

Nov. 13, 1978

NOTE TO: Mike Collins & Don Lanham, DSB (016)
FROM: Reba Diggs, License Fee Management Branch, ADM
SUBJECT: PROCESSING LETTERS WITH CHECKS RECEIVED DIRECTLY BY THE
LICENSE FEE MANAGEMENT BRANCH

Please process the enclosed letter under the applicable docket and give the following distribution under code M008:

Original of ltr to Regulatory Docket File
Action Cy w/check to W. O. Miller, LFMB (L-233)
3 cys to applicable Branch of DOR or DPM
1 to LPDR
1 to PDR

I am retaining the check and the following information is for your records.

Check No.: 251131
Amount: \$12,300
Date: 11/7/78
Applicant: Niagara Mohawk Power Corp.

Thanks!

Reba M. Diggs
License Fee Management Branch
Office of Administration

781115 0159

4-24-64

PROPERTY

A 8/1/78

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)
DISTRIBUTION FOR INCOMING MATERIAL 50-220

REC: SALTZMAN J
NRC

ORG: RUSHMORE J W
NIAGARA MOHAWK PWR

DOCDATE: 08/01/78
DATE RCVD: 08/03/78

DOCTYPE: LETTER NOTARIZED: YES
SUBJECT:

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LTR 1 ENCL 1

TRANSMITTAL OF ANNUAL CERTIFIED FINANCIAL STATEMENT FOR 1977, A CONSOLIDATED
BALANCE SHEET AND STATEMENT OF EARNINGS ENDING 6/30/78 AND A ONE YEAR
INTERNAL CASH FLOW PROJECTION.

PLANT NAME: NINE MILE PT -- UNIT 1

REVIEWER INITIAL: XRS
DISTRIBUTOR INITIAL: M

***** DISTRIBUTION OF THIS MATERIAL IS AS FOLLOWS *****

ANNUAL FINANCIAL RPTS ADDRESSED TO ANTITRUST GROUP(SALTZMAN)
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Map 4

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***** THE END *****

copy

Faint, illegible text at the top of the page, possibly a header or introductory paragraph.

Second section of faint, illegible text, appearing as several lines of a list or report.

Third section of faint, illegible text, continuing the list or report.

Fourth section of faint, illegible text, possibly a concluding paragraph or summary.

Fifth section of faint, illegible text at the bottom of the page, possibly a footer or additional notes.

August 1, 1978

Jerome Saltzman, Chief
Antitrust & Indemnity Group
Nuclear Reactor Regulation
Nuclear Regulatory Commission
Washington, D. C. 20555

RECEIVED
AUG 3 1978
INSURANCE SERVICES

RE: Docket No. 50-220
Guarantee of Retrospective Premium

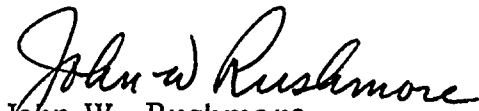
Dear Mr. Saltzman:

Pursuant to the Commission's requirements as published in The Federal Register on January 3, 1977 (42 F.R. 46) and as we filed last year, enclosed are:

1. The annual certified financial statement for 1977
2. a Consolidated Balance Sheet and Statement of Earnings ending June 30, 1978 and twelve months ending June 30, 1978
3. a one year internal cash flow projection with a narrative statement certified by John M. Haynes, Vice President and Treasurer.

If there are any questions on the enclosed material, we will be pleased to provide a prompt response.

Very truly yours,


John W. Rushmore
Supervisor - Insurance
System Risk Management

JWR/cig

Enclosures

782160076

M005
5/11

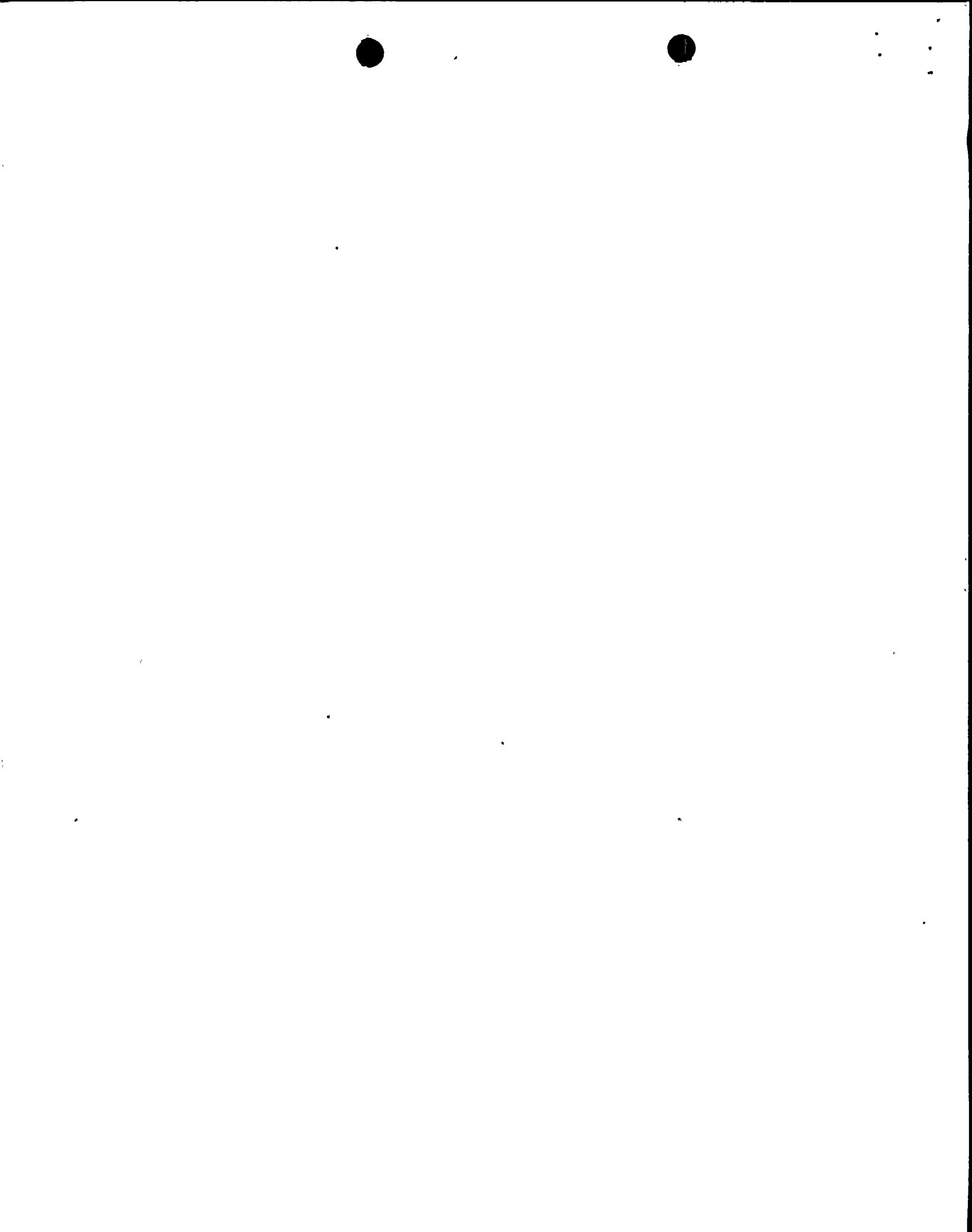
NIACARA MOHAWK POWER CORPORATION AND SUBSIDIARY COMPANIES
STATEMENT OF CONSOLIDATED EARNINGS
(In Thousands of Dollars)

	Three Months Ended June 30,		Twelve Months Ended June 30,	
	1978	1977	1978	1977
Electric Operating Revenues	\$249,139	\$230,565	\$1,018,521	\$ 900,434
Gas Operating Revenues	60,527	51,197	255,053	235,677
Total Operating Revenues	<u>309,666</u>	<u>281,762</u>	<u>1,273,574</u>	<u>1,136,111</u>
Operation				
Fuel for Electric Generation	79,259	67,592	326,773	256,225
Electricity Purchased	22,966	22,726	92,687	95,031
Gas Purchased	32,163	26,508	156,867	140,148
Other Operation Expenses	43,950	40,655	172,689	159,630
Maintenance	19,426	19,714	83,195	73,639
Depreciation	19,957	19,201	78,542	77,741
Federal and Canadian Income Taxes	5,789	6,618	23,063	22,144
Other Taxes	38,180	36,101	153,250	138,322
Total Operating Expenses	<u>261,690</u>	<u>239,115</u>	<u>1,087,066</u>	<u>962,880</u>
Operating Income	<u>47,976</u>	<u>42,647</u>	<u>186,508</u>	<u>173,231</u>
Allowance for Funds Used During Construction (Note 1)	-	-	-	11,347
Allowance for Other Funds Used During Construction (Note 1)	6,852	5,200	25,171	9,844
Income Tax Refunds (Note 2)	-	-	-	8,986
Other - Net	1,799	725	5,643	1,611
Total Other Income and Deductions	<u>8,651</u>	<u>5,925</u>	<u>30,814</u>	<u>31,788</u>
Income Before Interest Charges	<u>56,627</u>	<u>48,572</u>	<u>217,322</u>	<u>205,019</u>
Interest on Long-Term Debt	24,956	22,409	96,898	88,277
Other Interest	193	305	2,708	1,109
Allowance for Borrowed Funds Used During Construction (Note 1)	<u>(4,049)</u>	<u>(3,044)</u>	<u>(14,606)</u>	<u>(5,741)</u>
Total Interest Charges	<u>21,100</u>	<u>19,670</u>	<u>85,000</u>	<u>83,645</u>
Net Income	35,527	28,902	132,322	121,374
Dividend Requirements on Preferred Stock	7,247	6,443	27,034	25,009
Balance Available for Common Stock	<u>\$ 28,280</u>	<u>\$ 22,459</u>	<u>\$ 105,288</u>	<u>\$ 96,365</u>
Average number of shares of common stock outstanding during the period	58,139,001	56,097,640	57,122,041	55,391,041
Earnings Per Average Share of Common Stock:	\$0.49	\$0.40	\$1.84	\$1.74

Note 1: Effective January 1, 1977, in accordance with revised accounting procedures as prescribed by the Federal Energy Regulatory Commission, the allowance for funds used during construction has been segregated into its two component parts, borrowed funds and other funds, with the borrowed funds component being included in interest charges.

Note 2: Represents that portion of income tax refunds, including interest, received for the years 1966 through 1968, previously recorded in Deferred Credits, no longer subject to a contingency.

The above information is not given in connection with any sale of, or offer to sell or buy, any stock or security.

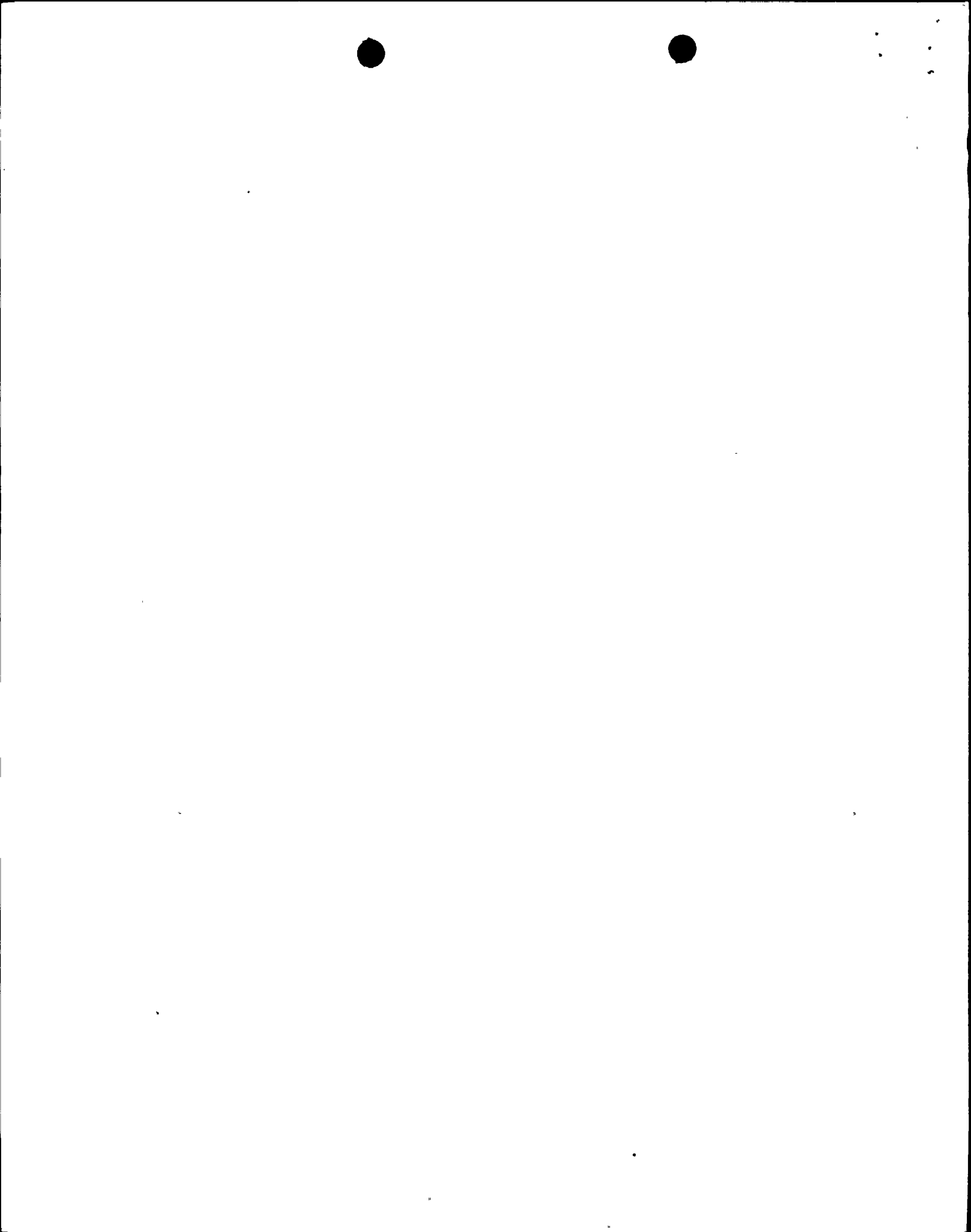


NIAGARA MOHAWK POWER CORPORATION AND SUBSIDIARY COMPANIES

·CONSOLIDATED BALANCE SHEET
·(UNAUDITED)

	At June 30,	
	<u>1978</u>	<u>1977</u>
	(In Thousands of Dollars)	
ASSETS		
Utility plant, at original cost:		
Electric.....	\$2,676,171	\$2,570,474
Nuclear fuel.....	82,190	87,290
Gas.....	345,209	336,217
Common.....	57,900	55,499
Construction work in progress.....	506,508	370,645
Total.....	<u>3,667,978</u>	<u>3,420,125</u>
Less-accumulated depreciation.....	873,972	810,199
Net utility plant.....	<u>2,794,006</u>	<u>2,609,926</u>
Other property and investments:	<u>15,240</u>	<u>15,676</u>
Current assets:		
Cash.....	9,908	4,160
Temporary cash investments.....	70,991	-
Accounts receivable (trade).....	112,974	110,310
Less-allowance for doubtful accounts.....	(1,600)	(1,300)
Income tax refund claims.....	8,027	7,188
Material and supplies, at average cost:		
Coal and oil for production of electricity.....	64,589	44,894
Other.....	28,585	25,594
Prepaid real estate taxes.....	23,395	23,055
Other prepayments.....	2,794	2,407
	<u>319,663</u>	<u>216,308</u>
Deferred debits:		
Unamortized debt expense.....	13,836	13,243
Deferred recoverable energy costs.....	11,588	29,914
Other.....	3,966	5,187
	<u>29,390</u>	<u>48,344</u>
	<u>\$3,158,299</u>	<u>\$2,890,254</u>

() Denotes Deduction



NIAGARA MOHAWK POWER CORPORATION AND SUBSIDIARY COMPANIES

CONSOLIDATED BALANCE SHEET
(UNAUDITED)

At June 30,
1978 1977
(In Thousands of Dollars)

LIABILITIES

Capitalization:

Common stockholders' equity:

Common stock - \$1 par value; authorized 85,000,000 shares; issued 61,360,036 and 56,375,219 shares, respectively.....	\$ 61,360	\$ 56,375
Premium on capital stock.....	636,083	570,409
Capital stock expense.....	(8,512)	(8,103)
Retained earnings.....	372,138	343,195
	<u>1,061,069</u>	<u>961,876</u>

Cumulative preferred stock - \$100 par value; authorized 3,400,000 shares; issued 3,364,000 and 3,382,000 shares, respectively (includes sinking fund requirements).....	334,600	336,400
Cumulative preferred stock - \$25 par value; authorized 9,600,000 shares; issued 2,800,000 and 1,200,000 shares, respectively.....	70,000	30,000
Cumulative preference stock - \$25 par value, authorized 4,000,000 shares; issued - none.....	-	-
Total stockholders' equity.....	1,465,669	1,328,276
Long-term debt.....	1,391,417	1,278,545
Total capitalization.....	<u>2,857,086</u>	<u>2,606,821</u>

Current liabilities:

Notes payable and commercial paper.....	-	43,200
Long-term debt due within one year.....	9,375	1,500
Sinking fund requirements on preferred stock.....	1,800	1,800
Accounts payable.....	96,089	68,921
Customers' deposits.....	5,001	4,301
Accrued taxes.....	36,747	34,799
Accrued interest.....	28,407	24,086
Accrued vacation pay.....	12,104	10,665
Other.....	11,312	4,977
	<u>200,835</u>	<u>194,249</u>

Deferred credits:

Income tax refunds.....	19,870	19,571
Other.....	9,768	11,794
	<u>29,638</u>	<u>31,365</u>

Accumulated deferred federal income taxes

.....	70,740	57,819
	<u>\$3,158,299</u>	<u>\$2,890,254</u>

() Denotes Deduction



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NIAGARA MOHAWK POWER CORPORATION

Sources and Uses of Funds Statement
(\$ Millions)

	12 Months Ending December 31,	
	1978	1979*
USES OF FUNDS:		
Construction (Including Overheads)	\$285	\$292
Nuclear Fuel Obligations	34	23
Bond Maturities and Sinking Fund Requirements	12	12
TOTAL USES	\$331	\$327
SOURCES OF FUNDS:		
<u>Internal Sources -</u>		
Retained Earnings (a)	\$ 27	\$ 26
Depreciation (b)	80	81
Deferred Federal Income Taxes (c)	15	4
Nuclear Fuel Amortization (d)	28	21
Other (e)	5	8
Sub Total Internal Sources	\$155	\$140
<u>External Sources - (f)</u>		
Long Term Debt	\$ -	\$120
Preferred Stock	40	30
Common Stock	72	70
Notes Payable	34	(33)
Sub Total External Sources	\$146	\$172
<u>Other Sources - (g)</u>	\$ 30	\$ -
TOTAL SOURCES	\$331	\$327

* Preliminary and unapproved.

- Note: (a) Assumes approximately a 10.5% and 10.3% Return on Average Equity in 1978 and 1979, respectively, and the continuation of current dividend policy.
- (b) Based on current plant levels and recognizes anticipated additions less projected retirements.
- (c) Recognizes current and prior years' deferrals in accordance with Public Service Commission policy including the Investment Tax Credit.
- (d) Reflects anticipated plant output levels.
- (e) Reflects anticipated changes to other balance sheet accounts including fuel inventory levels, deferred energy costs, accounts receivable, accounts payable, etc.
- (f) Based on current estimates projected to achieve target capitalization ratios (subject to change).
- (g) Sale of portion of Roseton Steam Plant.

- (4) A narrative statement indicating which capital expenditures (if any) would be curtailed to ensure that retrospective premiums up to \$10 million would be available for payment.

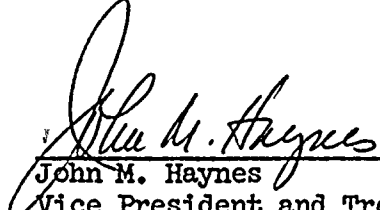
It is Niagara Mohawk's view that the curtailment of capital expenditures to ensure payment of possible retrospective premiums of up to \$10 million would not be a material problem as this amount represents only about 3.5% of currently scheduled construction expenditures for each of the years 1978 and 1979.

DATE:

7/11/78

CERTIFIED:

NIAGARA MOHAWK POWER CORPORATION



John M. Haynes
Vice President and Treasurer

... .. (6)

... ..

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...

NIAGARA MOHAWK POWER CORPORATION

I, HAROLD J. BOGAN, Assistant Secretary of Niagara Mohawk Power Corporation, a corporation organized and existing under the laws of the State of New York, HEREBY CERTIFY:

1. That a meeting of the Board of Directors of Niagara Mohawk Power Corporation was duly called and held on August 15, 1973, pursuant to law and the By-Laws of said Corporation;

2. That a quorum of said Board of Directors was present at said meeting and acted throughout;

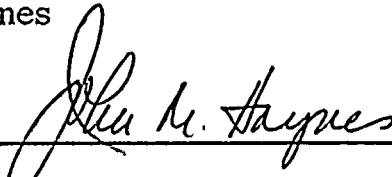
3. That at said meeting the following resolution was duly adopted by said Board of Directors:

RESOLVED, that John M. Haynes, be and hereby is elected Vice President and Treasurer of the Corporation effective forthwith, to hold such office subject to the further action of this Board of Directors.

4. That said resolution has not been in any respect amended, rescinded or annulled, but remains in full force and effect;


5. That the Secretary or any Assistant Secretary of said Corporation is authorized by provision of the By-Laws of said Corporation to certify as to the acts of the Board of Directors.

6. That the following is the genuine signature of John M. Haynes



IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed the corporate seal of Niagara Mohawk Power Corporation this

12th day of July 1978.


Harold J. Bogan
Assistant Secretary



ELECTION OF CERTAIN
OFFICERS:

The Chairman reviewed for the Board proposed changes in the Corporation's management structure. He suggested it is appropriate at this time to consider certain executive designations and submitted to the Board his recommended executive changes.

After discussion, upon motion duly made, seconded and carried by the affirmative vote of all directors present, the following resolution was adopted:

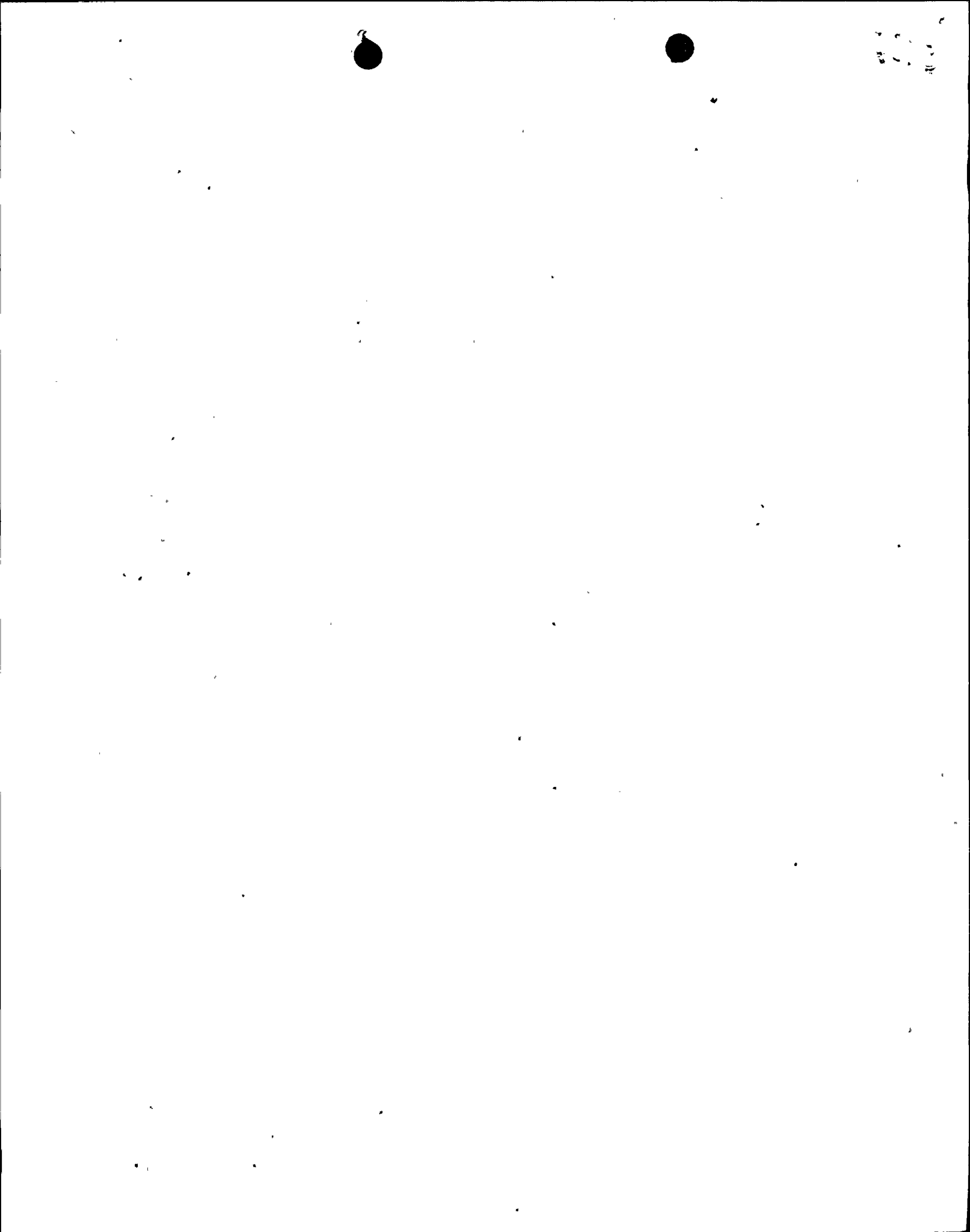
RESOLVED, that effective August 15, 1973, the following persons be elected officers of this Corporation:

John M. Haynes - Vice President and Treasurer

James F. Morrell - Vice President-Corporate Planning

John M. Endries - Vice President and Controller

and that their annual salaries be fixed at



NRC DISTRIBUTION FOR PART 50 DOCKET MATERIAL

TO: Mr. E. Case

FROM: LeBoeuf, Lamb, Leiby & MacRae
Washington, D.C. 20036

DATE OF DOCUMENT
3-30-78

DATE RECEIVED
3-31-78

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DESCRIPTION Ltr trans the following: 1P

PLANT NAME :Nine Mile Island Units 1 & 2
JCM 3-31-78

ENCLOSURE 1977 Annual Report.... 25P

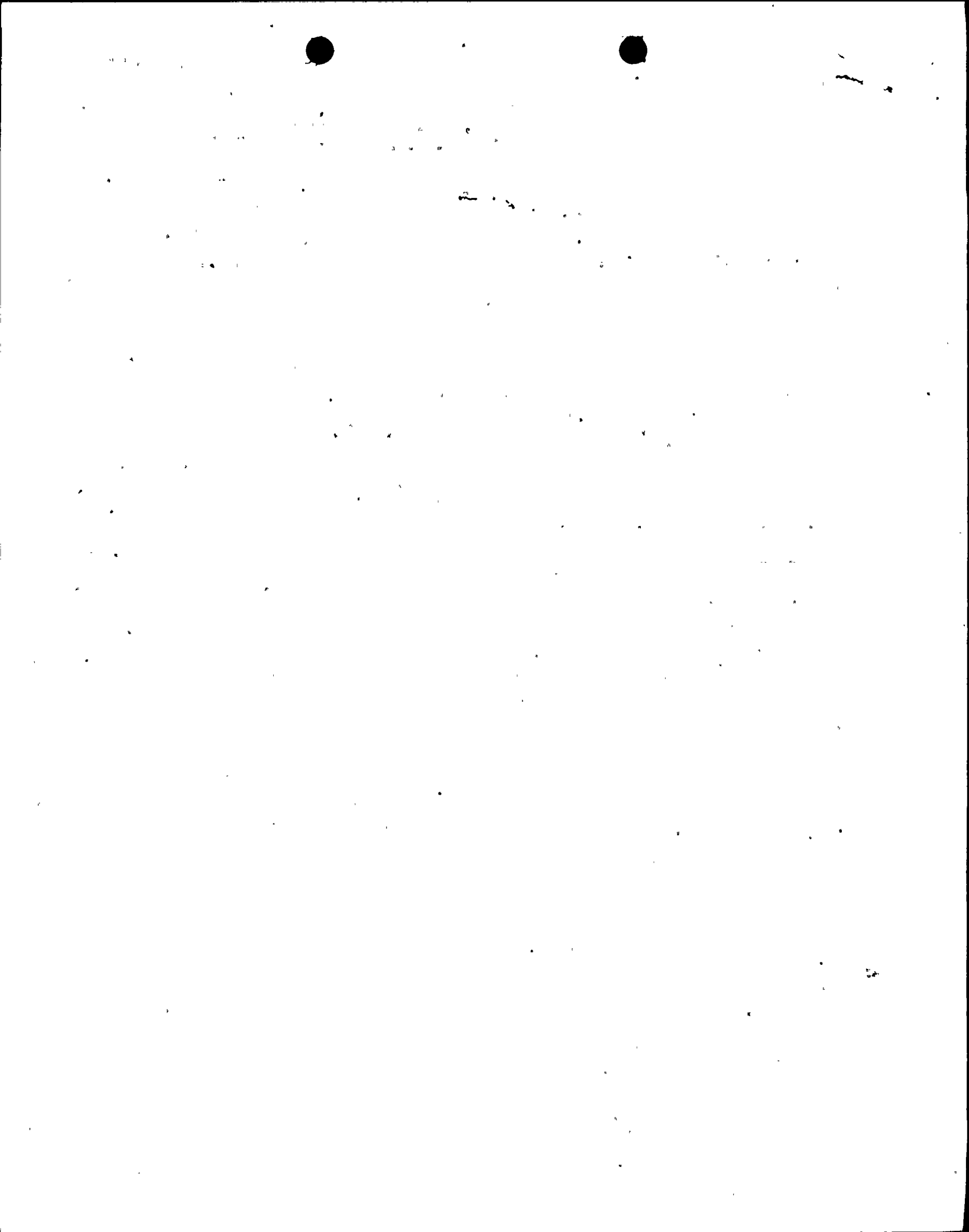
See Rpt

6 ENCL / REPRO LTR'S

SAFETY	FOR ACTION/INFORMATION	ENVIRONMENTAL
ASSIGNED AD:		ASSIGNED AD: V. MOORE (LTR)
BRANCH CHIEF: (3) LTR LEAR		BRANCH CHIEF:
PROJECT MANAGER:		PROJECT MANAGER:
LIC. ASST:		LIC. ASST:
	VARGA LTR	
	M. SERVICE W/ENCL	B. HARLESS

INTERNAL DISTRIBUTION			
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OELD		LATNAS	CRUTCHFIELD
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HANAUER	KNIGHT	F. ROSA	ENVIRON TECH
MIPC	BOSNAK		ERNST
CASE	SIHWEIL	OPERATING REACTORS	BALLARD
BOYD	PAWLICKI	STELLO	YOUNGBLOOD
		EISENHUT	
PROJECT MANAGEMENT	REACTOR SAFETY	SHAO	SITE TECH
SKOVHOLT LTR	ROSS	BAER	GAMMILL (2)
P. COLLINS	NOVAK	BUTLER	
ROZTOCZY	ROZTOCZY	GRIMES	SITE ANALYSIS
MELTZ W/ENCL	CHECK		VOLLMER
HELTEMES			BUNCH
SK	AT & I		J. COLLINS
B. SCOTT LTR	SALTZMAN LTR		KREGER
	RUTBERG		

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LEBOEUF, LAMB, LEIBY & MACRAE

1757 N STREET, N.W.

WASHINGTON, D. C. 20036

TELEPHONE 202-457-7500

CABLE ADDRESS

LEBWIN, WASHINGTON, D. C.

TELEX: 440274

TELECOPIER:

202-457-7543

RANDALL J. LEBOEUF, JR. 1929-1976

HORACE R. LAMB 1934-1977

ADRIAN C. LEIBY 1952-1976

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JOSEPH E. BACHELDER, III
ERNEST S. BALLARD, JR.
G. S. PETER BERGEN
GEOFFRY D. C. BEST
DAVID P. BICKS
TAYLOR R. BRIGGS
CHARLES N. BURGER
THOMAS E. BURKE
ROGER D. FELDMAN
EUGENE R. FIDELL
JACOB FRIEDLANDER
GERARD GIORDANO
DONALD J. GREENE
JAMES A. GREER, II
JOHN L. GROSE
DOUGLAS W. HAWES
CARL D. HOBELMAN
MICHAEL IOVENKO
JAMES F. JOHNSON, 4TH
RONALD D. JONES
LEX K. LARSON
GRANT S. LEWIS
KIMBA W. LOVEJOY

CAMERON F. MACRAE
CAMERON F. MACRAE, III
GERARD A. MAHER
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JAMES P. McGRANERY, JR.
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HAROLD M. SEIDEL
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EUGENE B. THOMAS, JR.
LEONARD M. TROSTEN
HARRY H. VOIGT
H. RICHARD WACHTEL
GERARD P. WATSON
THOMAS A. ZIERK

140 BROADWAY

NEW YORK, N. Y. 10005

TELEPHONE 212-269-1100

CABLE ADDRESS

LEBWIN, NEW YORK

TELEX: 440274

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March 30, 1978

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* ADMITTED TO THE DISTRICT OF COLUMBIA BAR

Mr. Edson G. Case
Acting Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Niagara Mohawk Power Corporation
Nine Mile Point Nuclear Station,
Unit No. 1 + 2
Docket No. 50-220/410

Dear Mr. Case:

As counsel for Niagara Mohawk Power Corporation,
I enclose a copy of its 1977 Annual Report filed herewith
pursuant to Section 50.71 of the regulations of the Nuclear
Regulatory Commission. For your convenience, I have
enclosed two (2) additional copies.

Very truly yours,

LEBOEUF, LAMB, LEIBY & MacRAE

By Eugene B. Thomas, Jr.
Eugene B. Thomas, Jr.

Enclosures

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50-220

NRC DISTRIBUTION FOR PART 50 DOCKET MATERIAL

FILE NUMBER

TO: Mr. George Lear

FROM: Niagara Mohawk
Syracuse, N. Y. 13202
Donald P. Dise

DATE OF DOCUMENT

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DESCRIPTION

ENCLOSURE

Response to NRC's ltr dtd 05/20/77
requesting info concerning the reactor vessel
material surveillance program of Unit 1...

1p

1/8"

DISTRIBUTION FOR MATERIAL ON REACTOR VESSEL
DATA PER R. INGRAM 5-26-77

PLANT NAME: NINE MILE POINT UNIT # 1
jcm 02/02/78

1 ENCL / DEMO AS NECESS

SAFETY

FOR ACTION/INFORMATION

BRANCH CHIEF: (3)

LEAR

PROJECT MANAGER:

LIC. ASST:

ZWETZIG

INTERNAL DISTRIBUTION

REG FILE

NRC PDR

I & E (2)

OELD

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HANAUER

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GRIMES

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R. GAMBLE

RANDALL

EXTERNAL DISTRIBUTION

LPDR: DS4960 N.Y.

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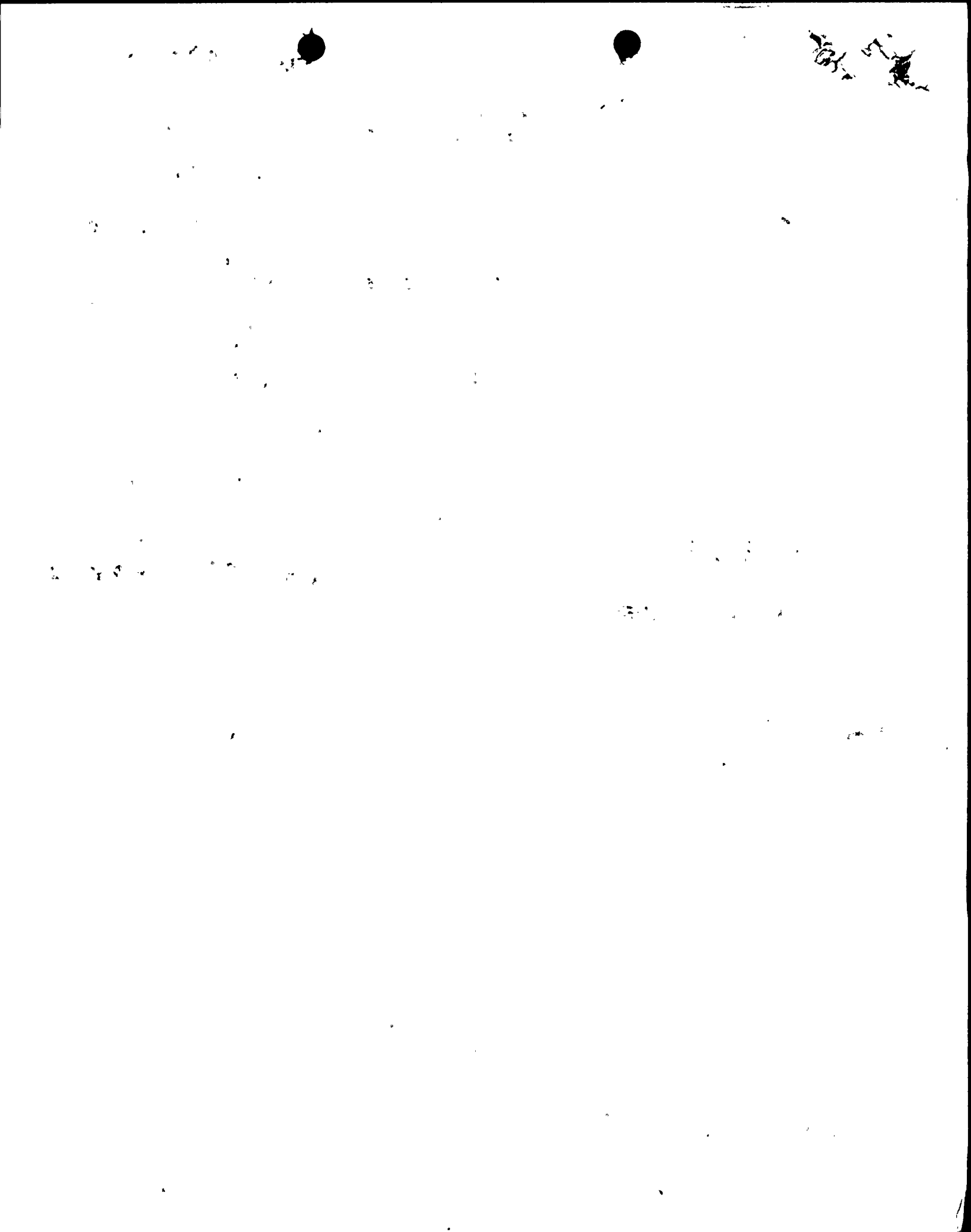
NSIC

ACRS 16 CYS SENT CATEGORY B

CONTROL NUMBER

apu

780330042



January 31, 1978

Director of Nuclear Reactor Regulation
Attn: Mr. George Lear, Chief
Operating Reactors/Branch #3
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555



Re: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63

Gentlemen:

Your letter of May 20, 1977 requested information concerning the reactor vessel material surveillance program of Nine Mile Point Unit 1.

The attachment to this letter addresses itself to those concerns.

Very truly yours,

NIAGARA MOHAWK POWER CORPORATION

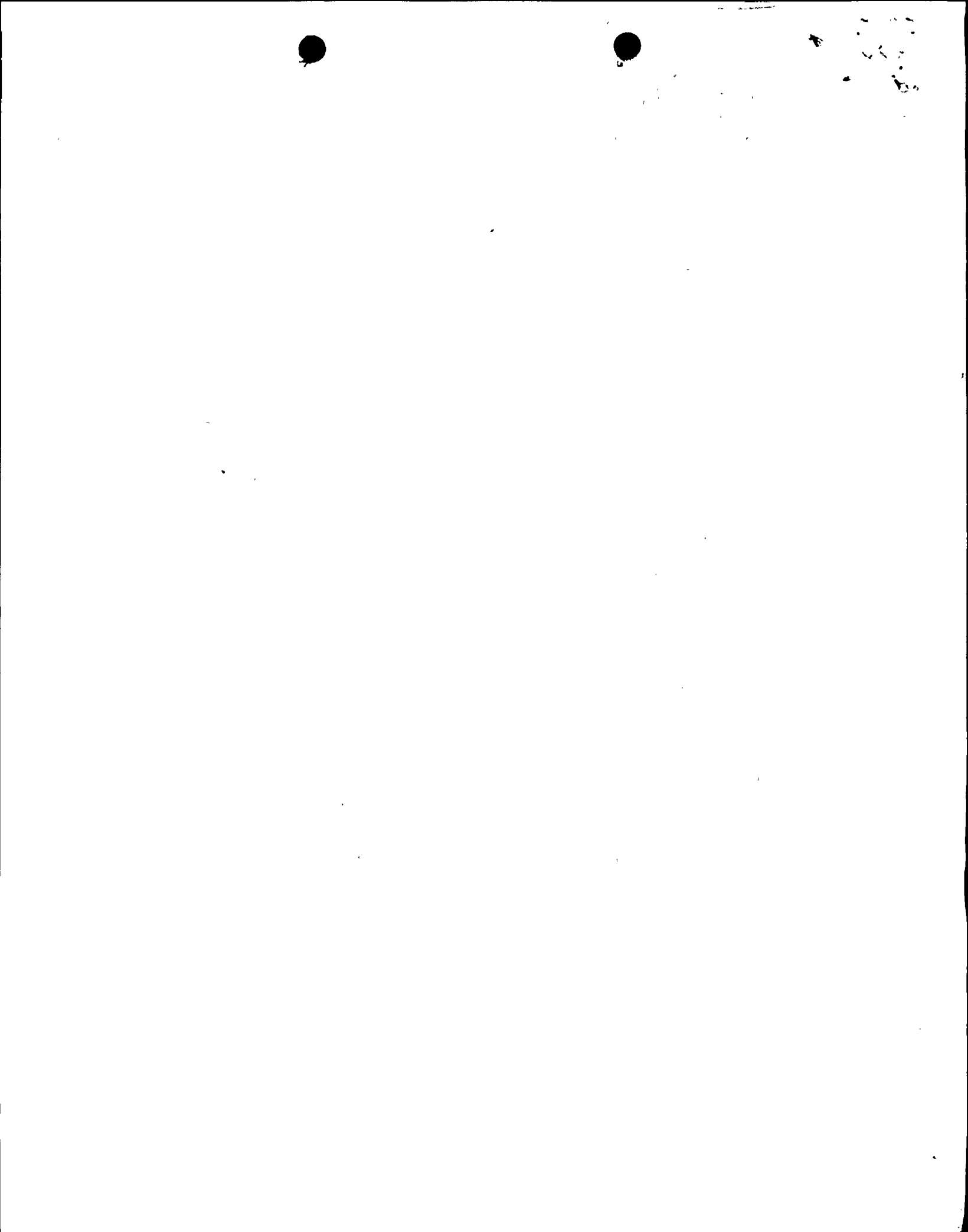
Donald P. Dise

Donald P. Dise
Vice President-Engineering

MGM/szd

Attachment

780330042



NINE MILE POINT UNIT 1

REACTOR VESSEL MATERIAL

SURVEILLANCE PROGRAM

11
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1. Question

Provide the estimated maximum fluence ($E > 1 \text{ Mev}$) at the inner surface of the reactor vessel wall as of March 31, 1977.

Response

The maximum estimated fluence at the interior surface of the reactor vessel for Nine Mile Point Unit 1 is $5.6 \times 10^{17} (\text{n/cm}^2)$ as of March 31, 1977.

1. NEDO-21708, October 1977, "Radiation Effects in Boiling Water Reactor Pressure Vessel Steels." General Electric Company.



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2. Question

Provide the effective full power years (EFPY) of operation accumulated as of March 31, 1977.

Response

The effective full power years of operation for Nine Mile Point Unit 1 is 4.4. This total is accumulated through March 31, 1977.



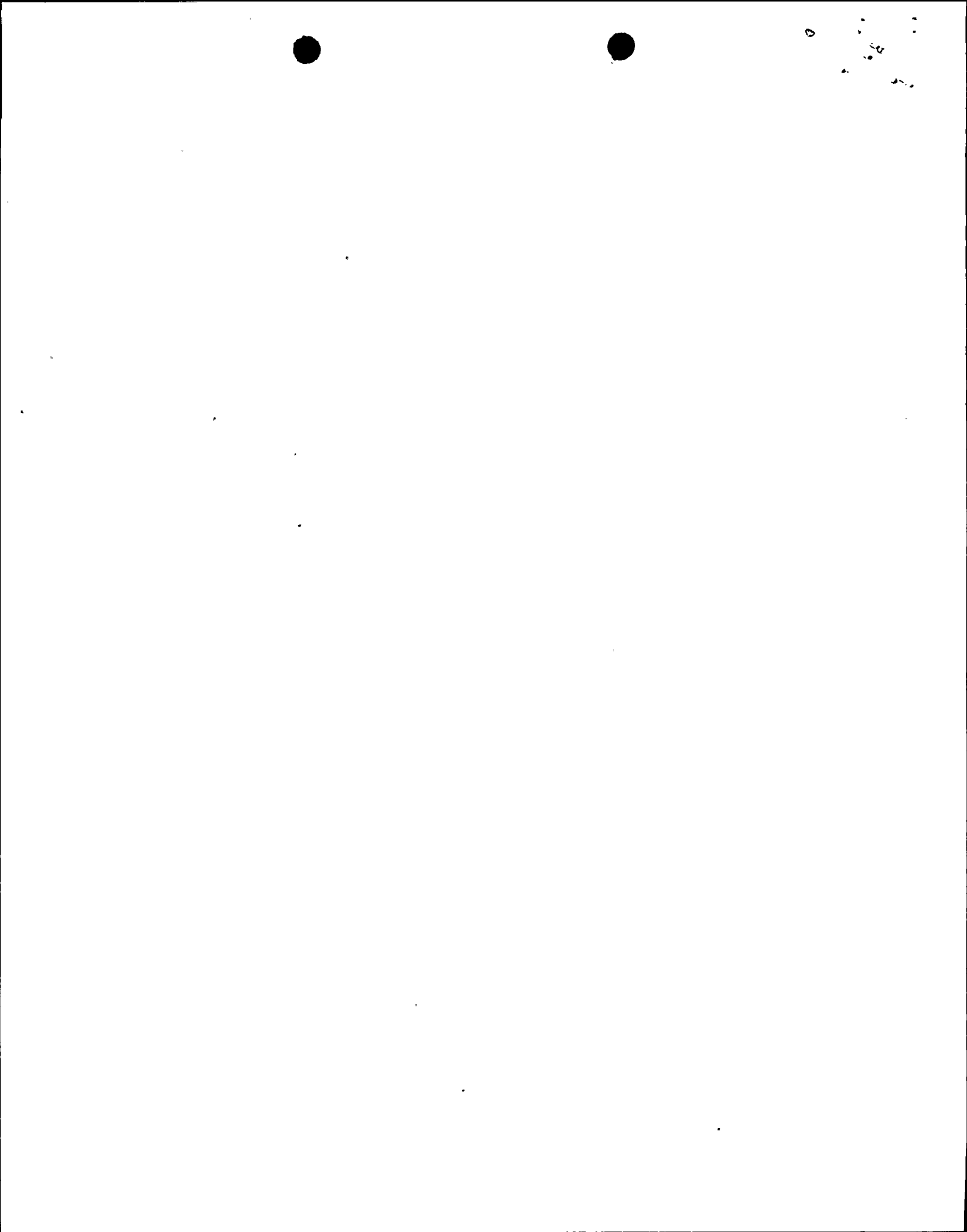
11
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3. Question

Identify the firm or firms that fabricated your reactor vessel.

Response

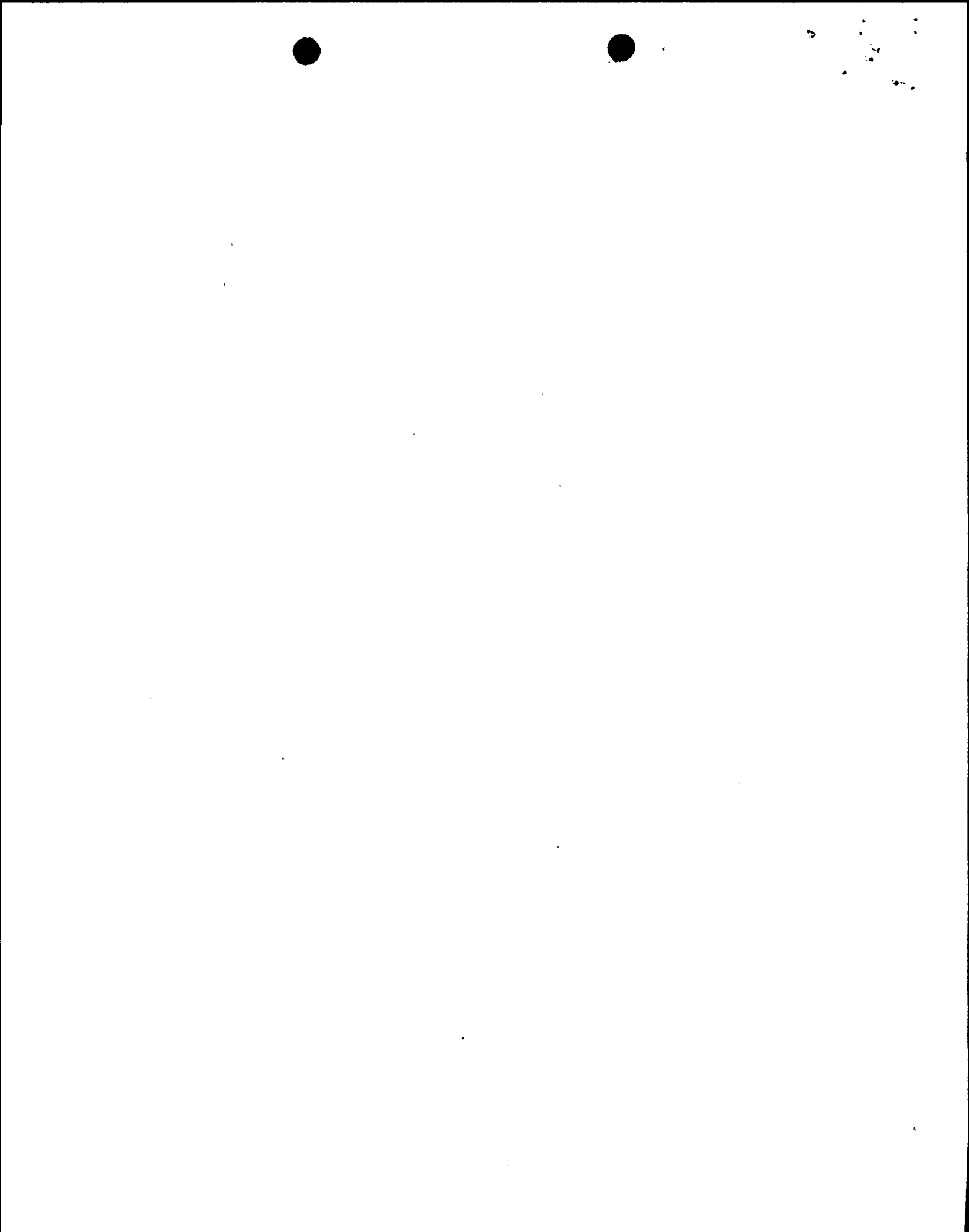
The Nine Mile Point Unit 1 reactor vessel was fabricated by Combustion Engineering.



4. Question

- a. Provide a sketch of the reactor vessel showing all materials, including welds, in the beltline region* and provide an identification number for each material.
- b. Provide the following information for each of the welds in the beltline region:
 - 1) Shop control number or procedure qualification number;
 - 2) Filler metal and heat number;
 - 3) Type of flux and batch number;
 - 4) Welding process (sub arc, electroslag, manual metal arc, etc.)
 - 5) Post-weld heat treatment;
 - 6) Chemical composition (particularly Cu, P and S content);
 - 7) Drop weight T_{NDT} ;
 - 8) RT_{NDT} ;
 - 9) Charpy upper shelf energy (unirradiated);
 - 10) Tensile properties (unirradiated);
 - 11) Firm performing weld if more than one firm participated in welding;
 - 12) The maximum end-of-life fluence at the vessel inner wall.
- c. Provide the following information for each of the plates or forgings in the beltline region:
 - 1) Plate or forging serial number;
 - 2) Plate or forging heat number;
 - 3) Plate or forging material specification number;
 - 4) Plate or forging supplier;
 - 5) Plate or forging heat treatment;
 - 6) Chemical composition (particularly Cu, P and S content);
 - 7) Drop weight T_{NDT} ;
 - 8) RT_{NDT} (unirradiated);
 - 9) Charpy upper shelf energy (unirradiated);
 - 10) Tensile properties (unirradiated);
 - 11) The maximum end-of-line fluence at the vessel inner wall.

*As defined in 10CFR 50, Appendix G, Section II.H.



5. Question

- a. List the weld plate and forging materials included in the vessel material surveillance program.
- b. For each weld listed in 5.a., provide the information requested in items (1) through (11) of Question 4.b.
- c. For each plate or forging specimen listed in 5.a.; provide the information listed in items (1) through (10) of Question 4.c.
- d. Provide a copy of the report which describes the surveillance program for your reactor vessel(s), if available.

Response

- a,b,c The material used in the material surveillance program of Nine Mile Point Unit 1 is similar to that described in response to 4.b,c.
- d. The material surveillance program for Nine Mile Point Unit 1 is described in General Electric Report NEDO-10115 July 1969, "Mechanical Property Surveillance of General Electric BWR Vessels." Our withdrawal program is per Technical Specification 4.2.2.c.



Response

- a. Figure 1 attached shows plate material and welds in the beltline region of Nine Mile Point Unit 1 reactor vessel. Vessel piece no. 564-02 contains welds 2-564 A, B, C. Piece no. 564-04 contains welds 2-564 D, E. F. Weld 3-564 joins piece nos. 564-02 and 564-04.

Attachment A contains information concerning welds and weld material use for the Nine Mile Point Unit 1 reactor vessel.

Specification Sheets G-8-1, G-8-3, G-8-4 of Attachment B are material which was used in piece no. 564-04. Specification sheets of Attachment B G-307-3, G-307-4, G-307-10 are for material used in piece no. 564-02.

b. Weld Material Information

- 1) See Attachment A
- 2) "
- 3) "
- 4) "
- 5) "
- 6) "
- 7) Drop weight, T_{NDT} - Not available
- 8) RT_{NDT} - 10F
- 9) Charpy upper shelf energy- Not available (unirradiated)
- 10) See Attachment A
- 11) "
- 12) Maximum end-of-life fluence at the vessel inner wall. $3.2 \times 10^{18} (n/cm^2)$

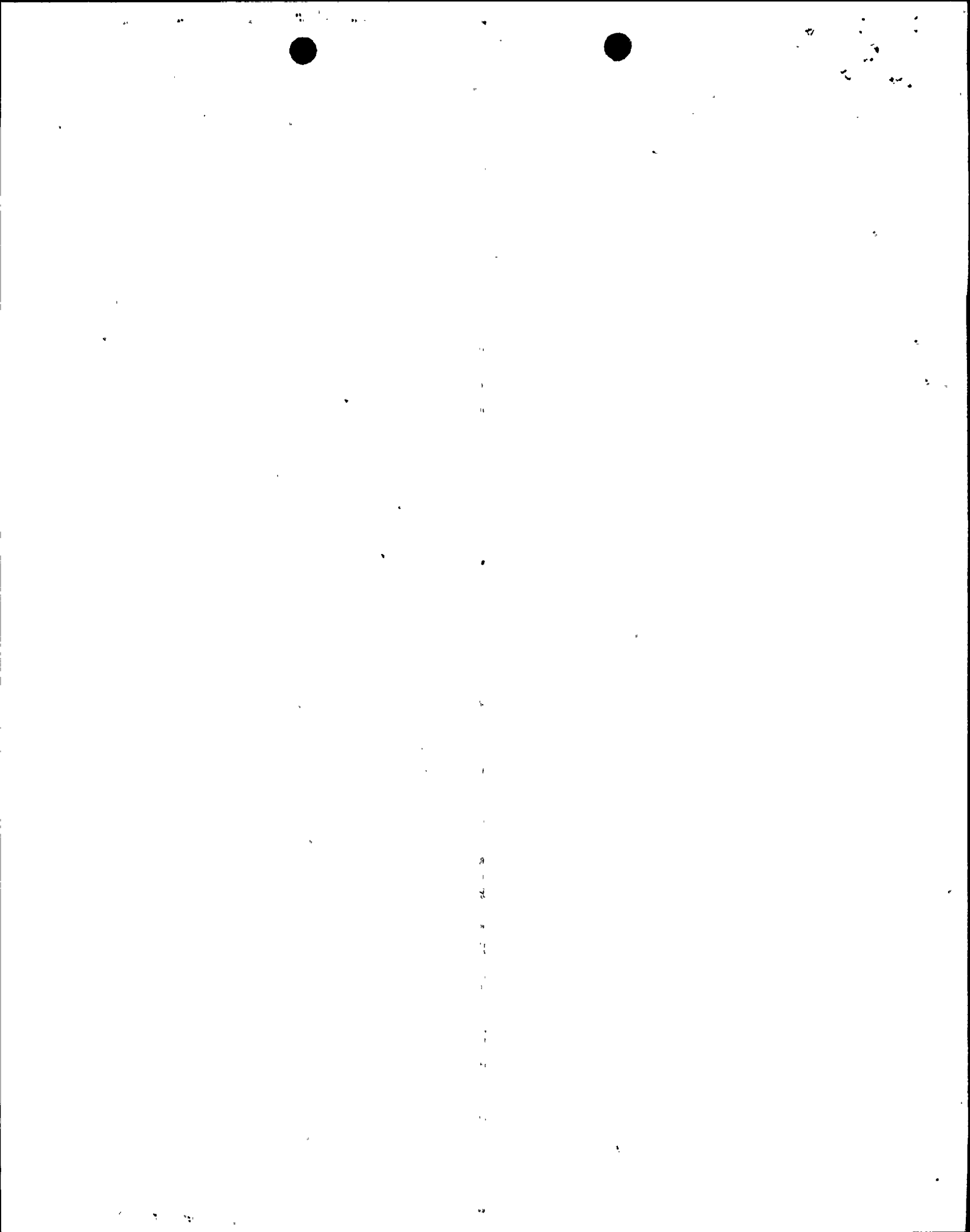
Items 7, 8, 9 above were not required at the time when the vessel was fabricated. However, methods described in Section 5.3.2 of the Standard Review Plan were used to calculate RT_{NDT} .

c. Plate and Forging Material Information

- 1) See Attachment B
- 2) "
- 3) "
- 4) "
- 5) "
- 6) "
- 7) Drop weight T_{NDT} - 10F
- 8) RT_{NDT} (unirradiated) - 10F
- 9) Charpy upper shelf energy - 100F (unirradiated)
- 10) See Attachment B
- 11) Maximum end-of-life fluence at the vessel minor wall $3.2 \times 10^{18} (n/cm^2)$



Items 7, 8, 9 above were not required when our reactor vessel was fabricated. However, methods described in Section 5.3.2 of the Standard Review Plan were used to calculate the requested information.



APPENDIX A

WELD MATERIAL QUALIFICATION
AND INSPECTION REPORTS



WELD INSPECTION RECORD

SEAM NO. 2-564 ABE

4b(1)

Contract 164 Unit _____ Job 31012

Weld Procedure No. SAA33A3 Control No. 027

Ref. Procedure SAA33A(3)

Procedure Requirements

4b(2)

Base Metal Type B3

Filler Metal Type RACO #3

Filler Metal Size NA

Preheat & Interpass Range 300-500 Maint. yes

INSP. RESULTS

Filler Metal Type RACO #3 { RACO #3 }

Filler Metal Size 3/16 { 3/16 }

4b(2)

Heat or Lot No. 86056 { 1248 }

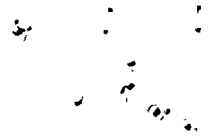
Welders Symbol ST KY ^{2ND} W P ^{1st} VA ⁵² BBT

Preheat 200° Interpass Temp. 300-450

4b(3)

Remarks FLUX LOT 465F
FLUX - Lot 4K13F

Inspectors and Dates JVA 11-20-64 R11-20-64
R11-21-64 R11-21-64 R11-24-64 JVA 11-25-64 R11-26-64
R11-23-64 R11-23-64 R11-25-64 R11-25-64
R11-26-64 R11-27-64 R11-28-64
R11-27-64 R11-28-64
Approved JVA Date 12-2-64



Mr. David Humble
Mr. A. Cozza

Welding Material Qualification to
Requirements of Navships 250-1500-1

Chattanooga
Nuclear Quality
Engineering

cc: Mr. R. A. Coulter
Mr. G. Hommel
Mr. W. H. Richardson
Bay 29 - Rod Room

October 1, 1964

The following heat of welding wire and a lot of Arcos B-5 modified flux have been tested by the Met. Lab. and is released for Navy nuclear work in accordance with NavShips 250-1500-1.

This testing is per Mr. W. H. Richardson's request letter to Mr. Steve Lewis dated August 19, 1964.

<u>Size</u>	<u>Type</u>	<u>Heat No.</u>	<u>Flux Lot No.</u>
3/16"	RACO 3	86054-B	4E-5F

46(3)

R. G. Kiyett

RGK:ES

NUCLEAR WELDING APPLICATIONS SECTION

Inter-Division Work Request

TO: METALLURGICAL RESEARCH AND DEVELOPMENT DIVISION

ATTENTION: Steve Lewis

CC: R. E. Lorentz, Jr.; O. N. Blevins, Dave Abercrombie, Sy Kivett, John Reed, George Hommel

CUSTOMER All present contracts subject to NAVShips 250-1500-1 requirements, Change Notice 1, Para. 7.2.3.1 and 7.2.3.2

CONTRACT JOB NO. M-62379

DESCRIPTION OF WORK REQUIRED:

Stress relieve and test weld coupon qualifying 3/16" ϕ Raco 3 (Heat No. 86054-B) and Lot No. 4E-5F Arcos B-5 Modified Flux. This coupon has been welded and is ready for stress relieving and testing.

1. Stress relieve the coupon for one hour at 1150° F \pm 25° F, F.C. to 600° F. Cut coupon in two and retain one-half.
2. Stress relieve one-half of the coupon an additional 19 cycles (1150° F \pm 25° F, one hour holding time - F.C. to 600° F) followed by 2 cycles (1150° F \pm 25° F, ten hours holding time - A.C. to 600° F).
3. Test as required by Para. 7.2.3.2, Change Notice 1.
4. Report test results to Quality Control.

WHR/ek

W. H. Richardson.

R. G. K.

AUG 21 1964



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COMBUSTION ENGINEERING, INC.

10(11)

ADDRESSEE

SUBJECT

FROM — DATE

Mr. R. G. Kivett

Welding Material Qualification
To Requirements Of NAVShips
250-1500-1

Metallurgical Research And
Development-Chattanooga

cc: Mr. R. E. Lorentz, Jr.

September 29, 1964

The following test data are for 3/16" diameter Raco #3 weld wire, heat number 86054B, and Arcos B-5 modified flux, lot number 4E-5F.

A weld deposit was made in a 1" thick plate using the above heat of wire and lot of flux. The weld was deposited in a standard U groove using automatic submerged arc process. The completed weldment was stress relieved at 1150° ± 25°F one (1) hour furnace cooled to 600°F twenty (20) cycles plus 1150° ± 25°F ten (10) hours furnace cooled to 600°F two (2) cycles.

The test results are as follows:

Charpy V Notch Impacts

<u>Test Code</u>	<u>Wire Heat No.</u>	<u>Flux Lot No.</u>	<u>+10°F Impact Values</u>	<u>Average</u>
BR	86054B	4E-5F	66.0, 64.5, 65.0	65.2

All Weld Metal .505 Tensile

<u>Test Code</u>	<u>Wire Heat No.</u>	<u>Flux Lot No.</u>	<u>Yield Strength Psi</u>	<u>Ultimate Tensile Strength Psi</u>	<u>Elongation In 2" %</u>	<u>Reduction Of Area %</u>
BR	86054B	4E-5F	75,500	90,000	27.5	69.9

Deposit Analysis

<u>Test Code</u>	<u>Wire Heat No.</u>	<u>Flux Lot No.</u>	<u>Lab. No.</u>	<u>Si</u>	<u>Sul</u>	<u>Phos</u>	<u>Mn</u>	<u>Car</u>	<u>Mo</u>
BR	86054B	4E-5F	D-3554	.34	.020	.015	1.64	.12	.51

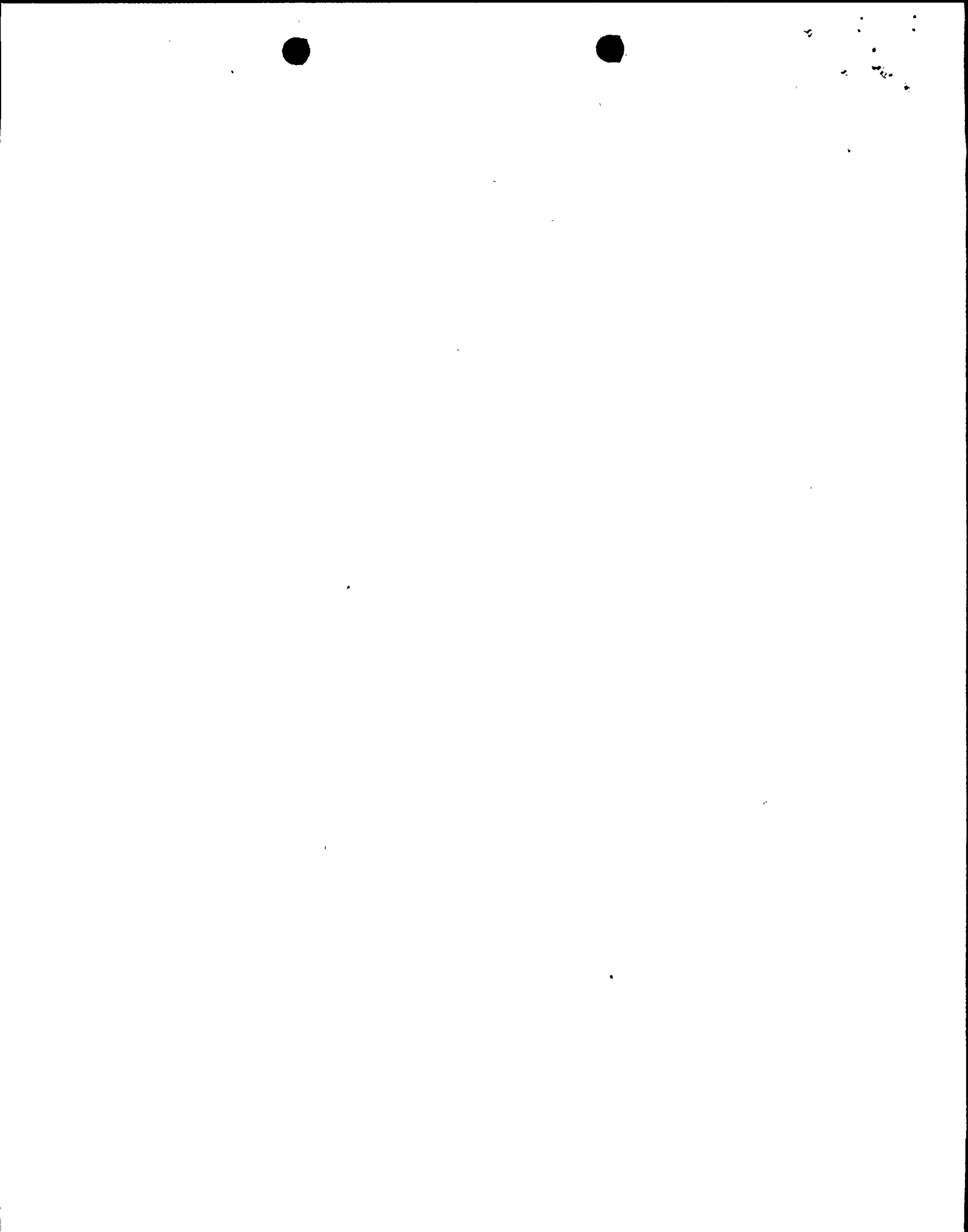
The above tests were witnessed by Inspector of Naval Materials, O. L. Truitt.

REQUESTED
 9/19/64
 REVER. RICHMOND
 9/30/64


 S. R. Lewis

SRL:mvc

R. G. K.
 SEP 30 1964



WELD INSPECTION RECORD

SEAM NO. 2-564-A-B-C BACK CHIP

Contract 164 Unit Job M-31012

Weld Procedure No. MA-33A(7) Control No. 027

Ref. Procedure

Procedure Requirements

Base Metal Type B-3

Filler Metal Type 8018

Filler Metal Size (NA)

Preheat & Interpass Range 300° MIN. Maint. 1/2 S

INSP. RESULTS

Filler Metal Type 8018 / 8018

Filler Metal Size 3/8 / 1/4

Heat or Lot No. HACD JBGD

Welders Symbol ^{3rd} RBG ^{3rd} AKP, ^{2nd} NP HL, ^{2nd} JG

Preheat 300° F Interpass Temp. 300° - 550° P12-9-64

Remarks

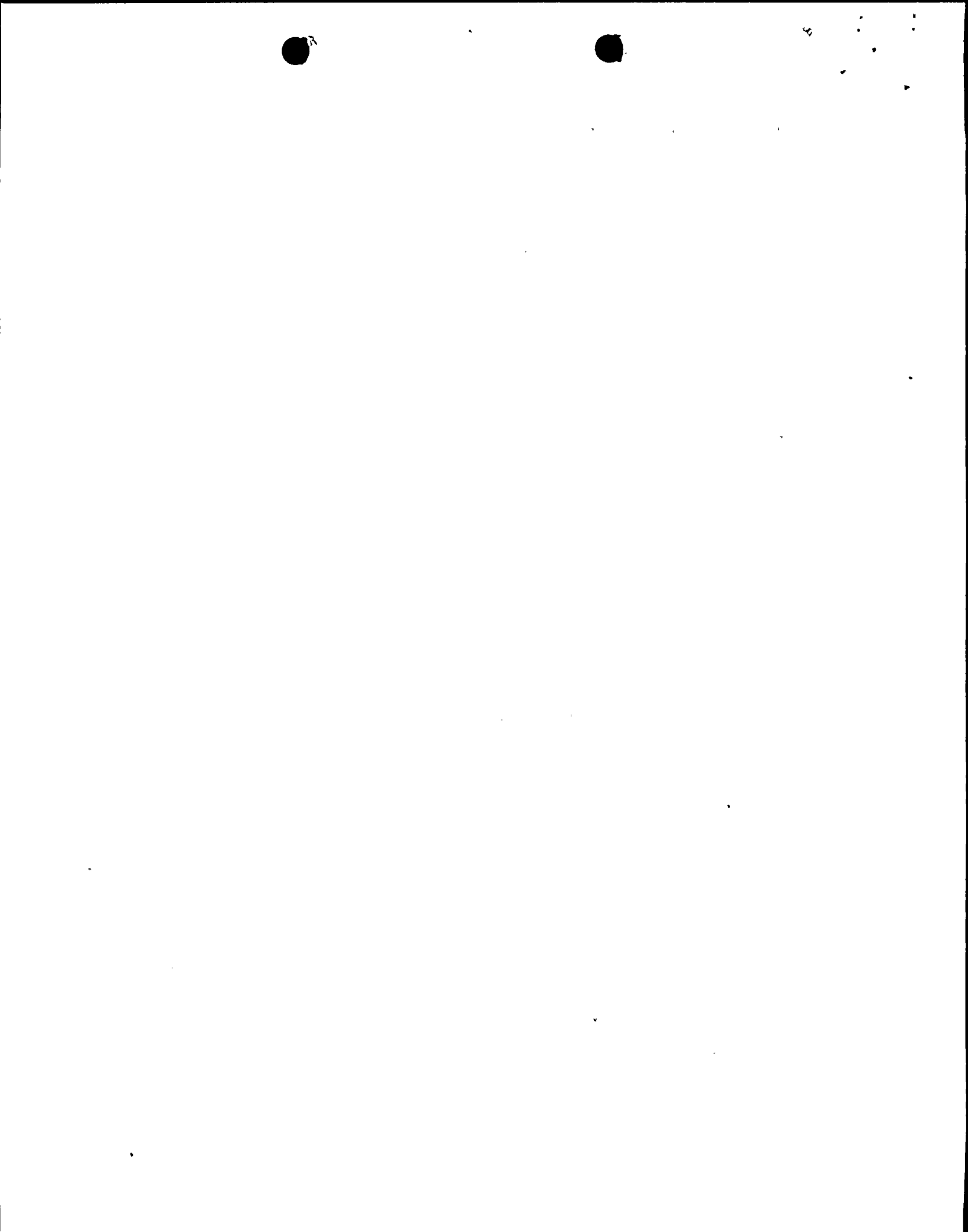
Inspectors and Dates P12-9-64 JMA 12-9-64 R12-9-64

Approved JMA

Date 12-16-64

**ADDED
WELD**

✓



LOWER Shell

WELD INSPECTION RECORD

SEAM NO. 2-56.4" D-E-F

Contract 164 Unit _____ Job M-31012

Weld Procedure No. SAA 33A(3) Control No. 026

Ref. Procedure SAA 33A(3)

Procedure Requirements

Base Metal Type B3

Filler Metal Type RACO #3

Filler Metal Size NA

Preheat & Interpass Range 300-500 Maint. yes

INSP. RESULTS

Filler Metal Type RACO #3

Filler Metal Size 3/16"

Heat or Lot No. 86054-B

Welders Symbol ST. SA^{2nd} ST BDT^{3rd}

Preheat 300 Interpass Temp. 300 - 350

Remarks FLUX - 4-E5-F

Inspectors and Dates JMA 11-10-64 R11-10-64

P11-11-64 R11-11-64

JMA 11-11-64 P11-12-64 JMA 11-12-64 R11-13-64

JMA 11-15-64 JMA 11-17-64 R11-15-64 JMA 11-15-64

R11-16-64 Approved JMA Date 11-18-64

R11-17-64
R11-18-64



WELD INSPECTION RECORD

BACK Chip

SEAM NO. 2-564 DEF

Contract 164 Unit _____ Job 31012

Weld Procedure No. _____ Control No. 026

Ref. Procedure MA 33 A (7)

Procedure Requirements

Base Metal Type B3

Filler Metal Type 8018

Filler Metal Size NA

Preheat & Interpass Range 300 MIN. Maint. Yes

INSP. RESULTS

Filler Metal Type 8018 | 8018 |

Filler Metal Size 3/16" | 1/8" |

Heat or Lot No. HACD | JBGD |

Welders Symbol TE ^{2nd} AGEATY ^{3rd} REQ ^{3rd} SLV RB HL

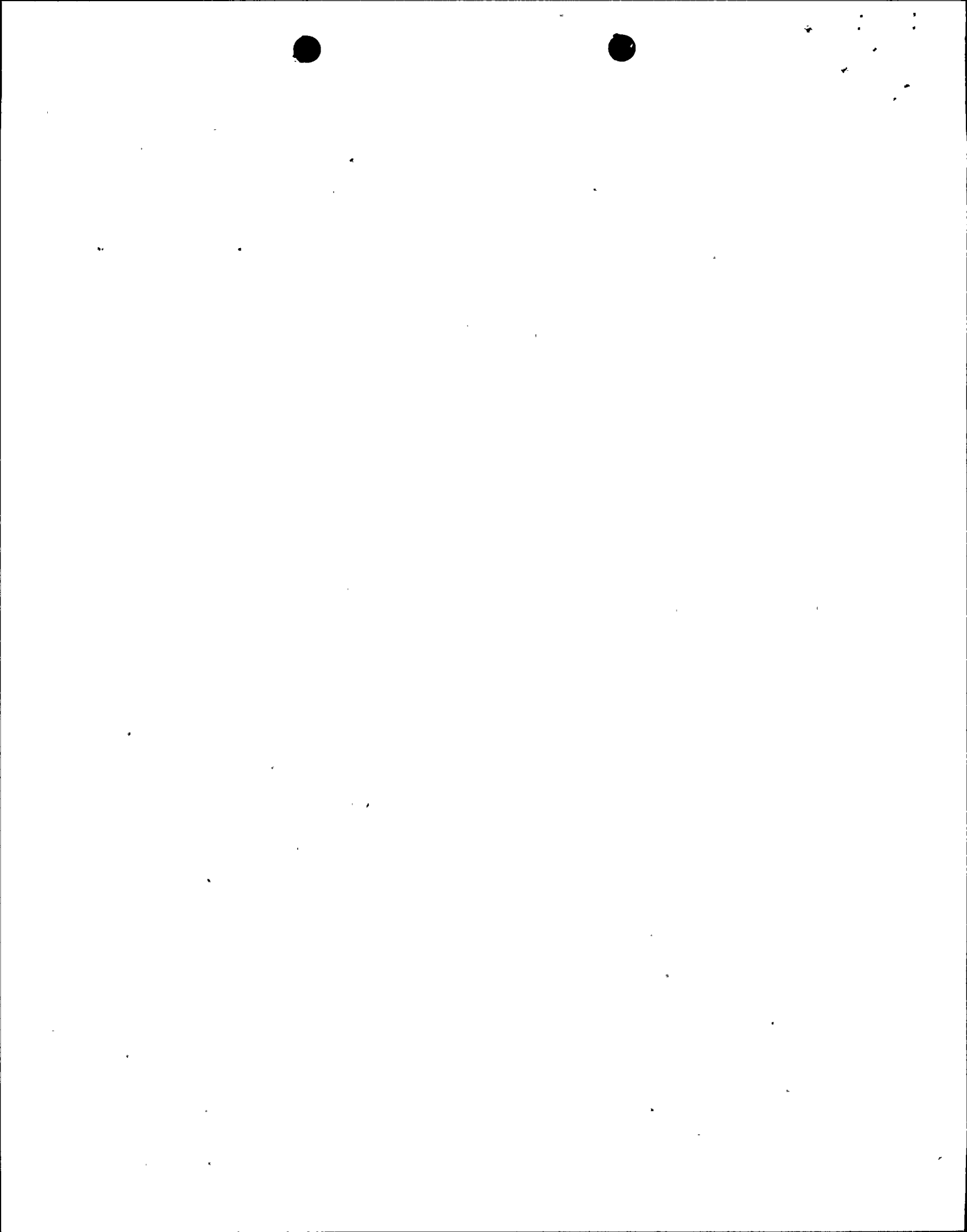
Preheat 300 MIN Interpass Temp. 300° - 400°

Remarks _____

Inspectors and Dates: JMA 11-30-64 R11-30-64

12-1-64 JMA 12-1-64

Approved JMA Date 12-2-64



WELD INSPECTION RECORD

Contract & Unit No. 164 Seam No. 3-564 Job & Control No. 31012-033

Weld Procedure No. _____ Ref. Procedure SAA-33A(3)
HA-33A(7)

PROCEDURE REQUIREMENTS

Base Metal Type B-3

Filler Metal Type Paco 3 - 8018

Filler Metal Size NA

Preheat & Interpass Range 300°-500° Maintain Yes

Other Requirements _____

INSPECTION RESULTS

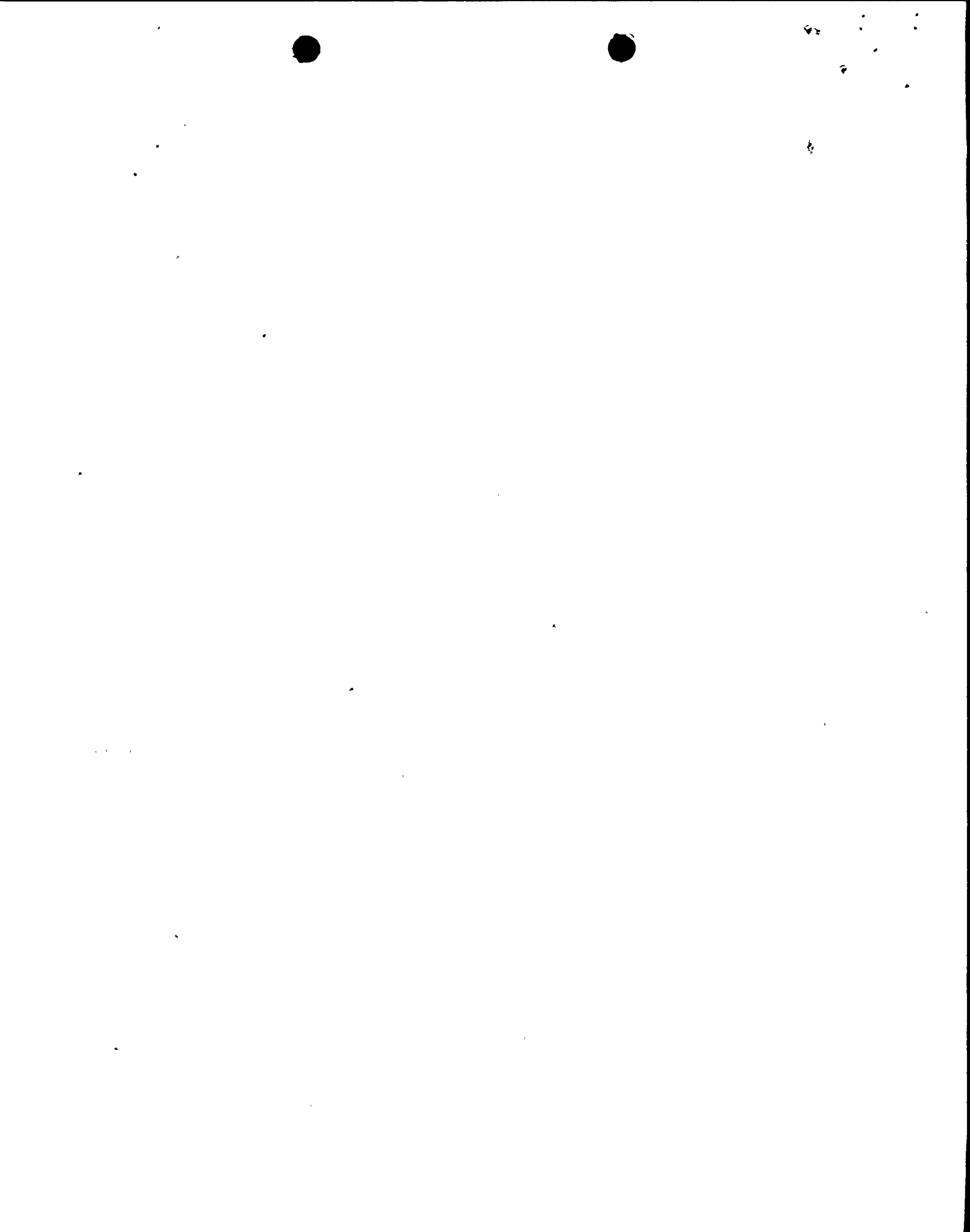
Filler Metal Type	<u>Paco 3</u>	<u>8018</u>							
Filler Metal Size	<u>3/16φ</u>	<u>1/4φ</u>							
Heat or Lot No.	<u>1248</u>	<u>DBDE</u>							
Welder Symbols	^{2nd} <u>SA</u>	^{3rd} <u>110</u>	<u>TU</u>	^{2nd} <u>ZLS4</u>	^{3rd} <u>AGY</u>	<u>YC</u>	^{2nd} <u>ZL</u>	^{2nd} <u>AON</u>	^{3rd} <u>10-15</u>

Preheat 300 Interpass Temp. 300-350

Remarks Final at 4:00 P.M. North main shell. H.C.

Inspectors & Dates 6-11-65 6-12-65 6-13-65 6-13-65
6-13-65 6-14-65 6-14-65 6-14-65 6-15-65 6-15-65
6-15-65 6-16-65 6-16-65 6-17-65 6-17-65
6-18-65 6-20-65 6-21-65 6-22-65
6-22-65

Completed SA Date 6-24-65 Traveler Cp. No. 2 31012-033-120
Seam No. 3-564 Approved [Signature] Date 6-25-65



WELD INSPECTION RECORD

CONTRACT & UNIT NO. 164 SEAM NO. 3-564 JOB & CONTROL NO. 11446

WELD PROCEDURE NO. _____ REF. PROCEDURE MA-33A(?)

PROCEDURE REQUIREMENTS

BASE METAL TYPE B-3 Repair

FILLER METAL TYPE 8018

FILLER METAL SIZE NA

PREHEAT & INTERPASS RANGE 300° min MAINTAIN yes

OTHER REQUIREMENTS _____

INSPECTION RESULTS

FILLER METAL TYPE	<u>8018</u>					
FILLER METAL SIZE	<u>1/16"</u>					
HEAT OR LOT NO.	<u>10GE</u>					

WELDER SYMBOLS ATX^{2ND}-D-A9F-RB

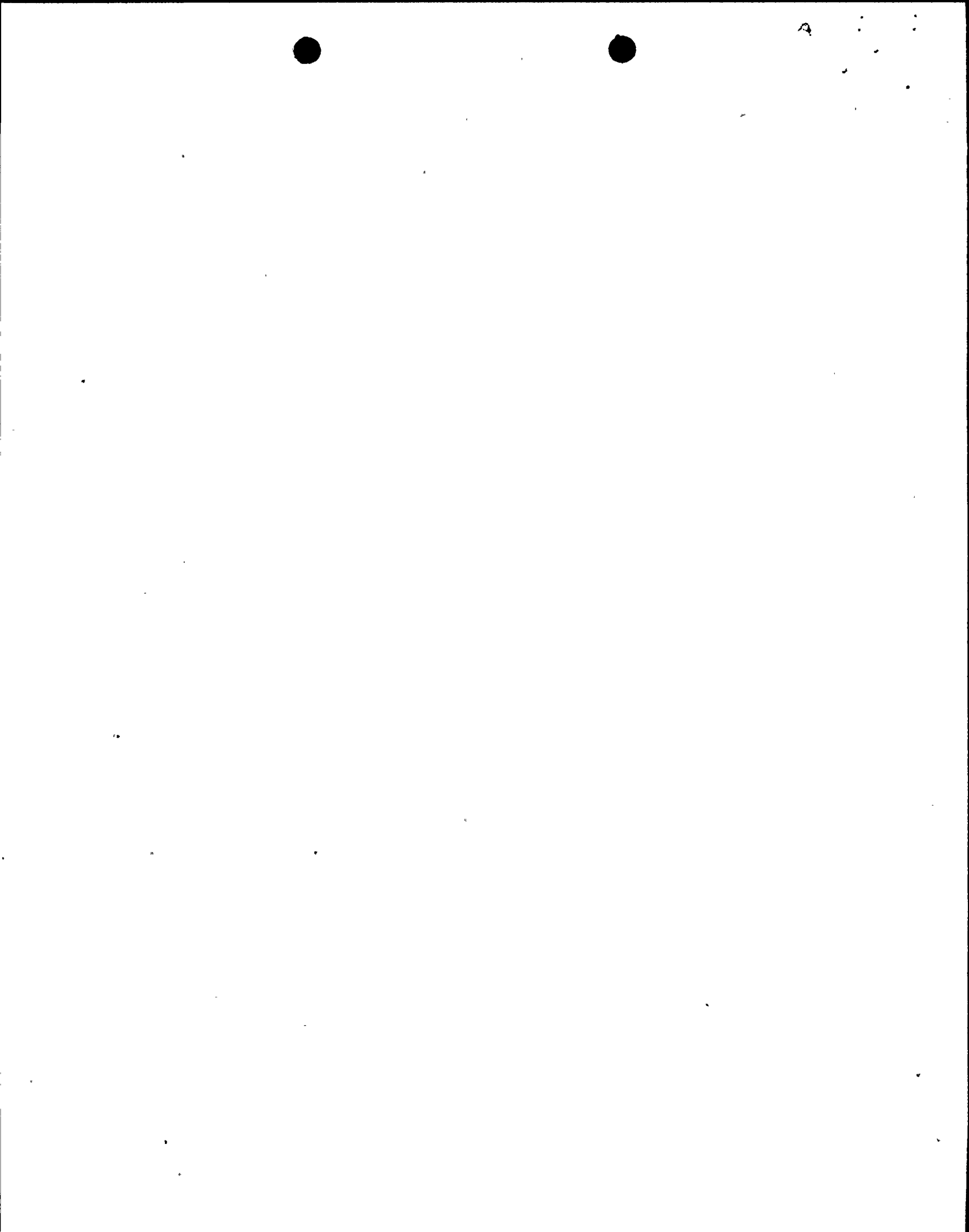
PREHEAT 300° INTERPASS TEMP. 300°-350°

REMARKS _____

INSPECTOR & DATES 12-9-65 - 12-10-65

COMPLETED by DATE 12-10-65 TRAVLER OP. NO. 140/6248

SEAM NO. 3-564 APPROVED [Signature] DATE 12-11-65



WELD INSPECTION RECORD

CONTRACT & UNIT NO. 164

SEAM NO. 3-564

REPAIR X-RAY CHIPS

JOB & CONTROL NO. 31012-037

WELD PROCEDURE NO. _____

REF. PROCEDURE MA33A 7

PROCEDURE REQUIREMENTS

BASE METAL TYPE B-3

FILLER METAL TYPE 8018

FILLER METAL SIZE NA

PREHEAT & INTERPASS RANGE 300° MIN

MAINTAIN NA

OTHER REQUIREMENTS _____

INSPECTION RESULTS

FILLER METAL TYPE

8018						
1/4						
IOCE						

FILLER METAL SIZE

HEAT OR LOT NO.

WELDER SYMBOLS RB ZK^{3rd}-B30-KI WE^{2nd} ABC^{2nd}

PREHEAT 300°

INTERPASS TEMP. 300°-350°

REMARKS _____

INSPECTOR & DATES AM-11-30-65 G-12-1-65 gm-12-1-65 JWA-11-30-65
G-12-1-65 G-12-2-65 gm-12-2-65

COMPLETED AM

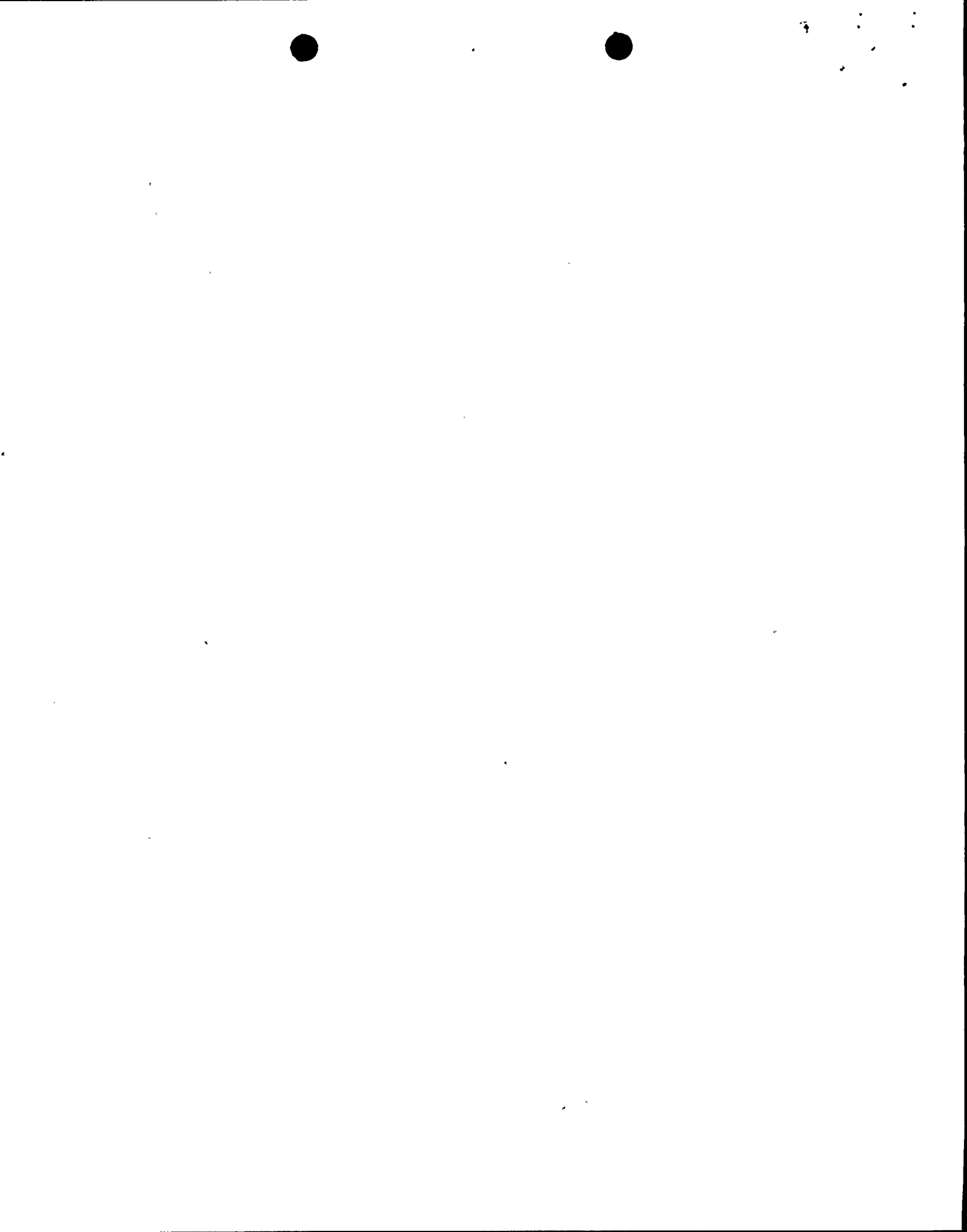
DATE 12-2-65

TRAVLER OP. NO. 50/1248

SEAM NO. 3-564

APPROVED [Signature]

DATE 12-3-65



Mr. David Humble
Mr. A. Cozza

Welding Material Qualification
to Requirements of NavShips
250-1500-1

Chattanooga
Nuclear Quality
Engineering

cc: Mr. George Hommel
Mr. R. A. Coulter
Mr. W. H. Richardson
Bay 29 - Rod Room

December 22, 1964

The following combination heat of 3/16" Raco 3 weld wire and Arcos B-5 (modified) flux have been tested by the Met. Lab. and is released for Navy Nuclear work in accordance with NavShips 250-1500-1.

<u>Size</u>	<u>Type</u>	<u>Heat No.</u>	<u>Flux Lot No.</u>
3/16"	Raco 3	1248	4K13F ✓

The following lot of 1/4" Dia. Type E-7018 electrodes have been tested by the Met. Lab. and are released in accordance with the same specifications.

<u>Size</u>	<u>Type</u>	<u>Heat No.</u>	<u>Flux Lot No.</u>
1/4"	E-7018	586666	J316H1A ✓

These tests are as per Mr. P. C. Klefer's letter dated 11/9/64 and Mr. W. H. Richardson's letter dated 11/25/64.

R. G. Kivett

RGK:ES

777.07



COMBUSTION ENGINEERING, INC.

ADDRESSEE

SUBJECT

FROM — DATE

Mr. R. G. Kivett

Welding Material Qualification
To Requirements Of NAVShips
250-1500-1

Metallurgical Research And
Development-Chattanooga

cc: Mr. R. E. Lorentz, Jr.

December 18, 1964

The following test data are for 3/16" diameter Raco #3 weld wire, Heat Number 1248, and Arcos B-5 (Modified) flux, Lot Number 4K13F.

A weld deposit was made in 1" thick plate using the above mentioned heat of wire and lot of flux. The weld was deposited in accordance with C-E Welding Procedure Specification SAA-33A(7). The completed weldment was stress relieved at 1150° ± 25°F one (1) hour furnace cool to 600°F twenty (20) cycles plus 1150° ± 25°F ten (10) hours furnace cool to 600°F two (2) cycles.

The test results are as follows:

Charpy V Notch Impacts

<u>Wire Heat Number</u>	<u>Flux Lot Number</u>	<u>+10°F Impact Values</u>	<u>Average</u>
1248	4K13F	55.0, 51.0, 57.0	54.4

All Weld Metal .505 Tensile Data

<u>Wire Heat Number</u>	<u>Flux Lot Number</u>	<u>Yield Strength KSI</u>	<u>Ultimate Tensile Strength KSI</u>	<u>Elongation In 2" %</u>	<u>Reduction Of Area %</u>
1248	4K13F	66.8	84.1	26.0	64.9

Deposit Analysis

<u>Wire Heat Number</u>	<u>Flux Lot Number</u>	<u>Si</u>	<u>Sul</u>	<u>Phos</u>	<u>Mn</u>	<u>Car</u>	<u>Mo</u>
1248	4K13F	.38	.017	.005	1.71	.11	.56

The above tests were witnessed by Inspector of Naval Materials, Tom Schreeder.

S. R. Lewis
S. R. Lewis

SRL:mvc

R. G. K.

DEC 21 1964

*Reviewed
12/21/64*



CERTIFICATION OF COMPLIANCE TO CUSTOMER'S REQUIREMENTS

This is to certify that the records of the REID-AVERY COMPANY indicate that the material shipped conforms to the appropriate specification and has the following chemical and physical properties as determined when accepted standard welding procedures are used:

Combustion Engineering, Inc.
Chattanooga Division
Chattanooga 1, Tennessee

P. O. No. 44-40138
April 8, 1965

GRADE	SIZE	HEAT NO.	WEIGHT
Hi-Mn-Mo.	3/16"	1248	21,292#

C	MN	P	S	SI	MO
.14	1.84	.010	.015	.02	.51

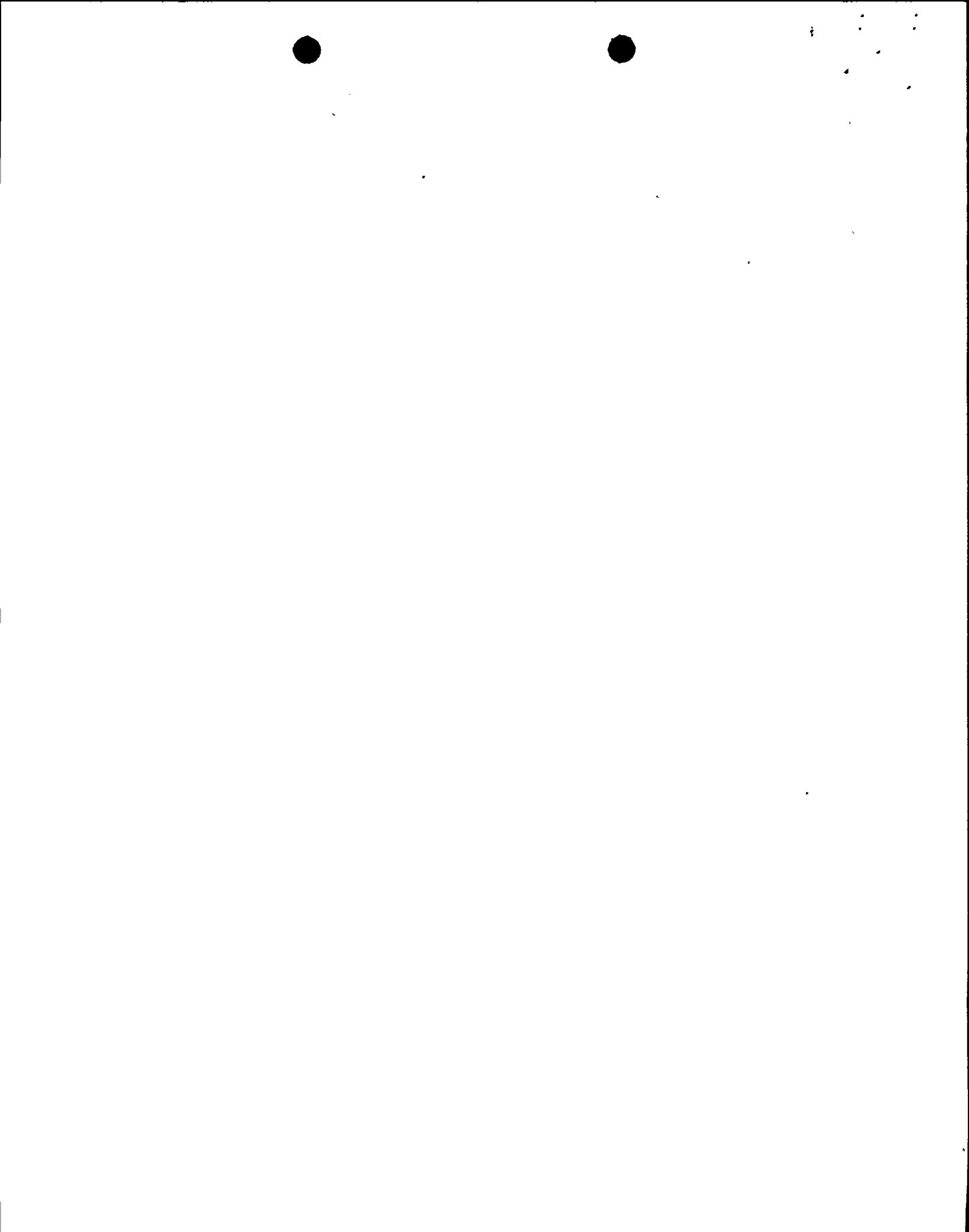
Sworn and subscribed to before me
this 8th day of April 1965 at
Baltimore 22, Maryland.

Civilian Notary

MY COMMISSION EXPIRES MAY 3, 1965

Harold E. Sinclair
Inspection Department

HES/cm



Mr. David Humble
Mr. George Hornel

Welding Material Qualification to
Requirements of NavShips 250-1500-1

Chattanooga
Nuclear Quality
Engineering

cc: Mr. C. E. Rigsby
Mr. J. Anderson
Mr. W. H. Richardson
Bay 29 - Rod Room

February 3, 1965

The following combination heat of 3/16" Raco 3 weld wire and Arcos B-5 (modified) flux has been tested by the Met. Lab. and is released for Navy Nuclear work in accordance with NavShips 250-1500-1.

<u>Size</u>	<u>Type</u>	<u>Heat No.</u>	<u>Flux Lot No.</u>
3/16"	Raco 3	1248	4M2F

These tests are as per Mr. P. C. Kiefer's request letter to Mr. Steve Lewis dated December 16, 1964.

R. G. Kivett

RGK:ES



COMBLSTON ENGINEERING INC.

ADDRESSER

SUBJECT

FROM — DATE

R. G. Kivett ✓
cc: Mr. R. E. Jorentz, Jr.
Mr. C. R. Pandelis

Welding Material Qualification
To Requirements of NAVShips
250-1500-1

Metallurgical Research And
Development-Chattanooga
February 1, 1965

The following test data are for 3/16" diameter Raco #3 weld wire, Heat Number 1248, and Arcos B-5 (Modified) flux, Lot Number LM2F.

A weld deposit was made in a 1" thick plate using the above mentioned heat of wire and lot of flux. The weld was deposited in accordance with C-E Welding Procedure Specification SAA-33A(7). The completed weldment was stress relieved at 1150° ± 25°F one (1) hour furnace cool to 600°F twenty (20) cycles plus 1150°F ± 25°F ten (10) hours furnace cool to 600°F two (2) cycles.

Charpy V Notch Impacts

<u>Wire Heat Number</u>	<u>Flux Lot Number</u>	<u>+10°F Impact Values</u>	<u>Requirements</u>
1248	LM2F	53.5, 57.0, 65.0	30 Ft/Lbs @ +10F

All Weld Metal .505 Tensile Data

<u>Yield Strength KSI</u>	<u>Ultimate Tensile Strength KSI</u>	<u>Elongation in 2" %</u>	<u>Reduction Of Area %</u>
63.0	80.0	27.5	64.3

Deposit Analysis

<u>Lab. No.</u>	<u>Si</u>	<u>Sul</u>	<u>Phos</u>	<u>Mn</u>	<u>Car</u>	<u>Mo</u>
D-3684	.22	.020	.015	1.26	.097	.57

The above tests were witnessed by Inspector of Naval Materials, R. L. Phillips.

R. G. K.

S. R. Lewis
S. R. Lewis

FEB 2 1965

SRL:mvc

RELEASED
2/2/65



2

CERTIFICATION OF COMPLIANCE TO CUSTOMER'S REQUIREMENTS

This is to certify that the records of the REID-AVERY COMPANY indicate that the material shipped conforms to the appropriate specification and has the following chemical and physical properties as determined when accepted standard welding procedures are used:

Combustion Engineering, Inc.
Chattanooga Division
Chattanooga 1, Tennessee

P. O. No. 44-40138
January 22, 1965

Shipped: 1-22-65
Combustion Engineering, Inc.
West Main Street Warehouse
Chattanooga, Tennessee
Contract No. WBS 90179

GRADE	SIZE	HEAT NO.	WEIGHT
H&Mang-Moly	3/16"	1248	20,3837

C	MN	P	S	SI	PO
.14	1.84	.010	.015	.02	.51

Sworn and subscribed to before me
this 22nd day of January 1965 at
Baltimore 22, Maryland.

Caroline M. Hall

MY COMMISSION EXPIRES MAY 3, 1965

Walter E. Lincoln
Inspection Department

HES/cm
c.c. with shipment
c.c. Mr. Topley
c.c. Navy Inspector



Chemical Analysis
 C-E Deposited All Weld Metal - Electrode Types E8018C-3 - E8018G
 And Core Wire Used to Manufacture Electrodes
 Time Period - 2/19/63 to 11/6/69

Size	R-No.	D-No.	Si	S	P	Mn	C	Ni	Mo	V	Cu	Lot No.
3/32	1379		.05	.018	.013	.24	.034					
		3250	.45	.016	.020	1.02	.109	1.32	.26			
		3276	.41	.015	.015	1.00	.088	1.13	.31			
3/32	1766		.05	.010	.009	.22	.029			.006		
			.27	.015	.021	.98	.088	1.00	.24			
1/8	1390		.05	.023	.008	.22	.028			.011		
		3247	.55	.016	.017	1.10	.094	1.28	.30			
		3262	.49	.018	.016	.93	.087	1.12	.32			
		3300	.39	.011	.015	1.12	.092	1.13	.27			1357
		3329	.46	.014	.020	1.10	.089	1.17	.34			
1/8	1813		.05	.018	.007	.27	.034			.001		
		4710	.26	.017	.022	.98	.086	1.01	.28			
1/8	2025		.05	.014	.007	.23	.035			.006		
		5048	.29	.014	.008	1.03	.065	1.04	.28			EBDG
		5272	.59	.011	.008	1.34	.071	1.32	.31			JOLG
5/32	1383		.05	.013	.003	.25	.039					
		3177	.36	.015	.016	.93	.056	1.10	.22			
5/32	1401		.05	.016	.005	.26	.034					
		3216	.61	.012	.015	1.24	.080	1.11	.26			
		3249	.45	.014	.014	.97	.076	1.09	.31			
		3307	.46	.014	.020	.98	.078	1.18	.29			1331
5/32	1735		.05	.011	.011	.24	.025			.005		
		4711	.33	.017	.022	.72	.075	.93	.27			
5/32	1697		.05	.012	.005	.21	.034			.004		
		4622	.24	.012	.011	.90	.072	1.04	.30			
5/32	1767		.05	.010	.010	.28	.029			.006		
		4729	.23	-	.020	1.24	.077	-	-			
		4820	.20	.014	.009	.82	.068	.96	.28			
		5118	.43	.012	.008	1.19	.058	1.49	.34			
5/32	1631		.05	.016	.005	.25	.028			.009		
		5000	.36	.017	.013	.93	.064	1.06	.31			EBFE
3/16	1391		.05	.018	.008	.22	.025			.008		
		3251	.48	.018	.012	.99	.069	1.10	.28			
3/16	1814		.05	.015	.008	.25	.038			.001		
		4728	.24	.016	.019	.97	.10	1.03	.29			
		4712	.32	.016	.020	1.08	.11	1.13	.28			



Chemical Analysis
C-E Deposited All Weld Metal - Electrode Types E8018C-3 - E8018G
And Core Wire Used to Manufacture Electrodes
Time Period - 2/19/63 to 11/6/69

Size	R-No.	D-No.	Si	S	P	Mn	C	Ni	Mo	V	Cu	Lot No.
3/16	1742		.05	.013	.007	.23	.027			.005		
		4626	.34	.013	.010	1.01	.070	1.14	.34			
3/16	1866	3252	.05	.017	.011	.20	.026			.005		
		5005	.17	.015	.008	.81	.064	1.04	.26			EOAG
1/4	1384		.05	.020	.005	.21	.023			.006		
		3252	.53	.018	.013	.94	.067	1.10	.36			
		3297	.50	.016	.013	1.04	.085	1.18	.30			1333
3/4	1736		.05	.012	.011	.21	.025			.005		
		4627	.49	.014	.012	1.17	.086	1.09	.34			
		4713	.20	.017	.021	.91	.090	1.02	.28			
1/4	1942		.05	.015	.001	.22	.034			.006		
		4971	.29	.011	.009	.95	.086	.92	.27			DAGG
		4972	.20	.012	.008	.84	.063	.98	.25			DAGG
5/32	2031		.05	.016	.005	.23	.003			.005		
		5158	.48	.011	.009	1.26	.062	1.46	.34			HOKG
1/4	2079		.05	.013	.006	.23	.031			.004		
		5159	.45	.010	.009	1.30	.081	1.49	.35			HAEG
3/32	2043		.06	.014	.006	.23	.032			.006		
		5181	.49	.011	.010	1.40	.074	1.75	.36			HBEG
1/4	2092		.05	.016	.008	.24	.043			.005		
		5274	.43	.010	.008	1.25	.081	1.29	.30			JBFG
3/16	2032		.05	.016	.005	.21	.034			.004		
		5508	.45	.011	.007	.99	.076	.94	.24	.004	.02	
5/32		5509	.44	.011	.007	.95	.073	.90	.22	.004	.02	
3/16	2506		.06	.008	.005	.25	.034					
5/32		7676	.37	.013	.010	.98	.077	.94	.29	.009	.04	KACI

Analysis for copper levels in the core wire and deposited weld metal was not performed by C-E during this time period. The wire supplier analyzed for copper but could not identify with the heats submitted although they did state that 99% of the wire contained less than .02% copper and very little scrap was used during this period.

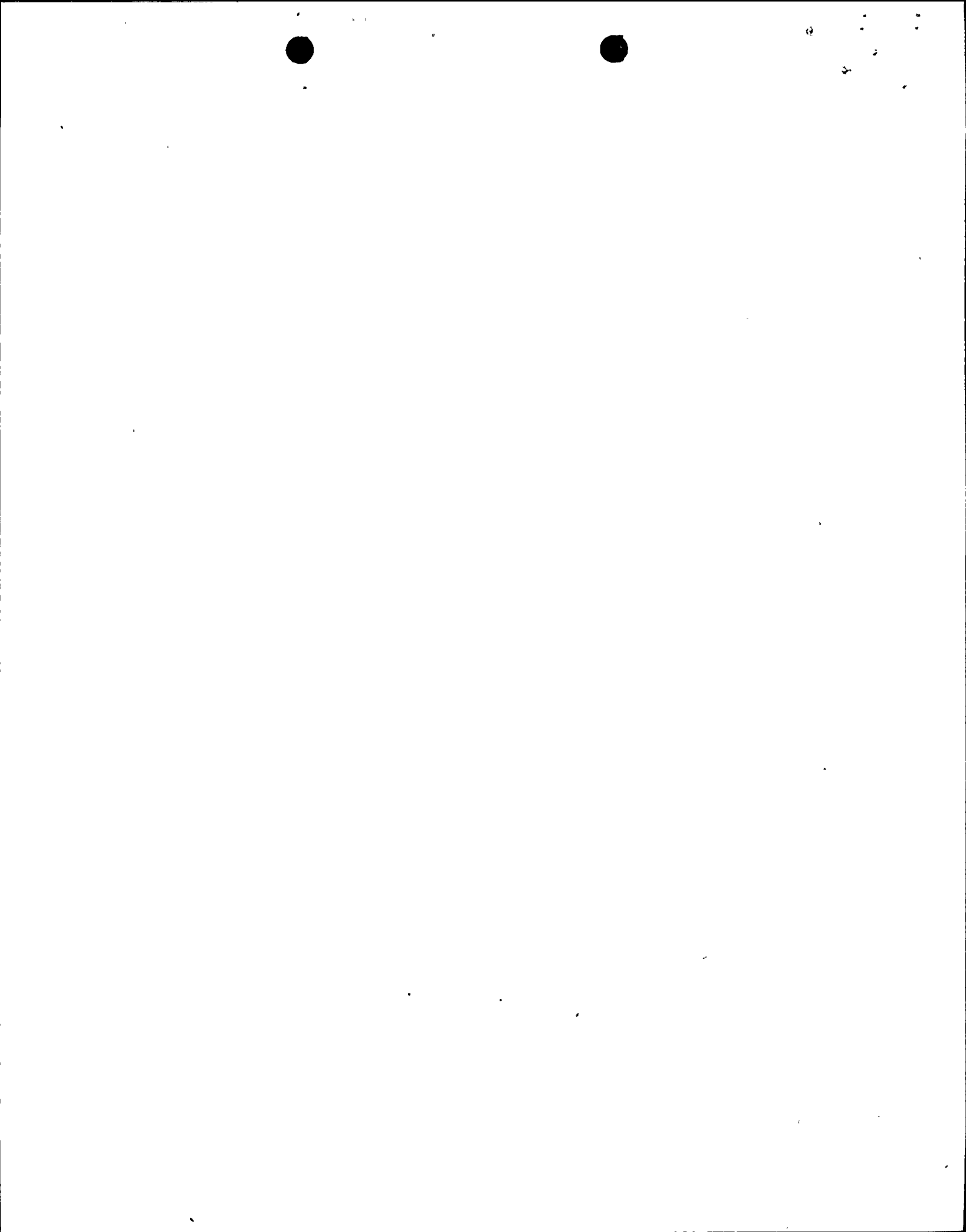
Therefore, since 100% of core wire copper is transferred across the arc and none was added through the electrode coating, it is safe to assume that all the deposited welds contained .02% or less copper during this period.

0.05



APPENDIX B

MATERIAL CERTIFICATIONS



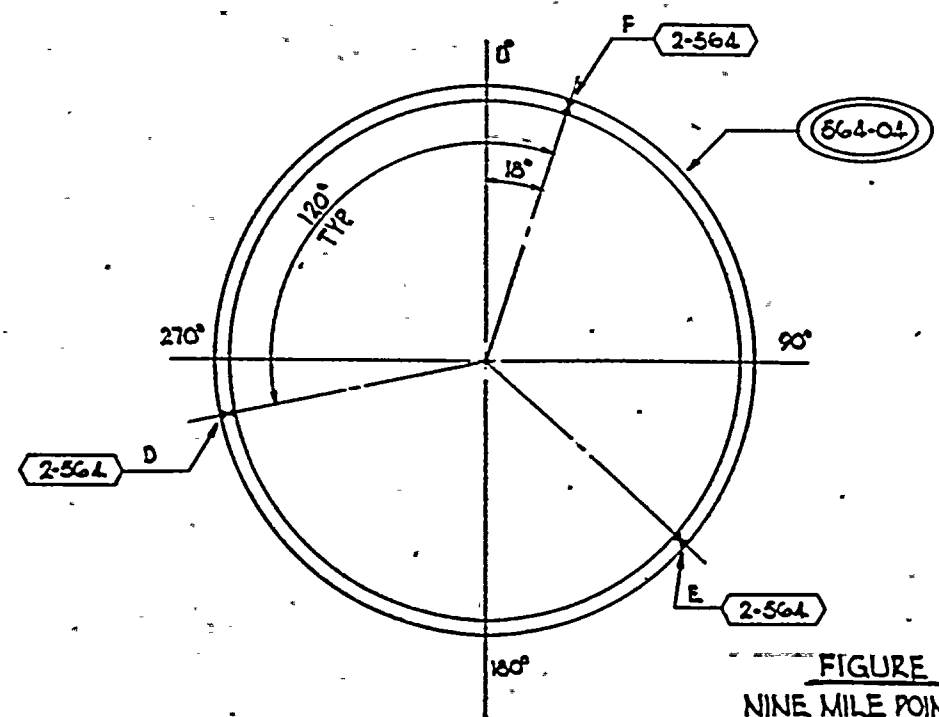
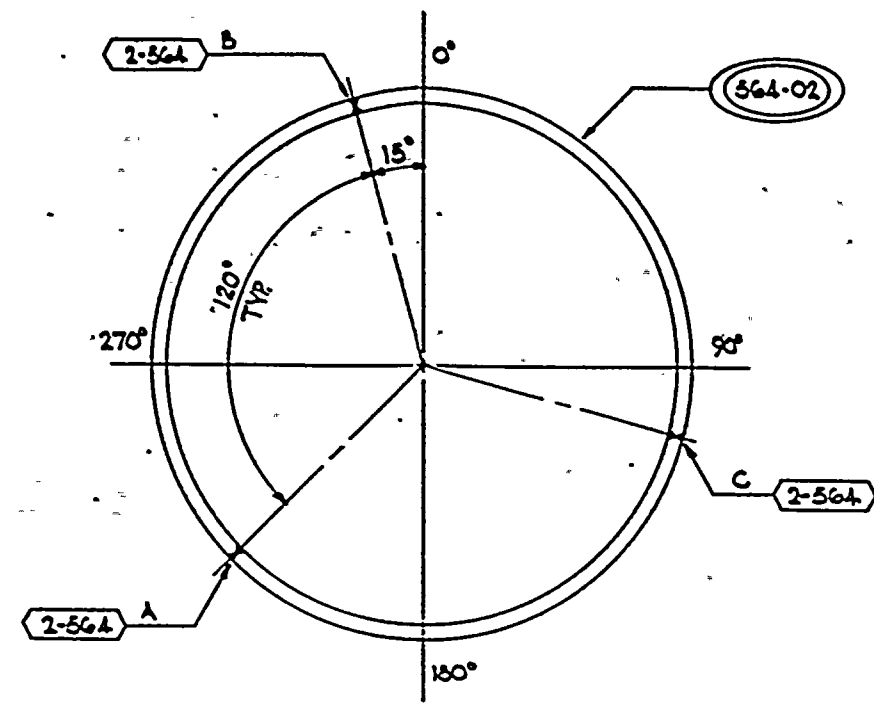
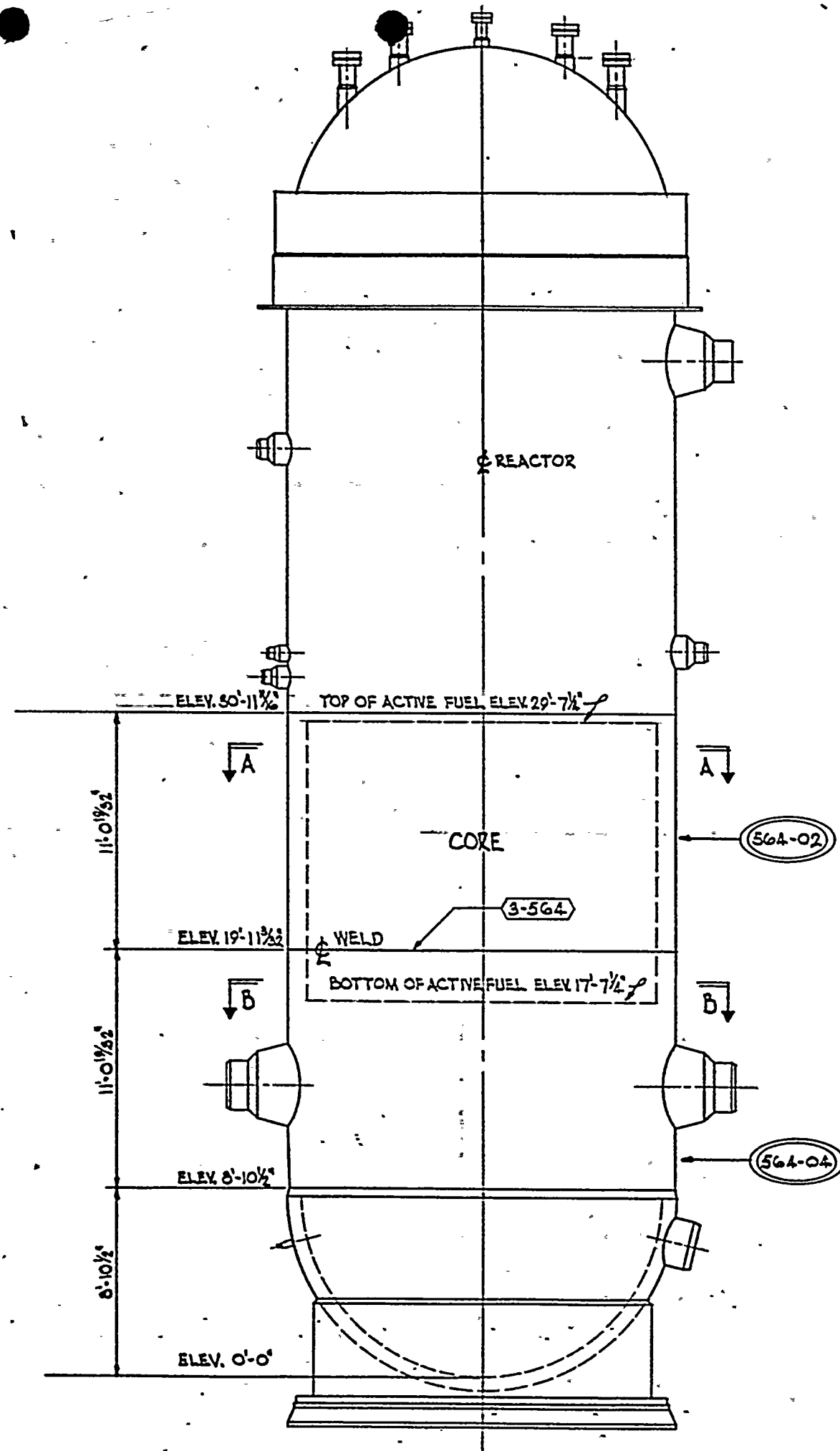
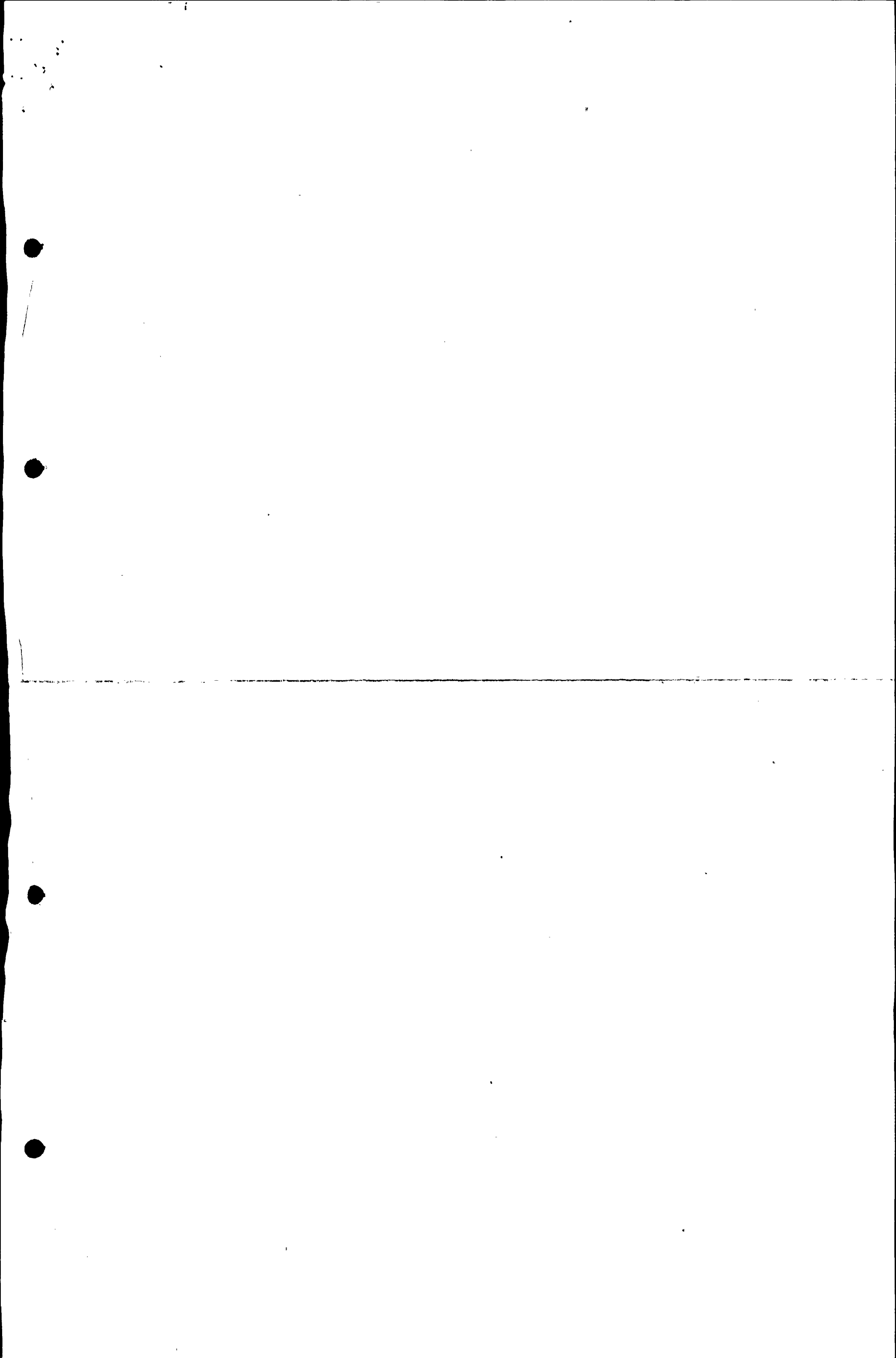


FIGURE 1
 NINE MILE POINT UNIT
 REACTOR VESSEL



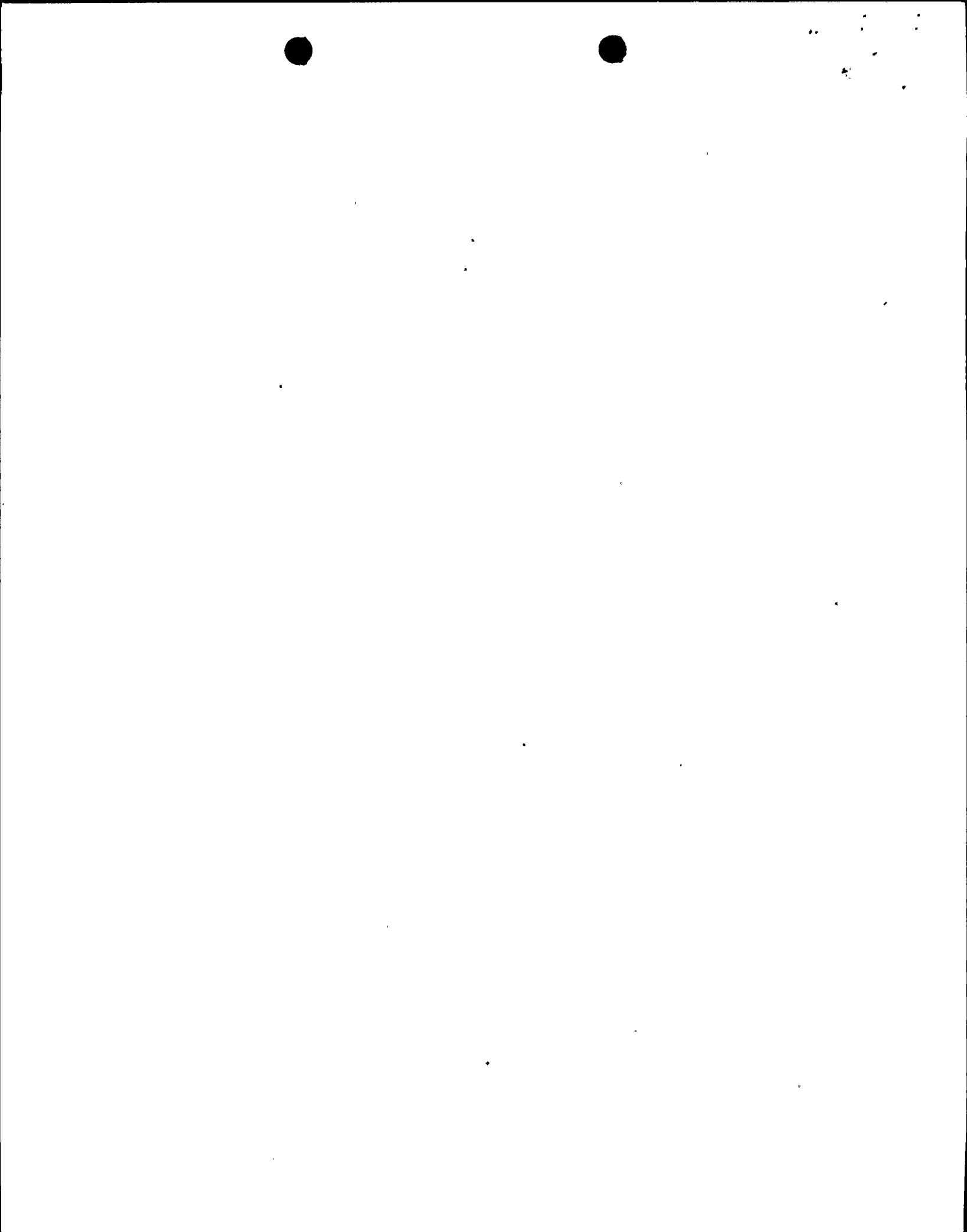
G-8-1

4c(4) CONSIGNEE	LUKENS STEEL COMPANY PHYSICAL TESTING LABORATORY COATESVILLE, PA. TEST CERTIFICATE	DATE 6-18-64 FILE NO 1771- CIT NO CJ 61564 GR
4c(6) PURCHASER 10 Combustion Engineering, Inc.	CARRIER SP 561701	PLG., STRUC T., & HULL QUAL: BENDING TESTS: FIRE BOX QUALITIES: BLENDING TESTS: O.K. ✓ HOMOGENEITY TESTS: O.K. ✓

CHEMICAL ANALYSIS																
MELT NO.	C	Mn	P	S	Cu	Si	Ni	Cr	Mo	V	Ti	Al	B	Grain Size		
4c(10) P2112	19	1.34	021	.028		21	51			45				NUCLEAR JUN 23 INSPECTION T#8 B#8 F.G.P.		

PHYSICAL PROPERTIES							DESCRIPTION
MILL ORDER & CUSTOMER P.O.	SPECIFICATIONS	MELT NO.	SLAB NO.	YIELD P.S.I. x 100	TENSILE P.S.I. x 100	% ELONG. IN 2"	
4c(3) 4c(1) 42469-1 44-38313	SA-302 Gr.B. CE-P3F6R Mod. for Ga. & Mod. for 40/70 Nickel Fbx. 80000	P2112	1	714	894 915	24	1-251-7/8 x 135-3/4 x 7-7/8"
Tests heated to 1550-1600°F., held 4 hours and water quenched in 16 minutes to 400°F., tests then tempered 1200-1250°F., held 1 hour per inch min. and furnace cooled to 600°F. Plates furnished in as rolled temper.							M 31012 164 G-8-1 7/31/64

7-11 0221 - We hereby certify the above figures are correct as contained in the records of the company. SUPERVISOR-TES *[Signature]*



COMBUSTION ENGINEERING, INC.

ADDRESSEE

SUBJECT

FROM — DATE

Mr. W. A. Stone

Mechanical Test Report

Metallurgical Research And
Development-Chatanooga

cc: Mr. R. E. Lorentz, Jr.

Contract 16h

Niagara Mohawk

E-6766 M-3101h

Mr. A. Kincaid

Mr. R. Hillis

Mr. J. Brasfield

O. E. Representative

September 8, 1964

The following test data are for Item Code G-8-1 which is a 251 7/8" x 134 3/4" x 7 7/8" SA-302-B shell plate for use on the subject contract.

The shell plate was heat treated by CEI at 1550°-1600°F, held at temperature four (4) hours dip quenched in agitated water plus 1225° ± 25°F, held at temperature four (4) hours. A test sample was then removed and given an additional heat treatment of 1150° ± 25°F, held at temperature thirty (30) hours furnace cooled to 600°F.

The test results are as follows:

Charpy V Notch Impacts

Test Code	Item Code	Test Temperature °F	Foot Pounds	Average
AR-4	G-8-1	-40	13.0	13.0
		+10	33.0, 33.5, 25.0	30.5
		40	43.5, 45.0	44.3
		60	47.0, 58.0, 55.0	53.3
		110	80.0, 70.0, 70.0	73.3
		212	82.0, 95.0, 83.0	86.7

.505 Tensile Data

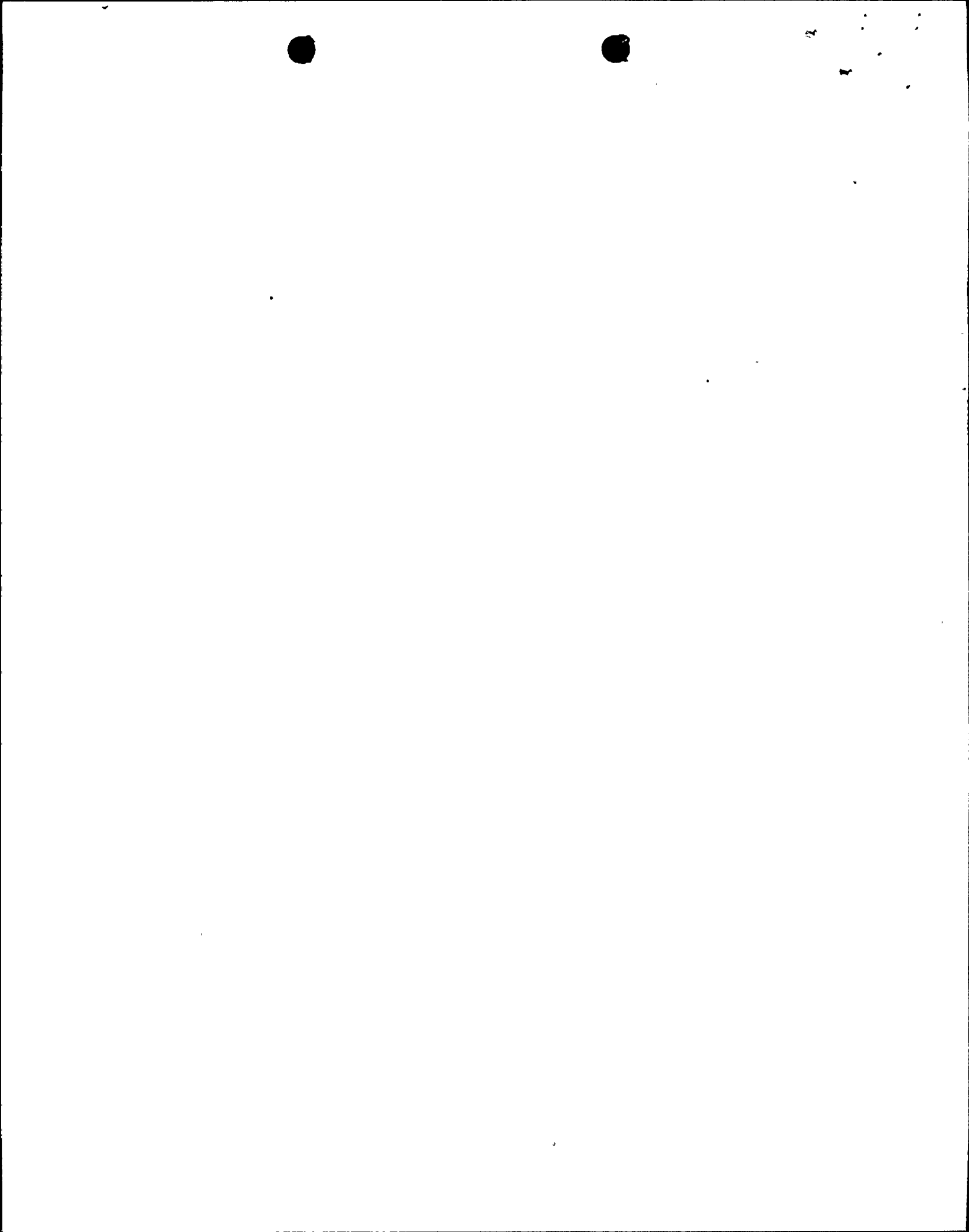
Test Code	Item Code	Yield Strength Psi	Ultimate Tensile Strength Psi	Elongation in 2" %	Reduction Of Area %
AR-4	G-8-1	66,600	87,500	27.0	66.0

The Charpy V Notch Impacts were taken with the length parallel to the major rolling direction of the plate with the length of the notch perpendicular to the plate surface. The .505 tensile specimen was taken with the length parallel to the major rolling direction of the plate. All test specimens were taken at least 1 T from the quenched edge.

A graph of the summary of the Charpy V Notch Impact Test results is attached.

SRL:mvc
attachment

38313
S. R. Lewis





CHARPY V. NOTCH IMPACTS

AK-4 SAMPLES, I.P.A. CODE G-2-1

631 X 1 1/2" X 1 1/2" S.A. 304-B

SEMI-PLATE

HEAT TREATMENT

1550 ± 100°F. 7 HOURS WATER

QUENCHED IN 1275 ± 7 HOURS

± 75 °F. 30 HOURS 750

± 6.76% M.S.D. 1/2" X 1/2"

10011577-1122

100

80

60

40

20

0

Foot Pounds

-40

0

+40

80

120

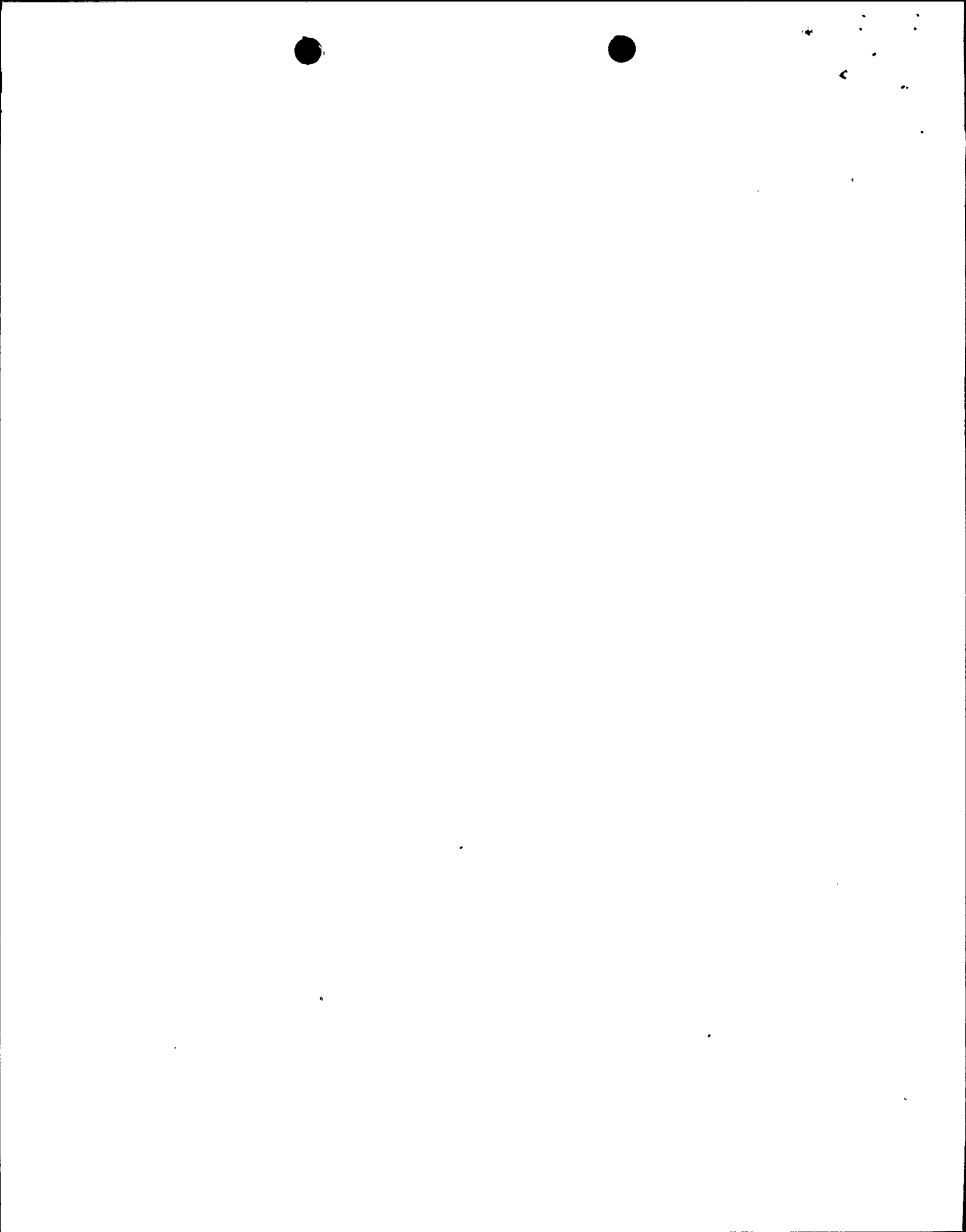
160

200

240

TEST TEMPERATURE °F





G-8-3

LUKENS STEEL COMPANY
 PHYSICAL TESTING LABORATORY
 COATESVILLE, PA.
 TEST CERTIFICATE

DATE 7/9/64
 FILE NO 1771-
 CTF NO EH-7864-BD

PURCHASER
 Combustion Engr., Inc.
 Chattanooga Div.
 10 Mr. Luther Lowry, Mgr. Purch.
 Chattanooga, Tenn.

CARRIER
 CB & Q 92404

PLG. STRUCT. & HULL QUAL.:
 BENDING TESTS:

FIRE BOX QUALITIES:
 BENDING TESTS: O.K. ✓
 HOMOGENEITY TESTS: O.K. ✓

CHEMICAL ANALYSIS

MELT NO.	C	Mn	P	S	Cu	Si	Ni	Cr	Mo	XXXXXXXXXXXXXXXXXX	
P2130	20	1.16	012	027		17	56		47	Grain Size T #8, B #7	F.G.P.

PHYSICAL PROPERTIES

MILL ORDER & CUSTOMER P.O.	SPECIFICATIONS	MELT NO.	SLAB NO.	YIELD P.S.I. x 100	TENSILE P.S.I. x 100	ELONG. IN 2"		DESCRIPTION
42469-2 44-38313	CE-P3F6B (Same As Mod. SA-302-56 Gr.B) Mod. for Ga. & Mod. for 40/70 N1. Fbx. 80000	P2130	1	565	837 803	34	G-8-3	1-251-7/8 x 135-3/4 x 7-7/8"

Tests heated to 1550/1600 F., held 4 hrs. & water quenched in 16 minutes to 400°F., Tests then tempered 1200/1250°F., held 1 hr. per inch minimum & furnace cooled to 600°F.

"Plate furnished in as rolled temper."

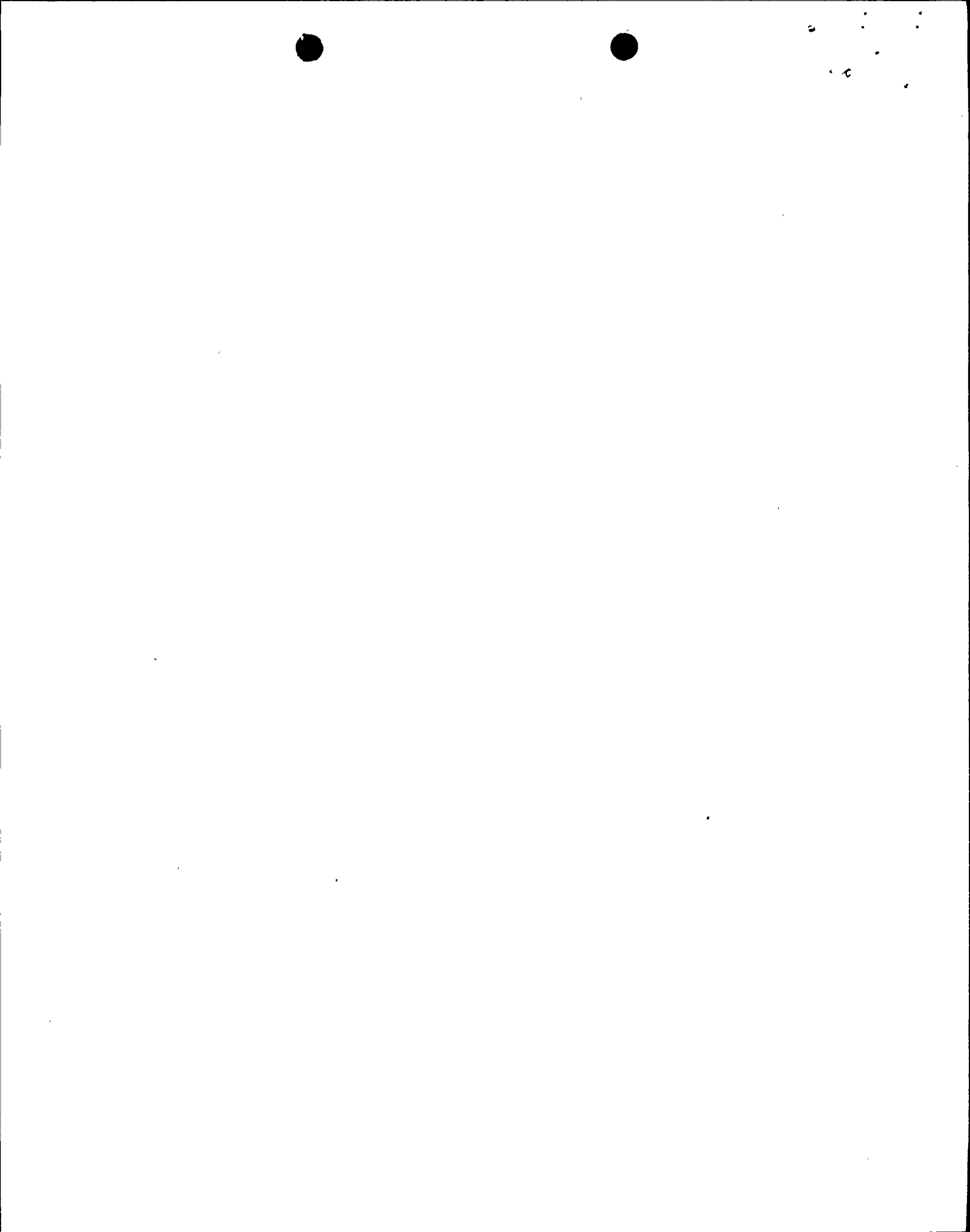
m 31012
164

(RUB) 8/4

0221 We hereby certify the above figures are correct as contained in the records of the company.

SUPERVISOR-TESTING

[Signature]



COMBUSTION ENGINEERING, INC.

ADDRESSEE	SUBJECT	FROM — DATE
Mr. W. A. Stone cc: Mr. R. E. Lorents, Jr. Mr. A. Kincaid Mr. R. Hillis Mr. J. Brasfield G. E. Representative	Mechanical Test Report Contract 164 Niagara Mohawk E-6766 M-31012	Metallurgical Research And Development-Chattanooga September 22, 1964

The following test data are for Item Code G-8-3 which is a 251 7/8" x 135 3/4" x 7 7/8" SA-302-B shell plate for use on the subject contract.

The shell plate was heat treated by CEI at 1550°-1600°F, held at temperature four (4) hours dip quenched in agitated water plus 1225° ± 25°F, held at temperature four (4) hours. A test sample was then removed and given an additional heat treatment of 1150° ± 25°F, held at temperature thirty (30) hours furnace cooled to 600°F.

The test results are as follows:

Charpy V Notch Impacts

<u>Test Code</u>	<u>Item Code</u>	<u>Test Temperature °F</u>	<u>Foot Pounds</u>	<u>Average</u>
MR-4	G-8-3	-80	9.0, 6.0	7.5
		-40	32.0, 17.0	24.5
		+10	50.0, 37.0, 47.5	44.8
		60	77.0, 63.0	70.0
		110	90.0, 99.0	94.5
		160	100.0, 96.0	98.0
		212	87.0, 78.5	82.7

.505 Tensile Data

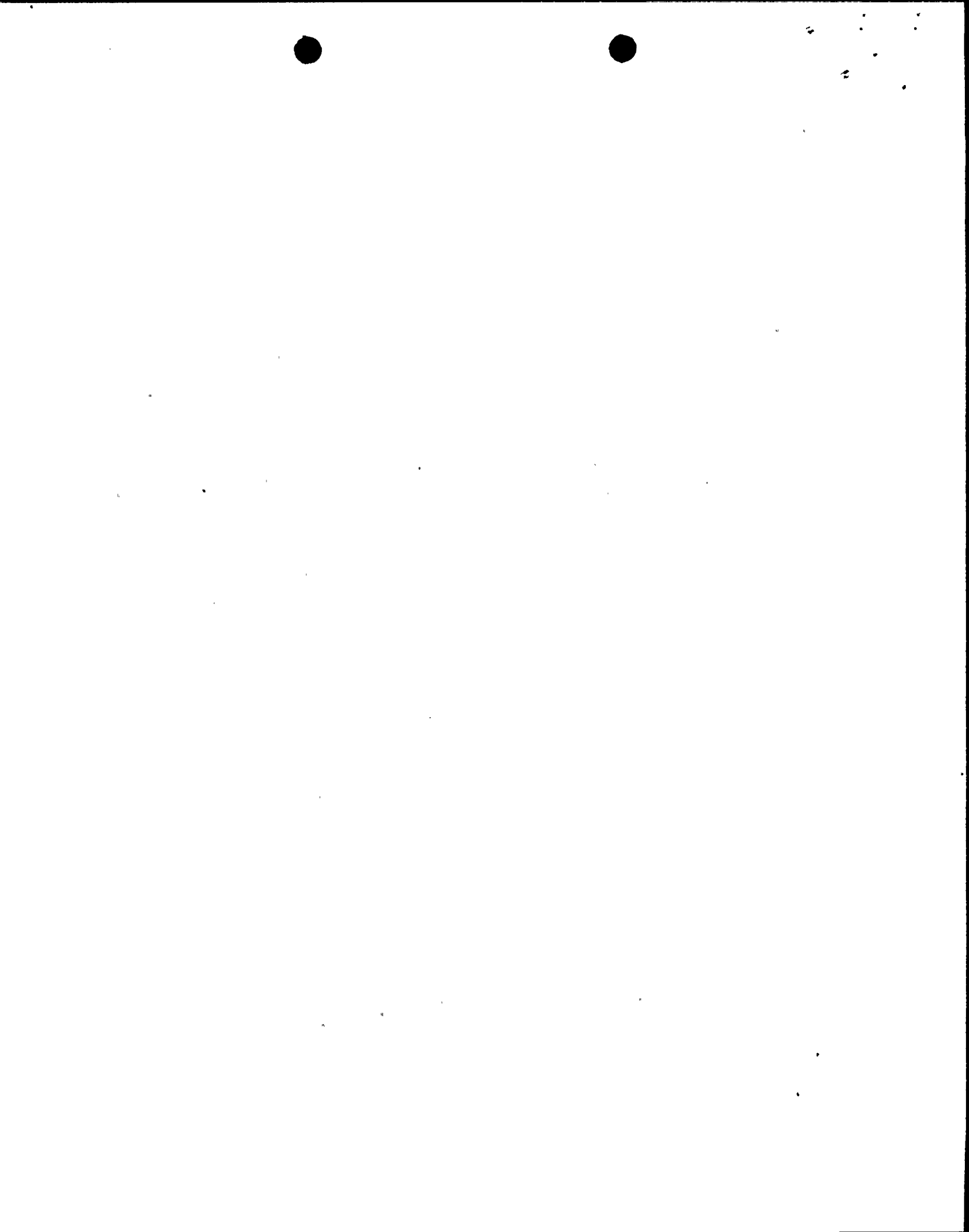
<u>Test Code</u>	<u>Item Code</u>	<u>Yield Strength Psi</u>	<u>Ultimate Tensile Strength Psi</u>	<u>Elongation In 2" %</u>	<u>Reduction Of Area %</u>
MR-4	G-8-3	65,000	86,200	26.0	65.4

The Charpy V notch impacts were taken with the length parallel to the major rolling direction of the plate and with the length of the notch perpendicular to the plate surface. The .505 tensile specimens were taken with the length parallel to the major rolling direction of the plate. All test specimens were taken from the 1/4" thickness level at least 1 T from the quenched edge.

38313

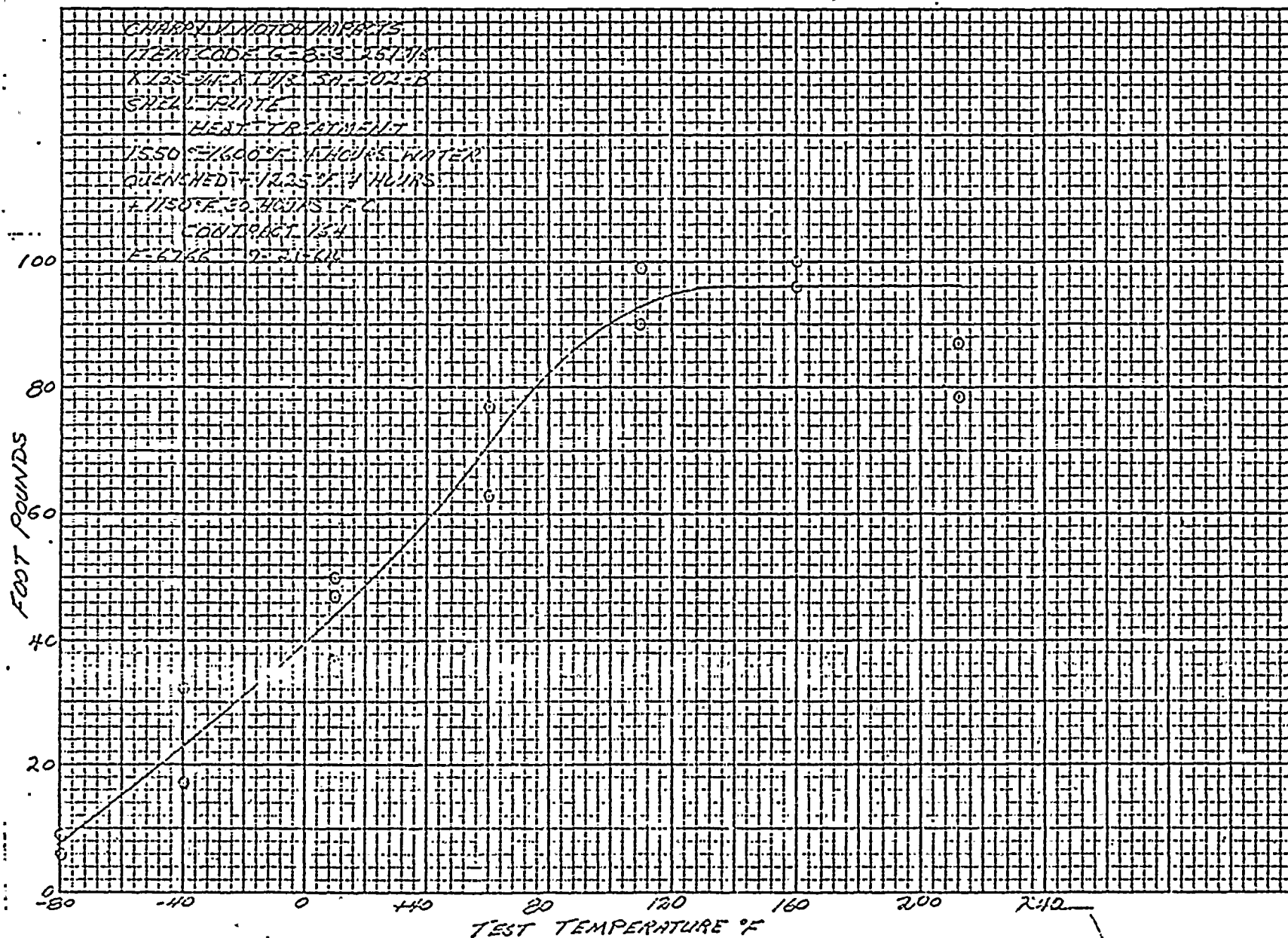
S. R. Lewis

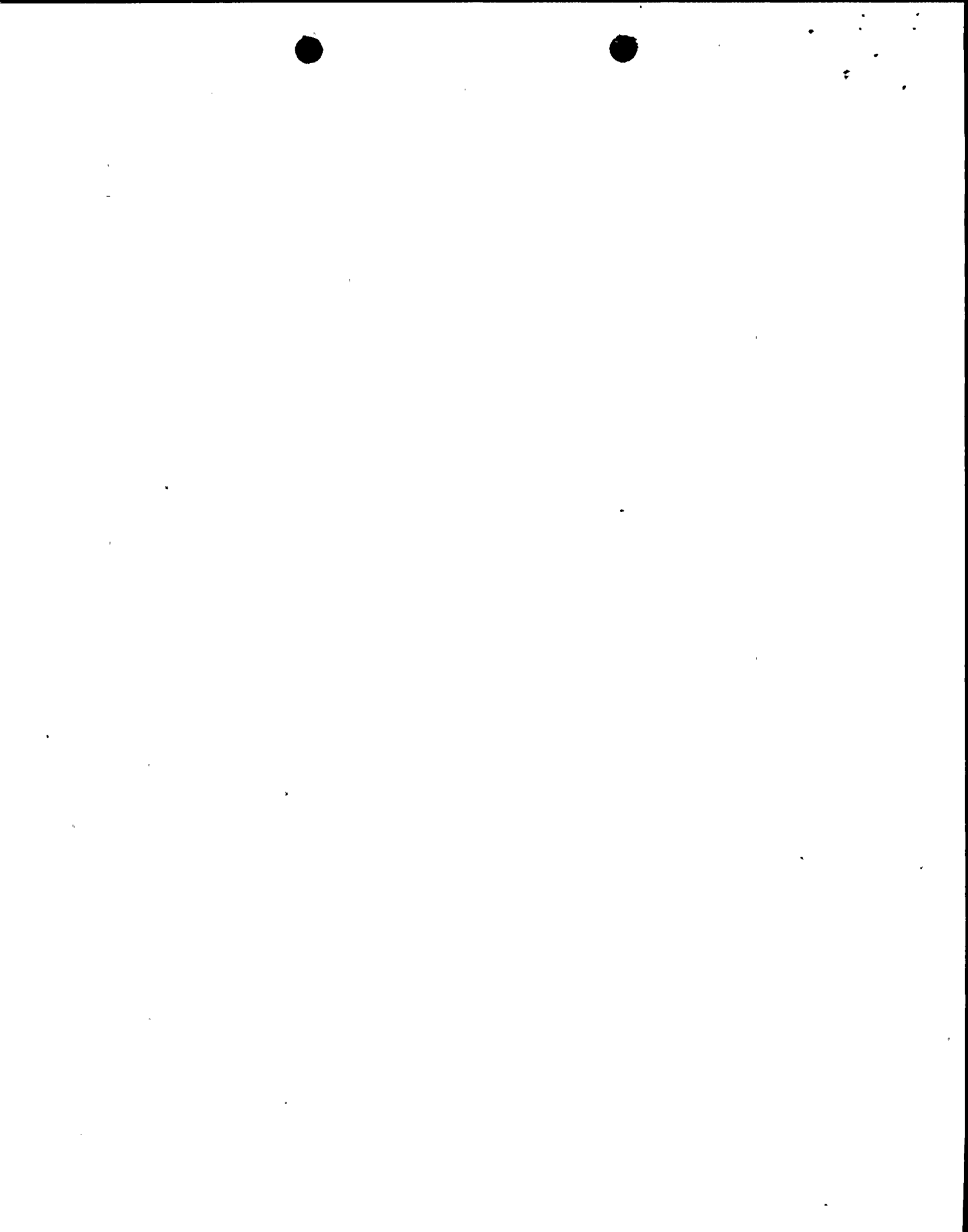
SRL:mvc
attachment





PRINTED IN U.S.A.





G-8-4

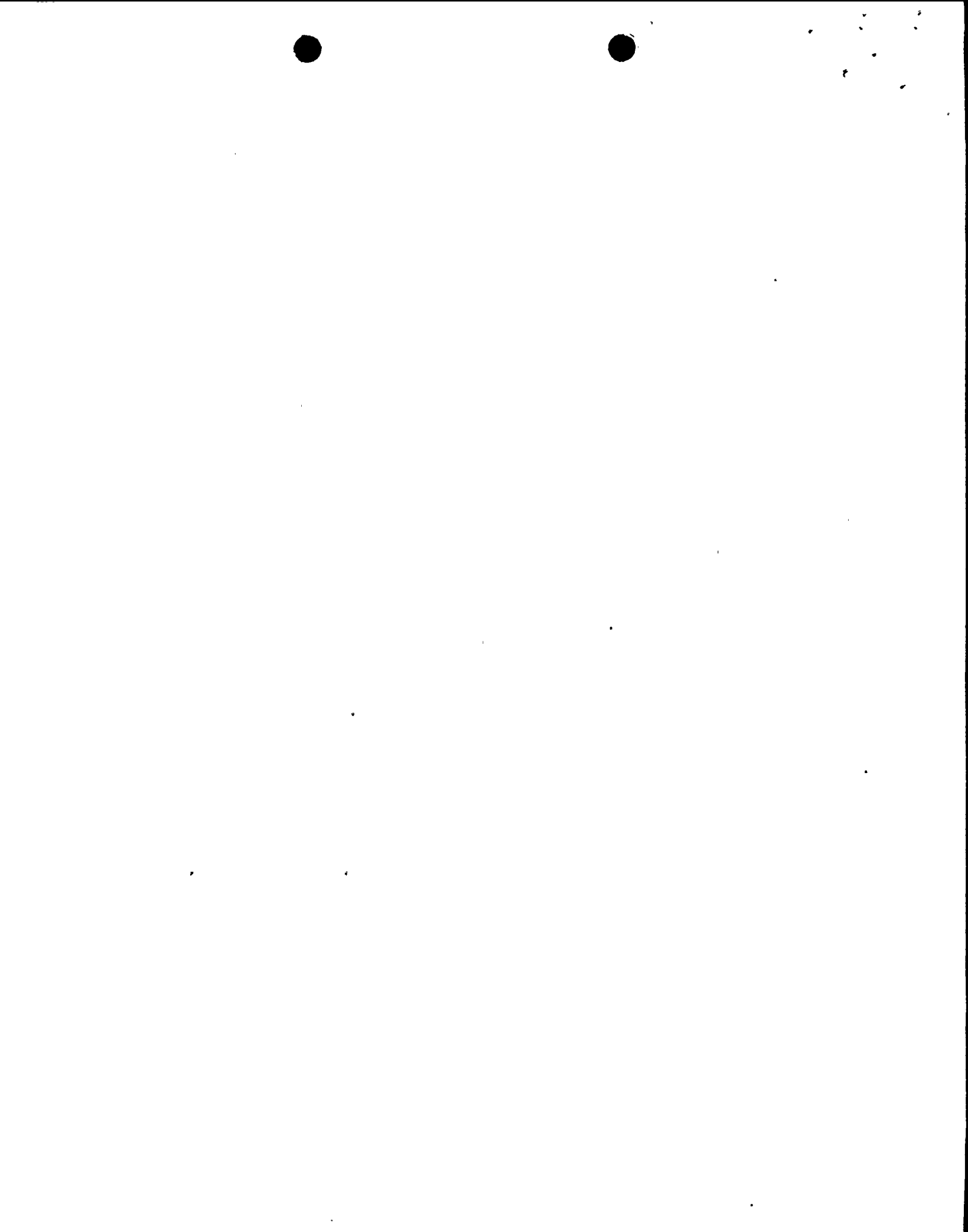
CONSIGNEE		LUKENS STEEL COMPANY PHYSICAL TESTING LABORATORY COATESVILLE, PA. TEST CERTIFICATE		DATE 7-8-64 FILE NO 1771- CTF NO MB 7664 IM
PURCHASER		CARRIER	FLO., STRUCT., & HULL QUALI BENDING TESTS: FIRE BOX QUALITIES: BENDING TESTS: O.K. HOMOGENEITY TESTS: O.K.	
Combustion Engineering Inc. 10 Mr. Luther Lowry Chattanooga Div. Chattanooga, Tenn.		GN-67305		

CHEMICAL ANALYSIS														Grain Size
MELT NO.	C	Mn	P	S	Cu	Si	Ni	Cr	Mo	V	Ti	Al	B	
P2130	20	1.16	012	027		17	56		47					T#8-B#7 P.G.P.

PHYSICAL PROPERTIES								DESCRIPTION
MILL ORDER & CUSTOMER P.O.	SPECIFICATIONS	MELT NO.	SLAB NO.	YIELD P.S.I. x 100	TENSILE P.S.I. x 100	% ELONG. IN 2"		
42469-2 44-38313	CE P3F6B Same, as Mod. SA-302 Gr. B Mod. for Ga. & Mod. for 40/70 Nickel Fbx. 80000	P2130	2	651	843 852	28	G-8-4	1-251-7/8 x 135-3/4 x 7-7/8"
<p>Tests heated to 1550-1600°F., held 4 hours and water quenched in 16 minutes to 400°F., tests then tempered 1200-1250°F., held 1 hour per inch min., & furnace cooled to 600°F.</p> <p>Plate furnished in as rolled temper.</p>								

FORM 0221 We hereby certify the above figures are correct as contained in the records of the company.

SUPERVISOR-TESTING *F. J. Eline*



FORM 10A

COMBUSTION ENGINEERING, INC.

ADDRESSEE	SUBJECT	FROM — DATE
Mr. W. A. Stone	Mechanical Test Report Contract 164 Niagara Mohawk E-6766 M-31012	Metallurgical Research and Development-Chattanooga
cc: Mr. R. E. Lorentz, Jr. Mr. A. Kincaid Mr. R. Hillis Mr. J. Brasfield G. E. Representative		October 30, 1964

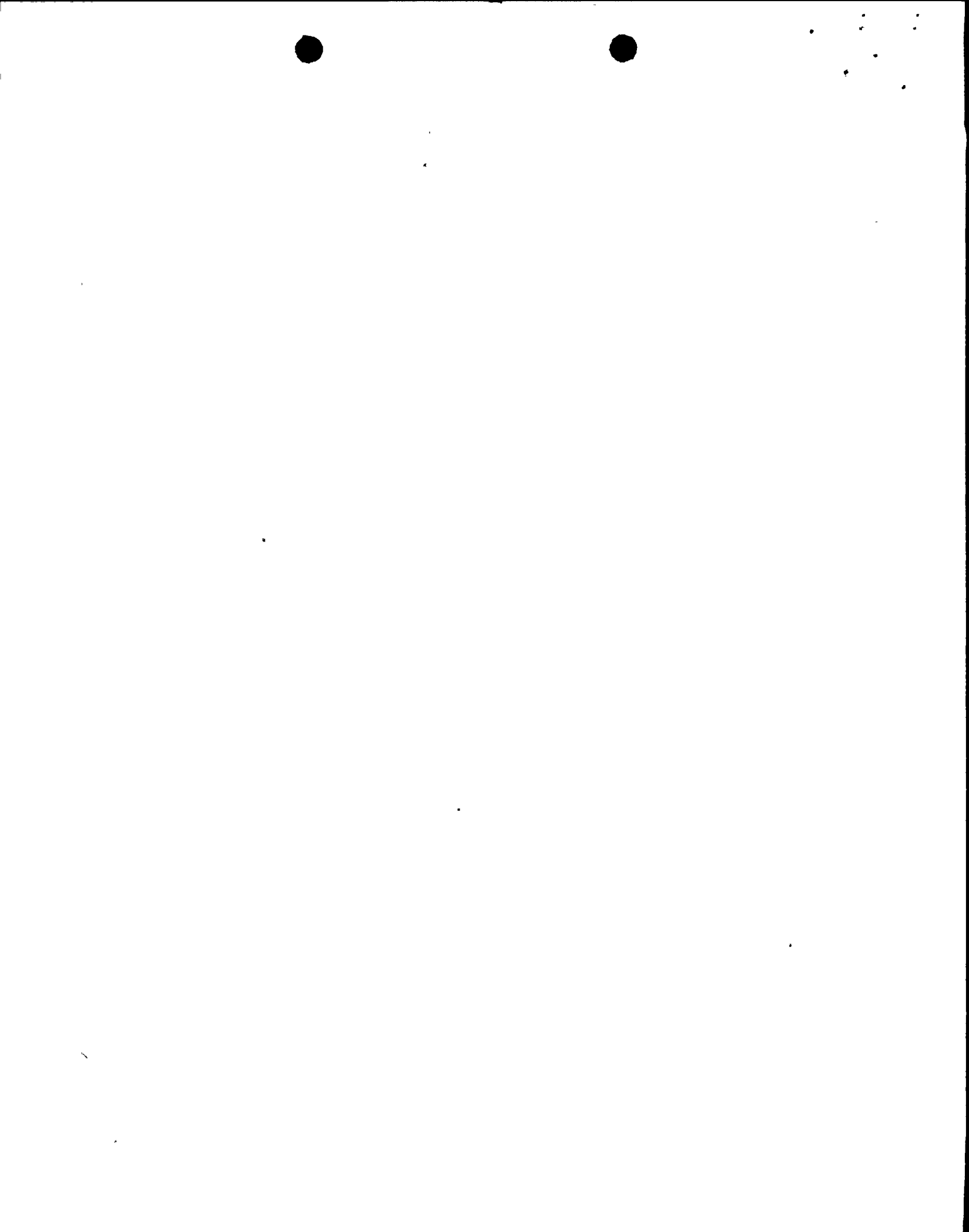
The following test data are for Item Codes G-8-2, G-8-4, G-8-6, G-8-7 and G-8-8 which are 251 7/8" x 135 3/4" x 7 7/8" SA-302-B material for use as shell plates on the subject contract.

The shell plates were heat treated by CEI at 1550°-1600°F, held at temperature four (4) hours dip quenched in agitated water plus 1225° ± 25°F, held at temperature four (4) hours. A test sample was then removed from each shell plate represented and given an additional heat treatment of 1150° ± 25°F, held at temperature thirty (30) hours furnace cool to 600°F.

The test results are as follows:

Charpy V. Notch Impacts

Test Code	Item Code	Test Temperature°F	Foot Pounds	Average
AT-4	G-8-2	-40	14.0, 16.5	15.2
AT-4	G-8-2	+10	25.0, 21.5, 21.5	22.6
AT-4	G-8-2	40	36.0, 36.5, 35.0	35.8
AT-4	G-8-2	60	51.0, 45.0	48.0
AT-4	G-8-2	110	67.0, 72.5	69.7
AT-4	G-8-2	160	73.0	73.0
AT-4	G-8-2	212	74.5, 70.5	72.5
LS-4	G-8-4	-40	23.5, 26.0	24.7
LS-4	G-8-4	+10	46.0, 61.0, 42.0	49.6
LS-4	G-8-4	40	58.0, 64.0	61.0
LS-4	G-8-4	60	72.5, 74.5	73.5
LS-4	G-8-4	110	98.0, 98.0	98.0
LS-4	G-8-4	160	100.5, 100.0	100.2
LS-4	G-8-4	212	106.0, 106.0	106.0
KS-4	G-8-6	-40	10.0, 13.5	11.7
KS-4	G-8-6	+10	35.0, 30.0, 29.5	31.5
KS-4	G-8-6	40	38.0, 39.5	38.7
KS-4	G-8-6	60	42.0, 40.0	41.0
KS-4	G-8-6	110	72.5, 80.0	76.2
KS-4	G-8-6	160	81.0, 78.5	79.7
KS-4	G-8-6	212	75.5, 76.0	75.7
ZS-4	G-8-7	-40	19.0, 18.5	18.7
ZS-4	G-8-7	+10	32.5, 31.0, 40.0	34.5
ZS-4	G-8-7	40	38.0, 51.5	44.7
ZS-4	G-8-7	60	52.0, 58.5	55.2
ZS-4	G-8-7	110	72.0, 72.0	72.0
ZS-4	G-8-7	160	79.5, 78.0	78.7
ZS-4	G-8-7	212	76.0, 76.0	76.0



COMBUSTION ENGINEERING, INC.

ADDRESSEE	SUBJECT	FROM — DATE
Mr. W. A. Stone	- 2 -	October 30, 1964

Charpy V Notch Impacts - Cont'd

<u>Test Code</u>	<u>Item Code</u>	<u>Test Temperature°F</u>	<u>Foot Pounds</u>	<u>Average</u>
MS-4	G-8-8	-40	13.0, 13.5	13.2
MS-4	G-8-8	+10	16.5, 23.0, 16.0	20.1
MS-4	G-8-8	+10	42.0, 38.0, 40.0	40.0 *
MS-4	G-8-8	60	49.0, 69.0	59.0
MS-4	G-8-8	110	79.0, 86.5	82.7
MS-4	G-8-8	160	99.5	99.5
MS-4	G-8-8	212	97.5, 99.5	98.5

* Denotes retest.

.505 Tensile Data

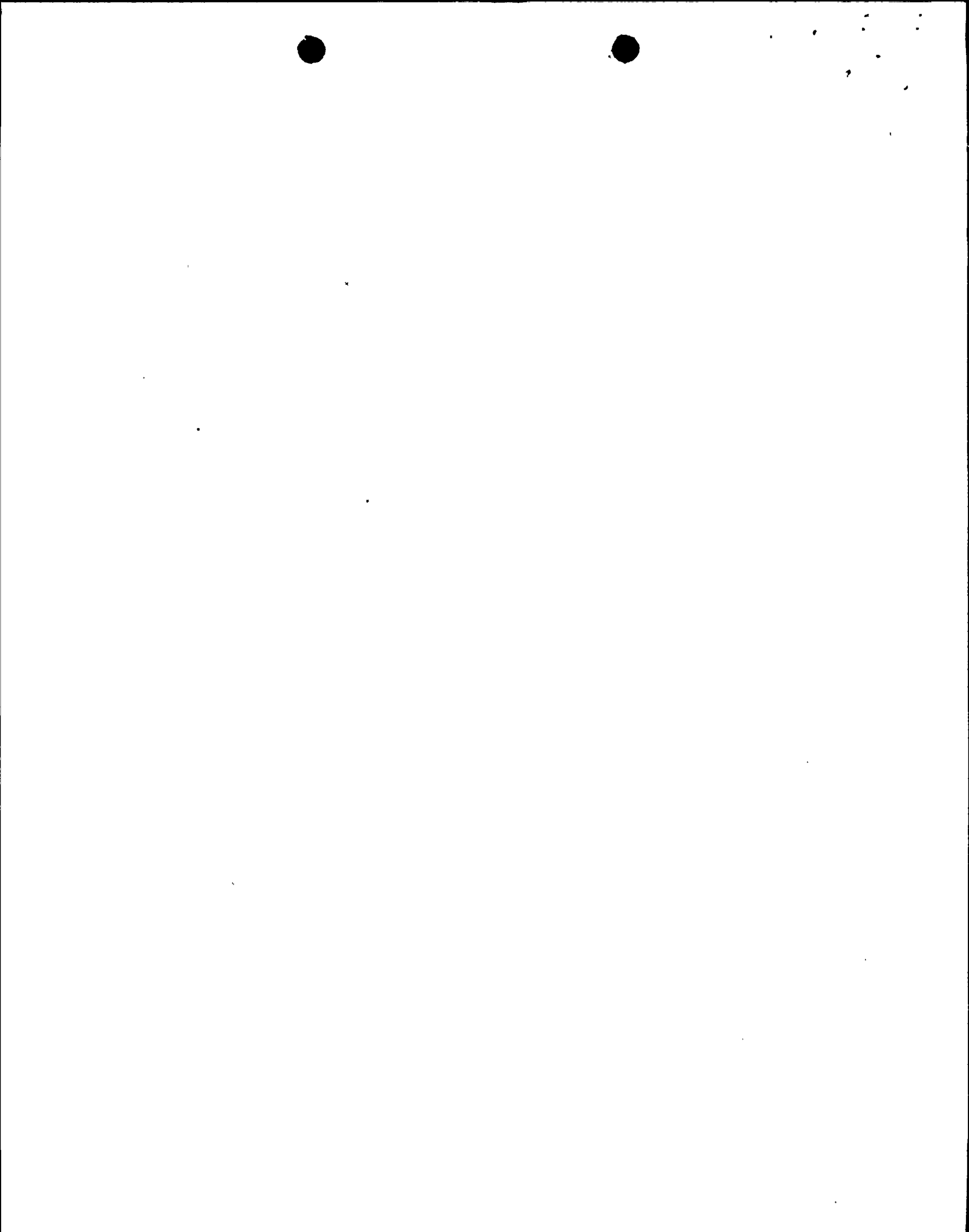
<u>Test Code</u>	<u>Item Code</u>	<u>Yield Strength Psi</u>	<u>Ultimate Tensile Strength Psi</u>	<u>Elongation In 2" %</u>	<u>Reduction Of Area %</u>
AT-4	G-8-2	67,500	89,500	27.0	65.6
LS-4	G-8-4	59,300	85,500	29.0	68.0
KS-4	G-8-6	62,700	85,100	28.0	66.0
ZS-4	G-8-7	67,200	88,600	25.0	66.0
MS-4	G-8-8	69,000	90,000	24.0	66.3

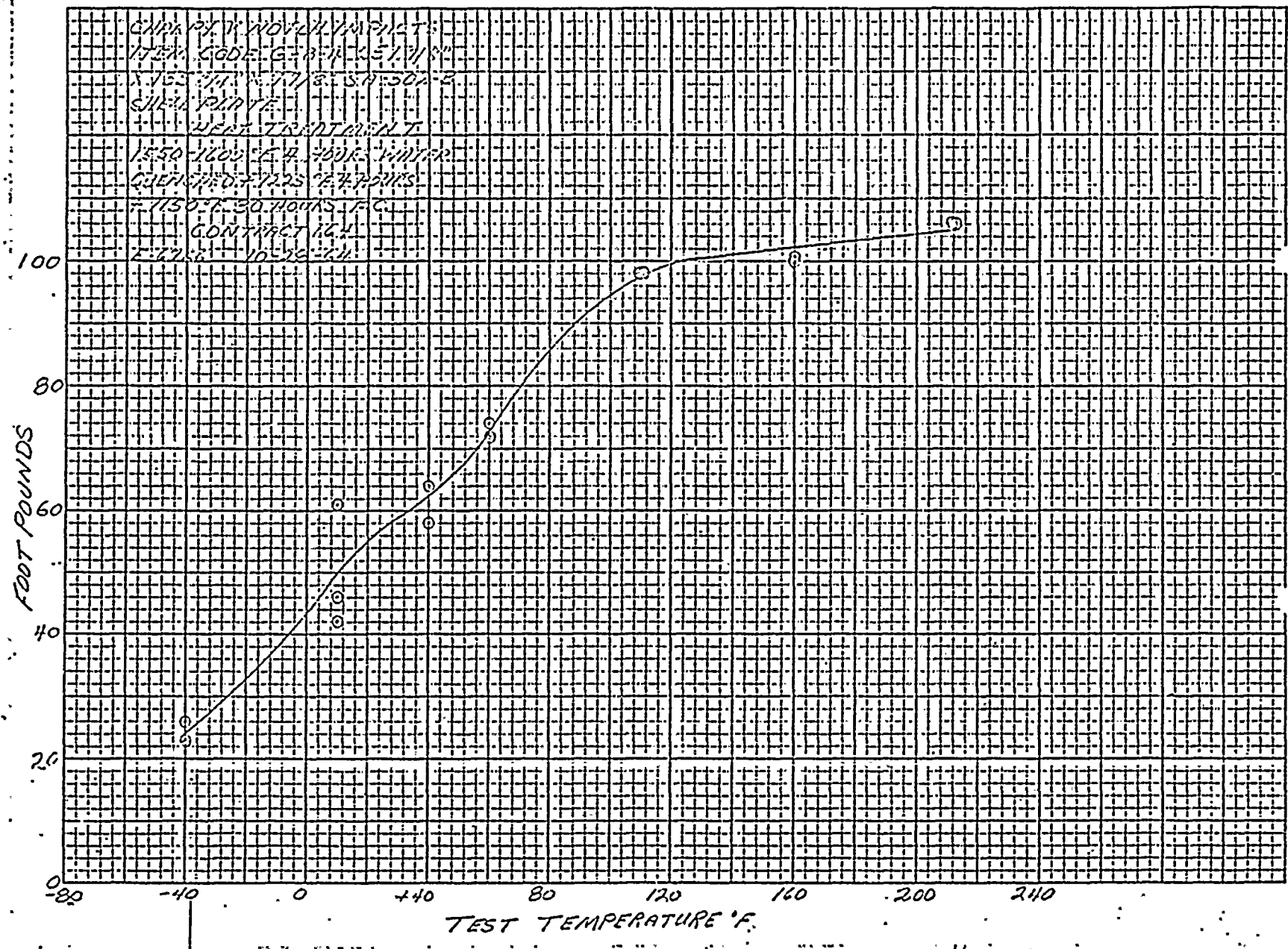
The Charpy V Notch Impact specimens were taken with the length parallel to the major rolling direction of the plate with the length of the notch perpendicular to the plate surface. The .505 tensile specimens were taken with the length parallel to the major rolling direction of the plate. All test specimens were removed at least 1 T from the quenched edge at the 1/4 thickness level.

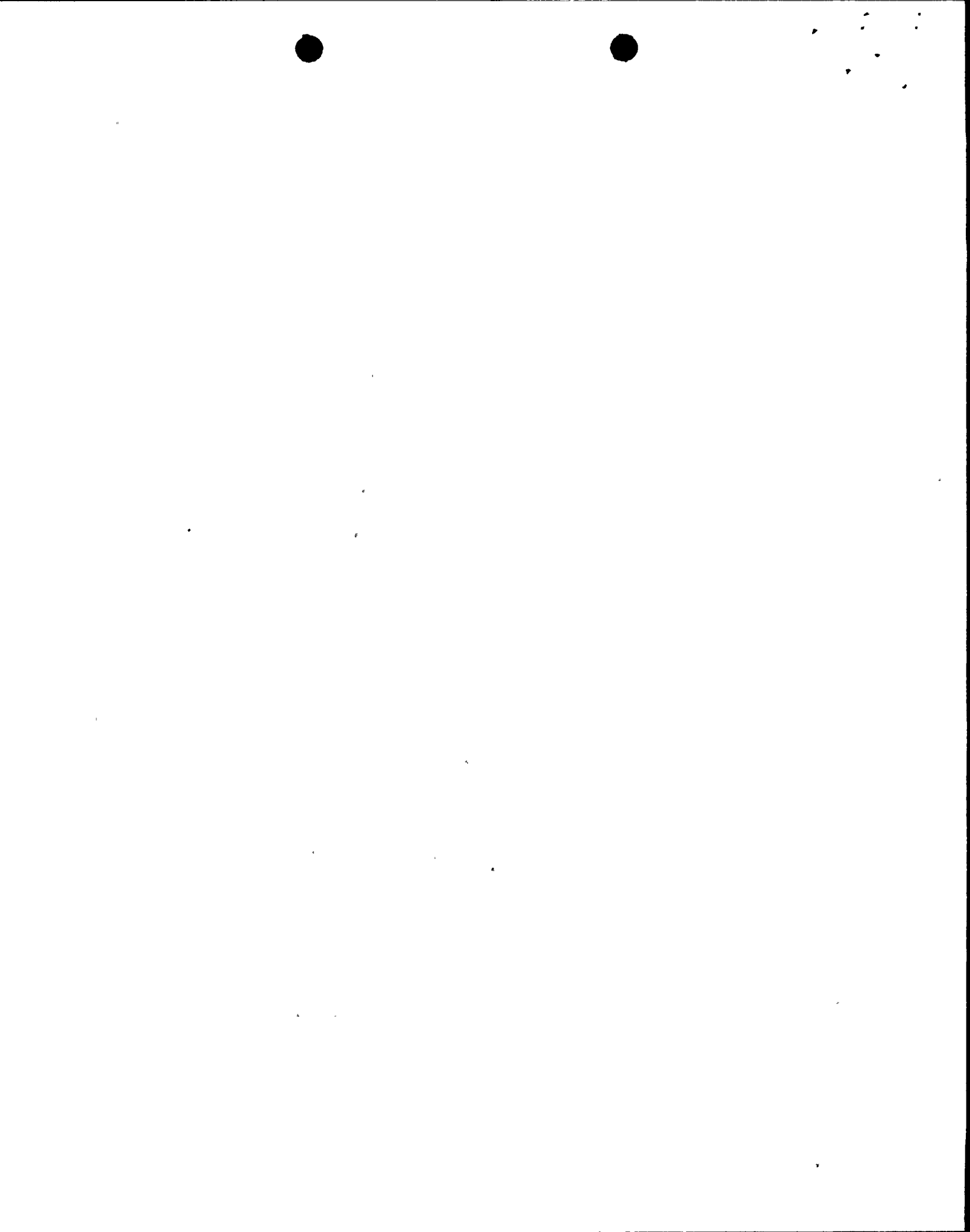
Graphs of the Charpy V Notch Impact test results are attached.

S. R. Lewis

SRL:mvc
Attachments







G-307-3

Corrected Copy 6-18-64

CONSIGNEE 		LUKENS STEEL COMPANY PHYSICAL TESTING LABORATORY COATESVILLE, PA. TEST CERTIFICATE		DATE 6-11-64 FILE NO 1771- CTF NO CJ 51664 GR
PURCHASER 10. Combustion Engr. & Inc. Attn: Mr. Luther Lowry Chattanooga Div. Chattanooga, Tenn.		CARRIER SSW 85523		FLG., STRUCT. & HULL QUAL: BENDING TESTS: FIRE BOX QUALITIES: BENDING TESTS: O.K. ✓ HOMOGENECITY TESTS: O.K. ✓

CHEMICAL ANALYSIS

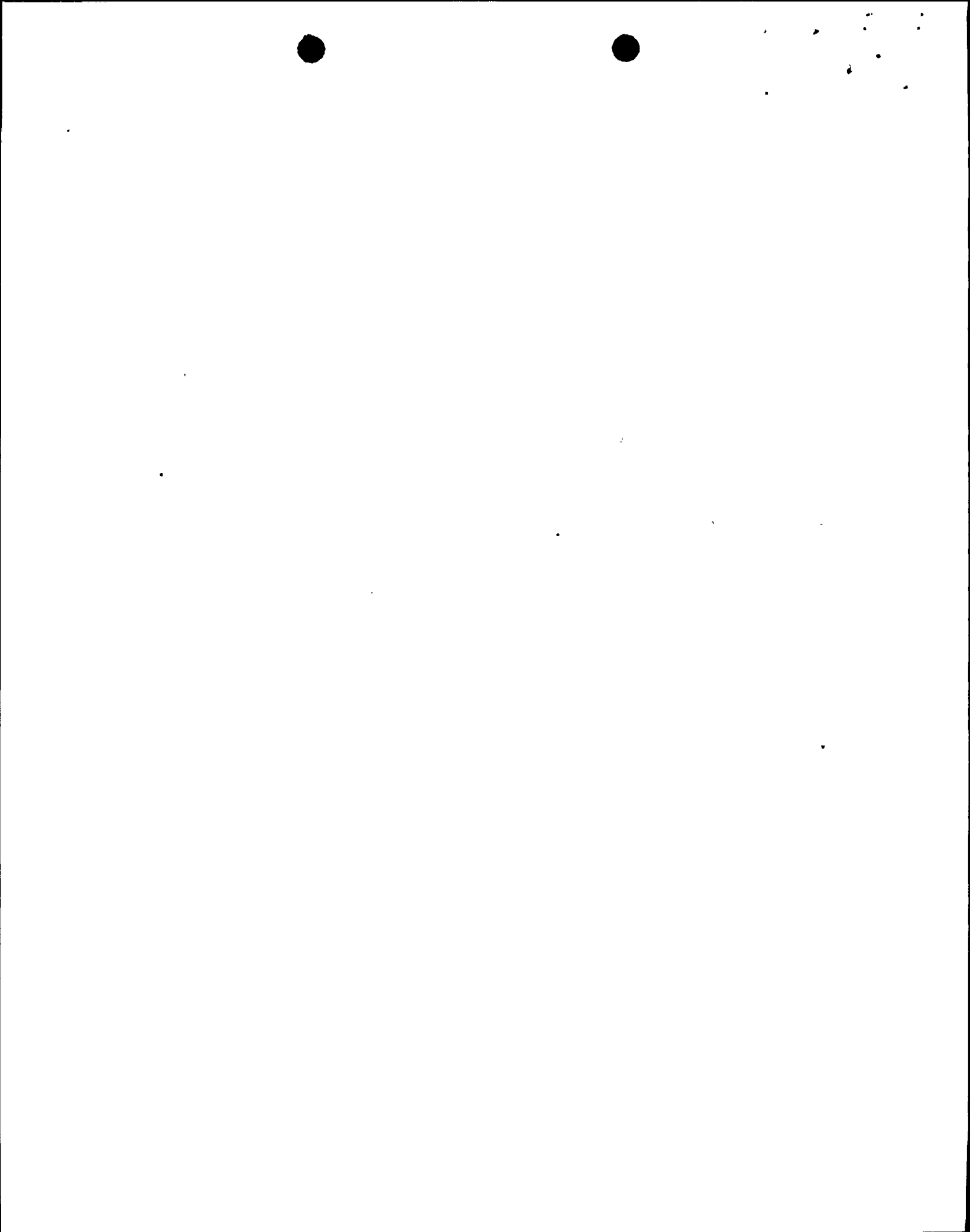
MELT NO.	C	Mn	P	S	Cu	Si	Ni	Cr	Mo	V	Ti	Al	B
P2074	18 ✓	1.45 ✓	018 ✓	034 ✓		26 ✓	48 ✓		45 ✓				
NUCLEAR JUN 23 1964 INSPECTION											T#8 B#8 F.G.P.		

PHYSICAL PROPERTIES

MILL ORDER & CUSTOMER P.O.	SPECIFICATIONS	MELT NO.	SLAB NO.	YIELD P.S.I. x 100	TENSILE P.S.I. x 100	ELONG. IN 2"		DESCRIPTION
42237-2 44-38314	SA-302 Gr.B CE-P3F6-B Mod. for Ga. & Nickel Mang. Nickel Fbx. 80000	P2074	2	719 ✓	949 ✓ 940 ✓	30 ✓	G-307-3	1-251-7/8 x 135-3/4 x 7-7/8"
Tests heated to 1550-1600°F., held 4 hours and water quenched in 16 minutes to 400°F., Tests then tempered 1200-1250°F., held 1 hour per inch min. and furnace cooled to 600°F. Plates furnished in as rolled temper.								M31035 VGP 264 2/3 3/4

FORM 0221 We hereby certify the above figures are correct as contained in the records of the company.

SUPERVISOR-TESTING *[Signature]*



38314 COMB. STION ENGINEER. AG, INC.

ADDRESSEE	SUBJECT	FROM — DATE
Mr. W. A. Stone	Mechanical Test Report N. J. Central Contract 264 E-6767 M-31035	Metallurgical Research And Development-Chattanooga
cc: Mr. R. E. Lorentz, Jr. Mr. A. Kincaid Mr. R. Hillis ✓ Mr. L. C. Northard G. E. Representative		July 27, 1964

The following test data are for four (4) of the shell plates which are 25 7/8" x 135 3/4" x 7 7/8" SA-302-B material for use on the subject contract.

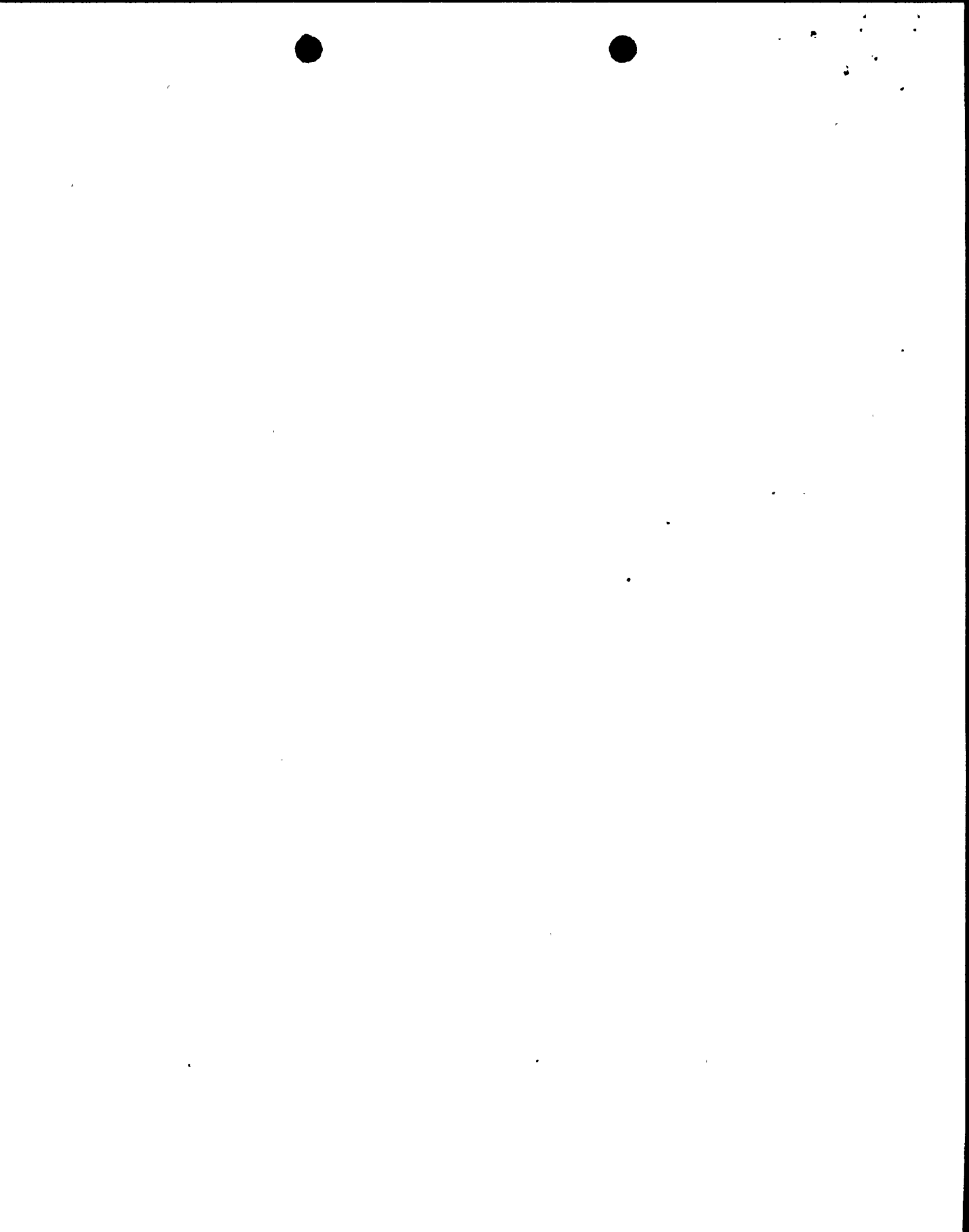
The shell plates were heat treated by C-E-I at 1550°-1600°F, held at temperature four (4) hours dip quenched plus 1225° ± 25°F, held at temperature four (4) hours. A test sample was then removed from each shell plate represented. The test samples were given an additional heat treatment of 1150°F ± 25°F, held at temperature thirty (30) hours furnace cooled to 600°F.

The test results are as follows:

Charpy V Notch Impacts

Test Code	Item Code	Test Temperature °F	Foot Pounds	Average
IP-4	G-307-5	-40	30.5	30.5
IP-4	G-307-5	+10	29.0, 39.5, 38.5	32.3
IP-4	G-307-5	40	54.5, 58.5, 45.5	52.8
IP-4	G-307-5	60	57.5	57.5
IP-4	G-307-5	110	85.8	85.8
IP-4	G-307-5	160	94.5	94.5
JP-4	G-308-1	-40	11.0	11.0
JP-4	G-308-1	+10	30.0, 39.5, 25.0	31.5
JP-4	G-308-1	40	40.0, 41.0, 45.0	42.0
JP-4	G-308-1	60	40.0	40.0
JP-4	G-308-1	110	92.0	92.0
JP-4	G-308-1	160	81.0	81.0
KP-4	G-307-3	-40	8.0	8.0
KP-4	G-307-3	+10	27.5, 37.5, 41.0	35.3
KP-4	G-307-3	40	41.5, 52.0, 57.0	50.2
KP-4	G-307-3	60	63.5	63.5
KP-4	G-307-3	110	82.0	82.0
KP-4	G-307-3	160	101.5	101.5
LP-4	G-307-1	-40	16.5	16.5
LP-4	G-307-1	+10	21.0, 22.5, 16.5	20.0
LP-4	G-307-1	+10*	37.5, 36.0, 30.0	34.5
LP-4	G-307-1	40	30.0, 39.0, 34.0	34.3
LP-4	G-307-1	60	46.0	46.0
LP-4	G-307-1	110	72.0	72.0
LP-4	G-307-1	160	99.5	99.5

* Denotes retest.



COMBUSTION ENGINEERING, INC.

ADDRESSEE

SUBJECT

FROM — DATE

Mr. W. A. Stone

- 2 -

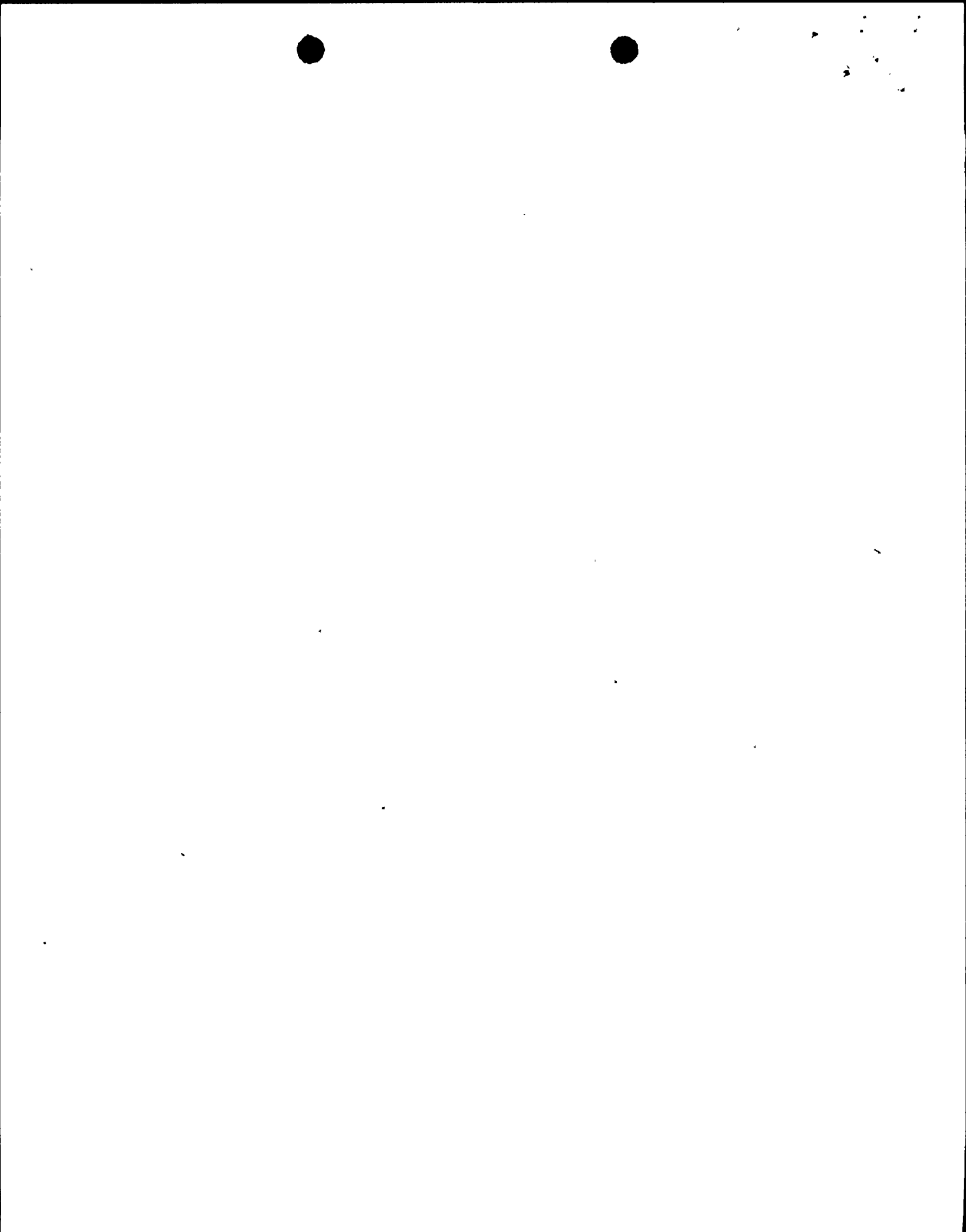
July 27, 1964

Test Code	Item Code	Yield Strength Psi	Ultimate Tensile Strength Psi	Elongation In 2" %	Reduction Of Area %
IP-4	G-307-5	66,500	83,500	28.0	66.4
JP-4	G-308-1	64,000	84,900	27.5	66.9
KP-4	G-307-3	62,000	82,000	28.0	69.0
LP-4	G-307-1	65,000	86,700	26.5	66.2

The Charpy V notch impacts were taken with the length parallel to the major direction of rolling of the plate with the length of the notch perpendicular to the plate surface. The .505 tensile specimens were taken with the length parallel to the major direction of rolling of the plate. All test specimens were taken at least 1 T from the quenched edge at the 1/4 thickness level.

S. R. Lewis

SRL:mvc



38314
COMBUSTION ENGINEERING, INC.

ADDRESS	SUBJECT	FROM — DATE
Mr. W. A. Stone	Mechanical Test Report N. J. Central Contract 241 E- 6767 X-31035	Metallurgical Research And Development—Chattanooga
cc: Mr. R. T. Roberts, Jr. Mr. A. "Al" Cain Mr. R. Millie ✓ Mr. J. Brasfield C. D. Representative		September 11, 1964

Reference: Memo dated July 29, 1964 reporting Charpy V Notch Impact values and tensile properties of four (4) shell plates, Item Codes G-307-5, G-308-1, G-307-3, and G-307-1.

The additional testing requested is as follows:

Charpy V Notch Impacts

<u>Test Code</u>	<u>Item Code</u>	<u>Test Temperature °F</u>	<u>Foot Pounds</u>
IP-4	G-307-5	+75	66.0
		90	77.0
		140	85.5
		212	92.0, 91.0
JP-4	G-308-1	+75	65.0
		90	73.5
		140	85.0
		212	92.0, 91.0
KP-4	G-307-3	+75	58.0
		90	71.5
		140	80.0
		212	90.0, 85.5
LP-4	G-307-1	+75	70.0
		+90	70.0

Graphs of the summary of the Charpy V Notch Impact test results are attached.

S. R. Lewis

SRL:mvc
attachment



CHARPY V NOTCH IMPACTS

ITEM CODE G-307-3

DATE 11/21/57

SHEET 2 OF 2

MANUFACTURER

1520-1600 HOURS

1000-1000 HOURS

2000-2000 HOURS

2000-2000 HOURS

2000-2000 HOURS

100

80

60

40

20

0

1000 POUNDS

-20

-10

0

40

80

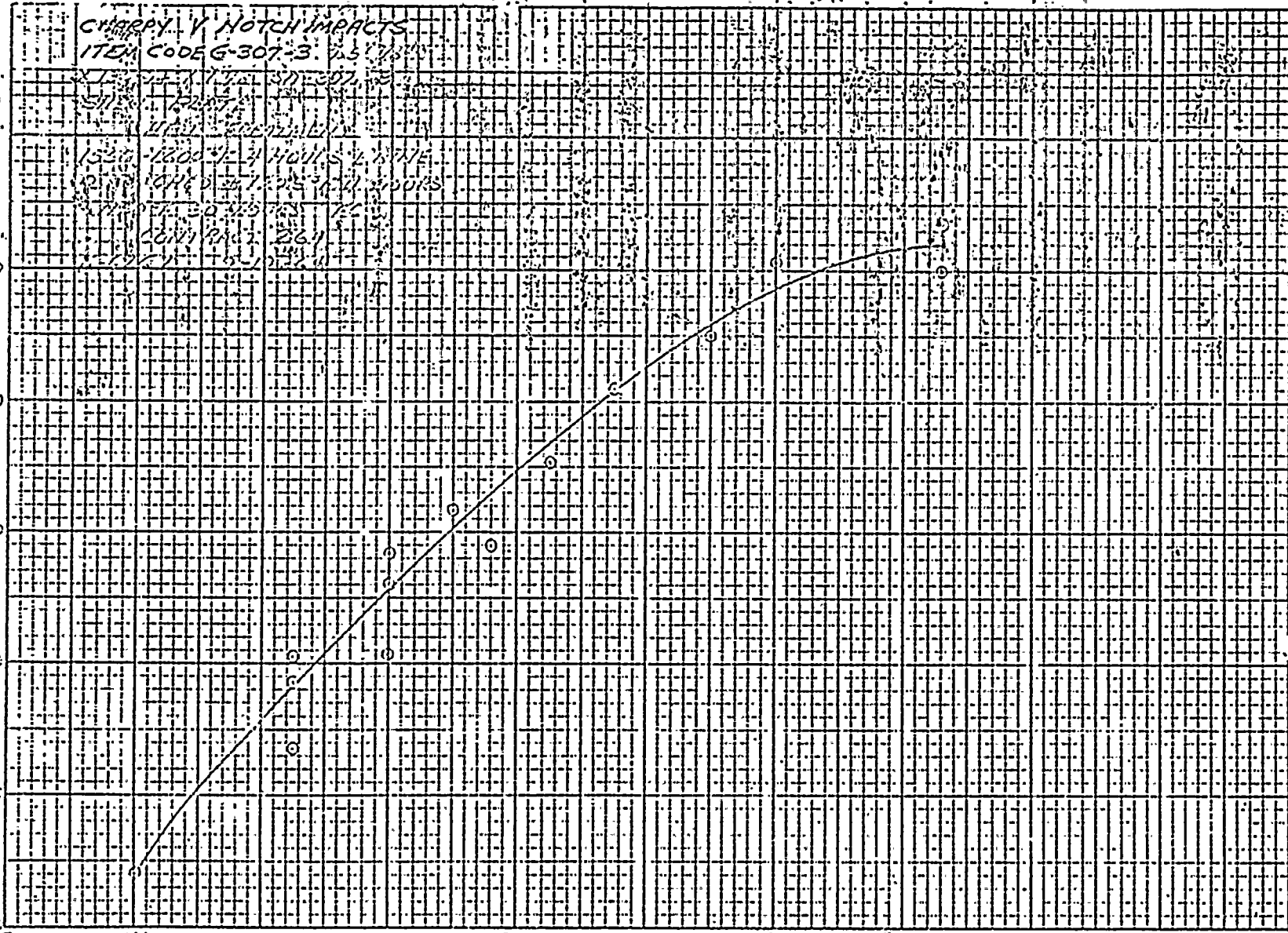
120

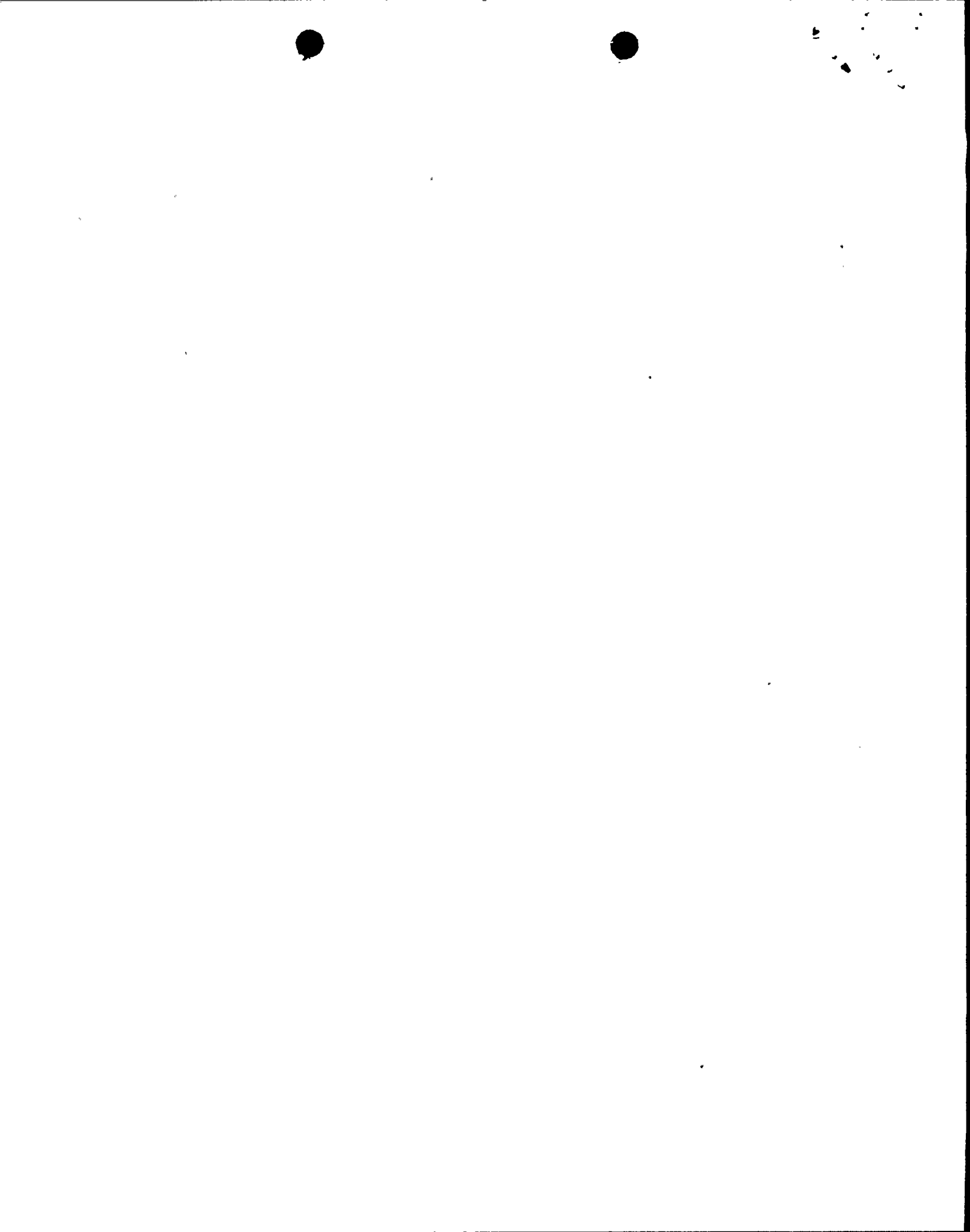
160

200

240

TEST TEMPERATURE °F





G-307-4
 G-307-5
 G-307-10

Corrected Copy 6-18-64
 Corrected Copy 6-11-64

CONC...	LUKENS STEEL COMPANY PHYSICAL TESTING LABORATORY COATESVILLE, PA. TEST CERTIFICATE	DATE 5-25-64 FILE NO 1771- CTF NO CJ 51664 GR
PURCHASER 10. Combustion Engr., Inc. . Attn: Mr. Luther Lowry . Chattanooga Div. . Chattanooga, Tenn.	CARRIER SSW 85523	FLG., STRUCT., & HULL QUAL: BENDING TLSTS: FIRE BOX QUALITIES: BENDING TESTS: O.K. ✓ HOMOGENEITY TESTS: O.K. ✓

CHEMICAL ANALYSIS

MELT NO.	C	Mn	P	S	Cu	Si	Ni	Cr	Mo	V	Ti	Al	B	Grain Size
P2076	20 ✓	1.28 ✓	019 ✓	030 ✓		21 ✓	53 ✓		52 ✓					✓ T#8 B#8 F.G.P. NUCLEAR JUN 23 1964 INSPECTION

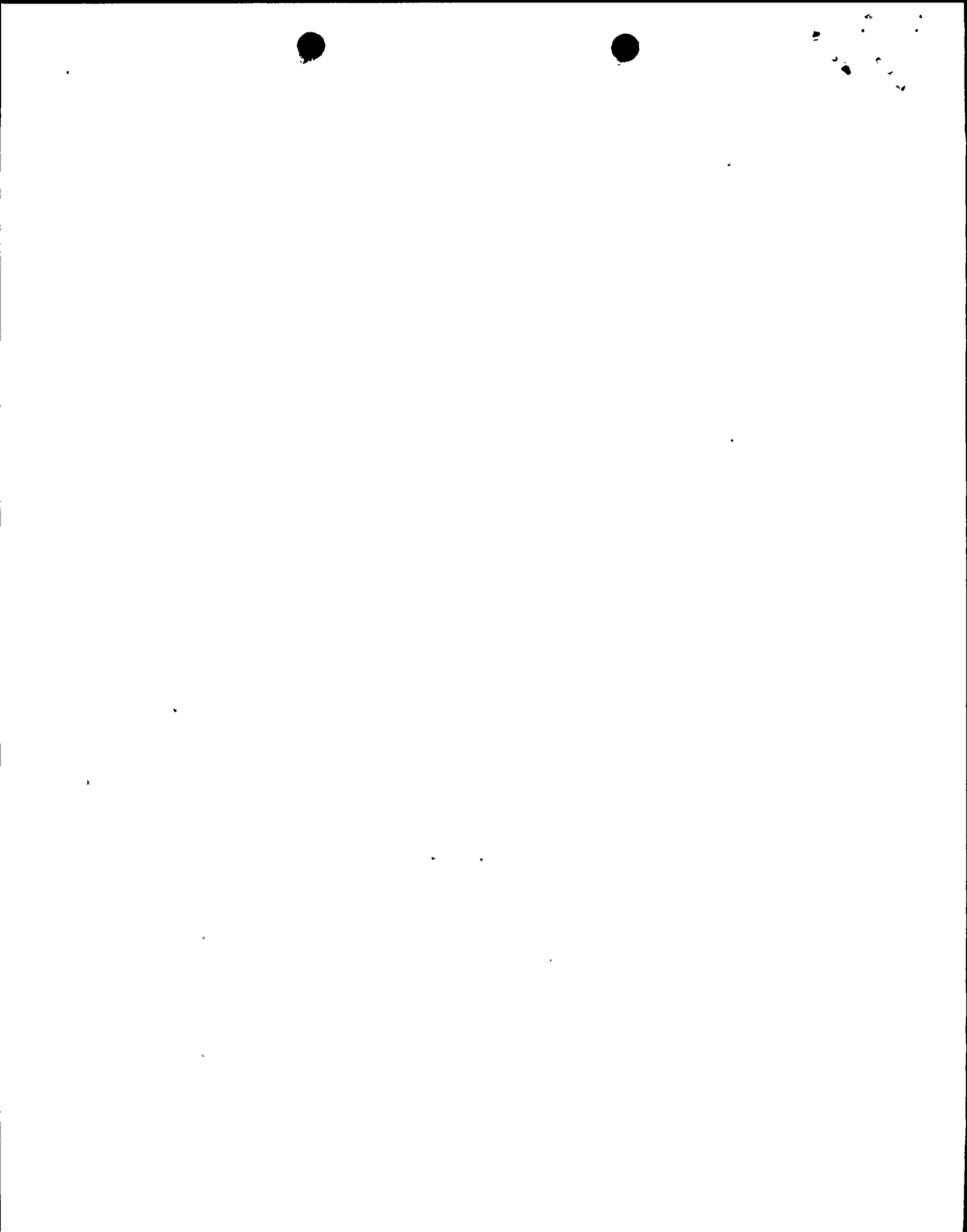
PHYSICAL PROPERTIES

MILL ORDER & CUSTOMER P.O.	SPECIFICATIONS	MELT NO.	SLAB NO.	YIELD P.S.I. x 100	TENSILE P.S.I. x 100	% ELONG. IN 2"	DESCRIPTION
42237-3 44-38314	SA-302 Gr.B. CE-P3F6-B Mod. for Ga. Mod. with 40/70 Ni Mang. Nickel Fbx. 80000	P2076	1	722 ✓	954 ✓ 950 ✓	27 ✓	1-251-7/8 x 135-3/4 x 7-7/8"
		"	2	710 ✓	980 ✓ 960 ✓	28 ✓	1- " "
Tests heated to 1550-1600°F., held 4 hours and water quenched in 16 minutes to 400°F., Tests then tempered 1200-1250°F., held 1 hour per inch min. and furnace cooled to 600°F. Plates furnished in as rolled temper.							M 31035 J.P.

FORM 0221 We hereby certify the above figures are correct as contained in the records of the company.

SUPERVISOR-TESTING

J.P. Jline



Corrected Copy 6/15/64

CONSIGNEE

LUKENS STEEL COMPANY
 PHYSICAL TESTING LABORATORY
 COATESVILLE, PA.
 TEST CERTIFICATE

DATE 6/12/64
 FILE NO 1771
 CTF NO NW-61064-BD

PURCHASER

Combustion Engr. Inc.
 10 Attn: Mr. Luther Lowry
 Chattanooga Div.
 Chattanooga, Tenn.

CARRIER

UP 59567


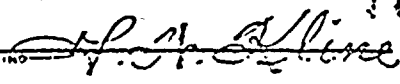
PLG. STRUCT. & MULL QUAL:
 BENDING TESTS:

FIRE BOX QUALITIES:
 BENDING TESTS: O.K.
 HOMOGENEITY TESTS: O.K.

CHEMICAL ANALYSIS

MELT NO.	C	Mn	P	S	Cu	Ga	Ni	Cr	Mo	V	Grain Size	
P2091	20	1.43	.018	.026		26	51		50		170, 170	F.G.P.
<i>Ramsey</i>												
<i>M 31012</i> <i>264</i>												

PHYSICAL PROPERTIES

MILL ORDER & CUSTOMER P.O.	SPECIFICATIONS	MELT NO.	SLAB NO.	YIELD P.S.I. x 100	TENSILE P.S.I. x 100	% ELONG. IN 2"		DESCRIPTION
42460-1 44-38313	CE-P3F6B (Same as Mod. SA-302-56 Gr.B) Mod. for Ga. & Mod. for 40/70 N1. Fbx. 80000	P2091	2	788	984 975	26	G-307-10	1-251-7/8 x 135-3/4 x 7-7/8"
<i>264</i>								
Tests heated 1550-1600°F., held 4 hrs. & water quenched in 16 minutes to 400°F., tests then tempered 1200-1250°F., held 1 hr. per inch minimum & furnace cooled to 500°F. "Plate furnished in as rolled temper."								
								
								

SUPERVISOR TESTING

FORM 0221 We hereby certify the above figures are correct as contained in the records of the company.



38314

PCRM 40A

COMBUSTION ENGINEERING, INC.

ADDRESSEE	SUBJECT	FROM - DATE
Mr. W. A. Stone	Mechanical Test Report N. J. Central Contract 264 E-6767 M-31035	Metallurgical Research And Development-Chattanooga
cc: Mr. R. E. Lorentz, Jr. Mr. A. Kincaid Mr. R. Hillis ✓ Mr. J. Brasfield G.E. Representative		September 15, 1964

The following test data are for four (4) shell plates which are 251 7/8" x 135 3/4" x 7 7/8" SA-302-B material for use on the subject contract.

The shell plates were heat treated by CEI at 1550-1600°F, held at temperature four (4) hours water quenched plus 1225° ± 25°F, held at temperature four (4) hours. A test sample was then removed from each shell plate represented. The test samples were given an additional heat treatment of 1150° ± 25°F, held at temperature thirty (30) hours furnace cooled to 600°F.

The test results are as follows:

Charpy V Notch Impacts

Test Code	Item Code	Test Temperature °F	Foot Pounds	Average
PP-4	G-307-4	-40	13.0, 20.0, 12.0	15.0
PP-4	G-307-4	+10	37.0, 35.0, 39.0	36.6
PP-4	G-307-4	60	50.0, 41.0, 61.0	50.6
PP-4	G-307-4	110	82.0, 75.0, 84.5	80.5
PP-4	G-307-4	212	80.0, 83.5, 80.0	81.0
YP-4	G-307-8	+10	25.0, 20.0, 36.0	
YP-4	G-307-8	+10	25.0, 40.0, 20.0	27.7
YP-4	G-307-8	60	39.0, 53.0, 31.0	52.0
YP-4	G-307-8	110	78.0, 64.5, 62.0	68.2
YP-4	G-307-8	212	105.0, 100.0, 97.0	100.7
RP-4	G-307-10	-40	16.5, 12.5, 13.0	13.3
RP-4	G-307-10	+10	40.0, 33.0, 45.0	39.3
RP-4	G-307-10	60	45.0, 56.5, 63.0	54.3
RP-4	G-307-10	110	68.0, 80.0, 63.0	70.3
RP-4	G-307-10	212	97.0, 100.0, 100.0	99.0
ZP-4	G-307-11	+10	26.0, 16.0, 23.0	21.7
ZP-4	G-307-11	+10	34.0, 37.0, 32.0	36.7
ZP-4	G-307-11	60	43.0, 43.0, 43.0	43.0
ZP-4	G-307-11	110	60.0, 55.5, 59.0	58.2
ZP-4	G-307-11	212	87.5, 90.0, 90.0	89.2

ZP-4¹ Denotes retest.



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58314 COMB STION ENGINEER. IG, INC.

ADDRESSEE

SUBJECT

FROM — DATE

Mr. W. A. Stone

Mechanical Test Report
N. J. Central
Contract 264
E-6767 M-31035Metallurgical Research And.
Development-Chattanoogacc: Mr. R. E. Lorentz, Jr.
Mr. A. Kincaid
Mr. R. Hillis ✓
Mr. L. C. Northard
G. E. Representative

July 27, 1964

The following test data are for four (4) of the shell plates which are 25 7/8" x 135 3/16" x 7 7/8" SA-302-B material for use on the subject contract.

The shell plates were heat treated by C-E-I at 1550°-1600°F, held at temperature four (4) hours dip quenched plus 1225° ± 25°F, held at temperature four (4) hours. A test sample was then removed from each shell plate represented. The test samples were given an additional heat treatment of 1150°F ± 25°F, held at temperature thirty (30) hours furnace cooled to 600°F.

The test results are as follows:

Charpy V Notch Impacts

<u>Test Code</u>	<u>Item Code</u>	<u>Test Temperature °F</u>	<u>Foot Pounds</u>	<u>Average</u>
IP-4	G-307-5	-40	30.5	30.5
IP-4	G-307-5	+10	29.0, 39.5, 38.5	32.3
IP-4	G-307-5	40	54.5, 58.5, 45.5	52.8
IP-4	G-307-5	60	57.5	57.5
IP-4	G-307-5	110	85.8	85.8
IP-4	G-307-5	160	94.5	94.5
JP-4	G-308-1	-40	11.0	11.0
JP-4	G-308-1	+10	30.0, 39.5, 25.0	31.5
JP-4	G-308-1	40	40.0, 41.0, 45.0	42.0
JP-4	G-308-1	60	40.0	40.0
JP-4	G-308-1	110	92.0	92.0
JP-4	G-308-1	160	81.0	81.0
KP-4	G-307-3	-40	8.0	8.0
KP-4	G-307-3	+10	27.5, 37.5, 41.0	35.3
KP-4	G-307-3	40	41.5, 52.0, 57.0	50.2
KP-4	G-307-3	60	63.5	63.5
KP-4	G-307-3	110	82.0	82.0
KP-4	G-307-3	160	101.5	101.5
LP-4	G-307-1	-40	16.5	16.5
LP-4	G-307-1	+10	21.0, 22.5, 16.5	20.0
LP-4	G-307-1	+10*	37.5, 36.0, 30.0	34.5
LP-4	G-307-1	40	30.0, 39.0, 34.0	34.3
LP-4	G-307-1	60	46.0	46.0
LP-4	G-307-1	110	72.0	72.0
LP-4	G-307-1	160	99.5	99.5

* Denotes retest.



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COMBUSTION ENGINEERING, INC.

ADDRESSEE

SUBJECT

FROM — DATE

Mr. W. A. Stone

- 2 -

September 15, 1964

.505 Tensile Data

Test Code	Item Code	Yield Strength Psi	Ultimate Tensile Strength Psi	Elongation In 2" ϵ	Reduction Of Area %
PP-4	G-307-4	69,400	89,900	27.0	66.2
YP-4	G-307-8	63,500	86,000	27.0	66.0
RP-4	G-307-10	69,400	92,900	25.0	67.0
ZP-4	G-307-11	75,000	97,500	24.0	60.5

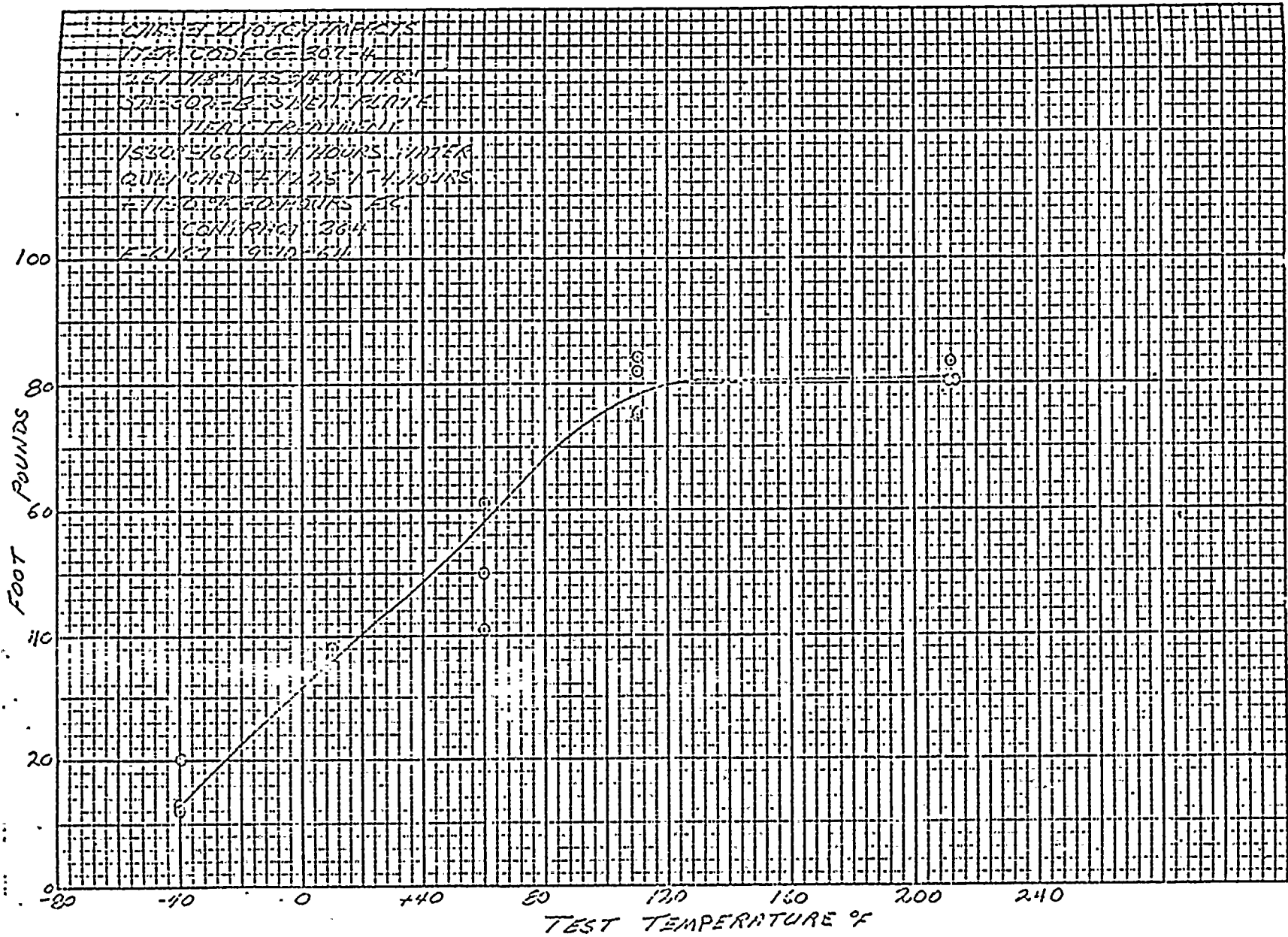
The charpy V notch impacts were taken with the length parallel to the major direction of rolling of the plate with the length of the notch perpendicular to the plate surface. The .505 tensile specimens were taken with the length parallel to the major direction of rolling of the plate. All test specimens were taken at least 1 T from the quenched edge at the 1/4 thickness level.

Graphs of the summary of the charpy v notch impact test results are attached.

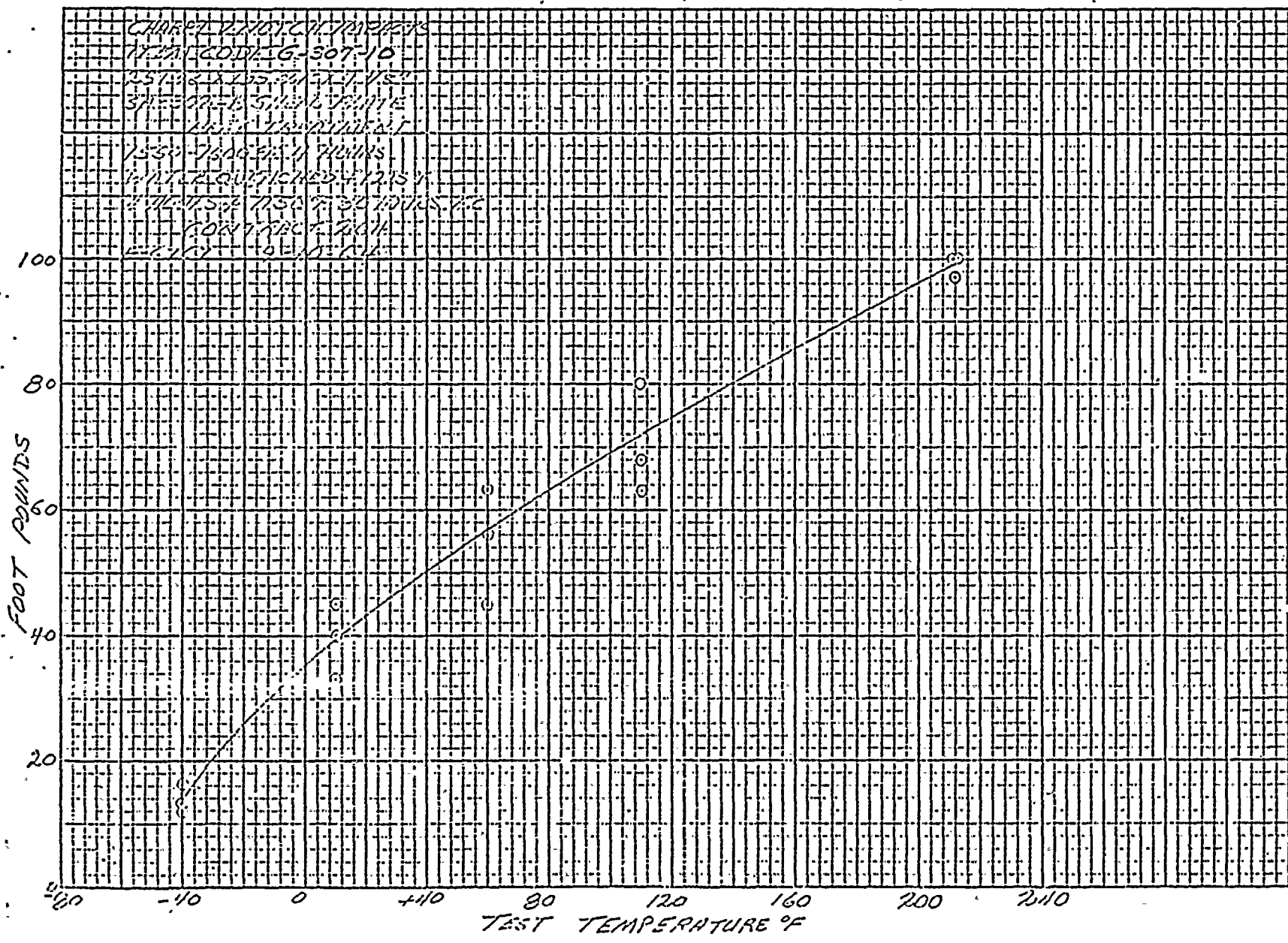
S. R. Lewis
S. R. Lewis

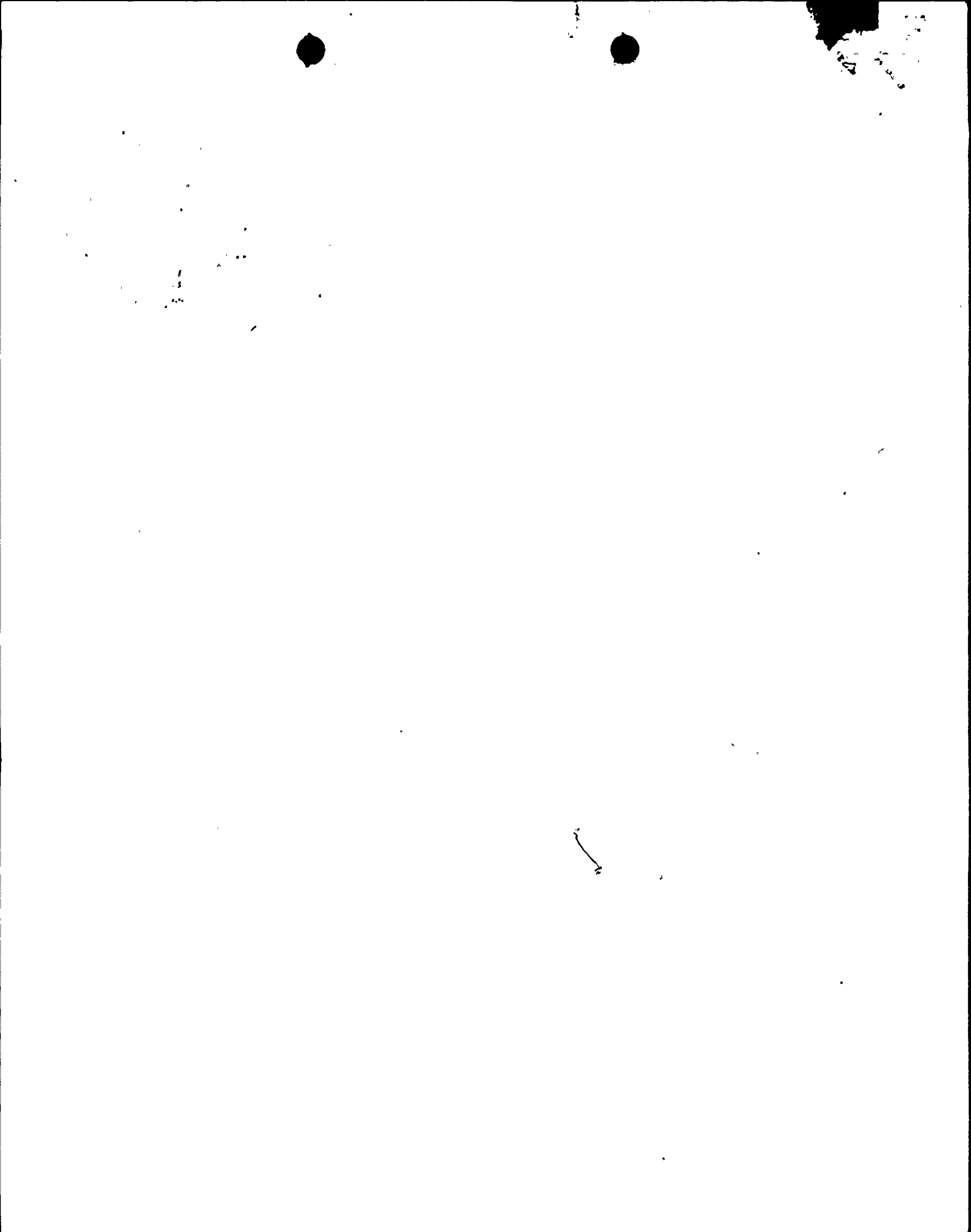
SRL:mvc
attachments





10/10/10





REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)
DISTRIBUTION FOR INCOMING MATERIAL 50-220

REC: GOLLER K R
NRC

ORG: DISE D P
NIAGARA MOHAWK PWR

DOCDATE: 01/13/78
DATE RCVD: 02/16/78

DOCTYPE: LETTER NOTARIZED: NO
SUBJECT:

COPIES RECEIVED
LTR 1 ENCL 0

RESPONSE TO NRC'S TELECON OF 01/27/78 REQUESTING INFO RE TERMINAL
BLOCKS AT UNIT 1... ADVISING THIS INFO WAS PROVIDED ON
01/31/78... AND THAT UNIT 1 DOES NOT UTILIZE UNPROTECTED TERMINAL
BLOCKS.

PLANT NAME: NINE MILE PT - UNIT 1

REVIEWER INITIAL: XJM
DISTRIBUTOR INITIAL:

***** DISTRIBUTION OF THIS MATERIAL IS AS FOLLOWS *****

GENERAL DISTRIBUTION FOR AFTER ISSUANCE OF OPERATING LICENSE.
(DISTRIBUTION CODE A001)

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INTERNAL:

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I & E**LTR ONLY(2)
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SHAO**LTR ONLY(1)
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OSWEGO, NY**LTR ONLY(1)
TIC**LTR ONLY(1)
NSIC**LTR ONLY(1)
ACRS CAT B**LTR ONLY(16)

DISTRIBUTION: LTR 40 ENCL 0
SIZE: 1P

CONTROL NBR: 780480248

***** THE END *****

ap 3 T

February 13, 1978

Mr. Karl R. Goller
Assistant Director for Operating Reactors
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555



Re: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63

Dear Mr. Goller:

Mr. Nowicki of your staff telephoned on January 27, 1978 requesting information regarding terminal blocks at Nine Mile Point Unit 1. This information was provided on January 31, 1978 before noon.

It was indicated that Unit 1 does not utilize unprotected terminal blocks. If you require any further information, please let us know.

Very truly yours,

NIAGARA MOHAWK POWER CORPORATION

A handwritten signature in cursive script that reads "Donald P. Dise".

Donald P. Dise
Vice President-Engineering

NLR/szd

A001/s *
1/0

RECEIVED DOCUMENT
CONTROL DESK

1978 FEB 10 PM 12 35

U.S. NRC
DISTRIBUTION SERVICES
BRANCH

100-100000-100000
100-100000-100000
100-100000-100000