OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : L. R. Rogers, Assistant Director for Nuclear Materials Safety
Division of Licensing and Regulation

DATE: MAR 6 1961

FROM : Donald E. Warner, Acting Assistant Director for Materials
Division of Compliance

Donald E. Warner

SUBJECT: SYLVANIA-CORNING NUCLEAR CORPORATION, HICKSVILLE, LONG ISLAND, NEW YORK; LICENSE NO. C-3700 - TYPE B INCIDENT

40-682

CO:RGC

Attached hereto is a memorandum dated January 17, 1961, from the NY Compliance Division, together with a report of an investigation and Exhibits A through E conducted on December 22, 1960, in connection with subject incident.

Based on the information set forth in the attachments this office concurs with the findings of NY and suggests that the licensee be cited for the item of noncompliance noted during the investigation.

No further action will be taken on this matter.

Attachment:
Copy trans memo fm R. W. Kirkman
to D. Warner dtd 1/17/61 w/inv rpt
dtd 12/22/60 w/Exhibits A thru E

cl

JAN 17 1961

Donald E. Warner, Act. Asst. Dir.
for Materials, Division of Compliance, HQ

Robert W. Kirkman, Director
Compliance Division, NYOO

TRANSMITTAL OF TYPE "B" INVESTIGATION REPORT -
SYLVANIA-CORNING NUCLEAR CORPORATION

CMP:EE

Transmitted herewith is the investigation report of a type "B" incident at:

SYLVANIA-CORNING NUCLEAR CORPORATION
Cantiague Road
Hicksville, Long Island, N.Y.

License No. C-3700

No items of noncompliance contributed to the incident.

The following item of noncompliance was noted during the investigation:

20.202 "Personnel monitoring"
(a)(1) - in that [redacted] a machinist, was not supplied with personnel monitoring equipment when he entered and worked for thirteen days between 9/31/60 and 10/23/60 in the PRDC Control Area, a restricted area, where he was likely to receive a radiation exposure in excess of 100 mrem during seven consecutive days. (See items 3 and 5 of report details.)

E46

The item of noncompliance was discussed with Mr. Boyd Metz, Plant Manager, who in the inspector's presence instructed the Safety Engineer, Henry Grieb, to make certain that all persons entering the PRDC Control Area are provided with film badges. Mr. Metz expressed his willingness to comply with the regulations.

It is our opinion that the excessive exposures noted on the film badges were to the badges and not to the individual, [redacted] because of the following: Ex 6

(1) Other workmen performing similar fuel rod straightening operations immediately alongside [redacted] during the same time period received exposures no greater than 155 mrem/week.

(2) Film badges supplied by HASL and exposed for 4-1/6 hours to the same number of fuel rods placed in the same location as described by [redacted] showed no exposure when developed by HASL. Ex 6

(3) Direct radiation surveys were performed by the inspector under the worst conditions of operation as described by [redacted] The maximum radiation measured under these conditions was 10 mr/hr beta at 15" from the table, which was the position occupied by [redacted] chest when performing fuel rod straightening. Ex 6

(4) Although [redacted] and his immediate supervisor Martin both stated that [redacted] wore his badge on his coverall, the excessive film badge exposures may be explained if [redacted] had placed the film badges on the fuel rods inside the tote box. Ex 6

Natural uranium has a surface dose rate of 239 mrem/hr beta according to AECD-2753. If [redacted] had placed his film badges on densely packed uranium, the film badges would have indicated an exposure of 20.3 rads beta. However, the fuel rods inside the tote box are not densely packed and placing film badges inside could produce exposures compatible to that which appeared on [redacted] badges, 11.4 rads beta.

E46

No further action is contemplated by this office with regard to this incident. We recommend that a letter be sent to the licensee advising him of the item of noncompliance and requiring corrective action to the satisfaction of the Commission.

Enclosure:
4 cys of Rpt.

~~COMPANY CONFIDENTIAL~~

Licensee: SYLVANIA-CORNING NUCLEAR CORP.
Hicksville, New York

Date of Investigation:
December 22, 1960

License No.: C-3700

Type of Investigation:
Type "B" Incident

Expiration Date: April 30, 1962

Applicable 10 CFR Part 20 - 40

FINDINGS

During the period 10/24/60 to 11/14/60 two successive biweekly film badges worn by [redacted] a Sylcor machinist, temporarily assigned to a control restricted area to straighten depleted 95% uranium-molybdenum fuel rods showed exposures of 5.7 rad beta.

Several other employees working alongside [redacted] and performing identical fuel rod straightening operations, did not receive exposures in excess of 155 mrem/week beta.

Independent radiation measurements made by the inspector of [redacted] operations under the worst possible conditions revealed a radiation level of 10 mr/hr beta. This radiation level during [redacted] total time that he performed fuel rod straightening would have resulted in a maximum radiation exposure of 850 mrems beta.

Film badges supplied by HASL when exposed for 4-1/6 hours in the same position that [redacted] occupied during actual operations showed no exposures.

It is concluded that the exposure occurred to the badges and not to the individual.

No items of noncompliance contributed to the incident.

The following item of noncompliance was noted during the investigation:

20.202 "Personnel monitoring"

(a)(1) - in that [redacted] a machinist, was not supplied with personnel monitoring equipment when he entered and worked for thirteen days between 9/31/60 and 10/23/60 in the PRDC Control Area, a restricted area, where he was likely to receive a radiation exposure in excess of 100 mrem during seven consecutive days. (See items 3 and 5 of report details.)

Ef 6

Inspector

Approved by: Robert W. Kirkman

January 12, 1961
Date Report Prepared

Distribution:
4 cys - Div of Cmp, HQ
2 cys - NYOO

SYLVANIA-CORNING NUCLEAR CORPORATION
Hicksville, Long Island, New York

Date of Investigation: December 20, 1960

Persons Accompanying Inspector:

Mr. John Mieli, Senior Radio-Physicist, Division of Industrial Hygiene, Department of Labor, New York State

Persons Contacted:

Dr. Benjamin Schloss, Ph.D., President, Nucleonic Corporation of America
Mr. William Herman, Physicist, Nucleonic Corporation of America
Mr. Henry E. Grieb, Safety Engineer, Sylvania-Corning Nuclear Corporation
Mr. Charles Bienholz, Foreman, PRDC, Control Area
[redacted] Machinist
Mr. George Martin, Leadman, PRDC, Control Area
Dr. William N. Young, Medical Director
Mr. Boyd Metz, Production Manager

DETAILS

1. Notifications

On December 8, 1960, a telephone call was received by Mr. J. Roeder of this office from Henry Grieb, Safety Engeneer, Sylcor., advising that they had received a film badge report from Nucleonic Corporation of America, 196 Degraw Street, Brooklyn, New York, that [redacted] a machinist, had received an exposure of 250 mrem gamma and 5.77 rad beta during a period of from 11/7/60 to 11/19/60. Grieb also stated that he received the film badge report on 12/8/60, which showed that [redacted] had received 400 mrem x-ray exposure. Grieb stated that he immediately telephoned Nucleonic Corporation and spoke to Mr. George Herman, a Physicist, stating that [redacted] could not be exposed to x-ray at Sylcor. Herman immediately read the badge and corrected the reading from 400 mrem x-ray exposure to 5.77 rad beta exposure. See Exhibit "A" showing the original and corrected film badge readings.

On 12/8/60 a confirming telegram was received at this office which stated that investigation details would follow. (See Exhibit "B"). On 1/9/61 a detailed report of the incident from H. Grieb, Safety Engineer, dated 1/3/61 was received at this office and is included as Exhibit "E".

2. License Status

License C-3700 is current with an expiration date of April 30, 1962 and extends to both Sylcor plants at Hicksville, New York and at Bayside, New York. The license permits the use of source material for research and development on fuel element manufacture and reprocessing. An initial inspection was conducted on 10/28/58 by R. S. Cleveland of this office but only operations at Bayside, New York were inspected. A reinspection was conducted on 2/17/60 by Mr. P. Klevin of this office and operations at Hicksville were reviewed and items of noncompliance were noted: 20.401(c) failure to maintain records of washings released to the sanitary sewerage system and of effluents to the air in the proper units; and 20.203(f)(1) failure to label containers. It was noted during this inspection that during the week of 11/2/59 [redacted] had received an exposure of 950 mrep beta while inspecting depleted uranium pins. This exposure occurred to only the head, chest and arms, and did not constitute an overexposure.

INVESTIGATION DETAILS

3. Henry E. Grieb, Safety Engineer and RSO

Grieb stated that until today he had believed that [redacted] a machinist, had worked in the Power Research Development Corporation (PRDC) Control Area for a period of three weeks from 10/24/60 to 11/14/60. However, in the inspector's presence it was learned from [redacted] time card records that [redacted] had been in the control area on 9/31/60 for 7.7 hours, on 9/14/60 for 6 hours, on 9/16/60 for 2.7 hours, on 9/29/60 for 7.7 hours stripping depleted uranium-molybdenum fuel rods with alcohol, on 7/30/60 for 7.7 hours stripping fuel rods, on 10/7/60 for 5.7 hours tooling, on 10/10/60 for 7.7 hours bagging fuel rods into polyethylene bags, on 10/11/60 for 1.5 hours bagging, on 10/17/60 for one hour bagging, on 10/18/60 for one hour bagging, on 10/23/60 5.7 hours bagging, on 10/20/60 for 7.7 hours cutting off fuel rods into 12" lengths, on 10/21/60 for 7.7 hours cutting off. On all the above dates Grieb stated that [redacted] was not issued a film badge. All the above operations were carried on in the PRDC Control Area, a restricted area. The Control Area is a caged-off restricted room which is entered through a dressing room. Posted printed restrictions stated that rubbers, gloves, protective clothing, protective eye glasses, and film badges must be worn. Grieb stated that the average

weekly exposure for personnel in the control area is about 100 mrem beta. Within the control area room, 40' x 60', is located an annealing furnace, swaging machines, centerless grinders, cut off wheel lathes and a degreaser.

Grieb stated that [redacted] was issued a Nucleonic Corporation film badge on 10/24/60, covering the two week period of 10/24/60 to 11/6/60 and then issued a new badge covering the two week period of 11/7/60 to 11/19/60. Grieb stated that [redacted] has not worked in the control area since 11/14/60. During the period of 10/24/60 to 11/14/60 time records show that [redacted] worked a total of 85 hours in straightening depleted fuel rods 12" long and 3/8" diameter. Grieb stated that the fuel rods were 95% uranium metal alloyed with 5% molybdenium with trace amounts of U-234, U-235 and U-233.

Grieb stated that he received the film badge exposure report for the period 10/24/60 to 11/6/60 on 11/11/60 and noted that [redacted] had received a 160 mrem x-ray exposure, but did not pay any attention to this reading until December 8, 1960 when he received the film badge report for the period of 11/7/60 to 11/19/60 showing a 400 mrem x-ray exposure for [redacted]. On December 8, 1960, Grieb stated that he called Dr. B. Schloss, President of Nucleonic Corporation of America and told him and Joan Cara, in charge of film badge records for Nucleonic, that [redacted] could not possibly be exposed to x-ray during this period. Herman reread the badge for the period of 11/7/60 to 11/19/60 revising [redacted] exposure to 5.7 rad beta, but neglected to reread the film badge for the period of 10/24/60 to 11/6/60, which also showed an x-ray exposure. Grieb stated that he spoke to Herman about the previous film badge on 12/9/60 when Herman delivered the revised film record to Grieb. Grieb stated that Herman told him that he would reread the film badge of 10/24/60 to 11/6/60. This film badge was not reread until the inspector, in looking over [redacted] film badge exposures for the period 10/24/60 to 11/6/60, noted a film badge exposure of 160 mrem x-ray. Grieb in the inspector's presence telephoned Dr. Schloss of Nucleonic, who reread the film badge for the period of 10/24/60. to 11/6/60 and stated to both Grieb and the inspector via telephone that this badge also showed another exposure of 5.7 rad beta to [redacted] for the period of 10/24/60 to 11/6/60. This exposure had not been reported to the Commission and Grieb stated that he should have been alert to note [redacted] previous exposures when he received Nucleonic's report on 11/11/60. On 12/23/60 a letter was received from Nucleonic Corporation of America dated 12/22/60 which explains the method of film interpretation and the correct exposures for [redacted] The developed film badges were also enclosed. The letter is included as Exhibit "D".

Grieb stated that he reviewed [redacted] operation in straightening fuel rods and believes that this was a badge exposure and not an overexposure to an individual. Grieb stated his opinion is based upon the following:

(a) [redacted] was seated at a table straightening 12" long 3/8" diameter rods between two V groove chucks and a press. Only one fuel rod could be straightened at a time and [redacted] production was approximately 250 rods during a 7.7 hour day. [redacted] had on his left a tote box approximately 8" wide 8" high and 18" long with a cover, and [redacted] would remove one rod from the tote box on the left, straighten the rod, and place it in an empty tote box on his right. [redacted] position at the table was such that the film badge attached to the coverall was 18" from the straightening jig, and Grieb stated that when he monitored the operation, he could not get a radiation level greater than 2 mr beta/hr at the film badge. Furthermore, only [redacted] chest, arms and head were exposed as he was sitting all the time.

(b) A Production Hand, [redacted] also did straightening occasionally and sat alongside [redacted] during this period. [redacted] time records and exposure records show that [redacted] worked alongside [redacted] assisting him in straightening fuel rods during the period of 11/7/60 to 11/14/60. Records of [redacted] working time during the aforementioned period indicated that [redacted] worked a total of 7.5 hours per day for the 5 day period. [redacted] film badge for the period 11/7/60 to 11/19/60 shows only an exposure of 155 mrem beta.

Grieb stated that he believed that [redacted] had put his film badge into the tote box which had approximately 200 rods in it at all times and which has a surface radiation level of 240 mrem per hour beta. Grieb stated that [redacted] is a top machinist, who complained to his union delegate when put into the control area to perform straightening operations which normally were performed by lower paid employees. Grieb stated that [redacted] was placed in the control area because of lack of work in the machine tool operations.

Grieb stated that [redacted] has been removed from all work within any controlled or restricted area effective 12/8/60.

4. George Martin, Leadman in Control Area

George Martin stated that he was [redacted] immediate supervisor in the control area during the straightening operation. Martin stated that although they were supposed to keep the tote boxes covered and remove only one fuel rod at a time, the cover of the tote box was continuously off because the design of the tote box was impractical and it was difficult to insert a gloved hand through the end slot and remove one rod. Therefore, the cover of the tote box was left off and [redacted] would have 20 or 30 rods lying on the table in front of him. Martin stated that he observed [redacted] and that [redacted] had his film badge attached to the outside label of his coverall.

5. [redacted] Machinist

[redacted] stated that he had worked in the control area on many occasions prior to 10/24/60 when he was first issued a film badge. He stated that he would be called in to work on machinery and occasionally for a day or two help out with the stripping and bagging operations. [redacted] stated that at the end of October he was put in the control area steady to straighten fuel rods. [redacted] stated that [redacted] worked alongside him two days (total work time 15 hours) performing the same operations. [redacted] worked one day and [redacted] worked one week alongside him. The personnel monitoring records for the two day period [redacted] worked alongside [redacted] show 20 mrem beta on the film badge of 10/24/60 to 11/6/60. [redacted] shows 80 mrem beta exposure for this period, but he was doing other work within the control area, as well, whereas [redacted] only worked two days in the control area alongside [redacted]

[redacted] stated that he never had the film badge off the coverall he was wearing and at the end of each day turned in his film badge to the security guard at the gate and picked up his film badge each morning. This was verified by examination of the security guard records which show that [redacted] film badge was never missing and was turned in each night and reissued each morning.

[redacted] showed the inspector the exact position he occupied during the fuel rod straightening operations and two film badges supplied by HASL were placed at the exact location where [redacted] indicated he was sitting. A cardboard carton was placed on a chair and the film badges were pinned to the box 16" away from the straightening jig. An open tote box containing 20 fuel rods and 20 scattered fuel rods were placed on the table. The badges were exposed 4 hours and 10 minutes and developed by HASL, who reported no badge exposure.

5. Dr. William Young, Medical Director

Dr. Young stated that on 12/8/60, he had [redacted] submit a urine sample which he sent to Controls for Radiation, Cambridge, Massachusetts for bioassay for uranium. The bioassay for [redacted] showed a concentration of uranium in urine of 4.6 micrograms per liter. A repeat urine taken 12/28/60 was analyzed by HASL and showed a urine concentration of 2.0 $ug/_l$ uranium. Dr. Young also took blood samples on 12/8/60 and made a differential count and stated that no blood abnormalities were noted.

6. Personnel Monitoring

[redacted] did not have any film badge or personnel monitoring device prior to 10/24/60, and did not work in the control area after 11/14/60, therefore, his thirteen week reported exposure consisted of two successive reported 5.7 rads beta for a total of 11.4 rads beta.

7. Direct Radiation Surveys

A direct radiation survey was performed by the inspector accompanied by Grieb in the PRDC Control Area, in the vicinity where [redacted] had worked, using a #1680 Juno survey meter, calibrated 11/23/60. The following are radiation measurements:

(a) With [redacted] occupying a seat and performing a simulated rod straightening operation with the number of fuel rods and location pointed out by [redacted] as typical of his operation. An open tote box containing 200 fuel rods (1/2 filled) was on a table immediately to the left of [redacted] and 20 fuel rods were strewn on the table in front of [redacted]. The radiation reading was taken at [redacted] chest which was 15" from the surface of the table and found to be - 10 mr/hr beta.

(b) At the surface of the tote box containing 200 fuel rods 6" from the surface of the fuel rods - 34 mr/hr beta.
No reading could be obtained at the surface of the fuel rods because the dimensions of the tote box were too small to allow the insertion of a survey instrument.

(c) At the surface of the fuel rod straightening jig with one fuel rod in the jig - 2 mr/hr beta.

8. Film Badge Evaluation

The two Nucleonic film badges which [redacted] wore between 10/24/60 and 11/14/60 were submitted to HASL for evaluation. HASL stated that the films showed no evidence of heat damages, and that both film badges appear to have been uniformly exposed to 5.7 rads beta radiation. The film badge is described as a #544 Dupont double emulsion in a plastic packet. Both Nucleonic and HASL made their evaluations from the insensitive films because the sensitive films were too blackened for evaluation.

9. Corrective Action

The following item noted during the investigation was discussed with Mr. Boyd Metz, Plant Manager:

20.202 "Personnel monitoring"
(a)(1) - in that [redacted] was not issued a film badge prior to 10/24/60 when he had in fact worked in the control area on thirteen different days between 9/31/60 and 11/23/60.

Mr. Metz stated that immediate steps will be taken to have badges issued to all persons who enter the control area.

Exhibit "A"

AMERICA

RADIATION EXPOSURE REPORT

Monitoring Period from 11-9-60 to 11-16-60

Badge Mailing Date _____

Report Prepared For

Mr. H. Grieb, Safety Dept.
Sylvania-Corning Nuclear
Cantiague Road
Hicksville, L.I., N.Y.

To Be Filled In By NCA

Badges Received 11-23-60
Badges Developed 11-29
Report Mailed 11-30
Prepared By F.T.
Approved By
Film Emulsion No.

0000

Approved By _____

Film Emulsion No. _____

Film Badge No.	Name	Exposures: Gamma (mrad)	X-Ray (mrad)	Beta Ray (mrad)	Neutrons: Fast	Neutrons: Total	Cumulative Totals to Date: Quarterly Period From / To: Gamma	X-Ray	Beta	Neutrons	Calendar Year: Gamma	X-Ray	Beta	Neutrons	Densities: DW	Co (.060")	Co (.020")	Co
		0	0	0							0		0					
		0	0	0							0		0					
		0	0	0							0		105					
		0	0	30							0		70					
		0	0	0							0		50					
		0	0	55							0		440					
		0	0	0							0		125					
		0	0	0							0		95					
		0	0	0							0		0					
		0	0	60							0		365					
		0	0	20							0		110					
		0	0	0							0		45					
		350	400	0							0	750	0					
		0	0	195							0		395					
		0	0	0							0		30					
		0	0	0							0		55					
		0	0	0							0		0					
		0	0	40							0		220					
		0	0	0							0		105					
		0	0	0							0		0					
		0	0	0							0		0					
		0	0	0							0		45					
		0	0	30							0		205					
		0	0	25							0		215					

Be determined by subtracting the number of last

REMARKS:

Film Badge Exposures

Gamma (mrad)

X-Ray (mrad)

Beta Ray (mrad)

Neutrons: Fast / Total

Cumulative Totals to Date: Quarterly Period From / To

Calendar Year

Densities: DW

Co (.060")

Co (.020")

Co

Prepared By _____

Approved By _____

Film Emulsion No. _____

Exhibit "A"

Film Badge No.	Name	Exposures: Gamma (mrad)	X-Ray (mrad)	Beta-Skin (mrad)	Neutrons: Fast (mrem)	Neutrons: Total (mrem)
		0	0	0		
		0	0	0		
		0	0	0		
		0	0	130		
		0	0	55		
		0	0	165		
		0	0	0		
		0	0	165		
		0	0	60		
		0	0	0		

CUMULATIVE TOTALS TO DATE

Quarterly Period From / To: Gamma	X-ray	Beta	Neutrons	Calendar Year: Gamma	X-ray	Beta	Neutrons
				0		0	
				0		75	
				0		130	
				0		380	
				0		135	
				0		675	
				0		0	
				0		635	
				0		170	
				0		155	

DENSITIES

OD		Cu (.008")		Cu (.024")		CD
F	S	F	S	F	S	F

Exhibit "B"

DEC 8 1960

ATTN R W KIRKMAN COMPLIANCE DIV

ACTION: Mr. Kirkman

TT #91

CONFIRMATION OF TELE CALL FROM H E GRIEB TO J ROEDER

FILM BADGE EXPOSURE OF 250 MREM GAMMA AND 5.77 RAD BETA MONITORING

PERIOD FROM 11/7/60 TO 11/19/60 NAME [redacted] Exh C

INVESTIAXXX INSTXXX INVESTIGATION DETAILS TO FOLLOW

H E GRIBE SYLCOR

SYLVANIA CORNING NUCLEAR CORP CORRECTION

H E GRIEB

END PLS ACK AC

R 1 CLR OK TNX WM

Exhibit C

NCA

11-2-
C ✓
R ✓

RADIATION EXPOSURE REPORT

From OCT 24 1950 To 8 1951

Date _____

Dr. H. Grich, Safety Dept.
Sylvania-Corning Nuclear
Cantiague Road
Hicksville, L.I., N.Y.

To Be Filled In By NCA

Badges Received _____
Badges Developed _____
Report Mailed _____
Prepared By _____
Approved By _____
Film Emulsion No. _____

Sylvania-
Bldg 67
Chemical Safety Dept
Sylvania Nuclear
Fortitude Road
Mineola, L.I., N.Y.

Report No.
Prepared By
Approved By
Film Emulsion No.

FILM CODE	NAME SyC-C	EXPOSURES: Gamma (mrem)	X-Ray (mrem)	Beta Ray (mrad)	Neutrons Fast	Neutrons Thermal	CUMULATIVE TOTALS TO DATE: Quarterly Period From / To: Gamma	X-Ray	Beta	Neutrons	Calendar Year: Gamma	X-Ray	Beta	Neutrons	DENSITIES: GM F	GM S	Cu (.008") F	Cu (.008") S	Cu (.008") F
		0		0							0		0						
		0		0							0		0						
		0		0							0		105						
		0		0							0		40						
		0		0							0		50						
		0		80							0		385		040				
		0		30							0		135		010				
		0		0							0		85						
		0		30							0		120		030				
		0		0							0		55						
		0		0							0		40						
		0		0							0		0						
		0		40							0		30		040				
		0		20							0		100		020				
		0		190							0		785		240				
		0		0							0		90						
		0		0							0		45						
		0		0							0		45						
		0		75							0		260		060				
		0		245							0		510		240				
		0		0							0		45						
		0		0							0		0						
		0		0							0		1460		030				
		0		45							0		255		040				

Total Gamma Exposure to be determined by subtracting the number of last ... from the number of this ...

REMARKS

Exhibit "C"

Film Badge No.	11 NAME SYC-C	EXPOSURES					CUMULATIVE TOTALS TO DATE							DENSITIES					
		Gamma (mrem)	X-Ray (mrem)	Beta-Ray (mrem)	Neutrons Fast (mrem)	Neutrons Thermal (mrem)	Quarterly Period From / To				Calendar Year				DR		Co (.889)		Co (.8
							Gamma	X-ray	Beta	Neutron	Gamma	X-ray	Beta	Neutron	P	S	P	S	P
		0		0							0		95						
		0		0							0		50						
		0		0							0		55						
		0		55							0		35						
		0		0							0		0						
		0		40							0		180						
		0		20							0		105						
		0		55							0		150						
		0		0							0		0						
		0		0							0		0						
		0		0							0		45						
		0		45							0		175						
		0		40							0		170						
		0		0							0		0						
		0		0							0		75						
		0		90							0		90						
		0		130							0		130						
		0		90							0		290						
		0		45							0		90						
		0		165							0		570						
		0		0							0		0						
		0		135							0		435						
		0		20							0		20						
		0		100							0		100						

NUCLEONIC CORPORATION OF AMERICA
RAY STREET • BROOKLYN 31, N. Y. • MAIN 4-7970
CABLE: NUCLEAN

Exhibit 'D'

December 22, 1960

Mr. . Epstein
. . . Compliance Div.
376 Hudson Street
New York 14, New York

Ref: Sylcor's Exposure Report

Dear Mr. Epstein:

In regard to the exposures received by [redacted] E46 during the weeks:

	O.W. Densities F	S
~~October 24th to November 6th~~	~~2.54~~	~~.160*~~
November 7th to November 21st	3.50	.160*

The sensitive film of the 544 packet indicates a saturation at densities of approximately 3.0 making the validity of an interpretation from this film questionable. Corrected exposure report has been interpreted from the insensitive film (O.W.*).

A density of .160 O.W. reading on the insensitive film against a Beta Calibration Curve indicates an exposure of 6.7 Rad. This reading is the corrected reading for [redacted] both weeks are the same. E46

Enclosed you will find [redacted] film, as requested by you.

Respectfully yours,

NUCLEONIC CORP. OF AMERICA

WCH/lc

W. C. Herman

LCOR Division of Sylvania Electric Prod. Inc.

Exhibit E-11

January 3, 1961

Mr. E. Epstein
United States Atomic Energy Commission
Compliance Division
376 Hudson Street
New York, N. Y.

Dear Mr. Epstein:

Attached is a copy of the report that was made on the film badge exposure of [redacted] E46

Please advise me if there is any further information required.

Very truly yours,

Henry E. Grieb
Chief Safety Engineer

HEG:dw
Att.

COMPANY CONFIDENTIAL

E46

FILM BADGE EXPOSURE - [redacted]

December 28, 1960 (Dist. 12/22/60)

C. LaPlaca

Safety Department

cc: D. B. Metz
R. Haffner

On December 8th, I received a film badge report from Nucleonic Corporation of America for the monitoring period of November 7th to November 19th, which indicated that [redacted] used by [redacted] was exposed to 400 mrem x-ray. I contacted NCA, and spoke to Miss J. Cara, and asked her to re-evaluate the film for beta exposure, because I did not think that [redacted] was exposed to any x-ray. She said that she would evaluate it and call me back. In the meantime, I contacted you, C. Bernbels and D. B. Metz. As a result of a quick investigation of [redacted] time during the above monitoring period, it was confirmed that [redacted] definitely had no x-ray exposure, but that he was working part of the time in the Control Area.

E46

W. Herman of NCA, called me in the middle of the afternoon on December 8th, to tell me that the x-ray exposure on [redacted] badge was a misinterpretation by NCA. The correct interpretation, according to W. Herman, was 250 mrem gamma and 5.77 rad beta. I asked him to confirm the reinterpretation in writing immediately, as it was necessary for our records. He said that he would do it. He also indicated that he was going to be at our Hicksville site the next day, Friday, December 9th, and that he would stop by to see me.

E46

After my telephone discussion with W. Herman, I contacted you and D. B. Metz, to inform you of the new badge interpretation and that it was necessary to inform the AEC. I then contacted by telephone, a Mr. J. Roeder of the AEC to inform them of the exposure. This was confirmed by

TWX from me to Mr. R. W. Kirkman in the Compliance Division of the AEC in New York.

Late in the afternoon on December 8th, I reviewed [redacted] prior film badge records. I found that the badge worn by [redacted] during the monitoring period beginning October 24th and ending November 6th, indicated an x-ray exposure of 160 mrem. I then attempted to contact Mr. Herman of NCA for a reinterpretation of this badge. Mr. Herman had left for the day, so I spoke to Miss J. Carr of NCA. I told her about the 160 mrem x-ray exposure. I indicated that this also must be a misinterpretation, and that the exposure was beta. I asked her to have this badge re-evaluated and any change in reading confirmed to me in writing immediately. She said that she would mention it to W. Herman as soon as she could contact him. On Friday, December 9th, when W. Herman stopped by my office, I showed him the second film badge report that indicated [redacted] had an x-ray exposure. I again indicated that it was necessary for me to obtain in writing a corrected film badge report for the monitoring period of November 7th through November 19th, on [redacted] I also indicated that the prior film badge report with the 160 mrem x-ray could not have been an x-ray exposure, but may have been a beta exposure. I said that I had contacted J. Carr about this second film badge because he was not in. He indicated that he would review the second film, and confirm any change in interpretation in writing.

On Tuesday, December 20th, a Mr. Epstein of the Compliance Division of the New York Office of the AEC, and Mr. J. Miele of the Division of Industrial Hygiene, Department of Labor for the State of New York, visited the plant to investigate the badge exposure for [redacted] During the investigation the following items were noted.

1. We had received a corrected copy of [redacted] badge report from NCA for the monitoring period of November 7th through November 19th. I pointed out that we still had no word from NCA on the 160 mrem x-ray exposure for the monitoring period beginning October 24th through November 6th. I called Mr. M. Schloss, President of NCA, and told him about the 160 mrem x-ray exposure, and that I had also talked to J. Carr and W. Herman of his organization, in attempts to have a re-evaluation of this film for beta exposure. I indicated that we wanted an immediate review of this film. Mr. Epstein of the AEC, then asked to speak to Mr. Schloss himself. Mr. Epstein indicated that he also wanted Schloss to re-evaluate this film immediately. About 15 or 20 minutes after the

phone call, Schloss called back to say that he had reviewed the film and that it also read a beta exposure in the order of 3.77 rad. The reason for the difference of x-ray mrem interpretation (160 mrem for one badge, and 400 mrem for the other badge), was that the two badges represented different film emulsions. The different emulsions involved different curves for standards. Schloss had no explanation as to why this second badge was not reinterpreted at the time I requested it. We also indicated to Schloss that it was necessary to obtain this new interpretation in writing. Up to this time, December 22nd, we still have not received a written report from NCA on this second badge. M. Norman was contacted today (December 22nd), and he indicated that the report was on his desk and he was going to mail it out today.

2. [redacted] was removed from radiation exposure on December 8th, as soon as it was known that he might have had an over-exposure. Exh

3. The urine analysis conducted by Dr. Young, and sent to Controls for Radiation for analysis, indicated a uranium concentration of 4.6×10^{-3} micrograms per milliliter.

4. Dr. Young's thorough medical examination of [redacted] including blood tests, gave no indication of a high radiation exposure. Exh

5. NCA's radiation report for the monitoring period from November 7th to November 19th, indicated that it was mailed on November 30th, and for some reason the report was not received until December 8th. There is a discrepancy somewhere here. I do not see how this report could have been in the mails for eight days. I suspect that NCA did not mail the report on November 30th.

6. During the two monitoring periods that [redacted] badge was exposed to the high beta source, there were other men working on the same jobs in the same area, and they did not have exposures anywhere near the magnitude of [redacted] badge. One man who was in the Control Area for a considerable length of time was [redacted] comprising of all his time in the Control Area and exposures with that for [redacted] as follows: Exh

FILM BADGE EXPOSURE - [redacted] (Continued) Page 4 EX6

Monitoring Period		Time in Control Area	Film Badge Reading
10/24/60-11/5/60	[redacted]	61.6 hrs 52.5 "	5.77 rad 65 mrad beta
11/7/60-11/19/60	[redacted]	23.1 hrs 26.0 "	5.77 rad 155 mrad beta

EX6

[redacted] was working primarily on the cut-off wheel, and [redacted] was working primarily on the straightening of the depleted PEDC pins, although he also worked on the cut-off wheel.

7. [redacted] timecards indicated that he worked on the PEDC material in the Control Area on September 29, 30, October 10, 11, 17, 18, 19, 20 and 21, during these days [redacted] did not have a film badge. This was contrary to procedures and had been discussed with the supervisors.

8. The bench and equipment used for the PEDC pin straightening [redacted] set-up to simulate conditions under which [redacted] worked. Two badges were attached to a cardboard carton and set in a position that approximated [redacted] when he worked there. One PEDC pin was in the jig, and a large number of PEDC pins were in a tote tray to the left of the jig. The tote tray was about half full, and there were about four pins on a table just to the right of the operator. The badges were left in this position for about four hours. These badges belong to the Commission, and were taken by Mr. Epstein for developing. EX6

9. George Martin, Leadman in the Control Area, indicated that he has seen on occasion, up to 50 PEDC pins on the table in front of the operator. Using a rule, Mr. Epstein could obtain no higher than 10 mr per hour with this large quantity of pins directly in front of the operator. George Martin also indicated that on several occasions he had seen some men in the Control Area toss their badge in the tote tray containing PEDC pins. He said he thought it was a joke or something. He also indicated that he had not seen [redacted] do this, but of course it does not mean it did not happen. Martin also indicated that he had seen a badge on [redacted] when he was working in the PEDC Area, EX6

This of course does not mean that [redacted] was wearing a badge at all times when he was in the area.

10. [redacted] indicated that he wore rubber shoe covers, laboratory coat and rubber gloves when he handled the FNDC material. He also wore glasses.

11. To get a 5.77 rad beta reading, the film badge would have to be in direct contact with uranium for a period of 24 hours, or for an 80 hour work period (the badge monitering period of two work weeks) the badge would have to be exposed to an average reading of 72 mrad per hour.

12. [redacted] indicated that he wore his film badge on the laboratory coat when he worked in the Control Area. He indicated that he had left his film badge on the lab coat when he hung it up in the change room to the Control Area. He did this when he went to lunch or out on coffee breaks.

Everyone I have talked to about this exposure is of the opinion that the badge worn by [redacted] was probably exposed to these high levels of radiation, but [redacted] could not have been exposed to these levels. I am of the strong opinion that both of [redacted] badges were deliberately exposed. Those people whom I have discussed this situation with have indicated that they also believe that this is true. The badges could not have accidentally been left long enough in any area to be exposed to these extremely high radiation levels. It would be rather strange to have accidentally exposed both badges to identical quantities of beta radiation. [redacted] is a Machinist, and he was being used on extremely simple production operations. He had indicated his dissatisfaction with this arrangement.

As a result of all of the above, the following recommendations are made:

1. The Supervisor of the Control Area, as well as other Supervisors in Commerical, must again be instructed that they are not to assign anyone to work on the melting operations or on the FNDC operations in the Control Area, unless the individual has a film badge. This applies even to a one day assignment. This has been called to the attention of Supervisors on numerous

occasions in the past.

2. All Supervisors of persons who wear film badges must watch these persons very closely to be certain that their film badge is worn properly at all times. Any instance of misuse of the film badge must be reported immediately to me.

3. I believe that it is unwise to assign a higher skilled person to temporary menial duty on production operations. We are in the unfortunate position of being at the mercy of an individual who is dissatisfied with the job, and he can deliverately expose the film badge, which will result in his being removed from this unwanted job. Most people seem to realize that if a film badge reading is high they will be removed from that particular job that caused the exposure. They don't realize the tremendous amount of work and trouble that it creates. Perhaps if this was pointed out to them, these people that might be inclined to pull this stunt would be discouraged. I am not saying that [redacted] took this action. EJ6

4. NCA, our film badge supplier, has been giving us pretty accurate beta exposure data. This is based upon test badges that we send in on occasion. I believe, the only reason that they are really good on beta exposure is that we, over a period of several years, have forced them into this position. A comment made by B. Schloss of NCA, to the AEC was that they had no idea of what type of exposure to expect from Sylcor. That is, whether they were beta, gamma or any other radiation. This is not true. We have, on occasions, filled out the NCA forms indicating the types of exposure to our people. We have also discussed this on numerous occasions with J. Cara and other personnel in NCA. In fact, Schloss has visited our facilities at Hicksville on numerous occasions to discuss the film badges and their use. Many of the NCA reports are not completed correctly. That is, they do not enter the monitoring period for the badges on the forms, nor do they fill in correctly the sections requiring the date the badges were received by them, the date of development by them, the date that the report was mailed to Sylcor, or the name of the person that compiled the report or prepared it. In addition to this, we have been experiencing a lot of difficulties in receiving film badges in

C O P Y

EXHIBIT "E"

FILM BADGE EXPOSURE [redacted] (continued) Page 7

Exh

time for the required monitoring period. For example, the NCA people said that they had mailed us badges on December 13th or 14th, to be used on December 19th. On the afternoon of Friday, December 16th, D. White contacted NCA to inform them that we had not received the badges to be used on the 19th. NCA people indicated that they could not understand this, because they mailed them on the 13th and 14th, but that they would look into the matter. On December 17th, at 3:30 PM a Special Delivery package containing the badges was delivered to the Guardhouse. The postmark stamped by the Brooklyn Post Office, where the package was mailed, indicated that they were mailed on the afternoon of Friday, the 16th. I contacted J. Cara of NCA about this, and she indicated that as far as she knew, the badges were sent on the 13th or 14th, and didn't know anything about the badges being mailed on the 16th as Special Delivery.

The above difficulties that we have been experiencing with NCA, have been discussed with NCA representatives and they have indicated that they will take immediate action to prevent any recurrences.

HEG:dw

Henry E. Grieb