

# ILLINOIS POWER

500 SOUTH 27TH STREET, P.O. BOX 511, DECATUR, ILLINOIS 62525-1805

U-601789

L30-91(04-12 )-LP

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JSP-0255-91

April 12, 1991

Docket No. 50-461

Document Control Desk  
Nuclear Regulatory Commission  
Washington, D.C. 20555

Subject: Clinton Power Station  
Resolution of Open Items Concerning Generic  
Letter 88-01

Dear Sir:

By letter dated August 24, 1990 (from J. B. Hickman to F. A. Spangenberg) the NRC Staff provided its assessment of Illinois Power Company's (IP's) response to Generic Letter (GL) 88-01, "NRC Position on IGSCC [Intergranular Stress Corrosion Cracking] in BWR Austenitic Stainless Steel Piping." The letter identified two letters submitted by IP (dated July 29, 1988 and September 21, 1989) which together constituted IP's response to GL 88-01. (The later letter was provided in response to a request from the Staff for additional information, and it described proposed changes to the Clinton Technical Specifications which were formally submitted later in a separate submittal.)

As discussed in the Staff's assessment, IP's response to GL 88-01 was found to be acceptable with two exceptions. These exceptions concerned (1) IP's classification of 50 welds as Category A based on the information presented in IP's second submittal, and (2) IP's position with respect to monitoring leakage in accordance with the Technical Specification changes described in IP's second submittal. IP is now submitting this letter to provide additional information to facilitate NRC closure of these two concerns.

Each of the two above-noted exceptions or concerns is specifically addressed in Attachment 1 to this letter. Also provided as attachments to this letter are a list of the 50 welds in question (Attachment 2) and copies of the Certified Material Test Reports applicable to these welds (Attachment 3). IP believes that, based on the information provided in these attachments, the first concern may be considered closed. With respect to the second concern, IP will submit a supplement to the Technical Specification changes previously proposed in

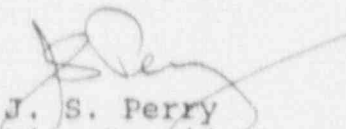
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response to GL 88-01. As discussed in further detail in Attachment 1, this supplement will be submitted to the NRC by June 1991.

In summary, with the information provided in this letter and its attachments, and upon submittal of the noted supplemental Technical Specification changes, IP's response to GL 88-01 may be considered complete for CPS.

Sincerely yours,



J. S. Perry  
Vice President

TBE/alh

Attachments

cc: NRC Clinton Licensing Project Manager  
NRC Resident Office  
NRC Region III, Regional Administrator  
Illinois Department of Nuclear Safety

Resolution of the Two Items Identified  
as Unacceptable in IP's Response to GL 88-01

In the review of IP's response to GL 88-01, the NRC Staff determined that the response was acceptable with the exception of two items. Each of these two items is addressed in detail following the list of references provided below.

- References:
- 1) NRC Letter from John B. Hickman to Frank A. Spangenberg dated August 24, 1990
  - 2) IP Letter from D. P. Hall to US NRC, U-601533, dated September 21, 1989
  - 3) IP Letter from D. P. Hall to US NRC, U-601217, dated July 29, 1988
  - 4) IP Letter from J. S. Perry to US NRC, U-601703, dated July 11, 1990

Item No. 1: Classification of 50 Category A Welds

In the letter identified as Reference 1 above, the Staff indicated that they disagreed with IP's classification of 50 welds (which IP identified as "Category A") that apparently contain non-resistant materials and for which no mitigating treatment was applied. The Staff stated that IP "should reclassify the 50 category A welds that contain non-resistant materials and have not been mitigated and modify the inspection plan accordingly."

IP Response

The 50 welds in question were identified from the letter identified as Reference 2 above. In that letter a table was provided (Table 2, "History of Welds and Prior Mitigating Actions/Treatments") which listed all applicable welds and identified for each weld number, the weld type, a description of its configuration, its IGSCC Category, a description of the weld and base material, and the treatment (if any) that was applied to that weld. A list of the 50 questionable welds has been extracted from Table 2 of that letter and is provided in Attachment 2 to this letter. Information similar to what was previously provided in Table 2 is also provided in Attachment 2 for each weld listed except that the information provided also includes the carbon content and ferrite level within the associated base/weld material (as applicable) as well as the associated Heat/Lot numbers for the base/weld material as identified in the associated Certified Material Test Reports (CMTRs). Accordingly, and in response to a previous telephone discussion with the NRC, copies of the CMTRS applicable to these welds are provided in Attachment 3 to this letter. (Attachment 3 consists of four sections each containing the CMTRS applicable to a particular group of welds as described below.)

The 50 welds in question may be addressed in four (4) different groups. Each group is addressed below. In most cases amplifying discussion is included which, based on the information provided in Attachments 2 and 3, provides justification for IP's classification of the applicable welds as "Category A."

Group 1 - There are 42 welds in this group. The weld numbers for these welds are identified as follows:

1-RR-AA-1	1-RR-AC-3	1-RR-BF-1	1-RR-BH-3
1-RR-AA-2	1-RR-AC-4	1-RR-BF-2	1-RR-BH-4
1-RR-AA-3	1-RR-AD-1	1-RR-BF-3	1-RR-BJ-1
1-RR-AA-4	1-RR-AD-2	1-RR-BF-4	1-RR-BJ-2
1-RR-AB-1	1-RR-AD-3	1-RR-BG-1	1-RR-BJ-3
1-RR-AB-2	1-RR-AD-4	1-RR-BG-2	1-RR-BJ-4
1-RR-AB-3	1-RR-AE-1	1-RR-BG-3	1-RR-BK-1
1-RR-AB-4	1-RR-AE-2	1-RR-BG-4	1-RR-BK-2
1-RR-AC-1	1-RR-AE-3	1-RR-BH-1	1-RR-BK-3
1-RR-AC-2	1-RR-AE-4	1-RR-BH-2	1-RR-BK-4
			1-RH-20-4-2
			1-RH-20-4-3

The weld metal utilized for each weld identified above was either 308L or 316L, which is resistant to IGSCC. [Note: See Section 1 of Attachment 3 for the associated CMTR(s).] The base material for the upstream and downstream sides of each of the above welds was either TP316 or TP316L. TP316L is also a resistant material. The carbon content of the TP316 material utilized was 0.020 percent or less. Per NUREG 0313 Rev. 2, this material is also IGSCC - resistant. Since the upstream, downstream and weld materials are resistant to IGSCC, these welds were categorized as Category A welds.

Group 2 - There are two welds in this group. The weld numbers for these welds are as follows:

1-RR-A-1

1-RR-B-1

These are safe-end to pipe welds. The pipe-side (upstream) base material is TP316 with a carbon content of 0.020 percent, which is resistant material (per NUREG 0313 Rev. 2). [Note: See Section 2 of Attachment 3 for the associated CMTR(s).] The safe-end side (downstream) base material is SA 336 CF8 Type 304L with a carbon content of 0.025 percent. This also is resistant material. The weld material for both welds is 308L which is resistant to IGSCC. Since the upstream, downstream and weld materials are resistant to IGSCC, these welds were categorized as Category A welds.

Group 3 - There are three welds in this group. The weld numbers for these welds are as follows:

1-RH-20-7 (reducing tee to pipe)  
1-RT-36-7 (sweepolet to pipe)  
1-RT-36-1A (sweepolet to pipe)

The ends of the reducing tee and both sweepolets (all upstream) were clad (with corrosion resistant cladding) and then solution-heat treated prior to installation in the field. Therefore, the upstream side base material is resistant material. The base material on the downstream side of weld 1-RH-20-7 is TP316 with a carbon content of 0.013 percent, which is resistant material (per NUREG 0313 Rev. 2). [Note: See Section 3 of Attachment 3 for the associated CMTR(s).] The base material for the downstream side of welds 1-RT-36-7 and 1-RT-36-1A is TP316L which also is a resistant material. The weld material utilized for all three of these welds is 316L which is resistant material. Since the upstream, downstream and weld materials are resistant to IGSCC, these welds were categorized as Category A welds.

Group 4 - Weld numbers for the three welds comprising Group 4 are identified as follows:

1RH-20-6                      1-RT-36-6A                      1-RT-36-1C

The upstream side of weld 1-RH-20-6 is TP316 with a carbon content of 0.013 percent, which is resistant material (per NUREG 0313 Rev. 2). [Note: See Section 4 of Attachment 3 for the associated CMTR(s).] The upstream side of welds 1-RT-36-6A and 1-RT-36-1C is TP316L which is resistant material. The downstream side of all of these three welds is carbon steel (either SA106 or SA216) which is not susceptible to IGSCC. The weld metal utilized for all three of these welds, however, is type 309 with a carbon content from 0.045 percent to 0.08 percent and ferrite deposited from 9.0 to 13 percent.

Welds of this type (involving dissimilar materials) were not specifically addressed in GL 88-01 or in NUREG 0313. Initially, IP considered the above welds to be IGSCC-resistant. However, in response to NRC comments, IP has reconsidered its original classification. Further research would be required to positively confirm whether the appropriate classification is Category A or D, but at this time, IP has reclassified these welds as Category D, and the welds have been inspected accordingly. If further research provides justification for relief from this classification or the inspection schedule, IP will submit a request and justification for such relief in the future.

In summary, with respect to all 50 Category A welds in question, IP believes that 47 of them (Groups 1, 2, and 3) can continue to be classified as Category A. The issue regarding IP's classification of these 47 welds appears to be primarily due to a

miscommunication of specific information (i.e., carbon content) needed to clearly confirm that the materials associated with these welds are IGSCC resistant. With the submittal of the information provided in this attachment and in Attachments 2 and 3, IP believes that sufficient information has been provided to support confirmation of the Category A classification. With respect to the remaining three welds (Group 4), IP has reclassified the welds in response to the NRC Staff's concern. Therefore, IP believes that the issue regarding the classification of welds has been resolved and this item may be considered closed.

Item No. 2:      Technical Specification Change Regarding Frequency  
for Monitoring Unidentified Leakage

In Reference 1, the Staff indicated that IP's position regarding the frequency at which leakage monitoring would be performed according to the Technical Specification changes described by IP is unacceptable. The Staff has therefore requested IP to submit a Technical Specification change that would require monitoring unidentified leakage at an acceptable frequency. Although GL 88-01 prescribed a frequency of at least once per four hours, the Staff has indicated that a frequency of at least once per eight hours is acceptable.

IP Response

By letter dated July 11, 1990 (identified previously as Reference 4) IP applied for amendment of the CPS Operating License to incorporate Technical Specification changes in response to GL 88-01. In order to incorporate a requirement to monitor unidentified leakage at a frequency of at least once per 8 hours, a supplementary submittal will be required to modify the July 11, 1990 submittal. As IP is aware that the staff has not yet completed its review of the July 11, 1990 submittal, IP will submit the required supplement by June 1991.

TABLE 1

WELD NUMBER	CONFIGURATION	IGSCC CATEGORY	BASE MATERIAL			WELD MATERIAL					TREATMENT	
			MATERIAL	HEAT NUMBER	CARBON CONTENTS	MATERIAL	HEAT NUMBER/ LOT NUMBER	CARBON CONTENTS	FERRITE AS DEPOSITED			
GROUP 1 - See Section 1 of Attachment 3 for CMTRs												
1-RR-AA-1	Pipe to Pipe	A	SS TP 316/ SS TP 316	69118-3B/ 69118-3B	0.020/ 0.020	308L	---	---	---	None		
1-RR-AA-2	Pipe to Elbow	A	SS TP 316/ SS WP 316-W	69118-3B/ 27130	0.020/ 0.014	308L	---	---	---	None		
1-RR-AA-3	Elbow to Pipe	A	SS WP 316-W/ SS TP 316	27130/ 69118-3B	0.014/ 0.020	308L	---	---	---	None		
1-RR-AA-4	Pipe to safe-end extension	A	SS TP 316/ SS TP 316L	69118-3B/ ---	0.020/ ---	308L	---	---	---	None		
1-RR-AB-1	Pipe to Pipe	A	SS TP 316/ SS TP 316	69118-3B/ 69118-3B	0.020/ 0.020	308L	---	---	---	None		
1-RR-AB-2	Pipe to Elbow	A	SS TP 316/ SS WP 316-W	69118-3B/ 27130	0.020/ 0.014	308L	---	---	---	None		
1-RR-AB-3	Elbow to Pipe	A	SS WP 316-W/ SS TP 316	27130/ 69118-3B	0.014/ 0.020	308L	---	---	---	None		
1-RR-AB-4	Pipe to safe-end extension	A	SS TP 316/ SS TP 316L	69118-3B/ ---	0.020/ ---	308L	---	---	---	None		
1-RR-AC-1	Pipe to Pipe	A	SS TP 316/ SS TP 316	69118-3B/ 69114-1B	0.020/ 0.020	308L	---	---	---	None		
1-RR-AC-2	Pipe to Elbow	A	SS TP 316/ SS WP 316-W	69114-1B/ 27130	0.020/ 0.014	308L	---	---	---	None		
1-RR-AC-3	Elbow to Pipe	A	SS WP 316-W/ SS TP 316	27130/ 69114-1B	0.014/ 0.020	308L	---	---	---	None		

TABLE 1

WELD NUMBER	CONFIGURATION	IGSCC CATEGORY	BASE MATERIAL			WELD MATERIAL					TREATMENT
			MATERIAL	HEAT NUMBER	CARBON CONTENTS	MATERIAL	HEAT NUMBER/ LOT NUMBER	CARBON CONTENTS	FERRITE AS DEPOSITED		
GROUP 1 - See Section 1 of Attachment 3 for CMTRs											
1-RR-AC-4	Pipe to safe-end extension	A	SS TP 316/ SS TP 316L	69114-1B/ ---	0.020/ ---	308L	---	---	---	None	
1-RR-AD-1	Pipe to Pipe	A	SS TP 316/ SS TP 316	69118-3B/ 69114-1B	0.020/ 0.020	308L	---	---	---	None	
1-RR-AD-2	Pipe to Elbow	A	SS TP 316/ SS WP 316-W	69114-1B/ 27130	0.020/ 0.014	308L	---	---	---	None	
1-RR-AD-3	Elbow to Pipe	A	SS WP 316-W/ SS TP 316	27130/ 69114-1B	0.014/ 0.020	308L	---	---	---	None	
1-RR-AD-4	Pipe to safe-end extension	A	SS TP 316/ SS TP 316L	69114-1B/ ---	0.020/ ---	308L	---	---	---	None	
1-RR-AE-1	Pipe to Pipe	A	SS TP 316/ SS TP 316	69118-3B/ 69118-3B	0.020/ 0.020	308L	---	---	---	None	
1-RR-AE-2	Pipe to Elbow	A	SS TP 316/ SS WP 316-W	69118-3B/ 27130	0.020/ 0.014	308L	---	---	---	None	
1-RR-AE-3	Elbow to Pipe	A	SS WP 316-W/ SS TP 316	27130/ 69118-3B	0.014/ 0.020	308L	---	---	---	None	
1-RR-AE-4	Pipe to safe-end extension	A	SS TP 316/ SS TP 316L	69118-3B/ ---	0.020/ ---	308L	---	---	---	None	
1-RR-BF-1	Pipe to Pipe	A	SS TP 316/ SS TP 316	69114-1B/ 69118-3B	0.020/ 0.020	308L	---	---	---	None	
1-RR-BF-2	Pipe to Elbow	A	SS TP 316/ SS WP 316-W	69118-3B/ 27130	0.020/ 0.014	308L	---	---	---	None	

TABLE 1

WELD NUMBER	CONFIGURATION	IGSCC CATEGORY	BASE MATERIAL			WELD MATERIAL					TREATMENT
			MATERIAL	HEAT NUMBER	CARBON CONTENTS	MATERIAL	HEAT NUMBER/ LOT NUMBER	CARBON CONTENTS	FERRITE AS DEPOSITED		
GROUP 1 - See Section 1 of Attachment 3 for CMTRs											
1-RR-BF-3	Elbow to Pipe	A	SS WP 316-W/ SS TP 316	27130/ 69118-3B	0.014/ 0.020	308L	---	---	---	None	
1-RR-BF-4	Pipe to safe-end extension	A	SS TP 316/ SS TP 316L	69118-3B/ ---	0.020/ ---	308L	---	---	---	None	
1-RR-2G-1	Pipe to Pipe	A	SS TP 316/ SS TP 316	69114-1B/ 69114-1B	0.020/ 0.020	308L	---	---	---	None	
1-RR-BG-2	Pipe to Elbow	A	SS TP 316/ SS WP 316-W	69114-1B/ 27130	0.020/ 0.014	308L	---	---	---	None	
1-RR-BG-3	Elbow to Pipe	A	SS WP 316-W/ SS TP 316	27130/ 69114-1B	0.014/ 0.020	308L	---	---	---	None	
1-RR-BG-4	Pipe to safe-end extension	A	SS TP 316/ SS TP 316L	69114-1B/ ---	0.020/ ---	308L	---	---	---	None	
1-RR-BH-1	Pipe to Pipe	A	SS TP 316/ SS TP 316	69114-1B/ 69114-1B	0.020/ 0.020	308L	---	---	---	None	
1-RR-BH-2	Pipe to Elbow	A	SS TP 316/ SS WP 316-W	69114-1B/ 27130	0.020/ 0.014	308L	---	---	---	None	
1-RR-BH-3	Elbow to Pipe	A	SS WP 316-W/ SS TP 316	27130/ 69114-1B	0.014/ 0.020	308L	---	---	---	None	
1-RR-BH-4	Pipe to safe-end extension	A	SS TP 316/ SS TP 316L	69114-1B/ ---	0.020/ ---	308L	---	---	---	None	
1-RR-BJ-1	Pipe to Pipe	A	SS TP 316/ SS TP 316	69114-1B/ 27130	0.020/ 0.020	308L	---	---	---	None	

TABLE 1

WELD NUMBER	CONFIGURATION	IGSCC CATEGORY	BASE MATERIAL			WELD MATERIAL					TREATMENT
			MATERIAL	HEAT NUMBER	CARBON CONTENTS	MATERIAL	HEAT NUMBER/ LOT NUMBER	CARBON CONTENTS	FERRITE AS DEPOSITED		
GROUP 1 - See Section 1 of Attachment 3 for CMTRs											
1-RR-BJ-2	Pipe to Elbow	A	SS TP 316/ SS WP 316-W	27130/ 27130	0.020/ 0.014	308L	---	---	---	None	
1-RR-BJ-3	Elbow to Pipe	A	SS WP 316-W/ SS TP 316	27130/ 27130	0.014/ 0.020	308L	---	---	---	None	
1-RR-BJ-4	Pipe to safe-end extension	A	SS TP 316/ SS TP 316L	27130/ ---	0.020/ ---	308L	---	---	---	None	
1-RR-BK-1	Pipe to Pipe	A	SS TP 316/ SS TP 316	69114-18/ 27130	0.020/ 0.020	308L	---	---	---	None	
1-RR-BK-2	Pipe to Elbow	A	SS TP 316/ SS WP 316-W	27130/ 27130	0.020/ 0.014	308L	---	---	---	None	
1-RR-BK-3	Elbow to Pipe	A	SS WP 316-W/ SS TP 316	27130/ 27130	0.014/ 0.020	308L	---	---	---	None	
1-RR-BK-4	Pipe to safe-end extension	A	SS TP 316/ SS TP 316L	27130/ ---	0.020/ ---	308L	---	---	---	None	
1-RH-20-4-2	Pipe to Elbow	A	SS TP 316/ SS WP 316L	P00484/ MCJL	0.013/ ---	316L	---	---	---	None	
1-RH-20-4-3	Elbow to Pipe	A	SS WP 316L/ SS TP 316	MCJL/ P00484	---/ 0.013	316L	---	---	---	None	

TABLE 1

WELD NUMBER	CONFIGURATION	IGSCC CATEGORY	BASE MATERIAL			WELD MATERIAL				TREATMENT
			MATERIAL	HEAT NUMBER	CARBON CONTENTS	MATERIAL	HEAT LOT NUMBER	CARBON CONTENTS	FERRITE AS DEPOSITED	
GROUP 2 - See Section 2 of Attachment 3 for CMTRs										
1-RR-A-1	Safe-end to Pipe	A	SA 336 CF8/ SS TP 316	623152/ 69133-2A	0.025/ 0.020	308L	---	---	---	None
1-RR-B-1	Safe-end to Pipe	A	SA 336 CF8/ SS TP 316	623152/ 69133-2A	0.025/ 0.020	308L	---	---	---	None

TABLE 1

WELD NUMBER	CONFIGURATION	IGSCC CATEGORY	BASE MATERIAL			WELD MATERIAL				TREATMENT
			MATERIAL	HEAT NUMBER	CARBON CONTENTS	MATERIAL	HEAT NUMBER/ LOT NUMBER	CARBON CONTENTS	FERRITE AS DEPOSITED	
GROUP 3 - See Section 3 of Attachment 3 for CMTRs										
1-2H-20-7	Reducing Tee to Pipe	A	SS WP 304-W/ SS TP 316	---/ P00484	---/ 0.013	316L	---	---	---	Corrosion resistant cladding at the end of reducing tee.
1-RT-36-7	Sweepolet to Pipe	A	SS WP 304/ SS TP 316L	---/ ---	---/ ---	316L	---	---	---	Corrosion resistant cladding at the end of sweepolet.
1-RT-36-1A	Sweepolet to Pipe	A	SS WP 304/ SS TP 316L	---/ ---	---/ ---	316L	---	---	---	Corrosion resistant cladding at the end of sweepolet.

TABLE 1

WELD NUMBER	CONFIGURATION	1GSCC CATEGORY	BASE MATERIAL			WELD MATERIAL			TREATMENT
			MATERIAL	HEAT NUMBER	CARBON CONTENTS	MATERIAL	HEAT NUMBER/ LOT NUMBER	CARBON CONTENTS	
GROUP 4 - See Section 4 of Attachment 3 for CMIRs									
1-RH-20-6	Pipe to Valve	D	SS TP 316/ SA 216-MCB	P00484/ ---	0.013/ ---	309	Ht. # 18167C	0.08	Delong 10.5 FN None
							Ht. # 18167C	0.08	Delong 10.5 FN
							Ht. # 18167C	0.08	Magna Gage 9 FN
							Ht. # 18167C	0.08	Magna Gage 9.0 FN
							Ht. # 03313T	0.066	13 FN
							Lot # 500511	0.045	10 FN, Percent-9% Magna Gage 8 FN
							Lot # 2129089	0.076	Magna Gage 9.8 FN (9.02) Delong 11.2 FN (10.13)
1-RT-36-6A	Pipe to Pipe	D	SS TP 316L/ CS SA 106	---/ ---	---/ ---	309	Ht. # 18167C	0.08	Delong 10.5 FN None
							Ht. # 18167C	0.08	Delong 10.5 FN
							Ht. # 18167C	0.08	Magna Gage 9 FN

WELD NUMBER	CONFIGURATION	IGSCC CATEGORY	BASE MATERIAL			WELD MATERIAL					TREATMENT
			MATERIAL	HEAT NUMBER	CARBON CONTENTS	MATERIAL	HEAT NUMBER/ LOT NUMBER	CARBON CONTENTS	FERRITE AS DEPOSITED		
GROUP 4 - See Section 4 of Attachment 3 for CMTR											
1-RT-36-6A (cont'd.)							Ht. # 18167C	0.08	Magna Gage 9.0 FN		
							Ht. # 03313T	0.066	13 FN		
1-RT-36-1C	Pipe to Pipe	D	SS TP 316L/ CS SA 106	---/ ---	---/ ---	309	Ht. # 18167C	0.08	Delong 10.5 FN	None	
							Ht. # 18167C	0.08	Delong 10.5 FN		
							Ht. # 18167C	0.08	Magna Gage 9.0 FN		
							Ht. # 18167C	0.08	Magna Gage 9.0 FN		
							Ht. # 03313T	0.066	13 FN		

This attachment (Attachment 3 to U-601789) consists of four (4) sections:

- Section 1 (4 pages) contains the Certified Material Test Reports (CMTRs) applicable to the Group 1 welds addressed in Attachment 1 (and listed in Attachment 2).
- Section 2 (2 pages) contains the CMTRs applicable to the Group 2 welds addressed in Attachment 1 (and listed in Attachment 2).
- Section 3 (1 page) contains the CMTRs applicable to the Group 3 welds addressed in Attachment 1 (and listed in Attachment 2).
- Section 4 (8 pages) contains the CMTRs applicable to the Group 4 welds addressed in Attachment 1 (and listed in Attachment 2).

Attachment 3 to  
U-601789  
Section 1

CERTIFIED MATERIAL TEST REPORTS FOR GROUP 1 WELDS

JOHNSON  
CONTROLS

Power & Process Piping  
Division

# ASSOCIATED PIPING & ENGINEERING CORP.

1707 WEST COMPTON BLVD., COMPTON, CA 90220 (213) 537-1200

Customer Associated Piping & Engr. Corp.

Customer Order No:

A.P. & E. Order No: E-20152-A

(For use on A.P. & E. Job # 20142-81)

(General Electric Co. - Clinton)

AP-E MATERIAL  
TRACEABILITY

20152-A ITEM  
EA-611

CODE NO.

Q.C. APPROVAL

DATE

Specification No: SA 403 WP316-W

ASME Section III, Class 1, 1977 Ed.

S/77 Add.

Base Material: SA240 T316

Heat Treatment: SPFF-1001 Rev. 0 With Add. #1

Rev. 0, and Add. #2 Rev. 0.

Hardness: 77 Rockwell "B"

Furnace Heat Load #738

DESCRIPTION	A.P. & E. Code No.	MIR Heat No.	MECHANICAL PROPERTIES				CHEMICAL ANALYSIS							
			Yield Strength PSI	Tensile Strength PSI	Elong in 2 %	Red. of Area %	C	Mn	P	S	Si	Cr	Ni	Mo
5-10" X 0.485" M.W. 90° L/R Ell	EA-418	27130	45,100	84,100	54	75	.014	1.74	.026	.006	.64	16.55	11.25	2.10
									Nitrogen	.085				
S/N's	Ell No.													
J-8774	1													
J-8778	5													
J-8779	6													
J-8782	9													
J-8783	10													
			22,200	At 550°F - 0.2% Offset										
			Intergranular attack per G.E. E50YP11: Less than 0.0005".											
			Depth of attack both specimens per G.E. E50YP13: Less than 0.001"											
			Grain boundary ditching per G.E. E50YP20: Less than 2%.											

## Remarks:

- All elbows are capable of withstanding without leakage a test pressure equal to that prescribed in the specification for the pipe with which the fitting is to be used.
- Welding was performed in accordance with ASME Section IX, radiographically examined in accordance with SPPQ-401 Rev. 4 and found acceptable.
- Welds were liquid penetrant examined in accordance with SPPQ-201 Rev. 0 with Add. Rev. 0 and found acceptable.
- Elbows were manufactured in accordance with SPPN-L 806 Rev. 1 with Add. #1 Rev. 1
- Elbow ends for a length of 6 inches were examined in accordance with SP-53 Rev. 5, Straight beam, and found acceptable.
- Elbows were cleaned per requirements of SPFF-3004 Rev. 1 with Add. #1, Rev. 0.

This is to certify that material furnished on the above purchase order was fabricated tested, and inspected in accordance with the requirements specified in the above purchase order and applicable specification.

*J. J. Odano - Q.C. Engineer*

Quality Control

9/10/79

Date

ASME Certificate No: N-1298

Expiration Date: 1/5/82



SEP 28 1979

001

EA-611

11/22/79  
9-12-79  
AT

B33-5001

JOHNSON  
CONTROLS

Power & Process Piping  
Division

# ASSOCIATED PIPING & ENGINEERING CORP.

1707 WEST COMPTON BLVD., COMPTON, CA 90220 (213) 537-7200

Customer: Associated Piping & Engr. Corp.

Customer Order No:

A.P. & E. Order No: E-20152-A

(For use on A.P. & E. Job E-20142-A)

(General Electric Co. - Clinton)

AP&E MATERIAL  
TRACEABILITY

P.O. 20152-A ITEM  
EA-611

CODE NO.

Q.C. APPROVAL

DATE

Specification No: SA 403 WP316-W

ASME Section III, Class I, 1977 Ed.

S/77 Add.

Base Material: SA240 T316

Heat Treatment: SPPF-1001 Rev. 0 With Add. #1

Rev. 0, and Add. #2 Rev. 0.

Hardness: 77 Rockwell "B" ✓

Furnace Heat Load #735

DESCRIPTION	A.P. & E. Code No.	MIL Heat No.	MECHANICAL PROPERTIES				CHEMICAL ANALYSIS							
			Yield Strength PSI	Tensile Strength PSI	Elong in 2" %	Red. of Area %	C	Mn	P	S	Si	Cr	Ni	Mo
5-10" X 0.485" M.W. 90° L/R Ell S/N's Ell No.	EA-418	27130	45,100 ✓	84,100 ✓	54 ✓	75 ✓	.014 ✓	1.74 ✓	.026 ✓	.006 Nitrogen	.64/ .085 ✓	16.55 ✓	11.25 ✓	2.10 ✓
J-8775 2														
J-8776 3														
J-8777 4														
J-8780 7														
J-8781 8														
			23,200 ✓	At 550°F - 0.2% Offset										
			Intergranular attack per G.E. E50YP11:							Less than 0.0005"				
			Depth of attack both specimens per G.E. E50YP13:							Less than 0.001"				
			Grain boundary ditching per G.E. E50YP20:							Less than 2%				

## Remarks:

- All elbows are capable of withstanding without leakage a test pressure equal to that prescribed in the specification for the pipe with which the fitting is to be used.
- Welding was performed in accordance with ASME Section IX, radiographically examined in accordance with SPPQ-401 Rev. 4 and found acceptable.
- Welds were liquid penetrant examined in accordance with SPPQ-201 Rev. 0 with Add. Rev. 0 and found acceptable.
- Elbows were manufactured in accordance with SPPN-L 806 Rev. 1 with Add. #1 Rev. 1
- Elbow ends for a length of 6 inches were examined in accordance with SP-53 Rev. 5, Straight beam, and found acceptable.
- Elbows were cleaned per requirements of SPPF-3004 Rev. 1 with Add. #1, Rev. 0.

This is to certify that material furnished on the above purchase order was fabricated tested, and inspected in accordance with the requirements specified in the above purchase order and applicable specification.

*W. J. Adams, P.E. Engineer*  
Quality Control

9/4/79  
Date

ASME Certificate No: N-1298

Expiration Date: 1/5/82

002

WELDED  
9-12-79  
P.C.

SEP 28 1979

CRW

B33-6001

BUYER ORDER NO.  
51063

P.O. 51063 ITEM

CODE NO. EA695

DATE SHIPPED

9-14-79

MILL ORDER NO.  
HM9-6705

Q.C. APPROVAL

DATE 9/26/79

ASSOCIATED PIPING & ENGINEERING CO.  
1707 West Compton Blvd.  
Compton, Ca. 90220

PRODUCT DESCRIPTION:

1. T316 - As Welded  
Annealed & Pickled  
Water Quenched

APPLICABLE SPECIFICATIONS AND PROCEDURES  
ASME SA358, Class 1, Sec. III, C1 1, SA655 Class I, 1977  
Edition including all addenda thru Summer 1977; GE Spec  
B50YP166 Rev 2 W/Al, G & K; Plate UT to NB2530 & GOC UTP400  
Rev 3; X-ray per NB 2560 & QC 4 Rev 9; PT per NB2560 & QC7  
Rev 4; Weld Filler Metal ER316 to SFA 5.9; Welding to WP5  
Rev 1; AP&E SPPP-10004, Rev 1 & SE-A200-AP Rev 0.

ITEM	SIZE	QUANTITY	SERIAL NO.
1.	10.750" OD x .485" Min x C/L (Nowhere does the pipe fall below the stated minimum wall required)	4 pcs @ 21'2"	SN9-6705- (3P2, 3P3, 6P2, 6P3)

ITEM	HEAT NO.	Plate Heat Anal.	Plate Prod. Anal.	Weld Anal.	CHEMICAL ANALYSIS										
					C	Mn	P	S	Si	Cr	Ni	Mo	N <sub>2</sub>	Ti	Cb
1.	27130 EACIS	X	X	X	.014	1.74	.026	.006	.64	16.55	11.25	2.10	.085		
					.020	1.89	.016	.009	.56	18.09	11.31	2.32	.064		
										16.76	11.54	2.35	.038		
Weld Wire - ER316, Ht. 21296 W/Lincoln (ST100), Lot 58S - Delta Ferride 9.3															

MECHANICAL TESTS

ITEM	HEAT NO.	Plate	Pipe	TENSILE PSI	YIELD PSI	ELONG. IN 2	HARD	GUIDED BENDS			FLAT
								FACE	ROOT	SIDE	
1.	27130	X		83,500	40,700	60	BHN163	OK	OK		
	(Rm. T.)	X		84,600	53,500	41	RB86			OK	
	(ET @ 550°F)	X		65,200	34,800	33	RB86			OK	

CERTIFICATION/REMARKS:

Certificate of Authorization N-1717  
Expiration date 4-29-80

3P - IGA - .00110"

1% Ditching; ASTM Grain Size- 6

Carbide Precip.: Control - .00220"

Exposed - .00175"

EXAMINATIONS

ITEM	RADIOGRAPHY	LIQUID PENT.	ULTRASONIC	HYDRO PSI
	100% - OK	100% - OK	100% - OK	1375 - OK

HEAT TREATMENT

All pipe have been heat treated to 1900° F minimum and  
immediately water quenched to below 800° F within 3  
minutes. Pickled & Passivated.

Subscribed and Sworn to Before Me

RIR

S-1123

WE CERTIFY THAT THE CHEMICAL ANALYSIS AND MECHANICAL  
TEST RESULTS APPLYING ON THE ABOVE NUMBER ARE CORRECT  
AND TRUE TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

ARMCO INC. - AMD Houston

Leland L. Barrington

QC Supervisor

QUALITY CONTROL DEPT.

EA695

AP&E MATERIAL 125/79

20145

BUYER ORDER NO. 51063 P.O. 51063 ITEM 1 DATE SHIPPED 9-7-79  
CODE NO. EA609510  
MILL ORDER NO. 21296 Q.C. APPROVAL  
HM9-6705 DATE 9/26/79

Associated Piping & Engineering Co.  
1707 West Compton Blvd.  
Compton, Ca. 90220

PRODUCT DESCRIPTION:

1. T316 - As Welded  
Annealed & Pickled  
Water Quenched

APPLICABLE SPECIFICATIONS AND PROCEDURES

ASME SA358, Class 1, Sec. III, C1 1, SA655 Class I, 1977  
Edition including all addenda thru Summer 1977; GE Spec  
B50YPL66 Rev 2 W/A1, G & K; Plate UT to NB2530 & GOC UTP400  
Rev 3; X-ray per NB2560 & QC 4 Rev 9; PT per NB2560 & QC 7  
Rev 4; Weld Filler Metal ER316 to SFA 5.9; Welding to WP5  
Rev 1; AP&E SPPP-10004, Rev 1 & SK-A200-AP Rev 0.

ITEM	SIZE	QUANTITY	SERIAL NO
1.	10.750" OD x .485" Min x C/L (Nowhere does the pipe fall below the stated minimum wall required)	17 pcs @ 82'9"	SN9-6705 - (1P2 1P3, 1P4, 1P5, 2P2, 2P4, 2P5, 4P2, 4P3, 4P4, 4P5, 5P2, 5P3, 5P4, 5P5, 5P6)

ITEM	HEAT NO.	Plate Heat Anal.	Plate Prod. Anal.	Weld Anal.	CHEMICAL ANALYSIS										
					C	Mn	P	S	Si	Cr	Ni	Mo	N <sub>2</sub>	Ti	Cb
1.	69118-3B EA609	X			.019	1.36	.025	.018	.58	17.52	11.25	2.14	.080		
			X		.020	1.43	.025	.005	.62	18.00	11.45	2.11	.077	.13	.01
	69114-1B EA610	X			.019	1.39	.022	.028	.52	17.22	11.47	2.22	.029		
			X		.020	1.47	.031	.018	.56	17.90	11.68	2.14	.042	.15	.01
Weld Wire - ERS16, Ht.-21296 W/Lincoln (ST100), Lot 58S - Delta Ferrite 9.3															

MECHANICAL TESTS

ITEM	HEAT NO.	Plate	Prod.	TENSILE PSI	YIELD PSI	ELONG. IN 2"	HARD	GUIDED BENDS FACE, ROOT, SIDE	F.A.
1.	69118-3B (Rm. T.) (ET @ 550°F)	X	X	86,800 83,600 65,900	44,200 40,500 25,500	55 42 31	BHN160 RB85 RB85	OK OK OK	
	69114-1B (Rm. T.) (ET @ 550°F)	X	X	81,000 79,600 62,600	41,700 35,300 25,100	57 52 34	BHN157 RB88 RB88	OK OK OK	



06 MAY 80

CERTIFICATION/REMARKS.

Certificate of Authorization N-1717

Expiration date 4-29-80

1P - ICA - .00162"

1% Ditching; ASTM Grain Size - 6  
Carbide Precip.: Control - .00202  
Exposed - .00211"

5P - ICA - .00063"

1% Ditching; ASTM Grain Size - 6  
Carbide Precip.: Control .00081"  
Exposed - .00108"

Subscribed and Sworn to Before Me

EXAMINATIONS

LOCATION	RADIOGRAPHY	LIQUID PENT.	ULTRASONIC	HYDRO PSI
	100% - OK	100% - OK	100% - OK	1375 - OK

HEAT TREATMENT:

All pipe have been heat treated to 1900° F minimum and  
immediately water quenched to below 800° F within 3  
minutes. Pickled & Passivated.

WE CERTIFY THAT THE CHEMICAL ANALYSIS AND MECHANICAL  
TEST RESULTS APPLYING ON THE ABOVE NUMBER ARE CORRECT  
AND TRUE TO THE BEST OF OUR KNOWLEDGE AND BELIEF

ARMCO INC. - AMD Houston

R. W. Schultz

Sr. Application Engr.

EA 609, 610

CERTIFIED MATERIAL TEST REPORTS FOR GROUP 2 WELDS



SEP 10 1979

*A. C. ...*

CERTIFIED MATERIAL TEST REPORTS FOR GROUP 3 WELDS

CERTIFIED MATERIAL TEST REPORT

PIPE: 18" 1.00" wall T-316

S  
J  
T  
O  
Guyon Alloys, Inc.  
P O Box 42345  
Houston, Texas 77042

BUYER ORDER NO.  
AT9887 HN

DATE SHIPPED  
9-4-80

MILL ORDER NO.  
HM9-7803

TAG: P O 4300N-133

PRODUCT DESCRIPTION:

2. T316 - .035% Max Carbon  
As Welded Annealed &  
Pickled - Water Quenched

APPLICABLE SPECIFICATIONS AND PROCEDURES

ASME SA358 Class 1, ASME Section III Class 1, 1974 Edition  
thru Summer 1974 Addenda; 100% X-ray per NB2560, Proc. QC 4  
Rev 10, Add 1; PT per NB2546, Proc. QC 7 Rev 4 Add 1 & 2;  
Plate UT per NDT-UT-80A, Rev 2; Weld Filler Metal ER316L to  
SFA 5.9; Welding to WP 5 Rev 2; Southwest Fab QA 20 Notes  
1, 3 & 4 dtd 10-11-74 10 CFR 21 Applies

ITEM	SIZE	QUANTITY	SERIAL NO.
2.	18.000" OD x 1.000" Wall x 9'6" C/L	1 pc @ 9'6"	SN9-7803 - 2P

ITEM	HEAT NO.	Plate Heat Anal.	Plate Prod Anal.	Weld Anal.	CHEMICAL ANALYSIS										
					C	Mn	P	S	Si	Cr	Ni	Mo	N <sub>2</sub>	Ti	Cb
2.	P00484	x	x	x	.024	1.58	.022	.014	.56	17.25	10.71	2.07	.060		
					.013	1.51	.029	.016	.57	19.19	11.52	2.10	.059		
Weld Wire ER316 - ID Ht. 4338F (Delta Ferrite 9%) - OD Ht. 173883 (Delta Ferrite 10%) W/lincoln (ST100), Lot 74P															
Repair Weld Wire - ER316 - Ht. 21296															

MECHANICAL TESTS

ITEM	HEAT NO.	Plate	Pipe	TENSILE PSI	YIELD PSI	% ELONG. IN 2"	HARD	GUIDED BENDS			FLAT	R	R
								FACE	ROOT	SIDE			
2.	P00484	x	x	87,300 81,700	42,000 39,500	50 42	HB159 RB70	OK OK	OK OK				
S - 11663													
NUCLEAR													

CERTIFICATION/REMARKS:

Certificate of Authorization N-1717  
Expiration Date 4-29-83

EXAMINATIONS

ITEM	RADIOGRAPHY	LIQUID PENT.	Plate ULTRASONIC	HYDRO PSI
2.	100% OK	100% OK	100% OK	1700

HEAT TREATMENT

All pipe have been heat treated to 1900° F minimum  
and immediately water quenched to below 800° F within  
3 minutes.

Subscribed and Sworn to Before Me

DATE

WE CERTIFY THAT THE CHEMICAL ANALYSIS AND MECHANICAL  
TEST RESULTS APPLYING ON THE ABOVE NUMBER ARE CORRECT  
AND TRUE TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

ARMCO INC. - AMD Houston  
Leland L. Barrington  
QA Supervisor

QUALITY CONTROL UNIT

C-4457



CERTIFIED MATERIAL TEST REPORTS FOR GROUP 4 WELDS

# ALLOY RODS DIVISION

2/8/79

# CERTIFICATE OF ANALYSIS

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

## CERTIFIED MATERIALS TEST REPORT

Baldwin Associates  
Clinton Power Station  
PO #C15350-39047  
Clinton, ILL 61727

Customer Order No. 4490-A, Addition 2

Order No. 166693-1...

Shipped .....

This material conforms to Specification  
ASME SFA 5.9 Sec II  
Part C, ASME Sec III Class 1  
1974 edition thru Summer 1975

Type ER 309

Test No. 2544

Trade Name  
or Trademark: Arcaloy 309 Bare Wire  
Diameter Size: 3/32"  
1500 lb.  
Lot Number:  
Heat Number: 18167C

Carbon	.08
Manganese	1.96
Chromium	24.30
Nickel	12.75
Silicon	.37
Columbium +	.01
Tantalum	.01
Molybdenum	.19
Tungsten	
Copper	.20
Titanium	.05
Phosphorus	.021
Sulphur	.008
Vanadium	.06
Cobalt	
Ferrite	10.5FN Delong

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FILE COPY

RIR

S-5549

BALDWIN ASSOCIATES  
RECEIVED

FEB 20 1979

DOCUMENT RECORD CENTER  
BARB BAUSCH

RECEIVED  
SUBJECT TO COUNT, WEIGHT AND  
QUALITY INSPECTION

FEB 16 1979

BALDWIN ASSOCIATES  
IN CLINTON

By: \_\_\_\_\_

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

State of Penna. )  
County of York ) SS



Subscribed and sworn to before me  
this 8th day of February 19 79

SEAL *Rebecca A. Jacobs*  
Notary Public

My commission expires: 11/22/82

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 specification and ASME Boiler and  
Pressure Vessel Code Section III Division I Sub-  
section NCA-3800

ALLOY RODS DIVISION  
CHEMETRON CORPORATION

BY *D.G. Flohr*

D.G. Flohr



## ALLOY RODS DIVISION

CHEMETRON CORPORATION

P.O. BOX 517 HANOVER, PA 17331 717/637-6911

## CERTIFICATE OF ANALYSIS

## CERTIFIED MATERIALS TEST REPORT

Weldstar  
1750 Mitchell Road  
Aurora, Ill. 60504

Ship to: Baldwin Assoc.

Trade Name  
or Trademark: Arcaloy 309 Bare Wire  
Diameter Size: 3/32"  
1500 lb.  
Lot Number:  
Heat Number: 18167C

Carbon	.08
Manganese	1.96
Chromium	24.30
Nickel	12.75
Silicon	.37
Columbium +	.01
Tantalum	.01
Molybdenum	.19
Tungsten	
Copper	.20
Titanium	.05
Phosphorus	.021
Sulphur	.008
Vanadium	.06
Cobalt	
Ferrite	10.5FN Delong

BALDWIN ASSOCIATES  
RECEIVED

MAY 14 1979

DOCUMENT RECORD CENTER  
BARB BAUSCH

Customer Order No. 4490:A.. Addition 2

..... Order No. 171263-1....

Shipped .....

This material conforms to Specification  
ASME SFA 5.9 Sec II  
Part C, ASME Sec III Class 1  
1974 edition thru Summer 1975

Type ..... ER 309 .....

Test No. 2544

P.O. # C-15350



R I R

S - 6345

State of Penna. )  
County of York ) SS

Subscribed and sworn to before me  
this 26th day of April 19 79



SEAL *Heborah A. Jacobs*  
Notary Public

My commission expires: 11/22/82

GVT-120

Quality Systems Certification No. M-1224  
Expiration Date: September 1, 1981

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 specification and ASME Boiler and  
Pressure Vessel Code Section III Division 1 Sub-  
section NCA-3800

ALLOY RODS DIVISION  
CHEMETRON CORPORATION

BY *D. G. Flohr*  
D.G. Flohr



# ALLOY RODS DIVISION

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

# CERTIFICATE OF ANALYSIS

## CERTIFIED MATERIALS TEST REPORT

Weldstar  
1750 Mitchell Road  
Aurora, IL 60504

Attn: Ed Houk

Trade Name: Arcaloy 309 Bare Wire  
or Trademark:  
Diameter Size: 3/32"  
1,920 lbs.  
Lot Number:  
Heat Number: 18167C

Carbon .08  
Manganese 1.96  
Chromium 24.30  
Nickel 12.75  
Silicon .37  
Columbium + .01  
Tantalum .01  
Molybdenum .19  
Zirconium .20  
Copper .05  
Titanium .021  
Phosphorus .008  
Sulphur .06  
Vanadium  
Cobalt  
Ferrite 9FN Magne Gage

Type Steel A-285

Test No.	Full	Split	Volts	Amps
Tensiles		6	24	195

Test Results: As Welded  
Yield 75,700  
Tensile 95,300  
Elongation 35.0%

Tensile Specimen .252"

Weldstar PO # 4966-A  
Customer Order No. C-16501-36449...

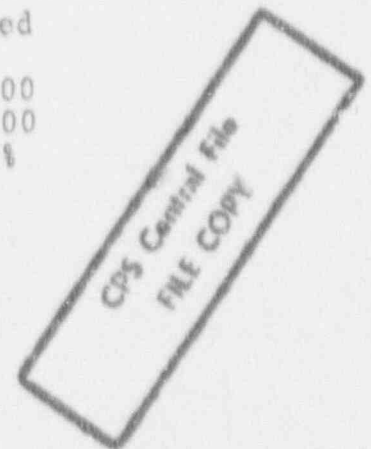
Order No. 171378-2

Shipped

This material conforms to Specification  
ASME Sec. II Part C SFA 5.9 &  
ASME Sec. III Subsection NB for  
Class 1 Material 1974 Ed. Win.  
1975 Add.

Type ER 309

Test No. 2949



RIR

S-6584

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

State of Penna. )  
County of York ) SS

Subscribed and sworn to before me  
this 31st day of May 19 79

SEAL *Kay Jackson*  
Notary Public

My commission expires: 11/22/82

GVT-120

DOCUMENT RECORD CENTER  
JOE NOLAN

JUN 7 1979

BALDWIN ASSOCIATES  
RECEIVED

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 specification and ASME Boiler and  
Pressure Vessel Code Section III Division I Sub-  
section NCA-3800

ALLOY RODS DIVISION  
CHEMETRON CORPORATION

BY *D.G. Flohr*

D.G. Flohr

## ALLOY RODS DIVISION

CHEMETRON CORPORATION

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

## CERTIFICATE OF ANALYSIS

## CERTIFIED MATERIALS TEST REPORT

Weldstar  
1750 Mitchell Road  
Aurora, IL 60504

Attn: Ed Houk

Trade Name  
or Trademark: Arcaloy 309 Bare Wire

Diameter Size: 1/8"  
3,000 lbs.

Lot Number:

Heat Number: 18167C

Carbon	.08
Manganese	1.96
Chromium	24.30
Nickel	12.75
Silicon	.37
Columbium +	.01
Tantalum	.01
Molybdenum	.19
Tungsten	
Copper	.20
Titanium	.05
Phosphorus	.021
Sulphur	.008
Vanadium	.06
Cobalt	
Ferrite	9.0FN Magne Gage

Type Steel A-285

Test No.	Full	Split	Volts	Amps
Tensiles		6	24	195
Test Results:	As	Welded		
Yield	68,900			
Tensile	91,300			
Elongation	33.0%			

Tensile Specimen .252"

Weldstar PO # 4966-A  
Customer Order No. C-16501-36449  
Order No. 171378-2

Shipped .....

This material conforms to Specification  
ASME Sec.II Part C SFA 5.9 & ASME  
Sec.III Subsection NB for Class 1  
Material 1974 Ed. Winter 1975 Add.

Type ..... ER 309 .....

Test No. 2506



Quality Systems Certification No.: N-1224

Expiration Date: September 8, 1981

State of Penna. )  
County of York ) SS

Subscribed and sworn to before me  
this 31st day of May 19 79

SEAL *Kay Olden*  
Notary Public

My commission expires: 11/22/82

GVT-120

RIR  
- 6584  
BALDWIN ASSOCIATES  
RECEIVED  
JUN 7 1979  
DOCUMENT RECORD CENTER  
JOE NOLAN

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 specification and ASME Boiler and  
Pressure Vessel Code Section III Division I Sub-  
section NCA-3800

ALLOY RODS DIVISION  
CHEMETRON CORPORATION

BY *D. G. Flohr*  
D. G. Flohr

# ARCOS CORPORATION

1500 SOUTH 50th STREET PHILADELPHIA, PA. 19143

Technical Department

Date March 23, 1976 APR 1 1976  
BALDWIN ASSOCIATES

## CERTIFICATION OF TESTS

BALDWIN ASSOCIATES  
Route 54  
6 Miles East of Clinton  
Clinton, Illinois

Customer's Order No. C-0983  
Arcos S. O. No. C51546-2-4 (1A3188)  
Shipping Date March 23, 1976  
ASME CERTIFICATE N-955  
Expiration date: Jan 6/78

Size 1/8x36" Grade CHROMENAR 309  
Lot No./Alloy No. D3313T309  
Lbs./No. Pieces 1002#

### SPECIFICATION

ASME SFA 5.9 Class ER309  
ASME B & PVC Section III  
all paras. and addenda  
thru Summer 1975

### WIRE TEST RESULTS

Carbon \_\_\_\_\_  
Manganese \_\_\_\_\_  
Silicon \_\_\_\_\_  
Sulphur \_\_\_\_\_  
Phosphorus \_\_\_\_\_  
Chromium \_\_\_\_\_  
Nickel \_\_\_\_\_  
Molybdenum \_\_\_\_\_  
Titanium \_\_\_\_\_  
Columbium + Ta \_\_\_\_\_  
Tungsten \_\_\_\_\_  
Aluminum \_\_\_\_\_  
Copper \_\_\_\_\_  
Iron \_\_\_\_\_  
Tantalum \_\_\_\_\_  
Cobalt \_\_\_\_\_  
Tin \_\_\_\_\_  
Vanadium \_\_\_\_\_  
Zinc \_\_\_\_\_  
Zirconium \_\_\_\_\_  
Ferrite Para NB-2433 - WRC  
X-Ray \_\_\_\_\_  
Charpys: As Welded Heat Treated

.066 ✓  
1.78 ✓  
.48 ✓  
.009 ✓  
.022 ✓  
24.29 ✓  
12.80 ✓  
.24 ✓  
.001 ✓  
.03 ✓  
.18  
Nitrogen .077  
.066  
13 FN ✓  
Baldwin Associates  
RECEIVED  
APR 2 1976  
QA Records Center

BALDWIN ASSOCIATES  
QA DOC. REVIEW  
NO. PAGES: 1  
BY: TH Replogh  
DATE: 4-1-76  
REV: 5-1-A111(2)  
PC C-913

Tensiles: Yield Tensile Elong.  
As Welded: \_\_\_\_\_  
Heat Treat: \_\_\_\_\_  
Hardness: \_\_\_\_\_  
Bonds: \_\_\_\_\_

As Welded Heat Treated  
Yield Tensile Elong.  
Yield Tensile Elong.  
Yield Tensile Elong.

Signature  
Date  
REVIEWED  
Eng. of Arcos

This material is free from Mercury, Radium or Alpha particle contamination.

We hereby certify that the above material has been tested in accordance with the listed specification and is in conformance with all requirements.

ARCOS CORPORATION

BA/QA  
V-18  
3/19/84

Thomas J. Kearney  
Technical Department  
Page 35

# SANDVIK

## MATERIAL CERTIFICATE

SANDVIK, INC. SCRANTON WORKS  
P.O. BOX 1220, SCRANTON, PA. 18501 PH. 717-587-5191  
PLANT LOCATION: INTERSTATE 81, WAVERLY EXIT 59

CUSTOMER PURCHASE ORDER NO.	SANDVIK ORDER NO.	ITEM	SPECIAL CODE	MARKS	CERTIFICATE NO.	CERTIFICATE DATE
C14269-72277	852776	01				REVISED 11-15-78

SOLD TO: BALDWIN ASSOCIATES

BALDWIN ASSOCIATES

### SPECIFICATION AND MATERIAL

ASME SECTION II: SFA 5.4; ASME SECTION III: I-PA. NB2400 1974 EDITION  
THRU WINTER 75 ADD.

SANDVIK STAINLESS STEEL COATED ELECTRODE TYPE E309-16 3/32" 3,030#

### Actual Weld Deposit Analysis, %

Lot	C	Si	Mn	P	S	Cr	Ni	Mo
50051-1	.045	.65	1.71	.025	.006	22.81	13.23	.07
AL	Co+Ta	Ti	V	Cu				
	.11	.04	.070	.033				

Delta Ferrite content as determined from above analysis per Fig. NB2433.1-1  
WRC Ferrite No. 10 FN

Corresponding ferrite percent 9 %

Ferrite by Magna Gage 8 FN

This is to certify that the contents of this certificate are correct and accurate, as contained in Sandvik's records, and that all above test results and operations performed are in compliance with the requirements of the purchase order and the applicable sections of the code and specifications as designated by the purchase order.

ASME Quality System certificate (materials) No. N-1402 and N-1403. Expiration date: June 11, 1979.

BALDWIN ASSOCIATES  
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For Bengt H. Berg, Quality Assurance Manager

*[Signature]* CARL BAUSCH

(W-C-SFA-1, REV. 3) dnm

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S-4771



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# MATERIAL TEST REPORT

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3/23/82

## TELEDYNE MCKAY

ASME QUALITY SYSTEM CERTIFICATE (MATERIALS)  
NUMBER QSC-242 EXPIRES 7-16-82

Welding Products Division  
P.O. Box 1509  
York, Pa. 17405  
Telephone: 717-845-7581  
Telex: 84-0428

Weldstar Co.  
1750 Mitchell Rd.  
P.O. Box 711  
Aurora, IL 60507

Your Order No. 9442-A  
Marked For C-35884

Our Order No. 04860-01  
Date Shipped 3/23/82



### Material Description and Specifications

Item	Weight, lb.	Size, in.	Classification	Coating
1	1,020	1/8"	E309-16	AC-DC
2				
3				
4				

**CPS Central File**  
**FILE COPY**

Item	Heat No. *	Lot No. *	Specification	Lab Test No.
1	42503	2129989	AWS A5.4-78; ASME Section II, Part C SFA5.4 (1980 Edition) Winter 1981 Addenda	9076-5419
2				
3				
4				

### Chemical Analysis: ACTUAL WELD METAL

Item	% C	% Mn	% P	% S	% Si	% Cr	% Ni	% Mo	% V	% Cu	Ta	% Nb	% Ti	% Cu
1	.076	1.03	.019	.010	.41	24.14	12.77	.06	.07	.03		.079	.08	.09
2														
3														
4														

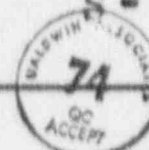
Ferrite (Magna Gage) 9.8 FN (9.0%)  
Ferrite (DeLong) 11.2FN (10.1%)

### Mechanical Properties: ACTUAL WELD METAL

Item	Tensile, psi	Yield, psi	% El.	% RA	
1	85,000	65,000	41.0	51.2	As Welded
2					
3					
4					

RIR

S-16778



\*Each container is identified by heat and lot number.  
All Welding Done DCRP.

WE CERTIFY THE ABOVE MATERIAL WAS MANUFACTURED IN ACCORDANCE WITH TELEDYNE MCKAY'S ASME QUALITY SYSTEM PROGRAM AND TESTED TO THE REQUIREMENTS OF NB-2400, SECTION III (1980 EDITION), INCLUDING WINTER 1981 ADDENDA, CLASS 1 COMPONENTS, OF THE ASME BOILER AND PRESSURE VESSEL CODES.

We hereby certify that the above material has been tested in accordance with the listed specifications and conforms to all applicable requirements thereof.

Sworn and Subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_

\_\_\_\_\_, 19\_\_\_\_\_, Notary Public  
My commission expires \_\_\_\_\_, Spring Garden Twp. York Co.

TELEDYNE MCKAY

Authorized Signature \_\_\_\_\_ Asst. Manager Q. A.



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# MATERIAL TEST REPORT

# SUPPLEMENTARY DATA

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## TELEDYNE MCKAY

Welding Products Division  
P.O. Box 1509  
York, Pa. 17405  
Telephone: 717-845-7581  
Telex: 84-0426

Your Order No. 9442-A

Our Order No. 04860-01

Size, in	Classification	Coating	Heat No.	Lot No.
1/8"	E309-16	AC-DC	42503	2129989

### FILLET WELD USABILITY TEST

Current	Amps	Position of Welding	Size of Fillet	Convexity	Variation in Leg Length
DC	70	Vertical	9/64"	0	0
DC	90	Horizontal	3/16"	0	0
DC	85	Overhead	5/32"	1/64"	1/64"



There was no weld metal cracking, surface porosity, undercut or overlap.  
Root Penetration - 100%

RADIOGRAPHIC TEST - Actual X-Ray Results Satisfactory

ACTUAL CONCENTRICITY (%) - .75 (.0012 " Avg. Ecc.)



ELECTRODES SUPPLIED BY TELEDYNE MCKAY DO NOT CONTAIN FUNCTIONAL MERCURY IN ANY FORM. MERCURY-BEARING INSTRUMENTS AND/OR EQUIPMENT WHICH MIGHT CAUSE CONTAMINATION HAVE NOT BEEN USED IN THE MANUFACTURE OF THESE ELECTRODES.

10 CFR Part 21 Applies

**RIR**  
**S-16778**

We hereby certify that the above material has been tested in accordance with the listed specifications and conforms to all applicable requirements thereof.

TELEDYNE MCKAY

*[Handwritten Signature]*  
Authorized Signature

ASQC Manager of Quality Assurance

