



LOUISIANA
POWER & LIGHT

WATERFORD 3 SES • P.O. BOX 8 • KILLONA, LA 70066

June 21, 1984

W3K84-1454
Q-3-A35.02.01.02


Mr. Jack Strosnider NS-5650
Materials Engineering Branch, USNRC
Nicholson Lane Building
5650 Nicholson Lane
Rockville, Maryland 20852

Dear Mr. Strosnider:

Enclosed is the additional information you requested concerning the installation of Chicago Bridge & Iron piece numbers 55-2 welded to 55-4. This information also includes applicable attachments to nonconformance report # W3-6224.

If you have any additional questions concerning this installation, please contact Mr. R. Hartnett at 504-467-2791, ext. 325.

Very truly yours,



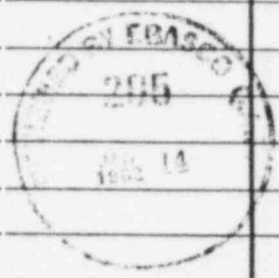
D. E. Dobson
Project Manager

DED/RAH/gc

cc: T. F. Gerrets - w/o attach.
L. L. Bass - w/o attach.
G. L. Constable - w/o attach.



MASTER CHECK LIST For Control and Certification

NO.	DESCRIPTION OPERATIONS, INSPECTIONS, EXAMINATIONS & REQUIREMENTS TO BE COMPLETED	APPLICABLE DETAIL RECORDS	CBI		AUTH. INSPTR.	
			LISTED OPRTS, INSPTS & EXAMINS COMPLTD & ACCPTD. LISTED REQRMTS CARRIED OUT		LISTED DATA REVIEWED & FOUND TO BE IN ACCOR- DANCE WITH THE CODE	
			PROJ. FOREMAN & PROJ. WELD & QA SUPR		AUTH. INSPECTOR	
			INITIALS	DATE	INITIALS	DATE
11	Inspect all welding material received for shipping damage and proper identi- fication. Obtain authorization with Test Reports from the Construction Welding and Q.A. Manager or his delegate.	8.19	TRK TFW	11-17-77 11-17-77	RL RL	11/17/77 11/17/77
12	Advise AI of disposition of any rejected materials.	8.19	TRK TFW	11-17-77 11-17-77	RL RL	11/17/77 11/17/77
13	Record the following information for each welder (including welders of attachments) and for supervisory welding personnel assigned to this contract: Name, ID, and process in which qualified and Electrode F number. Verify that these welders are qualified on the dates that the welding processes are used.	GO 1152 Or The 8.10	TRK TFW	11-17-77 11-17-77	RL RL	11/17/77 11/17/77
						

MADE BY JIM DATE 11-23-75	CHKD BY RDJ DATE 12-11-75	AUTHD BY LCW DATE 4-22-76	BY LCW DATE 1-29-76	AUTHD RDJ DATE 4-22-76	CONTRACT NO. 71-2426	SHEET M4
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METAL MATERIAL VERIFICATION SUMMARY SHEET

Contract No. 71-2426
Sheet 22 of 23

Copy to Engineering - By _____ Date _____

No. of Ctrs For Customer _____

NO. OF PCS.	ORDERED ITEM NO.	SUPPLIER'S HEAT, LOT OR OTHER IDENTIFICATION NUMBER	SUPPLIER'S SLAB NUMBER	MATERIAL SPEC. AND THICKNESS FOR PLATES	CAR OR TRUCK NUMBER AND SUPPLIER	CTR CHECKED Date & CBI Initial No.	METAL REC'D INSPECTION REPORT CHECKED Date & CBI Initial No.	DAILY FABRICATION OR STORES RELEASE REPORT CHECKED Date & CBI Initial No.	ENG'R. MARK	SERIAL NUMBER	NO. OF PIECES FABRICATED	COMPLETED INITIAL	REMARKS
1	51K 105	000 8408		A56	E 302 1/4 x 60'0			62	69-52	-	32	58	PROB
2	51K 106/1008											58	
4	51K 000 8772			A56	E 9 x 13'4 x 60'0			63	70-4	-	82	58	PROB
1	51K 107/108/109											58	
2	51K 000 8701			A56	E 7 x 9'8 x 50'0			64 } 65 }	71-5	-	159	58	PROB
1	51K 116											58	
2	55-2 H25062			A56	W 8 x 13 x 40'0			* 53	55-2	-	16	58	
1	51K 000 8722				E 3-3 1/2 x 60'0			61	55-42	-	16	58	PROB
	700 55-2											58	
	700 55-2							* 53	55-8	-	2	58	
1	51K 000 8729				E 3 x 5 x 1/2 x 40'0			53	55-6	-	7	58	
								61	55-92	-	2	58	PROB
1	51K 150											58	
10	51K			A56	E 2 x 2 x 1/2 x 0'8				92-4	-	10	58	
1	51K 000 8722			A56	E 2 x 1/2 x 20'0			66	92-5	-	10	58	PROB
												58	
												58	

CB&I DWG.#	MARK#	STATUS BASED ON CB&I RESPONSE	REMARKS	
71-2426-45	45-3	NOTE 1	ACCEPT AS IS	
-46	15B&C	NOTE 2 & 5 - TEST HEAD	ENGINEERING TO EVALUATE	
-47	47-3	NOTE 1		
-48	15-A&C	NOTE 2 & 5 - TEST HEAD		
-49	49-6	NOTE 1		
-53	53-11 R _L	NOTE 4		
	53-12 R _L			
	53-13, 14,			
	16, 17, 18,			
	19, 20, 21,			
	22, 23, 25,			
	31 & 32			
-55	55-2, 6, 8	NOTE 1		
	55-4 R _L	NOTE 3 - FOOT CLIPS - ANGLES	ENGINEERING TO EVALUATE	
	55-9 R _L			
-56	56-4&7	NOTE 4	ACCEPT AS IS	
-57	58-1, 13, A1,	NOTE 1		
	2, B1, C1,			
	D1, 3, F1,			
	4, G1, 5,			
	H1, J1, 6,			
	C1A, 7 R _L ,			
	8			
	58-12	NOTE 3 - ANGLE IRON ON	ENGINEERING TO EVALUATE	
		MAINTENANCE TROLLEY RAILS		
	58-9, 10, 14	NOTE 2 - 3" φ SCH. PIPE ON		
	11	MAINTENANCE TROLLEY RAILS		

ATTACHMENT #4

NCR W3-6224

Based on Chicago Bridge & Iron Company's (CB&I) response dated 7-5-83 (Attachment #5), the table below summarizes the findings on the original CB&I Class D materials supplied. The following is the note legend for this table:

- NOTE 1 CB&I provided Material Test Reports or Certificates of Compliance. See Attachment 5.
- NOTE 2 CB&I can not trace physical/mechanical properties through Purchase Orders.
- NOTE 3 Although actual records do not uniquely tie these pieces to particular stock materials, CB&I shop had available remaining material from these purchases for fabrication at that time. See Attachment 5.
- NOTE 4 Material originally identified to the supplier by the Supplemental Summary Sheet for Material Verification.
- NOTE 5 Temporary material, therefore no material traceability required.
- NOTE 6 Seismic Class 1 as defined by Attachment #3 doesn't include miscellaneous hardware. Therefore, miscellaneous hardware doesn't require material traceability.

ESSE engineering will be required to evaluate the acceptability of those materials so noted in the tables.

J. Charles

8-23-83



July 5, 1983

8900 Fairbanks North Houston Road
P O Box 40066
Houston, Texas 77240
713 466 7581

Ebasco Services, Incorporated
P. O. Box 70
Killona, Louisiana 70066-0070

Att: Mr. L. A. Stinson, Manager
Site Quality Program

RE: LOUISIANA POWER & LIGHT COMPANY
WATERFORD STEAM ELECTRIC STATION
UNIT NO. 3

SUBJECT: EBASCO LETTER dated May 24, 1983

Dear Mr. Stinson:

Your letter of May 24, 1983 requested that CBI undertake a search of CBI in-house records to provide you with assistance in the resolution of a non-conformance report written against the Class D items on CBI bills of materials. After receipt of that request, Bill Ricketts, Birmingham Manufacturing Quality Assurance, directed a records search by his group and the Birmingham Purchasing group. The final results of this search are the (3) folders included with this letter.

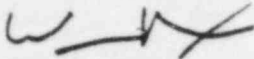
The first folder, 5.1 Material Verification Summary Sheets, is a summary of all the Class D items supplied by CBI and indicates the information found by CBI. A key for the use of this file is included in the file. On each summary sheet, you will find a column labeled "Daily Fab'r or Stores Release Report Checked". In this column, you will find the file number for the CTR or COFC for the item listed on that particular line. If any further explanation is needed, please contact Mr. Bill Ricketts, Birmingham CQA.

These documents are not being submitted by CBI as formal, audited, nuclear records. Instead, they are being provided by CBI in an effort to help Ebasco resolve this non-conformance. It is hoped that the information they contain will in some way be beneficial to Ebasco in this effort. I must also point out that it is the feeling of CBI's Birmingham Quality Assurance group that no other relevant information is available.

Page 2
July 5, 1983
Mr. L. A. Stinson

If I can be of any further assistance in this matter, please contact me.

Sincerely,



Wayne Nixon
Chicago Bridge & Iron
Project Manager

yw

Enclosures

*I have a copy of the letter #2
5/13
2004*

THE UNIVERSITY OF CHICAGO

B929

B'ham, Ala. 35202

THIS IS TO CERTIFY THAT THE ABOVE IS A TRUE AND CORRECT COPY OF THE
CERTIFIED EXPOSITION OF THE ABOVE.

CHARLES W. DEAN

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ATTACHMENT # 5
NCR-W3-6224
CLASS "D" MATERIALS

PAGE 2 OF 6

CB&I DWG. No.	MARK No.	DESCRIPTION	SPEC.	STATUS BASED ON CB&I RESPONSE	REMARKS BY ESSE-CIVIL
71-2426-31	31-6	14'-0" ID MAINTENANCE HATCH 1/8" COTTER PIN	STEEL	NOTE 2	ACCEPT AS IS. THIS IS NOT A PRIMARY ITEM THAT IS STRESSED UNDER DURESS.
	31-9	1/4" PIPE PLUG FOR TEST PORT	STEEL	NOTE 2	ACCEPT AS IS.
		14'-0" MAINTENANCE HATCH HANDLING DEVICE ASS'Y			
		TROLLEY BEAM ASS'Y			
-34	35-7	FL 8x1/2	A-36	NOTE 2	ACCEPT AS IS. THEORETICALLY ANY ORDINARY A36 STRUCTURAL STEEL WOULD DO.
	35-11	BEAM S 24x79.9	A36	NOTE 2	
	35-12	L-5x3x3/8	A36	NOTE 3	ACCEPT AS IS. MATERIAL HEAT NO. IS KNOWN.
	34-3	FL 2" OD x 1 1/16" ID x 1/4" THK	A36	NOTE 3	ACCEPT AS IS. MATERIAL HEAT NUMBER IS KNOWN.
	34-4	1" Ø ROD x 2'-7" LG	A36	NOTE 2	ACCEPT AS IS.
	34-2	BEAM S 24x79.9	A36	NOTE 2	ACCEPT AS IS. ANY A36 STRUCTURAL STEEL SHAPE MAY BE CONSIDERED SUFFICIENT ENOUGH.
	34-24	BEAM S 24x79.9	A36	NOTE 2	
	35-2	FL 8x1/2	A36	NOTE 2	ACCEPT AS IS.
	34-20	FL 3x1/2	A36	NOTE 2	
	34-21	FL 7x1/2	A36	NOTE 2	
	35-18, 19	FL 5x1/2	A36	NOTE 2	
		DETAILS FOR HANDLING DEVICE FOR 14'-0" MAINTENANCE HATCH			
-35	35-17	1/4" Ø PIN	STEEL	NOTE 2	ACCEPT AS IS.
	35-20	7/8" Ø ROD	1017 CRS	NOTE 2	ACCEPT AS IS.
		SPRAY HEADER SUPPORT CLIP			
-55	55-4 ^R	L-3x3x1/2	A36	NOTE 3	ACCEPT AS IS. MATERIAL HEAT NUMBER IS KNOWN.
	55-9 ^R	L-3x3x1/2	A36	NOTE 3	

SSFR

Task: Allegation A-259

Reference No.: 4-84-A-06-142(3)

Characterization: It has been alleged that "Class D" material used by Chicago Bridge and Iron (CB&I) in the fabrication of certain non-pressure bearing structural components inside containment was not welded with traceable weld rod and that the welds are not traceable to a specific welder.

Assessment of Allegation: This allegation is related to Allegation A-258 regarding the traceability of materials categorized by CB&I as Class D that were used in the fabrication of certain non-pressure bearing structural components in the containment vessel. As described in the assessment of Allegation A-258, these structural components include seismic clips that support safety class piping systems, parts of the equipment hatch handling device, parts of the personnel and escape locks, crane rails and girders, stairs, ladders, and some temporary attachments and components. Ebasco categorized these components, with the exception of ~~these~~ temporary items, as Seismic Category I, therefore requiring material traceability, but according to CB&I quality assurance procedures, material traceability was not required for Class D material and thus was not maintained. As further stated in the assessment of Allegation A-259, the issue of traceability of the Class D structural steel was satisfactorily resolved by Nonconformance Report (NCR) 6224. However, this NCR did not address the traceability of the weld material. ✓

To assess this issue the NRC staff review^{ed} the structures in which the D Class material was used and requested the licensee to provide the quality assurance documentation for welds in several of the structural components considered to have the greatest safety significance. These components were the containment spray system pipe supports (seismic clips), crane girders, and equipment hatch handling device. Quality assurance (QA) documentation including items such as welding procedures, welder identification and qualifications, weld rod ✓

identification, and weld inspection results were requested for certain welds in these components. This quality assurance information is required for welds in safety related structures. As of May 31, 1984 LP&L was unable to produce the records requested by the NRC staff. The inability to produce the appropriate quality assurance records makes the quality of the subject safety related structures undeterminable and the NRC staff has concluded that additional actions as described below should be taken by LP&L to resolve this issue. ✓

Potential Violations: The inability to produce quality assurance records for welds in safety related structures constitutes a violation of Criterion XVII, "Quality Assurance Records" of Appendix B ^{to 10CFR Part 50}. Criterion XVII requires that sufficient records be maintained to furnish evidence of activities affecting quality. Furthermore, the possibility exists that because of the erroneous ~~Class D~~ ^{classification} of materials in safety related structures, ~~as Class D~~ the required quality assurance activities were not performed and the required quality assurance records never generated. Thus, there are potentially violations of Criterion VIII, "Identification and Control of Materials, Parts, and Components;" Criterion IX, "Control of Special Processes;" and Criterion X, "Inspection." ✓
Criteria VIII ~~and IX~~ ^{Criteria IX requires} require identification and control of materials and identification ~~and control~~ of welding and inspection processes and personnel. ✓
~~respectively.~~ Criterion X requires establishment and execution of an inspection program. ✓

Actions Required: In the event that the licensee cannot produce for NRC review the required quality assurance documentation related to welding of Class D materials inside containment, he shall develop and implement a program to assure that the subject safety related structural components have adequate quality so as not to adversely affect their structural integrity and safety related functions. This program shall be submitted to NRC for review prior to its implementation. The program should include a review of the structures in which Class D material was used and identification of those that are safety related. Actions taken by the licensee to resolve the issue may include but are not limited to the following.

- o Demonstration that quality assurance requirements were met through the review of supplier, contractor, and/or other records.
- o Demonstration that the structural component of concern does not have a significant safety function and hence that quality assurance records are not necessary. ✓
- o Appropriate nondestructive inspection and/or evaluations of subject structural welds.
- o Rewelding of critical components in accordance with approved quality assurance and quality control procedures.

The results of the licensee's program shall be submitted to NRC and the NRC staff^{shall} review the results to ensure that this issue has been satisfactorily resolved prior to initial criticality. ✓

References

1. Assessment of Allegation A-258
2. Nonconformance Report 6224 issued May 13, 1983
3. Code of Federal Regulation, Title 10, Part 50, Appendix B.

Statement Prepared By:

J. Strosnider

Date

Reviewed By:

Team Leader

Date

Reviewed By:

Site Team Leader(s)

Date

Approved By:

Task Management

Date

SSER

Task: Allegation A-259

Reference No.: 4-84-A-06-142(3)

Characterization: It has been alleged that "Class D" material used by Chicago Bridge and Iron (CB&I) in the fabrication of certain non-pressure bearing structural components inside containment was not welded with traceable weld rod and that the welds are not traceable to a specific welder.

Assessment of Allegation: This allegation is related to Allegation A-258 regarding the traceability of materials categorized by CB&I as Class D that were used in the fabrication of certain non-pressure bearing structural components in the containment vessel. As described in the assessment of Allegation A-258, these structural components include seismic clips that support safety class piping systems, parts of the equipment hatch handling device, parts of the personnel and escape locks, crane rails and girders, stairs, ladders, and some temporary attachments and components. Ebasco categorized these components, with the exception of those temporary items, as Seismic Category I, therefore requiring material traceability, but according to CB&I quality assurance procedures, material traceability was not required for Class D material and thus was not maintained. As further stated in the assessment of Allegation A-259, the issue of traceability of the Class D structural steel was satisfactorily resolved by Nonconformance Report (NCR) 6224. However, this NCR did not address the traceability of the weld material.

To assess this issue the NRC staff review the structures in which the D Class material was used and requested the licensee to provide the quality assurance documentation for welds in several of the structural components considered to have the greatest safety significance. These components were the containment spray system pipe supports (seismic clips), crane girders, and equipment hatch handling device. Quality assurance (QA) documentation including items such as welding procedures, welder identification and qualifications, weld rod

identification, and weld inspection results were requested for certain welds in these components. This quality assurance information is required for welds in safety related structures. As of May 31, 1984 LP&L was unable to produce the records requested by the NRC staff. The inability to produce the appropriate quality assurance records makes the quality of the subject safety related structures underterminable and the NRC staff has concluded that additional actions as described below should be taken by LP&L to resolve this issue.

Potential Violations: The inability to produce quality assurance records for welds in safety related structures constitutes a violation of Criterion XVII, "Quality Assurance Records" of Appendix B. Criterion XVII requires that sufficient records be maintained to furnish evidence of activities affecting quality. Furthermore, the possibility exists that because of the erroneous classification of materials in safety related structures as Class D the required quality assurance activities were not performed and the required quality assurance records never generated. Thus, there are potentially violations of Criterion VIII, "Identification and Control of Materials, Parts, and Components;" Criterion IX, "Control of Special Processes," and Criterion X, "Inspection." Criteria VIII and IX require identification and control of materials and identification and control of welding and inspection processes and personnel, respectively. Criterion X requires establishment and execution of an inspection program.

Actions Required: In the event that the licensee cannot produce for NRC review the required quality assurance documentation related to welding of Class D materials inside containment, he shall develop and implement a program to assure that the subject safety related structural components have adequate quality so as not to adversely affect their structural integrity and safety related functions. This program shall be submitted to NRC for review prior to its implementation. The program should include a review of the structures in which Class D material was used and identification of those that are safety related. Actions taken by the licensee to resolve the issue may include but are not limited to the following.

- o Demonstration that quality assurance requirements were met through the review of supplier, contractor, and/or other records.
- o Demonstration that the structural component of concern does not have a significant safety function and hence that quality assurance records are not necessary.
- o Appropriate nondestructive inspection and/or evaluations of subject structural welds.
- o Rewelding of critical components in accordance with approved quality assurance and quality control procedures.

The results of the licensee's program shall be submitted to NRC and the NRC staff review the results to ensure that this issue has been satisfactorily resolved prior to initial criticality.

References

1. Assessment of Allegation A-258
2. Nonconformance Report 6224 issued May 13, 1983

Statement Prepared By:	_____	_____
	J. Strosnider	Date
Reviewed By:	_____	_____
	Team Leader	Date
Reviewed By:	_____	_____
	Site Team Leader(s)	Date
Approved By:	_____	_____
	Task Management	Date

SSER

Allegation
TASK: A-259

REF NO.: 4-84-A-06-~~14~~ 142 (3)

CHARACTERIZATION: It has been alleged that ~~the~~ "Class D" material used by Chicago Bridge and Iron (CBI) in the fabrication of certain non-pressure bearing structural components inside containment was not welded with traceable weld rod and that the welds are not traceable to a specific welder.

ASSESSMENT OF ALLEGATION:

This allegation is related to Allegation A-258 regarding the traceability of ~~Class D~~ materials categorized by CBI as Class D that were used in the fabrication of certain non-pressure bearing structural components in the containment vessel. As described in the assessment of Allegation A-258, these structural components include seismic clips that support safety class piping systems, parts of the equipment hatch handling device, parts of the personnel and escape locks, crane rails and girders, stairs, ladders, and some temporary attachments and components. Basco

categorized these components, with the exception of those temporary items, as Seismic Category I, therefore requiring material traceability, but according to CB&I quality assurance procedures, material traceability was not required for Class D material and thus was not maintained. As further stated in the assessment of Allegation A-259, the issue of traceability of the ~~slender~~ Class D structural steel was satisfactorily resolved by Non Conformance Report (NCR) 6224. However, this NCR did not address the traceability of the weld material. ~~and~~

To assess this issue the NRC staff reviewed the structures in which the D Class material was used and requested the licensee to provide the quality assurance documentation for ~~the~~ welds in several of the ~~most safety~~ structural components ~~with~~ considered to have the greatest safety significance. These components were the ~~cont~~ containment spray system pipe supports (seismic clips), crane guiders, and equipment hatch handling device. The Quality assurance documentation ~~should~~ ~~requested~~

including items such as welding procedures, welder identification and qualifications, weld rod identification, and weld inspection results ~~was~~^{were} requested for certain welds in these components. This quality assurance information is required for welds in safety ~~of~~^{LP&H} related structures. As of May 31, 1984 the licensee was unable to produce the records requested by the NRC staff. The inability to produce the appropriate quality assurance records makes the quality of the subject safety related structures undeterminable and the NRC staff has concluded that additional action as described below should be taken by the licensee to resolve this issue.

POTENTIAL VIOLATIONS:

The inability to produce quality assurance records for the welds in safety related structures constitutes a violation of Criterion XIII, "Quality Assurance Records" of Appendix B. Criterion XIII requires that sufficient records be maintained to furnish evidence of activities affecting quality. Furthermore, the possibility ~~and~~ exists that because of

the erroneous classification of ~~as~~ materials in safety related structures as Class D ~~that~~ the required quality assurance activities ~~and records~~ ^{required quality assurance} were not performed and the records never generated. Thus, there are potentially violations of Criterion ~~III~~, "Identification and Control of Materials, Parts, and Components"; Criterion ~~IX~~, "Control of Special Processes"; and Criterion ~~X~~, "Inspection". Criteria ~~VIII~~ and ~~IX~~ require identification and control ^{and identification and control of} of materials, welding and inspection processes and personnel, respectively. Criterion ~~X~~ requires establishment and ~~an~~ execution of an inspection program.

ACTIONS REQUIRED:

In the event that the licensee cannot produce for NRC review the required quality assurance documentation related to welding of Class D materials inside containment, he shall develop and implement a program to assure that the subject ^{safety related} structural components ~~have adequate quality~~ have adequate quality so as not to adversely affect their structural integrity and safety

related function. This program shall be submitted to NRC for review prior to its implementation. The program shall include a review of the structures in which Class 1 material was used and identification of those that are safety related. Actions taken by the licensee to resolve the issue may include but are not limited to the following.

- Demonstration ~~of quality~~ that quality assurance requirements were met through the review of supplier, ~~contract~~ contractor, and/or other records.
- Demonstration that the structural component at ~~issue~~ concern does not have a significant safety function and hence that ~~does not require extensive~~ quality assurance records are not necessary.
- Appropriate nondestructive examination inspection and/or evaluation of suspect structural welds.
- Rewelding ~~of~~ of critical components in accordance with approved quality assurance and quality control procedures.

~~The licensee program shall be satisfactory~~

The results of the licensee program shall be submitted to NRC and the NRC shall review the results to ensure that ~~adequate~~ ~~quality assurance~~ This issue has been satisfactorily resolved initial criticality.

& prior to granting a full power operating license. However, this issue should not cause delay in fuel loading and low power testing operations.

References:

1. Assessment of Allegation A-258
2. Non Conformance Report 6224 issued May 13, 1983

W This statement prepared by J. ^{NEWIE} Strosnider _____ Date _____

Reviewed by: _____ Team Leader _____ Date _____

Reviewed by: _____ Site Team Leader(s) _____ Date _____

Approved by: _____ Task Management _____ Date _____

ISX: A-259

REF NO: 4-84-A-06/66

CHARACTERIZATION: It has been alleged that ~~the~~ "Class D" material used by Chicago Bridge and Iron (CBI) in the fabrication of certain non-pressure bearing structural components inside containment was not welded with traceable weld rod and that the welds are not traceable to a specific welder.

ASSESSMENT OF ALLEGATION:

This allegation is related to allegation A-258 regarding the traceability of ~~Class D~~ materials categorized by CBI as Class D that were used in the fabrication of certain non-pressure bearing structural components in the containment vessels. As described in the assessment of allegation A-258, these structural components include seismic clips that support safety class piping systems, parts of the equipment hatch handling device, parts of the personnel and escape locks, crane rails and girders, stairs, ladders, and some temporary attachments and components. Based

categorized these components, with the exception of those temporary items, as Seismic Category I, therefore requiring material traceability, but according to CB&I quality assurance procedures, material traceability was not required for Class D material and thus was not maintained. As further stated in the assessment of allegation A-259 the issue of traceability of the ~~shelter~~ Class D structural steel was satisfactorily resolved by Non-Conformance Report (NCR) 6224. However, this NCR did not address the traceability of the weld material.

To assess this issue the NRC staff reviewed the structures in which the D class material was used and requested the licensee to provide the quality assurance documentation for ~~the~~ welds in several of the ~~most safety~~ structural components ~~with~~ considered to have the greatest safety significance. These components were the ~~core~~ containment spray system pipe supports (seismic clips), crane guiders, and equipment hatch handling device. The Quality assurance documentation ~~included~~ ~~requested~~

including items such as welding procedures, welder identification and qualifications, weld rod identification, and weld inspection results was requested for certain welds in these components. This quality assurance information is required for welds in safety ~~and~~ related structures. As of May 31, 1984 the licensee was unable to produce the records requested by the NRC staff. The inability to produce the appropriate quality assurance records makes the quality of the subject safety related structures undeterminable and the NRC staff has concluded that additional action as described below should be taken by the licensee to resolve this issue.

POTENTIAL VIOLATIONS:

The inability to produce quality assurance records for the welds in safety related structures constitutes a violation of Criterion XVII, "Quality Assurance Record" of Appendix B. Criterion XVII requires that sufficient records be maintained to furnish evidence of activities affecting quality. Furthermore, the possibility ~~and~~ exists that because of

the erroneous classification of ~~as~~ materials in safety related structures as Class D ~~that~~ the required quality assurance activities ~~and records~~ ^{required quality assurance} were not performed and the records never generated. Thus, there are potentially violations of Criterion ~~III~~, "Identification and Control of Materials, Parts, and Components"; Criterion ~~IX~~, "Control of Special Processes"; and Criterion ~~X~~, "Inspection". Criteria ~~VIII~~ ^{and IX} require identification and control of materials, ^{and identification and control of} welding and inspection processes and personnel, respectively. Criterion ~~X~~ requires establishment and ~~an~~ execution of an inspection program.

ACTIONS REQUIRED:

In the event that the licensee cannot produce for NRC review the required quality assurance documentation related to welding of Class D materials inside containment he shall develop and implement a program to assure that the subject's ^{safety related} structural components ~~have adequate quality~~ have adequate quality so as not to adversely affect their structural integrity and safety.

A291

J20K

related function. This program shall be submitted to NRC for review prior to its implementation. The program shall include a review of the structures in which Class D material was used and identification of those that are safety related. Actions taken by the licensee to resolve the issue may include but are not limited to the following.

- Demonstration ~~of quality~~ that quality assurance requirements were met through the review of supplier, ~~contract~~ contractor, and/or other records.
- Demonstration that the structural component at ~~under~~ concern does not have a significant safety function and hence that ~~does not require extensive~~ quality assurance records are not necessary.
- ~~Appropriate no structural experiments~~ inspection and/or evaluation of suspect structural welds.
- Rewelding ~~of~~ of critical components in accordance with approved quality assurance and quality control procedures.

~~The licensee program shall be satisfactory~~

The results of the licensee program shall be submitted to NRC and the NRC shall review the results to ensure that ~~adequate~~

~~quality assurance~~ This issue has been satisfactorily resolved
initial criticality.

& prior to granting a full power operating license. However, this issue should not cause delay in fuel loading and low power testing operations.

related function. This program shall be submitted to NRC for

review prior to its implementation. The program shall include a review of the structures in which Class D material was used and identification of those that are safety related. Actions taken by the licensee to resolve the issue may include but are not limited to the following.

- Demonstration ~~of quality~~ that quality assurance requirements were met through the review of supplier, ~~contract~~ contractor, and/or other records.
- Demonstration that the structural component at ~~issue~~ concern does not have a significant safety function and hence that ~~does not require extensive~~ quality assurance records are not necessary.
- Appropriate nondestructive examination inspection and/or evaluation of suspect structural welds.
- Rewelding ~~of~~ of critical components in accordance with approved quality assurance and quality control procedures.

~~The licensee program shall be satisfactory~~

The results of the licensee program shall be submitted to NRC and the NRC shall review the results to ensure that ~~adequate~~

~~quality assurance~~ this issue has been satisfactorily resolved

& prior to granting a full power operating license. However, this issue should not cause delay in fuel loading and low power testing operations.

Reference::

1. Assessment of Allegation A-258
2. Non Conformance Report 6224 issued May 13, 1983

Prepared by

J. Stromler

Date

TASK: Allegation 259

REF NO: 4-84-A-06-259

CHARACTERIZATION: It has been alleged that the "Class D" material used by Chicago Bridge and Iron (CBI) as attachments to the containment was not welded with traceable weld rod and the welds are not traceable to a specific welder.



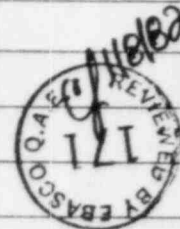
METAL MATERIAL VERIFICATION SUMMARY SHEET

Contract No. 71-2426
Sheet 26 of 30

Copy to Engineering - By _____ Date _____

No. of Ctrs For Customer _____

NO. OF PCS.	ORDERED ITEM NO.	SUPPLIER'S HEAT, LOT OR OTHER IDENTIFICATION NUMBER	SUPPLIER'S SLAB NUMBER	MATERIAL SPEC. AND THICKNESS FOR PLATES	CAR OR TRUCK NUMBER AND SUPPLIER	CTR CHECKED		METAL REC'G INSPECTION REPORT CHECKED		DAILY FAB' OR STORES RELEASE REPORT CHECKED		ENGR. PIECE MARK	SERIAL NUMBER	NO. OF PIECES FABRICATED	CHECKED COMPLETE	INITIAL	REMARKS
						Date & Initial	CBI No.	Date & Initial	CBI No.	Date & Initial	CBI No.						
#2426	-55	Luk	SA516	-70 (MS 647)	- Crane Bldg Main Members												
1	CG5	C5170	7A	T=1	7-12-75 LDB 98107	9-29-75	SB	10/3	7-26-76	68-6	65-68	4	SB				
1		"	7B		"	9-29-75	SB	10/3	7-19-76	68-6	53-56	4	SB				
1		"	8A		"	9-29-75	SB	10/3	7-19-76	68-6	13-16	4	SB				
1		"	8B		"	9-29-75	SB	10/3	7-26-76	68-6	69-72	4	SB				
1		"	9A		"	9-29-75	SB	10/3	7-19-76	68-6	5-8	4	SB				
1		"	9C		"	9-29-75	SB	10/3	7-19-76	68-6	17-20	4	SB				
1		"	11B		10-9-75 PRR 375299	10-30-75	SB	11/5	7-19-76	68-6	41-44	4	SB				
1		"	18C		"	10-30-75	SB	11/5	7-19-76	68-6	45-48	4	SB				
1	CG5	D1828	8A	T=1	"	10-30-75	SB	11/5	7-19-76	68-6	37-40	4	SB				
#2426	-57	Buth	SA516	-70 (MS 647)	- Gen. Inert												
1	P22	802T71440	T12380-1	T=5 1/2	11-11-75 PRR 475463	11-20-75	SB	12-1	3-12-76	64-1	1	1	SB				THIN - RES P437
1	P24	802P67440	T12107-1	T=5	11-8-75 NYC 500514	11-19-75	SB	12/5	2-5-76	47-4	1-2	2	SB				
1	P26	802T71440	T220146	"	11-11-75 PRR 475463	11-20-75	SB	12-1	2-16-76	62-1	1	1	SB				THIN - RES P438
#2426	-61	Luk	SA516	-70 (MS 647)	- Noz. Nicks												
1	NK	C6522	5C	T=1 13/16	4-30-76 NYC 506107	5-13-76	SB	5/24	5-25-76	64-2	1	1	SB				
1	NU	D1752	6	T=5 1/2	4-13-76 Truck	4-22-76	SB	6/4	6-4-76	63-3	1	1	SB				
1	76-1	C6482	3	T=4 1/2	7-9-76 MITT 97592	7-26-76	SB	7-30	8-9-76	36-4	1	1	SB				
1	34-1	C6248	3B	T=2 1/4	10-13-76 Truck	10-18-76	SB	10/17	10-20-76	27-6L	1	1	SB				



SUR DCS > P465

(46)

PURCHASER:

6. CHICAGO BRIDGE & IRON CO.
MR. S. E. WIGGIN, BUYER
P.O. BOX 277
BIRMINGHAM, ALA. 35202

LUKENS STEEL COMPANY

COATESVILLE, PA. 19320

TEST CERTIFICATE

DATE: 10-14-76

FILE NO: 1540-02-04

CONSIGNEE:

MILL ORDER NO.
70380-3CUSTOMER P.O.
2426 SHEET 61BL 101376 VS
4/1CHICAGO BRIDGE & IRON CO.
BOYLES, ALA. 35202

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

CB&I MS-647 REV. 0 SA-516 GR. 70 ASME CODE SECT. II & III SUB NE 1971 EDITION THRU SUMMER
1971 ADDENDA N-1160 8/4/78

BEND TEST O.K. HOMOGENEITY TEST

CHEMICAL ANALYSIS

MELT NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	TI	AL	B	GRAIN SIZE
c6248	24✓	98✓	010	022✓		23✓								7-8

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 2"	% R.A.	BHN	IMPACTS LV -30°F.	FRACTURE APPEARANCE % SHEAR	DESCRIPTION
c6248	3B	606✓ 636✓	823✓ 833✓	27✓ 27✓			45✓ 56✓ 48✓ LATERAL EXPANSION IN INCHES .054 .043 .046	40-40-40	1 - 2-1/4" X 72 X 125
PLATE AND TESTS HEATED 1625-1675°F., HELD 1/2 HR. PER INCH MIN. AND WATER QUENCHED, THEN TEMPERED 1260°F., HELD 1/2 HR. PER INCH MIN. AND WATER. QUENCHED.									
TESTS STRESS RELIEVED BY HEATING WITHIN A RATE OF 178°F. PER HR. TO 1150°F. HELD 15 HRS. AND FURNACE COOLED WITHIN A RATE OF 222°F. PER HR. TO 600°F.									
REVIEWED BY							EBASCO VQA REP.		

We hereby certify the above information is correct.

SUPERVISOR TESTING

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SUPPLEMENTAL SUMMARY SHEET
FOR MATERIAL VERIFICATION

CONTRACT NO. 71-2426

LOCATION 24-5

SUPPLIER'S ID NO.		ENGINEERING PIECE MARK	SERIAL NO.	NO. PIECES FABRICATED
9/0 SHC - <u>A4448</u> <u>2A</u>	5/25/77 2	54-1	-	20
		54-2	-	12
		54-3	-	7
		54-4	-	6
		54-5	-	1
		54-6	-	1
		54-7	-	1
		54-8	-	1
		54-9	-	1
		54-10	-	1
	5/26/77 28	55-1	-	15
		55-3	-	16
		55-5	-	16
		84-3	-	1
		81-3	-	1
	5/27/77 28	53-1	-	29
		53-2	-	2
		53-3	-	1
		53-4	-	1
		53-5	-	30
		53-6	-	2
		53-7	-	30
		53-8	-	1
		53-9	-	1
		53-10	-	30
	6/2/77 28	53-31	-	1
		53-32	-	1
		74-3A	-	1
		74-3B	-	1
		74-3C	-	1
	7/19/77 28	55-3	-	6



PURCHASER:

6. CHICAGO BRIDGE & IRON CO.
BIRMINGHAM, ALA. 35202

LUKENS STEEL COMPANY

COATESVILLE, PA. 19320

TEST CERTIFICATE

DATE: 12-15-75 FILE NO: 1540-02-01

CONSIGNEE
CHICAGO BRIDGE & IRON CO.
BOYLES, ALA. 35202

MILL ORDER NO.
67953-1

CUSTOMER P.O.
2426 SHEET 51

MP. 121175 DM
1/6

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

CBI MS-647 REV. 0 QAS 301 REV.. 1 SA-516 GR. 70 ASME CODE SECT. 2 & 3 SUB NE 1971 EDITION THRU
SUMMER 1971 ADDENDA N-1160 8/4/78

BEND TEST O.K. HOMOGENEITY TEST

CHEMICAL ANALYSIS

MELT NO.	C	Mn	P	S	CU	Si	Ni	Cr	Mo	V	Ti	Al	B	GRAIN SIZE
A4448	23	1.00	005	017		21								7-8

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 8"	% R.A.	BHN	IMPACTS LV -30°F.	FRACTURE APPEARANCE	DESCRIPTION
A4448	2A	587	800	26			48 51 50 .043 .046 .047	40-40-40	1- 3/4" x 80 x 274"

LATERAL EXPANSION IN INCHES

PLATE AND TESTS NORM. 1621-1675°F., HELD 1/2 HR. PER INCH MIN.
AND AIR COOLED.

*LENGTH REFERRED AND ACCEPTED BY CUSTOMER.

REVIEWED BY
J. Thomas
EBASCO VQA REP.

SHC

179

We hereby certify the above information is correct.

SUPERVISOR TESTING

J. Kline



METAL MATERIAL VERIFICATION SUMMARY SHEET

Contract No. 71-2426
Sheet 7 of 30LLC
11/18/82

Copy to Engineering - By _____ Date _____

No. of Ctrs For Customer _____

NO. OF PCS.	ORDERED ITEM P.O.	SUPPLIER'S HEAT, LOT OR OTHER IDENTIFICATION NUMBER	SUPPLIER'S SLAB NUMBER	MATERIAL SPEC. AND THICKNESS FOR PLATES	CAR OR TRUCK NUMBER AND SUPPLIER	CTR CHECKED		METAL REC'G INSPECTION REPORT CHECKED		DAILY FAB'R OR STORES RELEASE REPORT CHECKED		ENGR. PIECE MARK	SERIAL NUMBER	NO. OF PIECES FABRICATED	CHECKED COMPLETE INITIAL	REMARKS
						Date & Initial	CBI No.	Date & Initial	CBI No.	Date & Initial	CBI No.					
1	STK	80441	P36075	AS16.70 Norm T = 1/2	Armco	(40	7302	3-22-77		3-22-77		82-5	-	52	SS	C-MATE
				"	"	-						83-10	-	8	SS	"
				"	"	-						83-9	-	8	SS	"
				"	"	-						83-8	-	28	SS	"
				"	"	-						83-7	-	28	SS	"
				"	"	-						83-6	-	28	SS	"
				"	"	-				4-11-77		87-2 ^R	-	2	SS	"
				"	"	-						87-3 ^R	-	2	SS	"
															SS	
1	PL2	802J08820	J30780-1	AS16.70 MS647	Bell	(40	4333	6-9-77		6-9-77		61-16	-	5	SS	UM
1	PL2	"	J30777-1	T = 1 1/4	"	(40	4334	6-9-77		6-9-77		61-16	-	5	SS	"
1	PL2	"	J30777-1	"	"	(40	4333	6-9-77		6-9-77		61-16	-	1	SS	"
		"	"	"	"	-						61-10	-	4	SS	"
1	PL2	802J06100	J30867-1	"	"	(40	4334	6-9-77		6-9-77		61-10	-	5	SS	"
															SS	
1	STK	67E024	9585A	AS16.70 Norm	USS	(B	362	6-3-77		6-3-77		74-4	-	17	SS	C-MATE
1	STK	"	9585B	T = 5/16	"	-						74-4	-	7	SS	"
4/0	GS	401P3241	P25350	T = 3/4	Bell	(40	4333	8-17-77		8-17-77		55-3	-	2	SS	UM
		"	"	"	"	-						53-24	-	1	SS	"
4/0	VS2	W93230	1X1	T = 1	USS	(40	4333					55-5	-	2	SS	UM

BETHLEHEM STEEL CORPORATION
METALLURGICAL DEPARTMENT

20671 (Rev.D 6-70)

DATE SHIPPED 8/12/74	SHIPMENT NO. 160-3270	CARRIER, INITIAL AND NO. SCL 133329	PLANT SPARROWS POINT
-------------------------	--------------------------	--	-------------------------

SOLD
TO

CHICAGO BRIDGE AND IRON COMPANY

BOYLES AL

SHIPPED TO

Joe 2426
VUM

REPORT OF MECHANICAL AND CHEMICAL TESTS

Customer's Order No.	Section Slab or Mill Order No.	Heat No.	Pcs.	Gauge	Width	Length	Yield Point	Tensile Strength	Elong. %	Red. %	Bends	CHEMICAL ANALYSIS					Specifications or Remarks
												C	Mn	P	S	SI	
4333 SHEET 32	P25349 P25350	401P3242 401P3241	1 1	1-1/4 3/4	48 84-1/2	120 120	44600 46500	71800 72200	28 25		OK OK	.24	1.03	.012	.024	.23	MS6003 REV QAS 321 ASME SA516 GR 70 PVQ ASME SECT 3 NORMALIZED
WE CERTIFY THAT THE REQUIREMENTS OF THE SPECIFICATION NUMBERS SHOWN HEREON HAVE BEEN MET																	
MC QUARD EBN TEST GRAIN SIZE 7-8 BOTH HEATS PLATES AND TEST PIECES NORMALIZED AT 1650°F AND HELD FOR 1/2 HOUR PER INCH OF THICKNESS TVA CONT #73C61-75320																	
LONGITUDINAL CHARPY V NOTCH IMPACT TESTS OF 20 FT LB AT MINUS 30°F PER NB2300																	
			#1	#2	#3	TEST SIZE	Z DUCTILE FRACTURE			LATERAL EXPANSION							
	P25349	401P3242	29	41	28	10 x 10 MM	25-45-24			20-39-31							
	P25350	401P3241	40	44	51	"	35-30-35			30-24-30							
<div>REVIEWED BY</div> <div>EDASCO VQA REP.</div>																	
<div>SUBSCRIBED AND SWORN TO</div> <div>BEFORE ME THIS 13 DAY OF August 1974</div> <div>Stanley S. Kowalsky</div> <div>NOTARY PUBLIC</div> <div>MY COMMISSION EXPIRES JULY 1, 1978</div> <div>208</div>																	



MASTER CHECK LIST

For Control and Certification

NO.	DESCRIPTION OPERATIONS, INSPECTIONS, EXAMINATIONS & REQUIREMENTS TO BE COMPLETED	APPLICABLE DETAIL RECORDS	CBI		AUTH. INSPTR.	
			LISTED OPRTS, INSPTS & EXAMINS COMPLTD & ACPTD. LISTED REQRMTS CARRIED OUT		LISTED DATA REVIEWED & FOUND TO BE IN ACCOR- DANCE WITH THE CODE	
			PROJ. FOREMAN & PROJ. WELD & QA SUPR		AUTH. INSPECTOR	
			INITIALS	DATE	INITIALS	DATE
17	Assure applicable information as required on the Record Drawings is completed for each Category A, B, C, or D joint and for each butt weld of pressure retaining pieces.	FILE 8.5 Doc # 1	TFW TRK	11-17-77 11-17-77	RL RL	11/17/77 11/17/77
18	Record the final location of all pressure retaining material by a serialization or coding of the pieces or Shop assemblies.	FILE 8.5 Doc # 1	TRK TFW	11-17-77 11-17-77	RL RL	11/17/77 11/17/77
19	Use authorized welding procedure (from Contract QA Handbook), Check Fit-up, check welding, and check all finished weld within four inches of the shell of permanent attachments to pressure retaining parts of the vessel (no detail records required).	FILE 8.5 Doc # 1	TRK TFW	11-17-77 11-17-77	RL RL	11/17/77 11/17/77

205
JAN 11 1982

MADE BY JIM DATE 11-23-75	CHKD BY RDJ DATE 12-11-75	AUTHD BY LCW DATE 4-22-76	BY AUTHD DATE	1 JC LCW 1-29-76	2 RDJ LCW 4-22-76	CONTRACT NO. 71-2426	SHEET MG
------------------------------------	------------------------------------	------------------------------------	---------------------	------------------------	-------------------------	-------------------------	-------------

INITIALS P.L.M. DATE 1-22-76

- | SEE
DWG
NO. | REF
MRK. | DESCRIPTION OF ITEMS, JOINTS OR ASSEMBLIES
AND OF OPERATION, INSPECTION OR EXAMINATION
TO BE COMPLETED |
|-------------------|-------------|--|
|-------------------|-------------|--|

[illegible]

MADE BY JLC	CHKD BY Jim	AUTHD BY LCW	REV	BY			CONTRACT NO. 71-2426	SHEET DCL13
DATE 12-10-75	DATE 1-20-76	DATE 1-22		AUTHD				
				DATE				

- 1) MT examine carbon steel with MT yoke. In areas inaccessible to MT equipment, PT may be used.
- 2) Jobsite QA enter ID and Rev. of Authorized Procedure to be used.



PRESENTED TO AUTHORIZED INSPECTOR FOR REVIEW
BEFORE USE PER NA-5241 *P O*

INITIALS

DATE _____

RO
5-24-77

2) Jobsite QA enter ID and Rev. of Authorized Procedure to be used.			PROCEDURE	REPAIR	OPERTR	PROJECT WELD & QA SUPERVISOR	AUTHORIZED INSPECTOR			
SEE DWG NO.	REF MRK	DESCRIPTION OF ITEMS, JOINTS OR ASSEMBLIES AND OF OPERATION, INSPECTION OR EXAMINATION TO BE COMPLETED	PROCEDURE IDENTIFICATION OF OPERATION PROCESS, INSPECTION OR EXAMINATION	REV NO.	SEE NON-CONFORMANCE CONTROL LIST NO.	ID OF NDE OPERTR	INITIALS	DATE	INITIALS	DATE
		MT(OR PT) PER ABOVE								
		INSTRUCTIONS ATTACHMENT	MTP 71-2426 13-B	1						
		WELDS OF THE FOLLOWING ASSEMBLIES TO THE ROOF:								
53		53-1 THRU 53-3 TO ROOF R'S. 12-1 (32 REQ'D.)	MTP 71-2426 13-B	1			TRK	11-23-77		
53		ASSY'S. 53-A ^{RL} , 53-B ^{RL} , 53-C, 53-D, 53-E, & 53-T TO ROOF R'S. 12-1 (13 REQ'D.)	MTP 71-2426 13-B	1			TRK	11-23-77		
55		55-1, 3, 5, & 7 TO ROOF R'S. 12-1 (18 REQ'D.)	MTP 71-2426 13-B	1			TRK	11-23-77		
57		57-3 TO ROOF R'S 12-1 (48 REQ'D.)	MTP 71-2426 13-B	1			TRK	11-23-77		

ROOF CLIPS IN RING #1

MADE BY RDJ	CHKD BY J	AUTHD BY LCW
DATE 5-17-77	DATE 5-17-77	DATE 5-17-77

BY	BY
	AUTHD
	DATE

1	RDJ
	LCW
	6-10-77

CONTRACT NO.

71-2426

SHEET DCL 17

(C.B.T.)
MAGNETIC PARTICLE EXAMINATION REPORT

Location Taft La. Shop ☐ Field ☒ Contract Number 71-2426 Report or Sequence Number 80

CUSTOMER INFORMATION

DESCRIPTION & STAGE OF

ART OR WELD

Nuclear Containment Vessel

34-1 & Adjacent Areas

☐ OUTSIDE

☒ INSIDE

PROCEDURE AND REV. NO.

☐ PRODS

☒ YOKE

MFR OR BRAND

PROD OR POLE SPACING

AMPS

☐ DC

☒ AC

CALIBRATION DATE

See Below

71-2426 138 Rev 1

MAGNAFLUX

6"

N/A

MACHINE

MFR OR

RATING

PARTICLES:

☒ DRY

☐ WET

71-2426 #4 MAGNAFLUX

10[±]

Record all non-conforming indications which were not removed during examination and/or evaluation. (Those base material must be accurately located and referenced to some definable point.)

COLOR & MFR:

Black Magnaflex

Piece Mks. 34-1-1 & 34-1-2 were examined and no non-conforming indications were found.

Calibration & Inspection dates:

5-19-77



JAN 12 1978

The initial examination covered by this report has been performed in accordance with applicable procedure:

All indications have been evaluated in terms of applicable acceptable standards.

Relevant non-conforming indications have been noted on above sketch and have been reported to the Quality Assurance supervisor.

Dennis Freeman

OPERATOR

II
LEVEL

5-20-77
DATE

Item is: Acceptable ☒

Unacceptable ☐

Dennis Freeman

EVALUATOR

II
LEVEL

5-20-77
DATE

Relevant, non-conforming indications, other than shown in above sketch, have been removed in accordance with approved procedure GRP _____ Rev _____ Para _____, the area re-examined, and found to be acceptable.

QA SUPERVISOR

DATE

Examination and evaluations have been performed to my satisfaction.

Witnessed and accepted by:

Witnessed by:

FOREMAN

CUSTOMER

AUTHORIZED INSPECTOR

80

NUCLEAR



MAGNETIC PARTICLE EXAMINATION REPORT

Location Taft, LA Shop ☐ Field ☒ Contract Number 71-2426 Report or Sequence Number 102

CUSTOMER INFORMATION NUCLEAR CONTAINMENT VESSEL

DESCRIPTION & STAGE OF PART OR WELD PIECE MKS 4 @ 55-5, 4 @ 55-3, 2 @ 53-T ☐ OUTSIDE ☒ INSIDE

1 @ 53-M, 2 @ 73-1, 2 @ 73-12, 1 @ 53-R & ADJ. AREAS *

PROCEDURE AND REV. NO. ☐ PRODS ☒ YOKE MFR OR BRAND MAGNAFLUX PROD OR POLE SPACING 6" AMPS N/A ☐ DC ☒ AC CALIBRATION DATE SEE BELOW

MACHINE 71-2426 #4 MFR OR MAGNAFLUX RATING 10# PARTICLES: ☒ DRY ☐ WET

Record all non-conforming indications which were not removed during examination and/or evaluation. (Those in base material must be accurately located and referenced to some definable point.) COLOR & MFR: BLACK MAGNAFLUX

ABOVE PIECE MARKS EXAMINED
& NO NON-CONFORMING INDICATIONS FOUND.
CALIBRATION & INSPECTION DATE
8-110-77.



JAN 11 1982

* PER STANDARD NO. 9301-2.

The initial examination covered by this report has been performed in accordance with applicable procedure: R. J. Mosselme II 8-30-77
OPERATOR LEVEL DATE

All indications have been evaluated in terms of applicable acceptable standards. Relevant non-conforming indications have been noted on above sketch and have been reported to the Quality Assurance supervisor. Item is: Acceptable ☒ Unacceptable ☐
R. J. Mosselme II 8-30-77
EVALUATOR LEVEL DATE

Relevant, non-conforming indications, other than shown in above sketch, have been removed in accordance with approved procedure GRP _____ Rev _____ Para _____, the area re-examined, and found to be acceptable. QA SUPERVISOR DATE

Examination and evaluations have been performed to my satisfaction. Foreman
Witnessed and accepted by: Customer
Witnessed by: 102 Authorized Inspector

NOTE FOR: RICHARD HARTNETT

5/25

FROM: JACK STROSNIDER, NRC

SUBJECT: INFORMATION REQUEST

PLEASE PROVIDE DOCUMENTATION DEMONSTRATING THE TRACEABILITY OF WELDS MADE BETWEEN ~~"CLASS D" WELDS~~ STRUCTURAL MEMBERS USED IN FABRICATION OF THE CONTAINMENT SPRAY SYSTEM SEISMIC CLIPS, CRANE ~~RAMS~~ AND GIRDERS, EQUIPMENT HATCH HANDLING DEVICE AND OTHER SEISMIC I CATEGORY STRUCTURES FABRICATED FROM "D CLASS" MATERIALS IN THE CONTAINMENT. THIS DOCUMENTATION SHOULD INCLUDE ITEMS SUCH AS WELDING PROCEDURES, WELDER IDENTIFICATION AND QUALIFICATIONS, WELD ROD IDENTIFICATION, AND WELD INSPECTION RESULTS. PROVIDE THIS INFORMATION ^{FOR} ~~FOR~~ A SAMPLING OF WELDS IN THE ABOVE LISTED STRUCTURES SUFFICIENT TO DEMONSTRATE THAT THE DOCUMENTATION IS ~~COMPLETE~~ COMPLETE (E.G. TWO OR THREE WELDS FROM EACH OF THE FOLLOWING ~~STRUCTURAL COMPONENTS~~ SEISMIC CLIPS, CRANE ~~RAMS~~ GIRDERS, AND THE EQUIPMENT HATCH ~~AND~~ HANDLING DEVICE.) THE ENTIRE SET OF FILES SHOULD BE AVAILABLE FOR NRC INSPECTION AT A ~~LATER~~ LATER DATE.

THE ABOVE INFORMATION SHOULD BE PROVIDED ASAP. IN THE EVENT IT MUST BE MAILED TO WASHINGTON USE THE FOLLOWING ADDRESS:

MR. JACK STROSNIDER NE-S65C
MATERIALS ENGINEERING BRANCH, USNRC
NICHOLSON LANE BUILDING
5650 NICHOLSON LANE
ROCKVILLE, MARYLAND 20852

MY PHONE NUMBER IN WASHINGTON IS: 301-443-7903

5/23/64

NOTE FOR: RICHARD HARTNETT

FROM: JACK STROSNICK, NRC

SUBJECT: INFORMATION REQUEST

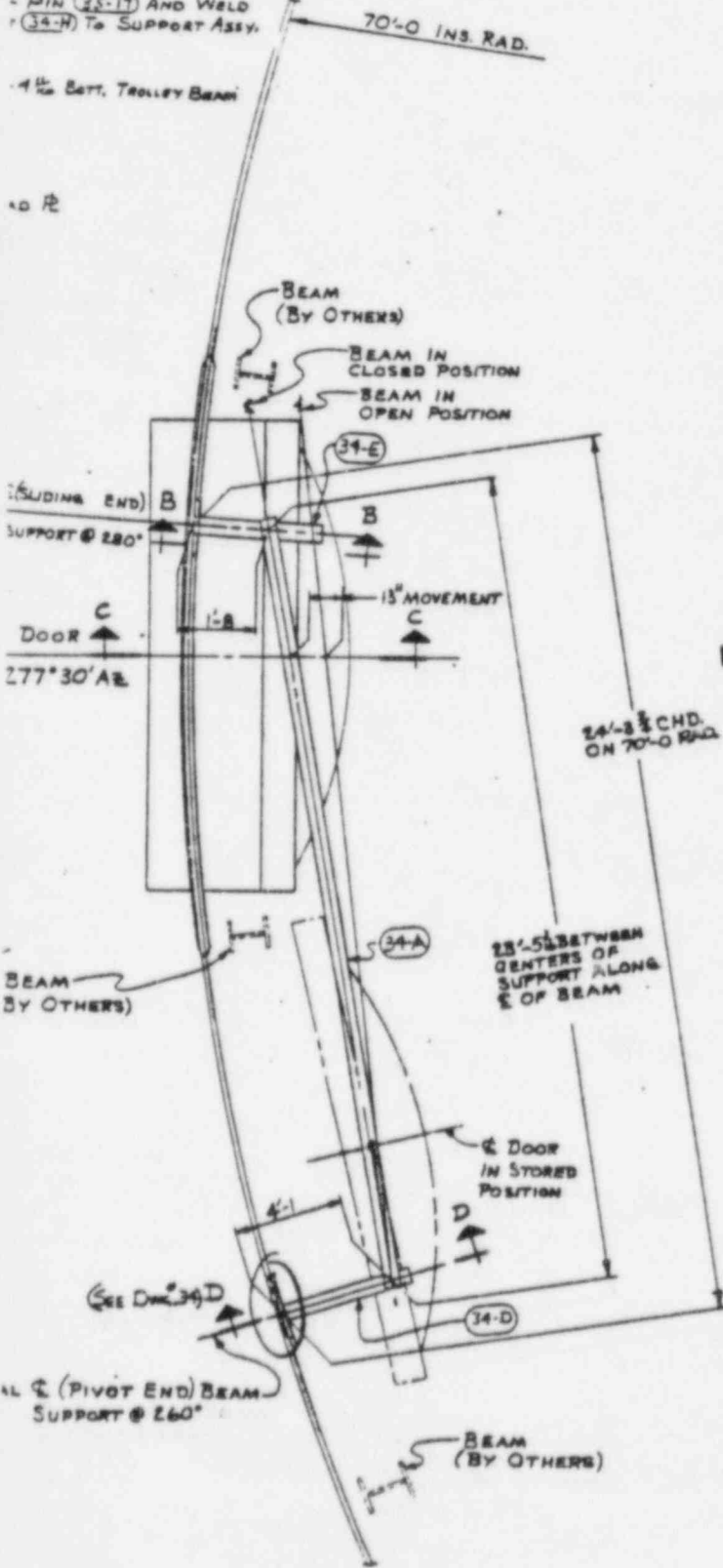
PLEASE PROVIDE DOCUMENTATION DEMONSTRATING TRACEABILITY OF THE WELD MATERIAL AND THE WELDER IDENTIFICATIONS AND CERTIFICATIONS FOR THE DISH TO CONTAINMENT SHELL WELDS (PART SS-3 TO THE CONTAINMENT SHELL) AND BEAM TO DISH WELD (PART SS-2 TO SS-3) IN CB&I DRAWING NO. 55 REV 7.

PROVIDE THE SAME INFORMATION FOR THE WELD BETWEEN PART 34-1 AND THE CONTAINMENT VESSEL ~~AND BETWEEN PARTS 34-24 AND 34-1~~ SHOWN IN CB&I DRAWING NO. 33 REV 3 AND BETWEEN PARTS 34-24 AND 34-1 IN CB&I DRAWING NO. 34 REV 4.

W3-6224

pg. 13 of 53

To SET SLIDING BEAM MIDWAY
IN THE OPEN & CLOSED POSITION.
JACTUATOR B. THEN POSITION
(34-H) SO THAT E OF HOLE IS
PIN (35-17) AND WELD
(34-H) TO SUPPORT ASSY.



SECTION 'A-A'
(HOIST OMITTED FOR CLARITY)

QTY	MARK	ASSEMBLY	DESCRIPTION	LENGTH	WTC
1	33-1		DUFF-NORTE 5-TON JACTUATOR D STEEL		45
			MODEL 1804 WITH FADED END 1/4\" RISE		
			2 INVERTED LIFTING SCREW		
1	33-2		YALE LOAD KING CLOE HEADROOM D STEEL		45
			10-TON HOIST & GEAR D TROLLEY COORD		
			N STD. 8\" D LIFT COMPLETE W/H HAND		
			HOIST & TROLLEY CHAIN NO 4\" D DROP		
2	33-3		CROSBY-LAUGHLIN TURNBUCKLE D STEEL		45
			1 1/2\" X 3/8\" JAW & JAW # G 228		
1	33-4		3 CLEVISES 1\" B UNC TAP RIGHT HAND THD. D STEEL		45
			7/16\" PIN HOLE (FOR DYWIDAG SON) 2 1/2\" GRIP OPENING		
1	33-5		CHAIN SHEAVE & GUIDE STD. 1/2\" D STEEL		45
			BORE & KEYWAY (PEH #15P #15PG)		
2	33-6		3/8\" NOM. SQ. KEY 0 1/2\" D 1018		45
1	33-7		1/2\" NOM. SQ. KEY 0 1/2\" D 1018		45
2	33-8		1/8\" STD. COTTER PINS 0 2 D STEEL		45
1	33-9		DODGE SC-2 FLANGE BEARING 1 1/2\" BORE D STEEL		45
2	33-10		1/4\"-14 UNC HEX HD. BOLTS 0 1 D A307B		45
2	33-11		LOCK WASHER FOR 1/4\" B BOLTS D STEEL		45
2	33-12		3/8\"-11 UNC HEX. HD. BOLTS 0 2 C A307B		45
4	33-13		3/8\"-11 UNC HEX. NUTS (SELF-LOCKING) 0 A307B		45
2	33-14		3/8\"-11 UNC HEX. HEAD BOLTS 0 2 D A307B		45
1	33-15		1/4\"-20 UNC-2A HEX. HD BOLT 0 0 1/2\" D A307B		45
1	33-16		WASHER 1 1/2\" O.D. X 1/8\" THK X 5/8\" I.D. D STEEL		45
1	214-E		SEIT COUPLING ASSY. D STEEL		45
1	33-17		W/HARDENED ALLOY STEEL CHAIN 37 0 D STEEL		45
			(CONTINUOUS LG 1/2\" P. 33-5)		
			(WALL STEEL-CASE NO 358TH & 604)		

OPERATING CHARACTERISTICS

- 1) HOISTING: 780 FT. OF CHAINS OVERHAULED TO LIFT LOAD A DISTANCE OF 3'-3\" OF CHAIN PULL TO LIFT LOAD.
- 2) TROLLEY: 30\" PULL W/86\" FT. OVERHAULED CHAIN FOR 14\" FT. MOVE.

APPROVED FOR DESIGN S.A. BARNER
DESIGNED FOR USE
A. C. Wilson 12-18-73
Checked by
UPWARD W/CW/MW 3 JAN 23-74

LOUISIANA POWER AND LIGHT COMPANY
WATERFORD STEAM ELECTRIC STATION UNIT 93
BATON ROUGE, LOUISIANA

CHICAGO BRIDGE & IRON COMPANY

**MAINTENANCE HATCH
HANDLING DEVICE**

DESIGNED BY R.T.B. DATE 8-22-74 CONTRACT NO. 71-2426

CHECKED BY R.W. DATE 7-7-74

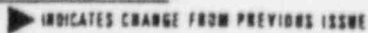
L.C. WILSON

WELDING CONNECTIONS

WELD NO. 33 OF 3

THIS DRAWING IS THE PROPERTY OF THE CHICAGO BRIDGE & IRON COMPANY AND IS TO BE USED ONLY IN CONNECTION WITH THE PERFORMANCE OF WORK BY THE COMPANY UNDER A FIRM CONTRACT. IT IS NOT TO BE REPRODUCED OR COPIED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF THE COMPANY.

pg. 16 of 53



proof for cat B & cat D weld
cat B & cat shell
temp welds

ATTACHMENTS TO CONTAINMENT SHELL

DRAWINGS 15 → 30 temporary test heads for penetrations

31 → 35 Maintenance door handling assembly
- attachments through Class B mat.
- how ~~were~~ Class B & Class D welds QAT?

36 → 49 penetration temporary

53 seismic clips for containment spray dike are cat B

54 - 60 - penetration

61 - roof hand pts - what are they?

62 - 64 pene

Review of DWGS 14 - 100 ⇒ all pods attached to containment vessel are Class B material

ASP IV-18 Rec, Stor, casing & control of weld clat & filler material

ASP IV-58 Attachment to seismic support

ASP IV-123 Use of Commercial Grade Item in Safety Related Apparatus

WQC-170 Control of weld filler materials

5/22/84

NOTE FOR: RICHARD HARTNETT

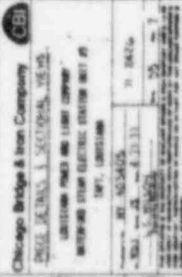
FROM: JACK STROSNIDER, NRC

SUBJECT: INFORMATION REQUEST

PLEASE PROVIDE THE FOLLOWING INFORMATION:

1. CB&I PROCEDURES FOR WELDING OF ~~TEMPORARY~~ ATTACHMENTS TO THE CONTAINMENT ~~TO~~ VESSEL SHELL (REQUIREMENTS FOR TRACEABILITY OF WELDING ELECTRODES, FILLER METAL, CERTIFICATION OF WELDERS, TRACEABILITY OF ATTACHMENT MATERIALS) ~~AND IN THE DURING CONSTRUCTION~~
~~AND IN THE DURING CONSTRUCTION~~
2. CB&I PROCEDURES FOR MAKING AND IDENTIFYING TEMPORARY ATTACHMENTS TO THE CONTAINMENT SHELL DURING CONSTRUCTION.

DATE RECEIVED: 4 - 25 - 2006 (P. 0005/07)



Received by Federal Express 6/14/84 a.m.

Talked to R. Hartnett 6/18 a.m. • confirmed receipt of package
• told him it didn't appear to fulfill
the requirements - ^{the transcript has word to} ~~the transcript has word to~~
• suggested that L'vick should look
for reversal on Class D to Class D number

Jack Stroud
6/16/84



LOUISIANA
POWER & LIGHT

142 DELARONDE STREET
P O. BOX 6008 * NEW ORLEANS, LOUISIANA 70174 * (504) 386-2345

June 12, 1984

W3884-0437
Q-3-A35.02.01.02

Mr. Jack Strosnider NL-5650
Materials Engineering Branch, USNRC
Nicholson Lane Building
5650 Nicholson Lane
Rockville, Maryland 20852

Dear Mr. Strosnider:

Attached is the information you requested on May 25 during your review of the Waterford SES Unit 3 records for Chicago Bridge and Iron. Please advise if there are any additional questions concerning these records by contacting Mr. R. Hartnett at 504 467-2791 ext. 325.

Very truly yours,

D. E. Dobson
Project Manager - Nuclear

Attachment

cc: without attachment
L. Constable
T. F. Gerrets
L. L. Bass
Nuclear Records
Project Files

NOTE FOR: RICHARD HARTNETT

5/25

FROM: JACK STROSNICK, NRC

SUBJECT: INFORMATION REQUEST

PLEASE PROVIDE DOCUMENTATION DEMONSTRATING THE TRACEABILITY OF WELDS MADE BETWEEN ~~"CLASS D" MATERIAL~~ STRUCTURAL MEMBERS USED IN FABRICATION OF THE CONTAINMENT SPRAY SYSTEM SEISMIC CLIPS, CRANE RAILS AND BEAMS, EQUIPMENT HATCH HANDLING DEVICE AND OTHER SEISMIC I CATEGORY STRUCTURES FABRICATED FROM "D CLASS" MATERIALS IN THE CONTAINMENT. THIS DOCUMENTATION SHOULD INCLUDE ITEMS SUCH AS WELDING PROCEDURES, WELDER IDENTIFICATION AND QUALIFICATIONS, WELD ROD IDENTIFICATION, AND WELD INSPECTION RESULTS. PROVIDE THIS INFORMATION ~~FOR~~ ^{FOR} A SAMPLING OF WELDS IN THE ABOVE LISTED STRUCTURES SUFFICIENT TO DEMONSTRATE THAT THE DOCUMENTATION IS ~~COMPLETE~~ COMPLETE (E.G. TWO OR THREE WELDS FROM EACH OF THE FOLLOWING ~~STRUCTURAL COMPONENTS~~ SEISMIC CLIPS, CRANE ~~BEAMS~~ BEAMS, AND THE EQUIPMENT HATCH ~~HANDLING~~ HANDLING DEVICE.) THE ENTIRE SET OF FILES SHOULD BE AVAILABLE FOR NRC INSPECTION AT A ~~LATER~~ LATER DATE.

THE ABOVE INFORMATION SHOULD BE PROVIDED ASAP. IN THE EVENT IT MUST BE MAILED TO WASHINGTON USE THE FOLLOWING ADDRESS:

MR. JACK STROSNICK NE-5650
MATERIALS ENGINEERING BRANCH, USNRC
NICHOLSON LANE BUILDING
5650 NICHOLSON LANE
ROCKVILLE, MARYLAND 20852

MY PHONE NUMBER IN WASHINGTON IS: 301-443-7903

CB&I (NY 403405)

Documentation demonstrating traceability of the following information for welds of permanent attachments to containment shells:

- 1) Welding procedures
- 2) Welder ID & qualifications
- 3) Weld rod identification
- 4) Weld inspection results

Sampling:

- A) Containment spray system pneumatic clips
- * 55-3 to containment shell } dwg. 55
 - * 55-2 to 55-3
- B) Equipment hatch handling device
- * 34-1 to containment shell - dwg. 33
 - ** 34-24 to 34-1 - dwg. 34
- C) Crane rail and girders
- * 68-1 to containment shell (assy 67-A) - dwg. 66 & 67
 - ** 68-1^L to 68-1^R (shop seam - B) - dwg. 67
 - * field welds
 - ** shop welds

B mat'l { 34-1, 55-3 & 68-1^{R/L}

D mat'l { 34-24, 55-2



NUCLEAR
QUALITY ASSURANCE MANUAL
FOR

ASME SECTION III PRODUCTS

DIVISION: 4 CONSTRUCTION
Section 7.0 Process Control

Rev No. 6 Date 4-3-75
Page: 8 of 18

7.5.7 (1) (continued)

- ▷ (e) Category I Repairs per 14.4.4.1 (excluding repairs to radiographed seams) will be documented on the "Repair Check List" GO 1002 (App. A, page 24) per 7.5.10.
- (f) Repairs to radiographed seams are documented as follows:
- 1) The location and identification of unacceptable defects are on the original radiograph, on the interim report per (b) above and later, on form GO 827 or GO 629.
 - 2) The repair welding procedure specification, checking of repair welding, repair procedure reference and signoff for examination of the repair cavity shall be documented by a second entry on the applicable Record Drawing.
 - 3) The repair welder ID is shown on the repair radiograph and form GO 827 or GO 629.
 - 4) The results of the re-examination are shown on the repair radiograph, on the interim report per (b) above and later on form GO 827 or GO 629.
 - 5) The ID of the radiographer(s) who made the repair radiograph is shown on form GO 827 or GO 629.
 - 6) CBI evaluation and acceptance of the re-examination is shown on the interim report per (b) above, later on form GO 827 or GO 629 and for the complete joint on the applicable Record Drawing.
 - 7) Authorized Inspector signoffs for any repairs that he has witnessed are shown on the applicable Record Drawings.
 - 8) Authorized Inspector signoff for review of re-examination radiographs is on form GO 827 or GO 629.
2. For attachment welds:
- (a) MT and PT examinations will be documented by groups on Detail Check List GE 682 (7.5.4) (App A, page 28) (see 7.5.8.1 for required control of individual examinations) and reports in accordance with para. 9.5.



7.5.7 (continued)

- (b) Welding process check points (fitup, welding, welding procedure and finished joint) will be covered by an overall signoff on the Master Check List GE 681 (7.5.2) (App A, page 27).
 - (c) Identification of welders of permanent attachments shall be shown on the Detail Check List or the record drawing (7.5.7(1)(a)), as agreed upon by Engineering and Construction QA. Specific identification is required on Class 1, 2, 3 and CS; group identification is acceptable on Class MC. The list of welders will include the identification of those who welded temporary attachments (8.4.2).
- 3. PWHT and Final Overload Test will be documented on Special Check Lists GE 684 (7.5.6) (App A, page 30) and will include CBI hold points.
 - 4. Other Examinations, Check Points, etc., (such as plate cleanup, dimensional checks) not directly identified (see 2) and not involving PWHT or final overload test (see 3) will be documented by groups on Detail Check Lists GE 682 (7.5.4) (App A, page 28).
 - 5. The initials of the Project Welding & QA Supervisor on lines of the Detail Check Lists and Special Check Lists indicate his acceptance of completed operations.

7.5.8 Temporary Records:

Jobsite QA may use any of the following for collecting data or for assuring completeness of examinations:

- (a) Marking on the shell surface per 7.5.8.2.
- (b) Marking on drawings or sketches.
- (c) Marking on tabular type records, which describe the location of items.

Paper aides must be clearly marked "Working Copy". They need be retained only until the data thereon has been signed off or has been transferred to the Official Record Drawings, Check List or other reports (see 7.5.7.1(b)).



IDENTIFICATION WPAT 71-2426

TITLE } WELDING PROCEDURE APPLICATION TABLE
 TAFT, LOUISIANA
 PRODUCT NUCLEAR CONTAINMENT VESSEL
 CUSTOMER EBASCO SERVICES FOR L. P & L

PAGE NO. 3 OF 8
 REV. NO. 13
 By, RSM DATE: 4/22/80

Numerical Code:

- 1 = No Preheat, No PWHT
- 2 = Preheat, No PWHT
- 3 = No Preheat, with PWHT
- 4 = Preheat, with PWHT
- 5 = With Back Up Bar

WELDING PROCEDURE APPLICATION TABLE

JOINT LOCATION	WPS NO.	MAT'L P. NO.	WELDING PROCESS	FILLER METAL	CODE NO.
Burner Cutout To Bottom Head	WPS IIIB 6201	SA-516-70 P-1	SMA	INCO 182	1
Burner Cutout To Shell	WPS IIIB 6201	SA-516-70 P-1	SMA	INCO 182	1
Equipment Hatch Together	WPS E7018	SA-516-70 P-1	SMA	E 7018	4
{ Permanent Attachments (Including Crane Girders)	WPS E7018	SA-516-70 or other P-1 Material P-1	SMA	E7018	4
Stainless Steel Pipe to Top Head	WPS IIIB 8103	SA 312 Type 304 to SA516- 70	SMA	E309	1
13 Stainless Steel Clips to Shell	WPS E309A	A240 Type 304 (P-8) to A516-70 (P-1)	SMA	E309	2
3 Stainless Steel Clips Together	WPS E308L	A240 Type 304 P-8	SMA	E308L	1



METAL MATERIAL VERIFICATION SUMMARY SHEET

Contract No. 71-2426
Sheet 29 of 30

Copy to Engineering - By _____ Date _____

No. of Ctrs For Customer _____

NO. OF PCS.	ORDERED ITEM NO.	SUPPLIER'S HEAT, LOT OR OTHER IDENTIFICATION NUMBER	SUPPLIER'S SLAB NUMBER	MATERIAL SPEC. AND THICKNESS FOR PLATES	CAR OR TRUCK NUMBER AND SUPPLIER	CTR CHECKED		METAL REC'G INSPECTION REPORT CHECKED		DAILY FABR OR STORES RELEASE REPORT CHECKED		ENGR. PIECE MARK	SERIAL NUMBER	NO. OF PIECES FABRICATED	CHECKED COMPLETE	INITIAL	REMARKS
						Date & Initial	CBI No.	Date & Initial	CBI No.	Date & Initial	CBI No.						
1	STK	80441	P36025	A516-70 Norm T = 1/2	Armco	(4/7302)		3-22-77		82-5		52	58				C-MATL
				"	"	-				83-10		8	58				"
				"	"	-				83-9		8	58				"
				"	"	-				83-8		28	58				"
				"	"	-				83-7		28	58				"
				"	"	-				83-6		28	58				"
				"	"	-		4-11-77		87-2 ^R		2	58				"
				"	"	-				87-3 ^R		2	58				"
																58	
1	PL2	802J08820	J30780-1	A516-70 MS 647	Beth	(4/4333)		6-9-77		61-16		5	58				UM
1	PL2	"	J30777-1	T = 1 1/4	"	(4/4334)		6-9-77		61-16		5	58				"
1	PL2	"	J30779-1	"	"	(4/4333)		6-9-77		61-16		1	58				"
		"	"	"	"	-				61-10		4	58				"
1	PL2	802J06100	J30867-1	"	"	(4/4334)		6-9-77		61-10		5	58				"
																58	
1	STK	67E024	9585A	A516-70 Norm	USS	(A362)		6-3-77		74-4		17	58				C-MATL
1	STK	"	9585B	T = 5/16	"	-				74-4		7	58				"
4/0	GS	401P3241	P25350	T = 3/4	Beth	(4/4333)		8-17-77		55-3		2	58				UM
		"	"	"	"	-				55-24		1	58				"
4/0	VS2	W93230	1X1	T = 1	USS	(4/4333)				55-5		2	58				UM

BETHLEHEM STEEL CORPORATION
METALLURGICAL DEPARTMENT

20671 (Rev.D 6-70)

DATE SHIPPED 8/12/74	SHIPMENT NO. 160-3270	CARRIER: INITIAL AND NO. SCL 133329	PLANT SPARROWS POINT
-------------------------	--------------------------	--	-------------------------

SOLD TO

CHICAGO BRIDGE AND IRON COMPANY

BOYLES AL

Joe 2426
VUM

SHIPPED TO

REPORT OF MECHANICAL AND CHEMICAL TESTS

Customer's Order No.	Section Slob or Mill Order No.	Heat No.	Pct.	Gauge	Width	Length	Yield Point	Tensile Strength	Elong. %	Red. %	Bends	CHEMICAL ANALYSIS					Specifications or Remarks
												C	Mn	P	S	SI	
4333 SHEET 32	P25349 P25350	401P3242 401P3241	1 1	1-1/4 48 3/4	84-1/2	120 120	44600 46500	71800 72200	28 25			OK OK	.24 1.03	.012 .012	.024 .024	.23 .23	MS6003 REV 0 QAS 321 ASME SA516 GR 70 PVQ ASME SECT 3 NORMALIZED
GD25-7737	<p>WE CERTIFY THAT THE REQUIREMENTS OF THE SPECIFICATION NUMBERS SHOWN HEREON HAVE BEEN MET</p> <p>MC QUAD EHN TEST GRAIN SIZE 7-8 BOTH HEATS PLATES AND TEST PIECES NORMALIZED AT 1650°F AND HELD FOR 1/2 HOUR PER INCH OF THICKNESS</p> <p>TVA CONT #73C61-75320</p> <p>LONGITUDINAL CHARPY V NOTCH IMPACT TESTS OF 20 FT LB AT MINUS 30°F PER NB2300</p>																
	P25349 P25350	401P3242 401P3241	#1 29 40	#2 41 44	#3 28 51	TEST SIZE 10 x 10 MM "	% DUCTILE FRACTURE 25-45-24 35-30-35			LATERAL EXPANSION 20-39-31 30-24-30							

REVIEWED BY
[Signature]
EDASCO VQA REP.

SUBSCRIBED AND SWORN TO
BEFORE ME THIS 13 DAY OF August 1974
[Signature]
NOTARY PUBLIC
MY COMMISSION EXPIRES JULY 1, 1978

208

I certify the above results to be correct as contained in the records of the company.

Per sb



SUPPLEMENTAL SUMMARY SHEET
FOR MATERIAL VERIFICATION

CONTRACT NO. 71-2426

LOCATION 24-3

SUPPLIER'S ID NO.		ENGINEERING PIECE MARK	SERIAL NO.	NO. PIECES FABRICATED	
6/22 SHC - <u>A4448</u> <u>2A</u>	5/25/77	2	54-1	-	20
			54-2	-	12
			54-3	-	9
			54-4	-	6
			54-5	-	1
			54-6	-	1
			54-7	-	1
			54-8	-	1
			54-9	-	1
			54-10	-	1
			55-1	-	15
		55-3	-	16	
		55-5	-	16	
	5/26/77	58	84-3	-	1
			81-3	-	1
	5/27/77	58	53-1	-	29
			53-2	-	2
			53-3	-	1
			53-4	-	1
			53-5	-	30
		53-6	-	2	
		53-7	-	30	
		53-8	-	1	
		53-9	-	1	
		53-10	-	30	
		53-31	-	1	
	53-32	-	1		
6/2/77	58	74-3A	-	1	
		74-3B	-	1	
		74-3C	-	1	
7/19/77	58	55-3	-	6	

REVIEWED BY: E.B. ASCO & A.E. 17 6/22/80



PURCHASER:

6. CHICAGO BRIDGE & IRON CO.
BIRMINGHAM, ALA. 35202

LUKENS STEEL COMPANY

COATESVILLE, PA. 19320

TEST CERTIFICATE

DATE: 12-15-75

FILE NO 1540-02-04

CONSIGNEE:

CHICAGO BRIDGE & IRON CO.
BOYLES, ALA. 35202

MILL ORDER NO.

67953-1

CUSTOMER P.O.

2426 SHEET 51

MP 121175 DM
1/6

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

CBI MS-647 REV. 0 QAS 301 REV.. 1 SA-516 GR. 70 ASME CODE SECT. 2 & 3 SUB NE 1971 EDITION THRU
SUMMER 1971 ADDENDA N-1160 8/4/78

BEND TEST O.K. HOMOGENEITY TEST

CHEMICAL ANALYSIS

MELT NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	Ti	AL	B	GRAIN SIZE
A448	23	1.00	005	017		21								7-8

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 8"	% R.A.	BHN	LV -30°F.	IMPACTS	FRACTURE APPEARANCE	DESCRIPTION
A448	2A	587	800	26			48	51	50	1- 3/4" x 80 x 274*
							.043	.046	.047	

PLATE AND TESTS NORM. 1624-1675°F., HELD 1/2 HR. PER INCH MIN.
AND AIR COOLED.

*LENGTH REFERRED AND ACCEPTED BY CUSTOMER.

REVIEWED BY
J. Thomas
ERASCO QA REP.

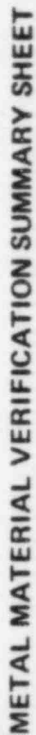
SHC

179

We hereby certify the above information is correct.

SUPERVISOR TESTING

J. H. Kline



Contract No. 71-2426
Sheet 22 of 23

No. of Ctrs For Customer

[illegible]

See standard 607.3.1 for instructions on using this form.

Contract No: 7/-2456

GO 590 REV DEC 74



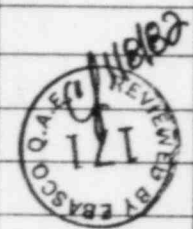
METAL MATERIAL VERIFICATION SUMMARY SHEET

Contract No. 71-2426
Sheet 26 of 30

Copy to Engineering - By _____ Date _____

No. of Ctrs For Customer _____

NO. OF PCS.	ORDERED ITEM NO.	SUPPLIER'S HEAT, LOT OR OTHER IDENTIFICATION NUMBER	SUPPLIER'S SLAB NUMBER	MATERIAL SPEC. AND THICKNESS FOR PLATES	CAR OR TRUCK NUMBER AND SUPPLIER	CTR CHECKED		METAL REC'G INSPECTION REPORT CHECKED		DAILY FABR OR STORES RELEASE REPORT CHECKED		ENGR. PIECE MARK	SERIAL NUMBER	NO. OF PIECES	FABRICATED	CHECKED COMPLETE	INITIAL	REMARKS
						Date & Initial	CBI No.	Date & Initial	CBI No.	Date & Initial	CBI No.							
#2426	-55	Luk	SA516-70 (MS 647)	- Crane Bldg. Main Members														
1	CG5	C5770	7A	T=1	7-12-75 ADG 38107	9-29-75	SL	10/3	7-26-76	68-6	65-68	4	SL					
1		"	7B	"	"	9-29-75	SL	10/3	7-19-76	68-6	53-56	4	SL					
1		"	8A	"	"	9-29-75	SL	10/3	7-19-76	68-6	13-16	4	SL					
1		"	8B	"	"	9-29-75	SL	10/3	7-26-76	68-6	69-72	4	SL					
1		"	9A	"	"	9-29-75	SL	10/3	7-19-76	68-6	5-8	4	SL					
1		"	9B	"	"	9-29-75	SL	10/3	7-19-76	68-6	17-20	4	SL					
1		"	11B	"	10-9-75 PRR 375299	10-30-75	SL	11/5	7-19-76	68-6	41-44	4	SL					
1		"	18C	"	"	10-30-75	SL	11/5	7-19-76	68-6	45-48	4	SL					
1	CG5	D1828	8A	T=1	"	10-30-75	SL	11/5	7-19-76	68-6	37-40	4	SL					
#2426	-57	Bulk	SA516-70 (MS 647)	- Bldg. Inert														
1	P22	802T71440	T12380-1	T=5 1/2	11-11-75 PRR 475463	11-20-75	SL	12/1	3-12-76	64-1	1	1	SL					THIN - RES P437-2
1	P24	802P67440	T12109-1	T=5	11-8-75 NYC 500514	11-19-75	SL	12/5	2-5-76	47-4	1-2	2	SL					
1	P26	802T71440	T220146	"	11-11-75 PRR 475463	11-20-75	SL	12/1	2-16-76	62-1	1	1	SL					THIN - RES P438-2
#2426	-61	Luk	SA516-70 (MS 647)	- No2. Necks														
1	NK	C6522	5C	T=1 1/16	4-30-76 NYC 506107	5-13-76	SL	5/24	5-25-76	64-2	1	1	SL					
1	MU	D1752	6	T=5 1/2	4-13-76 Truck	4-22-76	SL	6/4	6-4-76	63-3	1	1	SL					
1	76-1	C6482	3	T=4 1/2	7-9-76 MTX 97592	7-26-76	SL	7-30	8-4-76	36-4	1	1	SL					
1	34-1	C6248	3B	T=2 1/4	10-13-76 Truck	10-18-76	SL	10/19	10-20-76	27-6	1	2	SL					SWR DES > P465-2



PURCHASER:

6. CHICAGO BRIDGE & IRON CO.
MR. S. E. WIGGIN, BUYER
P.O. BOX 277
BIRMINGHAM, ALA. 35202

LUKENS STEEL COMPANY

COATESVILLE, PA. 19320

TEST CERTIFICATE

DATE: 10-14-76

FILE NO 1540-02-04

CONSIGNEE:

MILL ORDER NO.
70380-3CUSTOMER P.O.
2426 SHEET 61BL 101376 VS
4/1CHICAGO BRIDGE & IRON CO.
BOYLES, ALA. 35202

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

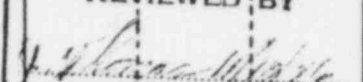
CB&I MS-647 REV. 0 SA-516 GR. 70 ASME CODE SECT. II & III SUB NE 1971 EDITION THRU SUMMER
1971 ADDENDA N-1160 8/4/78

BEND TEST O.K. HOMOGENEITY TEST

CHEMICAL ANALYSIS

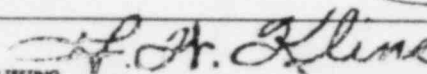
MELT NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	Ti	AL	B	GRAIN SIZE
c6248	24✓	98✓	010	022✓		23✓								7-8

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 2"	% R.A.	BHN	IMPACTS LV -30°F.	FRACTURE APPEARANCE % SHEAR	DESCRIPTION
c6248	3B	606✓ 636✓	823✓ 833✓	27✓ 27✓			45✓ 56✓ 48✓ LATERAL EXPANSION IN INCHES .054 .043 .046	40-40-40	1 - 2-1/4" x 72 x 125
PLATE AND TESTS HEATED 1525-1675°F., HELD 1/2 HR. PER INCH MIN. AND WATER QUENCHED, THEN TEMPERED 1260°F., HELD 1/2 HR. PER INCH MIN. AND WATER QUENCHED.									
TESTS STRESS RELIEVED BY HEATING WITHIN A RATE OF 178°F. PER HR. TO 1150°F. HELD 15 HRS. AND FURNACE COOLED WITHIN A RATE OF 222°F. PER HR. TO 600°F.									
REVIEWED BY  EBASCO VQA REP.									

We hereby certify the above information is correct.

SUPERVISOR TESTING



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METAL MATERIAL VERIFICATION SUMMARY SHEET

Contract No. 71-2426
Sheet 4 of 23

Copy to Engineering - By _____

Date _____

No. of Ctrs For Customer _____

NO. OF PCS.	ORDERED ITEM NO.	SUPPLIER'S HEAT, LOT OR OTHER IDENTIFICATION NUMBER	SUPPLIER'S SLAB NUMBER	MATERIAL SPEC. AND THICKNESS FOR PLATES	CAR OR TRUCK NUMBER AND SUPPLIER	CTR CHECKED Date & CBI Initial No.	METAL REC'G INSPECTION REPORT Date & CBI Initial No.	DAILY FABR OR STORES RELEASE REPORT Date & CBI Initial No.	ENG. MARK PIECE	SERIAL NUMBER	NO. OF PIECES FABRICATED	COMPLETED INITIAL	REMARKS
	34D	Support	Beam	Assy									
1	34-2	9w 35-11		A36	524 x 79.9			X	34-2	-	1	52	
1	5TK			A36	TE 8 x 1/2 x 0'11 3/32				35-2	-	1	53	
1	7221B	- Dixie		Carbonite	TE 8 x 3/4 x 0'11 3/32		*		98 35-4	-	1	✓	
2	5TK			A307B	5/8-11UNC	HEX NUTS			34-22	-	2	✓	
2	5TK			A307	do	Flt Hb Mach Screw			34-23	-	2	✓	
	34E	Support	Beam	Assy									
1	34-24	9w 35-11		A36	524 x 79.9			X	34-24	-	1	58	
1	5TK			A36	TE 3 x 1/2 x 0'17				34-20	-	1	✓	
1	5TK			A36	TE 7 x 1/2 x 2'3				34-21	-	1	✓	
2	5TK			A307B	5/8-11UNC	HEX NUTS			34-22	-	2	✓	
2	5TK			A307	do	Flt Hb Mach Screw			34-23	-	2	✓	
1	35-8	9w 35-4		Carbonite	TE 7 x 3/4 x 2'0		*		98 35-8	-	1	✓	
1	5TK	0022	B679	A36	TE 200 x 1/6 x 1				87 34-3	-	1	58 (PROE)	
	34F	Beam	Support	Assy									
1	5TK			A36	TE 5 x 1/2 x 0'8				35-18	-	1	✓	
1	5TK			A36	TE 7 x 1/2 x 0'8				35-19	-	1	✓	
												58	

BIRMINGHAM PHONE
(205) 595-1191

PURCHASE ORDER
CHICAGO BRIDGE & IRON COMPANY
1500 NORTH 50TH STREET
P. O. BOX 277
BIRMINGHAM, ALABAMA 35201

PURCHASE ORDER NO. MUST APPEAR ON ALL
INVOICES, PACKAGES AND SHIPPING PAPERS

PURCHASE ORDER NO.	
2426 Sheet 44	
COMM. C. #	CHARGE #
790-35	71-2426

NR

DATE 9/1/74

SHEET NO. OF

To:

Ship to above address unless noted below:

Ingalls Iron Works
P. O. Box 2527
Birmingham, Alabama 35202

Boyles, Alabama

Routing: LAN Delivery

NO
SC 2119
CB

COLLECT ☐
PREPAID ☐

SPECIFICATIONS:

ASTM A-36

SPECIAL INSTRUCTIONS:

CONFIRMATION

END USE:

TEST, LA. - CONTAINMENT

MILL:	NO. SHIPPING NOTICES: 3	
	NO. TEST REPORTS: 2	
	NO. MONEY INVOICES: 2	
	NO. BILLS OF LADING: 1	
VENDOR ORDER NO.:	INSPECTION BY MILL UNLESS OTHERWISE NOTED	ALA. TAX: EXEMPT <input type="checkbox"/> APPLIES <input type="checkbox"/>
SCHEDULED ROLLING:	SHIPPING PROMISE:	CONFIRMING <input type="checkbox"/> NON-CONFIRMING <input type="checkbox"/>
At Once		

ITEM NO.	NO. OF PIECES	DESCRIPTION	LENGTH		THEOR. WEIGHT	
			FEET	INCHES	EACH	TOTAL
HANDLING DEVICE FOR EQ. DOOR						
<u>35-11</u>	<u>1</u>	<u>S24 x 79.9</u>	<u>60</u>	<u>0</u>		<u>4794</u>

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ATTACHMENT # 4
NCR-W3-6224
CLASS "D" MATERIALS

PAGE 4 OF 9

CB&I DWG. #	MARK#	STATUS BASED ON CB&I RESPONSE	REMARKS
71-2426-34 CONTINUED		SUPPORT BEAM ASSY.	
	34-2	} NOTE 2 - STRUCTURAL SHAPES & PLATES	} ENGINEERING TO EVALUATE
	35-2		
	34-24		
	34-20		
	34-21		
	34-3	NOTE 3 - PLATE	
	34-22&23	NOTE 2 - MISC. HARDWARE-FASTENERS	— ACCEPT AS IS
		BEARING SUPPORT ASSY.	
	35-18&19	NOTE 2 - PLATES	ENGINEERING TO EVALUATE
71-2426-35	35-17&20	NOTE 2 - 1 1/4" ϕ AN & 7/8" ϕ ROD	ENGINEERING TO EVALUATE
-36	36-5,6,7	NOTE 1	ACCEPT AS IS
-37	37-5	NOTE 2 & 5 - TEST HD	ACCEPT AS IS
	37-7	NOTE 1	" " "
-38	15-D	NOTE 2 & 5 - TEST HD.	ACCEPT AS IS
	37-7	NOTE 1	
-39	37-7	NOTE 1	
-40	37-7	NOTE 1	
-41	37-1	NOTE 1	
	15-D	NOTE 2 & 5 - TEST HD	
-42	37-7	NOTE 1	
-43	43-5&6	NOTE 1	
	15-B	NOTE 2 & 5 - TEST HD.	
✓ -44	15B&C	NOTE 2 & 5 - TEST HD.	✓

ATTACHMENT #4

NCR W3-6224

Based on Chicago Bridge & Iron Company's (CB&I) response dated 7-5-83 (Attachment #5), the table below summarizes the findings on the original CB&I Class D materials supplied. The following is the note legend for this table:

- NOTE 1 CB&I provided Material Test Reports or Certificates of Compliance. See Attachment 5.
- NOTE 2 CB&I can not trace physical/mechanical properties through Purchase Orders.
- NOTE 3 Although actual records do not uniquely tie these pieces to particular stock materials, CB&I shop had available remaining material from these purchases for fabrication at that time. See Attachment 5.
- NOTE 4 Material originally identified to the supplier by the Supplemental Summary Sheet for Material Verification.
- NOTE 5 Temporary material, therefore no material traceability required.
- NOTE 6 Seismic Class 1 as defined by Attachment #3 doesn't include miscellaneous hardware. Therefore, miscellaneous hardware doesn't require material traceability.

ESSE engineering will be required to evaluate the acceptability of those materials so noted in the tables.

J. Chirko

8-23-83



ATTACHMENT #5
NCR-W3-6224
CLASS "D" MATERIALS

PAGE 2 OF 6

CB&I DWG. No.	MARK No.	DESCRIPTION	SPEC.	STATUS BASED ON CB&I RESPONSE	REMARKS BY ESSE-CIVIL
71-2426-31	31-6	14.0 ID MAINTENANCE HATCH 1/8 COTTER PIN	STEEL	NOTE 2	ACCEPT AS IS. THIS IS NOT A PRIMARY ITEM THAT IS STRESSED UNDER DURESS.
	31-9	1/4 PIPE PLUG FOR TEST PORT	STEEL	NOTE 2	ACCEPT AS IS.
		14.0 MAINTENANCE HATCH HANDLING DEVICE ASS'Y			
		TROLLEY BEAM ASS'Y			
-34	35-7	FE 8x1/2	A-36	NOTE 2	ACCEPT AS IS. THEORETICALLY ANY ORDINARY A36 STRUC- TURAL STEEL WOULD DO.
	35-11	BEAM S 24x79.9	A36	NOTE 2	
	35-13	L-5x3x3/2	A36	NOTE 3	ACCEPT AS IS. MATERIAL HEAT NO. IS KNOWN.
	34-3	FE 2" OD x 1/16 ID x 1/4 THK	A36	NOTE 3	ACCEPT AS IS. MATERIAL HEAT NUMBER IS KNOWN.
	34-4	1" Ø ROD x 2.7 LG	A36	NOTE 2	ACCEPT AS IS.
	34-2	BEAM S 24x79.9	A36	NOTE 2	ACCEPT AS IS. ANY A36 STRUCTURAL STEEL SHAPE MAY BE CONSIDERED SUFFICIENT ENOUGH.
	34-24	BEAM S 24x79.9	A36	NOTE 2	
	35-2	FE 8x1/2	A36	NOTE 2	ACCEPT AS IS.
	34-20	FE 3x1/2	A36	NOTE 2	
	34-21	FE 7x1/2	A36	NOTE 2	
	35-18, 19	FE 5x1/2	A36	NOTE 2	
		DETAILS FOR HANDLING DEVICE FOR 14.0 MAINTENANCE HATCH			
-35	35-17	1/4 Ø PIN	STEEL	NOTE 2	ACCEPT AS IS.
	35-20	7/8 Ø ROD	1017 CRS	NOTE 2	ACCEPT AS IS.
		SPRAY HEADER SUPPORT CLIP			
-55	55-4 ^R	L-3x3x1/2	A36	NOTE 3	ACCEPT AS IS. MATERIAL HEAT NUMBER IS KNOWN.
	55-9 ^R	L-3x3x1/2	A36	NOTE 3	



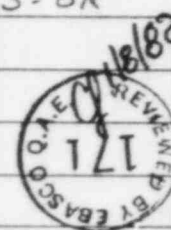
METAL MATERIAL VERIFICATION SUMMARY SHEET

Contract No. 71-2426
Sheet 24 of 30

Copy to Engineering - By _____ Date _____

No. of Ctrs For Customer _____

NO. OF PCS.	ORDERED ITEM NO.	SUPPLIER'S HEAT, LOT OR OTHER IDENTIFICATION NUMBER	SUPPLIER'S SLAB NUMBER	MATERIAL SPEC. AND THICKNESS FOR PLATES	CAR OR TRUCK NUMBER AND SUPPLIER	CTR CHECKED		METAL REC'G INSPECTION REPORT CHECKED		DAILY FAB'R OR STORES RELEASE REPORT CHECKED		ENGR. PIECE MARK	SERIAL NUMBER	NO. OF PIECES FABRICATED	CHECKED COMPLETE INITIAL	REMARKS
						Date & Initial	CBI No.	Date & Initial	CBI No.	Date & Initial	CBI No.					
	⁺ 2426-49	Luk	SA516-70	(MSG47)	-											Rang Hardprint
1	HP6	C5931	5B	T=1	9-23-75 PC532059	10-1-75	SB	10/23	See Supp	24-2	SB					
1	HP6	C5740	45A	"	9-3-75 RDG 33671	11-14-75	SB	10/5	See Supp	24-1	SB					
1	HP7	C5731	7P	T=3/4	9-4-75 RDG 36814	10-1-75	SB	10/3	6-3-77	61-12	-	6	SB			
1	HP7	D1976	16T	"	9-3-75 RDG 33671	10-1-75	SB	10/3	6-3-77	61-12	-	6	SB			
1	HP7	C5731	9S	"	11-24-75 PC552709	9-15-75	SB	7/25	6-3-77	61-12	-	6	SB			
1	HP8	C5931	10B	"	9-3-75 RDG 33671	1-5-76	SB	1-15-77	See Supp	24-1	SB					S-OK
1	HP9	D1925	10AA	"	9-4-75 RDG 36814	9-18-75	SB	7/25	6-6-77	61-14	-	4	SB			
1		D1995	15BB	"	"	9-18-75	SB	7/25	6-6-77	61-14	-	4	SB			
1		D1995	10AB	"	"	10-1-75	SB	10/3	6-6-77	61-14	-	4	SB			
1	HP7	D1975	15BH	"	"	10-1-75	SB	10/6	6-6-77	61-14	-	4	SB			
	⁺ 2426-51	Luk	SA516-70	(MSG47)	-											Misc. Spring Header Nips
1	SHC	A4448	2A	T=3/4	12-11-75 RDG 9342	1-5-76	SB	1-27-77	1-3-77	56-5	-	1	SB			OK SEE 2-5 Supp 24-3
																56-6 - 3 SB
	⁺ 2426-55	Luk	SA516-70	(MSG47)	-											Cross Binder Main Panels
1	CG1	C5731	2A	T=1	9-3-75 RDG 33671	9-18-75	SB	7/25	8-10-76	68-1L	-	2	DL			
1		"	2B	"	"	9-18-75	SB	7/25	8-10-76	68-1L	-	2	DL			
1		"	3S	"	"	9-18-75	SB	7/25	8-10-76	68-1L	-	2	DL			
1		"	1A	"	9-4-75 RDG 36814	9-23-75	SB	7/25	8-10-76	68-1L	-	2	DL			
1	CG1	"	1E	"	"	9-23-75	SB	7-26	8-10-76	68-1L	-	2	DL			S-OK



CBI

METAL MATERIAL VERIFICATION SUMMARY SHEET

Contract No. 71-2426
Sheet 25 of 30

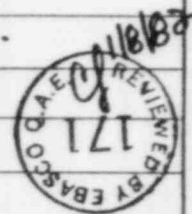
Copy to Engineering - By _____ Date _____

No. of Ctrs For Customer _____

NO. OF PCS.	ORDERED ITEM NO.	SUPPLIER'S HEAT, LOT OR OTHER IDENTIFICATION NUMBER	SUPPLIER'S SLAB NUMBER	MATERIAL SPEC. AND THICKNESS FOR PLATES	CAR OR TRUCK NUMBER AND SUPPLIER	CTR CHECKED		METAL REC'G INSPECTION REPORT CHECKED		DAILY FABR OR STORES RELEASE REPORT CHECKED		ENGR. PIECE MARK	SERIAL NUMBER	NO. OF PIECES FABRICATED	CHECKED COMPLETE	INITIAL	REMARKS
						Date & Initial	CBI No.	Date & Initial	CBI No.	Date & Initial	CBI No.						
#2426	-55	Luk	SA516	-70 (M-647)	-	Cape Verde Air Members											
1	CG1	C5931	16	T=1	9-4-75 RDG 36814	9-23-75	SB	9/25	8-18-76	68-1L			2	DL			
1		"	4B		"	9-23-75	SB	9/25	8-10-76	68-1R			2	DL			
1		A4493	3		9-12-75 1713 38107	9-29-75	SB	10/6	8-10-76	68-1R			2	DL			
1		C5931	11		"	9-29-75	SB	10/6	8-10-76	68-1R			2	DL			
1		"	12		"	9-29-75	SB	10/3	8-10-76	68-1R			2	DL			
1		"	15		"	9-29-75	SB	10/3	8-10-76	68-1R			2	DL			
1		"	17B		"	9-29-75	SB	10/6	8-10-76	68-1R			2	DL			
1		"	14		10-9-75 PRR 375299	10-30-75	SB	11/15	8-10-76	68-1L			2	DL			
1		C5771	6B		"	10-30-75	SB	11/15	8-10-76	68-1L			2	DL			
1		C5931	4A		10-29-75 RDG 36815	11-7-75	SB	11/15	8-10-76	68-1R			2	DL			
1	CG1	C5771	6C		11-7-75 Truck	11-17-75	SB	11-18 12-12	8-10-76	68-1L			2	DL	N-OK		
1	CG5	C5931	6A		7-3-75 RDG 33671	9-18-75	SB	9/25	7-19-76	68-6	29-32		4	SB			
1		"	7B		"	9-18-75	SB	9/25	7-19-76	68-6	25-28		4	SB			
1		"	8B		"	9-18-75	SB	9/25	7-19-76	68-6	33-36		4	SB			
1		"	7A		9-4-75 RDG 36814	9-23-75	SB	9/25	7-19-76	68-6	1-4		4	SB			
1		"	8A		"	9-23-75	SB	9/25	7-19-76	68-6	21-24		4	SB			
1		"	17A		7-12-75 1713 38107	9-29-75	SB	10/3	7-19-76	68-6	49-52		4	SB			
1		(2.1.11)	10A		"	9-29-75	SB	10/3	7-19-76	68-6	57-60		4	SB			
1		"	10B		"	9-29-75	SB	10/3	7-19-76	68-6	9-12		4	SB			
1	CG5	"	11A	T=1	"	9-29-75	SB	10/3	7-20-76	68-6	61-64		4	SB			

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REVIEWED BY EBASCO



PURCHASER:

G. CHICAGO BRIDGE & IRON CO.
BIRMINGHAM, ALA. 35202LUKENS STEEL COMPANY
COATESVILLE, PA. 19320

TEST CERTIFICATE

MILL ORDER NO.
68063-1

CUSTOMER P.O.

2426 SHEET 55

DP 9375 JW
1/10

DATE: 9-8-75

FILE NO 1540-02-04

CONSIGNEE:

CHICAGO BRIDGE & IRON CO.
BOYLES, ALA. 35202

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S):

CBI MS-647 REV. 0 QAS 301 REV. 1 SA-516 GR. 70 ASME CODE SECTION 2 & 3 SUB NE 1971 EDITION THRU SUMMER
1971 ADDENDA

SHEET 1 OF 2

BEND TEST O.K.

HOMOGENEITY TEST

CHEMICAL ANALYSIS

MELT NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	Ti	AL	B	GRAIN SIZE
C5931	23	1.14	007	025		23								7-8

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 8	% R.A.	BHN	IMPACTS LV 30°F.	FRACTURE APPEARANCE	DESCRIPTION
C5931	2B	518	783	26			23 25 23 LATERAL EXPANSION IN INCHES .022 .020 .020	20-20-20	1- 1" X 106-1/2 X 328-1/2
"	2A	504	774	27			55 55 56 LATERAL EXPANSION IN INCHES .048 .051 .050	50-50-50	1- " CG1
"	3B	496	772	27			48 51 53 LATERAL EXPANSION IN INCHES .048 .045 .044	40-40-40	1- "
"	7B	532	778	22			45 46 46 LATERAL EXPANSION IN INCHES .040 .041 .041	40-40-40	1- 1" X 89 X 287 CG5

REVIEWED BY

H. P. Richardson
10/22/76

EBASCO VQA REP.

SUPERVISOR TESTING

We hereby certify the above information is correct.

183

H. P. Richardson

PURCHASER:

6. CHICAGO BRIDGE & IRON CO.
MR. S.E. WIGGIN, BUYER

LUKENS STEEL COMPANY

COATESVILLE, PA. 19320

TEST CERTIFICATE

DATE: 9-12-75

FILE NO. 1540-02-04

CONSIGNEE:

CHICAGO BRIDGE & IRON CO.
BOYLES, ALA. 35202

MILL ORDER NO.

68063-1

CUSTOMER P.O.

2426 SHEET 55

DP 9475 DM
5/29

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

CBI MS-647 REV. 0 QAS 301 REV. 1 SA-516 GR. 70 ASME CODE SECT. 2 & 3 SUB NE 1971 EDITION THRU
SUMMER 1971 ADDENDA

BEND TEST O.K. HOMOGENEITY TEST

SHEET #1 OF 2

CHEMICAL ANALYSIS

MELT NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	Ti	AL	B	GRAIN SIZE
C5931	23✓	1.14✓	007✓	025✓		23✓								7-8

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 8	% R.A.	BHN	IMPACTS LV -30°F.	FRACTURE APPEARANCE	DESCRIPTION
C5931	8A	512✓	778✓	27✓			45✓ 48✓ 46✓ LATERAL EXPANSION IN INCHES .044 .046 .043	40-40-40 % SHEAR	1- 1" X 89 X 287
"	4B	504✓	788✓	28✓			23✓ 21✓ 24✓ LATERAL EXPANSION IN INCHES .019 .017 .020	20-20-20	1- 1" X 106-1/2 X 328-1/2
"	1A	498✓	775✓	26✓			68✓ 67✓ 66✓ LATERAL EXPANSION IN INCHES .056 .055 .054	50-50-50	1- "
"	16	492✓	786✓	27✓			25✓ 23✓ 23✓ LATERAL EXPANSION IN INCHES .019 .019 .022	20-20-20	1- "

REVIEWED BY

A. V. Richardson

10/27/76

EBASCO VQA REP.

We hereby certify the above information is correct.

SUPERVISOR TESTING

184

PURCHASER:

6. CHICAGO BRIDGE & IRON CO.
MR. S.E. WIGGIN, BUYER

LUKENS STEEL COMPANY

COATESVILLE, PA. 19320

TEST CERTIFICATE

DATE: 9-12-75

FILE NO: 1540-02-04

CONSIGNEE:

CHICAGO BRIDGE & IRON CO.
BOYLES, ALA. 35202

MILL ORDER NO.

68063-1

CUSTOMER P.O.

2426 SHEET 55

5/30

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S):

SAME

BEND TEST

O.K.

HOMOGENEITY TEST

SHEET #2 OF 2

CHEMICAL ANALYSIS

MELT NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	TI	AL	B		

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 8"	% R.A.	BHN	LV	IMPACTS -30°F.	FRACTURE APPEARANCE	DESCRIPTION
C5931	1B	497✓	793✓	20✓			53✓	68✓	60✓	50-50-50 1- 1" X 106-1/2 X 328-1/2
										CG1
"	7A	501✓	769✓	20✓			52✓	50✓	50✓	40-40-40 1- 1" X 89 X 287
										CG5
PLATES AND TESTS NORM. 1625-1675°F., HELD 1/2 HR ✓ PER INCH MIN. AND AIR COOLED.										
<div>REVIEWED BY A. P. Richardson 10/17/76 EBASCO VQA REP.</div> <div>184</div>										

We hereby certify the above information is correct.

SUPERVISOR TESTING



NUCLEAR RECORD INDEX

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		TEST REPORTS Ref: Heat-Slab Number
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186	3	802P67440 T12109-1
187	3	802T71440 T12380-1, 802T71440 T220146
188	2	C6248-3B
189	2	D1752-6
190	2	C6522-5C
191	2	C6482-3
192	2	C6682-9B
193	2	412A1741 A4752
194	1	411A2541 A49362, 412A3451 A45540
195	3	801X22879 A10165-1
196	2	802X82966 A30759-1, 802A55209 A10147-1
197	3	821A07640 A30795-1, 801W10670 A10164-1 801A04520 A10175-1, 802X69860 A10146-1
198	1	68321-P76451
199	1	67E024-9585A, 67E024-9585B
200	2	80441-P36025
201	3	801H04279 H26418-1
202	3	69E807-275192A
203	1	T82807-8W1
204	1	C5469-5B
205	2	801T21450 W30329-1
206	3	802J06100 J30867-1, 802J08820 J30777-1

COPIES of documents covered by this index are certified to be true copies

Date 5-15-78

Signature E. Strickland

BPM

Office Code

5.2

Classification

71-2426

Contract Number

Page 1 of 2

Folder 5 of 11

PURCHASER:

6. CHICAGO BRIDGE & IRON CO.
MR. S.E. WIGGIN, BUYER
P.O. BOX 277
BIRMINGHAM, ALA. 35202

LUKENS STEEL COMPANY

COATESVILLE, PA. 19320

TEST CERTIFICATE

MILL ORDER NO.

68063-1

CUSTOMER P.O.

2426 SHEET 55

DP 91275 DM
4/11

DATE: 9-18-75

FILE NO 1540-02-04

CONSIGNEE:

CHICAGO BRIDGE & IRON CO.
BOYLES, ALA. 35202

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

CBI MS-647 REV. 0 QAS 301 REV. 1 SA-516 GR. 70 ASME CODE SECT. 2 & 3 SUB NE 1971 EDITION
THRU SUMMER 1971 ADDENDA

BEND TEST O.K. HOMOGENEITY TEST

SHEET #1 OF 4

CHEMICAL ANALYSIS

MELT NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	Ti	AL	B	GRAIN SIZE
493	24	95	005	014		24								7-8
931	23	1.14	007	025		23								7-8
5970	22	97	009	021		20								7-8

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 8	% R.A.	BHN	IMPACTS LV -30°F.	FRACTURE APPEARANCE	DESCRIPTION
A4493	3	475	781	26			53 55 55 LATERAL EXPANSION IN INCHES .052 .053 .049	50-50-50 % SHEAR	1- 1" X 106-1/2 X 328-1/2
931	11	517	782	25			58 60 60 LATERAL EXPANSION IN INCHES .057 .056 .054	50-50-50	1- "
"	12	501	779	25			50 51 50 LATERAL EXPANSION IN INCHES .047 .048 .047	40-40-40	1- "
"	15	516	779	28			43 48 46 LATERAL EXPANSION IN INCHES .042 .045 .040	40-40-40	1- "

REVIEWED BY

[Signature]
10/27/16

EBASCO VQA REP.

CG-1

185

We hereby certify the above information is correct.

SUPERVISOR TESTING

[Signature]
line

PURCHASER:

6. CHICAGO BRIDGE & IRON CO.
MR. S.E. WIGGIN, BUYER

LUKENS STEEL COMPANY

COATESVILLE, PA. 19320

TEST CERTIFICATE

MILL ORDER NO.

68063-1

CUSTOMER P.O.

2426 SHEET 55

4/12

DATE: 9-18-75

FILE NO: 1540-02-04

CONSIGNEE:

CHICAGO BRIDGE & IRON CO.
BOYLES, ALA. 35202

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

SAME

BEND TEST O.K. HOMOGENEITY TEST

SHEET #2 OF 4

CHEMICAL ANALYSIS

MELT NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	TI	AL	B		

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 8"	% R.A.	BHN	LV	IMPACTS 30°F.	FRACTURE APPEARANCE	DESCRIPTION
C5931	17B	495	776	27				55 53 53	50-50-50	1- 1" X 106-1/2 X 328-1/2
								LATERAL EXPANSION IN INCHES		
								.048 .049 .052		
970	7A	477	757	28				59 60 55	50-50-50	1- 1" X 89 X 287
								LATERAL EXPANSION IN INCHES		
								.054 .057 .049		
"	7B	482	748	25				43 52 48	40-40-40	1- "
								LATERAL EXPANSION IN INCHES		
								.044 .046 .038		
"	9A	492	745	26				52 42 50	40-40-40	1- "
								LATERAL EXPANSION IN INCHES		
								.046 .047 .037		

REVIEWED BY

D. G. Richardson
10/27/76

EBASCO VQA REP.

185

We hereby certify the above information is correct.

SUPERVISOR TESTING

H. H. Kline

PURCHASER:

6. CHICAGO BRIDGE & IRON CO.
BIRMINGHAM, ALA. 35202

LUKENS STEEL COMPANY

COATESVILLE, PA. 19320

TEST CERTIFICATE

DATE: 10-21-75 FILE NO: 1540-02-04

CONSIGNEE:
CHICAGO BRIDGE & IRON CO.
BOYLES, ALA. 35202

MILL ORDER NO.

68063-1

CUSTOMER P.O.

2426 SHEET 55

MP 10975 DM
2/2

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

CBI MS-647 REV. 0 QAS 301 REV. 1 SA-516 GR. 70 ASME CODE SECT. 2 & 3 SUB NE 1971 EDITION THRU
SUMMER 1971 ADDENDA N-1160 8/4/78

BEND TEST O.K. HOMOGENEITY TEST

SHEET #1 OF 2

CHEMICAL ANALYSIS

MELT NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	Ti	AL	B	GRAIN SIZE
C5970	22	97	009	021		20								7-8
328	23	93	005	012		21								7-8
C5931	23	1.14	007	025		23								7-8
C5771	24	1.05	002	016		25								7-8

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 8	% R.A.	BHN	IMPACTS LV -30°F.	FRACATURE APPEARANCE	DESCRIPTION
C5970	18C	468	746	27			38 35 39	30-30-30	1- 1" x 89 x 287
							LATERAL EXPANSION IN INCHES .034 .035 .034	% SHEAR	
"	11B	451	743	25			40 40 38	30-30-30	1- "
							LATERAL EXPANSION IN INCHES .035 .037 .036		
D1828	8A	468	736	28			48 55 58	50-50-50	1- "
							LATERAL EXPANSION IN INCHES .053 .050 .045		
C5931	14	519	779	25			63 66 68	50-50-50	1- 1" x 106-1/2 x 328-1/2
							LATERAL EXPANSION IN INCHES .053 .054 .052		

REVIEWED BY

A. P. Richardson
10/27/75

EBASCO MOA REP

We hereby certify the above information is correct.

SUPERVISOR TESTING

CGI
A. P. Kline (182)

PURCHASER:

6. CHICAGO BRIDGE & IRON CO.
BIRMINGHAM, ALA. 35202

LUKENS STEEL COMPANY

COATESVILLE, PA. 19320

TEST CERTIFICATE

DATE: 10-21-75 FILE NO: 1540-02-04

CONSIGNEE:
CHICAGO BRIDGE & IRON CO.
BOYLES, ALA. 35202

MILL ORDER NO.
68063-1

CUSTOMER P.O.
2426 SHEET 55

4/37

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

SAME

BEND TEST O.K. HOMOGENEITY TEST

SHEET #2 OF 2

CHEMICAL ANALYSIS

MELT NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	Ti	AL	B		

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 8"	% R.A.	BHN	LV -30°F.	IMPACTS	FRACTURE APPEARANCE	DESCRIPTION
C5771	6B	496	801	25			56	55	56	1- 1" X 106-1/2 X 328-1/2
							LATERAL EXPANSION IN INCHES			
							.043	.046	.047	

PLATES AND TESTS NORM. 1625-1675°F., HELD 1/2 HR. PER INCH MIN.
AND AIR COOLED.

REVIEWED BY

J. P. Richardson
10/27/75

EBASCO VQA REP.

REVIEWED BY

J. P. Richardson
10/27/75

EBASCO VQA REP.

We hereby certify the above information is correct.

SUPERVISOR TESTING

J. P. Richardson
182

PURCHASER:

6* CHICAGO BRIDGE & IRON CO.
MR. S.E. WIGGIN, BUYER
P.O. BOX 277
BIRMINGHAM, ALA. 35202

LUKENS STEEL COMPANY

COATESVILLE, PA. 19320

TEST CERTIFICATE

DATE: 11-3-75

FILE NO. 1540-02-04

CONSIGNEE:

CHICAGO BRIDGE & IRON CO.
BOYLES, ALA. 35202

MILL ORDER NO.

68063-1

CUSTOMER P.O.

2426 SHEET 55

MP 102975 DM
1/26

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

CBI MS-647 REV. 0 QAS-301 REV. 1 SA-516 GR. 70 ASME CODE SECT. 2 & 3 SUB NE 1971 EDITION THRU
SUMMER 1971 ADDENDA N-1160 8/4/78

BEND TEST O.K. HOMOGENEITY TEST

CHEMICAL ANALYSIS

MELT NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	TI	AL	B	GRAIN SIZE
931	23	1.14	007	025		23								T-8

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 8"	% R.A.	BHN	IMPACTS LV -30°F.	FRACTURE APPEARANCE	DESCRIPTION
C5931	4A	500	784	26			28 31 30 LATERAL EXPANSION IN INCHES .027 .027 .026	20-20-20 % SHEAR	1- 1" X 106-1/2 X 228-1/2
PLATE AND TESTS NORM. 1625-1675°F., HELD 1/2 HR. PER INCH MIN. AND AIR COOLED.									
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> REVIEWED BY <i>E. L. Richardson</i> 10/27/76 EBASCO VQA REP. </div>									

We hereby certify the above information is correct.

SUPERVISOR TESTING

181

PURCHASER:
6. CHICAGO BRIDGE & IRON CO.
BIRMINGHAM, ALA. 35202

LUKENS STEEL COMPANY

COATESVILLE, PA. 19320

TEST CERTIFICATE

DATE: 11-12-75 FILE NO: 1540-02-04

CONSIGNEE:
CHICAGO BRIDGE & IRON CO.
BOYLES, ALA. 35202

MILL ORDER NO.
68063-1

CUSTOMER P.O.
2426 SHEET 55

DP 11775 DM
3/25

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

CBI MS-647 REV. 0 QAS-301 REV. 1 SA-516 GR. 70 ASME CODE SECT. 2 & 3 SUB NE 1971 EDITION THRU
SUMMER 1971 ADDENDA N-1160 8/4/78

BEND TEST O.K. HOMOGENEITY TEST

CHEMICAL ANALYSIS

MELT NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	TI	AL	B	GRAIN SIZE
C5771	24	1.05	002	016		25								7-8

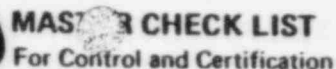
PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 8"	% R.A.	BHN	LV	IMPACTS -30°F.	FRACTURE APPEARANCE	DESCRIPTION	
C5771	6C	473✓	798✓	27✓			48✓	51✓	50✓	1- 1" X 105-1/2" X 328-1/2	
LATERAL EXPANSION IN INCHES							.038	.040	.042		
PLATE AND TESTS NORM. 1625-1675°F., HELD 1/2 HR. PER INCH MIN. AND AIR COOLED.											
*WIDTH REFERRED AND ACCEPTED BY CUSTOMER.											
							REVIEWED BY A.P. Richardson 10/27/76 EBASCO VQA REP.		CG!		
											180

We hereby certify the above information is correct.

SUPERVISOR TESTING

A. J. Line

GE 681 REV 1-74



MASTER CHECK LIST

For Control and Certification

NO.	DESCRIPTION OPERATIONS, INSPECTIONS, EXAMINATIONS & REQUIREMENTS TO BE COMPLETED	APPLICABLE DETAIL RECORDS	CBI		AUTH. INSPTR.	
			LISTED OPRTS, INSPTS & EXAMINS COMPLTD & ACPTD. LISTED REQRMTS CARRIED OUT	LISTED DATA REV. EWED & FOUND TO BE IN ACCOR- DANCE WITH THE CODE	AUTH. INSPECTOR	
			PROJ. FOREMAN & PROJ. WELD & QA SUPR			
			INITIALS	DATE	INITIALS	DATE
17	Assure applicable information as required on the Record Drawings is completed for each Category A, B, C, or D joint and for each butt weld of pressure retaining pieces.	File 8.5 Doc # 1	TFW TRK	11-17-77 11-17-77	RR	11/17/77
18	Record the final location of all pressure retaining material by a serialization or coding of the pieces or Shop assemblies.	File 8.5 Doc # 1	TRK TFW	11-17-77 11-17-77	RR	11/17/77
19	Use authorized welding procedure (from Contract QA Handbook), Check Fit-up, check welding, and check all finished weld within four inches of the shell of permanent attachments to pressure retaining parts of the vessel (no detail records required).	File 8.5 Doc # 1	TRK TFW	11-17-77 11-17-77	RR	11/17/77
<div>205 JAN 11 1982</div>						
MADE BY JIM DATE 11-23-75			CHKD BY RDJ DATE 12-11-75	AUTHD BY LCW DATE 4-22-76	BY JC AUTHD LCW DATE 1-29-76	2 RDJ LCW DATE 4-22-76
CONTRACT NO. 71-2426						SHEET MG

MAGNETIC PARTICLE EXAMINATION REPORT

Report or
Sequence
Number

80

Contract
Number 71-2426

Location Taft La. Shop ☐ Field ☒

CUSTOMER INFORMATION

Nuclear Containment Vessel

DESCRIPTION & STAGE OF
PART OR WELD

34-1 & Adjacent Areas

☐ OUTSIDE
☒ INSIDE

PROCEDURE AND REV. NO.

☐ PRODS
☒ YOKE

MFR OR
BRAND

MAGNAFLUX

PROD OR POLE
SPACING

6"

AMPS

N/A

☐ DC
☒ AC

CALIBRATION
DATE

See Below

MACHINE

MFR OR

RATING

71-2426 #4 MAGNAFLUX

10

PARTICLES:

☒ DRY
☐ WET

Record all non-conforming indications which were not removed during examination and/or evaluation. (Those base material must be accurately located and referenced to some definable point.)

COLOR & MFR:

Black Magnaflex

Piece Mks. 34-1-1 & 34-1-2 were
examined and no non-conforming
indications were found.
Calibration & Inspection dates:

5-19-77



The initial examination covered by this report has been performed in accordance with applicable procedure:

Dennis Freeman
OPERATOR

II
LEVEL

5-20-77
DATE

All indications have been evaluated in terms of applicable acceptable standards. Relevant non-conforming indications have been noted on above sketch and have been reported to the Quality Assurance supervisor.

Item is: Acceptable ☒
Unacceptable ☐

Dennis Freeman
EVALUATOR

II
LEVEL

5-20-77
DATE

Relevant, non-conforming indications, other than shown in above sketch, have been removed in accordance with approved procedure GRP _____ Rev _____ Para _____ the area re-examined, and found to be acceptable.

QA SUPERVISOR

DATE

Examination and evaluations have been performed to my satisfaction.

Witnessed and accepted by:

Witnessed by:

FOREMAN

CUSTOMER

AUTHORIZED INSPECTOR

80

NUCLEAR



MAGNETIC PARTICLE EXAMINATION REPORT

Report or
Sequence
Number

102

Contract
Number

71-2426

Shop ☐ Field ☒

Location Taft, LA

CUSTOMER INFORMATION

NUCLEAR CONTAINMENT VESSEL

DESCRIPTION & STAGE OF

☐ OUTSIDE

PART OR WELD

PIECE MKS 4 @ 55-5, 4 @ 55-3, 2 @ 53-T

☒ INSIDE

1 @ 53-M, 2 @ 73-1, 2 @ 73-12, 1 @ 53-R & ADJ. AREAS *

PROCEDURE AND REV. NO.

☐ PRODS

MFR OR

PROD OR POLE

AMPS

☐ DC

CALIBRATION

INTP 71-2426 13B REV 1

☒ YOKE

BRAND

SPACING

N/A

☒ AC

DATE SEE
BELOW

MAGNAFLUX

6"

MACHINE

MFR OR

RATING

PARTICLES:

☒ DRY

71-2426 #4

MAGNAFLUX

10 #

☐ WET

Record all non-conforming indications which were not removed during examination and/or evaluation. (Those in base material must be accurately located and referenced to some definable point.)

COLOR & MFR: BLACK
MAGNAFLUX

ABOVE PIECE MARKS EXAMINED

& NO NON-CONFORMING INDICATIONS FOUND.

CALIBRATION & INSPECTION DATE

8-110-77.



JAN 11 1982

* PER STANDARD NO. 9301-2

The initial examination covered by this report has been performed in accordance with applicable procedure:

All indications have been evaluated in terms of applicable acceptable standards. Relevant non-conforming indications have been noted on above sketch and have been reported to the Quality Assurance supervisor.

Item is: Acceptable ☒

Unacceptable ☐

R. F. Moseley II

EVALUATOR

LEVEL

8-30-77

DATE

Relevant, non-conforming indications, other than shown in above sketch, have been removed in accordance with approved procedure GRP _____ Rev _____ Para _____, the area re-examined, and found to be acceptable.

QA SUPERVISOR

DATE

Examination and evaluations have been performed to my satisfaction.

Witnessed and accepted by:

Witnessed by:

FOREMAN

CUSTOMER

AUTHORIZED INSPECTOR

102

NUCLEAR



MAGNETIC PARTICLE EXAMINATION REPORT

Location Taft, LA Shop ☐ Field ☒ Contract Number 71-2426 Report or Sequence Number 103

CUSTOMER INFORMATION

NUCLEAR CONTAINMENT VESSEL

DESCRIPTION & STAGE OF

PART OR WELD PIECE MKS. 2@53-K, 2@54-1, 1@53-N, 1@54-2, 1@53-R, 2@54-3, 1@57-1, 2@55-5, 2@55-3, 2@55-1 & ADJ. AREAS ☐ OUTSIDE ☒ INSIDE

PROCEDURE AND REV. NO.

MTP 71-2426 13B Rev 1

☐ PRODS☒ YOKE

MFR OR BRAND

MAGNAFLUX

PROD OR POLE SPACING

6"

AMPS

N/A

☐ DC☒ AC

CALIBRATION DATE

SEE BELOW

MACHINE

71-2426 #4

MFR OR

MAGNAFLUX

RATING

10#

PARTICLES:

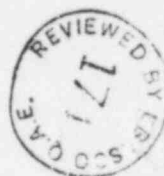
☒ DRY☐ WET

Record all non-conforming indications which were not removed during examination and/or evaluation. (Those in base material must be accurately located and referenced to some definable point.)

COLOR & MFR: BLACK

MAGNAFLUX

ABOVE PIECE MARKS EXAMINED & NO
NON-CONFORMING INDICATIONS FOUND.
CALIBRATION & INSPECTION DATE
8-15-77.



JAN 11 1992

* PER STANDARD NO. 9301-2.

The initial examination covered by this report has been performed in accordance with applicable procedure:

R. J. Minildine II 8-30-77
OPERATOR LEVEL DATE

All indications have been evaluated in terms of applicable acceptable standards. Relevant non-conforming indications have been noted on above sketch and have been reported to the Quality Assurance supervisor.

Item is: Acceptable ☒
Unacceptable ☐

R. J. Minildine II 8-30-77
EVALUATOR LEVEL DATE

Relevant, non-conforming indications, other than shown in above sketch, have been removed in accordance with approved procedure GRP _____ Rev _____ Para _____, the area re-examined, and found to be acceptable.

QA SUPERVISOR

DATE

Examination and evaluations have been performed to my satisfaction.

Witnessed and accepted by:

Witnessed by:

FOREMAN

CUSTOMER

AUTHORIZED INSPECTOR

123

NUCLEAR

(C1391)

MAGNETIC PARTICLE EXAMINATION REPORT

Location Taft La. Shop ☐ Field ☒ Contract Number 71-2426 Report or Sequence Number 41

CUSTOMER INFORMATION

Description & Stage of Part or Weld Nuclear Containment Vessel ☐ OUTSIDE ☒ INSIDE
68-1-R, 68-1-L & 68-6 (Crane

Girder to shell
 Procedure and Rev. No. ☐ PRODS ☒ YOKE MFR OR BRAND MAGNAFLUX PROD OR POLE SPACING 6" AMPS N/A ☐ DC ☒ AC CALIBRATION DATE see below

Machine 71-2426 #4 MFR OR MAGNAFLUX RATING 10[±] PARTICLES: ☒ DRY ☐ WET
 Record all non-conforming indications which were not removed during examination and/or evaluation. (Those base material must be accurately located and referenced to some definable point.) COLOR & MFR: Black Magnaflex

No Non-conforming indications

Calibration dates:

4-4-77 5-13-77
 4-5-77 5-16-77
 4-6-77 5-17-77
 4-7-77 5-18-77
 5-19-77



JAN 12 1982

The initial examination covered by this report has been performed in accordance with applicable procedure:

Donnie Goodman II 5-20-77
 OPERATOR LEVEL DATE

All indications have been evaluated in terms of applicable acceptable standards. Relevant non-conforming indications have been noted on above sketch and have been reported to the Quality Assurance supervisor.

Item is: Acceptable ☒

Unacceptable ☐

Donnie Goodman II 5-20-77
 EVALUATOR LEVEL DATE

Relevant, non-conforming indications, other than shown in above sketch, have been removed in accordance with approved procedure GRP 10A Rev 4 Para . TR Kimbrik 5-20-77
 the area re-examined, and found to be acceptable. QA SUPERVISOR DATE

Examination and evaluations have been performed to my satisfaction.

Witnessed and accepted by:

Witnessed by:

FOREMAN

CUSTOMER

AUTHORIZED INSPECTOR 41

Chicago Bridge & Iron Company **CBI**

HAZARDING DEVICE ASSX
Five 15' O MAINTENANCE HATCH

NY 904405
RIF-BL-5-6-23-74 71-2426
L-100-421
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THIS DOCUMENT CONTAINS NEITHER RECOMMENDATIONS NOR
CONCLUSIONS OF THE NATIONAL BUREAU OF STANDARDS
AND IS INTENDED TO PRESENT THE RESULTS OF THE RESEARCH
IN A MANNER THAT WOULD BE USEFUL TO OTHER INDIVIDUALS
CONDUCTING RESEARCH IN THIS FIELD

BRIDGE

SECTION 1-1 (FROM ROAD TO ROAD)

SECTION 2-2 (FROM ROAD TO ROAD)

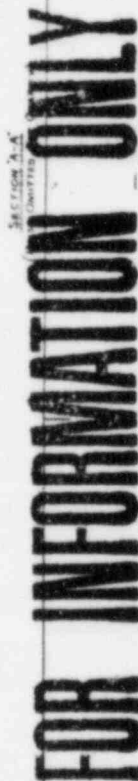
SECTION 3-3 (FROM ROAD TO ROAD)

SECTION 4-4 (FROM ROAD TO ROAD)

DETAIL 1 (FROM ROAD TO ROAD)

DETAIL 2 (FROM ROAD TO ROAD)

DETAIL 3 (FROM ROAD TO ROAD)

[illegible]

Первая публикация

- (1) HORIZ. 780 FT. OF CHAIN'S OVERHUNG
TO LIFT LOAD A DISTANCE OF 3'-5"
780' OF CHAIN PULL TO LIFT LOAD.
- (2) TOWERS: 30' PULL 74/85 FT. OVERHUNG
CHAIN FOR 14 FT. ABOVE.

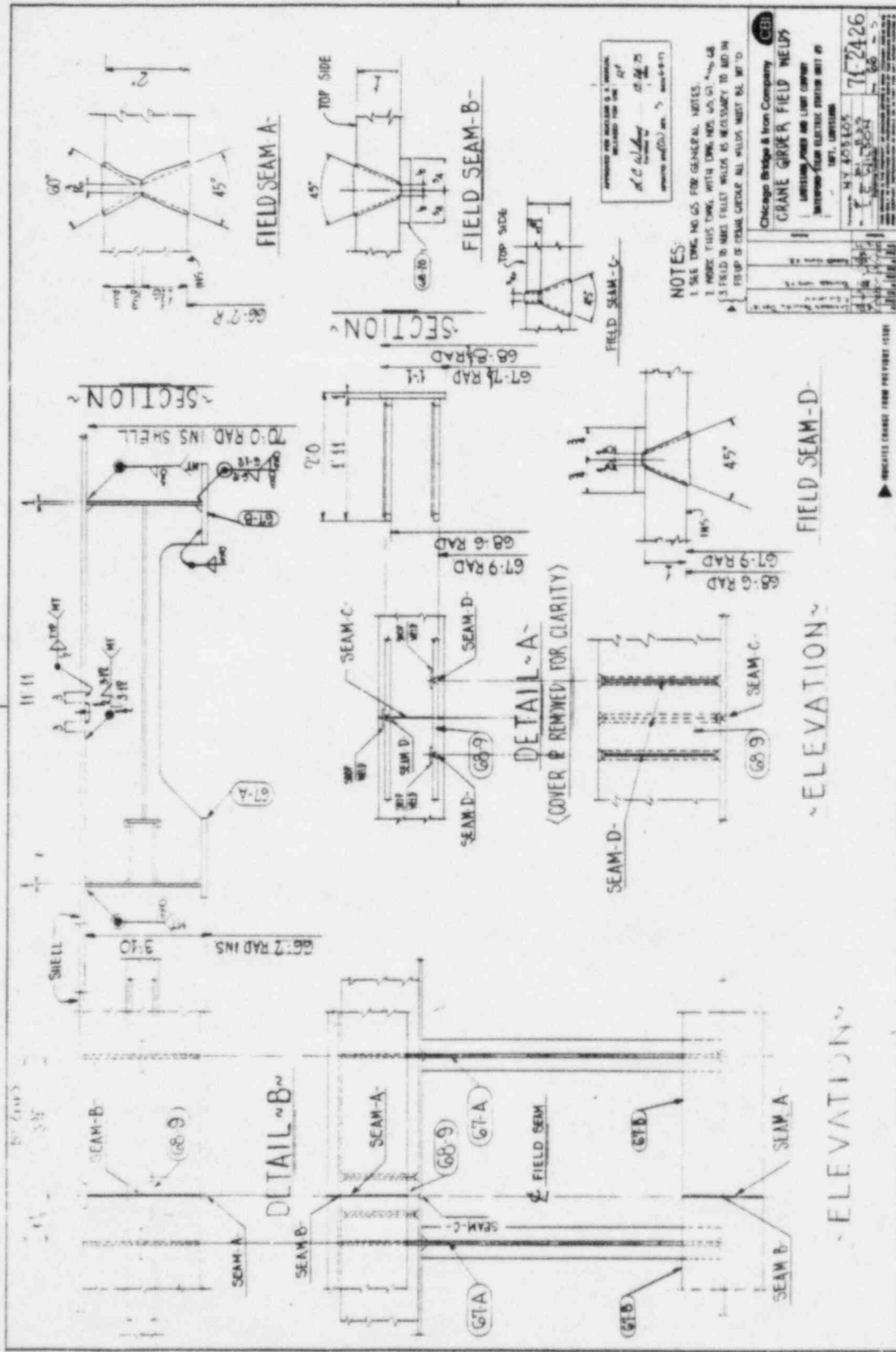
APPROVED FOR RELEASE U.S. NATIONAL
INTELLIGENCE ARCHIVE

LAMBERTSON, RICHARD ALLEN
 1001 E. 10TH AVE. S.W. ALBUQUERQUE, N.M. 87102

SELECTED & 100% GUARANTEED
MAINTENANCE HATCH
HANDLING DEVICE
REGISTERED U.S. PAT. NO. 4,327,946
INVENTED BY: J. S. SHERMAN
U.S. 505,555-1
11-1-81

[illegible]

FOR INFORMATION ONLY







NUCLEAR RECORD INDEX

Document Number	Number of Pages	DESCRIPTION		
		WELDERS QUALIFICATIONS		
		NAME	I.D.	PROCESS
1	3	JESSE W. PAYNE	JWP	SMA F4 & F5
2	2	DAVID W. SCHLECHT	DWS	SMA F4
3	3	CLAUDE P. RIDENS	CPD	SMA F4 & F5
4	2	HERMAN MONAEDI	HM	SMA F4 & F5
5	1	BILLY S. BEAUCHAMP	BSB	SMA F4
6	1	CARL C. MCKAY	CCM	SMA F4
7	3	EUGENE D. RICHARDSON	EDR	SMA F4 & F5
8	1	LURIE J. NUNEZ	LJN	SMA F4
9	1	LOUIS A. DAWSON	LAD	SMA F4
10	1	JESSIE D. POSTON	JDP	SMA F4
11	1	JOE G. SIMMONS	JGS	SMA F4
12	1	JOSEPH C. LOPEZ	JCL	SMA F4
<p>THESE QUALIFICATIONS ARE FOR WELDERS USED DURING INSTALLATION OF EQUIPMENT HATCH COVER ASSY 28-A.</p>				
<p>Where's the QA stamp on this page? JF 6/18</p>				
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Signature <u>JW</u>				
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DESCRIPTION

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WELDERS QUALIFICATIONS

NAME _____

I.D.

PROCESS

/

4

BILLY D. CHILDRESS

BDC

SMA F5 & F4

2

/

JOE G. SIMMONS

JGS

5MAF4

3

3

EUGENE D. RICHARDSON

FDR

SMA F4 & F5

4

3

JESSIE D. POSTON

JDP

SMA F4

THESE QUALIFICATIONS ARE FOR WELDERS
USED DURING INSTALLATION OF DOLLAR &

PA Stamp?
J 6/18

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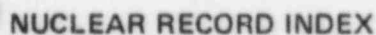
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JAN 12 1962

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REVIEWED BY 205
JAN 12 1982



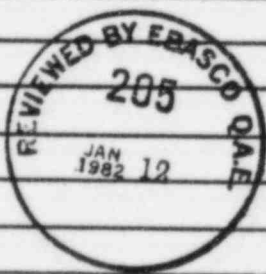
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Document Number	Number of Pages	DESCRIPTION
		CLOCK # NAME & PROCEDURE
47	6	417 J.E. PERDUE SMA & MIG
48	6	419 DONALD SLOCUMB SMA, MIG & SUB ARC
49	8	428 W.B. WILLIAMS SMA & SUB ARC
50	3	440 MELVIN G JONES SMA
51	3	443 P.R. DAVIS SMA
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53	5	450 E.W. WOMACK SMA GMA SMA(E7018)
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60	7	512 H.R. MAYES GMA SMA(E7018) SMA SMA(ENCRPT)
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GO 1152 JAN 75



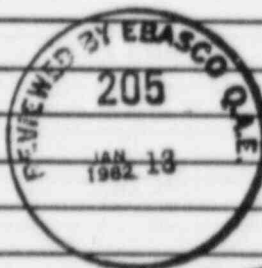
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BASCO

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Document Number	Number of Pages	DESCRIPTION	
		Clock #	Name
109	6	954	B.E. LAVAN GMA SMA(E7018)
110	10	956	FRED PALMER SMA SMA(INCO) GMA SMA
111	7	958	J. R. GLOVER GMA SMA(E7018)
112	6	959	C.B. HARRIS SMA GMA SMA(E7018)
113	6	962	A.L. ORTON SMA GMA SMA(E7018)
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115	5	970	FRED FINLEY SMA GMA SMA(E7018)
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127	7	1015	G.G. LEACH SMA(E309) GMA SMA(E7018)



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CBI

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		NAME	F.No.	DATE QUAL.	I.D.	PROCESS
1	2	ROBERT FRANK DURMON	F-4	3-13-75	RFD(SMA)	
2	1	JOHN D. WILLIAMS	F-4	11-23-75	JDW(SMA)	
3	1	LURCIE JOHN NUVEZ	F-4	12-12-75	LJN(SMA)	
4	1	CHARLES OLIVER WARD	F-4	10-20-75	COW(SMA)	
5	1	DAVID P. DUNNING	F-4	10-31-75	DPD(SMA)	
6	1	ROBERT J. HOWE	F-4	1-6-76	RJH(SMA)	
7	1	TERRY LYNN EMERY	F-5	12-18-75	TLE(SMA)	
8	1	TERRY LYNN EMERY	F-4	12-19-75	TLE(SMA)	
9	2	THOMAS R. KENDRICK	F-4	9-25-75	TRK(SMA)	
10	1	ANTHONY TERRY PIERRE	F-4	1-20-76	ATP(SMA)	
11	1	JOHN H. MURCHIE	F-4	1-26-76	JHM(SMA)	
12	1	CLAYTON E. DESIDERE, JR	F-4	1-27-76	CED(SMA)	
13	1	CALVIN W. FONTENOT	F-4	6-19-75	CWF(SMA)	
14	1	ROBERT J. MAGEE	F-4	2-3-76	RJM(SMA)	
15	1	ROBERT F. DURMON	F-6	12-15-75	RFD(SAW)	
16	1	RONALD P. LEO	F-4	2-5-76	RPL(SMA)	
17	1	JOSEPH D. MILLER	F-4	2-10-76	JDM(SMA)	
18	1	MICHAEL M. MATHERNE	F-4	2-11-76	MMM(SMA)	
19	1	JOHN H. MURCHIE	F-6	2-4-76	JHM(SAW)	
20	1	JOHN D. WILLIAMS	F-6 (3/16 To 1)	2-4-76	JDW(SAW)	
21	1	TERRY LYNN EMERY	F-6 (1/16 To 1/2)	2-16-76	TLE(SAW)	
22	1	TERRY LYNN EMERY	F-6	2-16-76	TLE(SAW)	
23	1	CHARLES OLIVER WARD	F-6	2-16-76	COW(SAW)	
24	1	ROBERT J. MAGEE	F-6 (3/16 To 3/4)	2-18-76	RJM(SAW)	
25	1	RONALD P. LEO	F-6 (3/16 To 3/4)	2-18-76	RPL(SAW)	
26	1	JOHN D. WILLIAMS	F-6	2-19-76	JDW(SAW)	

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Date 5-10-78Signature Ronald D. NickleyHHC
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27	1	ROBERT J. MAGEE	F-6	2-19-76	RJM	(SAW)
28	1	WILLIAM E. DILLON	F-4	3-31-76	WED	(SMA)
29	2	JOHN N. LEJEUNE	F-4	7-10-75	JNL	(SMA)
30	1	LARRY F. KOONTZ	F-4	6-18-76	L.F.K.	(SMA)
31	1	BILLY R. MAY	F-4	7-14-76	BRM	(SMA)
32	1	RICHARD T. GELLATLY	F-4	7-14-76	RTG	(SMA)
33	1	ELRY P. OUBRE	F-4	7-14-76	EPO	(SMA)
34	1	SAMMY W. PERKINS	F-4	7-14-76	SWP	(SMA)
35	1	NORMAN P. SYMONS II	F-4	7-15-76	NPS	(SMA)
36	1	CHARLES R. JOHNSON	F-4	7-15-76	CRT	(SMA)
37	1	DENNIS E. PAULLUS	F-4	7-15-76	DFP	(SMA)
38	1	JESSE W. PAYNE	F-4	7-6-76	JWP	(SMA)
39	1	HENRY J. BLANCO	F-4	7-21-76	HJB	(SMA)
40	1	HARVEY J. RIVIERE	F-4	7-21-76	HJR	(SMA)
41	1	VINCENT CAIAZZO	F-4	7-22-76	VC	(SMA)
42	2	HOWARD G. DESPAIN	F-4	8-8-72	HGD	(SMA)
43	3	DAN B. HOLDER	F-4	7-22-76	DBH	(SMA)
44	1	CHARLES W. DEVINEY	F-4	4-9-73	CWD	(SMA)
45	1	BILLY J. WILLIAMS	F-4	3-28-74	BJW	(SMA)
46	1	LEONARD GRAHAM	F-4	8-6-76	LG	(SMA)
47	1	CLIFTON MILLER	F-4	8-11-76	CM	(SMA)
48	1	ROBERT J. MAGEE	F-6	7-21-76	RJM	(GMA)
49	1	JOHN N. LEJEUNE	F-6	7-22-76	JNL	(GMA)
50	1	JOHN N. LEJEUNE	F-6	7-23-76	JNL	(SAW)
51	1	BILLY J. WILLIAMS	F-6	7-29-76	BJW	(SAW)
52	1	CHARLES W. DEVINEY	F-6	7-23-76	CWD	(SAW)

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53	2	CLAUDE BAPTISTE	F-4	(SMA)	CJB
54	1	TERRY L. EMERY	F-6	(SAW)	AGWI TLE
55	1	DAN B. HOLDER	F-6	(SAW)	AGWI DBH
56	1	ANTHONY G. RABATHALY	F-4	(SMA)	AGR
57	1	DUDLEY C. WILLIAMS	F-4	(SMA)	DCW
58	1	BILLY D. CHILDRESS	F-4	(SMA)	BDC
59	1	VIRGIL D. DILLARD	F-4	(SMA)	VDD
60	1	CHRISTOPHER F. BAKER	F-4	(SMA)	CFB
61	1	THOMAS H. BAKER	F-4	(SMA)	TMB
62	1	CHARLES E. McDUFFIE	F-4	(SMA)	CEM
63	1	DONALD R. METCALF	F-4	(SMA)	DRM
64	1	WILLIAM C. SWEARINGEN	F-4	(SMA)	WCS
65	1	JAMES NORMAN DAY	F-4	(SMA)	JND
66	1	BILL D. SCANNELLA	F-4	(SMA)	BDS
67	1	DOUGLAS J. TOZEL	F-4	(SMA)	DJT
68	1	BILLY R. MAY	F-6	(GMA)	BRM
69	1	BILLY R. MAY	F-6	(SAW)	BRM
70	1	JAMES R. WILLIAMS III	F-6	(SAW)	JRW
71	1	JAMES R. WILLIAMS III	F-6	(GMA)	JRW
72	1	CHARLES O. WARD	F-6	(GMA)	COW
73	1	CHARLES O. WARD	F-6	(SAW)	COW
74	1	WILLIAM A. CHILDRESS	F-4	(SMA)	WAC
75	1	ROBERT J. MAGEE	F-6	(SAW)	RJM
76	1	TERRY L. EMERY	F-6	(GMA)	TLE
77	1	WILLIAM L. THWEATT	F-4	(SMA)	WLT
78	1	STEVEN C. JAMES	F-4	(SMA)	SCJ

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Q.A.E.

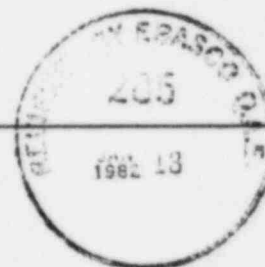
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Document Number	Number of Pages	DESCRIPTION		
		NAME	F.No. Process	I.D.
89	1	JACK W. GEE JR.	F-4 (SMA)	JWG
90	1	JOSEPH S. TATUM III	F-4 (SMA)	JST
91	1	CLYDE T. MINTER	F-4 (SMA)	CTM
92	1	NATHAN N. TIBBS	F-4 (SMA)	NNT
93	1	MARTIN R. NEELY	F-4 (SMA)	MRN
94	1	HOWARD F. MINTER	F-4 (SMA)	HFM
95	1	EDMOND J. RESTIVO	F-4 (SMA)	EJR
96	1	KENNETH R. ODOM	F-4 (SMA)	KRO
97	1	DOUGLAS E. FOSTER	F-4 (SMA)	DEF
98	1	DARRELL W. DELAY	F-4 (SMA)	DWD
99	1	BARRY R. GALEGOS	F-4 (SMA)	BRG
100	1	LONDON C. MELTON	F-4 (SMA)	LCM
101	1	VICTOR F. FEFFIE	F-4 (SMA)	VFF
102	1	LAWRENCE H. BYRD	F-4 (SMA)	LHB
103	1	WILLIE D. JOHNSON	F-4 (SMA)	WDJ
104	1	JAMES W. HESTER	F-4 (SMA)	JWH
105	1	JAMES W. HESTER	F-6 (GMA)	JWH
106	1	JAMES W. HESTER	F-6 (SAW)	JWH
107	1	GABRIEL S. TREVINO	F-4 (SMA)	GST
108	1	GABRIEL S. TREVINO	F-6 (GMA)	GST
109	1	GABRIEL S. TREVINO	F-6 (SAW)	GST
110	1	CLYDE PARKER, JR	F-4 (SMA)	CP
111	1	CLYDE PARKER, JR	F-6 (GMA)	CP
112	1	DAVID R. JETER	F-4 (SMA)	DRJ
113	1	JOEL K. LAX	F-4 (SMA)	JKL
114	1	JACK W. TALMADGE	F-4 (SMA)	JWT

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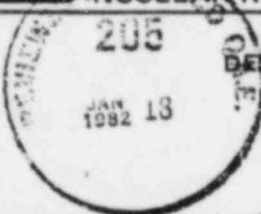
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115	1	WALLACE D. MILEY	F-4(SMA)		WDM
116	1	KENNETH W. BATCHELOR	F-4(SMA)		KWB
117	1	WARREN L. BATCHELOR	F-4(SMA)		WLB
118	1	JIMMY R. EDWARDS	F-4(SMA)		JRE
119	1	WILLIS WILDER	F-4(SMA)		WW
120	1	WILNER L. SANFORD	F-4(SMA)		WLS
121	1	NORMAN PAUL SYMONS	F-6(SAW)		NPS
122	1	NORMAN PAUL SYMONS	F-6(GMA)		NPS
123	1	OZARE J. MARCEAUX	F-4(SMA)		OJM
124	1	OZARE J. MARCEAUX	F-6(GMA)		OJM
125	1	OZARE J. MARCEAUX	F-6(SAW)		OJM
126	1	JUNIOR E. GORDON	F-6(SAW)		JEG
127	1	JUNIOR E. GORDON	F-6(GMA)		JEG
128	1	JUNIOR E. GORDON	F-4(SMA)		JEG
129	1	WILLIAM C. ERWIN	F-4(SMA)		WCE
130	1	ALBERT H. RICKERT	F-4(SMA)		AHR
131	1	RONNIE D. PAYNE	F-4(SMA)		ROP
132	1	LLOYD J. MERRITT, JR.	F-4(SMA)		LJM
133	1	DANIEL G. MARCEAUX	F-4(SMA)		DGM
134	1	LUTHER JORDAN	F-4(SMA)		LJ
135	1	DAVID C. HYLTON	F-4(SMA)		DCH
136	1	WILLIAM H. SAUNDERS	F-4(SMA)		WHS
137	1	JOHN N. LEJEUNE	F-43(SMA)		JNL
138	1	ALBERT H. RICKERT JR	F-43(SMA)		AHR
139	1	VINCENT CAIAZZO	F-43(SMA)		VC
140	1	RODGER D. NORRIS	F-43(SMA)		RDN

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GO 1152 JAN 75



GO 1152 JAN 75

JAA 11/27/79

CERTIFIED MATERIALS TEST REPORT

Post Welding Supply Co.
 P.O. Box 10763
 300 7th Ave. North
 Birmingham, AL 35202

Customer Order No: 80360P

Order No: 179236-2

Shipped: 11/1/79

B&I PO #B91151-0406-31

This material conforms to Specification
 *WMS 501 Rev. 2 & WMS 568 Rev. 0 & QAS
 311 Rev. 12 ASME SFA 5.1 Sec. II Part C
 & ASME B&PVC Sec. III NE-2400.

Trade Name
 or Trademark: Atom Arc 7018

Type: E 7018

Diameter Size: 5/32"

Test No: 3964

Weight: 30,000 lbs.

Control No: VV065

Lot Number: 3J908L02

X-Rays Satisfactory

Heat Number: 411J2971

Moisture @ 1800° F. 0.13%
 Concentricity 3%
 Type Steel A-285

Tensile Specimen .505"
 Impact Specimen .394" x .394"

DC REVERSE POLARITY

Carbon .04
 Manganese 1.07
 Chromium .03
 Nickel .02
 Silicon .40
 Columbium+
 Tantalum
 Molybdenum .01
 Tungsten
 Copper .01
 Titanium
 Phosphorus .008
 Sulphur .016
 Vanadium .02
 Cobalt

*THIS ELECTRODE MEETS THE REQUIREMENTS OF CHICAGO
 BRIDGE & IRON WELDING SPECIFICATION WMS 501 Rev. 2
 & WMS 568 Rev. 0 & QAS 311 Rev. 12 ASME SFA 5.1
 Sec. II Part C & ASME B&PVC Sec. III NE-2400.

SEE PAGE TWO FOR TEST RESULTS.

errite
 Descr

Quality Systems Certification No. N-1224
 Expiration Date: September 8, 1981

State of Pennsylvania }
 County of York } SS

Subscribed and sworn to before me
 this 1st day of November 1979

The undersigned certifies that the
 contents of this report are correct
 and accurate and that all operations
 performed by the undersigned or sub
 contractors are in compliance with
 requirements of the material speci-
 fication and ASME Boiler and Pressure
 Vessel Code Section III Division I
 Subsection NCA-3800

EAL.....
 Notary Public

ALLOY RODS DIVISION
 Chemetron Corporation

My Commission expires: 11/22/82

By.....

D. A. Smith

(5)

TEST NO. 3964

JAR 11/27/79

PAGE 2 OF 2

MATERIAL 7018

SIZE 5/32"

HEAT 411J2971

LOT 3J908L02

TEST RESULTSWITHOUT PREHEAT

Test No.	Full	Split	Volts	Amps
Tensiles & Impacts	1	6	24	175

Test Results:	As Welded	Stress Relieved	15 Hrs. @ 1150° F.	
Yield	71,800	62,500		
Tensile	78,400	75,200		
Elongation	28.0%	32.0%		
Red. of Area	66.1%	74.7%		

Charpy V-Notch Impacts Tested @ -30° F.

Impacts	15-76-96-24-89	80-98-100-29-96
Lat. Exp.	17-63-78-27-76	70-70-79-29-79
% Shear	20-20-40-10-30	20-20-20-40-30

WITH PREHEAT

Test No.	Full	Split	Volts	Amps
Tensiles & Impacts	1	6	24	175

Test Results:	As Welded	Stress Relieved	15 Hrs. @ 1150° F.	
Yield	71,100	61,700		
Tensile	78,100	74,900		
Elongation	30.0%	32.0%		
Red. of Area	76.0%	76.7%		

Charpy V-Notch Impacts Tested @ -30° F.

Impacts	17-34-100-114-42	17-98-148-120-112
Lat. Exp.	21-31-73-81-35	21-79-92-90-91
% Shear	10-50-20-40-10	40-20-40-20-20

5

ALLOY RODS DIVISION

CHEMETRON CORPORATION

P.O. BOX 517 HANOVER, PA 17331 717-8911

CERTIFICATE OF ANALYSIS

JHR
3/18/81

CERTIFIED MATERIALS TEST REPORT

Customer Order No. 87643C

Order No. 193462-6

Shipped:

This Material conforms to Specification
WMS 501 REV. 4, WMS 568 REV. 1, QAS 311
REV. 12. ASME SFA 5.1 SEC. II PART C &
ASME SEC. III NE-2400 10 CFR PART 21
APPLIES.

Post Welding Supply Co.
P. O. Box 10763
1300 7th Ave. North
Birmingham, AL 35202

P. O. B102352-0406-31

Trade Name
or Trademark: Atom Arc 7018

Diameter Size: 3/16"

Weight: 30,000 lbs.

Lot Number: 3B109P02

Heat Number: 401N0311

Type: E-7018

Test No. 6096

Control No. AA056
X-Rays Satisfactory

Carbon	.03	
Manganese	1.10	.01
Chromium	.03	.01
Nickel	.04	.03
Silicon	.42	.04
Columbium		1.12
Tantalum		1.17
Molybdenum	.01	
Tungsten		
Copper	.03	
Titanium		
Phosphorus	.006	
Sulphur	.015	
Vanadium	.01	
Cobalt		

Moisture @ 1800°F. 0.18%
Concentricity 4%
Type Steel A-285

This electrode meets the requirements of
Chicago Bridge & Iron Welding Specification
WMS 501 REV. 4, WMS 568 REV. 1, QAS 311
REV. 12. ASME SFA 5.1 SEC. II PART C &
ASME SEC. III NE-2400 10 CFR PART 21 APPLIES.

Tensile Specimen .505"
Impact Specimen .394" x .394"

Filletts: OK Horizontal

State of Pennsylvania }
County of York } SS

Subscribed and sworn to before me
this 26th day of February, 1981

SEAL *Kay K. K. K.*
Notary Public

My Commission Expires: 11/22/82

Quality Systems No. N-1224
Expiration Date: September 8, 1981

The undersigned certifies that the con-
tents of this report are correct and
accurate and that all operations per-
formed by the undersigned or subcon-
tractors are in compliance with require-
ments of the material specification and
ASME Boiler and Pressure Vessel Code
Section III Division I Subsection NCA-
3800.

ALLOY RODS DIVISION
Chemetron Corporation

BY *J. L. Starnier*
J. L. Starnier

6

TEST NO. 6095

PAGE 2 OF 2

MATERIAL 7018

SIZE 3/16"

HEAT 401N0311

LOT 3B109P02

TEST RESULTSWITHOUT PREHEAT

Test No.	Full	Split	Volts	Amps
Tensiles & Impacts	2	6	24	240 DC+
Test Results:	As Welded		Stress Relieved	
			15 Hrs. @1150° F.	
Yield	63,500		57,700	
Tensile	76,200		71,100	
Elongation	33.0%		34.0%	
Red. of Area	75.3%		78.2%	
Charpy V-Notch Impacts Tested @ -300° F.				
Impacts	131-19-79-21-123		99-92-263-26-109	
Lat. Exp.	89-25-64-27-84		76-72-82-29-80	
% Shear	70-15-30-20-50		40-40-100-20-70	

WITH PREHEAT

Test No.	Full	Split	Volts	Amps
Tensiles & Impacts	2	7	23	240 DC+
Test Results:	As Welded		Stress Relieved	
			15 Hrs. @1150° F.	
Yield	65,000		57,000	
Tensile	76,000		71,000	
Elongation	33.0%		35.0%	
Red. of Area	77.0%		79.4%	
Charpy V-Notch Impacts Tested @ -300° F.				
Impacts	205-239-226-137-210		131-239-81-248-263	
Lat. Exp.	68-61-64-85-83		82-80-68-67-85	
% Shear	100-100-100-60-100		60-100-20-100-100	

ALLOY RODS DIVISION

CHEMETRON CORPORATION

P.O. BOX 517 HANOVER, PA 17331 717/637-8911

CERTIFICATE OF ANALYSIS

JAN
4/2/80

CERTIFIED MATERIALS TEST REPORT

C B & I
P.O. # 121510406-31
1500 N. 50th St.
Birmingham, AL 35202

Customer Order No. 82543C

Order No. 183700-2

Shipped:

This Material conforms to Specification
*WMS 501 Rev. 4, WMS 568 Rev. 1, QAS 31
Rev. 12 ASME SFA 5.1 Sec II Part C &
ASME B&PVC Sec III NE-2400 10 CFR Part
21 Applies.

Contract #0406-31

Trade Name
or Trademark: Atom Arc 7018

Diameter Size: 1/8"

Weight: 35,000 lbs.

Lot Number: 2D015T02

Heat Number: 412K1491

Type: E 7018

Test No. 4767

Control No. XXX062

X-Rays Satisfactory

Carbon	.04
Manganese	1.08
Chromium	.04
Nickel	.02
Silicon	.41
Columbium	
Tantalum	
Molybdenum	.01
Tungsten	
Copper	.01
Titanium	
Phosphorus	.013
Sulphur	.014
Vanadium	.03
Cobalt	

Moisture @ 1800°F. 0.22%
Concentricity 4%
Type Steel A-285

This electrode meets the requirements of
Chicago Bridge & Iron Welding Specification
*WMS 501 Rev. 4, WMS 568 Rev. 1, QAS 31 Rev
12 ASME SFA 5.1 Sec II Part C & ASME B&PVC
Sec. III NE-2400 10 CFR Part 21 Applies.

Tensile Specimen .252"
Impact Specimen .394" x .394"

Fillets: OK Vertical &
Overhead

DC Reverse Polarity

State of Pennsylvania)
County of York)SS

Subscribed and sworn to before me
this 29th day of May 1980

SEAL.....
Notary Public

My Commission Expires: 11/22/82

Quality Systems No. N-1224
Expiration Date: September 8, 1981

The undersigned certifies that the con-
tents of this report are correct and
accurate and that all operations per-
formed by the undersigned or subcon-
tractors are in compliance with require-
ments of the material specification and
ASME Boiler and Pressure Vessel Code
Section III Division I Subsection NCA-
3800.

ALLOY RODS DIVISION
Chematron Corporation

BY.....
D. A. Smith

7

MR
d/180

TEST NO. 4767

PAGE 2 OF 2

MATERIAL 7018

SIZE 1/8"

HEAT 412K1491

LOT 2D015T02

TEST RESULTS

WITHOUT PREHEAT

Test No.	Full	Split	Volts	Amps
Tensiles & Impacts	1	5	20	140

Test Results: As Welded

Stress Relieved
15 Hrs. @ 1150° F.
63,600
78,700
31.0%
78.3%

Yield 68,300
Tensile 80,400
Elongation 32.0%
Red. of Area 77.1%

Charpy V-Notch Impacts Tested @ -30° F.

Impacts 80-106-92-104-19
Lat. Exp. 60-77-70-73-27
% Shear 40-50-40-50-20

133-148-115-18-81
92-95-87-20-67
70-70-60-15-20

WITH PREHEAT

Test No.	Full	Split	Volts	Amps
Tensiles & Impacts	1	5	20	140

Test Results: As Welded

Stress Relieved
15 Hrs. @ 1150° F.
62,900
77,700
32.0%
78.4%

Yield 67,900
Tensile 80,400
Elongation 30.0%
Red. of Area 75.6%

Charpy V-Notch Impacts Tested @ -30° F.

Impacts 20-99-117-37-117
Lat. Exp. 22-69-78-30-79
% Shear 20-40-70-20-70

149-123-96-32-117
96-89-78-28-88
70-60-30-15-50

7

CHEMETRON CORPORATION.
WELDING PRODUCTS DIVISION

CERTIFICATE OF ANALYSIS

Customer Order No. G-122182-0401-31

Order No. 918715-1

Shipped _____

CHICAGO BRIDGE & IRON CO
MERCER COUNTY
GREENVILLE, PENN. 16125

This material conforms to Specification
WMS 501 REV. 2 &
QAS 311 REV. 9

Trade Name
or Trademark:

Atom Arc 7018

Diameter Size:

1/8"
15,000 lb.

Lot Number:

A717N1AD

Heat Number:

432X4491

Type E 7018

Test No. 539

X-Ray Satisfactory

Control No. KKK050

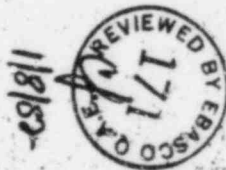
Moisture @1800°F. 0.14%
Concentricity 4%

(See Attached Sheet For Test Results)

This electrode meets the requirements of Chicago
Bridge & Iron Welding Specification WMS 501 REV. 2 &
QAS 311 REV. 9 ASME SFA 5.1.

ASME QUALITY SYSTEM CERTIFICATE (MATERIALS)
NUMBER N-1224 EXPIRES ON SEPTEMBER 8, 1978.

Carbon	.05
Manganese	.93
Chromium	.04
Nickel	.02
Silicon	.31
Columbium + Tantalum	
Molybdenum	.01
Tungsten	
Copper	.02
Titanium	
Phosphorus	.013
Sulphur	.018
Vanadium	.02



State of Penna.)
County of York) SS

Subscribed and sworn to before me
this 10th day of March 19 77

SEAL

Notary Public

My commission expires:

8-21-78

CLASS 5.2
FOLDER 1 NO. 1

The undersigned certifies that this report is
correct and that no significant change has
been made in any of the elements described in
the qualification approval.

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

BY

R. W. Boyer
R. W. Boyer

TEST NO. 539

WITH PREHEAT

Test Results:	As Welded	Stress Relieved 15 hrs. @1150°F.
Yield	66,300 -	62,500 -
Tensile	76,100 -	77,000 -
Elongation	28.0%	34.0%
Red. of Area	77.7%	71.7%

Charpy V-Notch Impacts Tested @-20°F. -

Impacts	83-109-128-153-180 -	12-50-101-107-125 -
Lat.Exp.	67-81-86-77-70	17-46-83-85-98
% Shear	30-40-70-90-100	10-20-40-40-50

WITHOUT PREHEAT

Test Results:	As Welded	Stress Relieved 15 hrs. @1150°F.
Yield	66,400 -	64,700 -
Tensile	79,900 -	79,000 -
Elongation	30.0%	30.0%
Red. of Area	76.4%	76.1%

Charpy V-Notch Impacts Tested @-20°F. -

Impacts	88-102-106-106-108 -	85-112-115-115-117 -
Lat.Exp.	73-78-81-81-84	72-88-83-87-83 -
% Shear	30-40-50-50-50	30-40-40-50-40 -



CLASS	5.2
FOLDER	1 NO. 1

Certificate of Analysis

Chicago Bridge & Iron Co.

Order No. B-110246-0406-30

Customer Order No. 39631

Post Welding Supply Co.

P.O. Box 10763

Birmingham, Alabama 36206

Order No. 64259

Shipped

This material conforms to Specification WMS 401 REV. 3 & QAS 311 REV. 3

Test No. 514

Control No. AAA039 Type E 7018

Trade Name: Atom Arc 7018

Concentricity 4%

Moisture @ 1800°F. 0.18%

Diameter Size: 7/32"
15,000 lb.

These electrodes meet the requirements of Para. N511.3 of ASME SEC. III Nuclear Code.

Lot Number: F308J1AG
Heat Number: 421K1561

Tensile Properties: Specimen Type .50

Carbon	.05
Manganese	1.23
Chromium	Nil
Nickel	Nil
Silicon	.44
Columbium	
Tantalum	
Molybdenum	.07
Tungsten	
Copper	
Titanium	
Phosphorus	.011
Sulphur	.019
Vanadium	.01
Iron	
Ferrite	

	AS	Stress
	Welded	Relieved **
Yield	68,900	58,000
Tensile	76,000	70,000
Elongation	31%	32%
Red. of Area	75.4%	76.5%

Charpy V-Notch Impacts Tested @ -20°F.
Impacts 112-113-117-118-128 30-30-129
132-155Lat.Exp. 76-73-82-81-88 13-21-78-90-8
% Shear 50-50-50-50-60 20-20-60-50-

** Stress Relieved for 15 hrs. @ 1150°C

WE HEREBY CERTIFY THAT
THIS IS A TRUE COPYSigned M.A.G. Date 9/6/73

JAN 9 1982

State of Penna.)
County of York) ssSubscribed and sworn to before me
this 19th day of July

19 73

SEAL

Connan W. Forceman
Notary Public

My commission expires: 5-8-76

The undersigned certifies that this report is correct and that no significant change has been made in any of the elements described in the qualification approval.

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

BY

J. L. Starner
J. L. Starner

(4)

EMETRON CORPORATION

WELDING PRODUCTS DIVISION

Certificate of Analysis

CHICAGO BRIDGE & IRON COMPANY

ORDER NO. B-82948-0406-30

Customer Order No. 41595

Post Welding Supply

P.O. Box 10763

1300 Seventh Avenue North

Birmingham, Alabama 35202

Order No. 66897

Shipped 1-4-74

This material conforms to Specification WMS 401 REV. 3 & QAS 311 REV. 3*

Test No. 761

X-Ray Satisfactory

Type E 7018

Control No. AA068

Trade Name: Atom Arc 7018

Diameter Size: 1/8"
30,000 lb.

Lot Number: K308HLAD

Heat Number: 09T480

Moisture @ 1800°F. 0.2%

Concentricity 3%

Type Steel A-285

Test No. Full Split Volts Amps

Tensile & Impacts 1 6 24 130

Test Results: AS Welded Stress Relieved 15 hrs. @ 1150°F.

Yield 65,100 62,300

Tensile 80,200 74,500

Elongation 28% 33%

Red. of Area 78.5% 80.3%

Charpy V-Notch Impacts Tested @ -20°F.

Impacts 131-140-141-149-210 17-120-147-160-221

Lat.Exp. 82-81-81-80-84 19-90-96-97-80

% Shear 70-60-70-70-100 10-60-70-80-10

Filletts: OK Vertical 1 Overhead 1

*These electrodes meet the requirements of Par. N511.3 of ASME SEC. III Nuclear Code.

Carbon

Manganese

Chromium

Nickel

Silicon

Columbium

Tantalum

Molybdenum

Tungsten

Copper

Titanium

Phosphorus

Sulphur

Vanadium

Iron

Ferrite

.06

.99

.06

.03

.32

.07

.012

.022

.02

JAN 9 1982

State of Penna.

County of York

1 55

Subscribed and sworn to before me

this 8th day of Jan.

19 74

SEAL

Notary Public

My commission expires:

4-12-76

The undersigned certifies that this report is correct and that no significant change has been made in any of the elements described in the qualification approval.

CHEMETRON CORPORATION

WELDING PRODUCTS DIVISION

BY

R. W. Boyer

③

CHEMETRON CORPORATION

WELDING PRODUCTS DIVISION

Certificate of Analysis Chicago Bridge & Iron Co.

Order No. B82948-0406-30 - Nuclear

Post Welding Supply Co.

P.O. Box 10763

Birmingham, Alabama 36206

Customer Order No. 39631

Order No. 64259

Shipped

This material conforms to Specification WMS 401 REV. 3 & QAS 311 REV. 3
Test No. 540
Control No. AAA043 Type E 7018

Trade Name: Atom Arc 7018

Diameter Size: 3/16"
50,000 lb.Lot Number: F325J1AF
Heat Number: 649K669

These electrodes meet the requirements
of Para. N511.3 of ASME SEC. III Nu-
clear Code.

Tensile Properties: Specimen Type .50:

Carbon	.04
Manganese	1.02
Chromium	.07
Nickel	.01
Silicon	.34
Columbium	
Tantalum	
Molybdenum	.06
Tungsten	
Copper	
Titanium	
Phosphorus	.007
Sulphur	.014
Vanadium	.01
Iron	
Ferrite	

AS Welded	Stress Relieved
	15 hrs. @ 1150°F. + 20°F.

UTS psi	76,500	70,000
YLP psi	67,000	63,000
Elong. 2"	32%	31%
Red. of Area	76.6%	77.4%

Charpy V-Notch Impacts Tested @ -20°F.

Impacts	64-105-121-128-135	142-204- 209-240-240
Lat.Exp.	40-50-50-60-60	70-100-100-100
% Shear	53-76-78-86-84	89-83-84-83-84

Concentricity 4%
Moisture @ 1800°F. 0.18%



JAN 9 1982

State of Penna.)
County of York) SS

Subscribed and sworn to before me

this 19th day of July 19 73

SEAL

Notary Public

My commission expires: 5--8--76

The undersigned certifies that this report is
correct and that no significant change has
been made in any of the elements described
in the qualification approval.

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

BY

J. L. Starnier

CHEMETRON CORPORATION

WELDING PRODUCTS DIVISION

Certificate of Analysis

Chicago Bridge & Iron Co.
Order No. B-82948-0406-30

Customer Order No. 41595

Order No. 66897

Shipped 1-4-74

Best Welding Supply
P.O. Box 10763
1300 Seventh Avenue North
Birmingham, Alabama 35202

This material conforms to Specification WMS 401 REV. 3 & QAS 311 REV. 3*

Test No. 735
X-Ray Satisfactory
Control No. AAA072

Type E 7018

Trade Name:

Atom Arc 7018

Moisture @ 1800°F. 0.2%
Concentricity 4%
Type Steel A-825

Diameter Size:

7/32"
20,000 lb.

Lot Number:

J326J1AG

Heat Number:

411L3061

Test No. Full Split Volts Amps

Tensile &
Impacts

2 6 24 260

Test
Results:

AS
Welded

Stress
Relieved
15 hrs. @ 1150°F.

Yield

65,000

58,500

Tensile

75,000

70,000

Elongation

32%

34%

Red. of Area

75.4%

79.0%

Charpy V-Notch Impacts Tested @ -20°F.

Impacts 17-26-35-36-91 110-114-128-136-181

Lat.Exp. 24-27-35-34-76 81-86-88-95-78

% Shear 20-20-20-20-50 60-70-70-70-80

Fillet: OK Horizontal 1

*These electrodes meet the requirements of Par. N511.3 of ASME SEC. III Nuclear Code.

WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY
9/19/74
Signed *[Signature]*



JAN 9 1982

State of Penna.)
County of York) SS

Subscribed and sworn to before me
this 8th day of Jan.

19 74

The undersigned certifies that this report is correct and that no significant change has been made in any of the elements described in the qualification approval.

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

BY

[Signature]
R. W. Boyer

My commission expires: 4-12-76

Notary Public

⑦

CERTIFICATE OF ANALYSIS

C B & I Order No. B-60553-0406-31-NU
Customer Order No. 52259P

509995

Order No. _____

Shipped _____

This material conforms to Specification
WMS 501 REV 0 &
QAS 311 REV 8

E 7018

Type _____

Test No. 540

X-Ray Satisfactory

Control No. (HHH046)

Post Welding Supply
P O Box 10763
1300 7th Avenue No.
Birmingham, Ala.
35202

Trade Name or Trademark: Atom Arc 7018

Diameter Size: 5/32"
33,800 lb.

Lot Number: A609M1AE
Heat Number: 411T5391

Moisture @ 1800°F. 0.2%
Concentricity 3%

Carbon	.04
Manganese	.94
Chromium	.04
Nickel	.03
Silicon	.33
Columbium + Tantalum	
Molybdenum	.04
Tungsten	
Copper	.03
Titanium	
Phosphorus	.015
Sulphur	.016
Vanadium	.02

(See Attached Sheet for Test Results)

ASME Quality System Certificate (Materials) Number
N-1224, expires on September 8, 1978.

This electrode meets the requirements of Chicago
Bridge & Iron Welding Specification WMS 501 REV 0
& QAS 311 REV 8 ASME SFAS.1.



JAN 9 1982

State of Penna.)
County of York) SS

Subscribed and sworn to before me
this 14th day of September

19 76

The undersigned certifies that this report is
correct and that no significant change has
been made in any of the elements described
in the qualification approval.

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

SEAL

Annette L. Almon

Notary Public

My commission expires:

8-21-78

**WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY**

BY

R. W. Boyer

R. W. Boyer

Signed REM

Date 8-22-76

(13)

WITHOUT PREHEAT

Test Results:	AS Welded	Stress Relieved 15 hrs. @ 1150°F.
Tensile	78,200	74,100
Yield	69,600	62,900
Elongation	29.0%	32.0%
Red. of Area	76.4%	76.7%

Charpy V-Notch Impacts Tested @ -20°F.

Impacts	30-86-115-119-136	114-119-120-132-181
Lat. Exp.	30-69-76-83-84	81-86-96-90-92
% Shear	30-40-50-50-60	50-50-50-60-100

WITH PREHEAT

Test Results:	AS Welded	Stress Relieved 15 hrs. @ 1150°F.
Tensile	78,300	74,000
Yield	71,800	64,000
Elongation	27.0%	32.0%
Red. of Area	76.4%	77.7%



JAN 9 1982

Charpy V-Notch Impacts Tested @ -20°F.

Impacts	17-96-96-102-109	20-26-59-108-115
Lat. Exp.	21-76-77-86-81	24-28-51-81-92
% Shear	35-80-70-70-70	40-30-40-70-80

WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY
Signed Ren Date 9-27-76

CHEMETRON CORPORATION

WELDING PRODUCTS DIVISION

CERTIFICATE OF ANALYSIS

B-60553-0406-31-N4

Post Welding Supply
P O Box 10763
1300 7th Avenue No
Birmingham, Ala.
35202

Customer Order No. 52259P

Order No. 509995

Shipped

This material conforms to Specification

WMS 501 REV 0

QAS 311 REV 0

Type E 7018

Test No. 555

X-Ray Satisfactory

Control No. (HHH051)

Trade Name or Trademark: Atom Arc 7018

Diameter Size: 32,800 lb.
3/16"Lot Number: A614N1AF
Heat Number: 411T6401Moisture @ 1800°F. 0.2%
Concentricity 3%

(See Attached Sheet for Test Results)

ASME Quality System Certificate (Materials) Number
N-1224, expires on September 8, 1978.This electrode meets the requirements of Chicago
Bridge & Iron Welding Specification WMS 501 REV
0 QAS 311 REV 0 ASME SFA5.1.

Carbon	.05
Manganese	1.21
Chromium	.03
Nickel	.03
Silicon	.38
Columbium + Tantalum	
Molybdenum	.06
Tungsten	
Copper	.03
Titanium	
Phosphorus	.014
Sulphur	.015
Vanadium	.02



JAN 9 1982

WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY

Signed R. W. Boyer Date 2-19-76

The undersigned certifies that this report is
correct and that no significant change has
been made in any of the elements described
in the qualification approval.

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

BY

R. W. Boyer

State of Penna. 1 SS
County of York 1

Subscribed and sworn to before me
this 18th day of February 19 76

SEAL

Canon H. Folcoment
Notary Public

My commission expires: 5-8-76

6610 00100

(14)

WITH PREHEAT

Test Results:	AS Welded	Stress Relieved 15 hrs. @ 1150°F.
Tensile	74,500	73,700
Yield	63,000	62,100
Elongation	30.0%	32.0%
Red. of Area	71.5%	77.5%

Charpy V-Notch Impacts Tested @ -20°F.

Impacts	44-88-93-96-99	21-30-34-106-149
Lat. Exp.	41-71-71-76-76	26-32-33-82-94
% Shear	25-65-65-65-65	30-30-30-70-80

WITHOUT PREHEAT

Test Results:	AS Welded	Stress Relieved 15 hrs. @ 1150°F.
Tensile	79,500'	76,300
Yield	69,000	64,300
Elongation	30.0%	31.0%
Red. of Area	75.5%	74.6%

Charpy V-Notch Impacts Tested @ -20°F.

Impacts	24-31-86-100-117	91-92-104-112-114
Lat Exp	27-33-68-76-83	72-77-80-83-83
% Shear	45-40-50-60-70	60-60-65-60-65



JAN 9 1982

WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY

Signed Rem Date 4-19-76

(CORRECTED REPORT)
CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

CERTIFICATE OF ANALYSIS

C B & I Order No. B-60553-0406-31-NU
Customer Order No. 52259P

Order No. 509995

Shipped _____

This material conforms to Specification
WMS 501 REV 0
QAS 311 REV B

Type E 7018

Test No. 555
X-Ray Satisfactory
Control No. (HHH051)

Post Welding Supply
P O Box 10763
1300 7th Avenue No
Birmingham, Ala.
35202

Trade Name or Trademarks: Atom Arc 7018
Diameter Size: 32,800 lb.
3/16"
Lot Number: A614N1AF
Heat Number: 411T6401

Moisture @ 1800°F. 0.2%
Concentricity 3%

(See Attached Sheet for Test Results)

ASME Quality System Certificate (Materials) Number
N-1224, expires on September 8, 1978.

This electrode meets the requirements of Chicago
Bridge & Iron Welding Specification WMS 501 REV
0 QAS 311 REV B ASME SFA5.1.

Carbon	.05
Manganese	1.21
Chromium	.03
Nickel	.03
Silicon	.38
Columbium + Tantalum	
Molybdenum	.06
Tungsten	
Copper	.03
Titanium	
Phosphorus	.014
Sulphur	.015
Vanadium	.02



JAN 9 1982

**WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY**

Signed REM Date 7-22-76

The undersigned certifies that this report is
correct and that no significant change has
been made in any of the elements described
in the qualification approval.

State of Penna.)
County of York) SS

Subscribed and sworn to before me
this 14th day of September 19 76

SEAL

Gunnetha L. Olmeyer
Notary Public

My commission expires: 8-21-78

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

BY

R. W. Boyer
R. W. Boyer

1 0 7 0 0 0 0 0 0

WITH PREHEAT

Test Results:	AS Welded	Stress Relieved 15 hrs. @ 1150°F.
Tensile	74,500	73,700
Yield	63,000	62,100
Elongation	30.0%	32.0%
Red. of Area	71.5%	77.5%

Charpy V-Notch Impacts Tested @ -20°F.

Impacts	44-88-93-96-99	21-30-34-106-149
Lat. Exp.	41-71-71-76-76	26-32-33-82-94
% Shear	25-65-65-65-65	30-30-30-70-80

WITHOUT PREHEAT

Test Results:	AS Welded	Stress Relieved 15 hrs. @ 1150°F.
Tensile	79,500	76,300
Yield	69,000	64,300
Elongation	30.0%	31.0%
Red. of Area	75.5%	74.6%



JAN Q 1002

Charpy V-Notch Impacts Tested @ -20°F.

Impacts	24-31-86-100-117	91-92-104-112-114
Lat Exp	27-33-68-76-83	72-77-80-83-83
% Shear	45-40-50-60-70	60-60-65-60-65

WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY

Signed Rem Date 8-22-26

(15)

Chicago Bridge & Iron Co.

B62590-0406-30 Nuclear

Customer Order No. 45243

Order No. 65244

-Shipped

This material conforms to Specification
AWS A5.1-69 & WMS 401
REV. 4 & QAS 311 REV. 6

Post Welding Supply

1300 7th Ave. No.
P. O. Box 10763
Birmingham, Ala. 35202

Trade Name or Trademark: Atom Arc 7018

Diameter Size: 1/8"
40,150 lb.

Lot Number: D522MIAD
Heat Number: 07L041

Carbon .04
Manganese 1.12✓
Chromium .03✓
Nickel .03.
Silicon .39✓

Columbium +
Tantalum
Molybdenum .04✓
Tungsten
Copper .08
Titanium
Phosphorus .015
Sulphur .014
Vanadium .02✓

Moisture @ 1800°F. 0.1%
Concentricity 4%

This electrode meets the requirements of Chicago
Bridge & Iron Welding Specification
WMS 401 Rev. 4 & QAS 311 Rev. 6 ASME SFA 5.1.

Test Results:	AS Welded	Stress Relieved 15 hrs. @ 1150°F.
Yield	71,700✓	64,100
Tensile	82,100✓	78,150
Elongation	29.0%✓	32.0%
Red. of Area	77.7%	77.7%
Charpy V-Notch Impacts Tested @ -20°F.		
Impacts	51-80-95-105-106✓	125-125-126-127-1.
Lat. Exp.	35-61-67-70-75	85-89-90-93-81
% Shear	50-50-50-70-60	80-80-80-80-80



WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY

Signed DW Date 9-26-75

State of Penna.)
County of York) SS

JAN 9 1982

Subscribed and sworn to before me
this 29th day of May

19 75

The undersigned certifies that this report is
correct and that no significant change has
been made in any of the elements described
in the qualification approval.

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

Notary Public
My commission expires: 8-21-78

BY R. W. Boyer
R. W. Boyer

CHEMETRON CORPORATION

WELDING PRODUCTS DIVISION

CERTIFICATE OF ANALYSIS

MARK: 860553 0406 30 Nuclear

Customer Order No. 52259P

Order No. 509995

Shipped _____

This material conforms to Specification

WMS 501 REV 0 &

QAS 311 REV 8

Type E 7018

Test No. 605

X-Ray Satisfactory

Control No. (HHH056)

Trade Name or Trademark: Atom Arc 7018

Diameter Size: 7/32"
30,000 lb.

Lot Number: A627N1AG

Heat Number: 431T1831

Moisture @ 1800°F 0.1%
Concentricity 3%

(See Attached Sheet for Test Results)

ASME Quality System Certificate (Materials)
Number N-1224 Expires on September 8, 1978.

This electrode meets the requirements of
Chicago Bridge & Iron Welding Specification
WMS 501 REV 0 & QAS 311 REV 8 AMSE SFA5.1.

Carbon	.04
Manganese	1.14
Chromium	.03
Nickel	.03
Silicon	.41
Columbium + Tantalum	
Molybdenum	.04
Tungsten	
Copper	.02
Titanium	
Phosphorus	.012
Sulphur	.016
Vanadium	.02



WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY

Signed REM Date 5/6/76

The undersigned certifies that this report is correct and that no significant change has been made in any of the elements described in the qualification approval.

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

BY

R. W. Beyer
R. W. Beyer

State of Penna.)
County of York) SS

JAN 9 1982

Subscribed and sworn to before me
this 2nd day of April

19 76

SEAL

Annella L. Almon
Notary Public

My commission expires: 8-21-78

WITH PREHEAT

Test	AS	Stress
Results:	Welded	Relieved
		15 hrs. @ 1150°F.

Tensile	75,300	73,500
Yield	63,800	62,500
Elongation	30.0%	33.0%
Red. of Area	72.5%	76.8%

Charpy V-Notch Impacts Tested @ -20°F.

Impacts	20-33-35-106-110	20- 44 -46-105-106
Lat. Exp.	23-31-35-76-76	23- 40 -41-82-80
% Shear	30-40-25-60-75	30-30-30-60-60

WITHOUT PREHEAT

Test Results:	AS Welded	Stress Relieved
		15 hrs. @ 1150°F.

Tensile	76,500	72,500
Yield	66,500	62,500
Elongation	30.0%	32.0%
Red. of Area	76.3%	76.0%

Charpy V-Notch Impacts Tested @ -20°F.

Impacts	23-23-45-72-93	93-100-100-100-112
Lat. Exp.	25-27-43-62-77	82-76-76-82-77
% Shear	40-40-30-50-60	80-70-70-80-70



JAN 9 1982

WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY

Signed REM Date 5/26/76

CHEMETRON CORPORATION

ARC PRODUCTS DIVISION

Certificate of Analysis

Post Wldg. Supply
P.O. Box 10763
Birmingham, Ala.

Customer Order No. 31035
CB&I P.O. 1102601 0406 30 - Nuclear
Order No. 66945

Shipped 12/13/71

This material conforms to Specification ASME SFA 5.1 Sec. III Nuclear, WMS 401
Test No. 440 Rev. 1
X-Ray Satisfactory Type E7018

Testing: The electrodes were tested in accordance with the requirements of NB 2400 of Section III of the ASME Code and the applicable requirements of SFA 5.1. One plate tested in the "as welded" condition and one plate post weld heat treated a minimum of 15 Hrs @ 1150°F + -20°F.

Tensile Properties

Specimen Type .505"	As Welded	Heat Treated
UTS (Psi)	75,000	71,000
YLP (Psi)	67,000	62,500
Elongation(2")	30%	34%
Red of Area	74.5%	79.6%

Impact Properties (Charpy V Notch)

Test Temp -20°F.

Ft Lbs.	189, 190, 192, 198, 214	26, 26, 132, 141, 24
Lateral Exp.	81, 77, 75, 77, 79	19, 20, 92, 94, 91
% Shear	100, 100, 100, 100, 100	20, 10, 80, 90, 100

Other Tests

Concentricity 3%

Moisture @ 1800°F. 0.18%



JAN 9 1982

WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY

State of Penna.
County of York

Signed REM Date 5/18/76

Subscribed and sworn to before me
this 10th day of Jan.

19 72

SEAL

Gorman H. L. Lecomte
Notary Public

My commission expires: 5/8/72

This is to certify that the original copy of this report has been properly signed and notarized.

The undersigned certifies that this report is correct and that no significant change has been made in any of the elements described in the qualification approval.

CHEMETRON CORPORATION
ARC PRODUCTS DIVISION

BY

D. J. Walker

25

Charles Letchman

CERTIFICATE OF ANALYSIS

Chicago Bridge & Iron Co
1511 N 50th St
Birmingham, Ala
35203

Customer Order No. B-81355 0406-30

10871

Order No. _____

Shipped _____

This material conforms to Specification
WMS 501 REV 0 &
QAS 311 REV 8

Type E 7018

Test No. 363
X-Ray Satisfactory
Control No. (GGG082)

Trade Name or Trademark: Atom Arc 7018
Diameter, Size: 7/32"
24,600 lb.
Lot Number: J528P1AG
Heat Number: 412T2741

Moisture @ 1800° F. 0.2%
Concentricity 3%

(See Attached for Test Results)

Carbon	.04
Manganese	1.15
Chromium	.04
Nickel	.03
Silicon	.35
Columbium + Tantalum	
Molybdenum	.05
Tungsten	
Copper	.02
Titanium	
Phosphorus	.013
Sulphur	.015
Vanadium	.02



JAN 9 1982

This electrode meets the requirements of Chicago Bridge & Iron Welding Specification WMS 501 REV 0 & QAS 311 REV 8 ASME SFA5.1.

**WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY**

Signed REM Date 2-12-76

The undersigned certifies that this report is correct and that no significant change has been made in any of the elements described in the qualification approval.

State of Penna.)
County of York) SS

Subscribed and sworn to before me
this 2nd day of December 1975

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

SEAL

Commonwealth of Pennsylvania
Notary Public

My commission expires: 5-8-76

**WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY**

Signed REM Date 2-11-76

BY

R. W. Boyer
R. W. Boyer

69

WITH PREHEAT

Test Results:	AS Welded	Stress Relieved 15 hrs. @ 1150° F.
Yield	68,300	62,200
Tensile	74,400	71,100
Elongation	31.0%	32.0%
Red. of Area	77.0%	79.8%

Charpy V-Notch Impacts Tested @ -20° F.

Impacts	56-89-118-132-154	65-82-117-135-143
Lat. Exp.	50-69-80-82-81	52-67-85-96-94
% Shear	30-50-60-60-80	30-40-60-70-70

NO PREHEAT

Test Results:	AS Welded	Stress Relieved 15 hrs. @ 1150° F.
Yield	68,500	62,500
Tensile	74,500	71,500
Elongation	32.0%	33.0%
Red. of Area	77.2%	78.1%

Charpy V-Notch Impacts Tested @ -20° F.

Impacts	74-109-123-154-159	60-86-119-125-135
Lat. Exp.	61-79-88-84-81	51-69-93-88-96
% Shear	30-50-60-80-80	30-40-60-60-70



JAN 9 1982

WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY

Signed REN Date 2-12-76

WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY

Signed REN Date 2-11-76

1 2 3 4 5 6 7 8 9 0

29

HEMETRON CORPORATION

WELDING PRODUCTS DIVISION

Certificate of Analysis

Chicago Bridge & Iron
1500 N. 50th St.
Birmingham, Alabama 35201

Customer Order No. B110105040630

Order No. 77144

Shipped _____

This material conforms to Specification WMS 401 REV. 4 & QAS 311 REV. 6

Test No. .674

X-Ray Satisfactory

Type E 7018

Control No. EEEE032

Trade Name:

Atom Arc 7018

Moisture @ 1800° F. 0.1%

Diameter Size:

7/32"

Concentricity 3%

Lot Number:

47,500 lb.

Test

AS

Stress

Heat Number:

C507M1AG

Results:

Welded

Relieved

401S2011

15 hrs. @ 1150° F.

Carbon

.05

Yield

70,500

63,000

Manganese

1.21

Tensile

81,000

75,000

Chromium

.02

Elongation

32%

32%

Nickel

.03

Red. of Area

74.3%

76.1%

Silicon

.49

Charpy V-Notch Impacts Tested @ -20° F.

Columbium

Impacts 43-83-96-97-106

45-75-90-110-123

Tantalum

Lat. Exp. 31-60-70-69-70

30-56-64-76-91

Molybdenum

.04

% Shear 50-60-60-60-70

20-30-60-60-70

Tungsten

Copper

.03

This electrode meets the requirements of
Chicago Bridge & Iron Welding Specifica-
tion WMS 401 REV. 4 & QAS 311 REV. 6 ASME
SFA 5.1.

Titanium

Phosphorus

.012

Sulphur

.014

Vanadium

.01

Iron

Ferrite



State of Penna.)

County of York)

SS

JAN 9 1982

Subscribed and sworn to before me
this 9th day of May

1975

The undersigned certifies that this report is
correct and that no significant change has
been made in any of the elements described
in the qualification approval.

CHEMETRON CORPORATION

WELDING PRODUCTS DIVISION

My commission expires:

8-21-78

BY

R. W. Boyer

(31)

CHEMETRON CORPORATION

WELDING PRODUCTS DIVISION

CERTIFICATE OF ANALYSIS

Chicago Bridge & Iron Co.

B62590-0406-30 Nuclear

Customer Order No. 45243

H1 partial

Order No. 65244

Shipped

Post Welding Supply

1300 7th Ave. No.

P. O. Box 10763

Birmingham, Ala. 35202



This material conforms to Specification

AWS A5.1-69 & WMS 401

REV. 4 & QAS 311 REV. 6

Trade Name
or Trademark:

Atom Arc 7018

Diameter Size:

1/8"

40,150 lb.

Lot Number:

D522MIAD

Heat Number:

07LO41

Type E 7018

Test No. 796

X-Ray Satisfactory

Control No. EEE076

Moisture @ 1800°F. 0.1%
Concentricity 4%

This electrode meets the requirements of Chicago
Bridge & Iron Welding Specification
WMS 401 Rev. 4 & QAS 311 Rev. 6 ASME SFA 5.1.

Test
Results:AS
WeldedStress
Relieved
15 hrs. @ 1150°F.Yield
Tensile
Elongation
Red. of Area71,700
82,100
29.0%
77.7%64,100
78,150
32.0%
77.7%

Charpy V-Notch Impacts Tested @ -20°F.

Impacts

51-80-95-105-106

125-125-126-127-13

Lat. Exp.

35-61-67-70-75

85-89-90-93-81

% Shear

50-50-50-70-60

80-80-80-80-80

WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY

Signed DW Date 9-26-75

State of Penna.)
County of York) SS

Subscribed and sworn to before me
this 29th day of May

19 75

SEAL

Notary Public

My commission expires: 8-21-78

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

BY

R. W. Boyer

34

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

CERTIFICATE OF ANALYSIS

Chicago Bridge & Iron Company
Order No. B62590-0406-30 Nuclear
Customer Order No. 45243 ^{H2} _{part 1}

Order No. 65244-2

Post Welding Supply
1300 7th Ave. No.
P. O. Box 10763
Birmingham, Ala. 35202

Shipped _____

This material conforms to Specification
WMS 401 REV. 4 &
QAS 311 REV. 6



JAN 9 1982

Type E 7018

Test No. 849
X-Ray Satisfactory
Control No. EEB079

Trade Name or Trademark: Atom Arc 7018
Diameter Size: 5/32"
36,650 lb.
Lot Number: B508JLAE
Heat Number: 61991

Moisture @ 1800°F. 0.1%
Concentricity 3%

This electrode meets the requirements of Chicago Bridge & Iron Welding Specification WMS 401 REV. 4 & QAS 311 REV. 6 and ASME SFA 5.1.

Carbon .04
Manganese .95
Chromium .05
Nickel .01
Silicon .24
Aluminum + Tantalum
Molybdenum .04
Tungsten
Copper .05
Titanium
Phosphorus .010
Sulphur .013
Vanadium .02

Test Results:	AS Welded	Stress Relieved 15 hrs. @ 1150°F.
Yield	68,000	50,000
Tensile	74,500	70,000
Elongation	30.0%	34.0%
Red. of Area	78.1%	78.7%

Charpy V-Notch Impacts Tested @ -20°F.

Impacts	19-25-27-32-189	171-223-240-240-240
Lat. Exp.	16-24-24-30-93	76-86-86-88-91
% Shear	20-20-20-20-100	100-100-100-100-100

State of Penna.)
County of York) SS.

Subscribed and sworn to before me
this 19th day of June

19 75

**WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY**

Signed WV

Date June 18, 1975

The undersigned certifies that this report is correct and that no significant change has been made in any of the elements described in the qualification approval.

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

My commission expires: 8-21-78

BY

R. W. Boyer

R. W. Boyer

36

CHEMETRON CORPORATION

WELDING PRODUCTS DIVISION

Certificate of Analysis

Post Welding Supply
P.O. Box 10763
1300 Seventh Avenue North
Birmingham, Alabama 35202
CBIN P.O.#ML009080416-30

Customer Order No. 41595Order No. 66897Shipped 1-4-74This material conforms to Specification WMS 401 REV. 3 & QAS 311 REV. 3Test No. 753

X-Ray Satisfactory

Type E 7018Control No. AAA075

Trade Name:

Atom Arc 7018

Moisture @ 1800°F. 0.2%Concentricity 3%

Diameter Size:

3/16"45,000 lb.

Lot Number:

K305J1AF

Heat Number:

629008

MATERIAL RELEASED CONDITIONALLY WITH
PRELIMINARY DOCUMENTATION
CORRECTION DOCUMENTATION TO FOLLOW

Purchasing Date

Ship QA Date

Test
Results:AS
WeldedStress
Relieved
15 hrs. @ 1150°F.

Carbon	.05
Manganese	.99
Chromium	.05
Nickel	.02
Silicon	.28
Columbium	
Tantalum	
Molybdenum	.07
Tungsten	
Copper	
Titanium	
Phosphorus	.012
Sulphur	.024
Vanadium	.01
Iron	
Ferrite	

Yield	67,000	59,000
Tensile	73,000	70,500
Elongation	32%	33%
Red. of Area	77%	77.3%

Charpy V-Notch Impacts Tested @ -20°F.

Impacts	27-116-129-176-178	33-85-185-189-197
Lat. Exp.	31-81-82-96-90	33-75-90-90-90
% Shear	40-60-60-100-100	30-50-100-100-100



JAN 9 1982

WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY.

State of Penna.)
County of York) ss

Signed [Signature] Date 9-15-75

The undersigned certifies that this report is
correct and that no significant change has
been made in any of the elements described
in the qualification approval.

Subscribed and sworn to before me
this 13th day of Nov. 1974

SEAL

Notary Public

My commission expires: 5-8-76

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

BY

R. W. Boyer
R. W. Boyer

(32)

Post Welding Supply
P.O. Box 10763
Birmingham, Alabama 35202

Customer Order No. 3669 0

Order No. 69299

Shipped 1-26-73

This material conforms to Specification *WMS-401 REV. 3, QAS 311 REV. 3

Test No. 217

Control # AAA005

Type E 7018

Trade Name: Atom Arc 7018

*These electrodes meet the requirements of Pa N511.3 of ASME SEC. III Nuclear Code.

Diameter Size: 5/32"
68,950 lb.

Testing: The electrodes were tested in accordance with the requirements of ND-2400 of SE III of the ASME Code & the applicable requirements of SFA 5.1. One plate tested in the "as welded condition" & one plate post weld heat treated a minimum of 15 hrs. @ 1150°F. 200°F.

Lot Number: L227HIAE

Heat Number: 626639

Tensile Properties: Specimen Type .505"

	AW	HT
UTS (psi)	73,000	70,500
YLP (psi)	67,500	60,000
Elongation (2")	30%	34%
Red. of Area	78.7%	79.5%

Impacts Properties: (Charpy V-Notch)

Test Temp. -20°F.

Ft. Lb.	117-123-130-135-177	33-48-86-112-14
Lat. Exp.	82-90-92-82-92	36-43-73-81-86
% Shear	60-60-70-60-100	25-50-50-60-80

Other Tests: Concentricity 4%
Moisture @ 1800°F. 0.17%

WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY

Signed [Signature] Date 2-13-74

The undersigned certifies that this report is correct and that no significant change has been made in any of the elements described in the qualification approval.

State of Penna.)
County of York)

Subscribed and sworn to before me
this 29th day of January 1973



CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

JAN 9 1982

BY [Signature]
J. L. Starnor

Notary Public

My commission expires: 4-12-76

38

CHEMETRON CORPORATION

WELDING PRODUCTS DIVISION

Certificate of Analysis

Post Welding Supply
P.O. Box 10763
Birmingham, Alabama 35202

Customer Order No. 3669 0

Order No. 69299

Shipped 1-26-73

This material conforms to Specification * WMS-401 REV. 3, QAS 311 REV. 3
Test No. 216
Control # AAA004 Type E 7018

Trade Name: Atom Arc 7018
Diameter Size: 3/16"
58,250 lb.
Lot Number: L226J1AF
Heat Number: 412JH971

Carbon .040
Manganese .96 -
Chromium .02 -
Nickel .01 -
Silicon .34 -
Columbium
Tantalum
Molybdenum .05 -
Tungsten
Copper
Titanium
Phosphorus .007
Sulphur .019
Vanadium .01 -
Iron
Ferrite

*These electrodes meet the requirements of Par. N511.3 of ASME SEC. III Nuclear Code.

Testing: The electrodes were tested in accordance with the requirements of NB-2400 of SEC. III of the ASME Code and the applicable requirements of SFA 5.1. One plate tested in the "as welded condition" and one plate post weld heat treated a minimum of 15 hrs. @ 1150°F ± 20°F.

Tensile Properties: Specimen Type .505"

	AW	HT
UTS (psi)	75,000	70,000
YLP (psi)	67,500	60,500
Elongation (2")	33%	34%
Red. of Area	76.1%	78.7%

Impact Properties: (Charpy V-Notch)

Test Temp. -20°F.

Ft. Lb.	25-54-57-68-98	17-21-120-128-129
Lat. Exp.	24-47-46-30-79	18-21-90-83-93
% Shear	10-30-20-30-40	10-10-60-80-70

Other Tests: Concentricity 4%
Moisture @ 1800°F. 0.16%

State of Penna.)
County of York) SS



JAN 9 1982

Subscribed and sworn to before me
this 29th day of January

19 73

The undersigned certifies that this report is correct and that no significant change has been made in any of the elements described in the qualification approval.

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

SEAL

Notary Public

My commission expires: 4-12-76

BY

J. L. Starnier

43

CHEMETRON CORPORATION

WELDING PRODUCTS DIVISION

411
4/2/73

Certificate of Analysis

Post Welding Supply
P.O. Box 10763
Birmingham, Alabama 35202

Customer Order No. 3669 0

Order No. 69299

Shipped 1-26-73

This material conforms to Specification *WMS-401 REV. 3 QAS 311 REV. 3
Test No. 228
Control # AAA006 ✓ Type E 7018

Trade Name: Atom Arc 7018

*These electrodes meet the requirements of PN
N511.3 of ASME SEC. III Nuclear Code.

Diameter Size: 7/32"
22,200 lb.
Lot Number: A303J1AG ✓
Heat Number: 432H2311 ✓

Testing: The electrodes were tested in accordance with the requirements of NB-2400 of SEC. III of the ASME Code & the applicable requirements of SFA 5.1. One plate tested in the "a welded condition" and one plate post weld heat treated a minimum of 15 hrs. @ 1150°F. ± 20°F.

Carbon .06
Manganese 1.19 ✓
Chromium .02 ✓
Nickel .01 ✓
Silicon .41 ✓
Columbium
Tantalum
Molybdenum .05 ✓
Tungsten
Copper
Titanium
Phosphorus .011
Sulphur .023
Vanadium .01 ✓
Iron
Ferrite

Tensile Properties: Specimen Type .505"

	AW	HT
UTS (psi)	77,000 ✓	71,000 ✓
YLP (psi)	66,000 ✓	62,000 ✓
Elongation (2")	30% ✓	32% ✓
Red. of Area	74.0%	71.8%

Impact Properties: (Charpy V-Notch)
Testing Temp. -20°F.

Ft. Lb.	96-105-116-117-158	79-106-115-150-236
Lat. Exp.	80-82-84-84-91	72-86-93-86-85
% Shear	60-60-70-70-90	50-60-60-80-100

Other Tests: Concentricity 4%
Moisture @ 1800°F. 0.17%



State of Penna.)
County of York) SS

JAN 9 1982

Subscribed and sworn to before me
this 29th day of January

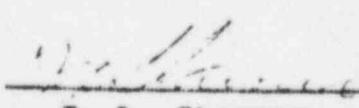
1973

The undersigned certifies that this report is correct and that no significant change has been made in any of the elements described in the qualification approval.

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

SEAL 
Notary Public

My commission expires: 4-12-76

BY 
J. L. Starner

44

CHEMETRON CORPORATION

WELDING PRODUCTS DIVISION

Certificate of Analysis

2/2/73

Post Welding Supply Company
P.O. Box 10763
Birmingham, Alabama 35202

Customer Order No. 36690

Order No. 67692

Shipped

This material conforms to Specification *
Test No. 212

Control # AAA 002

Type E 7018

Trade Name:

Atom Arc 7018

Diameter Size:

1/8"
62,650 lb.

Lot Number:

L219H1AD

Heat Number:

626793

*These electrodes meet the requirements of PAR N511.3 of ASME SEC. III Nuclear Code.

Testing: The electrodes were tested in accordance with the requirements of NB-2400 of Section III of the ASME Code and the applicable requirements of SFA 5.1. One plate tested in the "as welded condition" and one plate post weld heat treated a minimum of 15 hrs. @ 1150°F. ± 20°F.

Tensile Properties: Specimen Type .505"

	AS	HT
UTS (psi)	79,300 -	74,300 -
YLP (psi)	71,500 -	61,700 -
Elong. 2"	32% -	34% -
Red. of Area	78%	78.5%

Impact Properties: (Charpy V-Notch)

Test Temp. -20°F.

	AS	HT
Ft. Lb.	93-94-95-104-105	63-96-119-126-135
Lat. Exp.	77-78-71-73-76	56-80-93-91-96
% Shear	50-50-50-70-60	20-50-80-70-90

Other Tests

Concentricity 4%
Moisture @ 1800°F. 0.19%

The undersigned certifies that this report is correct and that no significant change has been made in any of the elements described in the qualification approval.

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

BY

J. L. Starner

Carbon .050
Manganese 1.08 -
Chromium .02 -
Nickel .01 -
Silicon .45 -
Columbium
Tantalum
Molybdenum .05 -
Tungsten
Copper
Titanium
Phosphorus .012
Sulphur .018
Vanadium .02 -
Iron
Ferrite



State of Penna.
County of York

SS

JAN 9 1982

Subscribed and sworn to before me
this 22nd day of Jan.

1973

SEAL *J. L. Starner*
Notary Public

My commission expires: 4-12-76

CORRECTED

CHEMETRON CORPORATION

ARC PRODUCTS DIVISION

Certificate of Analysis

Post Wldg Supply
P.O. Box 10763
Birmingham, Ala.

Customer Order No. 31035
CB&I P.O. B102601 0406 30 *Nuclear*

Order No. 66945

Shipped 12/13/71

This material conforms to Specification ASME SFA 5.1 Sec. III Nuclear WMS-401
Test No. 441 Rev. 1
X-Ray Satisfactory Type E7018

Trade Name: Atom Arc 7018

Diameter Size: 3/16
50,150 Lbs.

Lot Number: K110J1A

Heat Number: 622398

Control #: K010

Carbon .04

Manganese 1.02

Chromium .05

Nickel .03

Silicon .49

Columbium

Tantalum

Molybdenum .03

Tungsten

Copper

Titanium

Phosphorus .018

Sulphur .021

Vanadium .01

Iron

Ferrite

Testing: The electrodes were tested in accordance with the requirements of NB 2400 of Section III of the ASME Code and the applicable requirements of the SFA 5.1. One plate tested in the "as welded" condition and one plate post weld heat treated a minimum of 15 Hrs @ 1150°F. +20°F.

Tensile Properties

Specimen Type .505" As Welded Heat Treated

UTS (Psi) 78,000 72,500

YLP (Psi) 66,500 61,000

Elongation(2") 26% 34%

Red of Area 73.6% 72.1%

Impact Properties (Charpy V Notch)

Test Temp -20°F.

Ft. Lbs 25,99,44,56,84 177,113,118,119,123

Lateral Exp. 16,83,40,49,69 84,92,86,85,93

% Shear 20,70,30,30,70 70,100,70,80,70

Other Tests

Concentricity 4%

Moisture @ 1800°F. 0.15%



JAN 9 1982

This is to certify that the original copy of this report has been properly signed and notarized.

The undersigned certifies that this report is correct and that no significant change has been made in any of the elements described in the qualification approval.

CHEMETRON CORPORATION

ARC PRODUCTS DIVISION

BY

D. J. Walker

State of Penna.)
County of York) SS

Subscribed and sworn to before me

this 10th day of Jan. 19 72

SEAL

Notary Public

My commission expires

5/8/72

CHEMETRON CORPORATION

ARC PRODUCTS DIVISION

CORRECTED

Certificate of Analysis

Post Wldg Supply
P.O. Box 10763
Birmingham, Ala.

Customer Order No. 31035
CB & I P.O. #102601 0-106 30 - *Nuclear*

Order No. 66945

Shipped 12/13/71

This material conforms to Specification
Test No. 448

ASME SFA 5.1 Sec. III Nuclear WMS-401
Rev. 1

X-Ray Satisfactory Type E7018

Testing: The electrodes were tested in accordance with the Requirements of NB 2400 of Section III of the ASME Code and the applicable requirements of SFA 5.1. One plate tested in the "as welded" condition and one plate post weld heat treated a minimum of 15 Hrs @ 1150°F. + -20°F.

Trade Name: Atom Arc 7018

Diameter Size: 7/32
35,000 Lbs.

Lot Numbers: K112J1A

Heat Numbers: 09M814

Control#: K012

Carbon .06

Manganese 1.24

Chromium .04

Nickel .03

Silicon .52

Columbium

Tantalum

Molybdenum .01

Tungsten

Copper

Titanium

Phosphorus .018

Sulphur .021

Vanadium .01

Iron

Ferrite

Tensile Properties

Specimen Type	.505"	As Welded	Heat Treated
UTS (Psi)	78,500	71,500	
YLP (Psi)	69,500	62,500	
Elongation (2")	30%	34%	
Red of Area	75.1%	76.7%	

Impact Properties (Charpy V Notch)

Test Temp -20°F.

Ft. Lbs	75, 112, 88, 94, 103	107, 129, 109, 110, 111
Lateral Exp	62, 85, 68, 76, 88	88, 82, 86, 88, 100
% Shear	50, 85, 65, 60, 80	70, 70, 75, 60, 80

Other Tests

Concentricity 4%

Moisture @ 1800°F. 0.17%



JAN 9 1982

State of Penna.)
County of York) SS

Subscribed and sworn to before me

this 10th day of Jan. 19 72

SEAL

Notary Public

My commission expires 5/8/72

This is to certify that the original copy of this report has been properly signed and notarized.

The undersigned certifies that this report is correct and that no significant change has been made in any of the elements described in the qualification approval.

CHEMETRON CORPORATION

ARC PRODUCTS DIVISION

BY *[Signature]*
F.D. J. Walker

CHEMETRON CORPORATION

ARC PRODUCTS DIVISION

CORRECTED

Certificate of Analysis

Post Wldg Supply
P.O. Box 10763,
Birmingham, Ala.

Customer Order No. 31035
CB & I P.O. BH02601 0406 30 - *Nuclear*
Order No. 66945

Shipped 12/13/71

This material conforms to Specification ASME SFA 5.1 Sec. III Nuclear WMS-401
Test No. 439 Rev. 1
X-Ray Satisfactory Type E7018

Trade Name: Atom Arc 7018

Diameter Size: 1/8
53,850 Lbs.

Lot Number: K109H1A

Heat Number: 412E4281

Control# K009

Carbon .04

Manganese 1.06

Chromium .05

Nickel .03

Silicon .50

Columbium

Tantalum

Molybdenum .01

Tungsten

Copper

Titanium

Phosphorus .016

Sulphur .021

Vanadium .01

Iron

Ferrite



JAN 9 1982

Testing: The electrodes were tested in accordance with the requirements of NB 2400 of Section III of the ASME Code and the applicable requirements of SFA 5.1. One plate tested in the "as welded" condition and one plate post weld heat treated a minimum of 15 Hrs @ 1150° F. + -20° F.

Tensile Properties

Specimen Type .505" As Welded Heat Treated

UTS (Psi) 84,100 76,800

YLP (Psi) 72,900 64,100

Elongation (2") 30% 31%

Red of Area 77.4% 79.4%

Impact Properties (Charpy V Notch)

Test Temp -20° F.

Ft. Lbs 27,88,36,68,80 94,101,111,118,119

Lateral Exp. 29,67,34,57,65 72,81,83,84,81

% Shear 25,70,30,40,50 70,80,60,70,60

Other Tests

Concentricity 4%

Moisture @ 1800° F. 0.17%

State of Penna. 1 SS
County of York 1

Subscribed and sworn to before me
this 10th day of Jan. 1972

SEAT

Comm. M. L. Comer
Notary Public

My commission expires: 5/8/72

This is to certify that the original copy of this report has been properly signed and notarized.

The undersigned certifies that this report is correct and that no significant change has been made in any of the elements described in the qualification approval.

CHEMETRON CORPORATION
ARC PRODUCTS DIVISION

BY

D. J. Walker

CHEMETRON CORPORATION

WELDING PRODUCTS DIVISION

Certificate of Analysis

Chicago Bridge & Iron Co. 6/17/72
Order No. B50246-0406-30-NuclePost Welding Supply
1300 7th Avenue No
Birmingham, Alabama

Customer Order No. 62465-0

Order No. 60580

Shipped 6/13/72

This material conforms to Specification
Test No. 779

* WMS-401 Rev. 1 and QAS-311 Rev.

Type E 7018

Trade Name: ATOM ARC 7018

*These electrodes meets the requirements of
PAR N511.3 of ASME Section III Nuclear CoDiameter Size: 5/32
58,800 lb.Testing: The electrodes were tested in
accordance with the requirements of NB-24
of Section III of the ASME Code and the
applicable requirements of SFA 5.1. One
plate tested in the "as welded condition"
and one plate post weld heat treated a
minimum of 15 hours @ 1150° F ± 20° F.Lot Number: E210H1A
Heat Number: 624255
Code No.: EEE010Tensile Properties:
Specimen type .503"Carbon .033
Manganese .90
Chromium .02
Nickel .01
Silicon .37

	AS Welded	Heat Treated
UTS (psi)	72,500	70,500
YLP (psi)	67,500	60,500
Elongation (2")	32%	32%
Red. of Area	78.9%	79.6%

Columbium
Tantalum
Molybdenum .01
Tungsten
Copper
Titanium
Phosphorus .010
Sulphur .018
Vanadium .01

JAN 9 1982

Impact Properties (Charpy V Notch)
Testing Temp. -20° F

	AS Welded	Heat Treated
Ft. Lbs.	76-115-128-163-167	14-22-26-2
Latual Exp.	48-61-96-76-82	19-26-40-4
% Shear	40-70-80-90-90	25-30-30-3

State of Penna.
County of York

SS

Concentricity 4% Moisture @ 1800° F 0.1

Subscribed and sworn to before me
this 16th day of June

19 72

The undersigned certifies that this report is
correct and that no significant change has
been made in any of the elements described
in the qualification approval.CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

My commission expires: 4/12/76

BY

J. L. Starnes

CHEMETRON CORPORATION

WELDING PRODUCTS DIVISION

CERTIFICATE OF ANALYSIS

Chicago Bridge & Iron Co.

#3 Order No. B62590-0406-30 Nuclear

Customer Order No. 45243

Post Welding Supply
1300 7th Ave No.
PO Box 10763
Birmingham, Ala.
35202

Order No. 65244

Shipped

This material conforms to Specification
WMS 401 REV. 4 &
QAS 311 REV. 6

Type E 7018

Trade Name or Trademark: Atom Arc 7018

Test No. 896
X-Ray Satisfactory

Concentricity 3%
Moisture @ 1800° F. 0.2%

Diameter Size: 3/16"
45,000 lb.
Lot Number: F502N1AF
Heat Number: 07L150

Control No. FFF013

Test
Results:

AS
Welded

Stress
Relieved
15 hrs. @ 1150° F.

Yield 67,000
Tensile 78,000
Elongation 31.0%
Red. of Area 74.6%

63,000
73,000
33.0%
77.3%

Carbon .05
Manganese 1.15
Chromium .04
Nickel .03
Silicon .36
Columbium +
Tantalum
Molybdenum .05
Tungsten .08
Copper .08
Titanium
Phosphorus .012
Sulphur .018
Vanadium .02

Charpy V-Notch Impacts Tested @ -20° F.

Impacts 35-43-53-92-93 20-97-101-110-122
Lat. Exp. 34-38-45-46-71 22-76-83-87-91
% Shear 30-40-40-50-55 40-75-75-70-80

This electrode meets the requirements of Chicago
Bridge & Iron Welding Specification WMS 401 REV.
4 & QAS 311 REV. 6 and ASME SFA5.1.



JAN 9 1982

WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY

WE HEREBY CERTIFY THAT
THIS IS A TRUE COPY

State of Penna.
County of York

1 SS
1

Signed DW Date 9-26-75

The undersigned certifies that this report is
correct and that no significant change has
been made in any of the elements described
in the qualification approval.

Subscribed and sworn to before me
this 15th day of July

19 75

SEAL

Notary Public

My commission expires: 8-21-78

BY

R.W. Boyer
R. W. Boyer

61
BBS

CHEMETRON CORPORATION

WELDING PRODUCTS DIVISION

CERTIFICATE OF ANALYSIS

#3

Chicago Bridge & Iron Co.

P. O. B62590-0406-30 Nuclear

Customer Order No. 45243

65244

Order No.

Shipped

This material conforms to Specification

WMS 401 REV. 4 &

QAS 311 REV. 6

E 7018

Type

Trade Name
or Trademark:

Atom Arc 7018

Diameter Size:

3/16"

25,000 lb.

Lot Number:

F502N1AF

Heat Number:

07L150

Control No. FFF014

Carbon .04

Manganese 1.06

Chromium .04

Nickel .03

Silicon .31

Columbium +
Tantalum

Molybdenum .05

Tungsten

Copper .07

Titanium

Phosphorus .012

Sulphur .016

Vanadium .02

Test No. 897

X-Ray Satisfactory

Test

Results:

AS

Welded

Stress

Relieved

15 hrs. @ 1150° F.

Yield

67,000

61,500

Tensile

77,500

72,500

Elongation

30.0%

32.0%

Red. of Area

75.2%

77.7%

Charpy V-Notch Impacts Tested @ -20° F.

Impacts

53-87-100-114-124

19-110-116-122-185

Lat. Exp.

46-67-74-85-81

23-89-80-89-72

% Shear

20-70-50-80-80

25-70-70-70-100

This electrode meets the requirements of Chicago Bridge & Iron Welding Specification WMS 401 REV. 4 & QAS 311 REV. 6 and ASME SFA5.1.



of Penna.
of York

SS

JAN 9 1982

cribed and sworn to before me
15th day of July

19 75

The undersigned certifies that this report is correct and that no significant change has been made in any of the elements described in the qualification approval.

CHEMETRON CORPORATION
WELDING PRODUCTS DIVISION

Amelia E. Almon
Notary Public

mission expires:

8-21-78

BY

R. W. Boyer
R. W. Boyer

1 9 7 0 0 7 0 0