.	70-337

DESCRIPTION: (Must Be Unclassified)
TWX ref. their 10-14-64 submittal and advising of a word to be inserted in connection with Item 9-A, shipping containers......

ENCLOSURES:

REMARKS: Mail Room Distribution:
1-PDR Copy

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer	10-30		
w/file cy.			
2-compliance cys.			
2-extras			

5090

U. S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM FORM AEC-326S (8-60)

OCT 30 1964

C. D. Luke, Chief
Criticality Branch, DML

D. A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch, DML

WESTINGHOUSE APPLICATION-AMENDMENT TO LICENSE SNM-338 FOR FABRICATION OF THE SAXTON REACTOR FUEL RODS AND ASSEMBLIES. OCTOBER 26, 1964. DOCKET NO. 70-337

DML:RLL

Please review the attached application from the standpoint of criticality control.

The extra copy may be retained for your files.

Attachment:
Extra copy

A/96

OFFICE ▶	ML					
SURNAME ▶	RLayfield/jc					
DATE ▶	10/30/64					

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch, DML

DATE: NOV 2 1964

FROM : Dale Smith
Source and Special Nuclear Materials Branch DML

SUBJECT: CHRONOLOGIES OF ACTIONS ON TIMELY RENEWAL APPLICATIONS

DML:RDS 70-337

Attached are chronologies outlining the actions taken on fourteen licenses which have expired and are being continued on a timely renewal basis. These chronologies represent the actions taken up to the time of preparation, about the first week of September.

Copies of these chronologies have been given to the staff members who are concerned with these cases.

Chronologies attached:

Docket No.	License No.	Licensee	Expiration Date
x 70-8	SNM-7	Battelle Memorial Institute	September 30, 1960
x 70-27	SNM-42	Babcock & Wilcox	August 31, 1961
x 70-33	SNM-23	Metals and Controls	January 31, 1963
x 70-36	SNM-33	United Nuclear Corporation	January 31, 1962
x 70-43	SNM-38	Westinghouse	July 1, 1961
+ 70-57	SNM-54	General Electric	December 1, 1961
x 70-58	SNM-53	Martin Company	April 30, 1963
x 70-72	SNM-69	General Atomic	September 1, 1963
x 70-135	SNM-145	NUMEC	November 30, 1962
x 70-143	SNM-124	Nuclear Fuel Services	September 30, 1962
+ 70-169	SNM-150	General Electric	November 30, 1962
70-204	SNM-206	General Electric	May 31, 1962
+ x 70-337	SNM-338	Westinghouse	June 30, 1964
x 70-364	SNM-414	NUMEC	October 31, 1963

Submitted previously:

Docket No.	License No.	Licensee	Expiration Date
x 70-97	SNM-82	Sylcor	May 31, 1961

x Renewed
+ Preparing consolidated appl. for [illegible] license

cc: K. E. Lauterbach
R. L. Layfield
C. E. MacDonald

Westinghouse Electric Corporation
Atomic Fuel Division
Cheswick, Pennsylvania
Docket 70-337

License SNM-338
Issued - July 26, 1960
Expiration date - June 30, 1964

CHRONOLOGY

Apr. 29, 1964	Letter dated 4/29/64 to WEC advising that SNM-338 expires 6/30/64.
May 21, 1964	Letter dated 5/19/64 from WEC requesting renewal of SNM-338.
May 25, 1964	Letter dated 5/20/64 from WEC transmitting application for amendment to SNM-338 to cover receipt, possession, use, storage and transfer of UO2 that will be fabricated into fuel rods and assemblies for Consolidated Edison Indian Point Reactor Core II.
May 26, 1964	Letter dated 5/25/64 from WEC transmitting supplemental shipping container information for the Spert amendment to SNM-338 dated 5/25/64.
May 28, 1964	Memo from Luke reviewing Westinghouse application of May 25, 1964 for shipping container for Spert fuel rods. Approval recommended from criticality standpoint, subject to structural integrity approval.
June 4, 1964	Memo from C. Beck commenting on structural integrity of SPERT fuel rod containers.
June 4, 1964	Memo to Luke transmitting Westinghouse letter dated May 19, 1964 for information and files.
June 8, 1964	Memo to files from G. W.Kerr reporting on compliance inspection conducted Jan 7 and 8, 1964.
June 11, 1964	TWX dated 6/11/64 from WEC referencing discussion of 6/9/64 and advising that they will tack weld the space ring to outside shell of the shipping container.
June 11, 1964	TWX dated 6/11/64 from WEC requesting issuance of the required allocation and/or nuclear materials draft which will permit them to order special nuclear material as set forth in this TWX, to be charged against the allocation previously issued to Consolidated Edison, License DPR-5, for use under SNM-338, as amended.

June 15, 1964	Memo to Luke transmitting Westinghouse letter dated June 11, 1964 concerning SPERT rod shipping container. Criticality review requested.
June 15, 1964	Letter dated 6/11/64 from WEC in confirmation of their 6/11/64 TWX.
June 10, 1964	Letter dated 6/10/64 to WEC referencing their 5/19/64 application and advising that SNM-338 will not expire until application is finally determined by the Commission.
June 18, 1964	TWX dated 6/18/64 to WEC authorizing them under SNM-338 to ship spert fuel rods from Cheswick, Pennsylvania to Idaho Falls, Idaho in accordance with their 5/25/64 application and supplement thereto.
June 18, 1964	Letter dated 6/18/64 to WEC advising that as requested in their letter of 6/11/64 distribution of 265 kg of U-235 contained in U enriched to 2.86%, as UF6 is hereby authorized under SNM-338 with procurement of 75 kg of U-235 being made prior to 6/30/64.
June 22, 1964	Memo from Luke evaluating Westinghouse application dated May 20, 1964 for fabrication of Consolidated Edison Indian Point Core II. Faborable review if two minor inconsistencies in application are corrected. Shipping not authorized.
June 24, 1964	TWX dated 6/23/64 from WEC referencing their 5/20/64 application and advising that Indian Point Fuel Assemblies will be shipped in the fuel assembly container as described in their attachments to amendment application dated 11/15/62.
June 24, 1964	Memo to files from R. L. Stevenson recording telecon with C. P. Skillern of Westinghouse. Two questions asked and answered concerning Indian Point Core II shipment.
June 24, 1964	Memo to Luke transmitting Westinghouse letter of June 15, 1964 concerning shipping containers for spert fuel rods for information and files.
June 23,1964	Letter dated 6/22/64 from WEC transmitting letter dated 6/22/64 from WEC to Nussbaumer furnishing justification as to why the information transmitted with their 5/20/64 letter should be withheld from the public and the revised attached Proprietary Information.

June 26, 1964	SNM draft #07/SNM-338/324(18) to WEC dated 6/26/64 allocating 190 kg of U-235 as UF6 prior to 9/30/64.
July 1, 1964	TWX dated 6/30/64 from WEC referencing their 5/20/64 request and advising that no enclosures are around the fuel assemblies, etc.
July 6, 1964	Memo from Luke reviewing container and procedures for shipment of finished fuel assemblies for the Indian Point Core II. Suggested that Westinghouse further demonstrate the safety of arrays of damaged containers.
July 16, 1964	Letter dated 7/16/64 to WEC advising that SNM-338 is hereby amended to authorize the receipt, possession & use of uranium oxide at U-235 enrichments of 2.81, 3.22 and 4.02 weight percent for the fabrication only of Indian Point Reactor Core II fuel rods and assemblies pursuant to 5/20/64 application and supplements thereto. Also advising that our review of the proprietary information has not been completed.
July 17, 1964	Letter dated 7/15/64 from WEC requesting allocation of SNM as described on the attached schedule.
Aug. 12, 1964	Letter dated 8/10/64 from WEC requesting amendment to SNM-338 in regard to their provisions for pellet storage.

5010-107

Layfield

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, DML

DATE: November 2, 1964

FROM : Charles D. Luke, Chief
Criticality Branch, DML

SUBJECT: WESTINGHOUSE ELECTRIC CORPORATION, FABRICATION AND SHIPMENT OF FUEL RODS FOR YANKEE CORES V AND VI, DOCKET NO. 70-337, OCTOBER 14, 1964

SYMBOL: DML:RLS

The application for license amendment concerns the receipt, possession, use, storage and transfer of 4.94 percent enriched UO_2 that will be fabricated into rods and assemblies for the Yankee Reactor Cores V and VI. The proposed nuclear safety controls for the in-plant operations are similar to those used in earlier core fabrication work and are clearly substantiated by the mass and geometry values in TID-7028. Thus, we have no objection from the nuclear safety viewpoint to your issuance of a license amendment that approves the manufacturing operations but does not at this time permit shipment of groups of finished assemblies.

There is one question that must be resolved before the proposed shipping procedures can be approved. This concerns the subcriticality of a pair of flooded assemblies in damaged containers. The shipping containers to be used have been reviewed by Mr. Christian Beck (Nussbaumer from Beck, 10/30/64), and based on his structural integrity analysis, the top half of the outer container would buckle when subjected to the thirty-foot drop test. Thus, we are concerned with the safety of a pair of damaged containers coming together, top-to-top under water, which would result in a rather compact array of two assemblies. The question of the k_{eff} value for a reflected pair of moderated assemblies was asked Mr. C. P. Skillern of Westinghouse in a telephone conversation between Skillern and Messrs. Layfield and Stevenson, DML, on October 29, 1964. Skillern indicated that Westinghouse would send a wire to answer this question.

A/98

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

5010-107

~~Official~~ File

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, DML

DATE: November 5, 1964

FROM : Charles D. Luke, Chief
Criticality Branch, DML CDL

SUBJECT: WESTINGHOUSE ELECTRIC CORPORATION, FABRICATION AND SHIPMENT OF FUEL RODS FOR SAXTON REACTOR, DOCKET NO. 70-337, OCTOBER 26, 1964

SYMBOL: DML:RLS

The application for license amendment concerns the receipt, possession, use, storage, and transfer of 5.7 per cent enriched UO_2 that will be fabricated into rods and assemblies for the Saxton Reactor. The proposed nuclear safety controls for the in-plant operations are similar to those used in earlier core fabrication work and are generally substantiated by appropriate mass and geometry values. We have no objection to your issuance of a license amendment that approves the manufacturing operations, but does not at this time permit shipment of groups of finished assemblies.

The application does not describe the shipping arrangements, although on page 5 of the application, it is stated that transfer will be made in accordance with contractual and license arrangements. The earlier Saxton assemblies were made about three years ago and hence the shipping arrangements may not satisfy current requirements, particularly as regards the structural integrity of shipping containers. We suggest that Westinghouse be requested to describe and justify their shipping procedures in the light of current acceptable practice.

A199

NOV 9 1964

C. Luke, Chief
Criticality Branch, DML

D. A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch, DML

WESTINGHOUSE ELECTRIC CORPORATION TWX DATED OCTOBER 14, 1964, SUPPLEMENTING ITEM 9-A, SHIPPING CONTAINERS. DOCKET NO. 70-337

DML:RLL

Attached is a copy of WEC's TWX dated October 14, 1964, for your review from the standpoint of criticality control. The extra copy may be retained for your files.

Attachment:
Extra copy

A/100

OFFICE ▶	ML					
SURNAME ▶	RLayfield/jc					
DATE ▶	11/9/64					

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

DOCKETED USAEC NOV 23 1964 REGULATORY MAIL SECTION DOCKET CLERK

Westinghouse Electric Corporation

Atomic Power Division Box 355, Pittsburgh 30, Pa.

November 19, 1964

FS-947

U.S. ATOMIC ENERGY COMM. REGULATORY MAIL SECTION 1964 NOV 23 PM 12 3 RECEIVED

United States Atomic Energy Commission
Division of Materials Licensing
St. Elmo and Norfolk Avenue
Bethesda, Maryland

Attention: Mr. Lyall Johnson
Acting Director

Gentlemen:

Subject: Request for Authorization to Order SS Material
San Onofre Nuclear Generating Station, Unit 1
Docket ~~50-206,~~ CPPR-13
70-337 File Copy

By letter dated September 11, 1964 (FS-896) a request was made for special nuclear material in the amount of 713 Kg of U235. It is our understanding that a nuclear materials draft has been issued to Oak Ridge in this amount.

During the interim period Westinghouse has continued to review nuclear characteristics and core fabrication requirements and have selected an enrichment of 3.4 w/o U235 for the initial region to be fabricated.

To accommodate this change please issue a nuclear materials draft in an additional amount of 40 Kg U_{235} to be furnished as UF6 at 3.4 w/o U_{235}. The required delivery schedule will be a continuation of that originally requested in our letter of September 11, 1964, and will be worked out directly with Mr. McAlduff at Oak Ridge. This material is a part of the 781 Kg U_{235} specified in Exhibit A to Amendment No. 6, Docket 50-206 as required in fiscal 1965. Total allocation requested to date is 753 Kg U_{235} and is expected to extend through the first quarter of calendar 1965.

Very truly yours,

H. E. Walchli

H. E. Walchli
Fuel Service Manager
(Acting in behalf of
EDISON-SAN DIEGO)

bm

cc: W. R. Gould
W. A. Zitlow
D. Barry
H. J. McAlduff

ACKNOWLEDGED

A1101

5356

GOVERNMENT PRINTING OFFICE: 1964 — 725

FROM: [illegible] [illegible] Walchli Pittsburgh 30, Pa.	DATE OF DOCUMENT: 11-19-64	DATE RECEIVED: 11-23-64
	NO.: 5058	
	LTR.: X	MEMO: REPORT: OTHER:
TO: L. Johnson	ORIG.: X	CC: & 5 rep'd cys OTHER: (3 cys verifaxed)
	ACTION NECESSARY ☒ NO ACTION NECESSARY ☐	CONCURRENCE ☐ COMMENT ☐ DATE ANSWERED: BY:
CLASSIF.: U POST OFFICE REG. NO.:	FILE CODE: DOCKET ~~50-206~~ 70-337	

DESCRIPTION: (Must Be Unclassified)

Subject: Request for Authorization to Order SS Material San Onofre Nuclear Generating Station, Unit No. 1, CPPR-13.

ENCLOSURES:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer	11-23		
w/1 cy--FOR ACTION			
Boyd (w/info cy)			

REMARKS:

Distribution: ~~1 - formal file~~ (orig)
1 - suppl file
1 - HQ PDR
~~1 - LA PDR~~
~~1 - SAN PDR~~
2 - Compliance
1 - OGC
1 - H. Steele

ACKNOWLEDGED

U. S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM FORM AEC-326S (8-60)

DML:RLL
70-337

NOV 19 1964

Westinghouse Electric Corporation
3 Gateway Center
Box 2278
Pittsburgh, Pennsylvania 15230

Attention: Mr. C. P. Skillern
License Administrator

Gentlemen:

As requested in your application dated October 26, 1964, Special Nuclear Material License No. SNM-338 is hereby amended to authorize the fabrication of fuel assemblies for the Saxton Reactor in accordance with the provisions described in the application dated October 26, 1964. All other conditions of this license shall remain the same.

Since you have specified that the transfer of these fuel assemblies will be made in accordance with contractual and previously approved license arrangements, this amendment does not authorize shipment of the fuel assemblies.

FOR THE ATOMIC ENERGY COMMISSION

Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch
Division of Materials Licensing

DISTRIBUTION:
Doc. Room
Compliance (2)
Suppl.
State Health
H. J. McAlduff, OROO
D. George, NMM
N. Doulos, ML
D. Nussbaumer, ML
C. Luke, CB
Br. & Div. RFs

A/102

OFFICE ▶	DML	DML:CB	DML		
SURNAME ▶	RLayfield:jb	CLuke	DNussbaumer		
DATE ▶	11/17/64	11/18/64	11/19/64		

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

DML:RLL
70-337

NOV 25 1964

Westinghouse Electric Corporation
3 Gateway Center
Box 2278
Pittsburgh, Pennsylvania 15230

Attention: Mr. C. P. Skillern
License Administrator

Gentlemen:

Pursuant to 10 CFR 70 and 10 CFR 71, Special Nuclear Material License No. SNM-338 is hereby amended to authorize the fabrication and shipment of fuel rods and assemblies for the Yankee Atomic Electric Company Reactor, in accordance with provisions described in your application dated October 14, 1964, and supplement dated October 29, 1964. All other conditions of this license shall remain the same.

FOR THE ATOMIC ENERGY COMMISSION

Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch
Division of Materials Licensing

Distribution:
H. J. McAlduff, Jr., OROO
D. George, NMM
D. A. Nussbaumer, DML
N. Doulos, DML
Compliance (2)
Doc. Room
Suppl.
S/Health
R. L. Layfield
C. Luke

A/103

OFFICE ▶	DML	DML	DML/CB			
SURNAME ▶	RLLayfield:bar	DANussbaumer	RJJ 887			
DATE ▶	11/17/64	11/23/64	11-18-64 11/18/64			

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

DOCKET NO. 70-337

File Copy

Westinghouse Electric Corporation

3 Gateway Center
Box 2278, Pittsburgh 30, Pa.

November 25, 1964

U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D.C., 20545

Attention: Mr. Lyall E. Johnson, Acting Director
Division of Materials Licensing

Subject: Amendment of Special Nuclear Material License SNM-338, Docket 70-337, for Additional Criticality Controls in the Engineering Development Laboratory

Gentlemen:

The Westinghouse Electric Corporation hereby applies for an amendment to the Special Nuclear Materials License SNM-338, Docket 70-337. This application requests authorization to use additional criticality controls in the Engineering Development Laboratory.

If you have any questions, please write to me at the above address or phone me collect, 412-391-2800, Extension 3449.

Very truly yours,

Copy to PDR, Compliance (2) + Luke 11/30/64 - RPQ

C. P. Skillern

C. P. Skillern
License Administrator

Attachment:
6 copies attached

DOCKETED
USAEC
NOV 27 1964
REGULATORY
MAIL SECTION
DOCKET CLERK

A/104

ACKNOWLEDGED

5414

Removed from Bound Rpt.

WESTINGHOUSE ELECTRIC CORPORATION

APPLICATION FOR AMENDMENT TO LICENSE

SNM-338

FOR ADDITIONAL CRITICALITY CONTROLS IN

THE ENGINEERING DEVELOPMENT LABORATORY

Date: November 25, 1964

U. S. ATOMIC ENERGY COMMISSION

DOCKET 70-337

ENGINEERING DEVELOPMENT LABORATORY

CRITICALITY CONTROLS

TABLE OF CONTENTS

Section		Page
	Revision Record	2
1.	Introduction	3
2.	Correspondence - Return Address	3
3.	Materials, Amounts and Specifications	4
4.	Equipment and Facilities for Radiation Protection	4
5.	Receipt of Material	4
6.	Powder Storage	5
7.	General Information about Equipment, Processing and Criticality Controls	5
	7.1 Processing Steps	6
	7.2 Criticality Determinations	6
8.	Emergency Controls	8

REVISION RECORD

Revision No.	Date of Revision	Pages Revised	Revision Reason

APPLICATION FOR AN AMENDMENT TO SNM-338 TO PROVIDE ADDITIONAL CRITICALITY CONTROLS IN THE ENGINEERING DEVELOPMENT LABORATORY

1. Introduction

An amendment to SNM-338 is hereby requested to provide for a change in the criticality controls used for UO_2 powder fully enriched in the isotope U-235, in the Engineering Development Laboratory. Controls presently used were approved in the license dated October 30, 1959. This license approved the methods described in the application dated June 2, 1959, and the transmittals dated August 10, 1959 and October 15, 1959.

The control presently approved for use in the Engineering Laboratory is the use of a safe batch quantity that consists of 350 grams of U-235 at separate work stations.

Westinghouse requests authorization to use certain geometry control in addition to the limit presently licensed. These new control methods are described in Section 7.1 of this application.

2. Correspondence - Return Address

The license amendment and any associated correspondence should be sent to C. P. Skillern, Westinghouse Electric Corporation, Box 2278, Pittsburgh, Pa. (15230).

3. Materials, Amounts, and Specification

No additional amount of SNM is required for the Engineering Development Laboratory. The special nuclear material discussed in this application will only be UO_2 powder, pellets or clad pellets fully enriched in the isotope U-235.

4. Equipment and Facilities for Radiation Protection

In addition to the information in the previous transmittals, the equipment, facilities and updated procedures outlined in the Westinghouse Electric Corporation Health Physics Manual, WAFD-HP-103, Rev. III, March, 1962, as previously submitted in the July 11, 1962 transmittal and revised in the January 17, 1964 transmittal, will be used.

5. Receipt of Material

The UO_2 powder is received from a licensed processor or under contractual relationships in an authorized shipping container. The shipping container is visually inspected to assure proper loading and spacing; any discrepancies are reported to the supplier. Smear tests are made and the containers are surveyed with radiation detection instruments.

The material is contained in a heavy plastic bottle with a screw cap in an inner container of the birdcage. This bottle containing the material is removed from the birdcage. This plastic bottle has a 5-inch diameter which is an always safe diameter for UO_2 powder that is fully enriched. The material has a density of <3.2 grams/cm^3. The individual

5. Receipt of Material (continued)

packages are then taken to an area adjacent to the storage vault shown in Figure 3 of the application dated June 2, 1959, where it is weighed and placed in the storage rack. Records of the incoming material are listed on the appropriate accountability documents.

6. Powder Storage

The UO_2 powder will be stored as described in the original application dated June 2, 1959, and supplemented in the transmittal of August 6, 1959, and the telegram of October 15, 1959.

7. General Information about Processing Materials, the Equipment used and Criticality Controls

This section describes various types of criticality controls that will be used in making UO_2 pellets, fully enriched with U-235, other ceramic shapes and fuel rods.

The equipment used in this laboratory will be similar to that used at other locations in the facility. This type of equipment is being used to fabricate Indian Point Core II fuel pellets and rods. Information regarding this core fabrication was transmitted on May 20, 1964, with approval given on July 16, 1964. The same type press, sintering furnace, centerless grinder, weld box, and leak testing equipment is used in this laboratory. Each one is separated from the other by a distance $>$12 inches.

7. (continued)

7.1 The following describes the type of process that will be used and the types of criticality controls:

Type of Process	Control
1. Drying of UO_2 Powder	Slab = 1.5 inches
2. Pressing of Pellets	
Feed Hopper	Cylinder = 5 inches
Pellet Trays	Slab = 1.5 inches
Waste Collection	Volume = $<$4.8 liters Slab = 1.5 inches
3. Sintering of Pellets	Slab = 1.5 inches
4. Tube Loading, Processing, Inspection	Slab = 1.5 inches
5. Leak Testing (clad fuel rods)	Cylinder = 2.7 inches

The total quantity of UO_2 for each laboratory work room will be limited to 22 Kg (UO_2).

7.2 Criticality Determinations

1. Batch Size

A maximum permissible batch size to be used for UO_2 powder in the laboratory will be 350 grams of U-235. This is equal to 430 grams of UO_2 powder. This is within the limit given in Table I, TID-7016, Rev. 1, Page 10.

7. (continued)

7.2 Criticality Determinations (continued)

2. Slab Determinations

A maximum slab thickness has been set at 1.5 inches for UO_2 powder and pellets fully enriched with U-235. This slab thickness is within the limits given in Table I, TID-7016, Rev. 1, Page 10.

3. Cylinder Determinations

The maximum permissible cylinder diameter for the powder has been set at 5 inches using the uranium solution limit for a cylinder, TID-7016, Rev. 1, Page 10, Table I. This cylinder diameter is based upon the reduced density for UO_2 powder of 3.2 g U-235/cm^3. In the case of pellets where the UO_2 has a density of 10.5 g U-235/cm^3, a safe diameter of 2.7 inches has been set as given in TID-7016, Rev 1, Page 10, Table I.

4. Laboratory Mass Limit

The total mass limit of 22 Kg of UO_2 (22 x .82 = 18 Kg U-235) in one laboratory room is safe as the material will be spread out in various groupings throughout the room, such as in a 5-inch cylinder (about 1/3 of the material), 1.5-inch slab (about 1/3 of the material), and about 1/3 of the material in safe mass batches, 350 grams U-235. Thus no individual location when the material is used will

7. (continued)

7.2 Criticality Determinations (continued)

4. Laboratory Mass Limit (continued)

exceed the recommended limit of 10 Kg as given in Table I; TID-7016. Each of these work locations where one control method is used will be separated from any other work location by $>$12 inches of floodable space.

5. Volume Limits

A solution volume limit of 4.8 liters has been set as a critical control in this laboratory. A safe volume for fully enriched Uranium solution is 4.8 l. (1.3 gallons) according to TID-7016, Rev. 1, Table I, Page 10.

8. Emergency Controls

The emergency controls for the Site have been updated in the amendment application of November 16, 1964, containing the Cheswick Site Emergency Procedure (AF294756). Criticality Alarms are within 120 ft. of any of the SNM and they are set to alarm between 5-20 mr/hr. The types of alarm used on the Site are described in Section 8.2 and V-1-A of the Emergency Procedures.

GOVERNMENT PRINTING OFFICE: 1964—725-83

FROM: Westinghouse Electric Corp.
Pittsburgh, Pa.

DATE OF DOCUMENT: 11-25-64
DATE RECEIVED: 11-27-64
NO.: 5414

LTR.: x
MEMO:
REPORT:
OTHER:

ORIG.: 6 conformed cys.
CC:
OTHER:

TO: Lyall Johnson

ACTION NECESSARY ☐
NO ACTION NECESSARY ☐
CONCURRENCE ☐
COMMENT ☐
DATE ANSWERED:
BY:

CLASSIF.: U
POST OFFICE
REG. NO.

FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)

Ltr. (in bound rpt.) trans:

ENCLOSURES:

(6 cys.)

Appl. for Amendment to SNM-338 for addtl. criticality controls in the Engineering Development Lab., dtd. 11-25-64....

REMARKS:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer: 11-27			
#w/file cy. & file			
1-PDR Copy			
2-compliance cys.			
2-extras			
II Removed from Bound Report.			
		ACKNOWLEDGED	
		5414	

U. S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM FORM AEC-326S (8-60)

C. D. Luke, Chief
Criticality Branch, DML

December 1, 1964

D. A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch, DML

WESTINGHOUSE, AMENDMENT APPLICATION DATED NOVEMBER 25, 1964, FOR ADDITIONAL CRITICALITY CONTROLS IN THE ENGINEERING LABORATORY

70-337

DML:RLL

Please review the attached application from the standpoint of criticality control. The extra copy may be retained for your files.

Attachment:
Extra copy

A/105

OFFICE ▶	ML
SURNAME ▶	RLayfield/jc
DATE ▶	12/1/64

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

DOCKET NO. 70-337

File Copy

Westinghouse Electric Corporation

3 Gateway Center
Box 2278, Pittsburgh, Pa. 15230

December 8, 1964

U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D. C., 20545

Attention: Mr. Lyall E. Johnson, Acting Director

Subject: Amendment of Special Nuclear License SNM-338, Docket 70-337, for Fabrication of Southern California Edison Fuel Rods and Assemblies

DOCKETED
USAEC
DEC 9 - 1964
REGULATORY
MAIL SECTION
DOCKET CLERK

Gentlemen:

The Westinghouse Electric Corporation hereby applies for an amendment to the Special Nuclear Materials License SNM-338, Docket 70-337. This application will provide for receipt, possession, use, storage, and transfer of UO_2 that will be fabricated into fuel rods and assemblies for one of the regions of the Southern California Edison Company Reactor. Additional information for the other two regions will be submitted at a later time.

If you have any questions, please write to me at the above address or phone me collect, 412-391-2800, Extension 3449. The license amendment should be sent to me at the above address.

12/14/64

Lake

Very truly yours,

C. P. Skillern

C. P. Skillern
License Administrator

A/106

Attachment:
6 copies transmitted

ACKNOWLEDGED

5578

WESTINGHOUSE ELECTRIC CORPORATION

APPLICATION FOR AMENDMENT TO

LICENSE SNM-338

FOR THE SOUTHERN CALIFORNIA EDISON

FUEL RODS AND ASSEMBLIES

12/8/64

DOCKETED
USAEC
DEC 9 - 1964
REGULATORY
MAIL SECTION
DOCKET CLERK
asc

U. S. ATOMIC ENERGY COMMISSION

DOCKET 70-337

File Copy

SNM-338
Southern Calif.
Edison

SOUTHERN CALIFORNIA EDISON AMENDMENT

TABLE OF CONTENTS

	Page No.
Revision Record	3
1. Introduction	4
2. Correspondence - Return Address	5
3. Materials, Amounts and Specifications	5
4. Equipment and Facilities for Radiation Protection	6
5. Receipt of Material	6
6. Powder Storage - Description and Criticality Controls	
A. Bottle Storage Rack Description	6
1. Bottle Storage Rack - Criticality Determinations	7-8
B. Belt Conveyer	9
7. Pellet Storage	
A. Pellet Conveyer Storage in Process	9
B. Sintered Pellet Storage After Grinding	9
8. General Information About Processing and Criticality Control	
A. Flow Scheme	10 & 12
Fig. 8.1 Building 5-D Annex	11
B. Criticality Determinations	
1. Batch Size Determinations	13

TABLE OF CONTENTS (continued)

				Page No.
8.	B.			
		2.	Slab Determinations	
			a. Pellets	13
			b. Powder	13
			c. Clad Rods	14
		3.	Cylinder Determinations	14
		4.	Volume Determination	14
		5.	Fuel Assembly Criticality Limits	14
9.	Shipping Containers			
	A.	Shipment of Assemblies and Scrap		15
	B.	Shipment of Rejected UO_2 Powder		15

SNM-338
Southern Calif.
Edison

REVISION RECORD

Revision No.	Date of Revision	Pages Revised	Revision Reason

APPLICATION FOR AN AMENDMENT TO LICENSE SNM-338 FOR FABRICATION OF THE SOUTHERN CALIFORNIA EDISON FUEL RODS AND ASSEMBLIES

1. Introduction

An amendment to License SNM-338 is hereby requested to provide for the receipt, possession, storage, use and transfer of UO_2 at an enrichment of 3.4 w/o. This material will be used to fabricate fuel rods and assemblies at the Cheswick Plant for one of the regions of the Southern California Edison's reactor core. These fuel assemblies will be installed as fuel in the Power Reactor of the Southern California Edison Company, Camp Pendleton, California.

The production equipment and general procedures for making fuel rods and assemblies have been adequately described and were approved in previous amendments of this license. Information presented in this application will reflect any significant changes. The basic "new fuel storage," manufacturing, shop locations for pelletizing UO_2, rod loading, inspection, and criticality controls remain the same as described in prior amendments approved by the Division of Materials Licensing, particularly in the application for an amendment to SNM-338 for the Indian Point Core II which was transmitted on May 20, 1964, with the approval given on July 16, 1964.

1. (continued)

Fuel assembly fabrication and storage methods will be the same as approved in the SELNI amendment, October 18, 1962, and later referenced in the Indian Point amendment application, except the material will be used and stored in a new portion of Building 5, designated 5-D. The same criticality controls as previously described in the SELNI and Indian Point amendments will be used. A drawing of the new portion of the building can be seen in Figure 8.1.

2. Correspondence - Return Address

The license amendment and any associated correspondence should be sent to C. P. Skillern, Westinghouse Electric Corporation, Box 2278, Pittsburgh, Pa. (15230).

3. Materials, Amounts, and Specifications

It is requested that Westinghouse be authorized to receive, possess, store, use, and transfer up to ~~2700~~ 27,600 kg of UO_2 at an enrichment of 3.4 w/o for the manufacture of Southern California Edison fuel rods and assemblies. The UO_2 will be formed into pellets and encapsulated in stainless steel tubes, having a wall thickness of ~ 0.8 times the pellet diameter. These resulting rods will be < 0.5 inches in diameter and about 120 inches long. Transfer will be made in accordance with contractual and license arrangements. No production, consumption or significant loss of special nuclear material is anticipated. Receipt of the first shipment is scheduled on or about December 28, 1964.

see TW 12/21/6

4. Equipment and Facilities for Radiation Protection

The procedures outlined in the Westinghouse Electric Corporation Health Physics Manual, WAFD-HP-103, Rev. III, March 1962, as previously submitted in the July 11, 1962 transmittal and revised in the January 17, 1964 transmittal, will be used.

5. Receipt of Material

The material is received from a licensed processor in plastic bottles in licensed shipping containers. These shipping containers are visually inspected upon receipt to assure proper loading and spacing. Material weights in each bottle are verified by reweighing before storage, thus assuring no extraneous foreign material, viz. water, from entering the storage area. The weight of powder in each bottle will not exceed the maximum permissible batch size indicated in "Criticality Determinations." The bottles are heavy walled polyethylene with a threaded cap.

6. Powder Storage - Description and Criticality Controls

A. Bottle Storage Rack - Description

The powder will be stored in the plastic bottles in which they are received on the conveyer that was described in the Indian Point Core II amendment application dated May 20, 1964. This conveyer is described on pages 5 and 6 of Indian Point Application and displayed in the Indian Point Application Proprietary Folder on Drawing C773D407.

6. A. (continued)

1. Bottle Storage Rack - Criticality Determination

Solutions or liquids will not be stored in this rack and the enrichment of the uranium oxide powder will not exceed 3.4 w/o for the Southern California Edison core material stored in this storage rack. Under normal storage conditions, an unlimited quantity of uranium oxide powder, having an enrichment of less than 5%, could be stored in this storage rack. This limit is based upon the fact that the uranium oxide powder is unmoderated and, when unmoderated, uranium oxide powders having an enrichment of less than 5% will not become critical in unlimited quantities.

Various types of accident conditions were evaluated on page 7 in the Indian Point amendment application that was transmitted on May 20, 1964, and these evaluations are also valid for this application as the storage facility remains the same.

a. Each bottle will contain no more than a maximum permissible batch of UO_2 powder as shown in "Criticality Determinations." Thus, the amount of powder in a single bottle is safe under conditions of ideal geometry, full reflection and optimum moderation.

6. A. 1. (continued)

b. The row of bottles in each section of the rack can be considered a cylinder. When considered individually, each cylinder would be safe under conditions of full reflection and optimum moderation. The inside diameter of the bottles is 9.75 inches (cylinder diameter), and data from K-1019, Rev. 5, Table III, page 21, indicates a permissible diameter of 10.2 inches for UO_2 of 5 w/o enrichment. The enrichment of UO_2 powder to be stored in this rack will always be less than 5 w/o. If this rack were flooded with water, isolation of the cylinders would be assured due to their 12" separation. Thus, there would be no moderation of the UO_2 in the bottles when there would not be isolation of the cylinders by a fully flooded condition. These bottles were tested for leakage of water as described in the Indian Point amendment application on page 8 and no leakage was found. The added safety feature of taping the cap of each bottle with flexible plastic tape will be continued.

6. (continued)

B. Belt Conveyer

A conveyer will be used to transfer the large plastic bottles from the storage rack to the Pelletizing Area. This is the same conveyer approved and used for the Indian Point Core II fabrication of UO_2 fuel and described on page 8 of the Indian Point application. However, this conveyer will have two rows of bottles instead of one and the rows of bottles will be separated by 12 inches of floodable space.

7. Pellet Storage

A. Pellet Conveyer Storage in Process

Green pellets will be stored as described in the previous applications in 2.5 inch deep boats. The depth of the pellets will be limited to the depth of the boats, thus assuring a 2.5 inch slab. These boats will be stored using the same methods described on page 9 in the Indian Point Amendment application.

B. Sintered Pellet Storage After Grinding

Sintered pellet storage, after leaving the centerless grinder, will be the same as described in the Indian Point amendment application on page 9, except that additional shelves may be added using the same spacing criteria. The pellets will be stored in these racks with a vertical opening just greater than the maximum permissible slab thickness for the enrichment stored such that the slab

7. B. (continued)

thickness is always maintained. These storage racks are constructed so that 12 inches spacing is assured between stored slabs of fuel. Thus if the storage rack were flooded, each slab would be isolated by at least 12 inches of water. If the water would drain away, the water also drains away from the trays, thus assuring unmoderated slabs. Only the one enrichment will be processed at one time. Other enrichments left over from other production will be stored separately in a rack properly identified in accordance with the storage criteria previously established for those materials.

8. General Information About Processing and Criticality Control

A. Flow Scheme

This section describes a flow scheme of the material used in the fabrication process and lists the criticality control used for each step. The equipment to be used has been described in the prior Indian Point Core II amendment. A new addition has been added to Building 5, designated 5-D, where the fuel assemblies will be assembled and stored. The procedures, spacing, equipment, and criticality controls will be the same as described in the SELNI and Indian Point amendments.

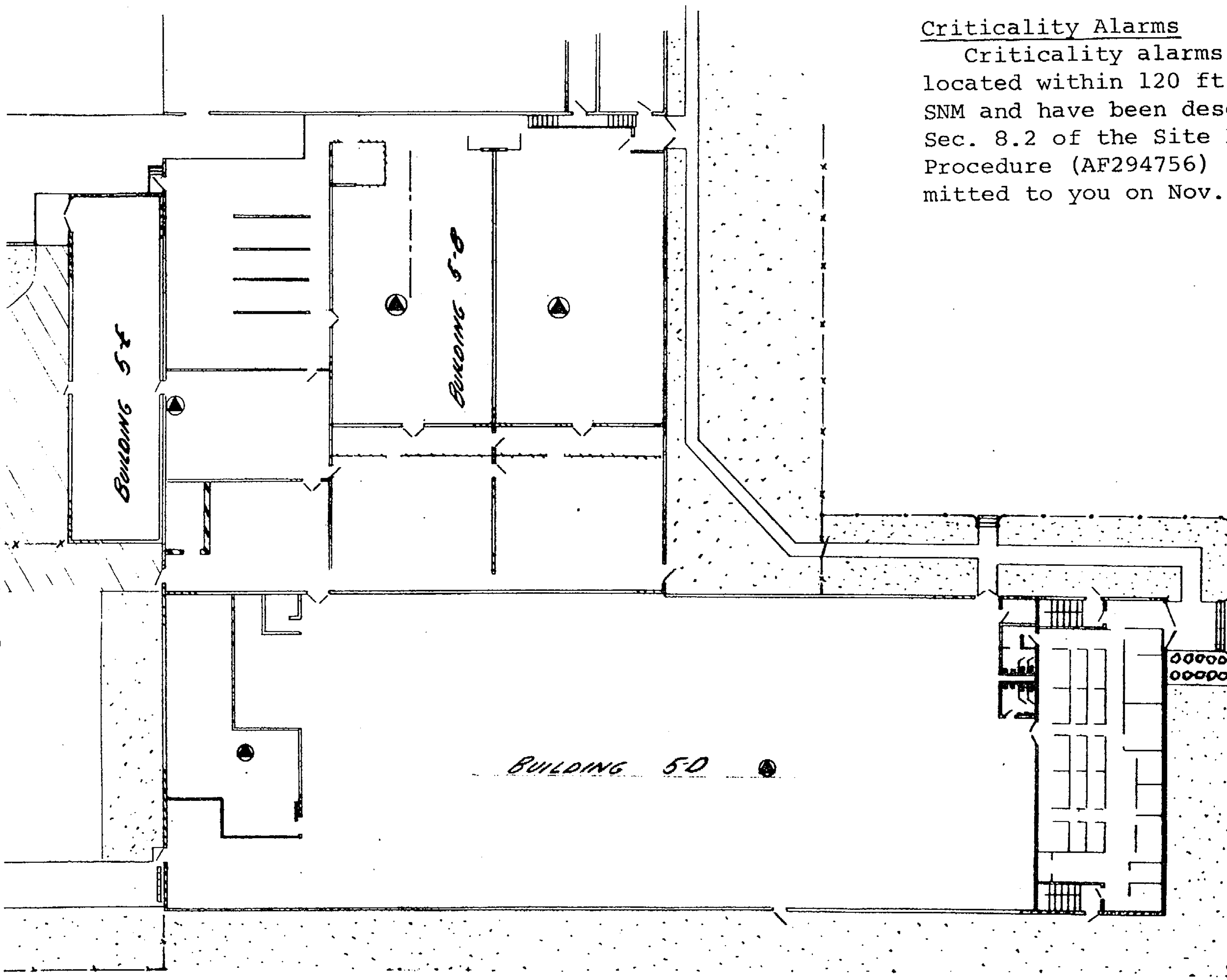


Figure 8.1 Building 5-D Annex

Criticality Alarms

Criticality alarms are located within 120 ft. of any SNM and have been described in Sec. 8.2 of the Site Emergency Procedure (AF294756) transmitted to you on Nov. 16, 1964.

SNM-338
Southern Calif.
Edison

8. A. (continued)

Process Step		Control
1.	Powder Preparation Weighing, mixing, granulating, etc.	Mass = 79 lbs.
2.	Powder Conveyer (storage)	Slab = 6"
3.	Powder Tray Cleaning Cart Component A Component B	 Volume < 4.8 liters Slab 4.5 inches
4.	Pellet Pressing (a) Feed Hopper (b) Conveyer	 Mass = 79 lbs. < 70 in^2 conveyer) = equivalent diameter is <9.8 inches 25 in^2 at Tee)
5.	Green Pellet Conveyer Storage	Slab 2.5 inches
6.	Sintering Furnace	Slab 2.5 inches
7.	Centerless Grinder (a) Feed Hopper (b) Waste Collection	Slab 2.5 inches Mass = 67 lbs. Volume < 4.8 liters Slab 4.5 inches
8.	Sintered Pellet Storage	Slab = 3.9 inches
9.	Rod Loading and Storage	Slab = 3.5 inches
10.	Leak Testing	Cylinder = 6.6 inches
11.	Fabrication of Fuel Assemblies Assumes sequential loading for any partially loaded assemblies	K_{eff} = < 0.78
12.	Fuel Assembly Storage Assembly Cleaning (isolated)	12 inch separation K_{eff} = < 0.78

8. (continued)

B. Criticality Determinations

1. Batch Size Determinations

The maximum permissible batch size to be used for the powder during processing operations is determined using the information given in Table XIII, page 22, K-1019, Rev. 5:

3.4 w/o enrichment $\frac{1.08 \text{ Kg } U^{235}}{(0.88)\ (.0340)} = 36 \text{ Kg} = 79 \text{ lbs.}$

The maximum permissible batch size to be used for pellets during processing operations is determined using the information given in Figure 13, page 21, TID 7016, Rev. I:

3.4 w/o $\frac{0.91 \text{ Kg } U^{235}}{(0.88)\ (.0340)} = 30.4 \text{ Kg} = 67 \text{ lbs.}$

2. Slab Determination

a. UO_2 Pellet Slab

A maximum permissible slab thickness for pellets has been set at 3.9 inches for 3.4 w/o enrichment of UO_2. This slab thickness is within the limits given in TID 7016, Rev. 1, Figure 16, page 21.

b. Powder Slab

A maximum powder slab thickness has been set at 6 inches for powder at 3.4 w/o. This is within the permissible limit for 6 w/o shown in K-1019, Rev. 5, Table XIII, page 21.

8. B. (continued)

c. Clad Rod Slab

After the fuel has been encapsulated, a maximum permissible slab thickness of 3.5 inches is used. This value is less than the limit given in TID 7016, Rev. 1, Figure 16, page 21. The parasitic absorption of neutrons by the cladding results in an added safety factor.

3. Cylinder Determinations

The maximum permissible cylinder diameter for leak testing of rods will be 6.6 inches in which the maximum enrichment is 3.4 w/o. This is more conservative than the maximum permissible cylinder diameter of 8 inches shown in TID 7016, Rev. 1, page 21, Figure 15.

4. Volume Determination

The maximum permissible volume for slurries of UO_2 at 3.4 w/o has been set at 4.8 liters. This is the always safe volume of 4.8 liters (1.27 gal.) as shown in TID 7016, Rev. 1, Table I, page 10.

5. Fuel Assembly Criticality Limits

The neutron multiplication (K_{eff}) for the Southern California Edison fuel assembly is $<$ 0.78 for one isolated assembly immersed in water. The method of determining the K_{eff} was the same as described on pages 14 and 15 of the Indian Point Amendment

8. B. 5. (continued)

Application, transmitted May 20, 1964. When the fuel assembly is being loaded sequentially with fuel rods and the fuel rods that have not been inserted into the assembly are located at a distance of about 3 ft. from the assembly, the K_{eff} of the partially loaded assembly is less than 0.78 when immersed in water. This is assured by the fuel rods being loaded sequentially.

9. Shipping Containers - Completed Fuel Assembly, Scrap Containers

A. Shipment of Completed Fuel Assemblies and Scrap

Westinghouse will submit information and criticality analysis at a later time for shipment of the assemblies and scrap, as new containers are being designed for shipment of scrap and the assemblies.

B. Shipment of Rejected UO_2 Powder

Westinghouse requests authority to transfer rejected material back to the supplier. Shipment of the material will then be made using the authorization as given in the supplier's license or through contractual arrangements.

GOVERNMENT PRINTING OFFICE: 1964 — 725-8

FROM: Westinghouse Electric Corp. Pittsburgh, Pa.	DATE OF DOCUMENT: 12-8-64 / DATE RECEIVED: 12-9-64 / NO.: 5578
	LTR.: x & appl. / MEMO: / REPORT: / OTHER:
TO: Lyall Johnson	ORIG.: 6 conformed cys. / CC: / OTHER:
	ACTION NECESSARY ☐ / NO ACTION NECESSARY ☐ / CONCURRENCE ☐ / COMMENT ☐ / DATE ANSWERED: / BY:
CLASSIF.: U / POST OFFICE / REG. NO.	FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)

Ltr.(in boundrpt.) trans:

ENCLOSURES: (6 cys.)

Appl. for Amendment to SNM-338 to cover receipt, possession, use, storage & transfer of UO_2 that will be fabricated into fuel rods & assemblies for one of the regions of the Southern California Edison Company Reactor.......

REMARKS:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer:	12-10		
w/file cy. (removed from bound rpt.) 1-PIR Copy 2-compliance cys. 2-extras			
		ACKNOWLEDGED	
		5578	

U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

DOCKETED USAEC DEC 21 1964 REGULATORY MAIL SECTION DOCKET CLERK

TWX INCOMING

MAIL SE... SE...

1964 DEC 21 AM 11 43

U. S. ATOMIC ENERGY COMMISSION WASHINGTON, D. C.

BETH

010

1964 DEC 21 AM 11 10

U.S. ATOMIC ENERGY COMM. T.W.X. UNIT

ROBERT LAYFIELD DIV. OF MATERIALS LICENSING

U. S. ATOMIC ENERGY COMMISSION

WASHINGTON, D. C.

DOCKET NO. 70-337

File Copy

SUBJECT SOUTHERN CALIFORNIA EDISON AMENDMENT, DATED DECEMBER 8, 1964, SNM-338, DOCKET 70-337

THE TOTAL AMOUNT OF MATERIAL, UO 2 REQUESTED IN THIS AMENDMENT APPLICATION SHOULD READ 27,000 KG INSTEAD OF 2,700 KG, PAGE 5, SECTION 3. A NEW PAGE 5 WILL BE SENT CORRECTING THIS CHANGE.

C P SKILLERN LICENSE ADMINISTRATOR WESTINGHOUSE ELECTRIC CORP

GATEWAY CENTER PITTSBURGH PA

5028

BL

RECEIVED 1964 DEC 21 PM 2 00 U.S. ATOMIC ENERGY COMM. REGULATORY MAIL SECTION

TWX INCOMING

Copy Supplied Public Document Room No. of Copies (2) 12/22/64-RRQ Luke

5711 A1107

U.S. GOVERNMENT PRINTING OFFICE: 1964 — 725-9...

FROM: Westinghouse Electric Corp. Pittsburgh, Pa.	DATE OF DOCUMENT: 12-21-64	DATE RECEIVED: 12-21-64	NO.: 5711	
	LTR.:	MEMO:	REPORT:	OTHER: TWX
TO: R. Layfield	ORIG.: x	CC:	OTHER:	
	ACTION NECESSARY ☐ NO ACTION NECESSARY ☐	CONCURRENCE ☐ COMMENT ☐	DATE ANSWERED: BY:	
CLASSIF.: U	POST OFFICE REG. NO.:	FILE CODE: 70-337		

DESCRIPTION: (Must Be Unclassified)

TWX ref. their 12-8-64 request; and hereby advising that the total amt. of matl., (UO_2) requested should read 27,000 kg. instead of 2,700 kg., Page

ENCLOSURES:

5, Section 3.......

REMARKS: Mail Room Distribution:

1-PDR Copy

REFERRED TO	DATE	RECEIVED BY	DATE
Hussbaumer: w/file cy. 2-compliance cys. 2-extras	12-21		
		5711	

U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

5010-107

File

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, DML

DATE: December 24, 1964

FROM : Charles D. Luke, Chief
Criticality Branch, DML

CDL

SUBJECT: WESTINGHOUSE ELECTRIC, ADDITIONAL CRITICALITY CONTROLS IN THE ENGINEERING LABORATORY, CHESWICK, DOCKET NO. 70-337, NOVEMBER 25, 1964

SYMBOL: DML:CB:RLS

The existing and previously approved controls in the Engineering Development Laboratory are based on 350 gram U-235 mass limits at the work stations and a minimum 12-inch spacing between work stations. Westinghouse proposes to supplement these mass controls with safe geometry controls and impose a 22 kilogram limit on the oxide in each laboratory work room. Westinghouse should provide additional information to demonstrate the nuclear safety of the proposed controls:

> "There is no information in your application to demonstrate the adequacy of the controls as regards neutron interaction between units in a room or between units within adjoining rooms. Please provide calculations and descriptive material to demonstrate that the required 12-inch edge-to-edge spacing between work stations, mass and geometry controls, and room arrangements will assure subcriticality by acceptable margins."

cc: R. L. Layfield

A/108

70-337

File Copy

Westinghouse Electric Corporation

3 Gateway Center
Box 2278, Pittsburgh 30, Pa.

December 29, 1964

U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D. C., 20545

RECEIVED DEC 31 1964 U.S. ATOMIC ENERGY COMMISSION Regulatory Mail Section

Attention: Mr. Lyall E. Johnson, Acting Director

Subject: Amendment to SNM-338, Docket 70-337, To Provide for Shipment of UO_2 Fuel Rods Fully Enriched in the Isotope U-235

Gentlemen:

Westinghouse Electric Corporation hereby applies for an amendment to the subject license to provide for the shipment of fully enriched UO_2 fuel rods between Cheswick, Pennsylvania and Oak Ridge, Tennessee. These fuel rods will be shipped on or about January 20, 1965.

A Bureau of Explosives permit has been requested.

If you have any questions, please write to me at the above address or call collect, 412-391-2800, extension 3449. The license amendment should be sent to me at the above address.

Very truly yours,

C. P. Skillern

C. P. Skillern
License Administrator

Copy Supplied
Public Document Room
Div. of Compliance (2)
Luke
1/5/65-RKR

DOCKETED USAEC DEC 31 1964 REGULATORY MAIL SECTION DOCKET CLERK asc

Attachment:
6 copies transmitted

A/109

ACKNOWLEDGED

5823

REMOVED FROM BOUND REPORT

WESTINGHOUSE ELECTRIC CORPORATION

APPLICATION FOR AMENDMENT TO

SNM-338

FOR SHIPMENT OF UO_2 FUEL RODS

FULLY ENRICHED IN THE ISOTOPE U-235

December 29, 1964

DOCKETED
USAEC
DEC 31 1964
REGULATORY
MAIL SECTION
DOCKET CLERK

U. S. ATOMIC ENERGY COMMISSION

DOCKET 70-337

File Copy

SNM-338
Shipping Containers
UO_2-Fully Enriched

SHIPMENT OF UO_2 FUEL RODS

FULLY ENRICHED IN THE ISOTOPE U-235

December 29, 1964

Westinghouse requests an amendment to SNM-338, Docket 70-337, to ship UO_2 fuel rods fully enriched in the isotope U-235 between Westinghouse Electric Corporation, Cheswick, Pennsylvania, and Oak Ridge, Tennessee.

A total of 60 UO_2 fuel rods (clad in stainless steel) fully enriched in the isotope U-235 will be shipped in the 5-inch central shipping container that was previously approved by the Division of Materials Licensing. The design of this shipping container was transmitted in a supplemental application for the shipment of SPERT fuel rods on May 25, 1964, and approval given in the telegram dated June 18, 1964. The total weight of fuel rods within each container will be less than 100 lbs. Thirty fuel rods will be packed at each end of the shipping container in packing material and separated by a physical barrier. A maximum of two of these shipping containers will be used per shipment and they will be sent via common carrier or corporate trucking using "Exclusive Use." A total of 16.1 kg of U-235 per shipping container contained in the fuel rods will be shipped. The nuclear safety will be assured for any arrangement of the fuel rods in the container (evenly dispersed, closed packed, and for dry condition) for the following reasons:

1. The nuclear safety of the shipment is assured as the 5-inch cylinder will maintain the fuel in a safe

geometric configuration in the individual container for normal packing of the rods in each container. The safe diameter for an infinitely long cylinder containing a fully enriched solution at optimum moderation and full water reflecting is 5 inches according to Table I of TID 7016, Rev. I. This limit can be used for these rods as the average uranium density within this 5-inch cylinder will be less than 1 gram/cm^3 which is typical of solution densities. Spreading the UO_2 over this entire volume would reduce the uranium density to this value.

2. The 60 rods will be split into two bundles 30 at each end of the central cylinder and separated by a physical barrier. One bundle, 30 rods, could result in a maximum close packed bundle of fuel rods having an equivalent diameter of 3.0 inches if the fuel were forced into a close packed arrangement. The density of this close packed bundle of fuel rods would be 6.3 gm U/cm^3 giving 5.9 gm U-235/cm^3. At this density, the U-235 is safe when compared to the critical diameter of 4.3 inches for an infinitely long and fully reflected cylinder of uranium fully enriched in U-235 as shown in Figure 10, page 16, of TID 7028.

3. For dry conditions, this number of UO_2 rods, if compressed into a single rod of uranium metal, is equivalent to a solid uranium metal cylinder of 1.7 inches in diameter. This reduction in size was

determined by using the difference in the density of UO_2 compared to solid uranium metal. The safe diameter for solid uranium metal fully enriched is 2.7 inches according to TID 7016, Rev. I, Table I, page 10.

The shipment will be safe if the two containers were accidentally flooded as the fuel would be separated by the $>$ 12-inch space maintained between the two central containers.

The shipment is also safe for an interacting system, as the solid interaction angle between these two containers would be less than 1 steradian. For an infinitely long 5-inch diameter cylinder the allowable interaction angle is 3.2 steradians as shown in Table XVII, page 29, K 1019, Rev. 5.

These conditions would be maintained as the structural integrity of the container would hold the fuel rods in this arrangement under accident conditions as described in the transmittal of May 25, 1964. For these reasons, Westinghouse feels the fuel can be shipped safely between Cheswick, Pennsylvania, and Oak Ridge, Tennessee.

GOVERNMENT PRINTING OFFICE: 1964—725-E

FROM: Westinghouse Electric Corp. Pittsburgh, Pa.	DATE OF DOCUMENT: 12-29-64 · DATE RECEIVED: 12-31-64 · NO.: [illegible]
	LTR. · MEMO: · REPORT: · OTHER: x 4 encl.)
TO: L. Bohnson	ORIG.: · CC: · OTHER: 6 conformed cys.
	ACTION NECESSARY ☐ · NO ACTION NECESSARY ☐ · CONCURRENCE ☐ · COMMENT ☐ · DATE ANSWERED: · BY:
CLASSIF.: U · POST OFFICE · REG. NO.	FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)

Ltr. (in bound rpt.) trans:

ENCLOSURES: (6 cys.)

Appl. for Amendment to SNM-338 to provide for shipment of fully enriched UO_2 fuel rods between Cheswick, Pa. & Oak Ridge, Tennessee......

REMARKS:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer: 12 1-5 w/file cy. (removed from bound rpt.) 1-PDR Cy. 2-compliance cys. 2-extras			

ACKNOWLEDGED

5823

U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

5010-107

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, DML

DATE: December 29, 1964

FROM : Charles D. Luke, Chief
Criticality Branch, DML

CDL

SUBJECT: WESTINGHOUSE ELECTRIC CORPORATION, FABRICATION OF SOUTHERN CALIFORNIA EDISON FUEL RODS AND ASSEMBLIES, DOCKET NO. 70-337, DECEMBER 8, 1964 AND TWX OF DECEMBER 21, 1964

SYMBOL: DML:RLS

The proposed amendment will provide for the receipt, possession, storage, use and transfer of up to 27,000 kilograms of UO_2 at an enrichment of 3.4 percent. The proposed methods of operation within the plant are similar to those used for fabrication of the Indian Point Core II assemblies. The specific mass and geometry limits to be used were justified using data from TID-7016, Revision 1. The in-plant operations should be safe and hence, we recommend approval of the license amendment for receipt of fuel, storage and fabrication of assemblies. The request for approval to ship rejected UO_2 powder, given on Page 15 of the application, presents no information to define the basis for nuclear safety of such shipments. We suggest that Westinghouse be requested to describe completely the equipment and procedures to be used for returning the reject material to the supplier or provide specific reference to the supplier's license application to define the nuclear safety controls.

A1110

DOCKET NO. 70-337

File Copy

Westinghouse Electric Corporation

3 Gateway Center
Box 2278, Pittsburgh, Pa. 15230

January 6, 1965

U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D. C., 20545

Attention: Mr. D. A. Nussbaumer, Chief,
Source and Special Nuclear Materials Branch

Subject: Revision of "Application to License SNM-338 For Saxton Fuel Rods and Assemblies, October 26, 1964"

Gentlemen:

The Westinghouse Electric Corporation hereby applies for approval of a revision in the amendment to the subject license, issued on November 19, 1964. This application revises the information transmitted to you on October 26, 1964, to provide for the shipment of Saxton fuel rods and scrap.

Revisions of the original application have been made on the attached sheets, which can be inserted in the binder and the old pages removed.

If you have any questions, please write to me at the above address or phone collect, 412-391-2800, Extension 3449.

Very truly yours,

C. P. Skillern

C. P. Skillern
License Administrator

Copy Supplied
Public Document Room
Div. of Compliance (2)
Luke
Beck
1/11/65

DOCKETED
USAEC
JAN 8 1965
REGULATORY
MAIL SECTION
DOCKET CLERK

Attachment:
6 copies transmitted

ACKNOWLEDGED

88

SNM-338
Saxton

FILING INSTRUCTIONS

The new cover letter dated January 6, 1965, should be inserted in the binder in front of the amendment application dated October 26, 1964.

The new Table of Contents, page 2, should be inserted following page 1 and the existing page 2 removed.

The new Revision Record, page 3, should be inserted and the old page 3 removed.

The Revision Record can be used as a guide for a location of pages to be replaced. Remove the existing page 15 and insert the new pages 15 and 16.

TABLE OF CONTENTS (continued)

		Page No.
8. B. (continued)		
	3. Cylinder Determination	14
	4. Volume Determination	14
	5. Fuel Assembly Criticality Limits	14
9. Shipment of Fuel Rods and Scrap		15-16

REVISION RECORD

Revision No.	Date of Revision	Pages Revised	Revision Reason
1	1/5/65	2	Table of Contents changed
1	1/5/65	15	Shipping Information added
1	1/5/65	16	New page added for convenience

8. 5. (continued)

of about 3 ft. from the assembly, the K_{eff} of the partially loaded assembly is less than 0.80 when immersed in water. This is assured by the fuel rods being loaded sequentially.

9. <u>Shipment of Fuel Rods and Scrap</u>

Westinghouse requests authorization to ship Saxton fuel rods between the Westinghouse Electric Corporation, Cheswick, Pa., and the Westinghouse Waltz Mill Site. One hundred twenty (120) Saxton fuel rods will be transported per shipping container. Two of these shipping containers will be used per shipment.

Additionally, Westinghouse requests authorization to ship Saxton fuel as scrap between the Westinghouse Electric Corporation, Cheswick, Pa., and our reprocessors, Nuclear Materials and Equipment Corporation, Apollo, Pa., Nuclear Fuel Service, Irwin, Tenn., or Union Carbide Nuclear Corp., Oak Ridge, Tenn. A maximum of 180 pounds of Saxton fuel as scrap contained inside a metal can will be transported in the shipping container. Two of these shipping containers will be used per shipment.

These materials, either the Saxton fuel rods or the Saxton fuel as scrap, will be shipped in the 5-inch pipe shipping container that was previously approved by the Division of Materials Licensing. The design of this shipping container was transmitted in a supplemental application for shipment of SPERT fuel rods on May 25, 1964, and approval given in the telegram dated June 18, 1964. The total weight of fuel rods

9. (continued)

or scrap within the shipping container will be less than 180 pounds. The shipping containers will be sent via common carrier or corporate trucking using "Exclusive Use." A maximum of 4.1 Kg of U-235 will be shipped per container. The nuclear safety will be assured for the following reasons:

1. The minimum critical diameter of an infinitely long cylinder for a heterogeneous system of uranium containing U-235 at an enrichment of 5.7 w/o is 8.6 inches as described in TID 7028, Figure 23, page 29. Applying the safety factor used in TID 7016, Rev. I, Figure 15, page 21, (0.88 x Critical Diameter) a cylinder with a diameter of 7.6 inches could be safely used.

2. The shipment will be safe if the two containers were accidentally flooded as the fuel would be separated by the 12-inch space maintained between the two central containers.

3. The shipment is also safe as an interacting system, for the solid angle between the two containers is less than one steradian. For an infinitely long 5-inch diameter cylinder, the allowable solid angle is 3.2 steradians as shown in Table XVII, page 29, K-1019, Rev. 5.

These conditions would be maintained as the structural integrity of the container would hold the fuel rods in this arrangement under accident conditions as described in the transmittal of May 25, 1964. For these reasons, Westinghouse feels the fuel or scrap can be safely shipped.

GOVERNMENT PRINTING OFFICE: 1964 — 725-8

FROM: Westinghouse Electric Corp. Pittsburgh, Pa.

DATE OF DOCUMENT: 1-6-65

DATE RECEIVED: 1-8-65

NO.: 88

LTR. MEMO: REPORT: OTHER:

x & pages

ORIG.: CC: OTHER:

x & 5

TO: D. Nussbaumer

ACTION NECESSARY ☐ CONCURRENCE ☐ DATE ANSWERED:

NO ACTION NECESSARY ☐ COMMENT ☐ BY:

CLASSIF.: U

POST OFFICE REG. NO.

FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)

Ltr. req. approval for revision of their "Appl. for Lic. SNM-338 for Saxton Fuel Rods & Assemblies" dtd. 10-26-64 by insertion of the following revised pages:

ENCLOSURES:

(6 cys. ea)

Pages 2, 3, 15, & 16

REMARKS:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer	1-8		
w/file cy.			
1-PDR Copy			
2-compliance cys.			
2-extras			
		ACKNOWLEDGED	
		88	

U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

DOCKET NO. 20-337

File Copy

WESTINGHOUSE ELECTRIC CORPORATION
Atomic Power Division
P.O. Box 355
Pittsburgh, Pa. 15230

RECEIVED
1965 JAN 8 AM 11 25
U.S. ATOMIC ENERGY COMM.
REGULATORY
MAIL SECTION

Jan. 6, 1965

U. S. Atomic Energy Commission
Division of Materials Licensing
St. Elmo and Norfolk Avenues
Bethesda, Maryland

X-C-391

Attn: Director

Subject: Request for Authorization to Order SS Material -- Regions II and III Indianpoint Core B

Gentlemen:

The Westinghouse Electric Corporation, Atomic Power Division, requests the issuance of the required allocation and/or nuclear materials draft which will authorize Westinghouse to order special nuclear material in the amounts and specifications listed below. This material should be charged against the allocation previously issued to Consolidated Edison, License No. DPR-5. Westinghouse will use the SS material under License No. SNM 338, as amended and Lease Agreement No. 245

Fiscal Year	Enrichment	Kg. U^{235}	Approx. start of Del. Date	U in Form of UF_6
1965	3.26	284	February 8, 1965	2400 Kg/wk.
1965	4.08	386	March 15, 1965	2400 Kg/wk.

It is anticipated that ~ 8-10% of the above material will be returned to the AEC from clean scrap recovery during fiscal 1966.

Thank you for your assistance in this matter.

Very truly yours,

H C Amtsberg

H. C. Amtsberg Manager
Administrative Services

cc: Mr. H. J. McAlduff, Leasing Officer
Oak Ridge, Tennessee

cc: Mr. E. B. Thomas, General Counsel
LeBoeuf, Lamb and Leiby
Washington 6, D.C.

cc: Mr. H. W. Dierman, Chief Mechanical Engr.
Consolidated Edison Co. of New York, Inc.

cc: Mr. W. J. Cahill, Jr., Nuclear and Turbine Engr.
Consolidated Edison Co. of New York, Inc.

DOCKETED
USAEC
JAN 8 1965
REGULATORY
MAIL SECTION
DOCKET CLERK

A/112

ACKNOWLEDGED

92

U.S. GOVERNMENT PRINTING OFFICE: 1964 — 725-85

FROM: Westinghouse Electric Corp.
Pittsburgh, Pa.

DATE OF DOCUMENT: 1-6-65
DATE RECEIVED: 1-8-65
NO.: 92

LTR.: x
MEMO:
REPORT:
OTHER:

ORIG.: x & 3
CC:
OTHER:

TO: DML

ACTION NECESSARY ☐
NO ACTION NECESSARY ☐
CONCURRENCE ☐
COMMENT ☐
DATE ANSWERED:
BY:

CLASSIF.: U
POST OFFICE
REG. NO.

FILE CODE: 70-337

DESCRIPTION: (Must Be Unclassified)
Ltr. req. issuance of the required allocation and/or nuclear matls. draft which will auth. WEC to order sms in the amts. & specifications as set forth in this ltr....

ENCLOSURES:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer: w/file cy. 1-PDR Cy. 2-compliance cys. 2-extras	1-8		
		92	

REMARKS: Mail Room Distribution:
1-suppl. file cy.(for Docket #50-3)
(thru Boyd)

U. S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM FORM AEC-326S
(8-60)

DOCKET NO. 70-337

File Copy

DOCKETED USAEC JAN 21 1965 REGULATORY MAIL SECTION DOCKET CLERK

Westinghouse Electric Corporation

3 Gateway Center
Box 2278, Pittsburgh, Pa. 15230

January 20, 1965

U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D. C., 20545

Attention: Mr. D. A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch

Subject: Application for an Amendment to License SNM-338, Docket 70-337, for Fabrication of Saxton Fuel Assemblies Containing Plutonium-Bearing Fuel Rods

Gentlemen:

Westinghouse Electric Corporation hereby applies for an amendment to the Special Nuclear Materials License SNM-338, Docket 70-337. This amendment will provide for the receipt, possession, use, storage, and transfer of PuO_2 contained in Saxton fuel rods and fuel assemblies. This work will be done at the Cheswick Plant.

Please send the amendment to me at the above address.

If you have any questions, please write to me at the above address or phone collect, 412-391-2800, Extension 3449.

Copy Supplied
Public Document Room
Div. of Compliance (2)
Luke
1/25/65-RRE

Very truly yours,

C. P. Skillern

C. P. Skillern
License Administrator

Attachment:
6 copies transmitted

A/1113

ACKNOWLEDGED

254

WESTINGHOUSE ELECTRIC CORPORATION

APPLICATION FOR AN AMENDMENT TO

LICENSE SNM-338

FOR FABRICATION OF SAXTON FUEL

ASSEMBLIES CONTAINING PLUTONIUM

BEARING FUEL RODS

1/20/65

U. S. ATOMIC ENERGY COMMISSION

DOCKET 70-337

FABRICATION OF SAXTON FUEL ASSEMBLIES CONTAINING PLUTONIUM

TABLE OF CONTENTS

		Page No.
	Revision Record	2
1.	Introduction	3
2.	Correspondence - Return Address	4
3.	Materials, Amounts, and Specifications	4
4.	Equipment and Facilities for Radiation Protection	5
5.	Receipt of Material and Rod Storage	5
6.	General Information About Processing and Associated Criticality Controls	
	A. Fuel Rod Handling	6
	B. Assembly Fabrication	6
	C. Flow Scheme	7
7.	Criticality Alarms	7
8.	Criticality Determinations	
	A. Slab and Cylinder Size Determinations	7
	B. Criticality Limits for Unmoderated Fuel Rods	11
	C. Fuel Assemblies	12
9.	Shipment of Assemblies	
	A. Shipment of (3 x 3) Saxton Assembly	12
	B. Shipment of (9 x 9) Saxton Assemblies	13

REVISION RECORD

Revision No.	Date of Revision	Pages Revised	Revision Reason

APPLICATION FOR AN AMENDMENT TO LICENSE SNM-338 FOR FABRICATION OF SAXTON FUEL ASSEMBLIES CONTAINING PLUTONIUM BEARING FUEL RODS

1. Introduction

An amendment to License SNM-338, Docket 70-337, is hereby requested to provide for the receipt, possession, storage, use and transfer of PuO_2 contained in Saxton fuel rods and fuel assemblies. Only completed fuel rods, which effectively encapsulate the fuel, will be received and they will be used to fabricate Saxton (3 x 3) and (9 x 9) fuel assemblies. The fuel in these fuel rods consists of a mixture of PuO_2 and Natural UO_2. The natural uranium is licensed under SMB-355, Docket 40-4739, issued November 10, 1964.

The production equipment and general procedures for making Saxton assemblies have been adequately described and approved in previous amendments of this license. Information presented in this application will reflect any significant changes. The basic fuel assembly fabrication and storage operations will be those described in the Saxton amendment application dated 10/26/64 with approval given on November 19, 1964.

Fuel assembly fabrication and storage will be in the same building as given in the Saxton amendment application dated 10/26/64.

2. Correspondence - Return Address

The license amendment and any associated correspondence should be sent to C. P. Skillern, Westinghouse Electric Corporation, Box 2278, Pittsburgh, Pa. (15230).

3. Materials, Amounts, and Specifications

It is requested that Westinghouse be authorized to receive, possess, store, use, and transfer up to 35 Kg of PuO_2 contained in $\sim$700 Saxton fuel rods. The fuel in these rods will consist of an intimate mixture of natural UO_2 and PuO_2. The weight percent of PuO_2 in the PuO_2-UO_2 mixture will be 6.6 w/o or less. The fuel is Zircaloy clad and seal welded. A description of these fuel rods was submitted in the application for amendment of SNM-783, Docket 70-826, transmitted on 10/28/64 with approval given on December 14, 1964.

Drawings of Saxton fuel assemblies were transmitted with the letter of April 18, 1961, SNM-38, Docket 70-43.

Transfer will be made in accordance with contractual and license arrangements. No production, consumption or significant loss of special nuclear material is anticipated. Receipt of the first shipment may occur on or about February 1, 1965.

4. Equipment and Facilities for Radiation Protection

The procedures outlined in the Westinghouse Electric Corporation Health Physics Manual, WAFD-HP-103, Rev. III, March 1962, as previously submitted in the July 11, 1962 transmittal and revised in the January 17, 1964 transmittal, will be used.

5. Receipt of Material and Rod Storage

These rods will be received from the processor in a licensed shipping container or by contractual arrangements. These shipping containers are visually inspected upon receipt to assure proper loading and spacing, and any discrepancies are reported to the supplier. Smear tests are made and the containers are surveyed with radiation detection instruments.

The rods will be individually removed from the shipping containers and given a smear test and, if not contaminated, they will be placed in an aluminum U-shaped storage channel and transferred into the production area where they will be stored. If contaminated, they will be placed in polyethylene bags and isolated. A check will be made to identify the contamination. If the contamination is Pu, it will be returned to the supplier for additional tests. This aluminum U-shaped channel will limit the unloading, transfer and storage of the fuel rods to one 2.5 inch thick safe slab. Only one layer as a linear array of these aluminum U-shaped channels will be used in unloading, transferring and storage of these rods. Storage of these fuel rods will be isolated from other work locations or other SNM by a distance greater than 12 ft.

6. General Information about Processing and Associated Criticality Controls

A. Fuel Rod Handling

The aluminum U-shaped storage channels containing the clad fuel rods will be removed from storage and will be moved to the assembly area which is at a distance greater than 12 ft. from the rod storage area.

B. Assembly Fabrication

The individual rods will be removed from the channels and then be sequentially placed in the Saxton assembly frame.

The completed assemblies will be either stored vertically with a 12-inch separation between assemblies and at a distance of 12 ft. from other SNM or shipped to the Saxton Reactor site. At the present time, it is planned to ship assemblies as soon as they are made. It is, also, presently planned to make (3 x 3) assemblies and ship them immediately. The (9 x 9) assemblies will not be made until later in the year (after March 1, 1965) at which time provision for shipping (9 x 9) assemblies will be made.

6. (continued)

C. Flow Scheme

Process Step	Control
1. Fuel Rod Storage	Slab = 2.5 inches
2. Loose Rod Handling	Slab = 2.5 inches
3. Fuel Assembly Fabrication	$K_{eff} = < 0.25$ (3 x 3) $= < 0.73$ (9 x 9)
4. Fuel Assembly Storage	12 in. separation $K_{eff} = < 0.25$ (3 x 3) $= < 0.73$ (9 x 9)

7. Criticality Alarms

A criticality alarm is located within 120 ft. of any of this SNM and the alarms have been described in Section 8.2 of the Site Emergency Procedure (AF294756) transmitted to you on November 16, 1964.

8. Criticality Determinations

A. Slab and Cylinder Size Determinations

Full moderation and reflection were assumed in these calculations except where dry conditions are specified, then full reflection is assumed.

A series of reactivity calculations was made for these Zircaloy clad mixed-oxide fuel rods to determine the infinite neutron multiplication constant (k_{∞}) using a wide range of pitches for these fuel rods, ranging from

8. A. (continued)

that possible at the minimum center-to-center pitch (close packed) to well beyond the optimum (e.g., most reactive) H/Pu ratios for geometry or mass. These calculations were done using the LEOPARD code[/1] which, among many other calculations, determines neutron spectra, neutron multiplication constants, and material bucklings for fissionable systems. Strawbridge[/2] presents the theory for these calculations along with a summary of experiment-theory correlations for uranium fueled systems. It should be noted that Barry[/1] and Strawbridge[/2] do not present the maximum permissible criticality parameters but describe methods that were used for such determinations.

After k_∞ was determined for the most reactive H/Pu ratio, the buckling for a critical system, where $K_{eff} = 1.0$, was then used to compute the critical dimensions for an infinite length cylinder and infinite size slab. The maximum permissible diameter for the cylinder and thickness of the slab were then

/1 R. F. Barry, "LEOPARD - A Spectrum Dependent Non-Spatial Depletion Code for the IBM-7094" WCAP 3741 (1963).

/2 L. E. Strawbridge, "Calculations of Lattice Parameters and Criticality for Uniform Water Moderated Lattices," WCAP-3742. See the SPERT Amendment transmittals dated Jan. 17, 1964 and Feb. 9, 1964, SNM-338, Docket 70-337, for this document and additional information.

8. A. (continued)

determined from the critical values by multiplying the critical cylinder diameter by 0.88 and the critical slab thickness by 0.84 as is done in Table I, page 10, of Ref. /3, where the recommended dimension is less than the minimum critical dimension by these factors. The maximum values as determined were 7.5 inches for cylinder diameter and 2.9 inches for the slab thickness. A more restrictive limit has been set for handling loose rods at Cheswick: 6.6 inches for cylinder diameter and 2.5 inches for slab thickness.

Discussion

The maximum permissible values shown above are larger than those shown for Pu^{239} in Table I of Reference /3. They are typical, instead, of the limits shown for low enrichment uranium rods in Figures 15 and 16 of the same reference. This is reasonable since the uranium in these Saxton rods is natural uranium and the weight of Pu constitutes 6.6 weight per cent of the total weight of the Uranium plus Plutonium in the fuel rods. Furthermore, the Pu contains 9 per cent of the non-fissionable and highly absorptive Pu^{240} isotope. For moderated systems, the effect of Pu^{240} in Pu increases the critical mass of Pu as

/3 TID-7016, Rev. I, "Nuclear Safety Guide" (1961).

8. A. (continued)

shown in the calculations by Goodwin and Roach reported in Figure 32 of Ref. /4.

Experimental Verification of Methods

Experimental verification of the LEOPARD calculational procedures for plutonium fueled systems was done for a series of Hanford critical and approach-to-critical experiments as discussed in the Saxton Quarterly Progress Report /5. Reactivity and buckling correlations were done for the 5 w/o Pu in Pu-Al alloy rodded lattices reported in Figure 33 of Ref. /4. These calculations tended to over-estimate K_{eff} which resulted in calculated material bucklings that were slightly larger than experimental values. For nuclear safety purposes, this gives a slightly conservative estimate of critical dimensions when they are computed from the calculated material buckling.

A similar set of calculations was done for mixed oxide lattices[/5] containing 1.5 PuO_2 in the PuO_2-UO_2 mix. This correlation also shows that the calculated critical dimensions would be conservative at the optimum moderating ratio as well as over a wide range of H/Pu ratios beyond the optimum.

/4 H. D. Paxton, et al, "Critical Dimensions of Systems Containing U-235, Pu-239, and U-233," TID-7028 (June 1964).

/5 N. R. Nelson, "Saxton Plutonium Program Quarterly Progress Report for the Period Ending September 30, 1964," WCAP-3385-1 (October, 1964).

8. (continued)

B. Criticality Limits for Unmoderated Fuel Rods

Although nuclear safety will be assured by handling of the clad fuel rods according to the limitations set for moderated fuel, it is of interest to note that the entire amount of Pu contained in the rods that will be made into 9 Saxton fuel assemblies (<21 Kg Pu*) would be safe unmoderated but fully reflected.

Safety would be assured by the fact that dilution of Pu with air or homogeneous mixing with various metals results in a considerable increase in the critical mass of Pu as shown in Figures 50 through 52 of Ref. /4.

With a 2-inch thick uranium reflector, which is equivalent to an infinite water reflector[/4], the mixing of Pu with depleted uranium to a Pu volume fraction of (0.35) results in a critical mass of 22 Kg Pu as shown in Figure 50; this is greater than the amount of Pu contained in 9 Saxton fuel assemblies. Further dilution of Pu with U to a value typical of that for the Saxton fuel (less than 0.10) would result in a critical mass many times that contained in rods of the 9 assemblies or all 700 fuel rods. Use of the data of Figure 50, which apply to depleted U (0.3 w/o U-235), is justifiable for dilution with natural U (0.7 w/o U-235)

*2.25 Kg Pu/ assembly x 9 = 20.25 Kg Pu, it is anticipated that only 9 of these 9 x 9 assemblies will be present at Cheswick as a maximum amount at one time; as now planned, they will probably be shipped as they are made.

8. B. (continued)

by conservatively assuming the 0.4 w/o difference in U-235 content to be Pu (as shown in Figure 45 of TID-7028, unmoderated Pu is worth more than unmoderated U-235).

C. Fuel Assemblies

Flooded Assembly

Nuclear safety for one (9 x 9) fuel assembly containing 72 PuO_2-UO_2 fuel rods (fully moderated and reflected) is assured by the fact that the equivalent cylindricized diameter of the bundle (5.5 inches) is considerably less than the maximum permissible diameter of 6.6 inches which is safe with even the most reactive arrangement of rods in the cylinder. The K_{eff} for a single fuel assembly (9 x 9) was calculated to be less than 0.73. The (3 x 3) assembly is much less reactive having a K_{eff} of $<$ 0.25.

9. Shipment of Assemblies

A. Shipment of (3 x 3) Saxton Assembly (Containing Pu)

One (3 x 3) assembly will be shipped in the 5-inch pipe shipping container that was previously approved by the Division of Materials Licensing. The design of this shipping container was transmitted in a supplemental application for shipment of SPERT fuel rods on May 25, 1964, and approval given in the telegram dated June 18, 1964. The weight of (3 x 3) assembly will be $<$ 150

9. A. (continued)

pounds. A total of 300 grams of plutonium will be contained in the (3 x 3) assembly. This shipment will be made by common carrier or corporate trucking using "Exclusive Use." The K_{eff} of the (3 x 3) assembly will be $<$ 0.25. Only one shipping container will be used for the shipment. These conditions would be maintained as the structural integrity of the container would hold the fuel rods in this arrangement under accident conditions as described in the transmittal of May 25, 1964. For these reasons, Westinghouse feels the (3 x 3) Saxton Assembly can be safely shipped.

B. Shipment of (9 x 9) Saxton Assemblies (containing Pu)

A container for shipping the (9 x 9) assemblies is being designed. The design of this container will be submitted when the design and tests are complete.

U. S. GOVERNMENT PRINTING OFFICE: 1964 — 720-835

FROM: Westinghouse Electric Corp. Pittsburgh, Pa.	DATE OF DOCUMENT: 1-20-65	DATE RECEIVED: 1-21-65	NO.: 254
	LTR.: x (in bound rpt.) & appl. MEMO: REPORT: OTHER:		
TO: Nussbaumer	ORIG.: 6 conformed cys. CC: OTHER:		
	ACTION NECESSARY ☐ NO ACTION NECESSARY ☐	CONCURRENCE ☐ COMMENT ☐	DATE ANSWERED: BY:
CLASSIF.: U POST OFFICE REG. NO.	FILE CODE: 70-337		

DESCRIPTION: (Must Be Unclassified)

Ltr. (in bound rpt.) trans:

ENCLOSURES:

(6 cys.)

Appl. for Amendment to SNM-338 for fabrication of Saxton fuel assemblies containing Pu-bearing fuel rods.....dated 1-20-65

"WCAP-3385-1" - Saxton Pu Program Quarterly Progress Report..." (1 cy. -- for info only)

REMARKS:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer	1-22		
w/file cy. (removed fm bound report)			
1-PDR Cy.			
2-compliance cys.			
2-extras			
		ACKNOWLEDGED	
		254	

U. S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM FORM AEC-326S (8-60)

DOCKET NO. 70-337

File Copy

Westinghouse Electric Corporation

3 Gateway Center
Box 2278, Pittsburgh, Pa. 15230

RECEIVED
JAN 25 1965

January 22, 1965

U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D. C., 20545

DOCKETED
USAEC
JAN 25 1965
REGULATORY
MAIL SECTION
DOCKET CLERK
asc

Attention: Mr. Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch

Subject: Additional Information Requested Regarding "Application for Amendment to License SNM-338 Docket 70-337, for Consolidated Edison Indian Point Reactor Core II Fuel Rods and Assemblies, May 20, 1964"

Gentlemen:

Enclosed is the additional information requested from the Westinghouse Electric Corporation in the second paragraph of your letter dated July 16, 1964. To update this basic application, we have incorporated this requested information and that transmitted in the telegrams of June 23 and June 30, 1964, into a revision of the original application dated May 20, 1964.

These revisions of the original application have been made on the attached sheets, which can be inserted in the binder and the old pages removed.

The revision approval should be sent to me at the above address.

If you have any questions, please write to me at the above address or phone me collect, 412-391-2800, Extension 3449.

Very truly yours,

C. P. Skillern

C. P. Skillern
License Administrator

A/114

Attachment:
6 copies submitted

ACKNOWLEDGED

290

SNM-338
Indian Point
Core II

FILING INSTRUCTIONS

The new cover letter dated January 22, 1965, should be inserted in the binder in front of the revision letter dated August 10, 1964.

The new Table of Contents, page 2, should be inserted following page 1 and the existing page 2 removed.

The new Revision Record, designated page 2.2, should be inserted following page 2.1 and the existing page 2.2 removed.

The Revision Record can be used as a guide for location of pages to be replaced. Remove the existing pages 11 and 16 and insert the new pages 11 and 16.

Add the new pages 17 and 18 that will immediately follow page 16.

TABLE OF CONTENTS (continued)

	Page No.
8. B. (continued)	
2. Slab Determinations	
a. Pellets	12
b. Powder	12
3. Cylinder Determination	12
4. Volume Determination	12
5. Clad Rods - Slab Determination	13
6. Fuel Assemblies	
a. Assembly Operation	13
b. Storage	13
c. Shipping	13
9. Shipping Containers	
A. Assemblies	15-16-17
B. Scrap	17
10. Criticality Alarms	18
11. Drawings (Attached)	
Proprietary Information	Attached Folder

REVISION RECORD

Revision No.	Date of Revision	Pages Revised	Revision Reason
2	8/10/64	1	Table of Contents - page 9.1 added.
2	8/10/64	9	Pellet Storage Rack criticality analysis revised.
2	8/10/64	10	Sintered pellet storage - slab thickness revised for the various enrichments.
2	8/10/64	12	Limits for UO_2 pellet slab thicknesses revised for the various enrichments.
3	1/22/65	2	Table of Contents changed because of additions.
3	1/22/65	11	K_{eff} for two assemblies set.
3	1/22/65	16	Assembly container drawings referenced. Statement that no enclosures around the assemblies in shipment will retain water. The K_{eff} was determined for accident conditions where container assemblies result in top to top alignment.
3	1/22/65	17	New page added - continuing the analysis from page 16.
3	1/22/65	18	New page added - information transferred from existing page 16.

Process Step	Control
12. Fuel Assembly Storage	12 inch Separation
Assembly Cleaning (isolated)	$K_{eff} = 0.74$
13. Shipping (2 assemblies)	$K_{eff} = 0.84$

A. New Equipment

1. Press Feed Hopper

This is proprietary information and is listed in the Proprietary Folder.

2. Powder Tray Cleaning Cart

This is proprietary information and is listed in the Proprietary Folder.

B. Criticality Determinations

1. Batch Size Determination

The maximum permissible batch size to be used for powders during processing operations is determined using the information given in Table XIII, page 22, K-1019, Rev. 5:

4.02 w/o enrichment $\frac{0.94 \text{ Kg } U^{235}}{(0.88)\ (.0402)} = 27 \text{ Kg} = 59 \text{ pounds}$

3.22 w/o enrichment $\frac{1.13 \text{ Kg } U^{235}}{(0.88)\ (.0322)} = 40 \text{ Kg} = 88 \text{ pounds}$

2.81 w/o enrichment $\frac{1.3 \text{ Kg } U^{235}}{(0.88)\ (.0281)} = 53 \text{ Kg} = 117 \text{ pounds}$

9. A. (continued)

This description of the fuel assembly shipping container, including drawings #10410, 10536, 10538 and 10541, was submitted in the November 15, 1962 application for amendment of License SNM-38, Docket 70-43. This container has Bureau of Explosives' Permit #BE 1497, revised January 14, 1963.

Under normal transportation conditions, the array of 8 shipping containers would be nuclearly safe since unmoderated U-235 cannot be made critical in any amount below 5 w/o enrichment.

The K_{eff} of two assemblies at the highest enrichment, when loaded in the shipping container with two inches separation, fully moderated and reflected, is no greater than 0.84. Thus, if accidental flooding occurred and water entered the shipping container, each individual shipping container would be nuclearly safe.

If the array of 8 shipping containers was flooded, each group of two assemblies would be isolated since they would be separated by at least 12 inches of water. There are no enclosures around the fuel assemblies that would retain water in the unlikely event of flooding and subsequent drainage. Thus, no water would be retained by the fuel assemblies, and in the unmoderated condition, no criticality could occur.

In the event of an accident where severe damage results to the assembly containers, Westinghouse believes no criticality can occur for the following reasons:

9. A. (continued)

1. The accident conditions were assumed whereby two damaged shipping containers became abutted top-to-top under water. The most reactive arrangement would be the condition where the complete collapsing of the container lid and the top cradle assembly structure around the fuel assemblies occurred. Thus, all that remains to separate the fuel assemblies of the two containers is 0.444 inches of carbon steel, which is the thickness of the two shipping container tops and the top cradle assembly structure. These four assemblies so arranged would remain subcritical as the resulting K_{eff} has been calculated to be less than 1.0 for the highest enrichment that will be shipped. Any other alignment of the shipping containers or abutment other than top-to-top would result in a less reactive system.

2. No criticality would occur if these damaged containers were to remain dry as the K_{eff} would be less than that occurring when the four assemblies were flooded.

3. The K_{eff} for these accident conditions was determined using the methods described in Section 6, pages 14 and 15, of this application.

B. Shipment of Scrap

Westinghouse will submit a shipping container design and criticality analysis at a later time for shipment of scrap, as a new container is being designed.

10. Criticality Alarms

The Criticality alarms have been relocated to adequately cover the new building area. These alarms have been relocated to points in the roof that give broad coverage of the manufacturing area. The sensing devices are within 120 ft. of any location where SNM is used or stored. There are no intervening walls which would attenuate the radiation beam. They are set to actuate at 20 mr/hr. The new locations are shown in Figure I.

U. S. GOVERNMENT PRINTING OFFICE: 1964 — 723-839

FROM: Westinghouse Electric Corp. Pittsburgh, Pa.	DATE OF DOCUMENT: 1-22-65	DATE RECEIVED: 1-25-65	NO.: 290
	LTR.: x & pages	MEMO:	REPORT: / OTHER:
TO: Nussbaumer	ORIG.: [illegible]	CC:	OTHER: 6 conformed cys.
	ACTION NECESSARY ☐ / NO ACTION NECESSARY ☐	CONCURRENCE ☐ / COMMENT ☐	DATE ANSWERED: / BY:
CLASSIF.: U / POST OFFICE / REG. NO.	FILE CODE: 70-337		

DESCRIPTION: (Must Be Unclassified)

Ltr. xxx trans. the following revisions as the addtl. information requested in our 7-16-64 letter re their 5-20-64 appl. for amendment to SNM-338:

ENCLOSURES:

(6 cys.)

Revised pages 2, 2.2, 11, 16, 17, & 18 for their 5-20-64 application amendment..

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer	1-26		
w/file cy.			
1-PDR Copy			
2-compliance cys.			
2-extras			
		ACKNOWLEDGED	
		290	

REMARKS:

U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

5010-107

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch

DATE: January 22, 1965

FROM : Charles D. Luke, Chief
Criticality Branch, DML CDL

SUBJECT: WESTINGHOUSE ELECTRIC CORPORATION, SHIPMENT OF SAXTON FUEL RODS AND SCRAP, DOCKET NO. 70-337, JANUARY 6, 1965

SYMBOL: DML:RLS

Westinghouse requests a revision to the Saxton amendment, issued on November 19, 1964, to provide for shipment of Saxton fuel rods and scrap between Cheswick, Pennsylvania, and reprocessors in Pennsylvania and Tennessee. The quantity of maximum 5.7 per cent enriched oxide will be limited so that each container holds a maximum of 4.1 kilograms of U-235. The containers, which are safe by geometry, will be limited to two per shipment and will be sent by exclusive-use carrier. The containers were previously approved for a somewhat similar shipment and have a high degree of structural integrity. Assuming containment of the material within the five inch diameter cylinders and only two containers per shipment, there is no interaction problem.

We recommend approval of the application.

A1115

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27
5010-107

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, DML

DATE: January 22, 1965

FROM : Charles D. Luke, Chief
Criticality Branch, DML
CDL

SUBJECT: WESTINGHOUSE ELECTRIC CORPORATION, SHIPMENT OF FUEL RODS BETWEEN CHESWICK AND OAK RIDGE, DOCKET NO. 70-337, DECEMBER 29, 1964

SYMBOL: DML:RLS

Westinghouse requests an amendment to ship uranium dioxide, stainless steel clad fuel rods fully enriched in the isotope U-235 between the site at Cheswick, Pennsylvania, and Oak Ridge, Tennessee. The 16.1 kilograms of U-235 per shipping container correspond to an average of less than 1 g uranium/cc within the five inch diameter, Schedule 40 pipe that is used for the inner container. If more compact arrangements of the elements are postulated, the corresponding cylinder diameters are also safe (TID-7016, Rev. I) at the corresponding average densities.

A maximum of two containers are to be sent by exclusive-use truck. The containers were reviewed by Christian Beck in June, 1964, and his recommendation for improving the structural integrity was carried out by Westinghouse. The solid angle criterion is generously fulfilled by the spacing of the two containers.

We recommend approval of the amendment application.

A1116

~~Leffield~~

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27
5010-107

Files

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, DML

DATE: January 28, 1965

FROM : Charles D. Luke, Chief
Criticality Branch, DML

SUBJECT: WESTINGHOUSE ELECTRIC CORPORATION, REVISED CRITICALITY CONTROLS IN THE ENGINEERING LABORATORY, DOCKET NO. 70-337, JANUARY 19, 1965

SYMBOL: DML:RLS

The criticality controls in the Engineering Development Laboratory have been based on maximum 350 gram U-235 masses at minimum 12-inch edge-to-edge spacing. In the submission of November 25, 1964, Westinghouse proposed the use of safe geometries to supplement the mass controls and an additional over-all limit of 22 kilograms on the mass of UO_2 in any laboratory workroom. In response to our questions concerning interaction, the telegram of January 19, 1965, assures a minimum edge-to-edge spacing of six feet for the processes where water is normally present at the fuel work station. The solid angles subtended for any of the moderated units are stated to be "near zero". The validity of this statement, and the safety as regards neutron interaction, is confirmed by the small geometries and limited masses involved. As an example, a five-inch diameter cylinder subtends an angle of about 0.12 steradian on a similar cylinder at a distance of six feet. For the unmoderated material, the total allowed quantity in any workroom is a subcritical mass. Each geometry limit is a safe geometry for optimum moderation and full reflection by water. Calculations were made to check the interaction between safe geometry units that might be moderated accidentally, as by the operation of a sprinkler system, so that the minimum 12-inch space between units would not provide isolation. The solid angle criterion indicates that the arrays of safe geometry units would be subcritical with the 18 kilogram mass limit per workroom.

We recommend approval of the license amendment as requested in the Westinghouse submittals of November 25, 1964 and January 19, 1965.

A1117

January 28, 1965

C. D. Luke, Chief
Criticality Branch, DML

D. A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch, DML

WESTINGHOUSE - LETTER DATED JANUARY 22, 1965, SUBMITTING ADDITIONAL INFORMATION REQUESTED REGARDING "APPLICATION FOR AMENDMENT TO LICENSE SNM-338, DOCKET 70-337, FOR CONSOLIDATED EDISON INDIAN POINT REACTOR CORE II FUEL RODS AND ASSEMBLIES, MAY 20, 1964."

DML:RLL

Please review the attachment from the standpoint of criticality control.

The extra copy may be retaindfor your files.

Attachment:
Extra copy

A1118

OFFICE ▶	ML					
SURNAME ▶	RLayfield/jc					
DATE ▶	1/28/65					

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

1965 FEB 1 PM 4 54

U.S. ATOMIC ENERGY COMM.
TWX UNIT

THIS IS WESTINGHOUSE PITTSBURGH PA

ROBERT LAYFIELD - DIV. OF MATERIALS LICENSING, 2/1/65 4.41P
U. S. ATOMIC ENERGY COMMISSION,
WASHINGTON, D. C.

DOCKET NO. 70-337

File Copy

SUBJECT - INDIAN POINT REACTOR CORE II AMENDMENT,
REVISION NO. 3, JAN. 22, 1965,
SNM-338, DOCKET 70-337.

CHANGE THE FOURTH SENTENCE OF THE FIRST PARAGRAPH ON PAGE 17 TO READ QUOTE THESE FOUR ASSEMBLIES SO ARRANGED WOULD REMAIN SUBCRITICAL AS THE RESULTING K EFFECTIVE HAS BEEN CALCULATED TO BE NO GREATER THAN 0.91 FOR THE HIGHEST ENRICHMENT THAT WILL BE SHIPPED UNQUOTE.

A LETTER FILL FOLLOW INCORPORATING THIS CHANGE.

C. P. SKILLERN - LICENSE ADMINISTRATOR,
WESTINGHOUSE ELECTRIC CORPORATION, 3 GATEWAY CENTER,
PITTSBURGH, PA.

BUDGET 9400-5028.
FB.

Copy furnished
~~Public Document Room~~
Div. of Compliance (2)
Luke
2/3/65 - RRL

1965 FEB 2 PM 9 47
U.S. ATOMIC ENERGY COMM.
REGULATORY
MAIL SECTION
RECEIVED

CORRECTION - LAST LINE A LETTER WILL FOLLOW
ETC.

A1129

DOCKETED
USAEC
FEB 2 1965
REGULATORY
MAIL SECTION
DOCKET CLERK

TKS.

TWX INCOMING

END

402

U. S. GOVERNMENT PRINTING OFFICE: 1964 — 725-839

FROM: Westinghouse Electric Corp. Pittsburgh, Pa. (C. P. Skillern)	DATE OF DOCUMENT: 2-1-65	DATE RECEIVED: 2-3-65		NO.: 402
	LTR.:	MEMO:	REPORT:	OTHER: TWX
TO: R. Layfield	ORIG.: X	CC:	OTHER:	
	ACTION NECESSARY ☐ NO ACTION NECESSARY ☐	CONCURRENCE ☐ COMMENT ☐	DATE ANSWERED: BY:	
CLASSIF.: U — POST OFFICE REG. NO.:	FILE CODE: 70-337			

DESCRIPTION: (Must Be Unclassified)

TWX ref. their 1-22-65 submittal and hereby req. a change in the 4th sentence of the first paragraph on Page 17.....

ENCLOSURES:

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer	2-2		
w/file cy.			
2-compliance cys.			
2-extras			
		402	

REMARKS: Mail Room Distribution:
1-PIR Copy

U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

WESTINGHOUSE ELECTRIC CORPORATION

Atomic Power Division
P.O. Box 355
Pittsburgh, Pa. 15230

February 1, 1965

U. S. Atomic Energy Commission
Division of Materials Licensing
St. Elmo and Norfolk Avenues
Bethesda, Maryland

Attn: Director

Subject: Request for Additional Authorization to Order SS Material -- Region II, Indian Point Core B (Ref. DML:ND, Docket 70-337, dated January 14, 1965)

File Copy

Gentlemen:

The Westinghouse Electric Corporation, Atomic Power Division, requests an additional allocation of special nuclear material for use in the production of UO2 powder for ultimate use in the fabrication of fuel assemblies for Region II, Indian Point Core B.

On January 6, 1965, Westinghouse requested the following:

Fiscal Year	Enrichment	Kg U^{235}	Approx. Dlvry Date	Dlvry. Rate
1965	3.26 W/O	284	Feb. 8, 1965	2400 Kg/week

This request, along with a request for 386 kg U^{235} at 4.08 w/o was granted by letter dated January 14, 1965.

DOCKETED USAEC FEB 3 1965 REGULATORY MAIL SECTION DOCKET CLERK

2 Cy ... Compliance 2-10-65

ACKNOWLEDGED 419

A1120

Westinghouse now requests an amendment to the allocation to authorize an additional 24 kg of U^{235} contained in uranium enriched to 3.26 w/o U^{235} as UF6. A revised table of SS material needs is presented below:

Fiscal Year	Enrichment	KgU^{235}	Approx. Dlvry. Date	Dlvry. Rate
1965	3.26 w/o	308	February 8, 1965	2400 kg/week

There is no apparent need to amend the allocation for the 4.08 w/o fuel for Region III of Indian Point Core B.

An OR-640 has been submitted to the Oak Ridge Leasing Officer for 283.9 kg U^{235} contained in uranium enriched to 3.26 w/o U^{235} as UF6. An additional OR-640 for the remainder of the fuel will be submitted following receipt of the approval for the above request.

All other conditions of the letter from Westinghouse to the AEC dated January 6, 1965, and the AEC letter to Westinghouse dated January 14, 1965, remain unchanged.

Thank you for your assistance in this matter.

Very truly yours,

H. C. Amtsberg

H. C. Amtsberg, Manager
Administrative Services

cc: Mr. H. J. McAlduff, Leasing Officer
Oak Ridge, Tennessee

Mr. E. B. Thomas, General Counsel
LeBoeuf, Lamb and Leiby
Washington 6, D.C.

Mr. H. Dierman, Chief Mech. Engr.
Consolidated Edison Co. of New York, Inc.

Mr. H. E. Walchli, Manager
Fuel Service, Westinghouse

U. S. GOVERNMENT PRINTING OFFICE: 1964 — 735-030

FROM: Westinghouse Electric Corp. Pittsburgh, Pa.	DATE OF DOCUMENT: 2-1-65	DATE RECEIVED: 2-3-65	NO.: 419
	LTR.: X	MEMO:	REPORT: / OTHER:
TO: DML	ORIG.: x & 2	CC:	OTHER:
	ACTION NECESSARY ☐ / NO ACTION NECESSARY ☐	CONCURRENCE ☐ / COMMENT ☐	DATE ANSWERED: / BY:
CLASSIF.: U / POST OFFICE REG. NO.	FILE CODE: 70-337		

DESCRIPTION: (Must Be Unclassified)

Ltr. req. addtl. allocation of snm for use in production of UO2 powder for ultimate use in the fabrication of fuel ass'ys for Region II, Indian Point Core B..

ENCLOSURES:

REMARKS: Mail Room Distribution:
1-PDR Copy

REFERRED TO	DATE	RECEIVED BY	DATE
Nussbaumer: 2-4 w/file cy. 2-compliance cys. 2-extras			
		419	

U. S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM FORM AEC-326S (8-60)

Layfield

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27
5010-107

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, DML

DATE: February 1, 1965

FROM : Charles D. Luke, Chief
Criticality Branch, DML CDL

SUBJECT: WESTINGHOUSE ELECTRIC CORPORATION - FABRICATION OF SAXTON FUEL ASSEMBLIES CONTAINING PLUTONIUM-BEARING FUEL RODS - DOCKET NO. 70-337, JANUARY 20, 1965

SYMBOL: DML:RLS

Westinghouse requests an amendment to provide for receipt, possession, storage, use and transfer of PuO_2 contained in Saxton fuel rods and fuel assemblies. Only completed (encapsulated) fuel rods will be received and the fuel will be a mixture of natural UO_2 containing 6.6 w/o PuO_2. The total quantity of material will involve up to 35 kilograms of PuO_2 in about 700 Saxton fuel rods. The nuclear safety controls are based on safe geometries and spacings that assume possible moderation and reflection. Two types of assemblies are to be fabricated and each of these has a safe geometry when water moderated and reflected. The loose rods will be handled and stored using a 2.5 inch slab geometry.

The application includes the proposal to ship one 3 x 3 type assembly at a time, by exclusive-use truck, employing the 5-inch pipe shipping container previously approved for shipment of SPERT fuel rods (approval date: June 18, 1964). There should be no nuclear safety problem in shipping the 3 x 3 assemblies in view of the quality of the shipping container and the less-than-400 gram total content of fissile isotopes in the assembly.

We recommend approval of the license amendment as requested but have one comment concerning the organization of the information. It has previously been observed by Mr. Layfield that the emergency procedures for the Cheswick Site given in AF 294756, November 13, 1964, do not in themselves provide enough information to assure that all the requirements for alarms and procedures are met. It is possible to find references to the emergency power to the criticality alarms, alarm response times, alarm settings, and alarm locations in earlier submissions concerning Cheswick. However, it is believed desirable to incorporate sufficient information in AF 294756 to establish that all of the requirements of Para. 70.24 of Part 70 are met. We suggest that Westinghouse be requested to supplement the emergency procedures in AF 294756 accordingly.

A/121

Layfield

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

5010-107

UNITED STATES GOVERNMENT

Memorandum

TO : Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch, DML

DATE: February 3, 1965

FROM : Charles D. Luke, Chief
Criticality Branch, DML

CDL

SUBJECT: WESTINGHOUSE ELECTRIC CORPORATION, ADDITIONAL INFORMATION ON THE INDIAN POINT CORE II APPLICATION OF MAY 20, 1964, DOCKET NO. 70-337, JANUARY 22, 1965

SYMBOL: DML:RLS

The information accompanying Westinghouse's letter of January 22, 1965, is supplied in response to our question concerning the safety of the shipments of Indian Point Core II assemblies. Pursuant to the recommendation of this Branch and Christian Beck, your letter of July 16, 1964, suggested that Westinghouse demonstrate the subcriticality of two damaged shipping containers each loaded with two maximum reactivity assemblies and abutted top-to-top under water. In the reply dated January 22, 1965, Westinghouse states that the k_{eff} for the accident situation has been calculated to be less than 1.0. Although the method of calculation used by Westinghouse is indicated to predict k_{eff} values within a fraction of a per cent of unity for critical systems, we prefer to know exactly what the k_{eff} is predicted to be for the two containers to see if subcriticality is indeed assured. In response to a telephone call from R. L. Layfield and R. L. Stevenson on February 1, 1965, Mr. C. P. Skillern reported that the k_{eff} for the accident case was 0.91. If this k_{eff} value is confirmed, we recommend approval of those parts of the Westinghouse application dealing with shipping as delineated in the May 20, 1964 application, and amended by the January 22, 1965 submission.

A1122

FEB 5 1965

DML:RLL
70-337

Westinghouse Electric Corporation
3 Gateway Center
Box 2278
Pittsburgh, Pennsylvania 15230

Attention: Mr. C. P. Skillern
License Administrator

Gentlemen:

Pursuant to Title 10, Code of Federal Regulations, Part 70 and Part 71, you are hereby authorized to receive, possess, store, use, transfer and transport plutonium dioxide contained in Saxton fuel rods and assemblies in accordance with the application dated January 20, 1965. All other conditions of this license shall remain the same.

FOR THE ATOMIC ENERGY COMMISSION

Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch
Division of Materials Licensing

DISTRIBUTION:
Doc. Rm.
Br. & Div. rfs
Compliance (Hqrs) 2
Suppl.
H. J. McAlduff, OROO
D. George, NMM
N. Doulos, ML
D. Nussbaumer, ML
State Health
C. Luke, ML
R. Layfield, ML

A/123

OFFICE ▶	ML	ML	ML			
SURNAME ▶	RLayfield/jc	RJJ 2-4-65 CDL CLuke	DN DNussbaumer			
DATE ▶	2/4/65	2-4-65	2/4/65			

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

MAR 17 1965

DML:RLL
70-337

DISTRIBUTION:
Doc. Rm.
Br. & Div. rfs
Compliance (2)
Suppl.
LJohnson
OGC
Director of Regulation RFS

Westinghouse Electric Corporation
Box 2278
Pittsburgh, Pennsylvania

Attention: Mr. C. P. Skillern
License Administrator

Gentlemen:

This refers to your application dated May 20, 1964, concerning fabrication of Indian Point Reactor Core II fuel rods and assemblies. On July 16, 1964, License No. SNM-338 was amended to authorize the receipt, possession and use of the uranium dioxide for fabrication of these fuel rods and assemblies. Additional information regarding shipment of these materials was requested in our July 16 letter.

In this application for amendment, you requested that Drawings C 773D407, C 1160495, C 1160491, SK-FC-5, and SK-GA-3, Sub. 1 and the narrative description thereof be withheld from public disclosure pursuant to Section 2.790(b), Title 10, Code of Federal Regulations, Part 2. We have determined that disclosure of such information is not required in the public interest and would adversely affect the interest of the Westinghouse Electric Corporation. Accordingly, Drawings C 773D407, C 1160495, C 1160491, SK-FC-5, and SK-GA-3, Sub. 1 and the narrative description thereof are being withheld from public disclosure pursuant to Section 2.790(b), 10 CFR 2. Such withholding from public inspection shall not, however, affect the right, if any, of persons properly and directly concerned to inspect this information.

As stated in our letter of July 16, 1964, we are enclosing five (5) copies each of Drawing SK-GA-3 and superseded title page and narrative page.

Sincerely yours,

Original Signed by
Lyall Johnson

Lyall Johnson, Assistant Director
Division of Materials Licensing

Retyped for L. Johnson's signature
see attached yellow
for concurrences

A/12.4

Enclosures:
As stated

OFFICE ▶	ML	OGC	ML	ML	
SURNAME ▶	RLayfield/jc		DNussbaumer	LJohnson	
DATE ▶				3/16/65	

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

DISTRIBUTION:
Doc. Room
Compliance
Dir. of REG RF
LJohnson, ML
OGC
Suppl.
Br. & Div. RFs

DML:RLL
70-337

Westinghouse Electric Corporation
Box 2278
Pittsburgh, Pennsylvania

Attention: Mr. C. P. Skillern
License Administrator

Gentlemen:

This refers to your application dated May 20, 1964, concerning fabrication of Indian Point Reactor Core II fuel rods and assemblies. On July 16, 1964, License No. SNM-338 was amended to authorize the receipt, possession and use of the uranium dioxide for fabrication of these fuel rods and assemblies. Additional information regarding shipment of these materials was requested in our July 16 letter.

In this application for amendment, you requested that Drawings C 773D407, C 116C495, C 116C491, SK-FC-5, and SK-GA-3, Sub. 1 and the narrative description thereof be withheld from public disclosure pursuant to Section 2.790(b), Title 10, Code of Federal Regulations, Part 2. We have determined that disclosure of such information is not required in the public interest and would adversely affect the interest of the Westinghouse Electric Corporation. Accordingly, Drawings C 773D407, C 116C495, C 116C491, SK-FC-5, and SK-GA-3, Sub. 1 and the narrative description thereof are being withheld from public disclosure pursuant to Section 2.790(b), 10 CFR 2. Such withholding from public inspection shall not, however, affect the right, if any, of persons properly and directly concerned to inspect this information.

As stated in our letter of July 16, 1964, we are enclosing five (5) copies each of Drawing SK-GA-3 and superseded title page and narrative page.

Sincerely yours,

Lyall Johnson, Acting Director
Division of Materials Licensing

Enclosures:
As stated above

OFFICE ▶		DML	OGC	DML	DML
SURNAME ▶		RLayfield:jb		DNussbaumer	LJohnson
DATE ▶					

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3