

Acme Coke
11236 S. Torrence Ave.
Chicago IL 60617



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Battery Expansion Measurements
Dated: 1959

INTERLAKE IRON CORPORATION
11236 Torrence Avenue
CHICAGO 17, ILLINOIS

FIRST CLASS MAIL

OVEN EXTENSION
MEASUREMENTS

Interlake Iron Corporation

1900 UNION COMMERCE BLDG.

Cleveland 14, Ohio

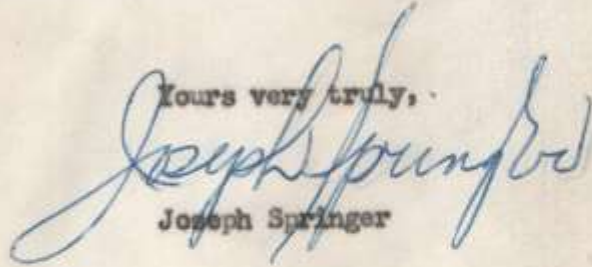
August 12, 1959

Mr. R. B. Chamberlin
Assistant Superintendant Coke Plant

Dear Sir:

Please find attached Expansion Spring measurements
P & C.S. Batteries 1 & 2. These measurements obtained with
great care and caution - and please note these measurements are
28 days after "Slow Down".

Yours very truly,

A handwritten signature in cursive script that reads "Joseph Springer". The signature is written in dark ink and is positioned above the typed name.

Joseph Springer

fn

Encl.

Top Expansion - Spring - Measurements

P.S. Battery #1

<u>North</u>	<u>Oven</u>	<u>South</u>	<u>North</u>	<u>Oven</u>	<u>South</u>
5-1/16	Pinion		4-15/16	29	4-15/16
5"	1	4-7/8	4-15/16	31	4-7/8
4-7/8	2	4-7/8	4-7/8	32	4-7/8
4-7/8	3	4-7/8	4-7/8	33	4-15/16
4-7/8	4	4-7/8	4-15/16	34	4-15/16
4-11/16	5	4-11/16	4-15/16	35	4-15/16
4-15/16	6	4-7/8	4-15/16	36	4-15/16
4-15/16	7	4-15/16	4-15/16	37	4-15/16
4-7/8	8	4-7/8	4-15/16	38	4-15/16
4-15/16	9	4-7/8	4-15/16	39	4-7/8
4-15/16	11	4-15/16	4-7/8	41	4-7/8
4-15/16	12	4-15/16	4-13/16	42	4-7/8
4-15/16	13	4-15/16	4-7/8	43	4-7/8
4-15/16	14	4-7/8	4-15/16	44	4-3/4
4-7/8	15	4-15/16	4-3/4	45	4-13/16
4-15/16	16	4-15/16	4-7/8	46	4-13/16
4-15/16	17	4-7/8	4-13/16	47	4-13/16
4-15/16	18	4-15/16	4-13/16	48	4-3/4
4-7/8	19	4-7/8	4-3/4	49	4-13/16
4-7/8	21	4-15/16	4-13/16	51	4-13/16
4-15/16	22	4-7/8	4-13/16	52	4-13/16
4-15/16	23	4-7/8	4-13/16	53	4-13/16
4-7/8	24	4-7/8	4-13/16	54	4-13/16
4-15/16	25	4-15/16	4-13/16	55	4-7/8
4-7/8	26	4-7/8	4-15/16	55E	
4-15/16	27	4-15/16			
4-15/16	28	4-15/16			

Aug 4, 886

Top Expansion - Spring - Measurements

C.S. Battery #1

<u>North</u>	<u>Oven</u>	<u>South</u>	<u>North</u>	<u>Oven</u>	<u>South</u>
4-15/16	Pinion				
5-1/16	1	4-7/8	4-13/16	28	4-7/8
4-15/16	2	4-7/8	4-13/16	29	4-7/8
4-13/16	3	4-13/16	4-7/8	31	4-3/4
4-13/16	4	4-13/16	4-13/16	32	4-13/16
4-13/16	5	4-7/8	4-3/4	33	4-13/16
4-7/8	6	4-13/16	4-13/16	34	4-13/16
4-13/16	7	4-7/8	4-7/8	35	4-7/8
4-13/16	8	4-15/16	4-7/8	36	4-13/16
4-13/16	9	4-13/16	4-7/8	37	4-7/8
4-13/16	11	4-7/8	4-7/8	38	4-3/4
4-7/8	12	4-7/8	4-3/4	39	4-13/16
4-13/16	13	4-7/8	4-13/16	41	4-15/16
4-7/8	14	4-3/4	4-7/8	42	4-13/16
4-13/16	15	4-13/16	4-13/16	43	4-7/8
4-13/16	16	4-13/16	4-15/16	44	4-13/16
4-13/16	17	4-13/16	4-13/16	45	4-3/4
4-13/16	18	4-13/16	4-3/4	46	4-15/16
4-15/16	19	4-13/16	4-13/16	47	4-13/16
4-7/8	21	4-13/16	4-13/16	48	4-13/16
4-13/16	22	4-7/8	4-13/16	49	4-7/8
4-13/16	23	4-13/16	4-13/16	51	4-7/8
4-13/16	24	4-13/16	4-7/8	52	4-15/16
4-3/4	25	4-7/8	4-7/8	53	4-7/8
4-7/8	26	4-7/8	4-7/8	54	4-15/16
4-13/16	27	4-13/16	4-7/8	55	5.0
			5-1/8	55E	

Avy 4/1. 846

Top Expansion - Spring - Measurements

P.S. Battery #2

<u>North</u>	<u>Oven</u>	<u>South</u>	<u>North</u>	<u>Oven</u>	<u>South</u>
5-3/16	Pinion	5-13/16	4-13/16	84	4-7/8
5-1/16	56	5"	4-7/8	85	5"
4-7/8	57	4-7/8	4-15/16	86	4-13/16
4-15/16	58	4-13/16	4-13/16	87	4-7/8
4-15/16	59	4-7/8	4-7/8	88	4-7/8
4-13/16	61	4-7/8	4-15/16	89	4-13/16
4-13/16	62	4-7/8	4-7/8	91	4-15/16
4-7/8	63	4-13/16	4-13/16	92	4-13/16
4-3/4	64	4-7/8	4-13/16	93	4-7/8
4-7/8	65	4-7/8	4-13/16	94	4-7/8
4-7/8	66	4-13/16	4-13/16	95	4-15/16
4-7/8	67	4-15/16	4-13/16	96	4-3/4
4-7/8	69	5"	4-13/16	97	5"
4-7/8	69	4-15/16	4-7/8	98	4-7/8
4-7/8	71	4-7/8	4-7/8	99	4-7/8
4-7/8	72	4-7/8	4-7/8	101	4-7/8
4-7/8	73	4-7/8	4-7/8	102	4-7/8
4-7/8	74	4-7/8	4-15/16	103	4-7/8
4-13/16	75	4-7/8	4-13/16	104	4-7/8
4-7/8	76	4-3/4	4-7/8	105	4-15/16
4-7/8	77	4-15/16	4-13/16	106	4-15/16
4-7/8	78	4-13/16	4-15/16	107	5"
4-7/8	79	5"	4-7/8	108	4-7/8
4-13/16	81	4-7/8	4-7/8	109	4-15/16
4-7/8	82	4-7/8	4-7/8	111	5-1/16
4-7/8	83	4-13/16	5-3/16	111E	

4.871

Top Expansion - Spring - Measurements

G.S. Battery #2

<u>North</u>	<u>Oven</u>	<u>South</u>	<u>North</u>	<u>Oven</u>	<u>South</u>
5-1/4	Pinion		4-7/8	84	4-13/16
5-1/8	56	4-15/16	4-15/16	85	4-7/8
4-13/16	57	4-13/16	4-7/8	86	4-7/8
4-13/16	58	4-11/16	4-13/16	87	4-7/8
4-13/16	59	4-13/16	4-7/8	88	4-15/16
4-13/16	61	4-13/16	5-1/16	89	4-13/16
4-15/16	62	4-7/8	4-13/16	91	5.0
4-7/8	63	4-3/4	5.0	92	4-7/8
5-1/16	64	4-15/16	4-13/16	93	4-15/16
4-7/8	65	4-13/16	4-13/16	94	4-15/16
4-13/16	66	4-7/8	4-7/8	95	4-7/8
4-15/16	67	5.0	4-7/8	96	4-13/16
4-15/16	69	4-15/16	4-13/16	97	4-7/8
4-7/8	69	4-3/4	4-13/16	98	5-11/16
4-7/8	71	4-15/16	4-7/8	99	4-3/4
4-15/16	72	5.0	4-7/8	101	4-15/16
4-7/8	73	4-13/16	4-7/8	102	4-7/8
4-13/16	74	4-7/8	4-7/8	103	4-11/16
4-15/16	75	4-3/4	4-7/8	104	4-7/8
4-3/4	76	4-13/16	4-7/8	105	5.0
4-3/4	77	4-13/16	4-7/8	106	4-15/16
4-7/8	78	5.0	4-13/16	107	4-7/8
4-7/8	79	4-13/16	4-15/16	108	4-13/16
4-13/16	81	4-7/8	4-13/16	109	5.0
4-15/16	82	4-7/8	4-13/16	111	5-1/16
4-13/16	83	4-15/16	5-1/16	111E	

4.877

Mr. J. B. Kaminski (3)

October 15, 1959

R. C. Kaase

Oven Expansion Measurements

H. R. Nicklaus

R. B. Chamberlin

C
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P
Y
This report is a summary of the method used and results obtained to establish the present location of buckstays and regenerator face brick at the Interlake Iron Corporation, Chicago Plant, Coke Ovens.

The results within were correlated at 100 hour coking time and can be used as a basis for comparison with future measurements at different coking times. By comparison of present and future measurements, regenerator movement can be determined.

Also included are buckstay tie-rod spring measurements. These measurements may be used as a basis for future measurements to determine general oven expansion or contraction.

Roger C. Kaase
Roger C. Kaase

RCK/jp

Location Of Guide Wires

Guide wires stretched through the pusher side and coke side alleys of Battery 1 and Battery 2 are used as the base line for regenerator face brick and buckstay measurements.

The following data was obtained to establish the exact location of each of the four wires so meaningful comparisons of future measurements can be made.

It should be noted that the end points of each wire is anchored at a fixed point away from the oven proper, at which point expansion and contraction is assumed to be negligible.

Knee Brace LocationBattery 1

North end:

Coke side - On third platform column north of pinion wall.

Pusher side - On third platform column north of pinion wall.

South end:

Coke side - On foundation of charging bin structure.

Pusher side - On foundation of charging bin structure.

Battery 2

North end:

Coke side - On first platform column north of pinion wall.

Pusher side - On first platform column north of pinion wall.

South end:

Coke side - On second platform column south of pinion wall.

Pusher side - On second platform column south of pinion wall.

Wire Location

Measurements taken as close to turnbuckles as possible.

	<u>Center Line of Bench Column to Wire</u>	<u>Floor to Wire</u>
Battery 1 - North end		
Coke side	50-1/16"	60-15/16"
Pusher side	45-5/8"	63-13/16"
Battery 1 - South end		
Coke side	48-15/16"	51-15/16"
Pusher side	46"	56-11/16"
Battery 2 - North end		
Coke side	51-15/16"	56-1/8"
Pusher side	45-14/16"	56-7/16"
Battery 2 - South end		
Coke side	52-4/16"	59-11/16"
Pusher side	46-14/16"	54-5/16"

Distance Between Wires

Measurements made with steel tape at 72°F. - no temperature corrections were made on following readings.

Battery 1	North end	-	50° 9-3/4"
	South end	-	50° 10-3/4"
Battery 2	North end	-	50° 7-3/4"
	South end	-	50° 6-1/2"

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Measurements

Measurements were taken from the wire to each buckstay and from the wire to the face brick of each regenerator, directly adjacent to each buckstay. This report includes the minimum and maximum measurement as well as the average for each series of measurements.

The following measurements were taken at 100 hour coking time. All measurements are tabulated and available for anyone concerned.

	<u>Max.</u>	<u>Min.</u>	<u>Avg.</u>	<u>Date</u>	<u>Average Flue Temp.</u>
Battery 1 - Coke Side					
Wire to Buckstay	33"	32-3/8"	32.707"	10-1-59	1998° F
Wire to Brick	47-1/4"	46-5/8"	46.968"	10-1-59	1998° F
Battery 1 - Pusher side					
Wire to Buckstay	33-1/16"	32-9/16"	32.733"	10-1-59	1998° F
Wire to Brick	47-1/16"	46-7/16"	46.810"	10-1-59	1998° F
Battery 2 - Coke side					
Wire to Buckstay	30-3/4"	30-5/16"	30.507"	10-2-59	2027° F
Wire to Brick	44-7/8"	44-9/16"	44.727"	10-2-59	2027° F
Battery 2 - Pusher side					
Wire to Buckstay	32-1/8"	31-7/16"	31.841"	10-2-59	2027° F
Wire to Brick	46-1/4"	45-3/4"	46.007"	10-2-59	2027° F

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SPRING MEASUREMENTS

Measurements were taken of all tie-rod springs both on the top and bottom of each buckstay. All measurements are tabulated and available. This report includes only minimum, maximum, and average measurements.

BATTERY 1

	<u>Max.</u>	<u>Min.</u>	<u>Avg.</u>	<u>Date</u>
C.S. Top	5-1/16"	4-3/4"	4.822"	10-7-59
P.S. Top	5"	4-11/16"	4.841"	10-7-59
C.S. Bottom	5-7/8"	5-9/16"	5.704"	9-30-59
P. S. Bottom	5-15/16"	5-1/4"	5.709"	9-30-59

BATTERY 2

	<u>Max.</u>	<u>Min.</u>	<u>Avg.</u>	<u>Date</u>
C.S. Top	5-1/8"	4-11/16"	4.844"	10-7-59
P.S. Top	5-1/8"	4-11/16"	4.834"	10-7-59
C.S. Bottom	5-5/8"	5-5/16"	5.494"	9-30-59
P.S. Bottom	5-5/8"	5-7/4"	5.503"	9-30-59

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INTERLAKE IRON CORPORATION
Cleveland 14, Ohio

From RBE 11/20

Mr. J. E. Kaminski - Chicago Plant
J. B. Hazle - Cleveland Office

October 19, 1959

Enclosed is a graph showing the thermal expansion for silica brick at various temperatures. I told Reg Chamberlin and Joe Springer that I would send them this information.

Will you please have them copy the graph and return the original to me.

ORIGINAL RECEIVED
J. B. HAZLE

J. B. Hazle

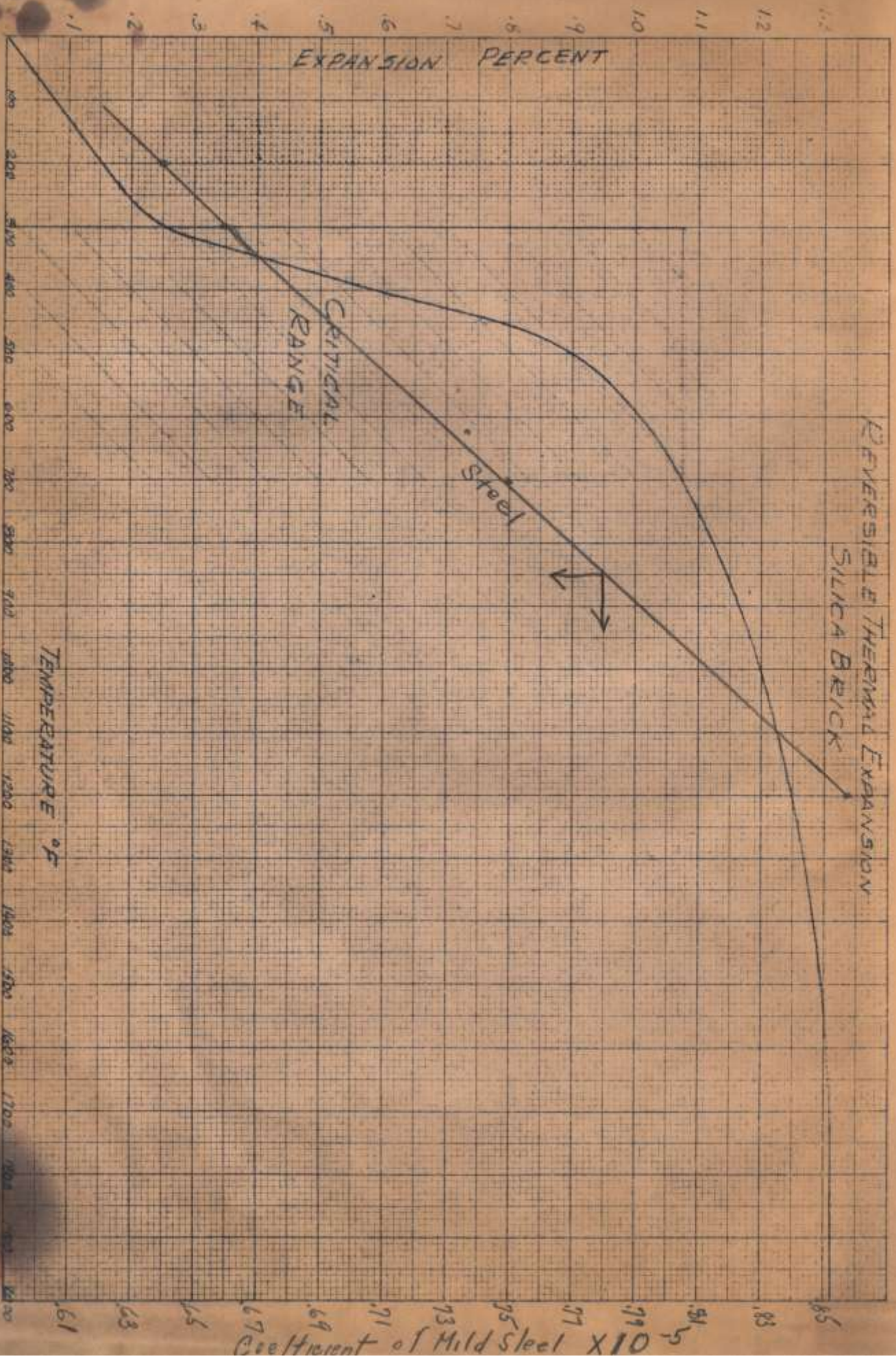
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Copies being made in engineering. 11/20

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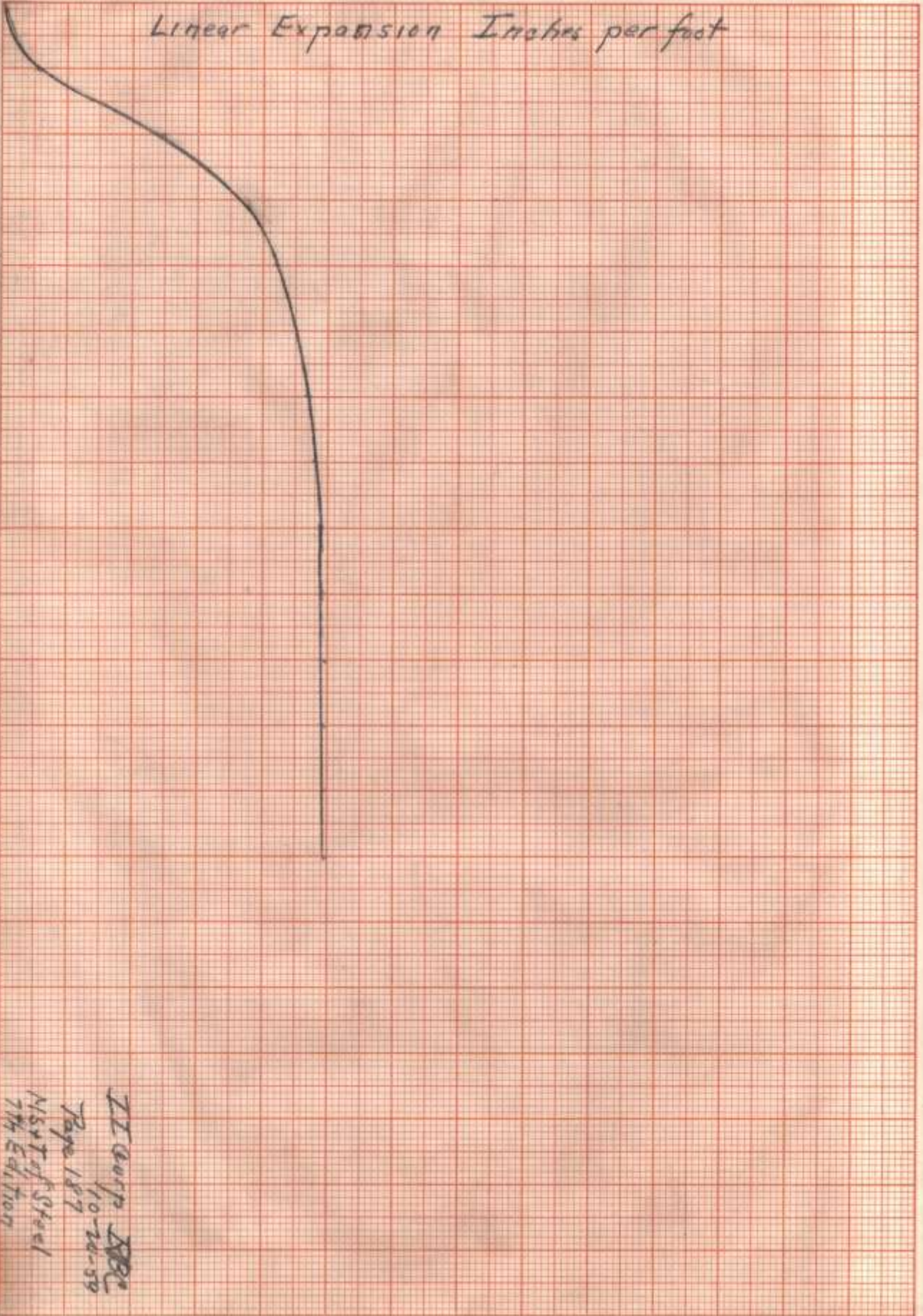


RBC
 OCT 21 1959

Linear Expansion Inches per foot

1/16 1/8 3/16 1/4

Temp. Degrees Fahrenheit
200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800



II Corp
Page 187
10-20-59
MSPT of Steel
7th Edition

Mr. J. B. Kaminski (3)

October 21, 1959

Mr. R. B. Chamberlin

Oven Expansion Measurements

H. R. Nicklaus

Attached is report of Roger Kaase, summarizing recent measurements taken at Ovens. This report includes:-

1. Measurement from reference wire to buckstays and also to face of regenerator brick work.
2. All spring measurements on tie rods.

A study of this work discloses the following general observations since the slowdown.

The regenerator brick work face has receded from the buckstays although no measurements at high speeds were available for comparison.

The tie rod springs on top of the batteries have been compressed. In many instances the springs show a measurement indicating full compression. These springs were measured in June, 1959, during high speed operation. At this time, no spring was under full compression. This is explainable because of contraction of steel tie rods due to drop in temperature.

The tie rod springs at the bottom of buckstays, have apparently opened up some on Battery 1. Their average measurement is 5.7" as compared to an original setting of 5.5". The bottom springs on Battery 2 still average 5.5".

Mr. Mc Cain of Wilputte spent about five hours with us yesterday studying these results and inspecting the batteries.

His comments were as follows.

No changes in springs should be made at present. All results of these measurements are as he would expect, except the bottom springs on Battery 1. If, when the batteries are taken back to 18 hour coking and these springs do not return to 5.5", he recommends they be set back manually to the 5.5" dimension.

October 21, 1959

Page -2-

Mr. Mc Cain commented on the general condition of both batteries as excellent. He requested a copy of Mr. Kaase's report as well as a copy of Mr. Springers report on re-generator temperatures. Three copies of these reports are attached for your disposition.

It is his recommendation that we continue these measurements at weekly intervals during speed up of batteries. We agree with this, and will carry it out unless otherwise noted.

R. B. Chamberlin

RBC/jp

INTERLAKE IRON CORPORATION

INTEROFFICE CORRESPONDENCE

TO: Mr. R. B. Chamberlin

October 29, 1959

FROM: R. C. Kaase

SUBJECT: Oven Measurements

COPIES TO:

*Copy to
R.B.C.
HRN*

The following information is a summary of results obtained on wire to buckstay, wire to regenerator brick and tie-rod spring measurements. The average top tie-rod temperatures are also included. All information was obtained at 100 hour coking time and results are compared with previous measurements. Only a representative number of measurements were obtained for comparison.

Wire to Buckstay Measurements

<u>Battery No. 1</u>	<u>Max.</u>	<u>Min.</u>	<u>Avg.</u>	<u>Date</u>	<u>Average Flue Temp.</u>
Coke Side	32-7/8"	32-1/2"	32.758"	10/28/59	2058°F
Coke Side	33-0"	32-3/8"	32.707"	10/1	1998°F
Pusher Side	32-7/8"	32-9/16"	32.680"	10/28	2058°F
Pusher Side	33-1/16"	32-9/16"	32.733"	10/1	1998°F
<u>Battery No. 2</u>					
Coke Side	30-9/16"	30-7/16"	30.477"	10/28	2062°F
Coke Side	30-3/4"	30-5/16"	30.507"	10/2	2027°F
Pusher Side	32-1/16"	31-9/16"	31.844"	10/28	2062°F
Pusher Side	32-1/8"	31-7/16"	31.841"	10/2	2027°F

Wire to Brick Measurements

<u>Battery No. 1</u>					
Coke Side	47-1/4"	46-11/16"	47.023"	10/28	2058°F
Coke Side	47-1/4"	46-5/8"	46.968"	10/1	1998°F
Pusher Side	47-0"	46-3/4"	46.852"	10/28	2058°F
Pusher Side	47-1/16"	46-7/16"	46.810"	10/1	1998°F
<u>Battery No. 2</u>					
Coke Side	44-13/16"	44-11/16"	44.766"	10/28	2062°F
Coke Side	44-7/8"	44-9/16"	44.727"	10/2	2027°F
Pusher Side	46-3/16"	45-13/16"	46.000"	10/28	2062°F
Pusher Side	46-1/4"	45-3/4"	46.007"	10/2	2027°F

Spring Measurements

<u>Battery No. 1</u>	<u>Max.</u>	<u>Min.</u>	<u>Avg.</u>	<u>Date</u>	<u>Average Flue Temp.</u>
C. S. Top	5-1/8"	4-11/16"	4.810"	10/26/59	2049°F
C. S. Top	5-1/16"	4-3/4"	4.822"	10/7	2016°F
P. S. Top	5-0"	4-11/16"	4.835"	10/26	2049°F
P. S. Top	5-0"	4-11/16"	4.841"	10/7	2016°F
C. S. Bottom	5-13/16"	5-5/8"	5.719"	10/28	2058°F
C. S. Bottom	5-7/8"	5-9/16"	5.704"	9/30	1990°F
P. S. Bottom	5-7/8"	5-5/8"	5.731"	10/28	2058°F
P. S. Bottom	5-15/16"	5-1/4"	5.709"	9/30	1990°F
<u>Battery No. 2</u>					
C. S. Top	5-1/8"	4-11/16"	4.867"	10/26	2046°F
C. S. Top	5-1/8"	4-11/16"	4.844"	10/7	2050°F
P. S. Top	5-1/8"	4-11/16"	4.862"	10/26	2046°F
P. S. Top	5-1/8"	4-11/16"	4.834"	10/7	2050°F
C. S. Bottom	5-1/2"	5-3/8"	5.477"	10/28	2062°F
C. S. Bottom	5-5/8"	5-5/16"	5.494"	9/30	2023°F
P. S. Bottom	5-5/8"	5-7/16"	5.527"	10/28	2062°F
P. S. Bottom	5-5/8"	5-1/4"	5.503"	9/30	2023°F

Top Tie-Rod Temperatures - Oct. 26, 1959

	<u>Max.</u>	<u>Min.</u>	<u>Avg.</u>	<u>Atm. Temp.</u>	<u>Average Flue Temp.</u>
Battery No. 1	410°F	264°F	337°F	38°F	2050°F
Battery No. 2	439°F	288°F	352°F	38°F	2044°F

Roger C. Kaase
Roger C. Kaase

Mr. H. R. Nicklaus

December 1, 1959

R. C. Kaase

Oven Measurements

R. B. Chamberlin

The following information is a summary of results obtained on wire to buckstay, wire to regenerator face brick and tie-rod spring measurements. The average top tie-rod temperatures are also included.

The results obtained during the present increase in pushing schedule are compared with previous measurements taken at 100 hour coking time.

Wire to Buckstay Measurements

Battery No. 1	Max.	Min.	Avg.	Date	Coking Time (Hrs)	Avg. Flue Temp.
Coke Side	33-0"	32-3/8"	32.713"	11/25	40.0	2118°F
Coke Side	33-0"	32-3/8"	32.707	10/1	100.0	1998°
Pusher Side	32-15/16"	32-7/16"	32.607"	11/25	40.0	2118°F
Pusher Side	33-1/16"	32-9/16"	32.733	10/1	100.0	1998°
<u>Battery No. 2</u>						
Coke Side	30-9/16"	30-1/8"	30.330"	11/30	34.8	2231°F
Coke Side	30-3/4"	30-5/16"	30.507"	10/2	100.0	2027°
Pusher Side	31-15/16"	31-5/16"	31.665"	11/26	36.4	2224°F
Pusher Side	32-1/8"	31-7/16"	31.841"	10/2	100.0	2027°

Wire to Brick Measurements

<u>Battery No. 1</u>						
Coke Side	47-5/16"	46-11/16"	46.983"	11/25	40.0	2118°F
Coke Side	47-1/4"	46-5/8"	46.968"	10/1	100.0	1998°
Pusher Side	47-1/16"	46-7/16"	46.717"	11/25	40.0	2118°
Pusher Side	47-1/16"	46-7/16"	46.810"	10/1	100.0	1998°
<u>Battery No. 2</u>						
Coke Side	44-11/16"	44-5/16"	44.507"	11/30	34.8	2231°F
Coke Side	44-7/8"	44-9/16"	44.727"	10/2	100.0	2027°
Pusher Side	46-1/8"	45-1/2"	45.778"	11/26	36.4	2224°F
Pusher Side	46-1/4"	45-3/4"	46.007"	10/2	100.0	2027°

Top Tie-Rod Temperatures (°F)

<u>Battery No. 1</u>	Max.	Min.	Avg.	Atm. Temp.	Avg. Flue Temp.	Date
	387	263	342	36	2142	11/30/59
	410	264	337	38	2050	10/26/59
<u>Battery No. 2</u>	430	265	353	36	2231	11/30/59
	439	288	352	38	2044	10/26/59

Spring Measurements

<u>Battery No. 1</u>	Max.	Min.	Avg.	Date	Colg. Time (Hrs.)	Avg. Flue Temp.
C. S. Top	5-1/16"	4-11/16"	4.809"	12/1	33.3	2136°F
C. S. Top	5-1/16"	4-3/4"	4.822"	10/7	100.0	2016°
P. S. Top	5-0"	4-3/4"	4.849"	12/1	33.3	2136°F
P. S. Top	5-0"	4-11/16"	4.841"	10/7	100.0	2016°
C. S. Bottom	5-13/16"	5-1/2"	5.635"	11/23	50.0	2076°F
C. S. Bottom	5-7/8"	5-9/16"	5.704"	9/30	100.0	1990°
P. S. Bottom	5-7/8"	5-1/4"	5.695"	11/23	50.0	2078°F
P. S. Bottom	5-15/16"	5-1/4"	5.709"	9/30	100.0	1990°
<u>Battery No. 2</u>						
C. S. Top	5-1/4"	4-11/16"	4.877"	12/1	33.3	2229°F
C. S. Top	5-1/8"	4-11/16"	4.844"	10/7	100.0	2050°
P. S. Top	5-3/16"	4-3/4"	4.890"	12/1	33.3	2229°F
P. S. Top	5-1/8"	4-11/16"	4.834"	10/7	100.0	2050°
C. S. Bottom	5-1/2"	5-1/4"	5.402"	11/24	44.4	2235°F
C. S. Bottom	5-5/8"	5-5/16"	5.494"	9/30	100.0	2023°
P. S. Bottom	5-9/16"	5-5/16"	5.427"	11/24	44.4	2235°F
P. S. Bottom	5-5/8"	5-1/4"	5.503"	9/30	100.0	2023°

Roger C. Kaase
Roger C. Kaase

COPY

INTERLAKE IRON CORPORATION

INTEROFFICE CORRESPONDENCE

TO: Mr. R. B. Chamberlin

December 16, 1959

FROM: R. C. Kaase

SUBJECT: Oven Measurements

COPIES TO:

→ JBN
JHN

The following information is a summary of results obtained on wire to buckstay, wire to regenerator face brick and tie-rod spring measurements. The results obtained during the present increase in pushing schedule are compared with previous measurements at different coking times.

It was found that the north end point of Battery No. 2, coke side, guide wire has moved 3/16" toward the bench column. At this location, the wire is anchored on the first platform column north of the pinion wall. No corrections were made on measurements taken.

Roger C. Kaase
Roger C. Kaase

lb.

attach.

WIRE TO BUCKSTAY MEASUREMENTS

<u>Battery No. 1:</u>	<u>Max.</u>	<u>Min.</u>	<u>Avg.</u>	<u>Date</u>	<u>Coking Time (Hrs)</u>	<u>Avg. Flue Temp. (*F)</u>
Coke Side	32-7/8"	32-5/16"	32.670"	12/16	23.5	2343
Coke Side	33-0"	32-3/8"	32.713"	11/25	40.0	2118
Coke Side	33-0"	32-3/8"	32.707"	10/1	100.0	1998
Pusher Side	32-15/16"	32-7/16"	32.597"	12/16	23.5	2343
Pusher Side	32-15/16"	32-7/16"	32.607"	11/25	40.0	2118
Pusher Side	33-1/16"	32-9/16"	32.733"	10/1	100.0	1998
<u>Battery No. 2:</u>						
Coke Side	30-12/16"	30-1/4"	30.460"	12/16	23.5	2356
Coke Side	30-9/16"	30-1/8"	30.330"	11/30	34.8	2231
Coke Side	30-3/4"	30-5/16"	30.507"	10/2	100.0	2027
Pusher Side	31-15/16"	31-1/2"	31.727"	12/16	23.5	2356
Pusher Side	31-15/16"	31-5/16"	31.665"	11/26	36.4	2224
Pusher Side	32-1/8"	31-7/16"	31.841"	10/2	100.0	2027

WIRE TO BRICK MEASUREMENTS

<u>Battery No. 1:</u>						
Coke Side	47-5/16"	46-11/16"	46.943	12/16	23.5	2343
Coke Side	47-5/16"	46-11/16"	46.983"	11/25	40.0	2118
Coke Side	47-1/4"	46-5/8"	46.968"	10/1	100.0	1998
Pusher Side	47-0"	46-9/16"	46.722"	12/16	23.5	2343
Pusher Side	47-1/16"	46-7/16"	46.717"	11/25	40.0	2118
Pusher Side	47-1/16"	46-7/16"	46.810	10/1	100.0	1998
<u>Battery No. 2:</u>						
Coke Side	44-13/16"	44-1/2"	44.653"	12/16	23.5	2356
Coke Side	44-11/16"	44-5/16"	44.507"	11/30	34.8	2231
Coke Side	44-7/8"	44-9/16"	44.727"	10/2	100.0	2027
Pusher Side	46-1/16"	45-5/8"	45.881"	12/16	23.5	2356
Pusher Side	46-1/8"	45-1/2"	45.778"	11/26	36.4	2224
Pusher Side	46-1/4"	45-3/4"	46.007	10/2	100.0	2027

SPRING MEASUREMENTS

<u>Battery No. 1:</u>	<u>Max.</u>	<u>Min.</u>	<u>Avg.</u>	<u>Date</u>	<u>Coking Time (Hrs)</u>	<u>Avg. Flue Temp. (*F)</u>
C. S. Top	5-1/8"	4-11/16"	4.816"	12/15	24.2	2344
C. S. Top	5-1/16"	4-11/16"	4.809"	12/1	33.3	2136
C. S. Top	5-1/16"	4-3/4"	4.822"	10/7	100.0	2016
P. S. Top	5-0"	4-3/4"	4.849"	12/15	24.2	2344
P. S. Top	5-0"	4-3/4"	4.849"	12/1	33.3	2136
P. S. Top	5-0"	4-11/16"	4.841"	10/7	100.0	2016
C. S. Bottom	5-3/4"	5-1/2"	5.623"	12/15	24.2	2344
C. S. Bottom	5-13/16"	5-1/2"	5.635"	11/23	50.0	2078
C. S. Bottom	5-7/8"	5-9/16"	5.704"	9/30	100.0	1990
P. S. Bottom	5-7/8"	5-1/2"	5.691"	12.15	24.2	2344
P. S. Bottom	5-7/8"	5-1/4"	5.695"	11/23	50.0	2078
P. S. Bottom	5-15/16"	5-1/4"	5.709"	9/30	100.0	1990
 <u>Battery No. 2:</u>						
C. S. Top	5-3/16"	4-11/16"	4.882"	12.15	24.2	2366
C. S. Top	5-1/4"	4-11/16"	4.877"	12/1	33.3	2229
C. S. Top	5-1/8"	4-11/16"	4.844	10/7	100.0	2050
P. S. Top	5-3/16"	4-3/4"	4.877"	12 15	24.2	2366
P. S. Top	5-3/16"	4-3/4"	4.890"	12/1	33.3	2229
P. S. Top	5-1/8"	4-11/16"	4.834"	10/7	100.0	2050
C. S. Bottom	5-1/2"	5-1/4"	5.403"	12/15	24.2	2366
C. S. Bottom	5-1/2"	5-1/4"	5.402"	11/24	44.4	2235
C. S. Bottom	5-5/8"	5-5/16"	5.494"	9/30	100.0	2023
P. S. Bottom	5-9/16"	5-5/16"	5.453"	12/15	24.2	2366
P. S. Bottom	5-9/16"	5-5/16"	5.427"	11/24	44.4	2235
P. S. Bottom	5-5/8"	5-1/4"	5.503"	9/30	100.0	2023

INTERLAKE IRON CORPORATION

INTEROFFICE CORRESPONDENCE

TO: Mr. R. B. Chamberlin
FROM: R. C. Kaase
SUBJECT: Oven Measurements
COPIES TO: J. B. Kaminski
H. R. Nicklaus

January 20, 1960

The following information is a summary of results obtained on wire to buckstay, wire to regenerator face brick and tie-rod spring measurements. The average top tie-rod temperatures are also included.

This report contains similar measurements for varying coking times between 100 hour and 16 hour coke. At the conclusion of the latest measurements, the guide wires and knee braces were removed and stored for future use.

All measurements are tabulated and available for anyone concerned.

Roger C. Kaase
Roger C. Kaase

1b.

attach.

WIRE TO BUCKSTAY MEASUREMENTS

Battery No. 1	Max.	Min.	Avg.	Date	Coking Time(Hrs)	Avg. Flue Temp. (*F)
Coke Side	32-7/8"	32-5/16"	32.653"	1/11/60	16.0	2453
Coke Side	32-7/8"	32-5/16"	32.670"	12/16/59	23.5	2343
Coke Side	33-0"	32-3/8"	32.713"	11/25/59	40.0	2118
Coke Side	33-0"	32-3/8"	32.707"	10/1/59	100.0	1998
Pusher Side	32-7/8"	32-1/2"	32.631"	1/11/60	16.0	2453
Pusher Side	32-15/16"	32-7/16"	32.597"	12/16/59	23.5	2343
Pusher Side	32-15/16"	32-7/16"	32.607"	11/25/59	40.0	2118
Pusher Side	33-1/16"	32-9/16"	32.733"	10/1/59	100.0	1998
<u>Battery No. 2:</u>						
Coke Side	30-3/4"	30-1/4"	30.432"	1/11/60	16.0	2496
Coke Side	30-3/4"	30-1/4"	30.460"	12/16/59	23.5	2356
Coke Side	30-9/16"	30-1/8"	30.330"	11/30/59	34.8	2231
Coke Side	30-3/4"	30-5/16"	30.507"	10/2/59	100.0	2027
Pusher Side	31-13/16"	31-7/16"	31.665"	1/11/60	16.0"	2496
Pusher Side	31-15/16"	31-1/2"	31.727"	12/16/59	23.5	2356
Pusher Side	31-15/16"	31-5/16"	31.665"	11/26/59	36.4	2224
Pusher Side	32-1/8"	31-7/16"	31.841"	10/2/59	100.0	2027

WIRE TO BRICK MEASUREMENT

<u>Battery No. 1:</u>						
Coke Side	47-5/16"	46-5/8"	46.920"	1/11/60	16.0	2453
Coke Side	47-5/16"	46-11/16"	46.943"	12/16/59	23.5	2343
Coke Side	47-5/16"	46-11/16"	46.983"	11/25/59	40.0	2118
Coke Side	47-1/4"	46-5/8"	46.968"	10/1/59	100.0	1998
Pusher Side	47-0"	46-5/8"	46.773"	1/11/60	16.0	2453
Pusher Side	47-0"	46-9/16"	46.722"	12/16/59	23.5	2343
Pusher Side	47-1/16"	46-7/16"	46.717"	11/25/59	40.0	2118
Pusher Side	47-1/16"	46-7/16"	46.810"	10/1/59	100.0	1998
<u>Battery No. 2:</u>						
Coke Side	44-13/16"	44-1/2"	44.631"	1/11/60	16.0	2496
Coke Side	44-13/16"	44-1/2"	44.653"	12/16/59	23.5	2356
Coke Side	44-11/16"	44-5/16"	44.507"	11/30/59	34.8	2231
Coke Side	44-7/8"	44-9/16"	44.727"	10/2/59	100.0	2027
Pusher Side	46-0"	45-9/16"	45.790"	1/11/60	16.0	2496
Pusher Side	46-1/16"	45-5/8"	45.882"	12/16/59	23.5	2356
Pusher Side	46-1/8"	45-1/2"	45.778"	11/26/59	36.4	2224
Pusher Side	46-1/4"	45-3/4"	46.007"	10/2/59	100.0	2027

SPRING MEASUREMENTS

<u>Battery No. 1:</u>	<u>Max.</u>	<u>Min.</u>	<u>Avg.</u>	<u>Date</u>	<u>Coking Time (Hrs)</u>	<u>Avg. Flue Temp. (*F)</u>
C. S. Top	5-1/8"	4-13/16"	4.892"	1/20/60	16.0	2475
C. S. Top	5-1/8"	4-11/16"	4.816"	12/15/59	24.2	2344
C. S. Top	5-1/16"	4-11/16"	4.809"	12/1/59	33.3	2136
C. S. Top	5-1/16"	4-3/4"	4.822"	10/7/59	100.0	2016
P. S. Top	5-2"	4-13/16"	4.886"	1/20/60	16.0	2475
P. S. Top	5-0"	4-3/4"	4.849"	12/15/59	24.2	2344
P. S. Top	5-0"	4-3/4"	4.849"	12/1/59	33.3	2136
P. S. Top	5-0"	4-11/16"	4.841"	10/7/59	100.0	2016
C. S. Bottom	5-11/16"	5-7/16"	5.557"	1/11/60	16.0	2453
C. S. Bottom	5-3/4"	5-1/2"	5.623"	12/15/59	24.2	2344
C. S. Bottom	5-13/16"	5-1/2"	5.635"	11/23/59	50.0	2078
C. S. Bottom	5-7/8"	5-9/16"	5.704"	9/30/59	100.0	1998
P. S. Bottom	5-11/16"	5-5/16"	5.594"	1/11/60	16.0	2453
P. S. Bottom	5-7/8"	5-1/2"	5.691"	12/15/59	24.2	2344
P. S. Bottom	5-7/8"	5-1/4"	5.695"	11/23/59	50.0	2078
P. S. Bottom	5-15/16"	5-1/4"	5.709"	9/30/59	100.0	1990
<u>Battery No. 2:</u>						
C. S. Top	5-3/16"	4-13/16"	5.014"	1/20/60	16.0	2496
C. S. Top	5-3/16"	4-11/16"	4.882"	12/15/59	24.2	2366
C. S. Top	5-1/4"	4-11/16"	4.877"	12/1/59	33.3	2229
C. S. Top	5-1/8"	4-11/16"	4.844"	10/7/59	100.0	2050
P. S. Top	5-3/16"	4-13/16"	4.935"	1/20/60	16.0	2496
P. S. Top	5-3/16"	4-3/4"	4.877"	12/15/59	24.2	2366
P. S. Top	5-3/16"	4-3/4"	4.890"	12/1/59	33.3	2229
P. S. Top	5-1/8"	4-11/16"	4.834"	10/7/59	100.0	2050
C. S. Bottom	5-1/2"	5-3/16"	5.372"	1/11/60	16.0	2496
C. S. Bottom	5-1/2"	5-1/4"	5.403"	12/15/59	24.2	2366
C. S. Bottom	5-1/2"	5-1/4"	5.402"	11/24/59	44.4	2235
C. S. Bottom	5-5/8"	5-5/16"	5.494"	9/30/59	100.0	2023
P. S. Bottom	5-1/2"	5-5/16"	5.412"	1/11/60	16.0	2496
P. S. Bottom	5-9/16"	5-5/16"	5.453"	12/15/59	24.2	2366
P. S. Bottom	5-9/16"	5-5/16"	5.427"	11/24/59	44.4	2235
P. S. Bottom	5-5/8"	5-1/4"	5.503"	9/30/59	100.0	2023

TOP TIE-ROD TEMPERATURES (°F)

<u>Battery No. 1</u>	<u>Max.</u>	<u>Min.</u>	<u>Avg.</u>	<u>Atm. Temp.</u>	<u>Avg. Flue Temp.</u>	<u>Date</u>
	594	300	409	37	2453	1/11/60
	387	263	342	36	2142	11/30/59
	410	264	337	38	2050	10/26/59

Battery No. 2:

	492	332	428	37	2496	1/11/60
	430	265	353	36	2231	11/30/59
	439	288	352	38	2044	10/26/59

lb.

Bat 1

Bat 2

	Buckstay		Brick		Buckstay		Brick		
	CS	IPS	ICS	IPS	2CS	2PS	2CS	2PS	
1									
2	Oct 1-2	32707	32733	46968	46810	30507	31841	44727	46007
3	Oct 28	32758	32680	47023	46852	30477	31844	44766	46000
4	Nov 25	32713	32607	46983	46717	30330	31665	44507	45778
5	Dec 15								
6									
7									
8									
9									
10									
11									

Bat #1

Bat 2

	Bat #1		K		Bat 2				
	CST	PST	CSTB	PSTB	CST	PST	CSB	PSTB	
12									
13									
14	Oct 7	4822	4841	5704	5709	4844	4834	5494	5503
15	Oct 26	4810	4835	5719	5731	4867	4862	5477	5527
16	Nov 25	4809	4849	5635	5695	4877	4890	5402	5427
17	Dec 15								
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									

Bat 1 C.S.

Date		10-1-59						
N ^o	Buck stay No	Book stay In	Brick In					
1	1	32-10	46-12					
2	2	32-9	46-12					
3	3	32-7	46-10					
4	4	32-6	46-10					
5	5	32-8	46-12					
6	6	32-6	46-12					
7	7	32-10	46-13					
8	8	32-11	46-14					
9	9	32-10	46-14					
10	10	32-8	46-13					
11	11	32-10	46-15					
12	12	32-11	46-15					
13	13	32-8	46-14					
14	14	32-11	46-14					
15	15	32-9	46-14					
16	16	32-9	46-14					
17	17	32-13	46-15					
18	18	32-10	46-15					
19	19	32-10	46-13					
20	20	32-10	46-13					
21	21	32-13	46-15					
22	22	32-12	46-15					
23	23	32-11	46-15					
24	24	32-10	46-14					
25	25	32-8	46-15					
26	26	32-10	46-15					
27	27	32-11	46-15					
28	28	32-12	47-0					

Bat 1 C 5

Date	10-1-59		Boat STBY	13v14 In 16's	13v14 In 16's
1	29	32-13	47-0		
2	30	32-11	47-1		
3	31	32-11	47-1		
4	32	32-12	47-1		
5	33	32-14	47-2		
6	34	32-13	47-1		
7	35	32-14	47-4		
8	36	32-14	47-4		
9	37	32-14	47-3		
10	38	32-13	47-2		
11	39	33-0	47-1		
12	40	32-13	47-2		
13	41	32-15	47-2		
14	42	32-14	47-2		
15	43	32-10	47-1		
16	44	32-13	47-1		
17	45	32-14	47-2		
18	46	32-13	47-2		
19	47	33-0	47-4		
20	48	32-15	47-3		
21	49	32-12	47-2		
22	50	32-14	46-14		
23	51	32-10	46-15		
24					
25	AVE	$32 \frac{11.314}{16}$	$46 \frac{15.470}{16}$		
26		$= 32.707$	$= 46.968$		
27					
28					

Bat 2 PS

Date		10-2-59					
	BUCK STAY No.	BUCK STAY IN 16's	BRICK IN 16's				
1	1	32-0	46-0				
2	2	31-15	46-2				
3	3	32-0	46-2				
4	4	32-0	46-2				
5	5	31-15	46-2				
6	6	31-15	46-1				
7	7	31-15	46-3				
8	8	31-15	46-1				
9	9	31-13	46-0				
10	10	31-13	46-0				
11	11	31-14	46-2				
12	12	31-15	46-3				
13	13	31-15	46-0				
14	14	31-15	46-3				
15	15	31-14	46-1				
16	16	31-15	46-3				
17	17	32-0	46-4				
18	18	32-2	46-3				
19	19	32-1	46-2				
20	20	32-1	46-3				
21	21	32-2	46-4				
22	22	32-0	46-1				
23	23	32-1	46-2				
24	24	32-0	46-2				
25	25	32-1	46-3				
26	26	31-14	46-0				
27	27	31-14	45-15				
28	28	31-14	46-0				

Bat 2 PS

	Date	10-2-59	
	Buck STAY No	Buck STAY	BRICK
1	29	31-14	46-0
2	30	-14	46-0
3	31	-13	46-1
4	32	-13	46-1
5	33	-14	46-0
6	34	-12	46-0
7	35	-13	45-15
8	36	-13	-15
9	37	-12	-14
10	38	-12	-15
11	39	-13	-13
12	40	-10	-13
13	41	-10	-13
14	42	-8	-12
15	43	-9	-12
16	44	-10	-12
17	45	-10	-14
18	46	-10	-13
19	47	-10	-14
20	48	-10	-12
21	49	-8	-14
22	50	-7	-13
23	51	v-10	v-14
24			
25	Ave	$31 \frac{15.457}{16}$	$46 \frac{.117}{16}$
26		= 31.841	= 46.007
27			
28			

Bat 2 CS

Date	10-2-59					
Buck stay No	Buck stay In	Brick In				
1	1	30-12	44-13			
2	2	-11	-13			
3	3	-9	-13			
4	4	-9	-13			
5	5	-10	-13			
6	6	-10	-13			
7	7	-8	-12			
8	8	-9	-13			
9	9	-8	-11			
10	10	-8	-11			
11	11	-9	-12			
12	12	-8	-11			
13	13	-8	-11			
14	14	-8	-10			
15	15	-9	-11			
16	16	-7	-12			
17	17	-7	-12			
18	18	-8	-12			
19	19	-7	-12			
20	20	-10	-14			
21	21	-9	-11			
22	22	-8	-12			
23	23	-7	-12			
24	24	-6	-12			
25	25	-7	-12			
26	26	-5	-11			
27	27	-8	-13			
28	28	Y-8	Y-11			

Box 2 CS

Pests

	Buck	Buck	Buck
	In	Out	In
1	29	30-7	49-11
2	30	-6	-10
3	31	-6	-11
4	32	-6	-10
5	33	-7	-10
6	34	-7	-9
7	35	-8	-14
8	36	-8	-12
9	37	-9	-11
10	38	-6	-11
11	39	-7	-11
12	40	-7	-10
13	41	-10	-12
14	42	-8	-11
15	43	-9	-12
16	44	-8	-12
17	45	-9	-11
18	46	-9	-10
19	47	-8	-12
20	48	-8	-10
21	49	-7	-12
22	50	-10	-12
23	51	√-11	√-13

24

25 AVE = $30 \frac{8.118}{16}$ $44 \frac{11.627}{16}$

26 = $30.507 = 44.727$