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SUBJECT: Provides third 10-yr ISI plan & requests relief from ASME
 Section XI requirements. Addl info in support of previous
 relief request submitted in 950728 ltr also encl.

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Indiana Michigan
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PO Box 16631
Columbus, OH 43216



January 25, 1996

AEP:NRG:0969AJ

Docket Nos.: 50-315
50-316

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Gentlemen:

References: Letter, E. E. Fitzpatrick to U.S. Nuclear Regulatory Commission, Donald C. Cook Nuclear Plant Units 1 and 2, Request for Relief for Augmented Reactor Vessel In-service Inspection, Dated July 28, 1995.

Donald C. Cook Nuclear Plant Units 1 and 2
RELIEF REQUESTS FOR THE THIRD TEN-YEAR
IN-SERVICE INSPECTION PLAN

The purpose of this letter is to provide the NRC with a copy of the Donald C. Cook Nuclear Plant's Third Ten Year In-service Inspection Plan and to request relief from ASME Section XI requirements which we have determined are impractical to meet. Additionally, we are providing additional information in support of a previous relief request which was submitted in the referenced letter.

Attachments 1 and 2 contain the relief requests for Unit 1 and Unit 2, respectively. Attachment 3 (Appendix H of the in-service inspection program) provides additional information on the accessibility of Unit 1 reactor vessel welds which must be inspected as part of the in-service inspection. These data were obtained during the augmented reactor vessel inspection conducted during the 1995 Unit 1 refueling outage. The Third Ten-Year Interval Long-Term Inservice Examination Plan is contained in attachment 4 as requested.

The current inservice inspection program will expire on June 30, 1996. These relief requests are being submitted in accordance with 10 CFR 50.55a(g)(5)(iv) which requires that when the revised in-service inspection program does not include an ASME Code requirement, the licensee must demonstrate the impracticability of those requirements to the satisfaction of the

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U. S. Nuclear Regulatory Commission
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NRC within twelve months of the expiration of the current program.
We therefore request approval of the relief requests by
June 30, 1997.

Sincerely,

for 
E. E. Fitzpatrick
Vice President

plt

Attachments

cc: A. A. Blind
G. Charnoff
H. J. Miller
NFEM Section Chief
NRC Resident Inspector - Bridgman
J. R. Padgett

ATTACHMENT 2 TO AEP:NRC:0969AJ

DONALD C. COOK NUCLEAR PLANT, UNIT 2

RELIEF REQUESTS

Donald C. Cook Nuclear Plant, Unit 2
Relief Requests

Relief Req. #	Code Section	Relief Requested
1	IWB-2500, Cat. B-A & Cat. B-D	100% Exam of RPV welds.
2	IWB-2500, Cat. B-F	Surface exam of RPV inlet and outlet nozzle-to-safe end welds.
3	IWB-2500, Cat. B-A	RPV shell to flange partial deferral.
4	IWB-2500, Cat. B-A	RPV closure and lower head dollar plate weld volumetric exam.
5	IWC-2500, Cat. C-F	Pipe to flued head penetration welds.
6	IWC-2500, Cat. C-F	Pipe to flued head weld whip restraint.
7	IWB-2500, Cat. B-D	Volumetric Examination of Pressurizer surge nozzle to lower shell welds.

Relief Request No. 1

Component Identification: Class 1- Volumetric examination of the Unit 2 Reactor Pressure Vessel (RPV) shell welds (See Figure 1-2).

Code requirement: American Society of Mechanical Engineers (ASME) Section XI, IWB-2500, Categories B-A (B1.11 & B1.12) and B-D (B3.90) requires volumetric examination of "essentially 100 % of the length" of all RPV welds. 10 CFR 50.55a(g)(6)(ii)(A) defines "essentially 100 % of the length" as meaning greater than 90% where a reduction in examination coverage is due to interference with another component or part geometry.

Relief requested: Code relief is being requested for the second and third intervals for those Unit 2 vessel welds listed in Table 1-2 where the approximate percent average examination coverage is less than or equal to 90 % of the required code examination coverage.

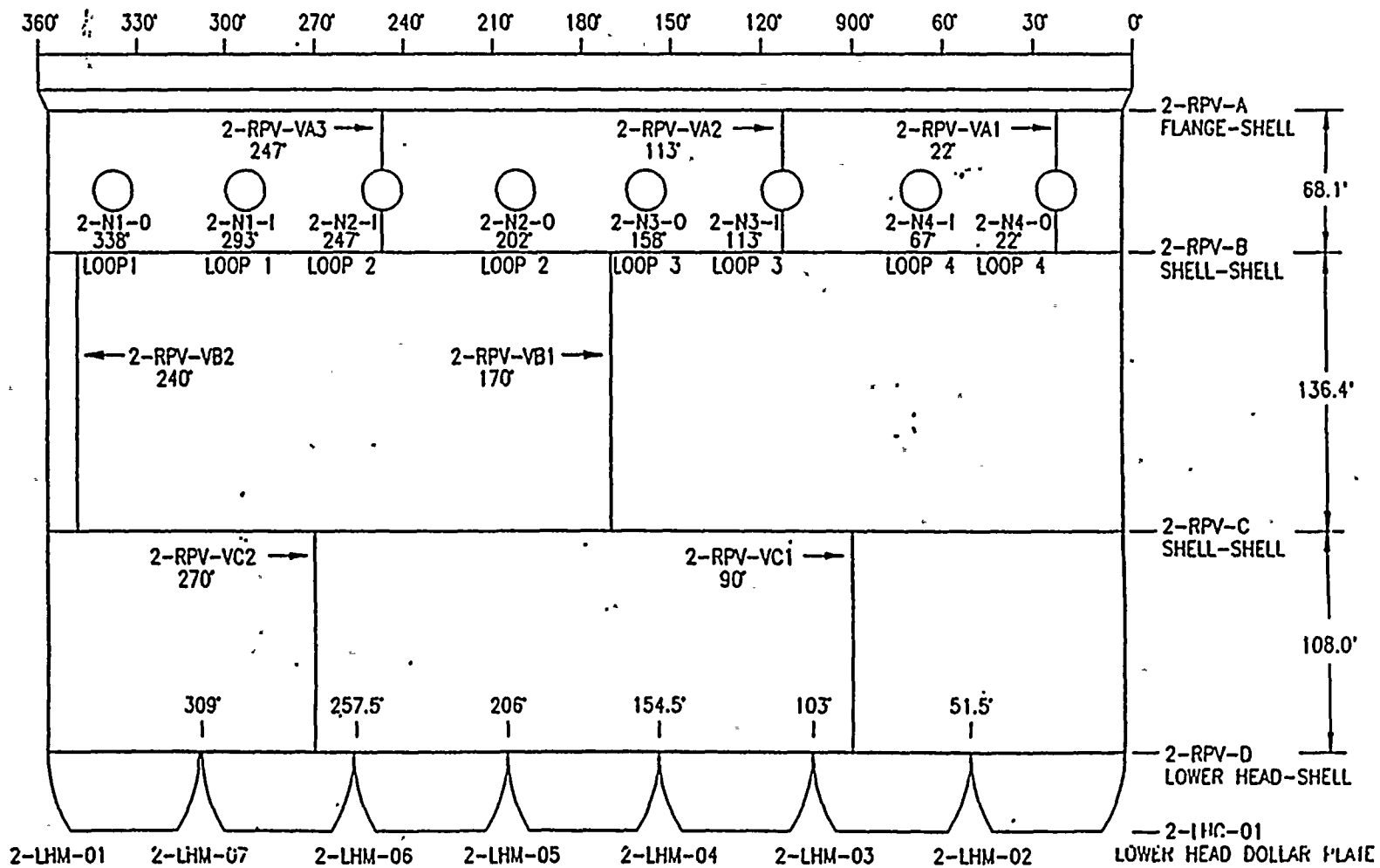
Basis for relief: Based on the actual augmented examination results of the vessel welds performed during the 1995 Unit 1 refueling outage, the percentage of examination coverage for the Unit 2 RPV shell welds has been reestimated and is included in the Table 1-2. The reestimated values include the benefits of using improved equipment and techniques.

Proposed Alternative: In lieu of the volumetric examination requirements of ASME Section XI and 10 CFR 50.55a(g)(6)(ii)(A), the limited examination will be augmented by system leakage tests and VT-2 visual examinations during the third ten-year interval. These examinations will be conducted in accordance with ASME Section XI, Category B-P, and Code Case N-498-1.

Table 1-2
D C Cook Nuclear Power Plant, Unit 2
Reactor Pressure Vessel
Examination Coverage

LTP Summary #	Weld #	Exam Area Identification	% Coverage Approx.	Remarks
000300	2-RPV-D	Lower Shell to lower head	70 %	Limited exam due to core supports and anti-rotation lugs.
000400	2-RPV-VA1	Upper shell (Long.) @ 22°	80 %	Limited due to outlet integral extension.
000500	2-RPV-VA2	Upper shell (Long.) @ 113°	80 %	Limited due to outlet integral extension.
000600	2-RPV-VA3	Upper shell (Long.) @ 247°	80 %	Limited due to outlet integral extension.
002100	2-N1-0	Outlet Nozzle @ 338°	60 %	Limited due to outlet integral extension.
002300	2-N2-0	Outlet Nozzle @ 202°	60 %	Limited due to outlet integral extension.
002500	2-N3-0	Outlet Nozzle @ 158°	60 %	Limited due to outlet integral extension.
002700	2-N4-0	Outlet Nozzle @ 22°	60 %	Limited due to outlet integral extension.

The above Table is an estimate based on the Unit 1 10-year ISI examination results.



D. C. COOK, UNIT 2

FIG. 1-2 REACTOR PRESSURE VESSEL LAYOUT

Relief Request No. 2

Component Identification: Unit 2, Class 1, Inlet and outlet nozzle-to-safe end dissimilar welds (See attached Fig. 2-2).

Code requirement: American Society of Mechanical Engineers, Section XI, IWB-2500, Category B-F, B5.10, requires surface and volumetric examination of dissimilar welds during each inspection interval.

Relief requested: Relief is requested from performing surface examinations (liquid penetrant) on these nozzle-to-safe-end welds associated with the main recirculation loops.

Basis for relief: Surface examination (liquid penetrant) of the nozzle-to-safe end welds requires seal ring and sand plug removal and entry into the sand box area. Limited space and permanent insulation restrict access to the surface and a complete surface examination cannot be performed. This area has a high level of radioactivity and is highly contaminated. Personnel performing the examination would be subjected to substantial exposure and contamination.

Proposed Alternative: Conduct a full volumetric ultrasonic examination using a technique which can detect discontinuities on the outside surface of the inlet and outlet nozzle-to-safe end welds in lieu of the outside surface examinations. The volumetric examination will cover the entire volume of the weld and 1/2" of the base material from the fusion line of the weld on either side of the weld. The examination will evaluate these welds both axially and circumferentially. Mockups of this area have been fabricated and the capability of the ultrasonic examination technique and procedure to detect outside surface indications has been demonstrated.

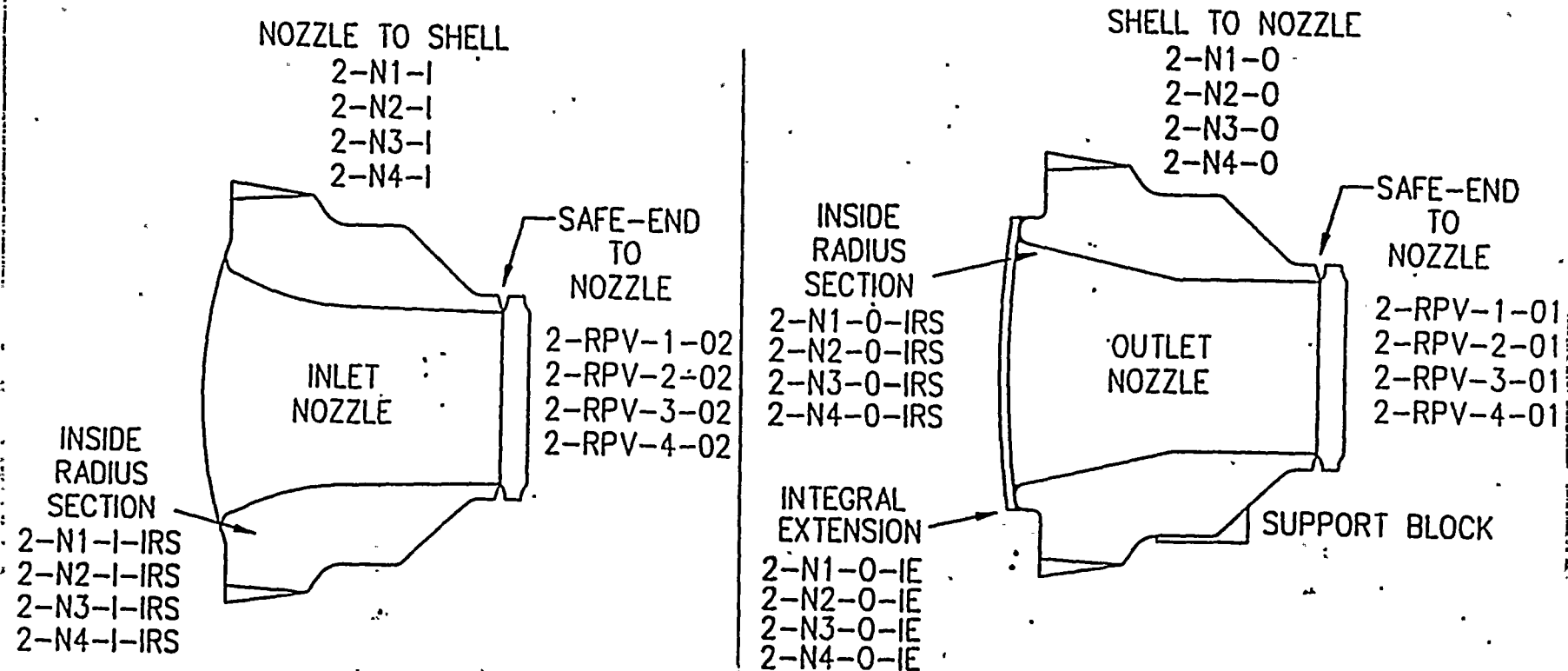


Figure 2-2
Inlet/Outlet Nozzle to Safe End
Dissimilar Welds

Relief Request No. 3

Component Identification: Class 1, volumetric examination of the Unit 2 reactor pressure vessel (RPV) shell-to-flange welds from the RPV seal surface (See Figure 3-2).

Code requirement: American Society of Mechanical Engineers, Section XI, IWB-2500, Category B-A, Item B1.30, requires that at least 50 % of the shell to flange weld shall be examined by the end of the first inspection period and the remainder by the end of the third inspection period for each 10-year interval.

Relief requested: Relief is requested to allow the deferral of the examination of the shell-to-flange weld from the seal surface side which is to be completed in the first period to the end of the third 10-year interval (third inspection period) so that the examination can be performed with automated equipment used for the RPV shell weld examinations.

Basis for relief: Examination of the shell-to-flange weld from the RPV seal surface during the first inspection is typically performed using manual ultrasonic techniques and equipment. This requires special scheduling of plant support and examination personnel to perform the examination and will subject these personnel to unnecessary radiation exposure without any significant benefit in quality. Deferral of the first period inspection requirements would permit the shell-to-flange weld to be completely examined using the automated equipment during the reactor pressure vessel exam with minimal radiation exposure to personnel supporting and performing this exam.

Proposed Alternative: Examination of the RPV shell-to-flange weld will be performed at the end of the third inspection period using the automated examination equipment scheduled for the third inspection period of the third 10-year interval.

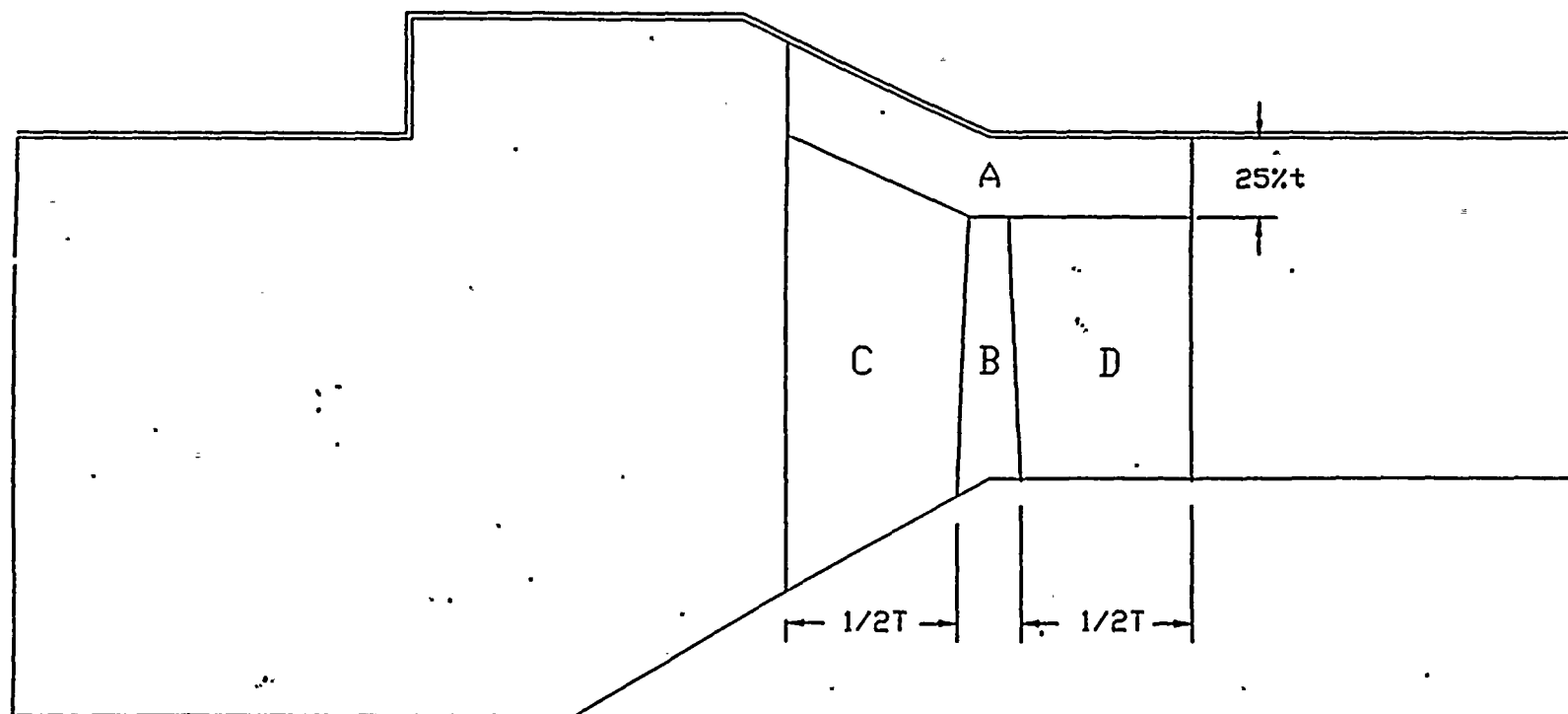


FIGURE 3-2

Vessel-to-Flange

DONALD C. COOK NUCLEAR PLANT

UNIT 2

Relief Request No. 4

Component Identification: Class 1, volumetric examination of the Unit 2 reactor pressure vessel (RPV) closure and lower head dollar plate welds (See Figure 4-2).

Code requirement: American Society of Mechanical Engineers, Section XI, IWB-2500, Category B-A, Item B1.21, requires a volumetric examination of the accessible length of RPV head welds.

Relief requested: Relief is requested from performing the code volumetric examination of the closure and lower head dollar plate welds since access limitations prevent any examination of either weld.

Basis for relief: As shown in the attached figure, the closure head dollar plate weld has limited access for ultrasonic examination due to the interference with the reactor vessel control rod drive housings. Additionally the control rod drive penetrations and shroud preclude film placement for volumetric examination by radiography.

The attached figure also shows the location of the lower head dollar plate weld among the in-core instrumentation tubes. Interference with the instrumentation tubes makes this weld inaccessible for ultrasonic examination.

Proposed Alternative: In lieu of the volumetric examination requirements of ASME Section XI, a system leakage test and VT-2 examination will be conducted for this inspection interval. These examinations will be conducted per the requirements of ASME Section XI, IWB-2500, Category B-P. Additionally, the accessible length of one closure head meridional weld (which intersects the closure head dollar plate weld) is volumetrically examined during the inspection interval per ASME Section XI, IWB-2500-1, Category B-A. Based on the above and the availability of the Reactor Coolant System Leakage Detection System, the overall level of plant safety will not be reduced by the proposed relief request.

Relief Request No. 5

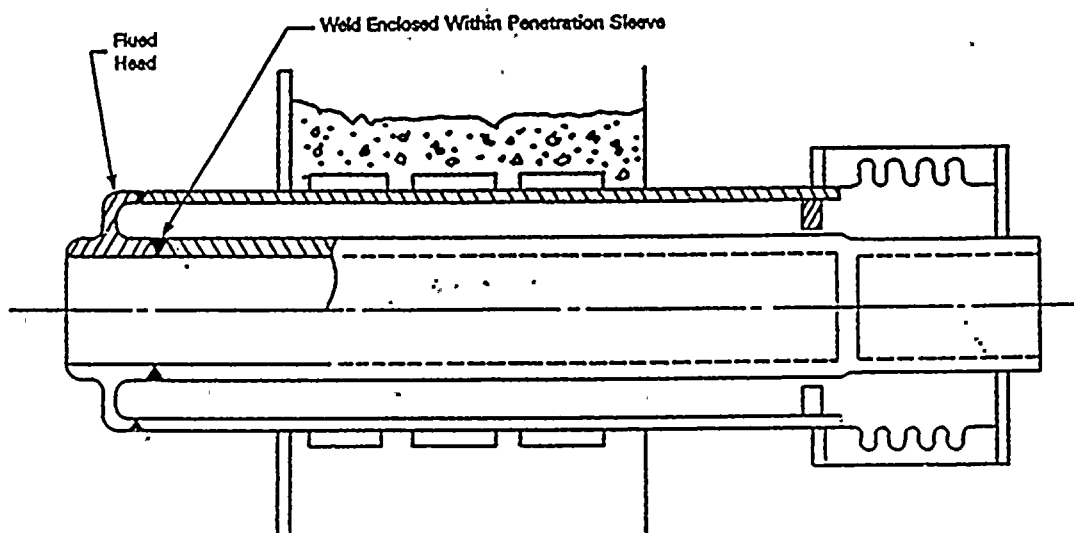
Component Identification: Unit 2, Class 2 pipe to flued head Feedwater and Main Steam penetrations.

Code requirement: ASME Section XI, IWC-2500, Category C-F, C5.21 requires surface and volumetric examination of welds during each inspection interval.

Relief requested: Relief is requested from performing the volumetric and surface examinations on these inaccessible welds.

Basis for relief: These welds are totally enclosed within a penetration sleeve, and are inaccessible for examination (see Figure 5-2). Since the inaccessible pipe to flued head weld thickness is substantially heavier than the proposed alternate weld to be examined and both are exposed to the same environment, the overall level of plant safety will not be reduced by performing the alternate examination. Additionally, previously submitted Code Relief Requests for the past two 10-year intervals have been approved for these welds and conditions have not changed.

Proposed Alternative: In lieu of the ASME Section XI requirements, the first accessible weld outside each penetration will be examined with the Code-required volumetric and surface examinations.



Main Steam or Feedwater Penetrations

FIGURE 5-2

DONALD C. COOK NUCLEAR PLANT

UNIT 2

Relief Request No. 6

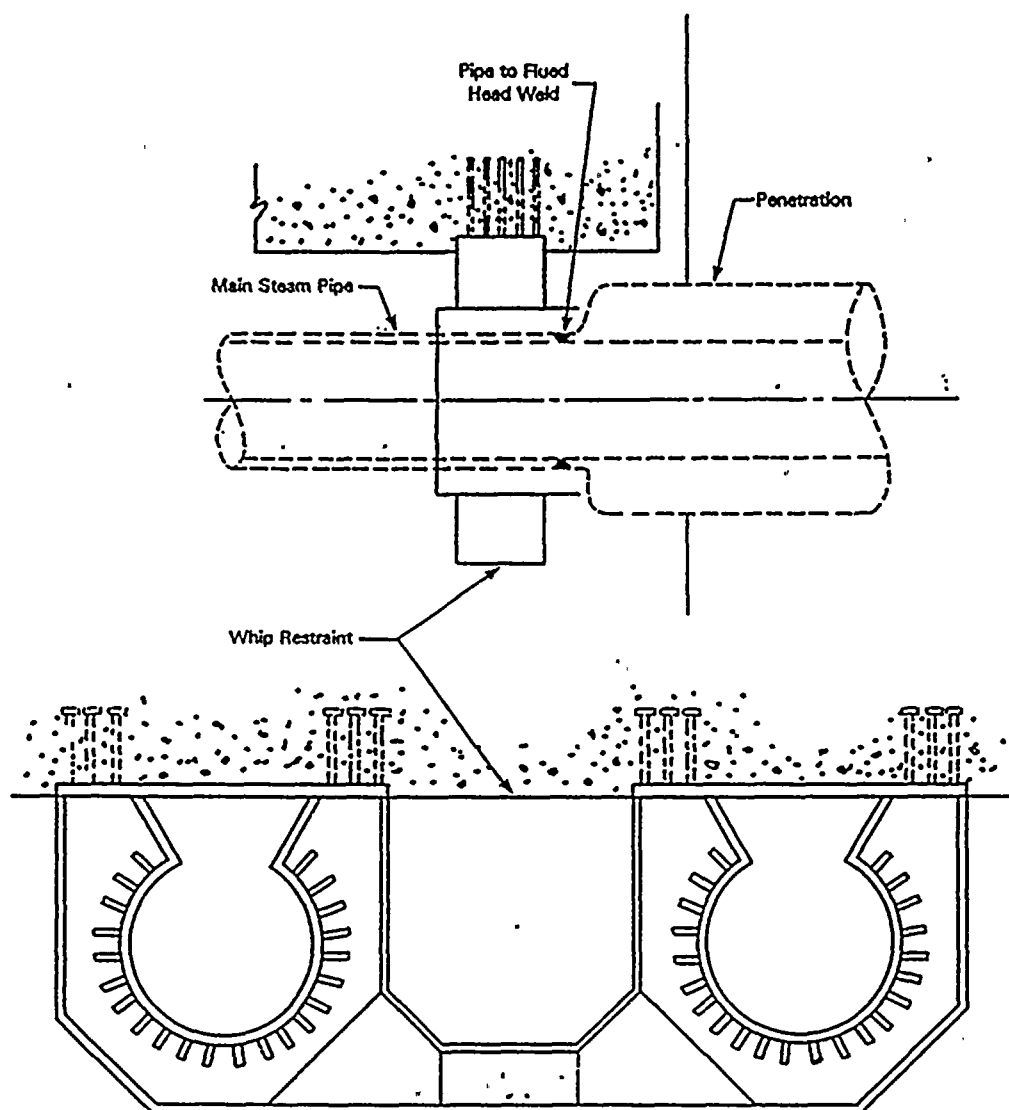
Component Identification: Unit 2, Class 2 pipe to flued head weld on the whip restraint of the Main Steam penetrations. (See Figure 6-2)

Code requirement: ASME Section XI, IWC-2500, Category C-F, C5.21 requires surface and volumetric examination of welds during each inspection interval.

Relief requested: Relief is requested from performing the volumetric and surface examinations on these inaccessible welds.

Basis for relief: This weld is inaccessible due to the large pipe whip restraint which surrounds the weld and adjacent area. Volumetric examination by the ultrasonic method is impractical because the weld cannot be reached for positioning and handling the transducer, and radiography is impractical because exposure would have to be made through the restraint. Surface examination is impractical because the weld is not readily accessible for application and removal of penetrant or manipulation of magnetic particle equipment. Removal of the pipe whip restraints would require removing, by torch cutting, approximately 2400-2700 lbs. sections that are supported from above. The proposed alternate examination of the adjacent weld has identical service conditions to inaccessible weld. Additionally, previously submitted Code Relief Requests for the past two 10-year intervals have been approved for this weld and conditions have not changed.

Proposed Alternative: In lieu of the ASME Section XI requirements, the first accessible adjacent weld in one steam line will be examined with the Code-required volumetric and surface examinations.



Whip Restraint on Main
Steam Penetration

FIGURE 6-2

DONALD C. COOK NUCLEAR PLANT

UNIT 2

Relief Request No. 7

Component Identification: Class 1, Examination category B-D, B3.30 Unit 2, pressure retaining nozzle-to-vessel welds in pressurizer.

Code requirement: American Society of Mechanical Engineers, Section XI, Table 2500-1, Category B-D, Item B3.30, requires 100% volumetric examination of nozzle-to-vessel welds in the pressurizer as defined by Figure IWB-2500-7 (See Figure 7-2).

Relief requested: Relief is requested from performing the code required volumetric examination from the weld surface and from the nozzle side of the weld (14" surge nozzle to lower head weld 2-RC-21).

Basis for relief: Interference with the nozzle blend radius prevents contact of the ultrasonic search unit. Based on the above and the availability of the Reactor Coolant System Leakage Detection System, we believe that the overall level of plant safety will not be compromised by performing the alternative examination.

Proposed Alternative: In lieu of the volumetric examination requirements of ASME Section XI, an ultrasonic full-vee examination be performed from the vessel side only, and a supplemental surface examination will be performed. The pressurizer will also receive a system leakage test and VT-2 visual examination in accordance with ASME Section XI, Category B-P, and Code Case N-498-1.

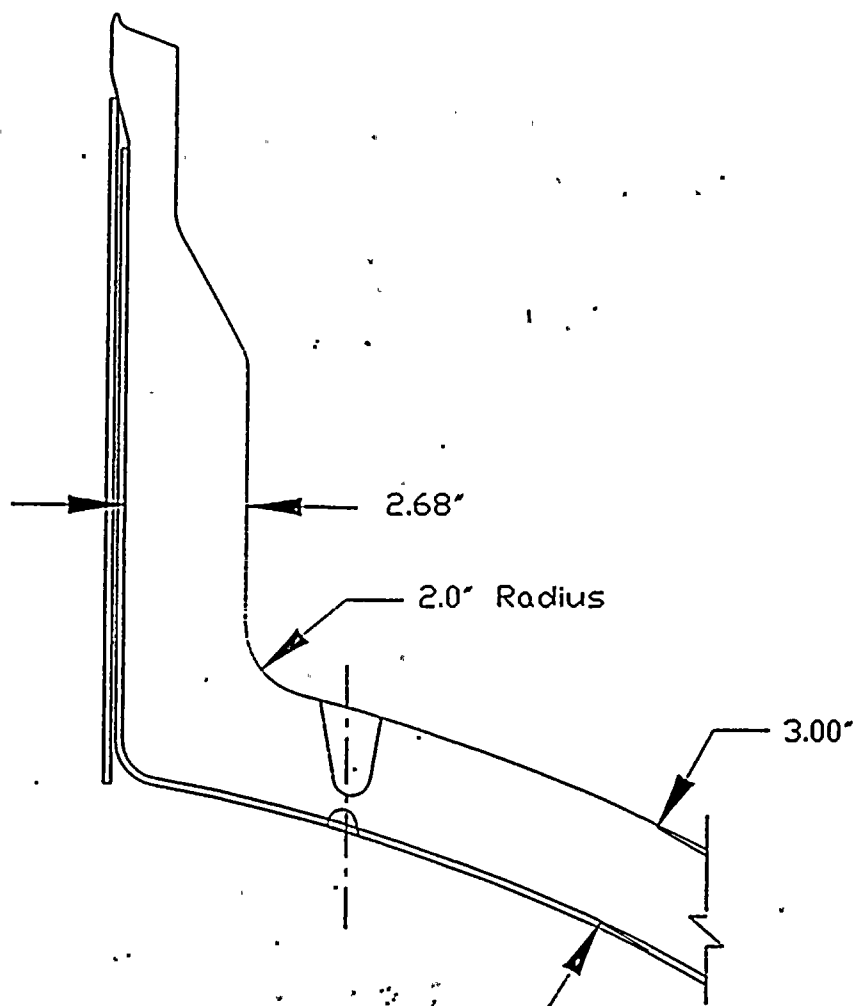


Figure 7-2
Donald C. Cook Nuclear Plant
Unit 2
Pressurizer Surge Nozzle
(14")

ATTACHMENT 3 TO AEP:NRC:0969AJ

IN-SERVICE INSPECTION PLAN

APPENDIX H

REACTOR VESSEL EXAMINATION LIMITATIONS

APPENDIX H

EXAMINATION AREA LIMITATIONS REPORT FOR DONALD C. COOK NUCLEAR PLANT, UNIT 1 REACTOR PRESSURE VESSEL WELDS

This appendix describes the automated ultrasonic (AUT) examination coverage obtained and examination limitations encountered during the 1995 inservice examination of the Donald C. Cook Nuclear Power Plant, Unit 1, reactor pressure vessel (RPV) welds and selected components. The examinations were performed by Southwest Research Institute (SwRI) using automated scanning equipment and AUT data recording and analysis systems in accordance with a Scan Plan and procedures approved by Indiana Michigan Power Company (IMP). These procedures comply with requirements of the 1983 Edition with Addenda through Summer 1983 of the American Society of Mechanical Engineers (ASME) Section XI and United States Nuclear Regulatory Commission Regulatory Guide 1.150, Rev. 1, Appendix A.

The scope of the AUT examinations included all RPV shell, lower head, and nozzle weld areas for 100% of the accessible weld lengths, and the scope of the AUT examinations of the piping butt welds included the inlet and outlet nozzle-to-safe end welds.

The examination coverage for the RPV welds was determined in accordance with the requirements of Section V, T-441.3.2. These requirements are as follows:

- (1) Reflectors oriented parallel to the weld (Reference Figures on pages H-14 through H-19)
 - (a) The inner 25%t including the weld metal and adjacent base metal for 1/2t either side of the weld fusion line (volume A in the figures) must be completely scanned with the 50/70 search unit aimed at the right angles to the weld axis. Scanning shall be performed in two directions 180 degrees to each other.
 - (b) The weld metal in the outer 75%t (volume B in the figures) must be completely scanned by two angle beams, (45- and 60-degree) with the search units aimed at right angles to the weld axis. Scanning shall be performed in two directions 180 degrees to each other.
 - (c) The adjacent base metal in the outer 75%t and 1/2t either side of the weld fusion line (volumes C and D in the figures) must be completely scanned by both angle beams from both directions (any combination of two angle beams will satisfy the requirement).
 - (d) For those examinations performed from the nozzle bores and flange seal surface, the ultrasonic (UT) beams must be directed essentially perpendicular to the plane of the weld to detect reflectors parallel to the welds. The beam angles used must be sufficient to provide complete coverage of the required volumes from one direction.
- (2) Reflectors oriented transverse to the weld (Reference Figures on pages H-14 through H-19)
 - (a) The inner 25%t including the weld metal and adjacent base metal for 1/2t either side of the weld fusion line (volume A in the figures) must be scanned with the 50/70 search unit beam directed parallel to the weld axis. Scanning shall be performed in two directions 180 degrees to each other to the extent possible. Areas blocked by geometric conditions shall be examined from at least one direction.

- (b) The weld metal and adjacent base metal in the outer 75%t for 1/2t either side of the weld fusion line (volumes B, C, and D, in the figures) must be scanned with the 45- and 60-degree search unit beams directed parallel to the weld axis. Scanning shall be performed in two directions 180 degrees to each other to the extent possible. Areas blocked by geometric conditions shall be examined from at least one direction.
- (3) The base material through which the angle beams pass must be scanned with a straight-beam search unit to detect laminar reflectors which might affect interpretation of angle-beam results. The required volume to be examined is limited to only those volumes that receive coverage with angle beams. This could be all, or any part of the ABCDEF volumes shown in the figures.
- (4) Straight beam scanning for planar reflectors must be performed on the entire weld and adjacent base material (volumes A, B, C, and D in the figures).

The examination coverage for nozzle inner radius areas was determined in accordance with the requirements of Figure IWB-2500-7. The required area must be scanned with 50/70 search units in two directions (clockwise and counterclockwise) to detect radial-axial flaws.

The examination coverage for nozzle-to-safe end, safe end-to-elbow, and safe end-to-pipe welds was determined in accordance with the requirements of Figure IWB-2500-1. An examination of the lower 1/3 of the weld volume and the heat-affected zone was performed as described below:

- (1) Reflectors parallel to the weld:

The weld metal and adjacent base metal for 1/4 inch either side of the weld fusion line (volume shown in Figure 8) must be examined from two sides of the weld using the SLIC 40 search unit. The UT beam must pass through the volume in two opposing directions.

- (2) Reflectors transverse to the weld:

The weld metal and adjacent base metal for 1/2 inch either side of the weld fusion line (volume shown in Figure 8) must be examined with the SLIC 40 search unit. The UT beam is directed parallel to the weld to detect reflectors transverse to the weld. The UT beam must pass through the volume in two opposing directions.

The integral extensions, the core stabilizing lugs, and the instrumentation tubes in the lower head limited scanning accessibility to the full length and/or width of some areas from the inside surface. AUT examination coverage tables in this appendix quantify the volume of material examined with each UT technique for each examination area.

The examination coverage obtained is compared to the weld and base metal volumes identified as the examination areas in Figures 1 through 8 contained in this report. The ASME Code-specified techniques for AUT RPV examinations were augmented by special, SwRI-qualified techniques to obtain complete and highly sensitive coverage of the underclad and near-surface material volumes.

EXPLANATION OF THE EXAMINATION COVERAGE TABLES

The following contains an explanation of each item listed in the Examination Coverage Tables.

Summary Number	- The examination Summary Sheet Number that is assigned to each particular weld.
Weld Number	- The specific weld identification number as supplied by IMP.
Exam Area Identification	- Description of the weld type or component identification.
Exam Volume and Figure	- The specific volume as identified in ASME Section XI, Regulatory Guide 1.150, and Figures 1 through 8.
Beam Angle(s)	- The refracted longitudinal- or shear-wave angles used for the examination.
Exam Type	- As defined in Article 4 of ASME Section V, the type of flaw that each examination is intended to detect, e.g., flaws transverse or parallel to the weld, straight beam for planar or laminar flaws etc.
Beam Direction(s)	- For each volume, the number of directions that the beam was directed to detect the type of flaw (parallel or transverse to the weld).
Code Coverage	- The Percent of coverage for each volume, as a function of beam angle(s), exam type, and beam direction(s) combined.
Remarks	- This section is used to explain the source or cause of any limitations encountered.

NOTES:

1. The average shown as a percent is a simple average of the coverage for all required examinations performed.
2. All straight-beam (0 degree) examination directions are listed as "N/A" because a straight beam can only be introduced into the volume in a single direction.
3. The examination limitations report and coverage tables are restricted to examinations performed by SwRI, and do not reflect limitations from examinations performed by others during previous inservice inspections, or examinations that have been deferred.
4. The required volume for straight-beam lamination examinations is defined as only the area through which the angle beam(s) pass.

Donald C. Cook Nuclear Plant, Unit 1
1995 Reactor Vessel Inservice Inspection
Examination Coverage Tables

Summary Number	Weld Number	Exam Area Identification	Exam		Beam Angle(s)	Exam Type	Beam Direction(s)	Code Coverage	Remarks
			Volume	Figure					
000100	1-RPV-B	Upper Shell -to- Middle Shell	A	1	50/70	Parallel	2 Directions	100%	Limited examination due to the proximity of the outlet integral extensions and inlet bore radii.
			A		50/70	Transverse	2 Directions	100%	
			B		45 & 60	Parallel	2 Directions	96%	
			BCD		45 & 60	Transverse	2 Directions	100%	
			C		45 & 60	Parallel	1 Direction	100%	
			D		45 & 60	Parallel	1 Direction	100%	
			ABCDEF		0	Lamination	N/A	100%	
			ABCD		0	Planar (Weld)	N/A	100%	
Average							100%		
000200	1-RPV-C	Middle Shell -to- Lower Shell	A	2	50/70	Parallel	2 Directions	100%	
			A		50/70	Transverse	2 Directions	100%	
			B		45 & 60	Parallel	2 Directions	100%	
			BCD		45 & 60	Transverse	2 Directions	100%	
			C		45 & 60	Parallel	1 Direction	100%	
			D		45 & 60	Parallel	1 Direction	100%	
			ABCDEF		0	Lamination	N/A	100%	
			ABCD		0	Planar (Weld)	N/A	100%	
Average							100%		
000300	1-RPV-D	Lower Shell -to- Lower Head	A	1	50/70	Parallel	2 Directions	62%	Limited examination due to the proximity of the core barrel support lugs.
			A		50/70	Transverse	2 Directions	65%	
			B		45 & 60	Parallel	2 Directions	65%	
			BCD		45 & 60	Transverse	2 Directions	66%	
			C		45 & 60	Parallel	1 Direction	60%	
			D		45 & 60	Parallel	1 Direction	93%	
			ABCDEF		0	Lamination	N/A	76%	
			ABCD		0	Planar (Weld)	N/A	68%	
Average							69%		

Donald C. Cook Nuclear Plant, Unit 1
1995 Reactor Vessel Inservice Inspection
Examination Coverage Tables (Cont'd)

Summary Number	Weld Number	Exam Area Identification	Exam Volume	Figure	Beam Angle(s)	Exam Type	Beam Direction(s)	Code Coverage	Remarks
000400	I-RPV-VA1	Upper Shell Longitudinal @ 26.5 deg.	A A B BCD C D ABCDEF ABCD	3	50/70 50/70 45 & 60 45 & 60 45 & 60 45 & 60 0 0	Parallel Transverse Parallel Transverse Parallel Parallel Lamination Planar (Weld)	2 Directions 2 Directions 2 Directions 2 Directions 1 Direction 1 Direction N/A N/A Average	79% 75% 78% 75% 82% 82% 95% 75% 80%	Limited examination due to the proximity of the outlet integral extension.
000500	I-RPV-VA2	Upper Shell Longitudinal @ 146.5 deg.	A A B BCD C D ABCDEF ABCD	3	50/70 50/70 45 & 60 45 & 60 45 & 60 45 & 60 0 0	Parallel Transverse Parallel Transverse Parallel Parallel Lamination Planar (Weld)	2 Directions 2 Directions 2 Directions 2 Directions 1 Direction 1 Direction N/A N/A Average	56% 52% 61% 52% 80% 60% 86% 52% 62%	Limited examination due to the proximity of the outlet integral extension.
000600	I-RPV-VA3	Upper Shell Longitudinal @ 266.5 deg.	A A B BCD C D ABCDEF ABCD	3	50/70 50/70 45 & 60 45 & 60 45 & 60 45 & 60 0 0	Parallel Transverse Parallel Transverse Parallel Parallel Lamination Planar (Weld)	2 Directions 2 Directions 2 Directions 2 Directions 1 Direction 1 Direction N/A N/A Average	97% 100% 92% 100% 100% 100% 100% 100% 99%	Limited examination due to the proximity of the outlet integral extension.

Donald C. Cook Nuclear Plant, Unit 1
1995 Reactor Vessel Inservice Inspection
Examination Coverage Tables (Cont'd)

Summary Number	Weld Number	Exam Area Identification	Exam Volume	Figure	Beam Angle(s)	Exam Type	Beam Direction(s)	Code Coverage	Remarks
000700	1-RPV-VB1	Middle Shell Longitudinal @ 0 deg.	A	3	50/70	Parallel	2 Directions	100%	
			A		50/70	Transverse	2 Directions	100%	
			B		45 & 60	Parallel	2 Directions	100%	
			BCD		45 & 60	Transverse	2 Directions	100%	
			C		45 & 60	Parallel	1 Direction	100%	
			D		45 & 60	Parallel	1 Direction	100%	
			ABCDEF		0	Lamination	N/A	100%	
			ABCD		0	Planar (Weld)	N/A	100%	
							Average	100%	
000800	1-RPV-VB2	Middle Shell Longitudinal @ 120 deg.	A	3	50/70	Parallel	2 Directions	100%	
			A		50/70	Transverse	2 Directions	100%	
			B		45 & 60	Parallel	2 Directions	100%	
			BCD		45 & 60	Transverse	2 Directions	100%	
			C		45 & 60	Parallel	1 Direction	100%	
			D		45 & 60	Parallel	1 Direction	100%	
			ABCDEF		0	Lamination	N/A	100%	
			ABCD		0	Planar (Weld)	N/A	100%	
							Average	100%	
000900	1-RPV-VB3	Middle Shell Longitudinal @ 240 deg.	A	3	50/70	Parallel	2 Directions	100%	
			A		50/70	Transverse	2 Directions	100%	
			B		45 & 60	Parallel	2 Directions	100%	
			BCD		45 & 60	Transverse	2 Directions	100%	
			C		45 & 60	Parallel	1 Direction	100%	
			D		45 & 60	Parallel	1 Direction	100%	
			ABCDEF		0	Lamination	N/A	100%	
			ABCD		0	Planar (Weld)	N/A	100%	
							Average	100%	

Donald C. Cook Nuclear Plant, Unit 1
1995 Reactor Vessel Inservice Inspection
Examination Coverage Tables (Cont'd)

Summary Number	Weld Number	Exam Area Identification	Exam		Beam Angle(s)	Exam Type	Beam Direction(s)	Code Coverage	Remarks
			Volume	Figure					
001000	1-RPV-VC1	Lower Shell Longitudinal @ 60 deg.	A	3	50/70	Parallel	2 Directions	77%	Limited examination due to the proximity of the core barrel support lugs.
			A		50/70	Transverse	2 Directions	77%	
			B		45 & 60	Parallel	2 Directions	77%	
			BCD		45 & 60	Transverse	2 Directions	77%	
			C		45 & 60	Parallel	1 Direction	78%	
			D		45 & 60	Parallel	1 Direction	78%	
			ABCDEF		0	Lamination	N/A	99%	
			ABCD		0	Planar (Weld)	N/A	77%	
							Average	80%	
001100	1-RPV-VC2	Lower Shell Longitudinal @ 180 deg.	A	3	50/70	Parallel	2 Directions	77%	Limited examination due to the proximity of the core barrel support lugs.
			A		50/70	Transverse	2 Directions	77%	
			B		45 & 60	Parallel	2 Directions	77%	
			BCD		45 & 60	Transverse	2 Directions	77%	
			C		45 & 60	Parallel	1 Direction	78%	
			D		45 & 60	Parallel	1 Direction	78%	
			ABCDEF		0	Lamination	N/A	99%	
			ABCD		0	Planar (Weld)	N/A	77%	
							Average	80%	
001200	1-RPV-VC3	Lower Shell Longitudinal @ 300 deg.	A	3	50/70	Parallel	2 Directions	77%	Limited examination due to the proximity of the core barrel support lugs.
			A		50/70	Transverse	2 Directions	77%	
			B		45 & 60	Parallel	2 Directions	77%	
			BCD		45 & 60	Transverse	2 Directions	77%	
			C		45 & 60	Parallel	1 Direction	78%	
			D		45 & 60	Parallel	1 Direction	78%	
			ABCDEF		0	Lamination	N/A	99%	
			ABCD		0	Planar (Weld)	N/A	77%	
							Average	80%	

Donald C. Cook Nuclear Plant, Unit 1
1995 Reactor Vessel Inservice Inspection
Examination Coverage Tables (Cont'd)

Summary Number	Weld Number	Exam Area Identification	Exam Volume	Figure	Beam Angle(s)	Exam Type	Beam Direction(s)	Code Coverage	Remarks
002200	1-LHM-03	Lower Head Meridional @150 deg.	A	3	50/70	Parallel	2 Directions	76%	Limited examination due to the proximity of the instrumentation tubes.
			A		50/70	Transverse	2 Directions	100%	
			B		45 & 60	Parallel	2 Directions	82%	
			BCD		45 & 60	Transverse	2 Directions	100%	
			C		45 & 60	Parallel	1 Direction	88%	
			D		45 & 60	Parallel	1 Direction	100%	
			ABCDEF		0	Lamination	N/A	100%	
			ABCD		0	Planar (Weld)	N/A	100%	
							Average	93%	
002600	1-RPV-A	Upper Shell -to- Flange	A	4	3,7,4,1	Parallel	2 Directions	100%	Limited examination due to the proximity of the flange keyways.
			A		11,4,18,0	Transverse	2 Directions	81%	
			B		50/70	Parallel	2 Directions	100%	
					3,7,4,1				
					11,4,18,0				
			BCD		45 & 60	Transverse	2 Directions	81%	
			C		3,7,4,1	Parallel	1 Direction	100%	
					11,4,18,0				
			D		3,7,4,1	Parallel	1 Direction	100%	
					11,4,18,0				
			ABCDEF		0	Lamination	N/A	100%	
			ABCD		0	Planar (Weld)	N/A	83%	
							Average	93%	

Donald C. Cook Nuclear Plant, Unit 1
1995 Reactor Vessel Inservice Inspection
Examination Coverage Tables (Cont'd)

Summary Number	Weld Number	Exam Area Identification	Exam		Beam Angle(s)	Exam Type	Beam Direction(s)	Code Coverage	Remarks
			Volume	Figure					
002800	1-N1A	Inlet Nozzle -to- Shell @ 247 deg.	A&B	5	6	Parallel	1 Direction	100%	
			A&B		45	Parallel	1 Direction	100%	
			B		50/70	Transverse	2 Directions	100%	
			A		45 & 60	Transverse	2 Directions	100%	
			A&B		0	Lamination	N/A	100%	
			A&B		0	Planar (Weld)	N/A	100%	
							Average	100%	
002900	1-N1B	Outlet Nozzle -to- Shell @ 202 deg.	A&B	6	6	Parallel	1 Direction	100%	Limited examination due to the proximity of the integral extension. Parallel examination performed during the 1989 ISI.
			A&B		45	Parallel	1 Direction	100%	
			B		50/70	Transverse	2 Directions	30%	
			A		45 & 60	Transverse	2 Directions	23%	
			A&B		0	Lamination	N/A	77%	
			A&B		0	Planar (Weld)	N/A	24%	
							Average	59%	
003100	1-N2A	Inlet Nozzle -to- Shell @ 293 deg.	A&B	5	6	Parallel	1 Direction	100%	
			A&B		45	Parallel	1 Direction	100%	
			B		50/70	Transverse	2 Directions	100%	
			A		45 & 60	Transverse	2 Directions	100%	
			A&B		0	Lamination	N/A	100%	
			A&B		0	Planar (Weld)	N/A	100%	
							Average	100%	

Donald C. Cook Nuclear Plant, Unit 1
1995 Reactor Vessel Inservice Inspection
Examination Coverage Tables (Cont'd)

Summary Number	Weld Number	Exam Area Identification	Exam		Beam Angle(s)	Exam Type	Beam Direction(s)	Code Coverage	Remarks
			Volume	Figure					
003200	1-N2B	Outlet Nozzle -to- Shell @ 338 deg.	A&B A&B B A A&B A&B	6	6 45 50/70 45 & 60 0 0	Parallel Parallel Transverse Transverse Lamination Planar (Weld)	N/A N/A 2 Directions 2 Directions N/A N/A Average	N/A N/A 30% 23% 77% 24% 39%	Limited examination due to the proximity of the integral extension.
003300	1-N3A	Inlet Nozzle -to- Shell @ 67 deg.	A&B A&B B A A&B A&B	5	6 45 50/70 45 & 60 0 0	Parallel Parallel Transverse Transverse Lamination Planar (Weld)	1 Direction 1 Direction 2 Directions 2 Directions N/A N/A Average	100% 100% 100% 100% 100% 100% 100%	
003400	1-N3B	Outlet Nozzle -to- Shell @ 22 deg.	A&B A&B B A A&B A&B	6	6 45 50/70 45 & 60 0 0	Parallel Parallel Transverse Transverse Lamination Planar (Weld)	1 Direction 1 Direction 2 Directions 2 Directions N/A N/A Average	100% 100% 30% 23% 77% 24% 59%	Limited examination due to the proximity of the integral extension. Parallel examination performed during the 1989 ISI.

Donald C. Cook Nuclear Plant, Unit 1
1995 Reactor Vessel Inservice Inspection
Examination Coverage Tables (Cont'd)

Summary Number	Weld Number	Exam Area Identification	Exam		Beam Angle(s)	Exam Type	Beam Direction(s)	Code Coverage	Remarks
			Volume	Figure					
003500	1-N4A	Inlet Nozzle -to- Shell @ 67 deg.	A&B A&B B A A&B A&B	5	6 45 50/70 45 & 60 0 0	Parallel Parallel Transverse Transverse Lamination Planar (Weld)	1 Direction 1 Direction 2 Directions 2 Directions N/A N/A Average	100% 100% 100% 100% 100% 100%	
003600	1-N4B	Outlet Nozzle -to- Shell '@ 158 deg.	A&B A&B B A A&B A&B	6	6 45 50/70 45 & 60 0 0	Parallel Parallel Transverse Transverse Lamination Planar (Weld)	N/A N/A 2 Directions 2 Directions N/A N/A Average	N/A N/A 30% 23% 77% 24% 39%	Limited examination due to the proximity of the integral extension.
003700	1-N1A-IRS	Inlet Nozzle Inner Radius @247 deg.	A	7	50/70	Transverse	2 Directions	100%	
004000	1-N2A-IRS	Inlet Nozzle Inner Radius @293 deg.	A	7	50/70	Transverse	2 Directions	100%	
004300	1-N3A-IRS	Inlet Nozzle Inner Radius @77 deg.	A	7	50/70	Transverse	2 Directions	100%	

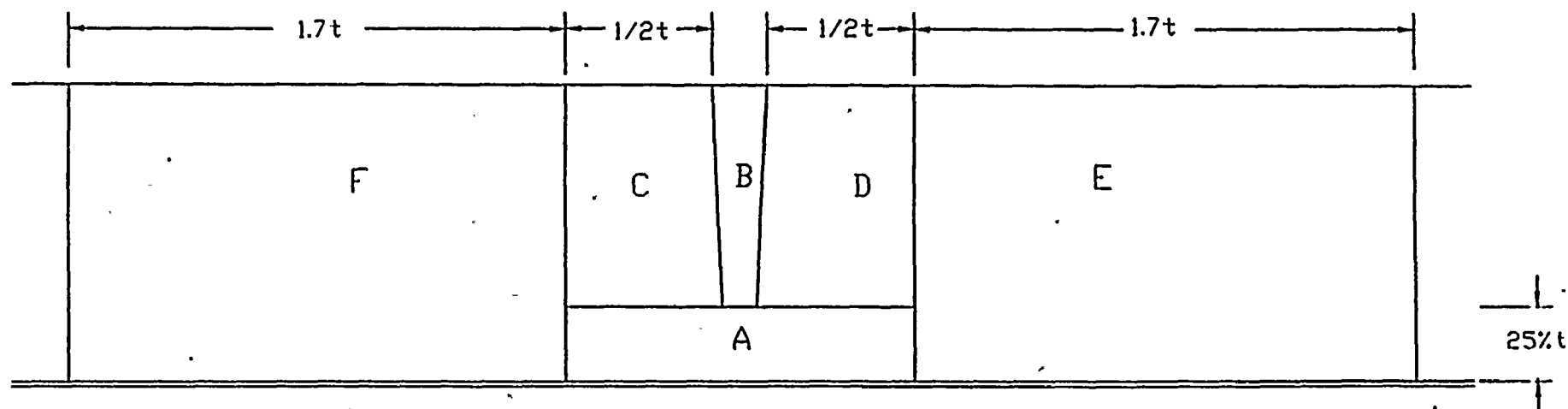
Donald C. Cook Nuclear Plant, Unit 1
1995 Reactor Vessel Inservice Inspection
Examination Coverage Tables (Cont'd)

Summary Number	Weld Number	Exam Area Identification	Exam		Beam Angle(s)	Exam Type	Beam Direction(s)	Code Coverage	Remarks
			Volume	Figure					
004600	1-N4A-IRS	Inlet Nozzle Inner Radius @ 113 deg.	A	7	50/70	Transverse	2 Directions	100%	
005200	1-RPV-1-02	Safe End -to- Nozzle @ 247 deg.	A A	8	SLIC 40 SLIC 40	Parallel Transverse	2 Directions 2 Directions Average	100% 100% 100%	
005400	1-RPV-2-02	Safe End -to- Nozzle @ 293 deg.	A A	8	SLIC 40 SLIC 40	Parallel Transverse	2 Directions 2 Directions Average	100% 100% 100%	
005600	1-RPV-3-02	Safe End -to- Nozzle @ 67 deg.	A A	8	SLIC 40 SLIC 40	Parallel Transverse	2 Directions 2 Directions Average	100% 100% 100%	
005800	1-RPV-4-02	Safe End -to- Nozzle @ 113 deg.	A A	8	SLIC 40 SLIC 40	Parallel Transverse	2 Directions 2 Directions Average	100% 100% 100%	
020000	1-RC-1-01F	Safe End -to- Pipe @ 202 deg.	A A	8	SLIC 40 SLIC 40	Parallel Transverse	2 Directions 2 Directions Average	100% 100% 100%	

Donald C. Cook Nuclear Plant, Unit 1
1995 Reactor Vessel Inservice Inspection
Examination Coverage Tables (Cont'd)

Summary Number	Weld Number	Exam Area Identification	Exam Volume	Exam Figure	Beam Angle(s)	Exam Type	Beam Direction(s)	Code Coverage	Remarks
028000	1-RC-3-21F	Elbow -to- Safe End @ 67 deg.	A A	8	SLIC 40 SLIC 40	Parallel Transverse	2 Directions 2 Directions Average	100% 100% 100%	

Limitations Report Prepared By: Carlos M. Barrera
Carlos M. Barrera
Level III

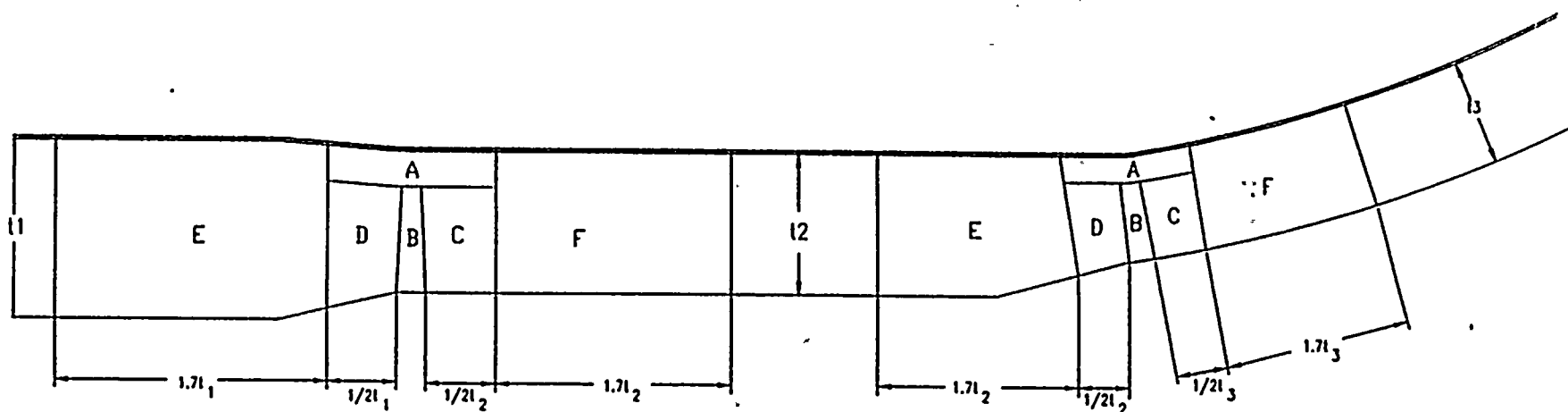


Vessel Shell Circumferential Welds
Other Than Vessel-to-Flange

Figure 1

D. C. Cook Unit 1
30 September 1995

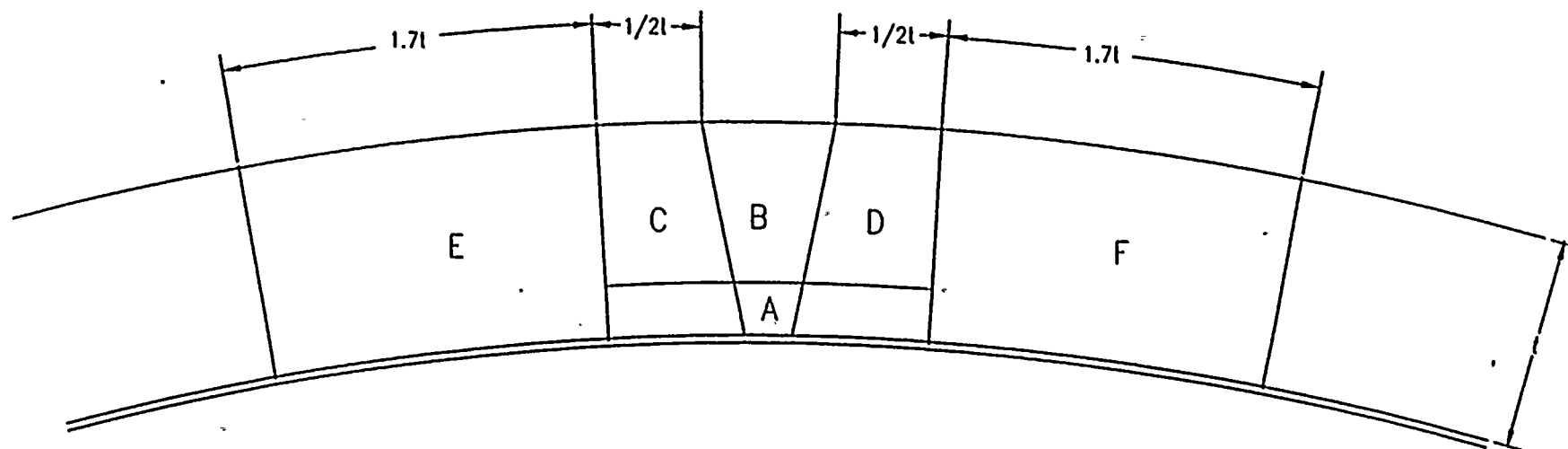
H-15



Vessel Shell Circumferential Welds
with Tapers

Figure 2

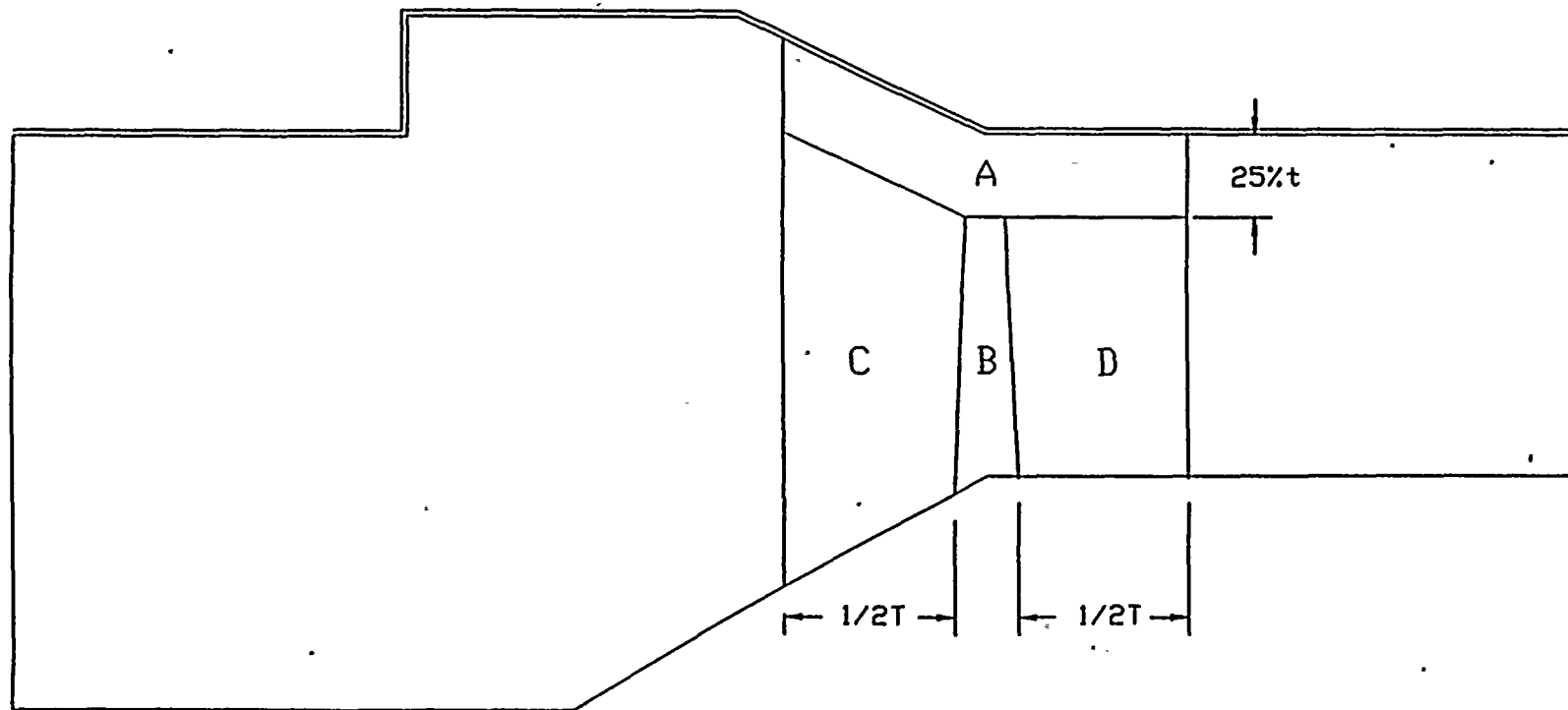
D. C. Cook Unit 1
30 September 1995



Longitudinal and Meridional Welds

Figure 3

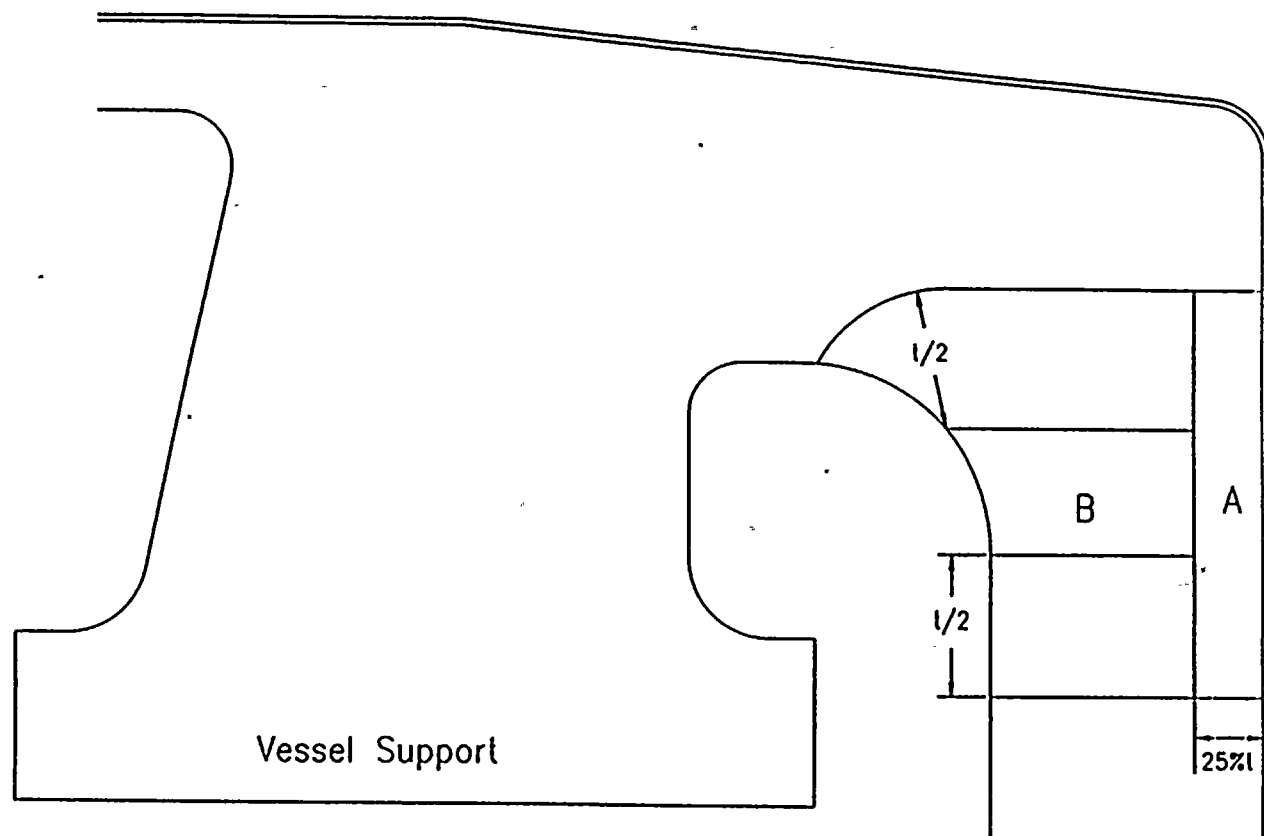
D. C. Cook Unit 1
30 September 1995



Vessel-to-Flange

Figure 4

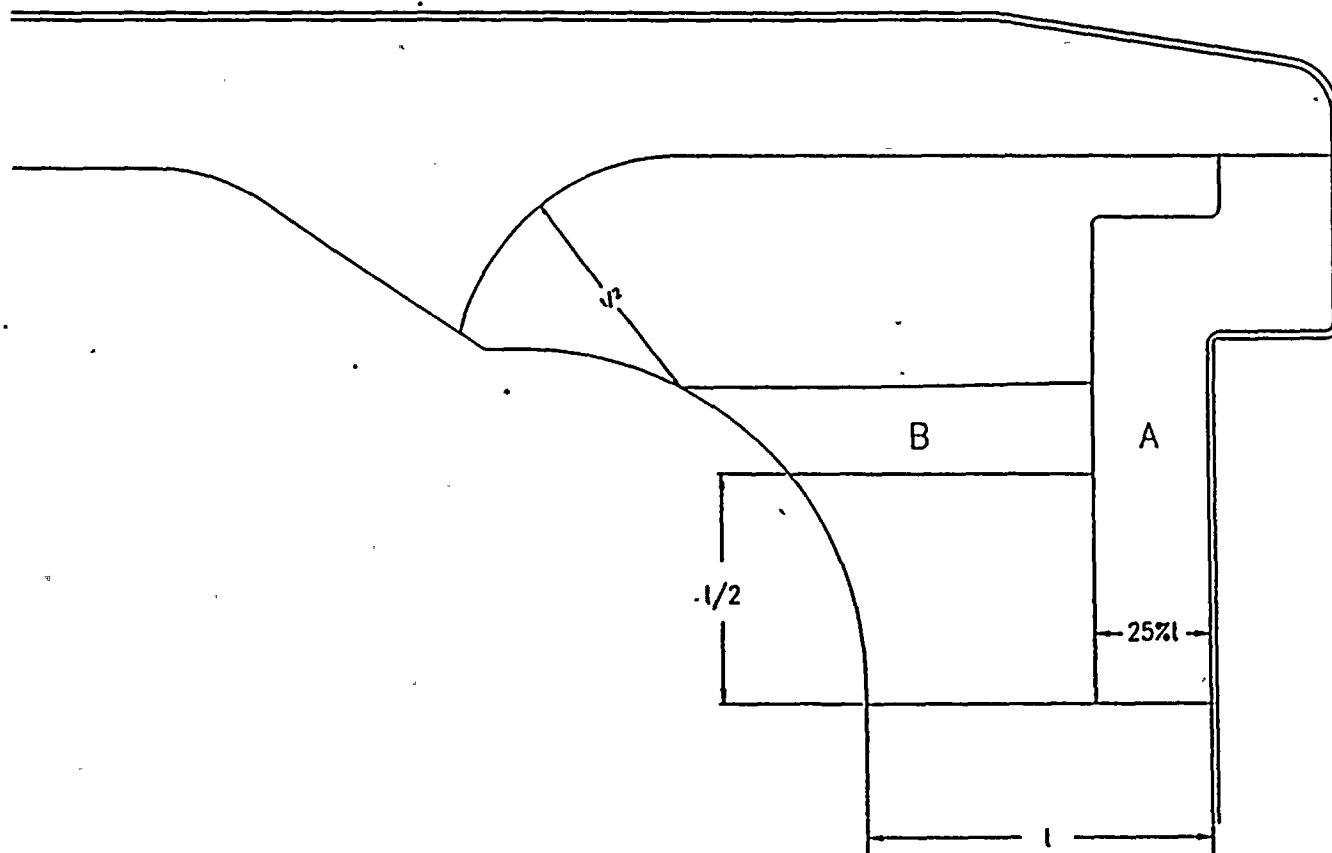
D. C. Cook Unit 1
30 September 1995



Inlet Nozzle-to-Shell Welds

Figure 5

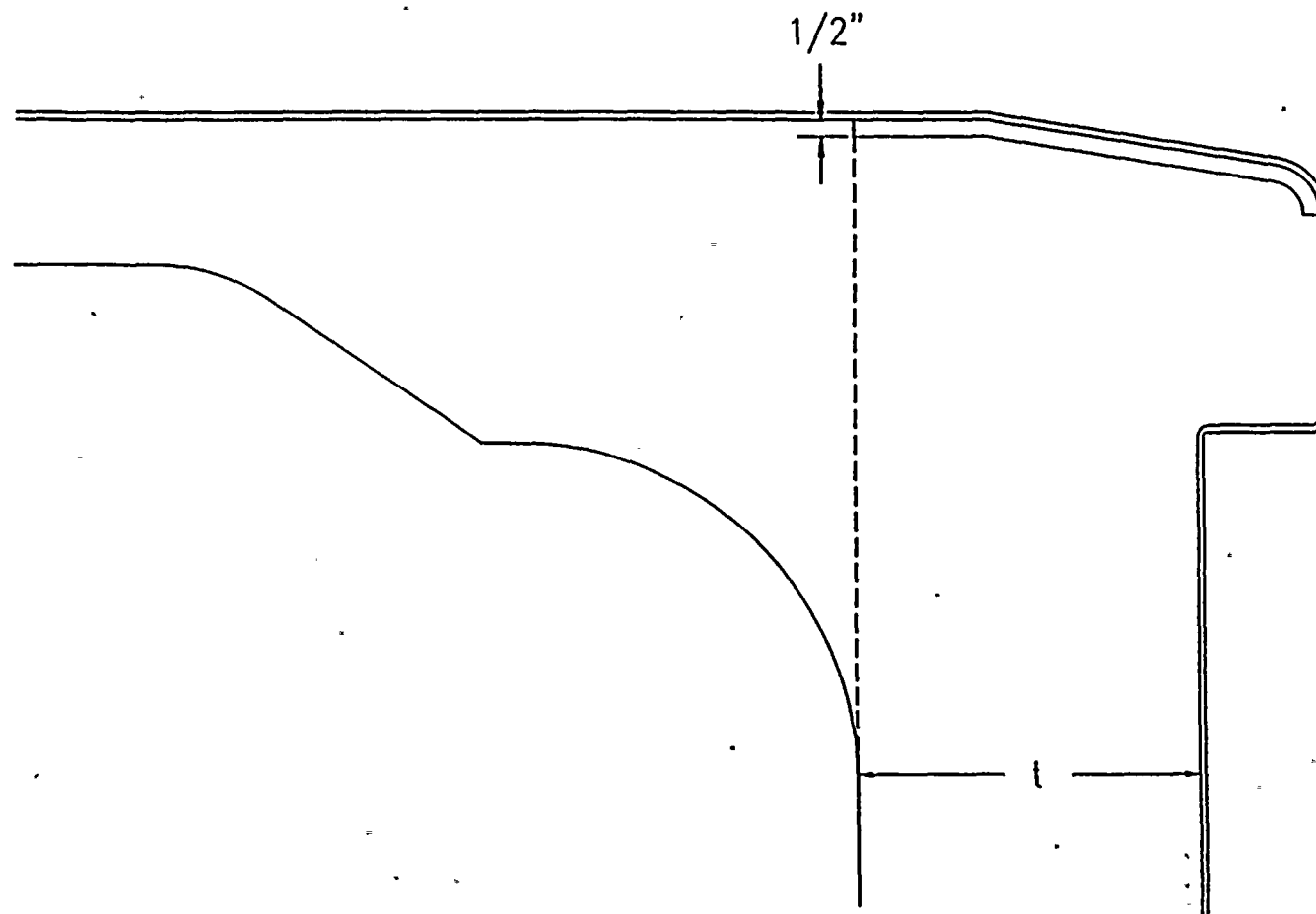
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30 September 1995



Outlet Nozzle-to-Shell Welds

Figure 6

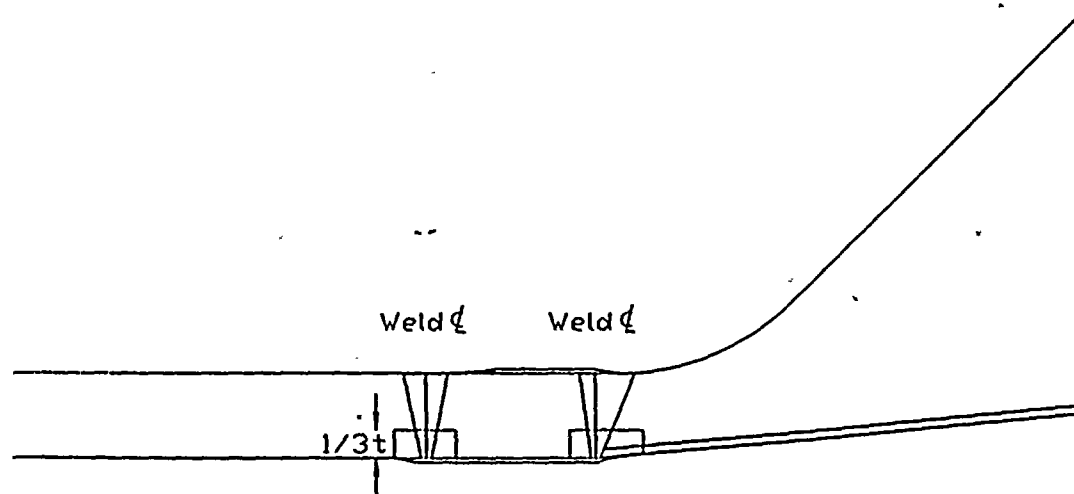
D. C. Cook Unit 1
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Inner Radius Section

Figure 7

D. C. Cook Unit 1
30 September 1995



Butt Welds

Figure 8

D. C. Cook Unit 1
30 September 1995

ATTACHMENT 4 TO AEP:NRC0969AJ

THIRD TEN-YEAR INTERVAL LONG TERM INSERVICE

EXAMINATION PLAN

50-315
1/25/96

**THIRD 10-YEAR INTERVAL LONG-TERM INSERVICE
EXAMINATION PLAN FOR CLASS 1, 2, AND 3 SYSTEMS
AND COMPONENTS FOR DONALD C. COOK
NUCLEAR PLANT, UNIT 1**


**VOLUME II
APPENDICES
SwRI Project 17-7208**

**Prepared for
American Electric Power Service Corporation
1 Riverside Plaza
Columbus, Ohio 43216-6631**


**Prepared by
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November 1995

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9601310012

APPENDIX A
WELD IDENTIFICATION FIGURES - CLASS 1

APPENDIX A

WELD IDENTIFICATION FIGURES - CLASS 1

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A-12	Line 1-RC-2 (Cold Leg)	5128	A-12
A-13	Line 1-RC-3 (Hot Leg)	5128	A-13
A-14	Line 1-RC-3 (Crossover Leg)	5128	A-14
A-15	Line 1-RC-3 (Cold Leg)	5128	A-15
A-16	Line 1-RC-4 (Hot Leg)	5128	A-16
A-17	Line 1-RC-4 (Crossover Leg)	5128	A-17
A-18	Line 1-RC-4 (Cold Leg)	5128	A-18
A-19	Line 1-RC-5 (Hot Leg)	5128A	A-19
A-20	Line 1-RC-6	5128A	A-20
A-21	Line 1-RC-6 (Cont'd)	5128A	A-21
A-22	Line 1-RC-6 (Cont'd)	5128A	A-22
A-23	Line 1-RC-7	5128A	A-23
A-24	Line 1-RC-8	5128A	A-24
A-25	Line 1-RC-9	5128A	A-25
A-26	Line 1-RC-10	5128A	A-26
A-27	Line 1-RC-10 (Cont'd)	5128A	A-27
A-28	Line 1-RC-11	5128A	A-28
A-29	Line 1-RC-12	5128	A-29
A-30	Line 1-RC-13	5128	A-30
A-31	Line 1-RC-13 (Cont'd)	5128	A-31
A-32	Line 1-RC-14	5128	A-32
A-33	Line 1-RC-14 (Cont'd)	5128	A-33
A-34	Line 1-RC-15	5128	A-34
A-35	Line 1-RC-15 (Cont'd)	5128	A-35
A-36	Line 1-RC-16	5128	A-36
A-37	Line 1-RC-16 (Cont'd)	5128	A-37
A-38	Line 1-RC-501	5128	A-38
A-39	Line 1-RC-504	5128	A-39
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APPENDIX A

WELD IDENTIFICATION FIGURES - CLASS 1

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A-47	Line 1-SI-21	5143	A-47
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A-49	Line 1-SI-23	5143	A-49
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A-51	Line 1-SI-26	5143	A-51
A-52	Line 1-SI-27	5143	A-52
A-53	Lines 1-SI-29, -28, -68	5143	A-53
A-54	Lines 1-SI-31, -30, -69	5143	A-54
A-55	Lines 1-SI-33, -32, 70; 1-RH-30	5143	A-55
A-56	Lines 1-SI-35, -34	5143	A-56
A-57	Line 1-SI-39	5142	A-57
A-58	Line 1-SI-40	5142	A-58
A-59	Line 1-SI-51	5142	A-59
A-60	Line 1-SI-545	5142	A-60
A-61	Line 1-SI-545 (Cont'd)	5142	A-61
A-62	Line 1-SI-545 (Cont'd)	5142	A-62
A-63	Line 1-SI-546	5142	A-63
A-64	Line 1-SI-546 (Cont'd)	5142	A-64
A-65	Line 1-SI-546 (Cont'd)	5142	A-65
A-66	Line 1-SI-548	5142	A-66
A-67	Line 1-SI-548 (Cont'd)	5142	A-67
A-68	Line 1-SI-548 (Cont'd)	5142	A-68
A-69	Line 1-SI-549	5142	A-69
A-70	Line 1-SI-549 (Cont'd)	5142	A-70
A-71	Line 1-SI-549 (Cont'd)	5142	A-71
A-72	Line 1-SI-549 (Cont'd)	5142	A-72
A-73	Line 1-SI-549 (Cont'd)	5142	A-73
<u>Chemical and Volume Control</u>			
A-74	Line 1-CS-92	5128	A-74
A-75	Line 1-CS-96	5128	A-75
A-76	Line 1-CS-99	5128	A-76
A-77	Line 1-CS-780	5129	A-77
A-78	Line 1-CS-780 (Cont'd)	5128	A-78

*Designated as Part of the High Pressure Safety Injection System

APPENDIX A

WELD IDENTIFICATION FIGURES - CLASS 1

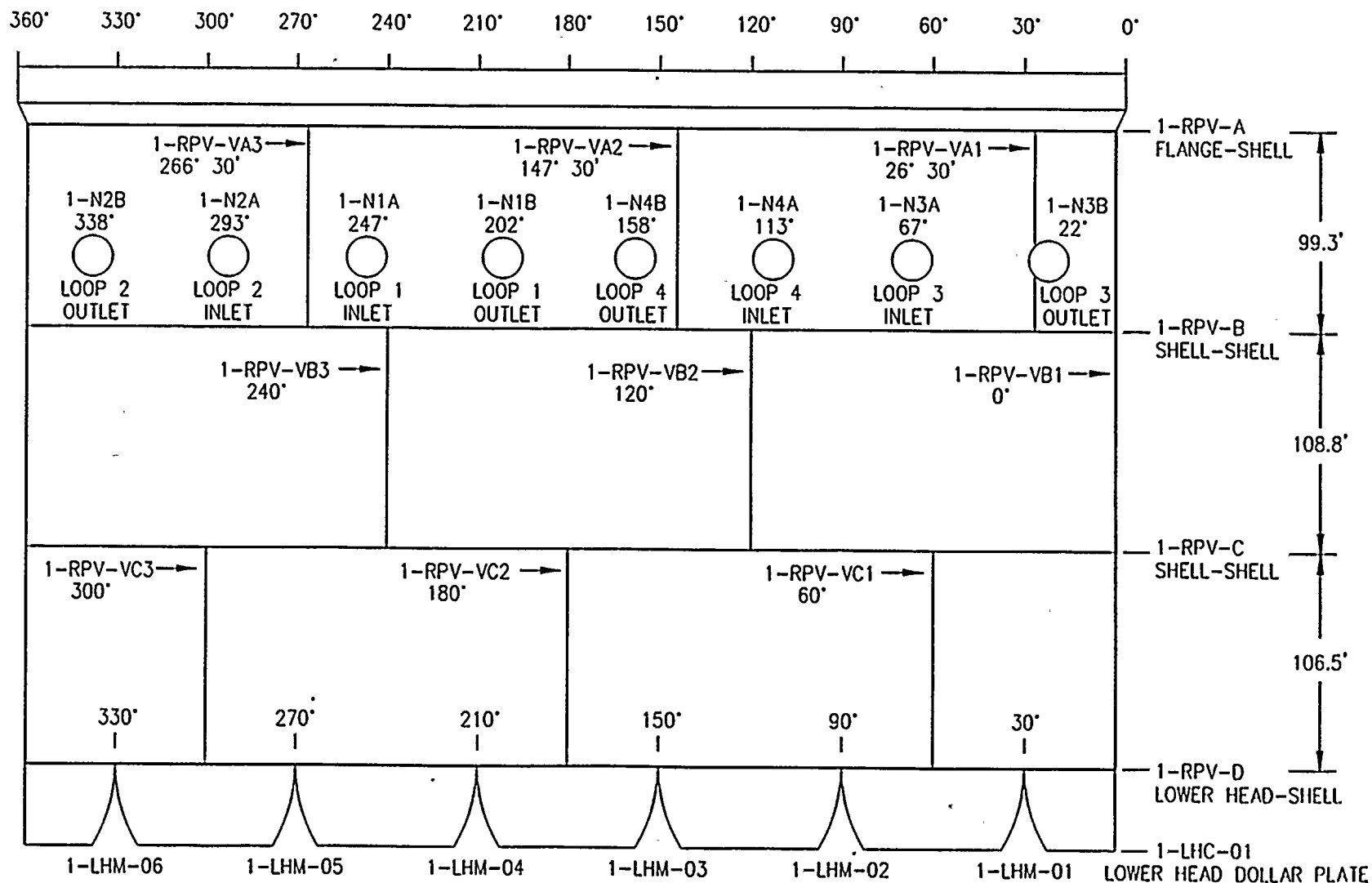
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A-80	Line 1-RH-28	5143	A-80
A-81	Line 1-RH-29	5143	A-81
<u>Waste Disposal</u>			
A-82	Line 1-WD-640	5128	A-82
A-83	Line 1-WD-642	5128	A-83
A-84	Line 1-WD-644	5128	A-84
A-85	Line 1-WD-651	5128	A-85
A-86	Typical Reactor Coolant Pump Stud Location		A-86

	Bend		Penetration of Wall, Floor, etc.
	Branch Connection, Requires Examination With Branch Line Shown in Detail		Pipe Lug(s)
	Branch Connection, Requires Examination With Branch Line Shown on Another Isometric		Spring Hanger
	Branch Connection, Does Not Require Examination		Pipe Restraint, Not Welded
	Butt Weld		Pipe Restraint
	Cap		Pipe Support, Welded
	Cat Walk		Whip Restraint
	Class Boundary		Pump
	Class X Class Y		Reducer
	Coupling, Socket Weld		A X B
	Coupling, Butt and Socket Weld		Socket Weld
	Elbow		Tee
	Flange		Valve, Relief
	Flow Direction		Valve, Check
	Line Break		Valve, Check
	Line Continuation		Valve, Globe
			Valve, Other

SYMBOLS FOR WELD IDENTIFICATION

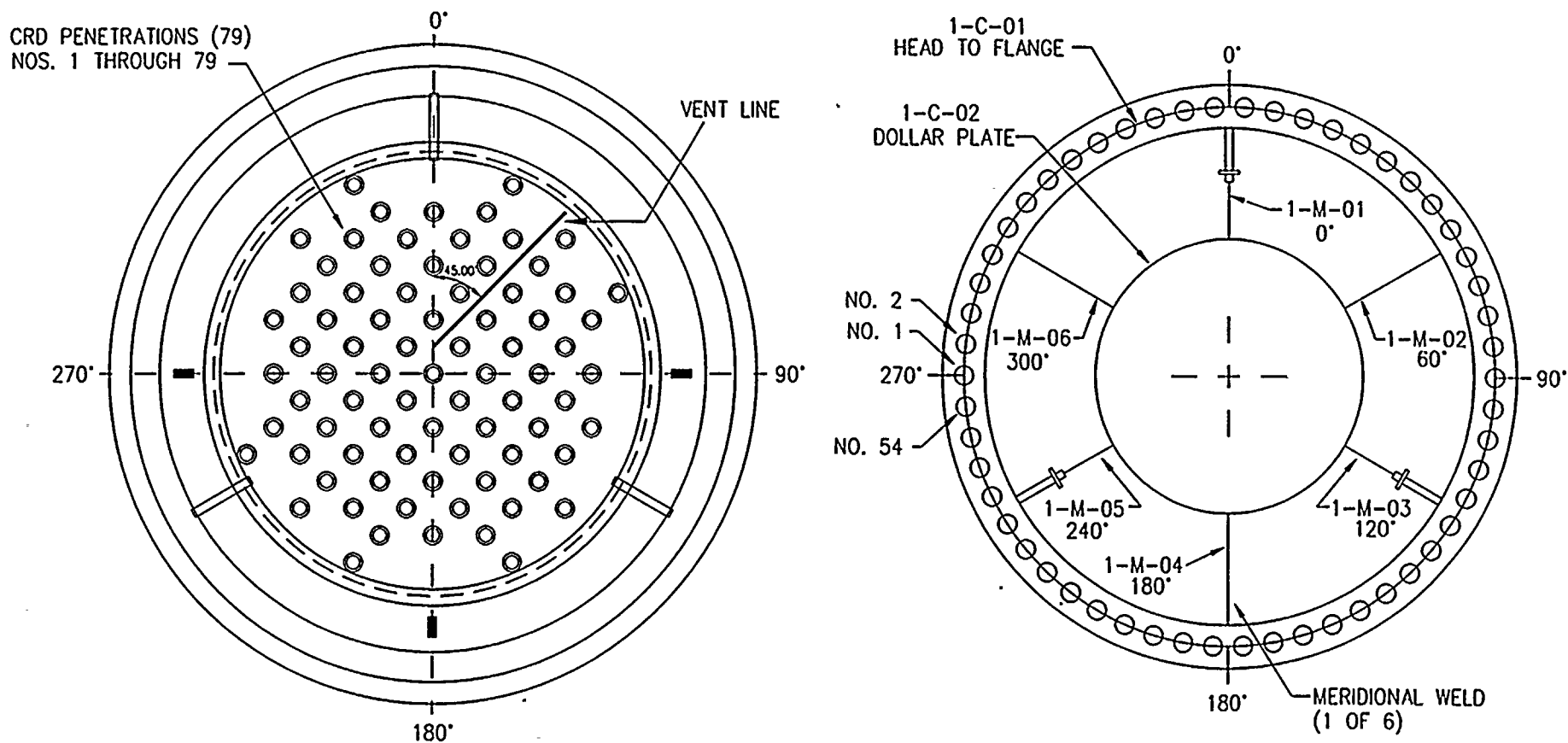
A-1



D. C. COOK, UNIT 1

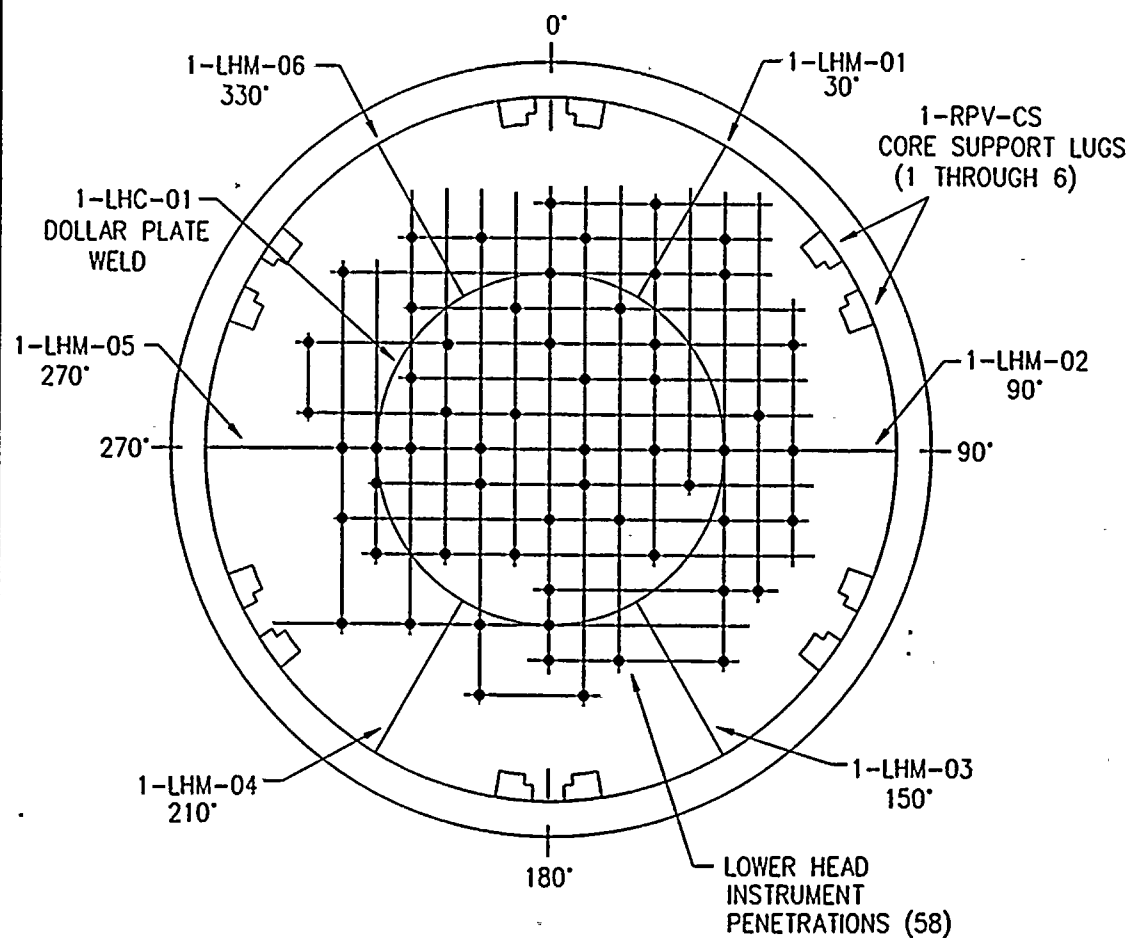
FIG. A-1 REACTOR PRESSURE VESSEL LAYOUT

A-2

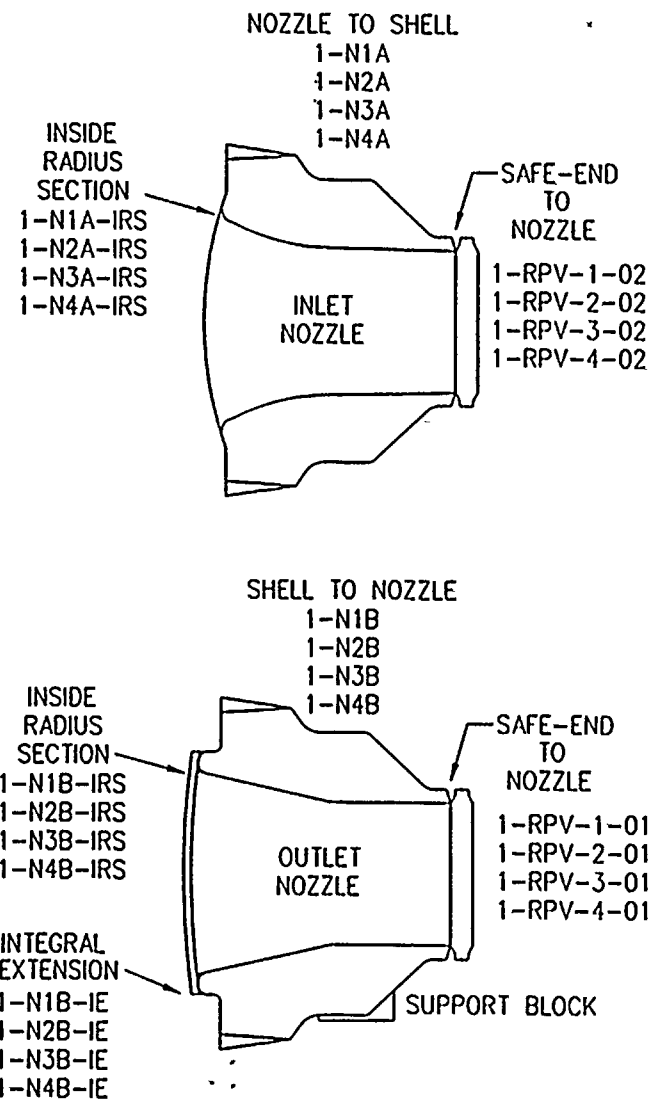


D. C. COOK, UNIT 1

FIG. A-2 REACTOR PRESSURE VESSEL CLOSURE HEAD LAYOUT

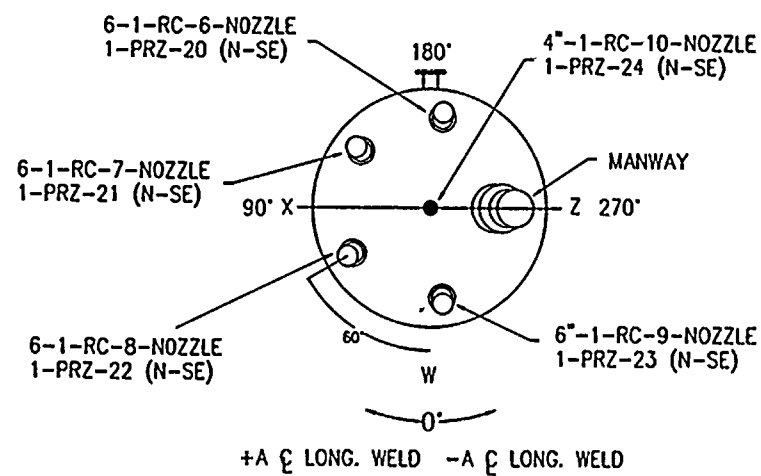
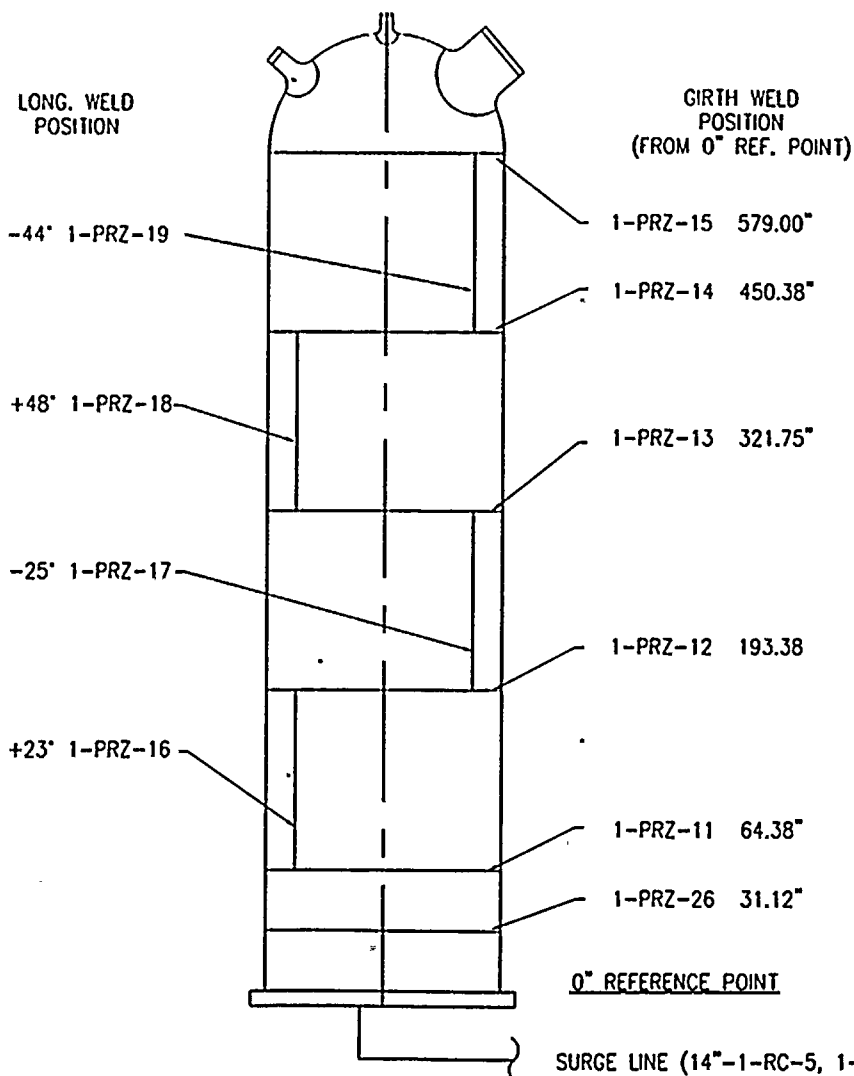


RPV LOWER HEAD



RPV VESSEL NOZZLES

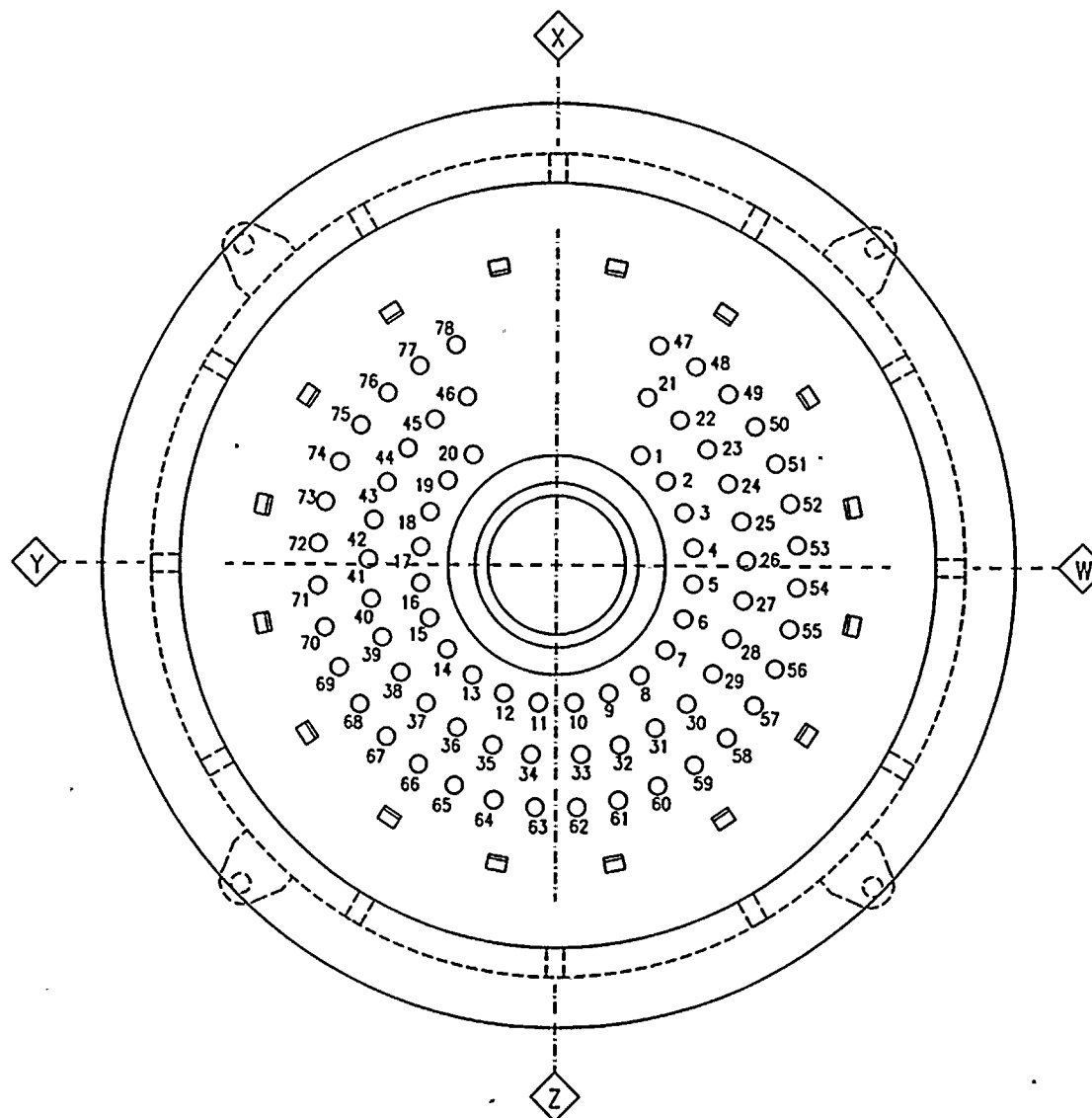
A-4



D. C. COOK, UNIT 1

FIG. A-4 PRESSURIZER

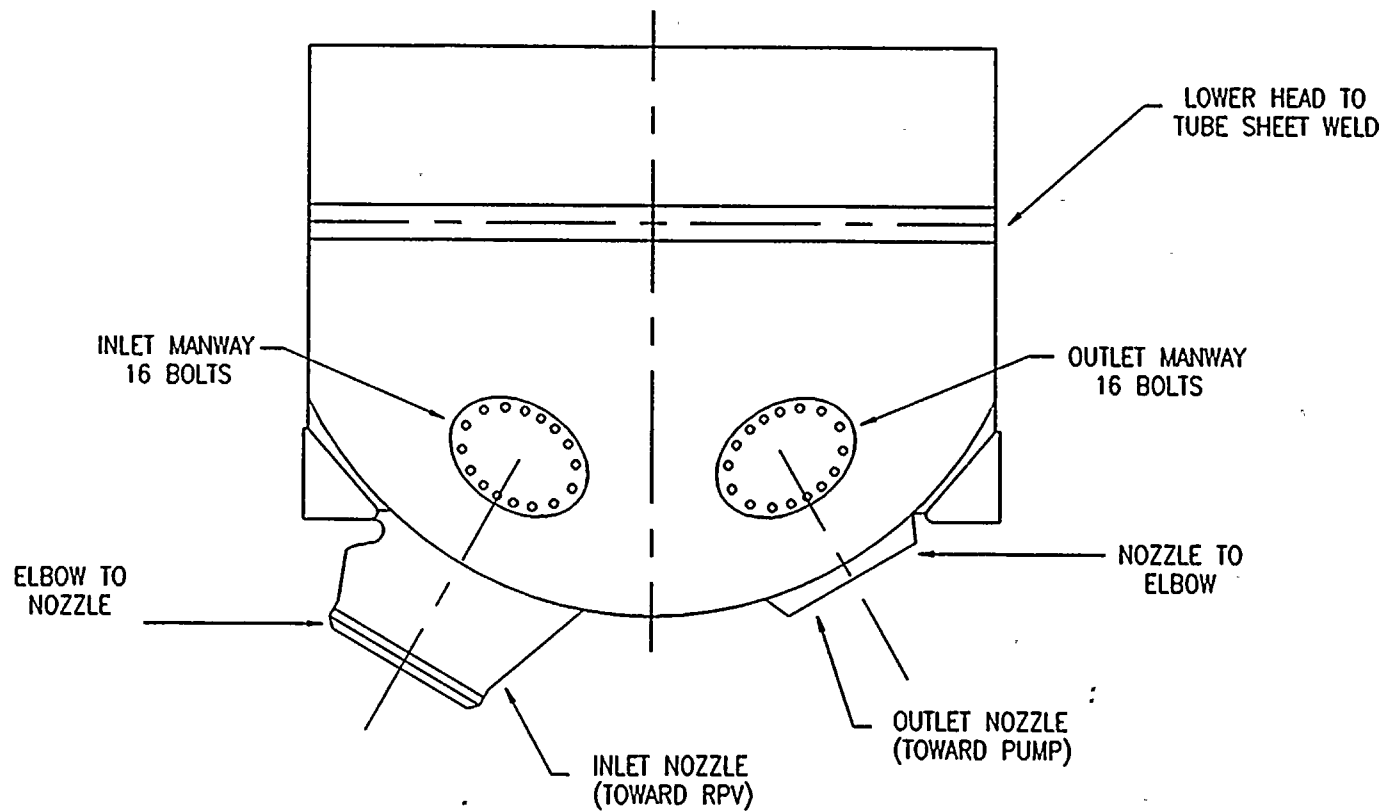
A-5



HEATER PENETRATIONS
NOS. 1 THROUGH 78

D. C. COOK, UNIT 1

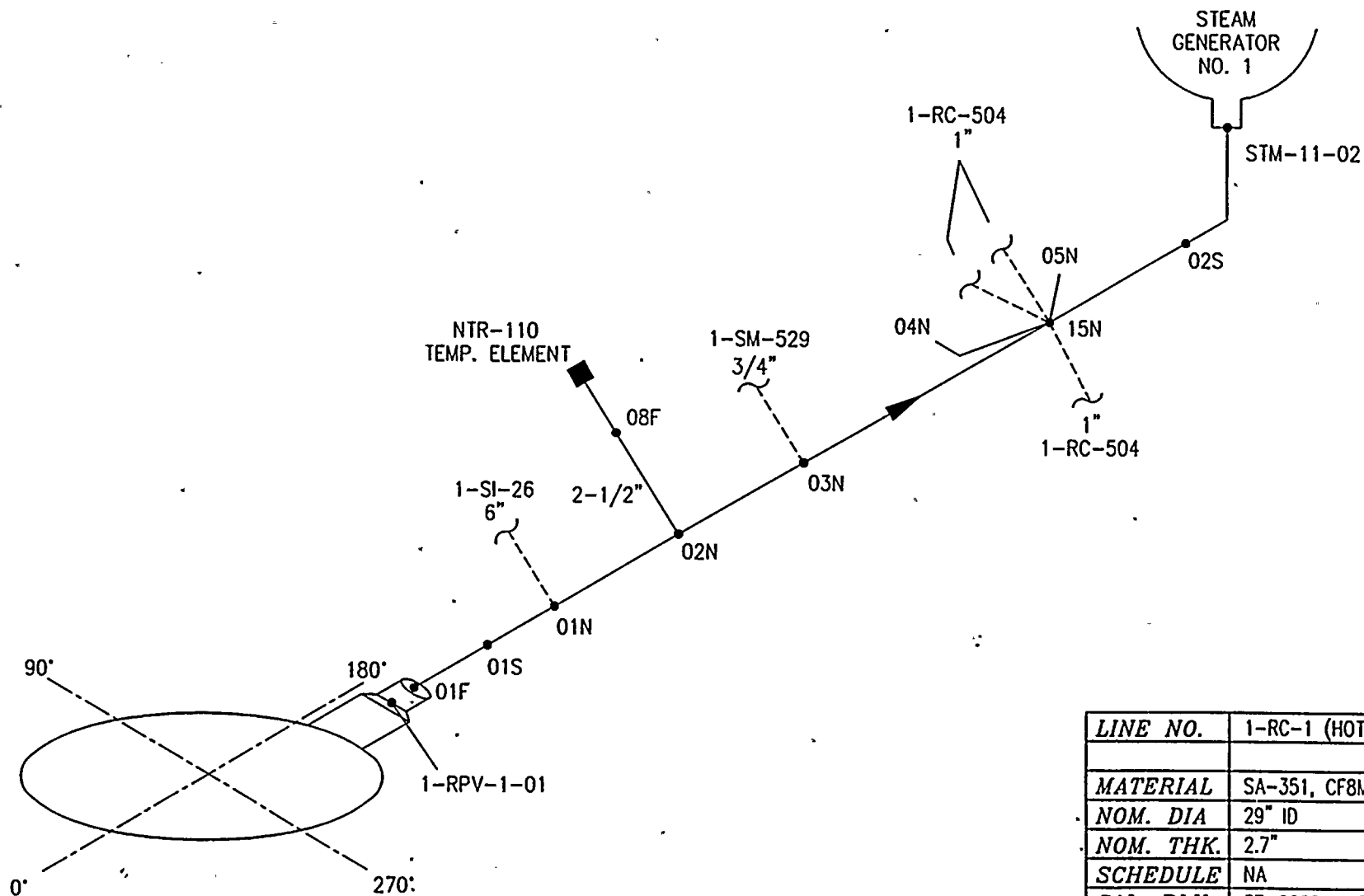
FIG. A-5 PRESSURIZER LOWER HEAD LAYOUT



STEAM GENERATOR NO.	LOWER HEAD TO TUBE SHEET WELD	INLET ELBOW-TO-NOZZLE	OUTLET NOZZLE-TO-ELBOW
11	STM-11-01	STM-11-02	STM-11-03
12	STM-12-01	STM-12-02	STM-12-03
13	STM-13-01	STM-13-02	STM-13-03
14	STM-14-01	STM-14-02	STM-14-03

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FIG. A-6 STEAM GENERATORS 11, 12, 13 AND 14

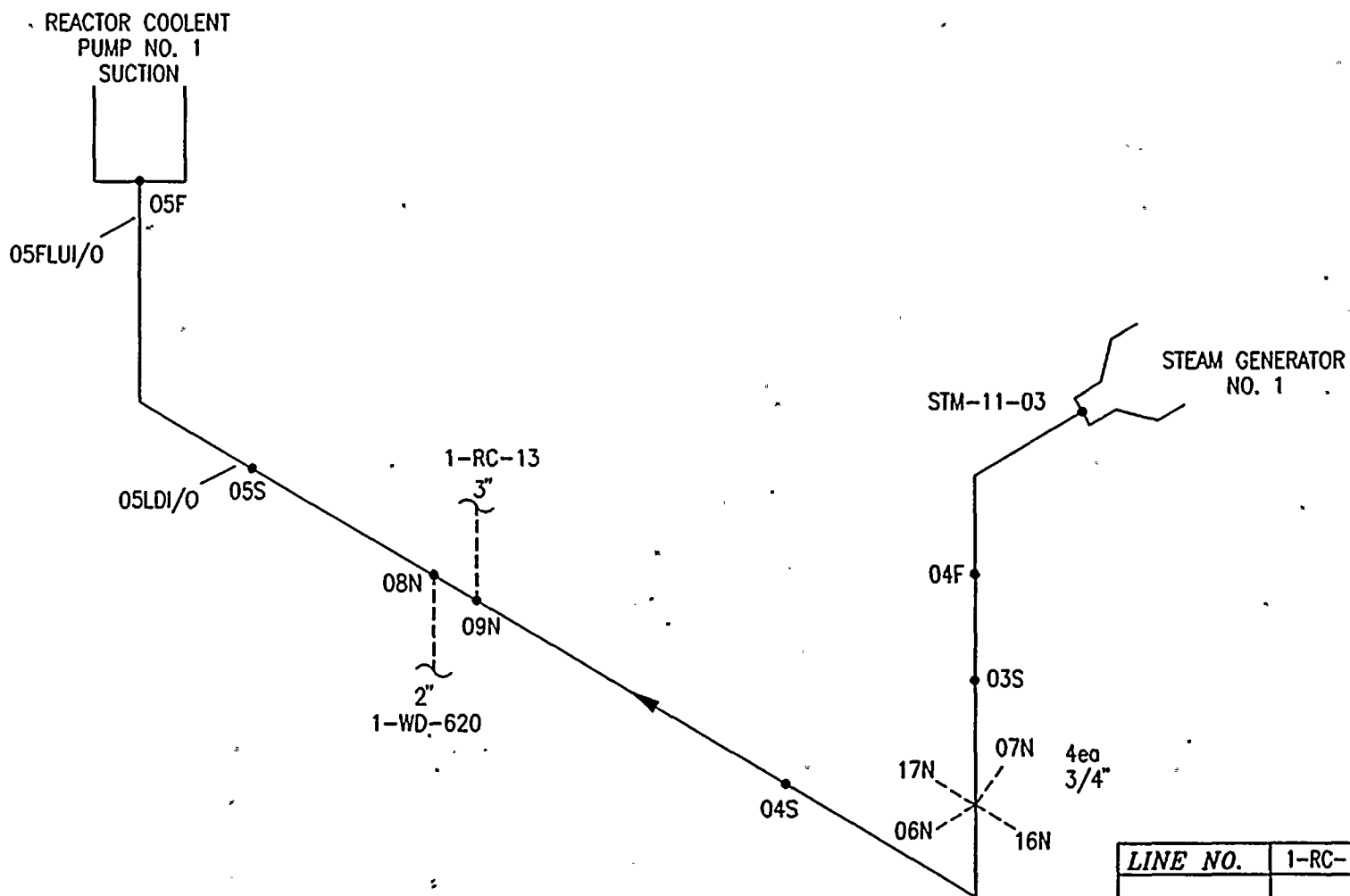


<i>LINE NO.</i>	1-RC-1 (HOT LEG)
<i>MATERIAL</i>	SA-351, CF8M
<i>NOM. DIA</i>	29" ID
<i>NOM. THK.</i>	2.7"
<i>SCHEDULE</i>	NA
<i>CAL. BLK.</i>	37-CCSS-X-3.0-9-0CC
<i>LOCATION</i>	

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FIG. A-7 REACTOR COOLANT SYSTEM

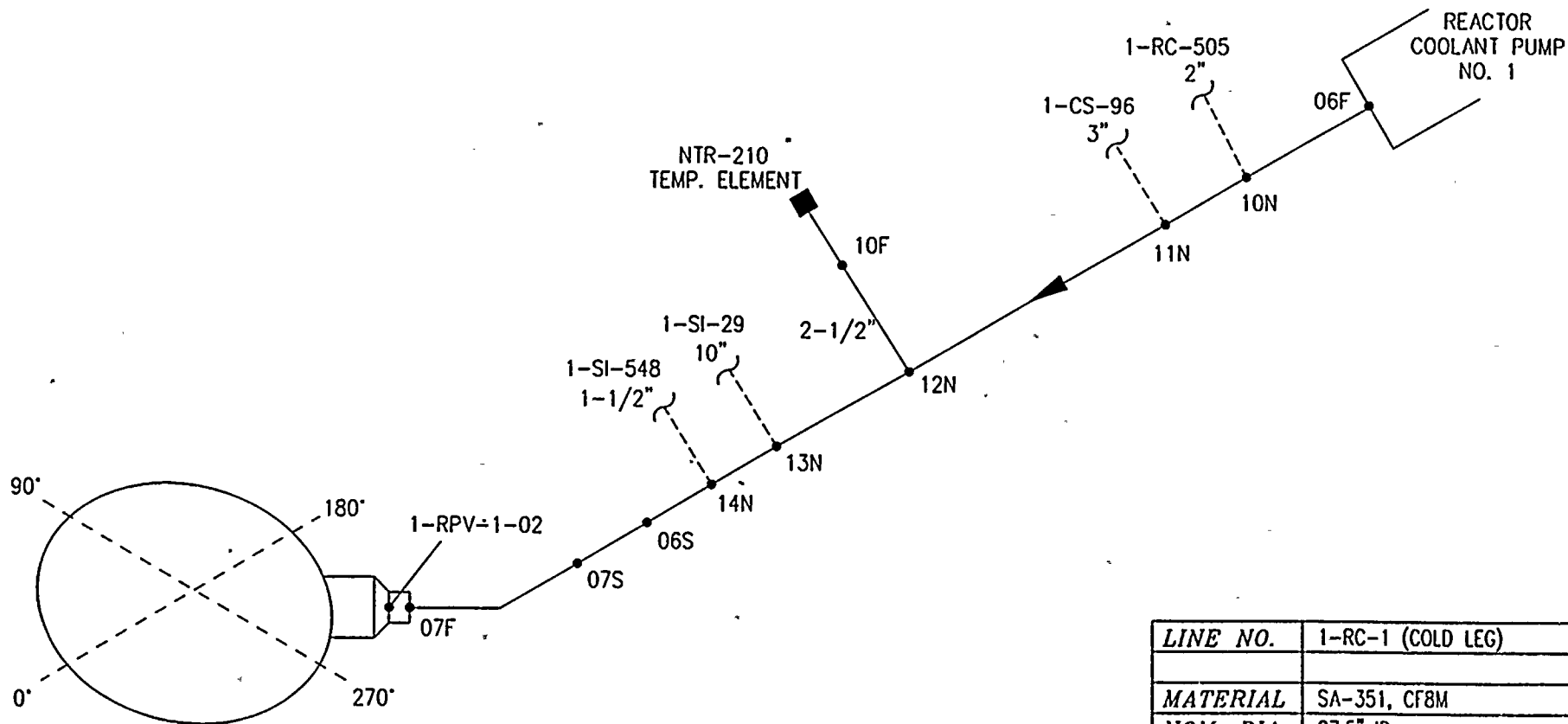
REF. DRAWING:	AEP 1-RC-1
FLOW DIAGRAM:	1-5128



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FIG. A-8 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-1
 FLOW DIAGRAM: 1-5128



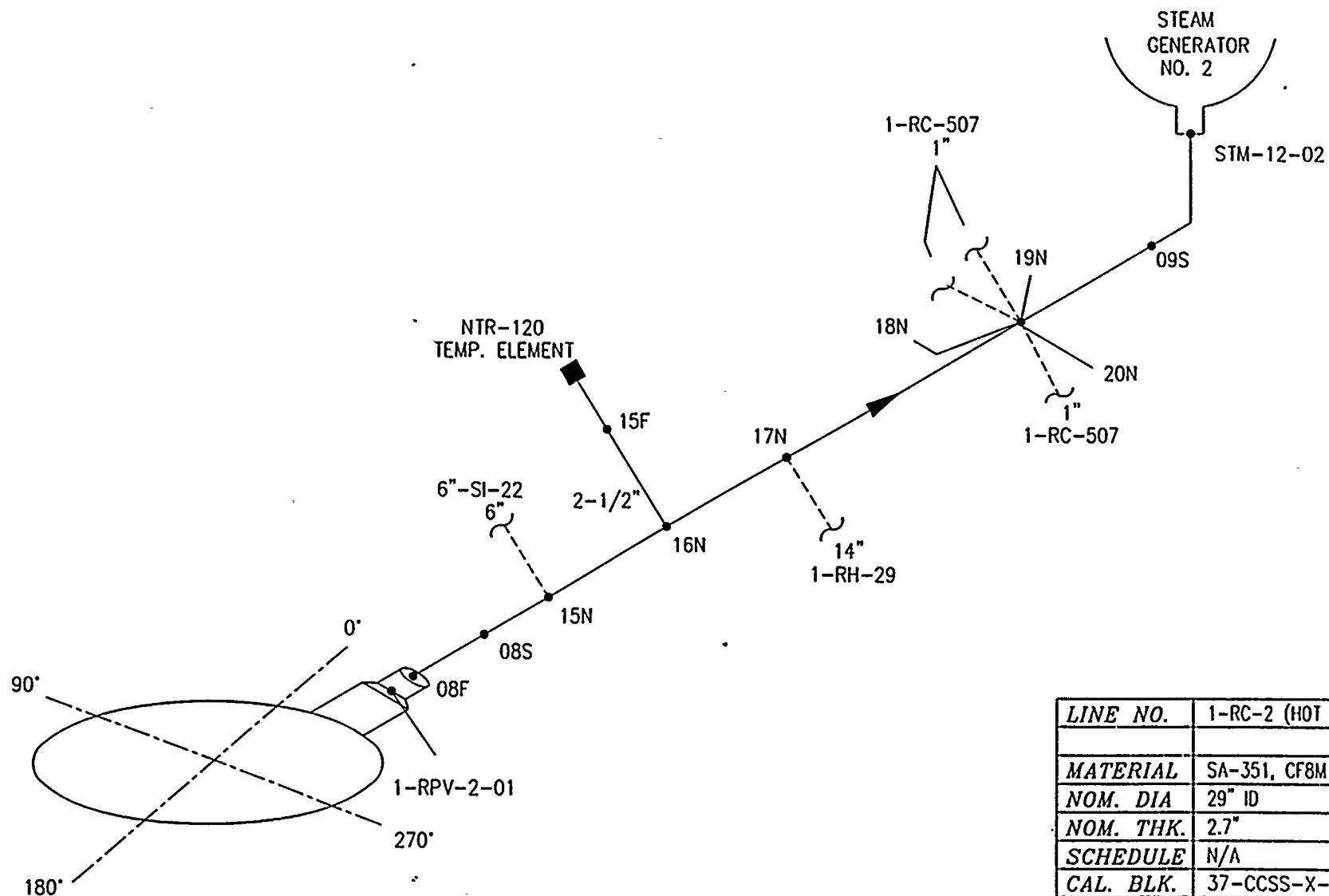
LINE NO.	1-RC-1 (COLD LEG)
MATERIAL	SA-351, CF8M
NOM. DIA	27.5" ID
NOM. THK.	2.56"
SCHEDULE	N/A
CAL. BLK.	37-CCSS-X-3.0-9-DCC
LOCATION	

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FIG. A-9 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-1

FLOW DIAGRAM: 1-2-5128



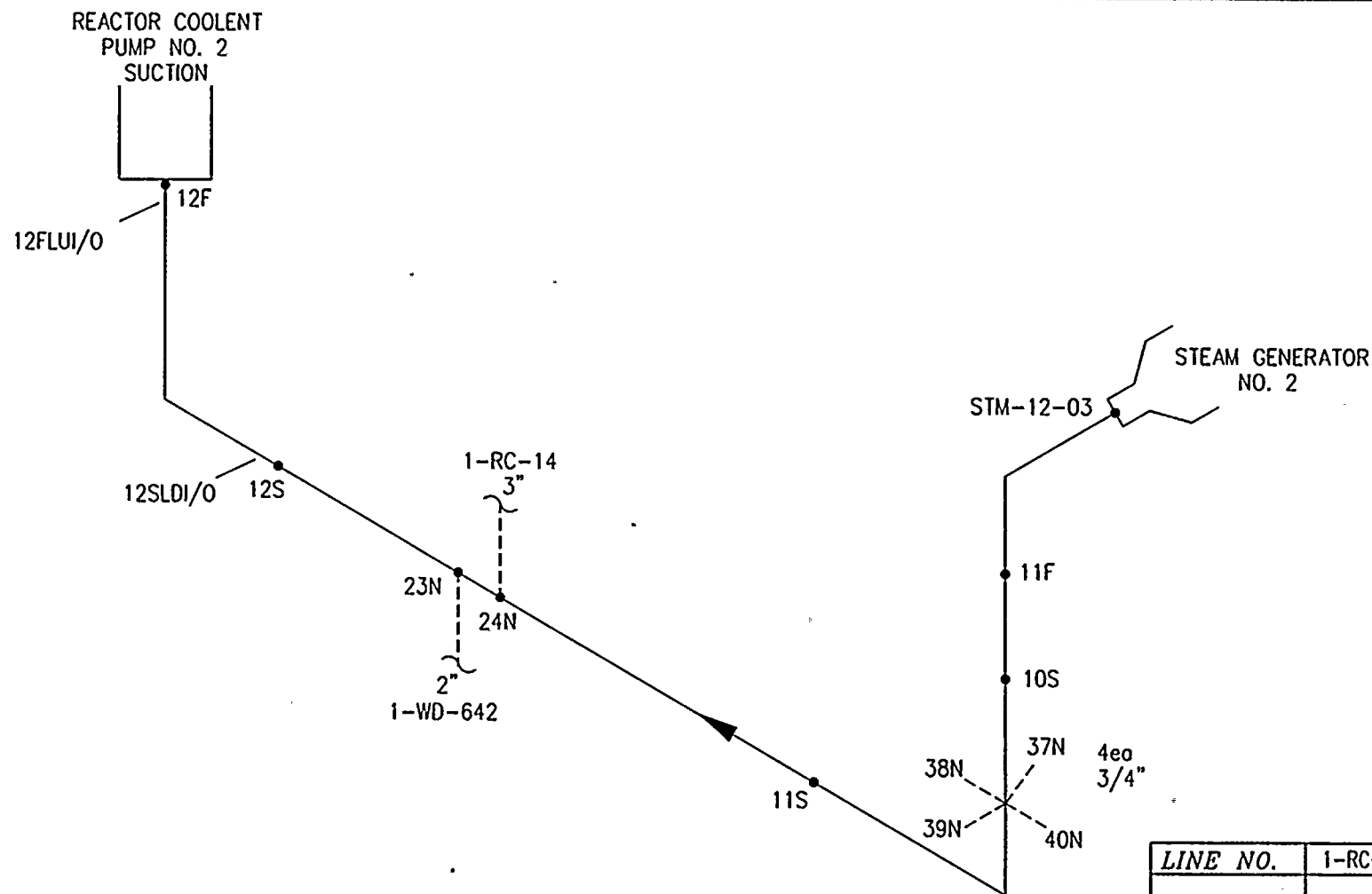
D. C. COOK, UNIT 1

FIG. A-10 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-2

FLOW DIAGRAM: 1-5128-25

A-11



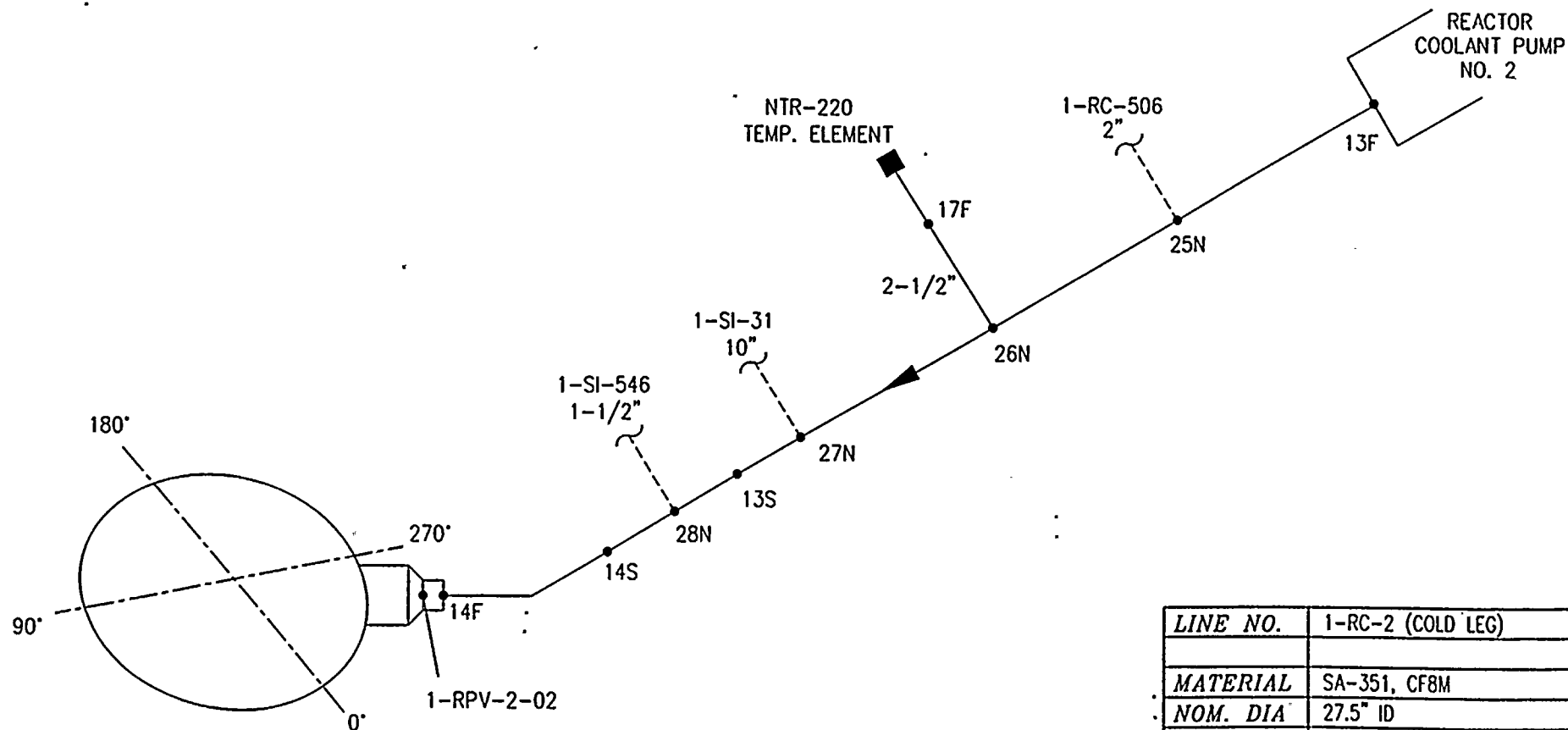
LINE NO.	1-RC-2 (CROSSOVER LEG)
MATERIAL	SA-351, CF8M
NOM. DIA	31" ID
NOM. THK.	2.88"
SCHEDULE	N/A
CAL. BLK.	37-CCSS-X-3.0-9-DCC
LOCATION	

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FIG. A-11 REACTOR COOLANT SYSTEM

 REF. DRAWING: AEP 1'-RC-2
 FLOW DIAGRAM: 1-5128

A-12

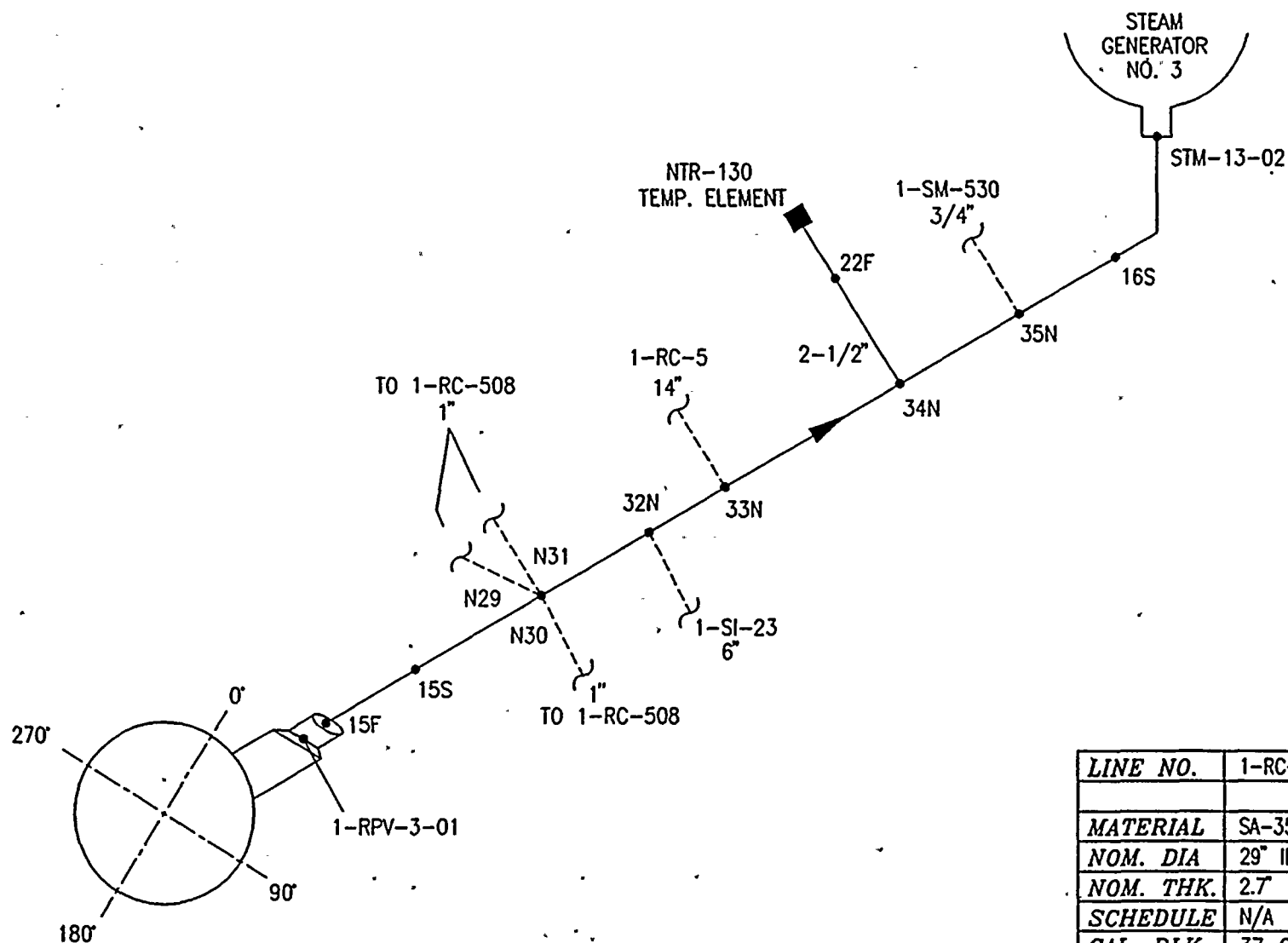


LINE NO.	1-RC-2 (COLD LEG)
MATERIAL	SA-351, CF8M
NOM. DIA	27.5" ID
NOM. THK.	2.56"
SCHEDULE	N/A
CAL. BLK.	37-CCSS-X-3.0-9-DCC
LOCATION	

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FIG. A-12 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-2
 FLOW DIAGRAM: 1-5128

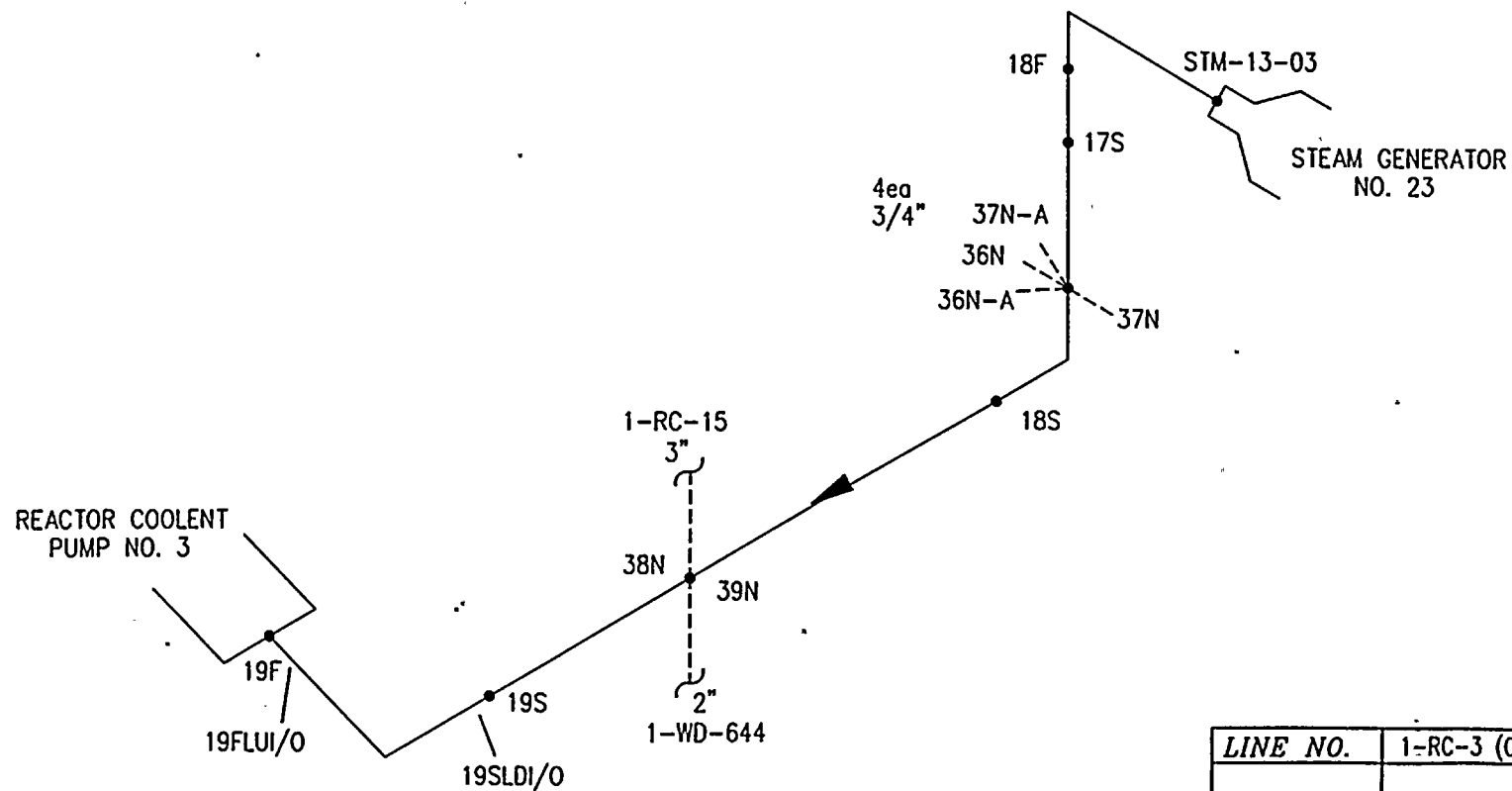


LINE NO.	1-RC-3 (HOT LEG)
MATERIAL	SA-351, CF8M
NOM. DIA	29" ID
NOM. THK.	2.7
SCHEDULE	N/A
CAL. BLK.	37-CCSS-X-3.0-9-DCC
LOCATION	

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FIG. A-13 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-3
 FLOW DIAGRAM: 1-5128



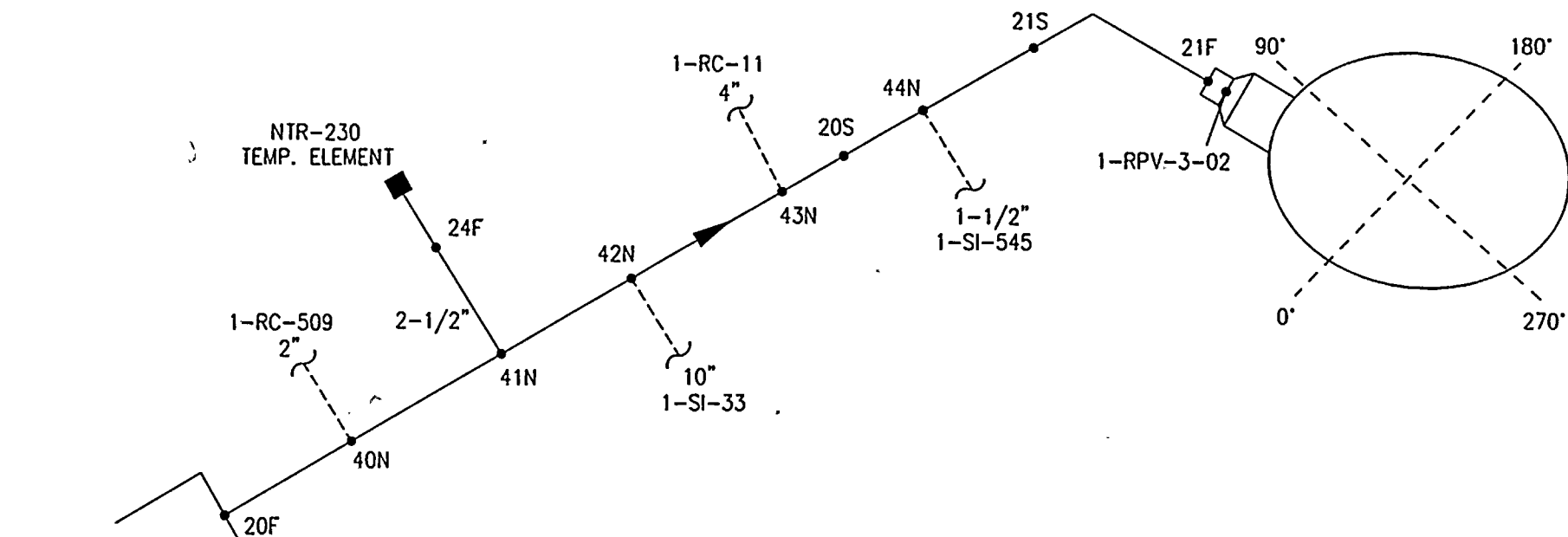
LINE NO.	1-RC-3 (CROSSOVER LEG)
MATERIAL	SA-351, CF8M
NOM. DIA	31" ID
NOM. THK.	2.88"
SCHEDULE	N/A
CAL. BLK.	37-CCSS-X-3.0-9-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. A-14 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-3

FLOW DIAGRAM: 1-5128-25



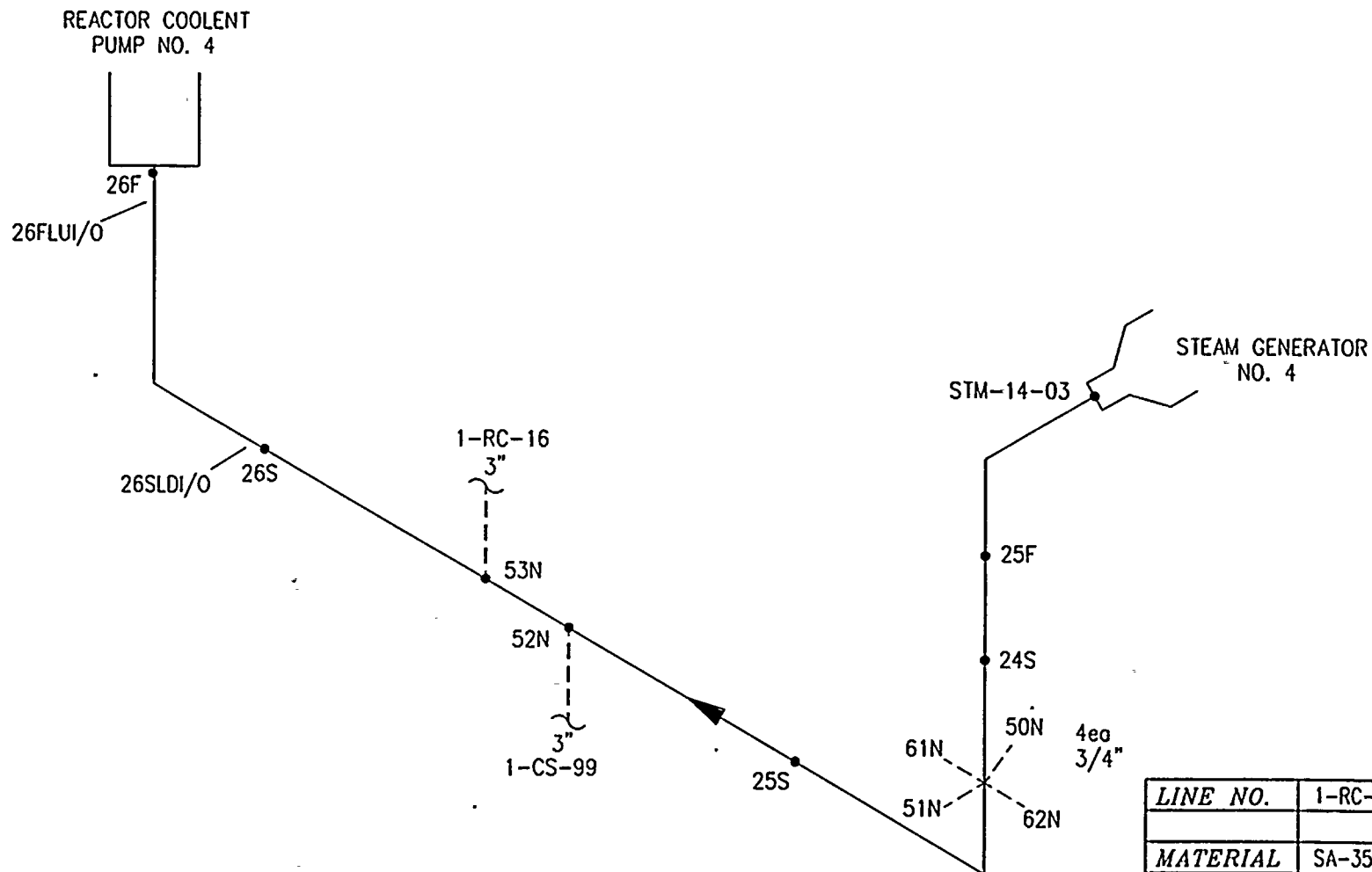
LINE NO.	1-RC-3 (COLD LEG)
MATERIAL	SA-351, CF8M
NOM. DIA	27.5" ID
NOM. THK.	2.56"
SCHEDULE	N/A
CAL. BLK.	37-CCSS-X-3.0-9-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. A-15 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-3

FLOW DIAGRAM: 1-5128-25

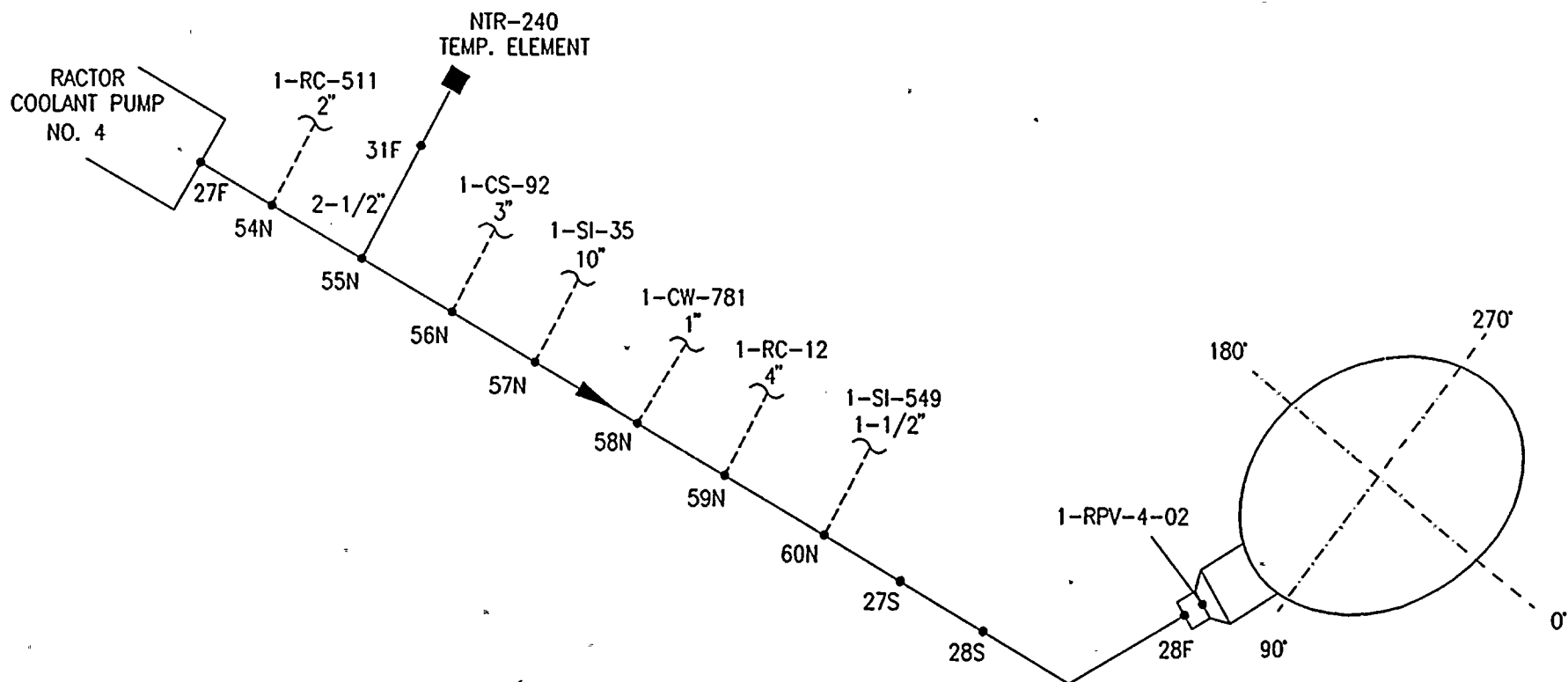


D. C. COOK, UNIT 1

FIG. A-17 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-4

FLOW DIAGRAM: 1-5128



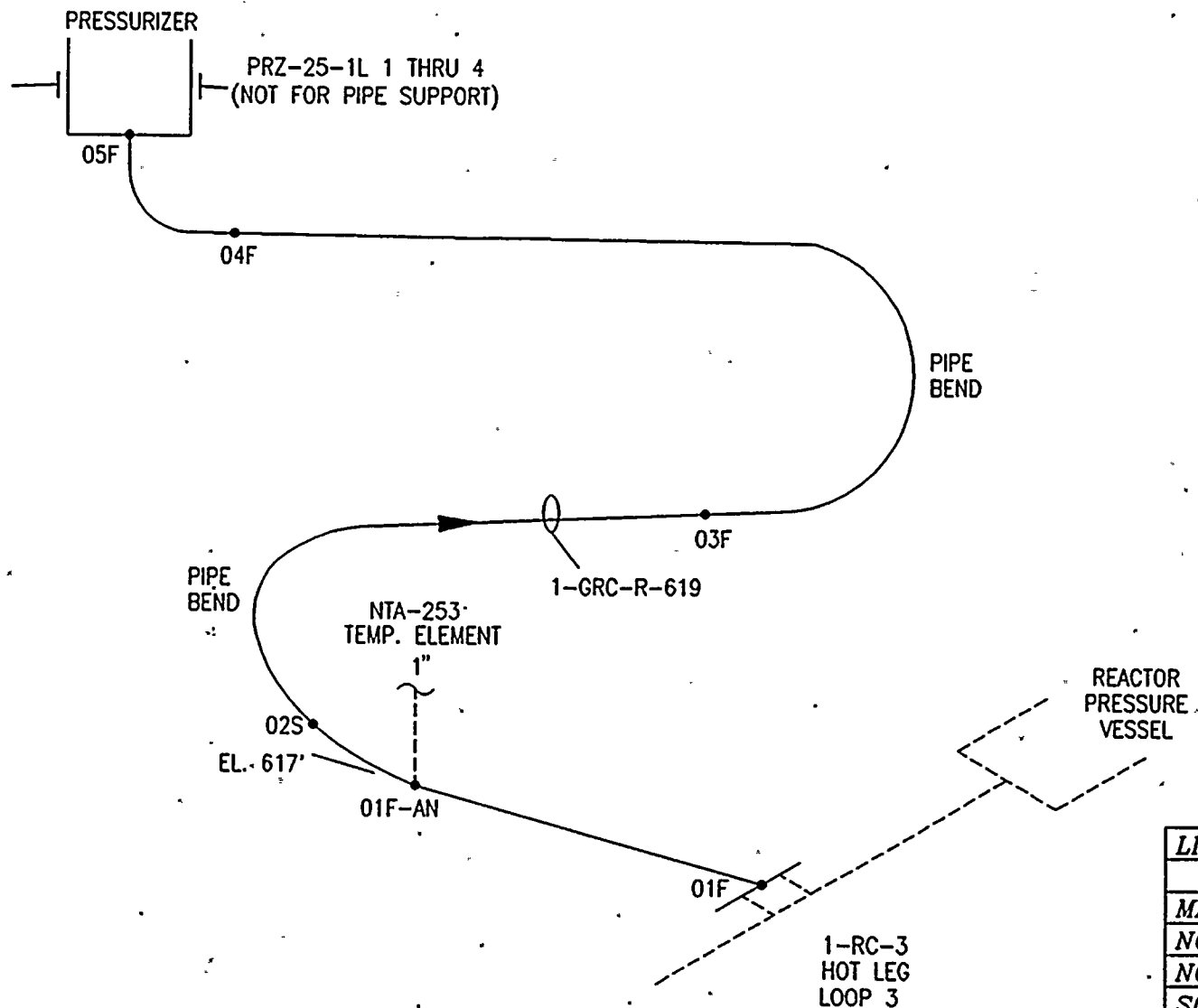
LINE NO.	1-RC-4 (COLD LEG)
MATERIAL	SA-351, CF8M
NOM. DIA	27.5" ID
NOM. THK.	2.56"
SCHEDULE	N/A
CAL. BLK.	37-CCSS-X-3.0-9-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. A-18 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-4

FLOW DIAGRAM: 1-5128



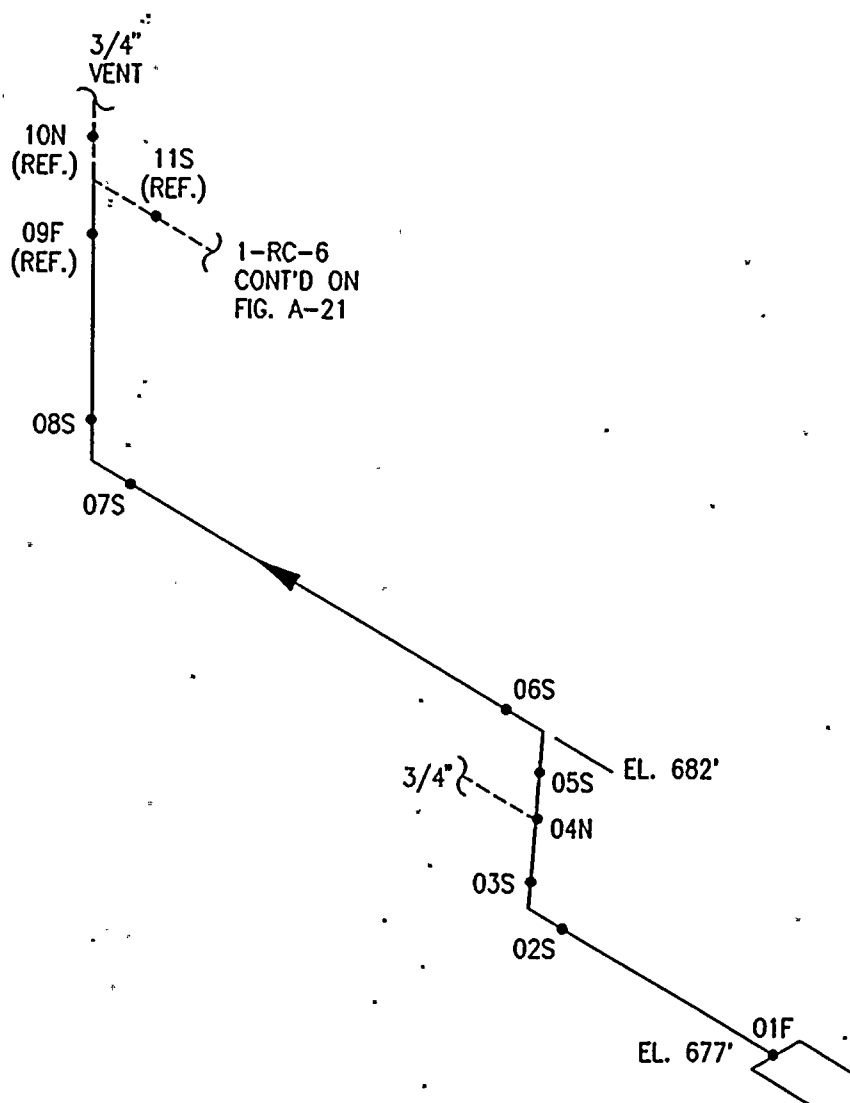
LINE NO.	1-RC-5
MATERIAL	SS
NOM. DIA	14"
NOM. THK.	1.406"
SCHEDULE	160
CAL. BLK.	3378032(14-SS-160-1.40)
LOCATION	

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FIG. A-19 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-5

FLOW DIAGRAM: 1-5128A



6" RELIEF
NOZZLE ON THE
PRESSURIZER

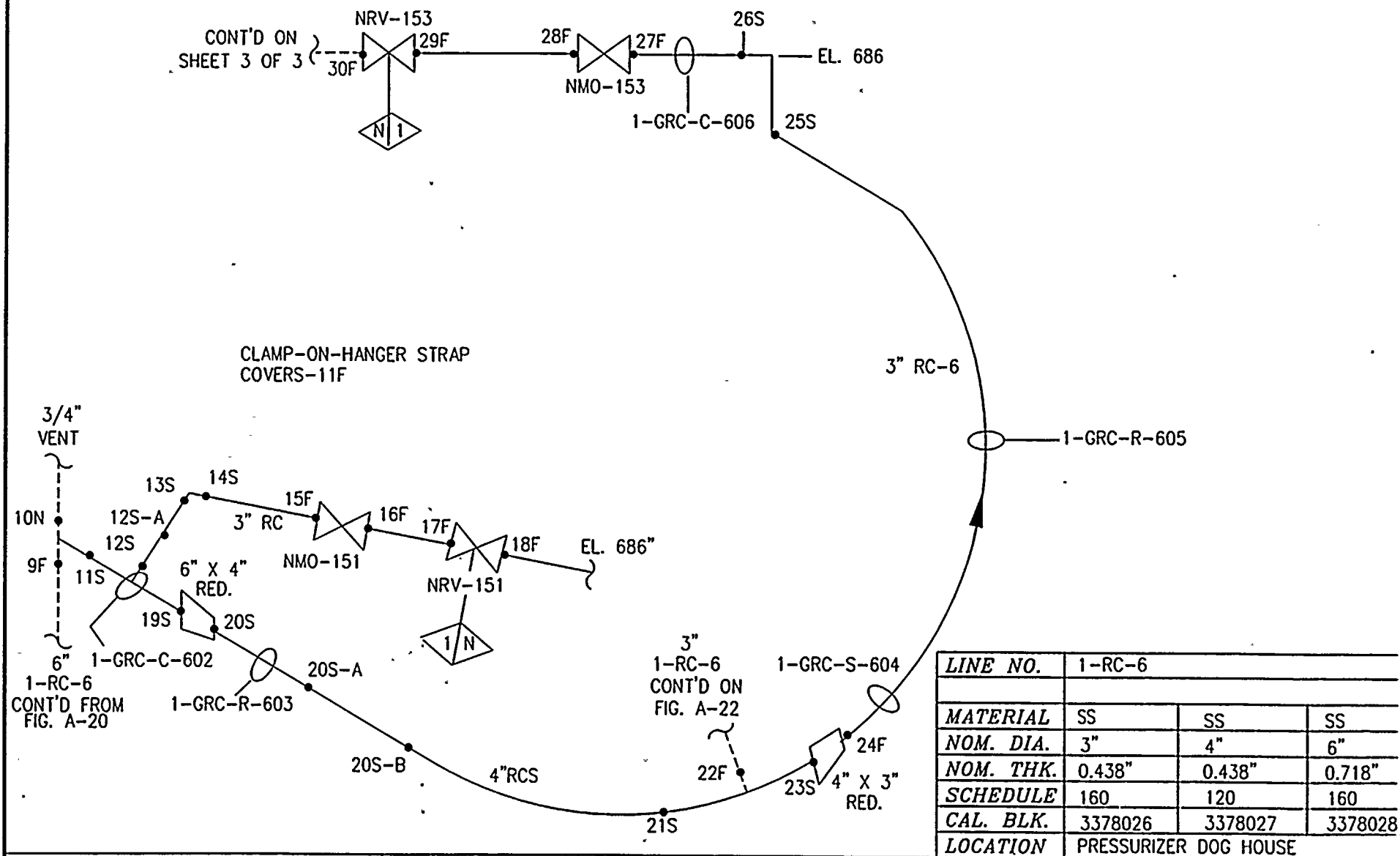
LINE NO.	1-RC-6
MATERIAL	SS
NOM. DIA	6"
NOM. THK.	0.718"
SCHEDULE	160
CAL. BLK.	3378028(6-SS-160-7.1)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-20 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-6
FLOW DIAGRAM: 1-5128A

A-21

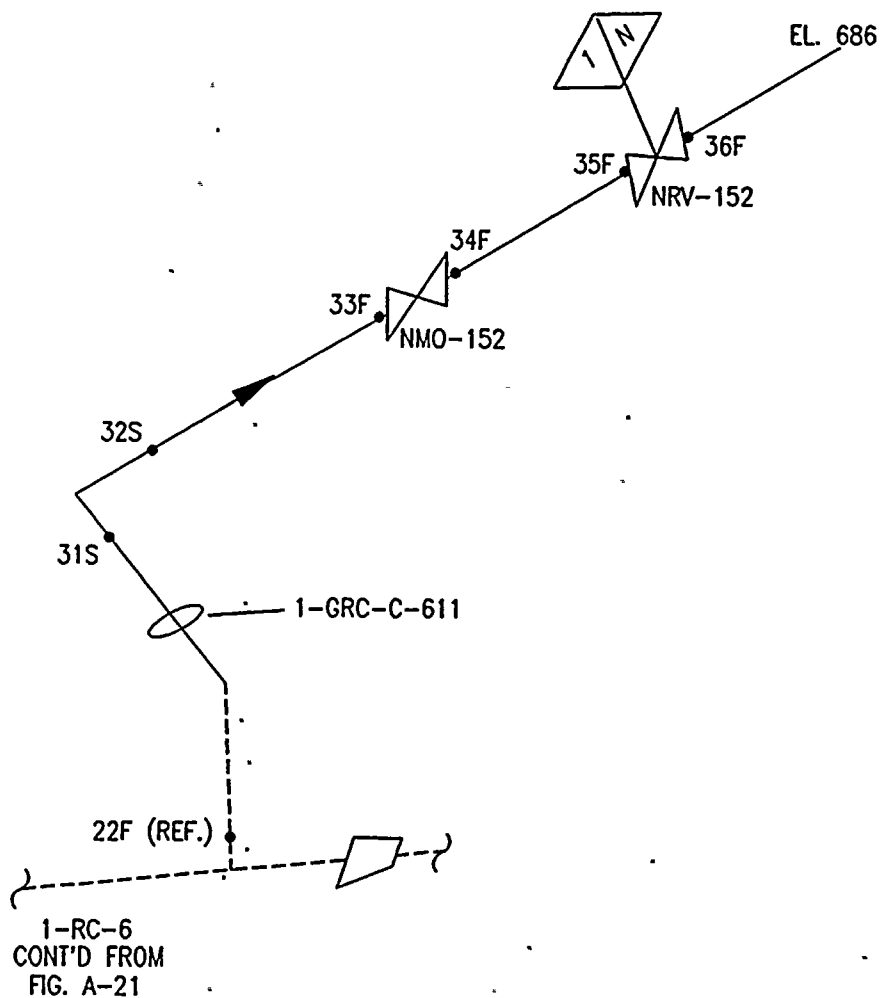


D. C. COOK, UNIT 1

FIG. A-21 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-6

FLOW DIAGRAM: 1-5128A



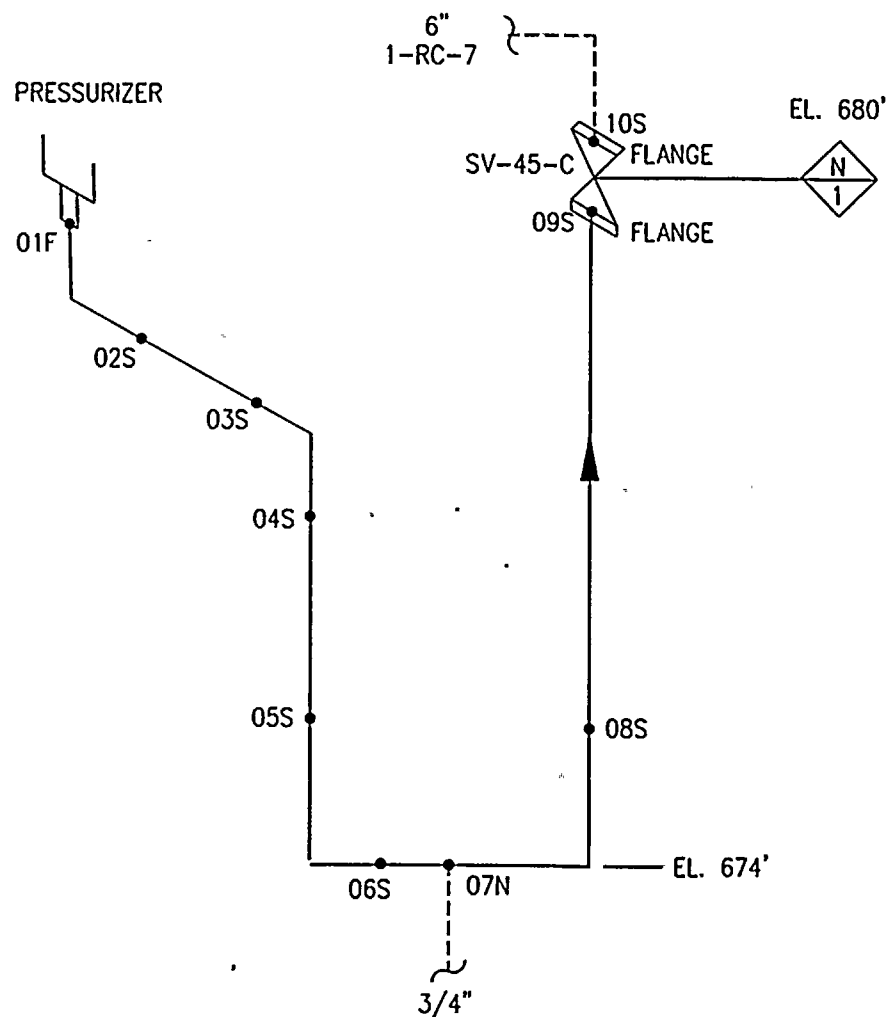
LINE NO.	1-RC-6
MATERIAL	SS
NOM. DIA	3"
NOM. THK.	0.438
SCHEDULE	160
CAL. BLK.	3378026 (3-SS-160-.430)
LOCATION	PRESSURIZER DOG HOUSE

D. C. COOK, UNIT 1

FIG. A-22 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-6

FLOW DIAGRAM: 1-5128A

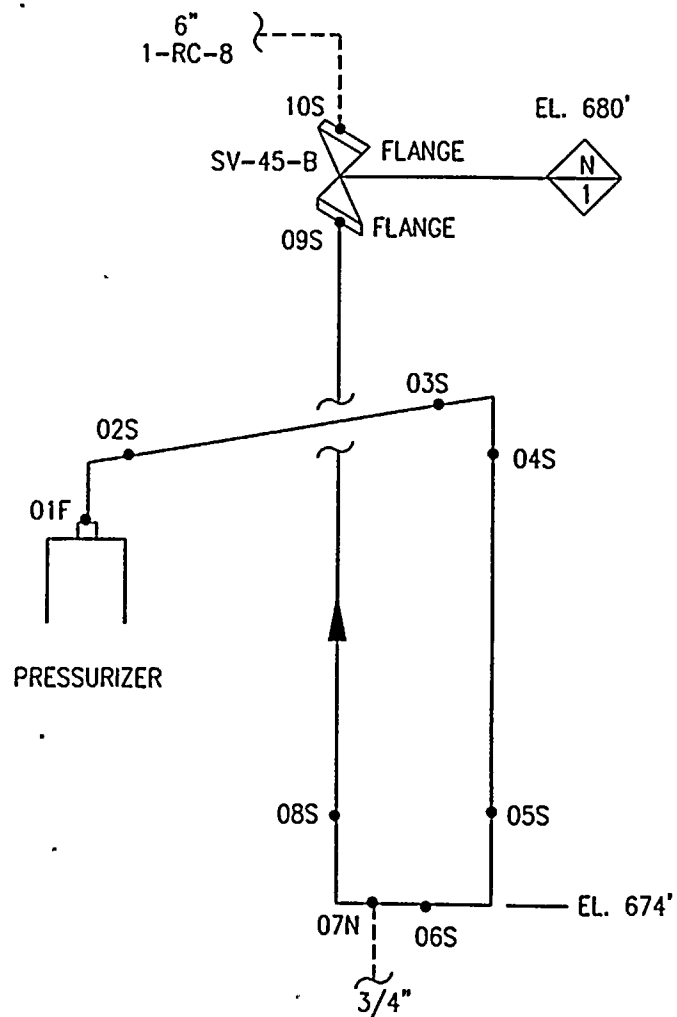


LINE NO.	1-RC-7
MATERIAL	SS
NOM. DIA	6"
NOM. THK.	0.718
SCHEDULE	160
CAL. BLK.	3378028(6-SS-160-.71)
LOCATION	PRESSURIZER DOG HOUSE

D. C. COOK, UNIT 1

FIG. A-23 REACTOR COOLANT SYSTEM

 REF. DRAWING: AEP 1-RC-7
 FLOW DIAGRAM: 1-5128A



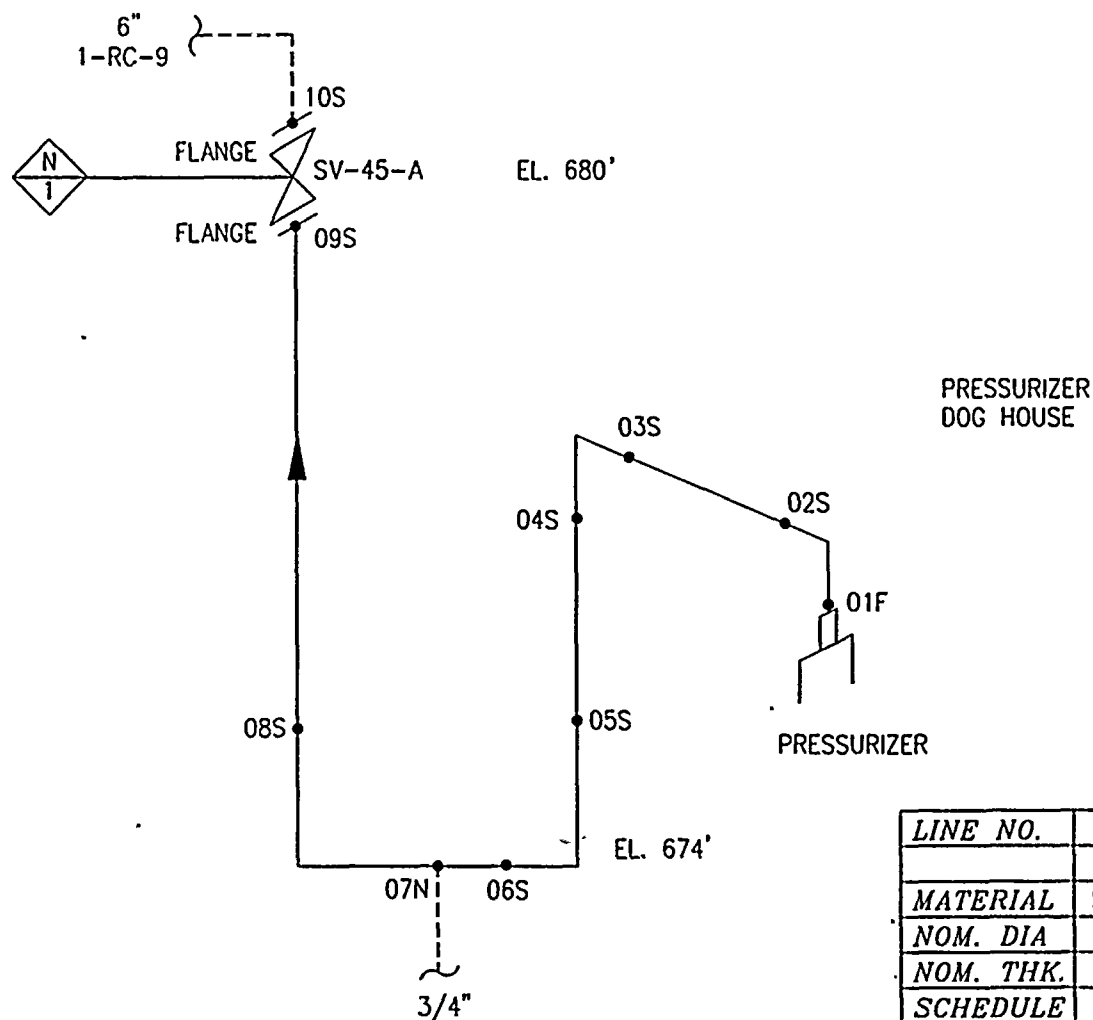
LINE NO.	1-RC-8
MATERIAL	SS
NOM. DIA.	6"
NOM. THK.	0.718
SCHEDULE	160
CAL. BLK.	3378028(6-SS-160-.71)
LOCATION	PRESSURIZER DOG HOUSE

D. C. COOK, UNIT 1

FIG. A-24 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-8

FLOW DIAGRAM: 1-5128A



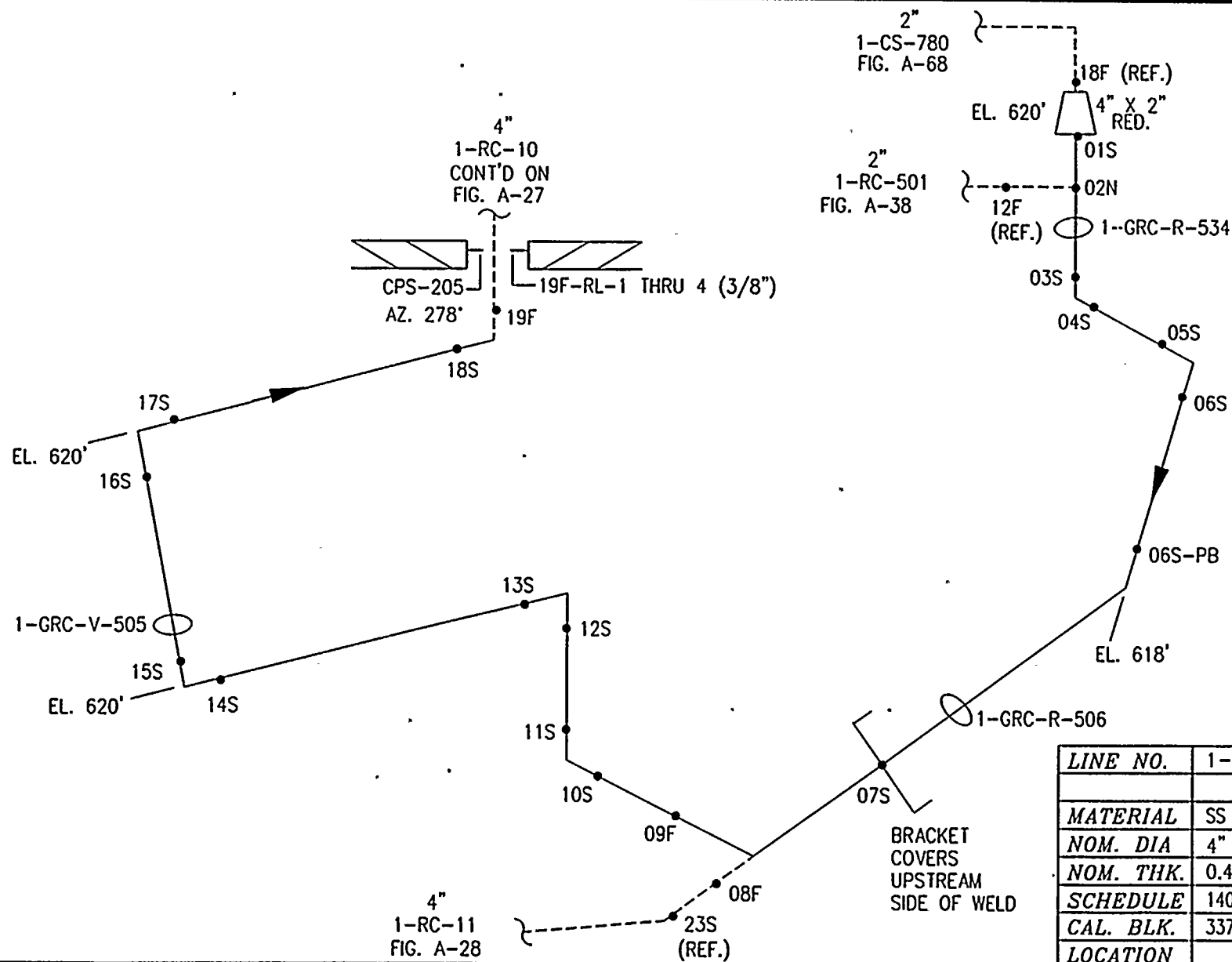
LINE NO.	1-RC-9
MATERIAL	SS
NOM. DIA	6"
NOM. THK.	0.718
SCHEDULE	160
CAL. BLK.	3378028(6-SS-160-.71)
LOCATION	PRESSURIZER DOG HOUSE

D. C. COOK, UNIT 1

FIG. A-25 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-9

FLOW DIAGRAM: 1-5128A

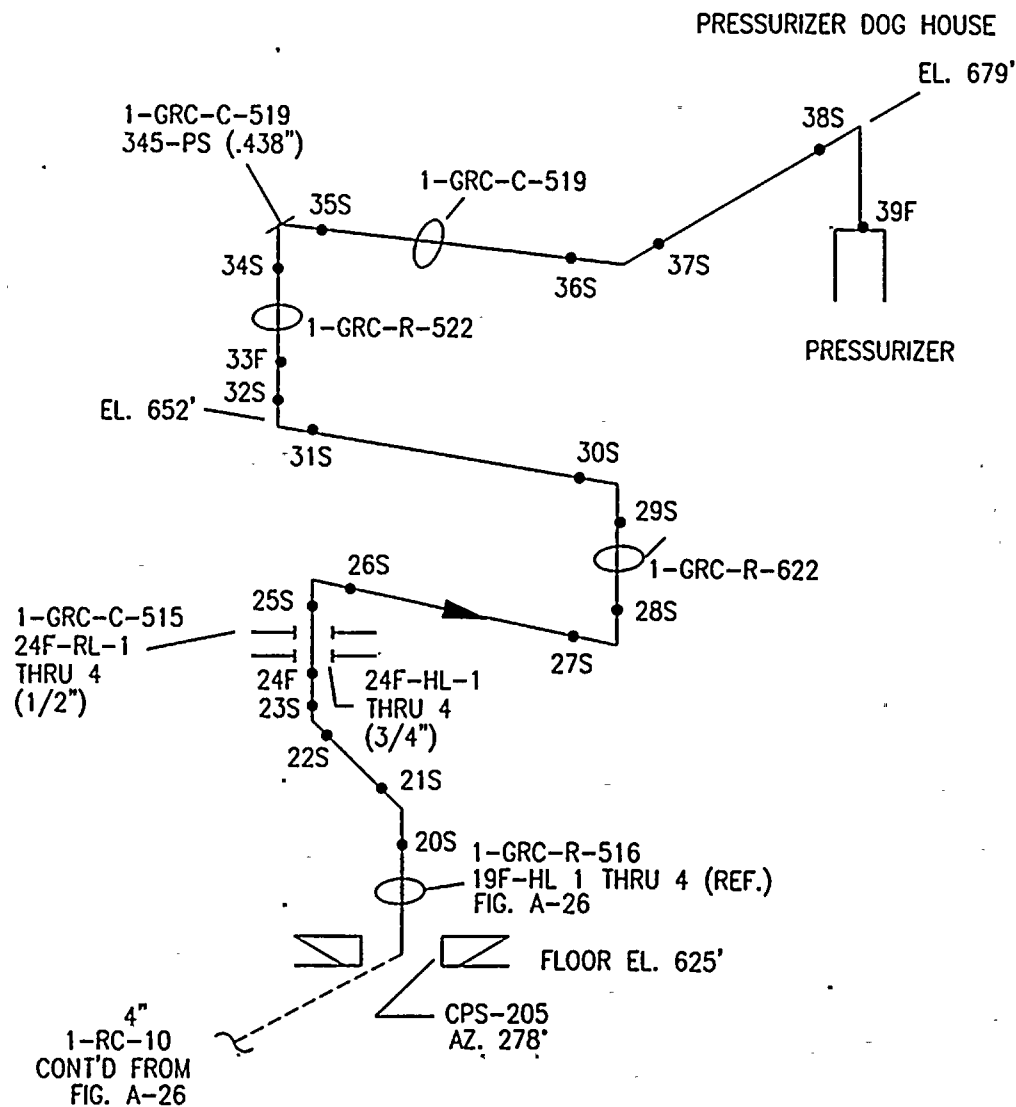


LINE NO.	1-RC-10
MATERIAL	SS
NOM. DIA	4"
NOM. THK.	0.438"
SCHEDULE	140
CAL. BLK.	3378027(4-SS-120-.430)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-26 REACTOR COOLANT SYSTEM

 REF. DRAWING: AEP 1-RC-10
 FLOW DIAGRAM: 1-5128A

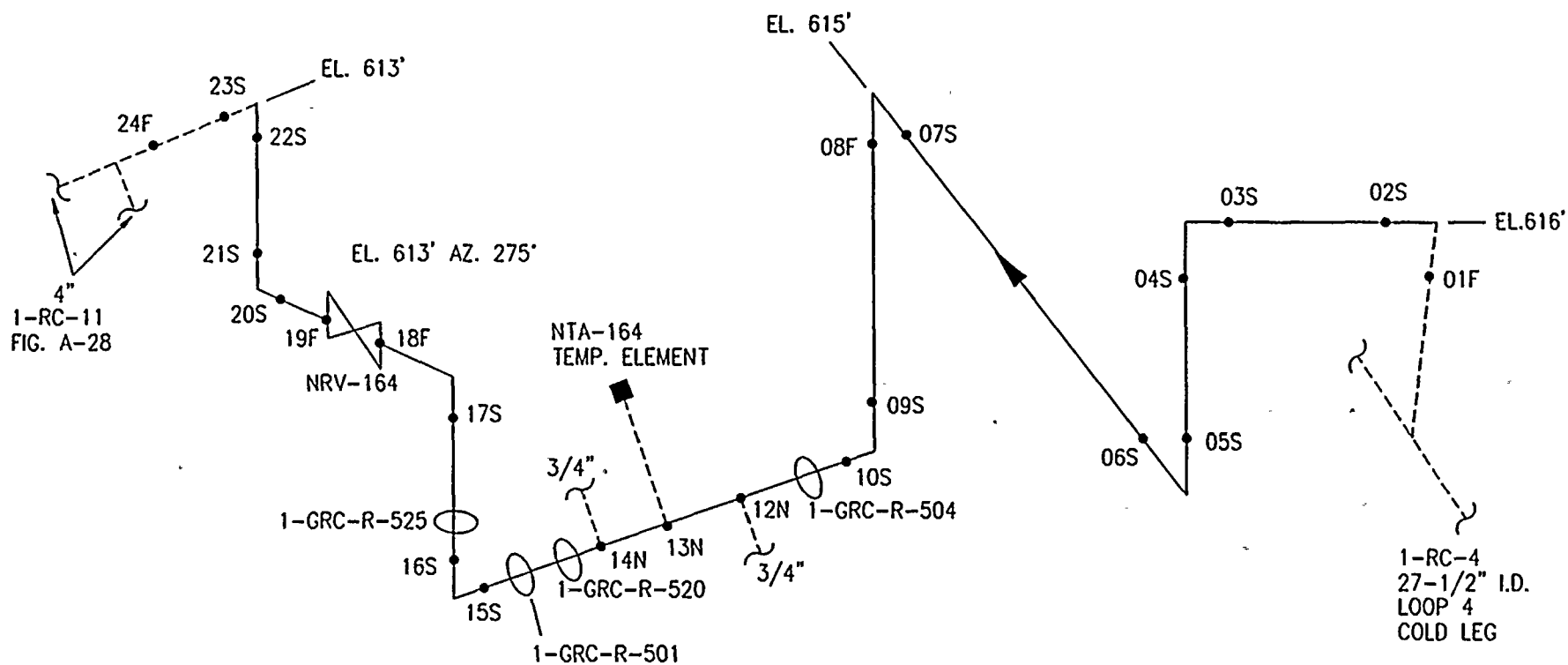


LINE NO.	1-RC-10
MATERIAL	SS
NOM. DIA	4"
NOM. THK.	0.438"
SCHEDULE	120
CAL. BLK.	3378027(4-SS-120-.430)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-27 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-10
 FLOW DIAGRAM: 1-5128A

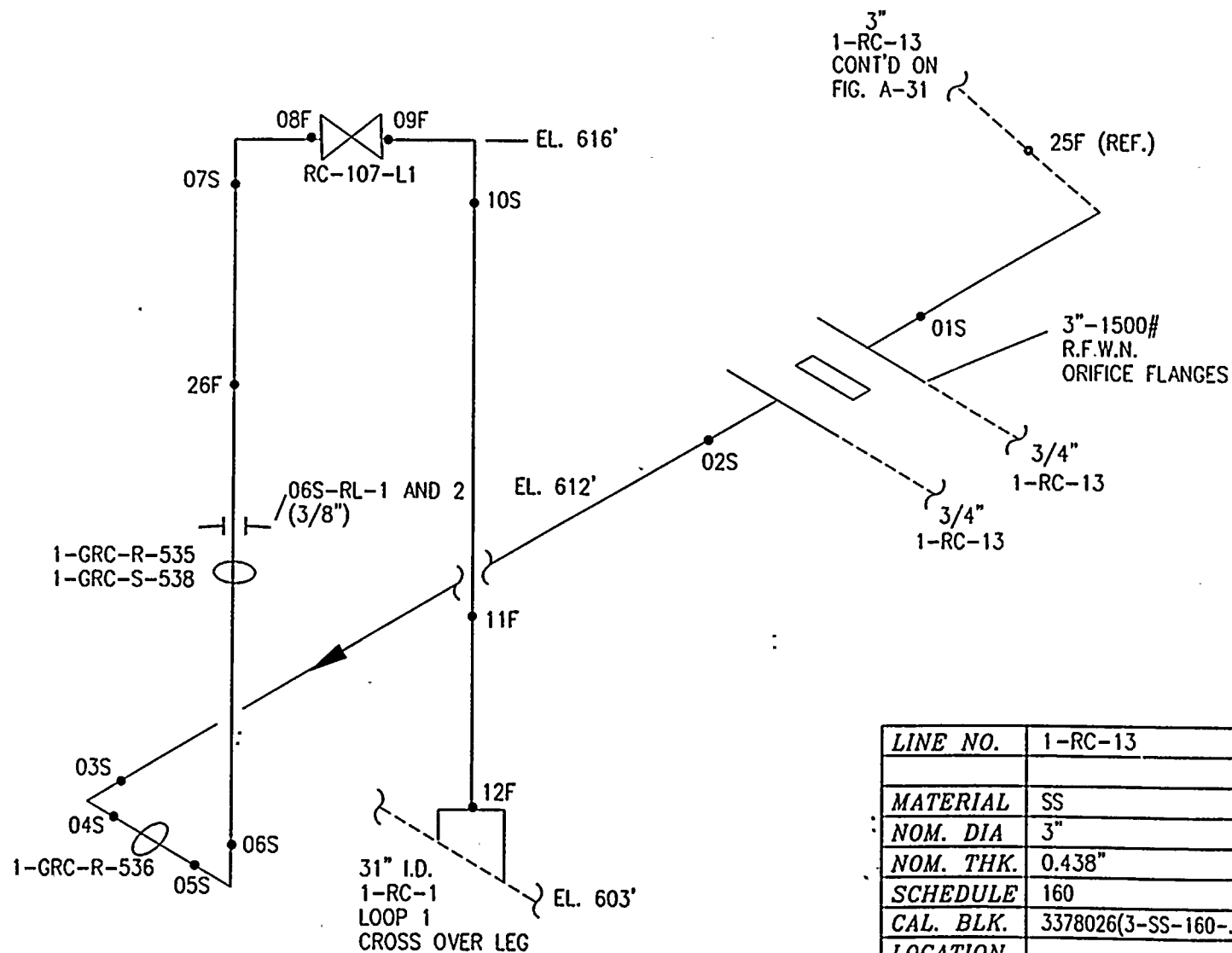


LINE NO.	1-RC-12
MATERIAL	SS
NOM. DIA	4"
NOM. THK.	0.438"
SCHEDULE	120
CAL. BLK.	3378027(4-SS-120-.430)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-29 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-12
FLOW DIAGRAM: 1-5128



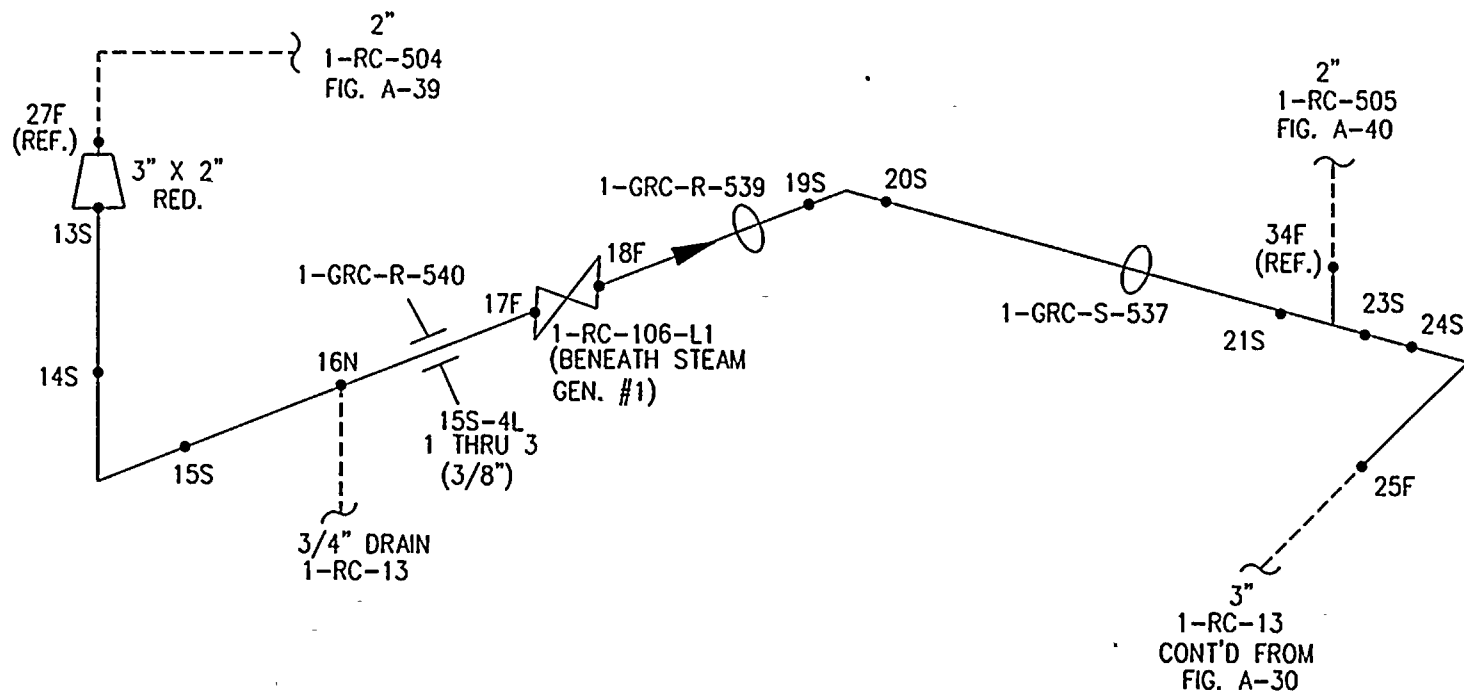
LINE NO.	1-RC-13
MATERIAL	SS
NOM. DIA	3"
NOM. THK.	0.438"
SCHEDULE	160
CAL. BLK.	3378026(3-SS-160-.430)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-30 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-13

FLOW DIAGRAM: 1-5128

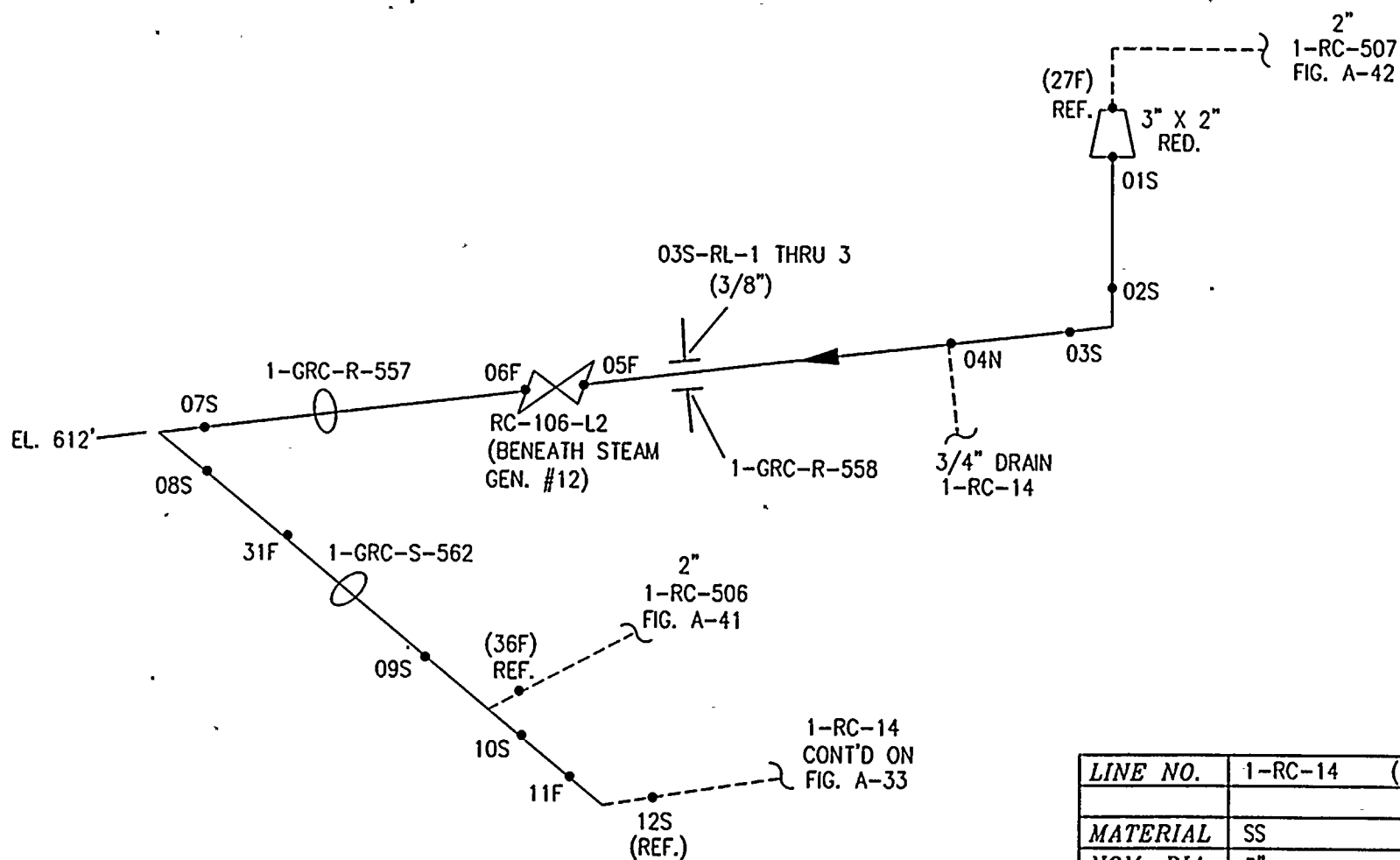


LINE NO.	1-RC-13 (LOOP 1)
MATERIAL	SS
NOM. DIA	3"
NOM. THK.	0.438"
SCHEDULE	160
CAL. BLK.	3378026(3-SS-160-.430)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-31 REACTOR COOLANT SYSTEM

 REF. DRAWING: AEP 1-RC-13
 FLOW DIAGRAM: 1-5128



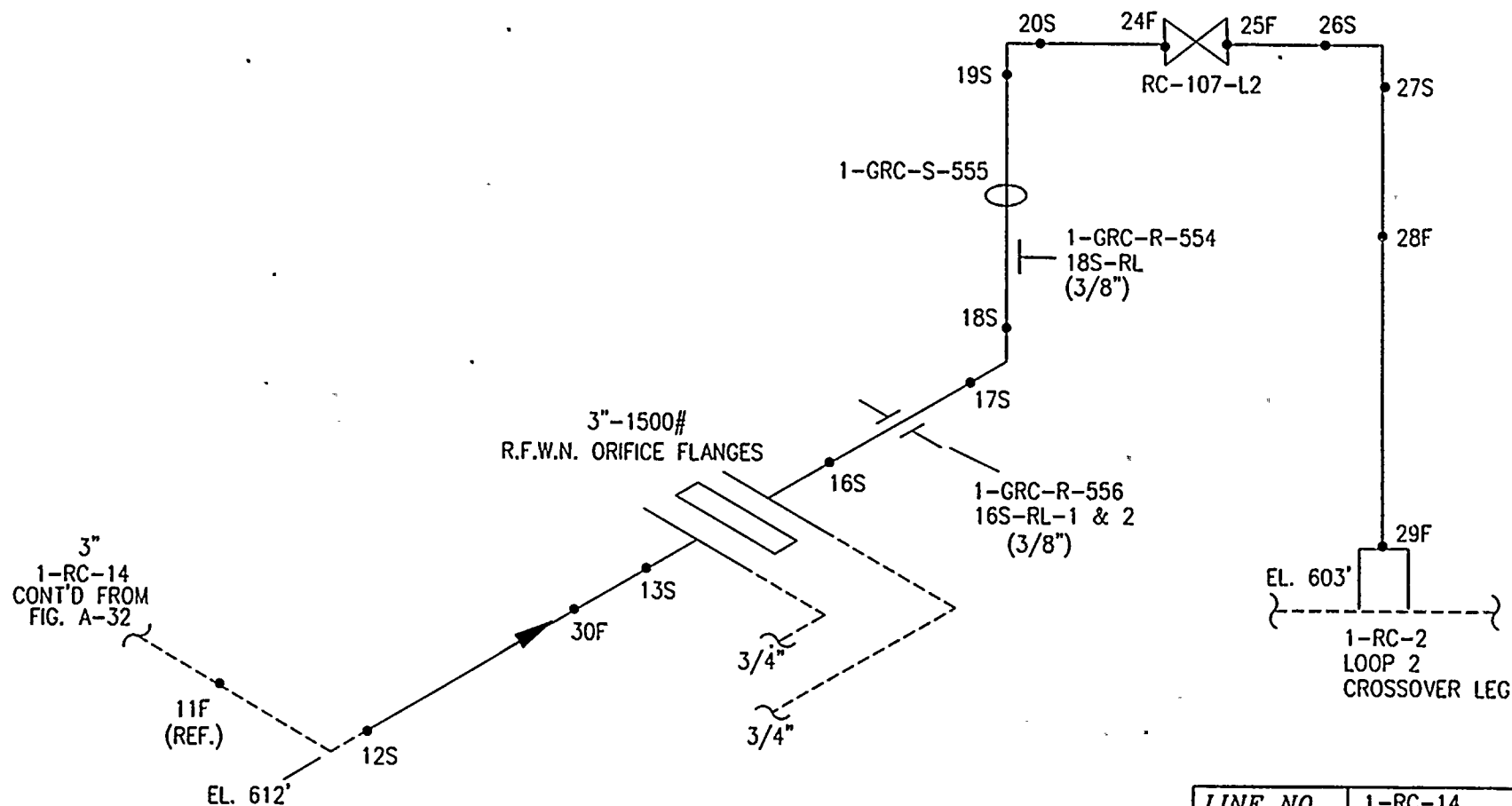
LINE NO.	1-RC-14 (LOOP 2).
MATERIAL	SS
NOM. DIA	3"
NOM. THK.	0.438"
SCHEDULE	160
CAL. BLK.	3378026(3-SS-160-.430)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-32 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-14

FLOW DIAGRAM: 1-5128



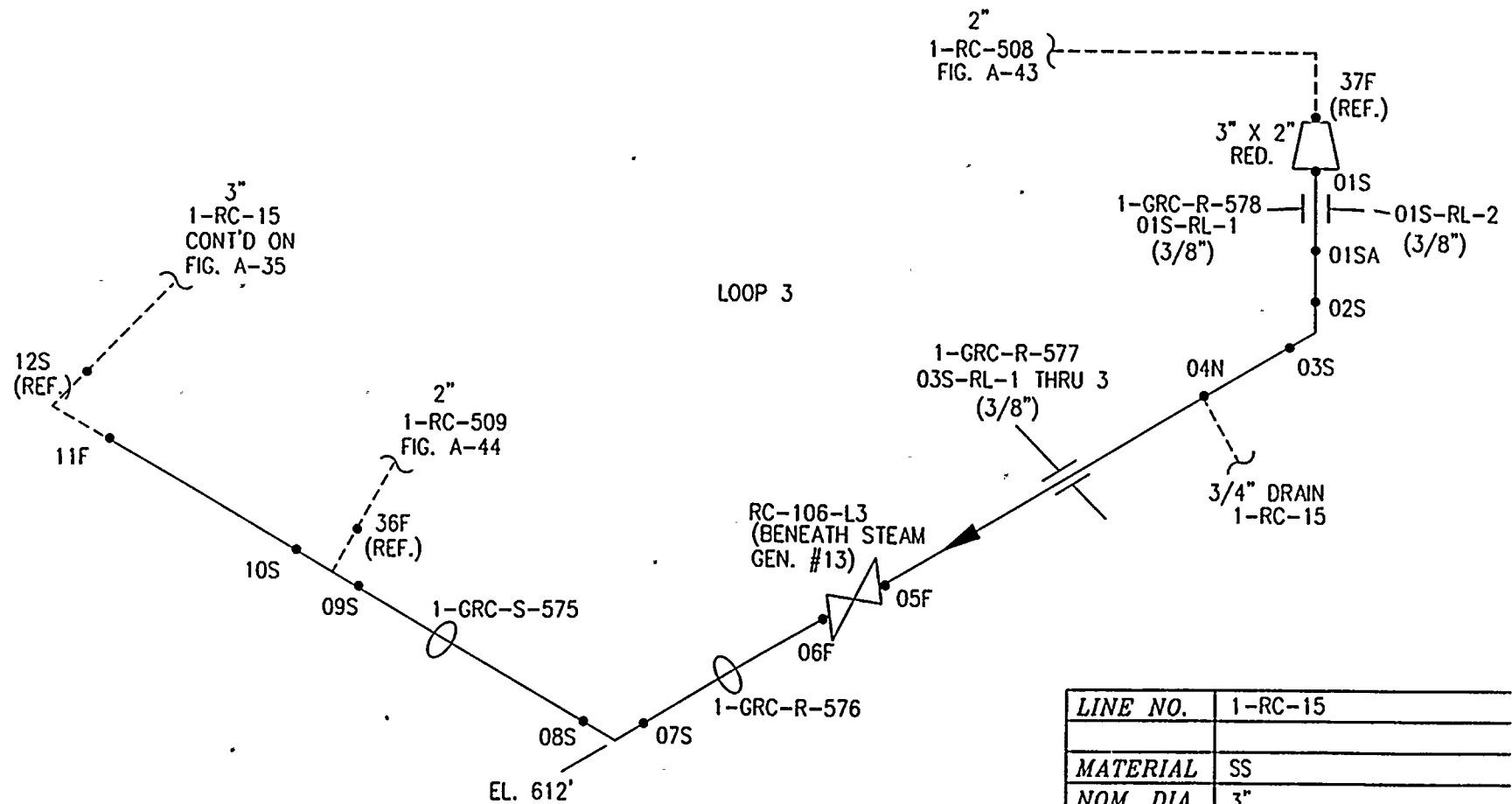
LINE NO.	1-RC-14
MATERIAL	SS
NOM. DIA	3"
NOM. THK.	0.438"
SCHEDULE	160
CAL. BLK.	3378026(3-SS-160-.430)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-33 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-14

FLOW DIAGRAM: 1-5128



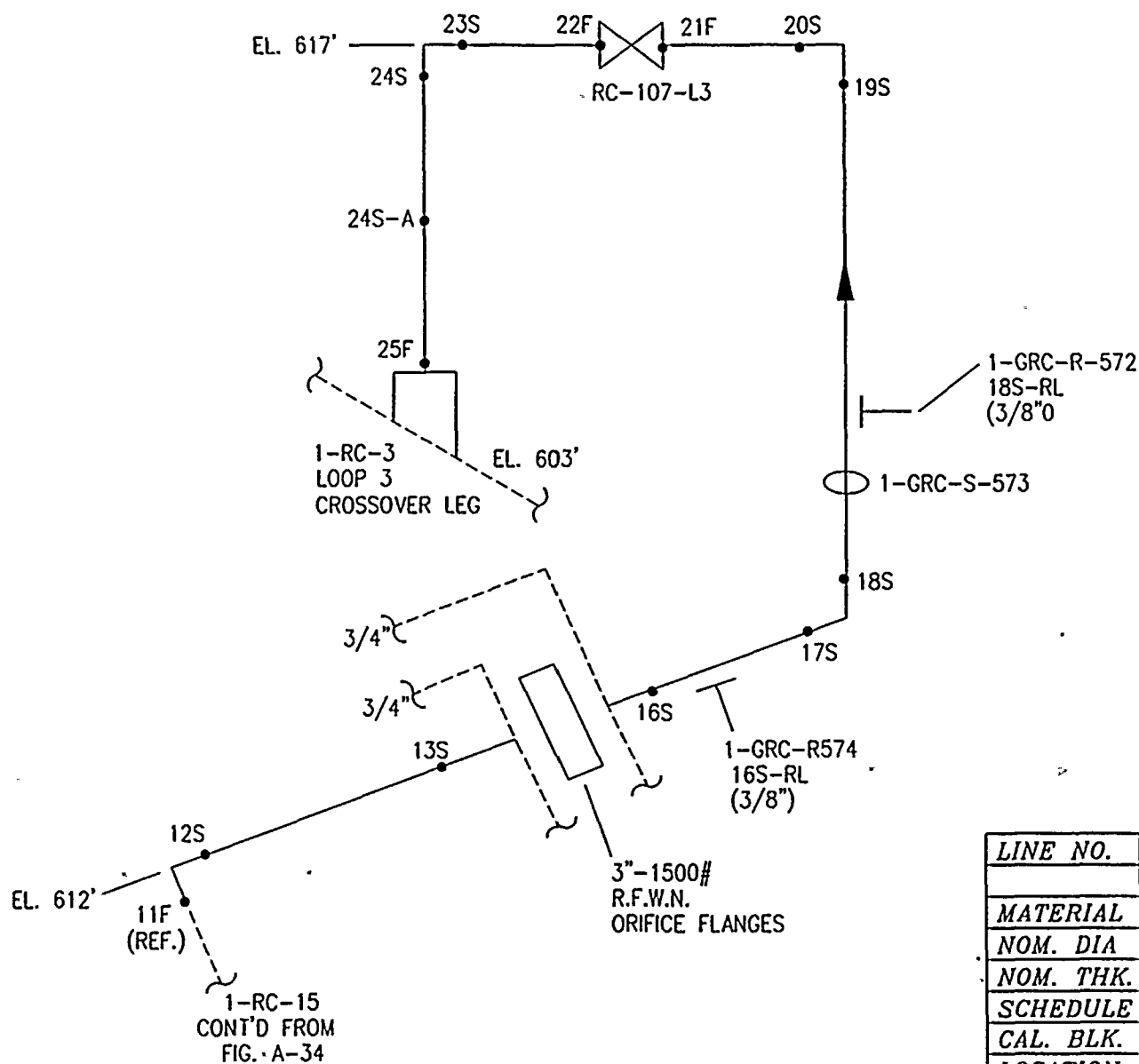
LINE NO.	1-RC-15
MATERIAL	SS
NOM. DIA	3"
NOM. THK.	0.438"
SCHEDULE	160
CAL. BLK.	3378026(3-SS-160-.430)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-34 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-15

FLOW DIAGRAM: 1-5128

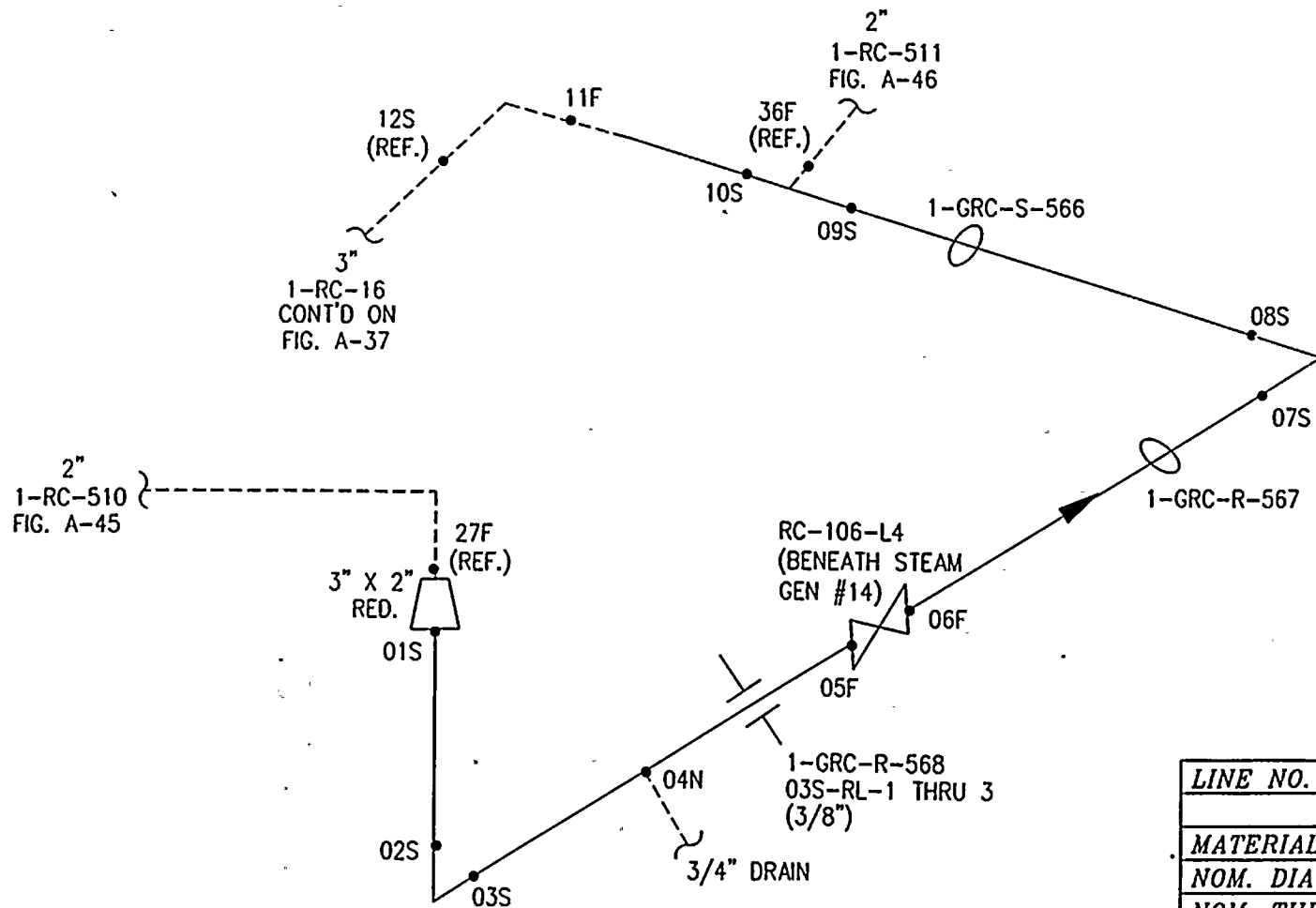


LINE NO.	1-RC-15
MATERIAL	SS
NOM. DIA	3"
NOM. THK.	0.438"
SCHEDULE	160
CAL. BLK.	3378026(3-SS-160-.430)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-35 REACTOR COOLANT SYSTEM

 REF. DRAWING: AEP 1-RC-15
 FLOW DIAGRAM: 1-5128



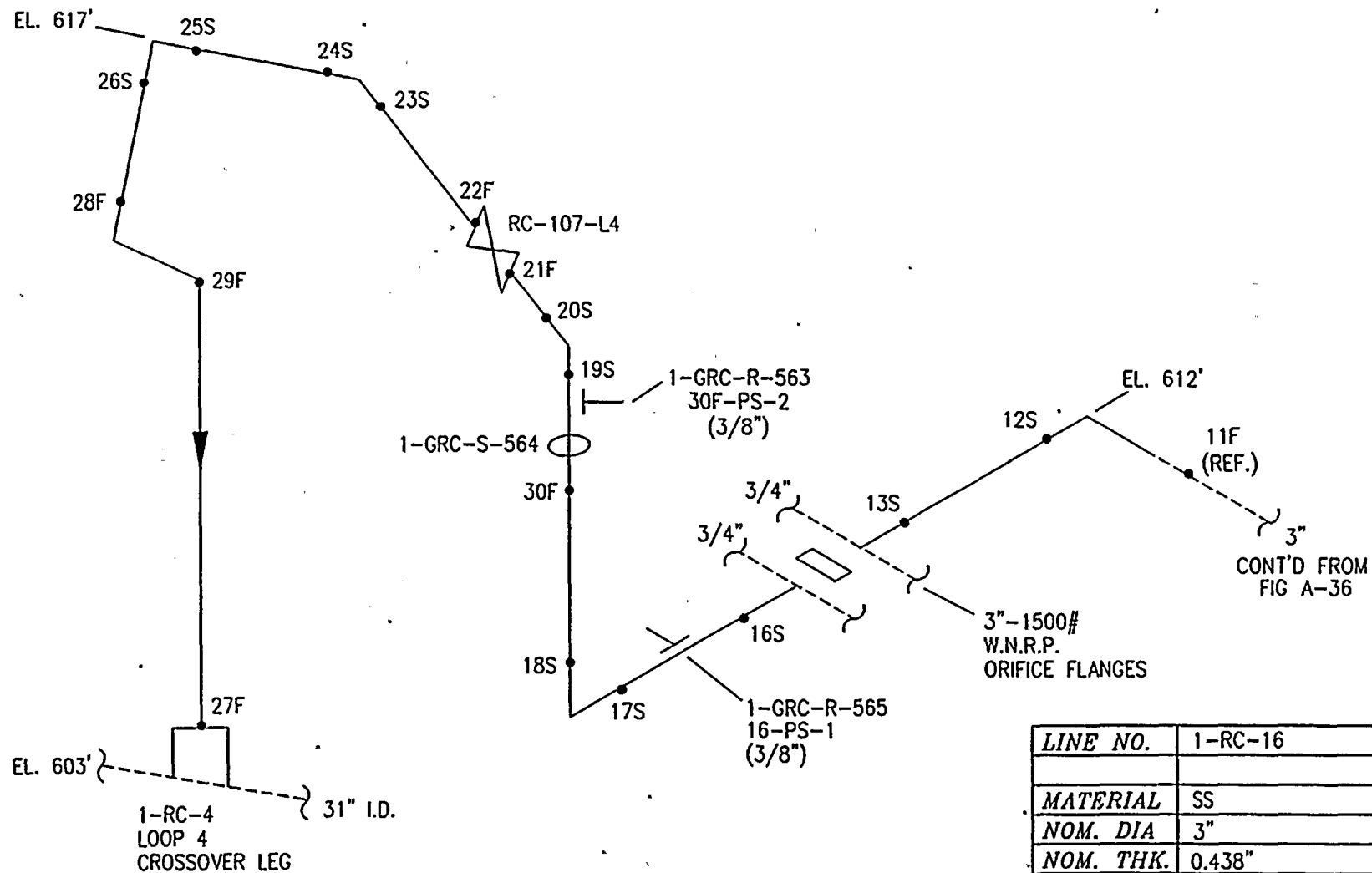
LINE NO.	1-RC-16
MATERIAL	SS
NOM. DIA	3"
NOM. THK.	0.438"
SCHEDULE	160
CAL. BLK.	3378026(3-SS-160-.430)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-36 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-16

FLOW DIAGRAM: 1-5128



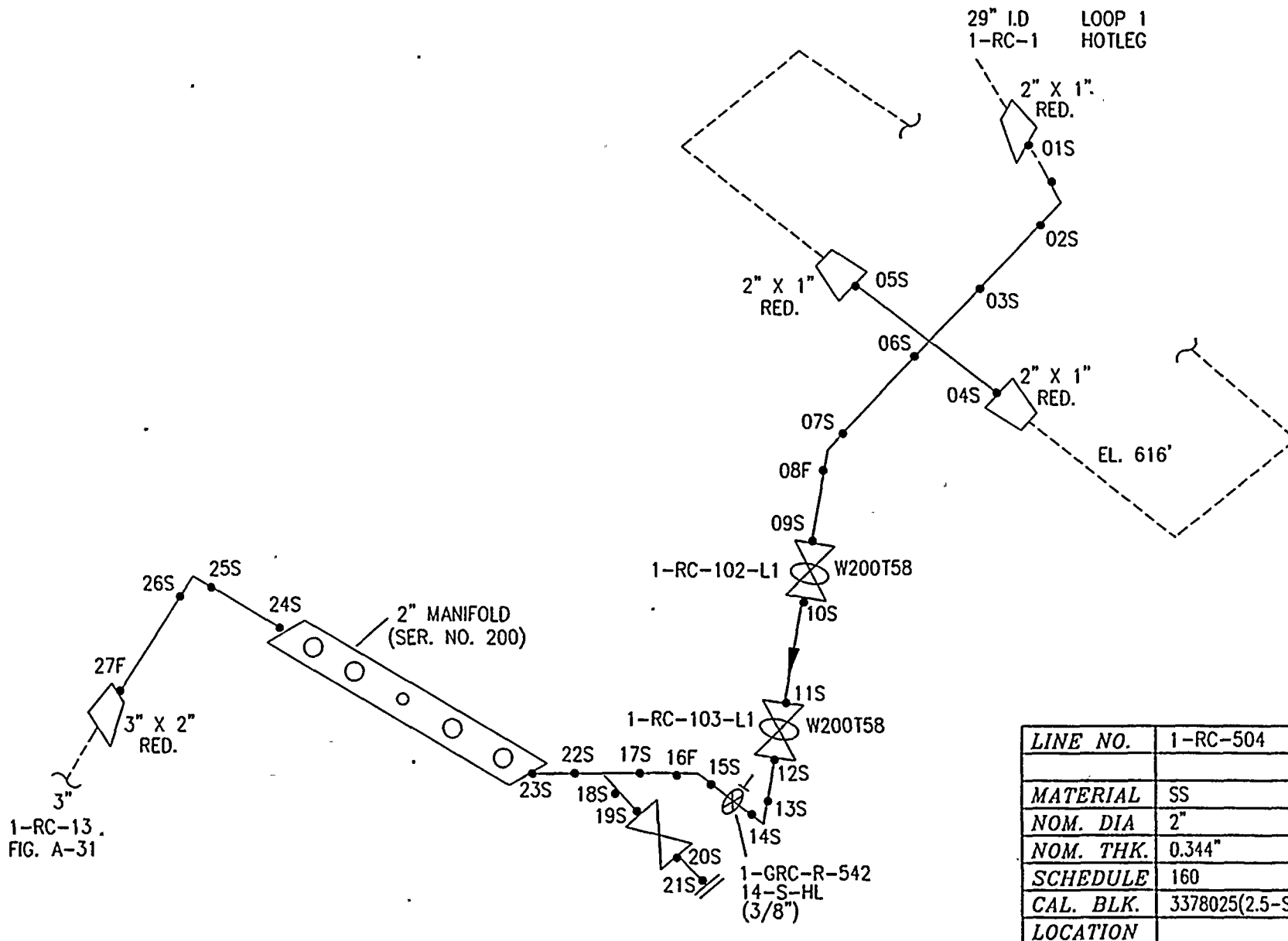
LINE NO.	1-RC-16
MATERIAL	SS
NOM. DIA	3"
NOM. THK.	0.438"
SCHEDULE	160
CAL. BLK.	3378026(3-SS-160-.430)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-37 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-16

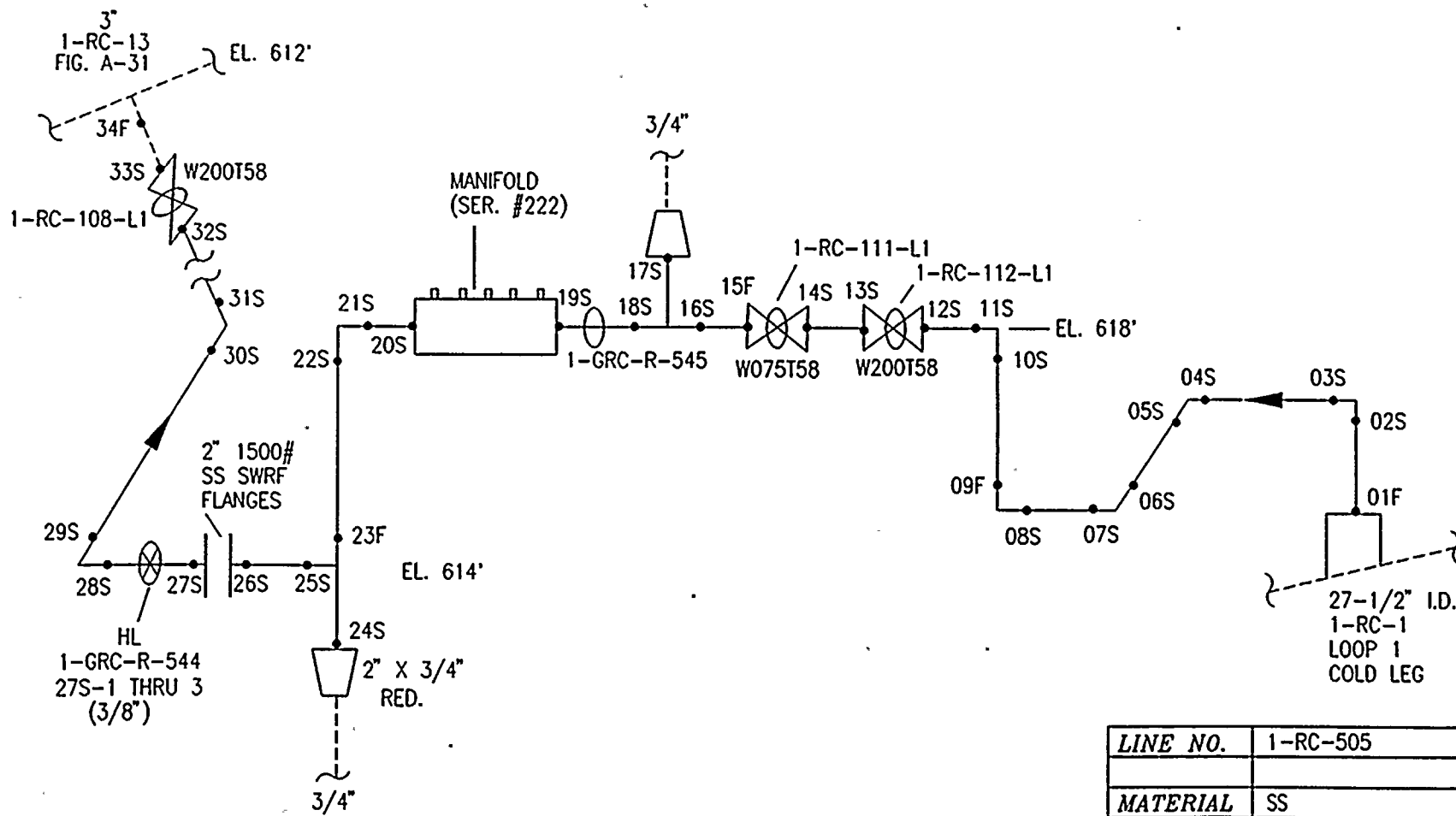
FLOW DIAGRAM: 1-5128



D. C. COOK, UNIT 1

FIG. A-39 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-504
FLOW DIAGRAM 1-5128

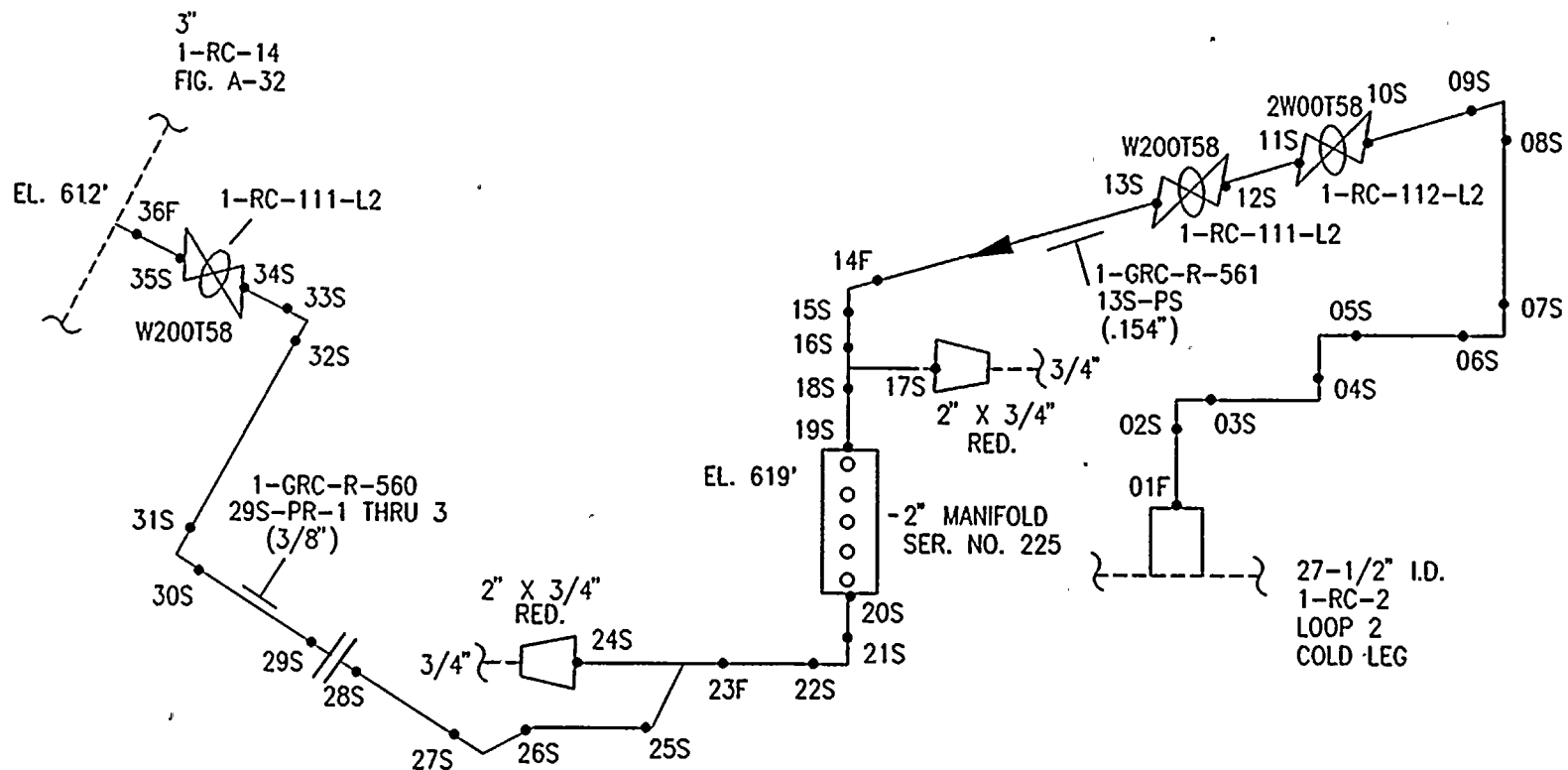


LINE NO.	1-RC-505
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	0.344"
SCHEDULE	160
CAL. BLK.	3378025(2.5-SS-160-.370)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-40 REACTOR COOLANT SYSTEM

 REF. DRAWING: AEP 1-RC-505
 FLOW DIAGRAM: 1-5128

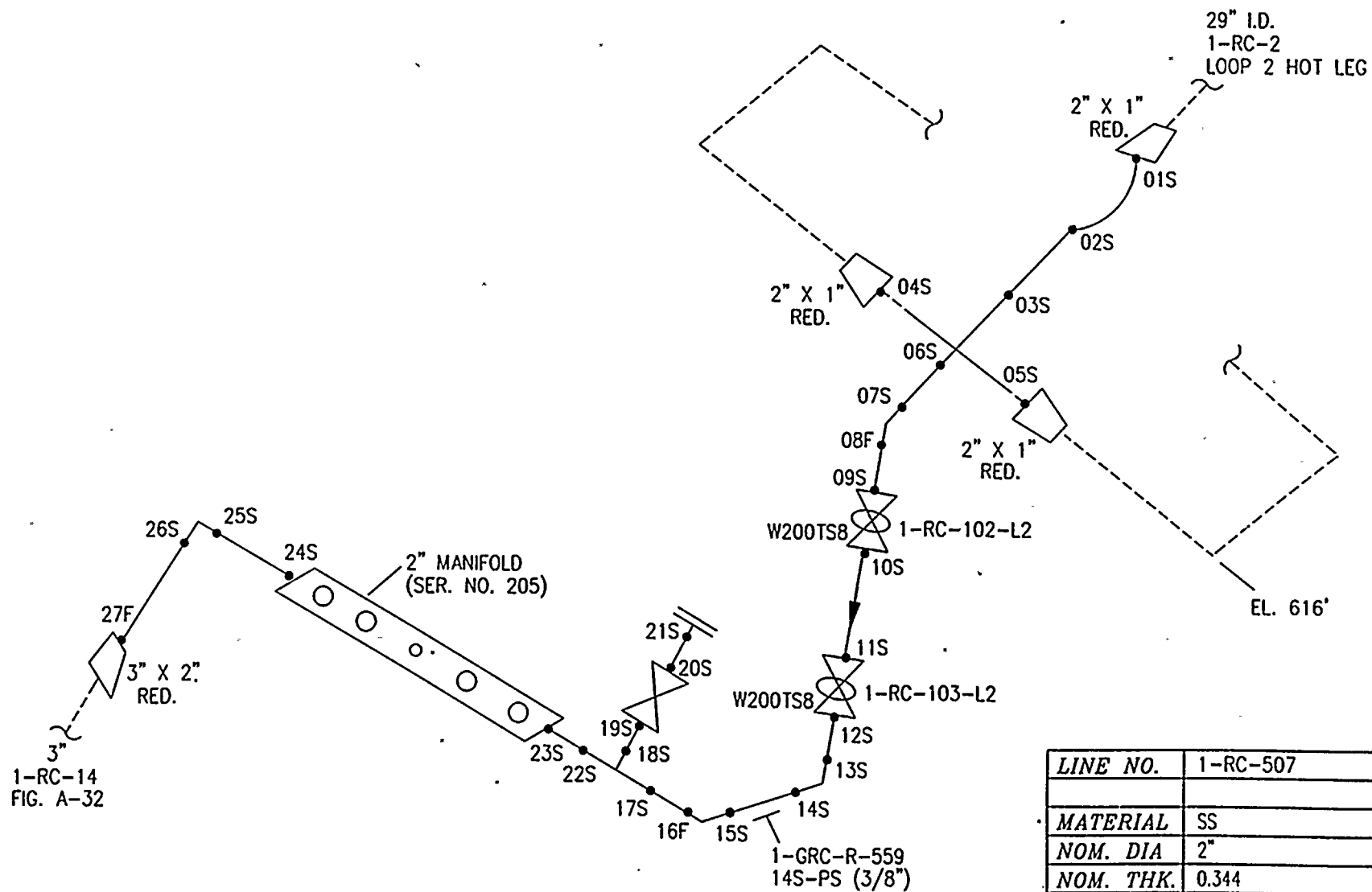


LINE NO.	1-RC-506
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	0.344"
SCHEDULE	160
CAL. BLK.	3378025(2.5-SS-160-.370)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-41 REACTOR COOLANT SYSTEM

 REF. DRAWING: AEP 1-RC-506
 FLOW DIAGRAM: 1-5128

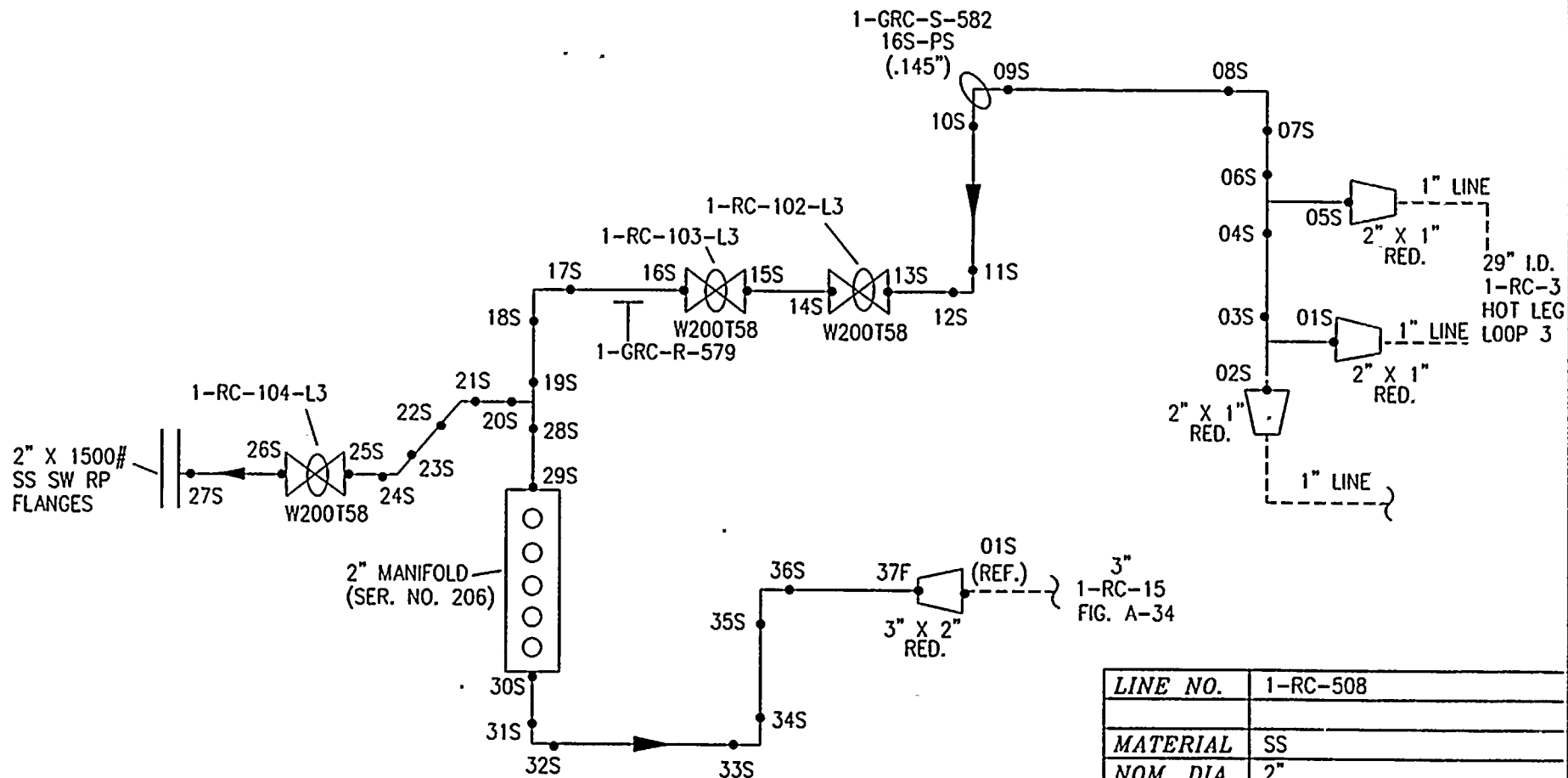


LINE NO.	1-RC-507
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	0.344
SCHEDULE	160
CAL. BLK.	3378025(2.5-SS-160-.370)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-42 REACTOR COOLANT SYSTEM

REF. DRAWING:	AEP 1-RC-507
FLOW DIAGRAM:	1-5128

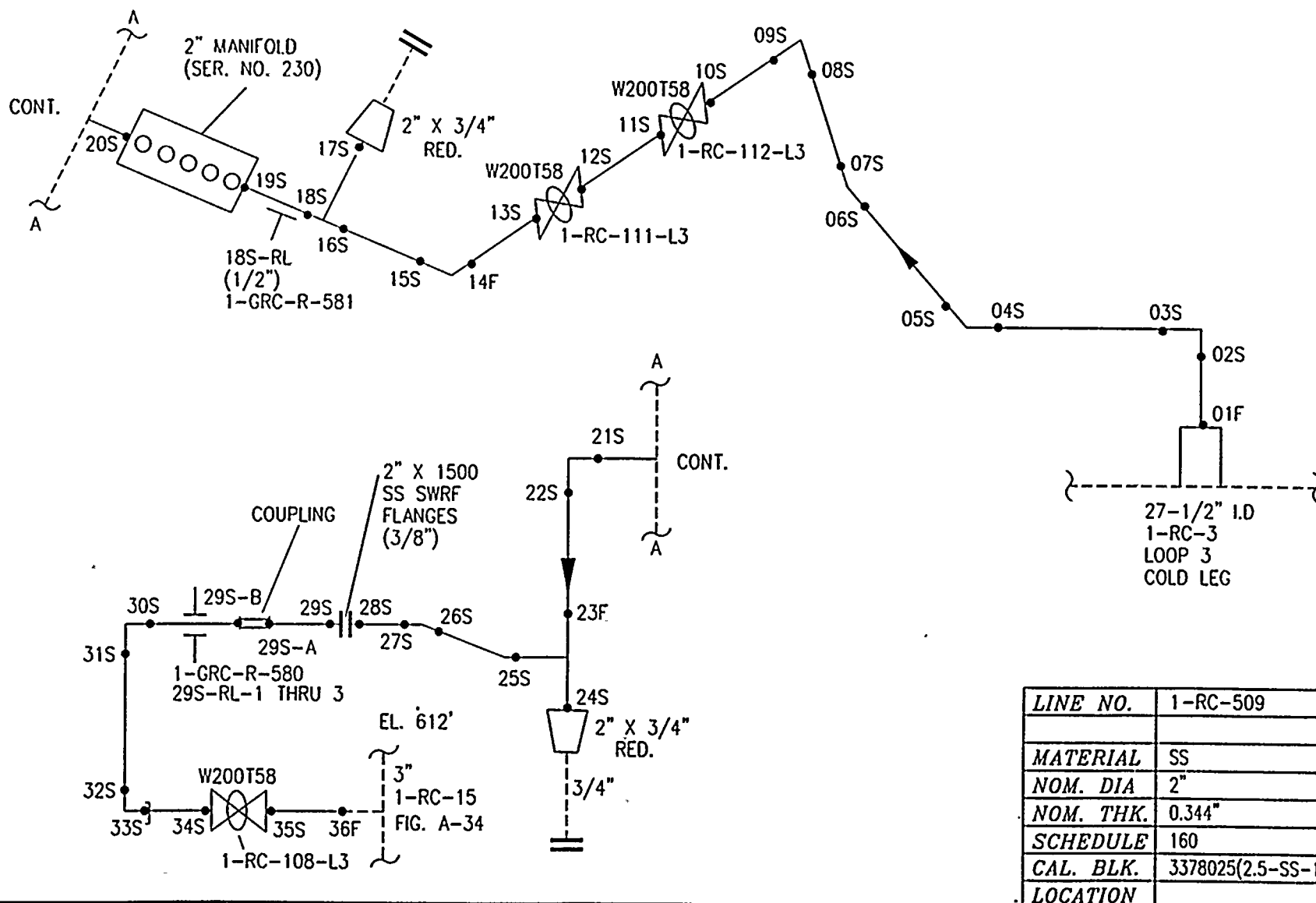


LINE NO.	1-RC-508
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	0.344"
SCHEDULE	160
CAL. BLK.	3378025 (2.5-SS-150-.370)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-43 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-508
FLOW DIAGRAM: 1-5128



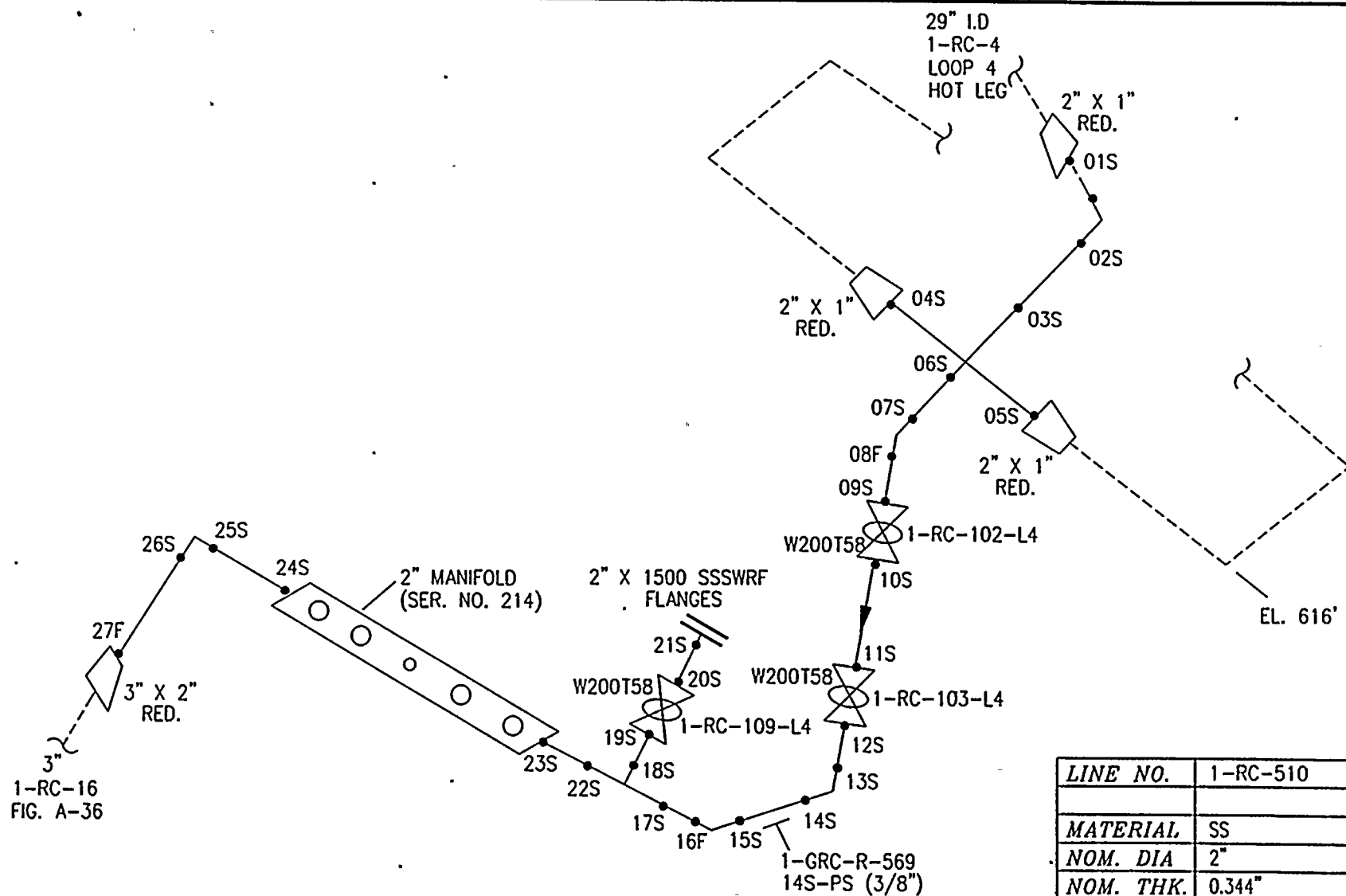
LINE NO.	1-RC-509
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	0.344"
SCHEDULE	160
CAL. BLK.	3378025(2.5-SS-160-.370)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-44 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-509

FLOW DIAGRAM: 1-5128

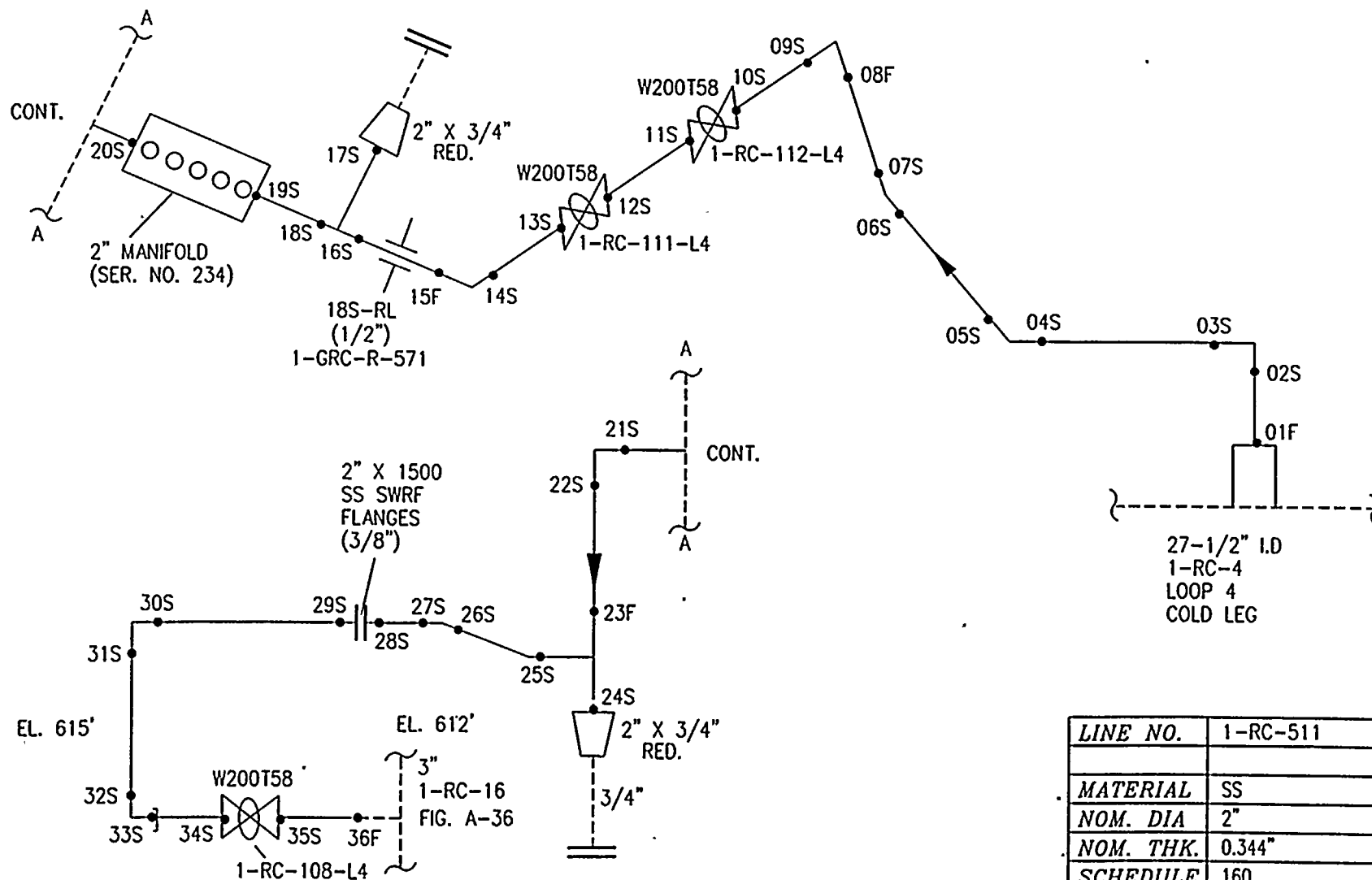


LINE NO.	1-RC-510
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	0.344"
SCHEDULE	160
CAL. BLK.	3378025(2.5-SS-160-.370)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-45 REACTOR COOLANT SYSTEM

 REF. DRAWING: AEP 1-RC-510
 FLOW DIAGRAM: 1-5128



LINE NO.	1-RC-511
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	0.344"
SCHEDULE	160
CAL. BLK.	3378025 (2.5-SS-160-.370)
LOCATION	

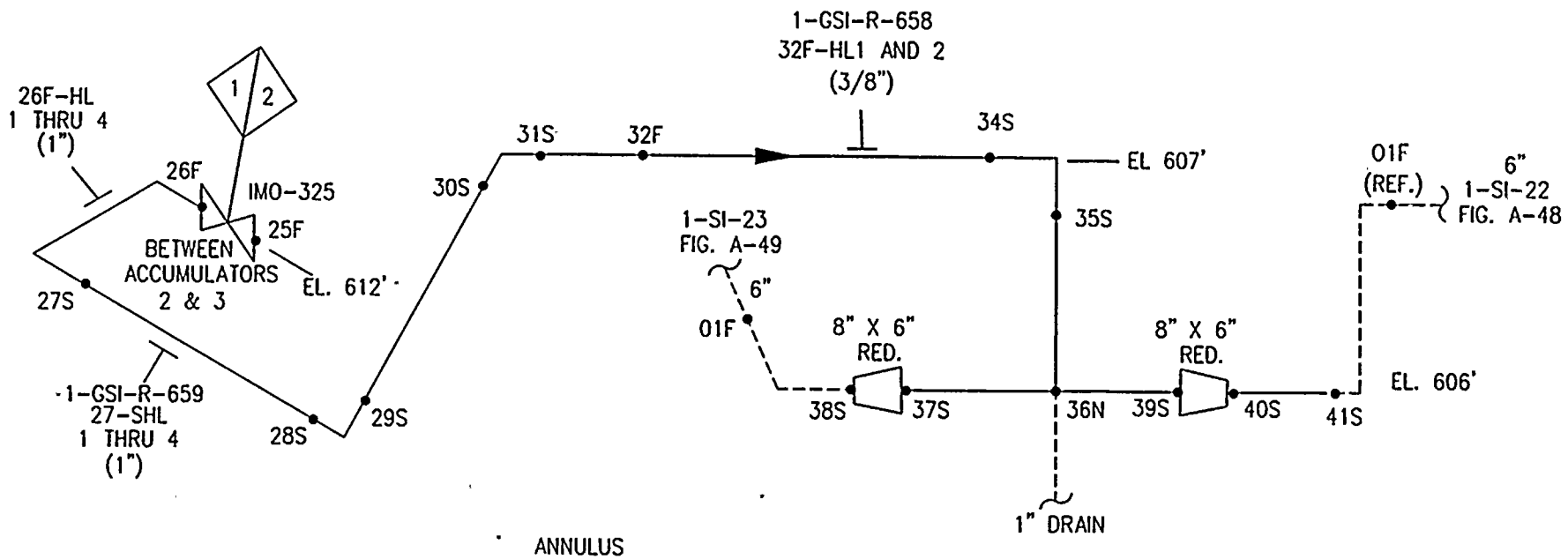
D. C. COOK, UNIT 1

FIG. A-46 REACTOR COOLANT SYSTEM

REF. DRAWING: AEP 1-RC-511

FLOW DIAGRAM: 1-5128

A-47



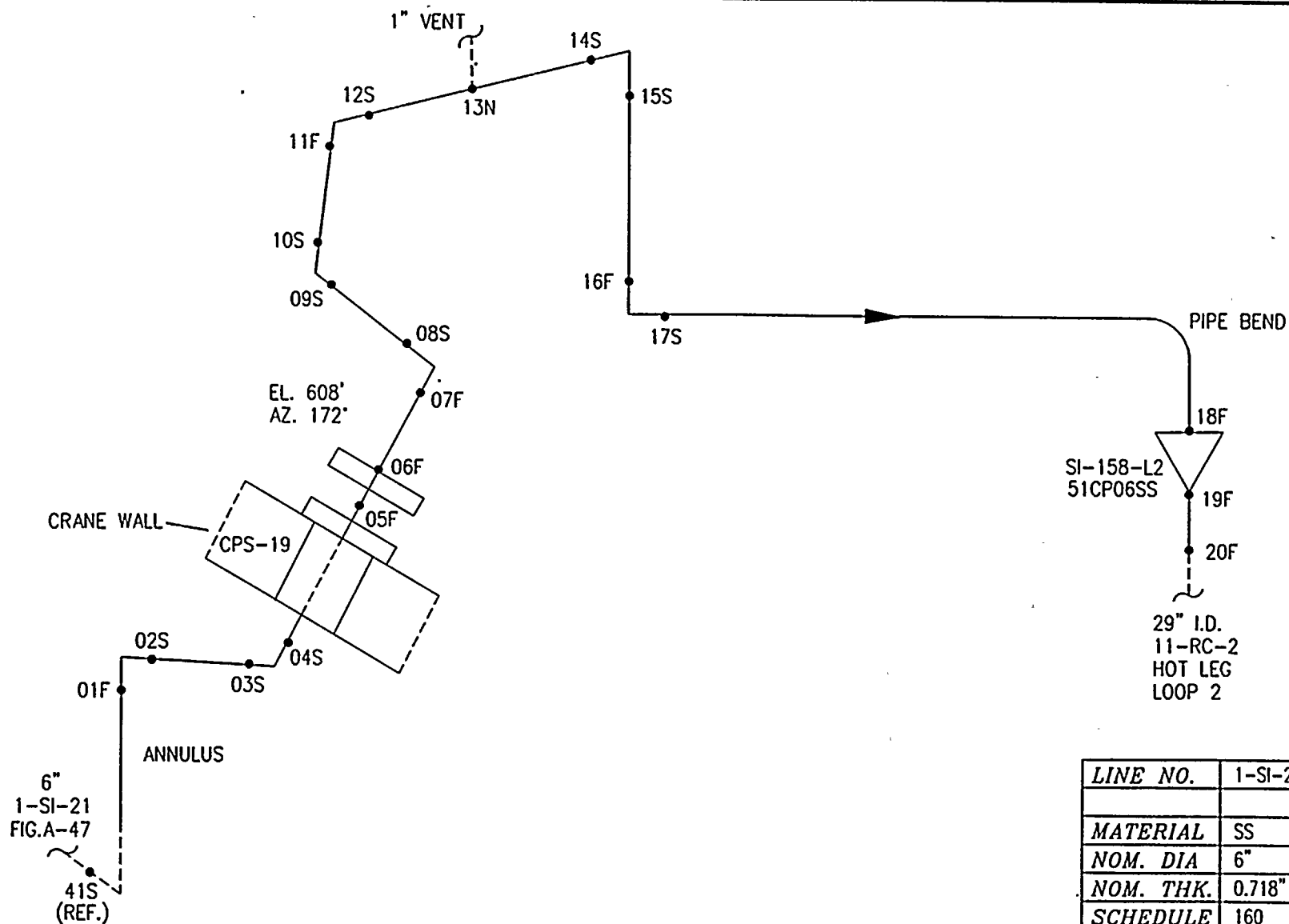
LINE NO.	1-SI-21	
MATERIAL	SS	SS
NOM. DIA	8"	6"
NOM. THK.	0.812"	.718"
SCHEDULE	140	160
CAL. BLK.	3378029	3378028
LOCATION		

D. C. COOK, UNIT 1

FIG. A-47 SAFETY INJECTION SYSTEM

 REF. DRAWING: AEP 1-SI-21
 FLOW DIAGRAM: 1-5143-53

A-48



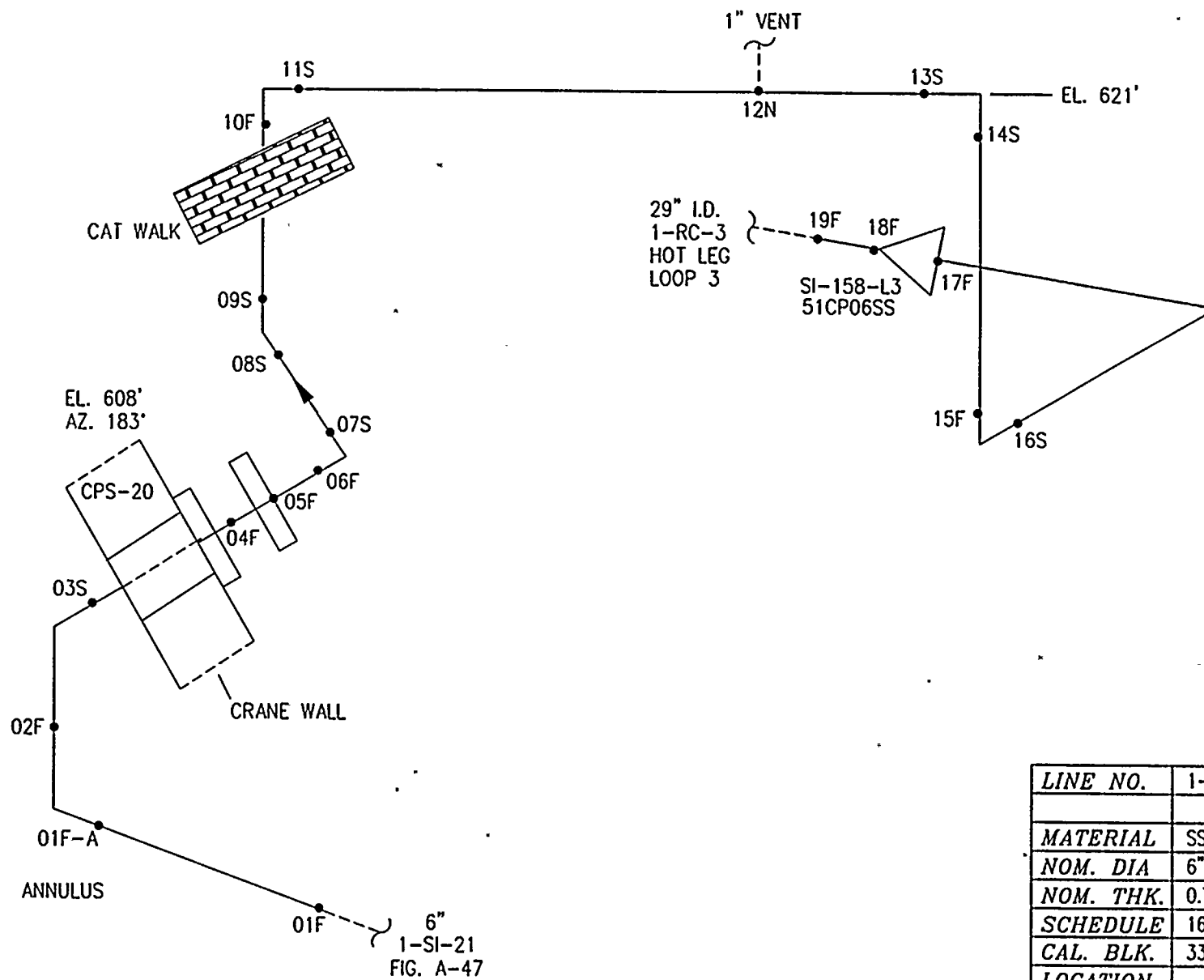
LINE NO.	1-SI-22
MATERIAL	SS
NOM. DIA	6"
NOM. THK.	0.718"
SCHEDULE	160
CAL. BLK.	3378028(6-SS-160-.071)
LOCATION	ANNULUS

D. C. COOK, UNIT 1

FIG. A-48 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-22, R22

FLOW DIAGRAM: 1-5143

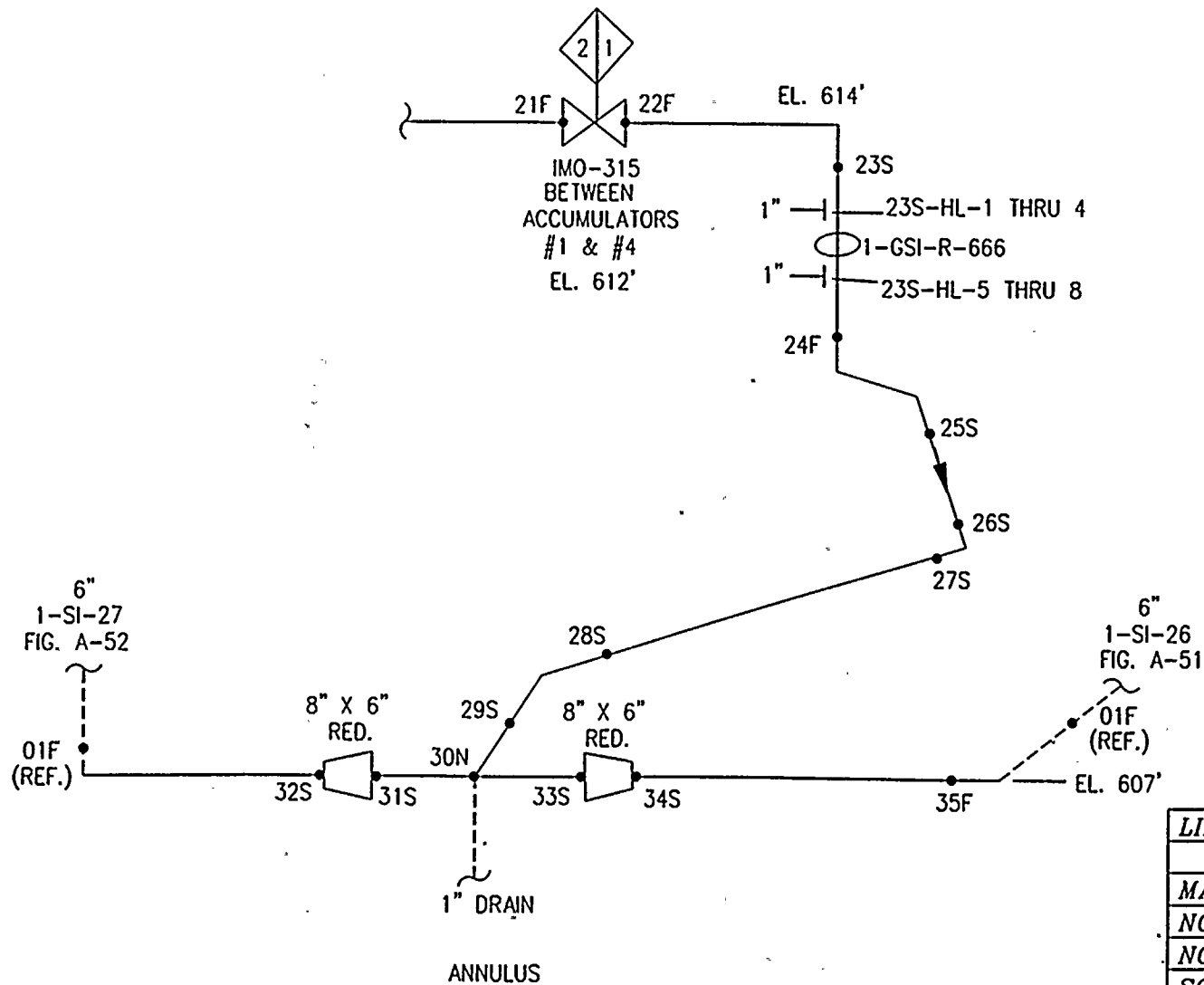


LINE NO.	1-SI-23
MATERIAL	SS
NOM. DIA	6"
NOM. THK.	0.718"
SCHEDULE	160
CAL. BLK.	3378028(6-SS-160-.071)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-49 SAFETY INJECTION SYSTEM

 REF. DRAWING: AEP 1-SI-23, R4
 FLOW DIAGRAM: 1-5143



LINE NO.	1-SI-25	
MATERIAL	SS	SS
NOM. DIA	8"	6"
NOM. THK.	0.812"	0.718"
SCHEDULE	140	160
CAL. BLK.	3378029	3378028
LOCATION		

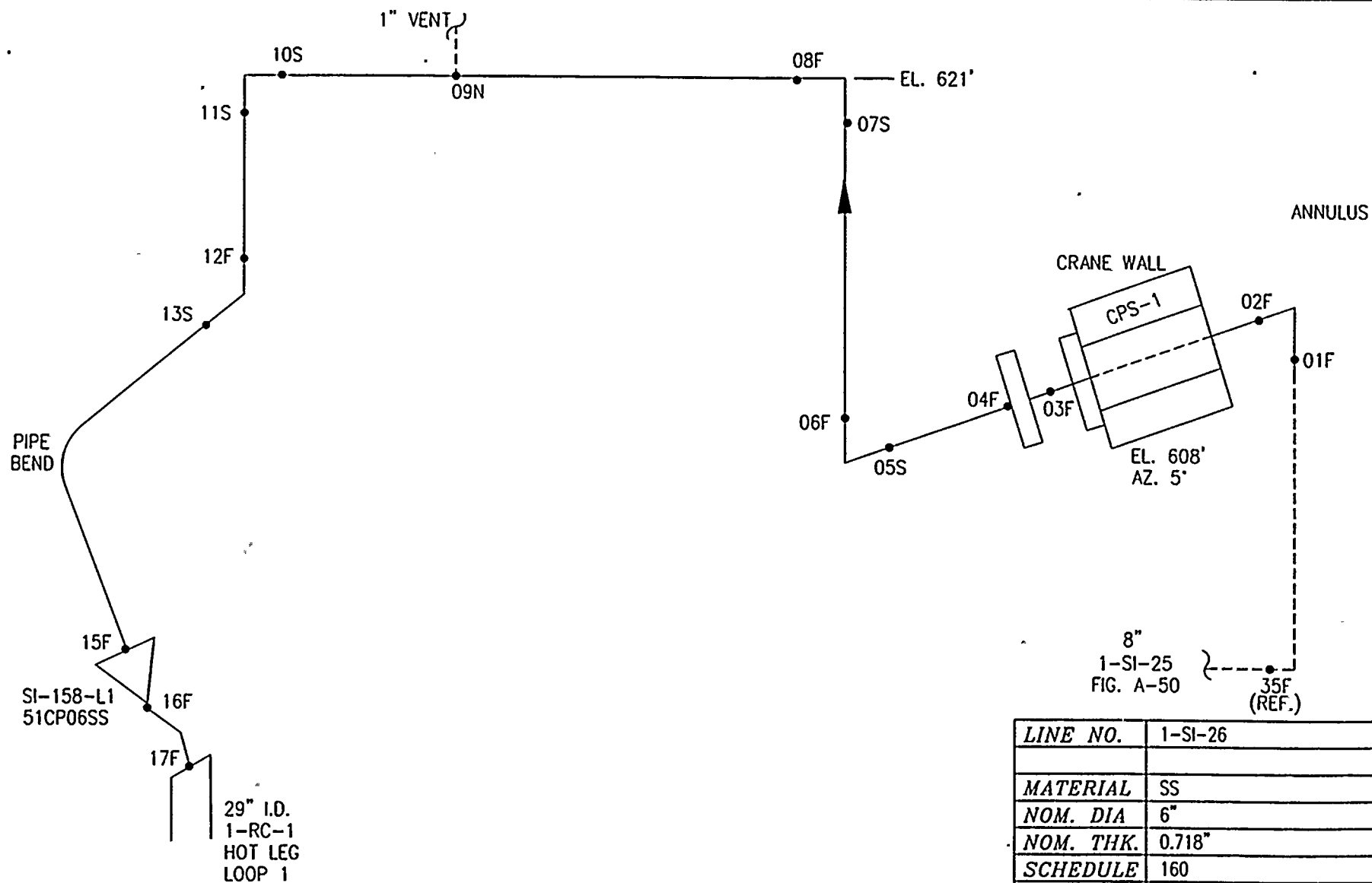
D. C. COOK, UNIT 1

FIG. A-50 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-25

FLOW DIAGRAM: 1-5143

A-51

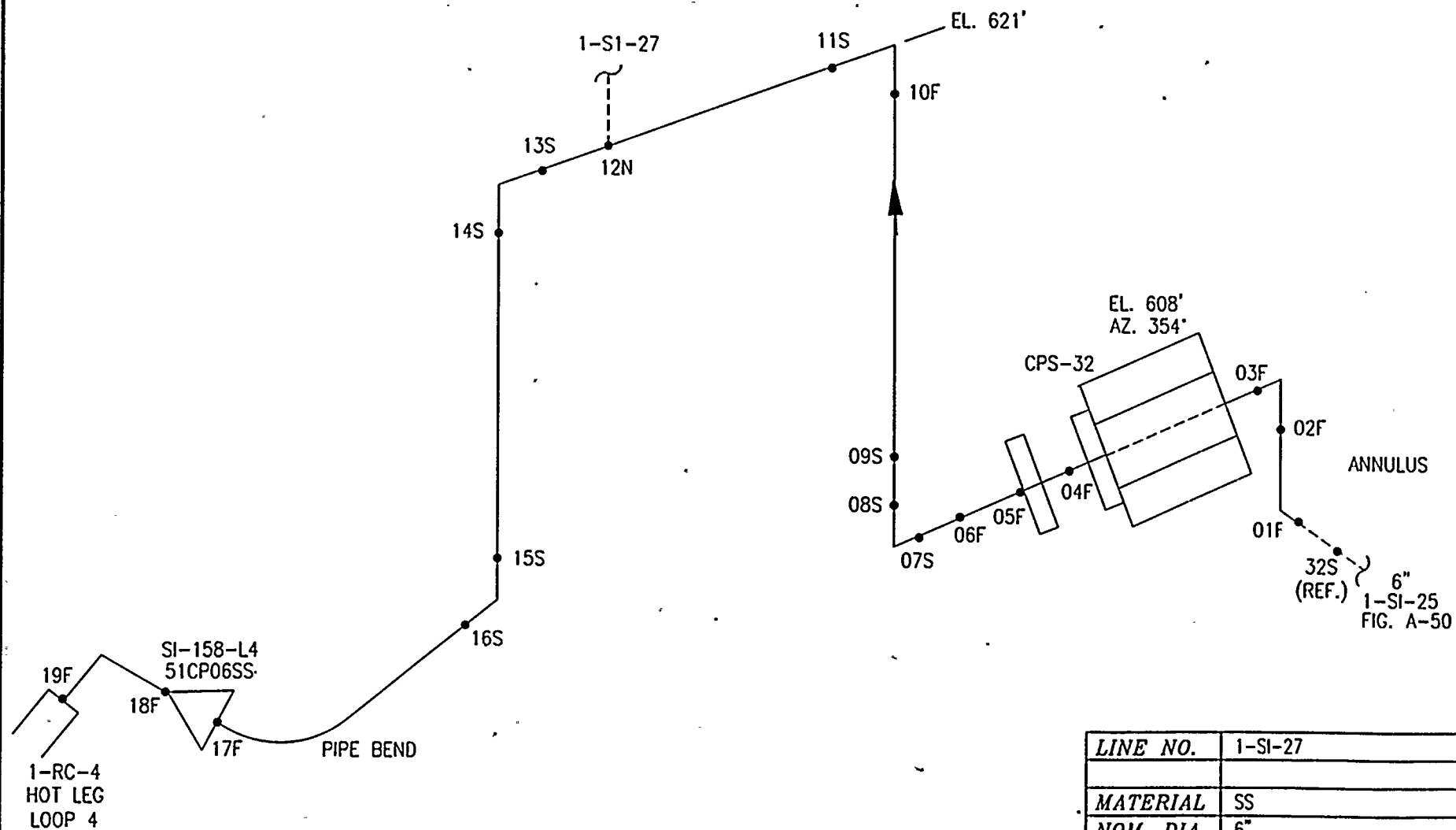


LINE NO.	1-SI-26
MATERIAL	SS
NOM. DIA	6"
NOM. THK.	0.718"
SCHEDULE	160
CAL. BLK.	3378028(6-SS-160-.71)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-51 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-26, R13
FLOW DIAGRAM: 1-5143



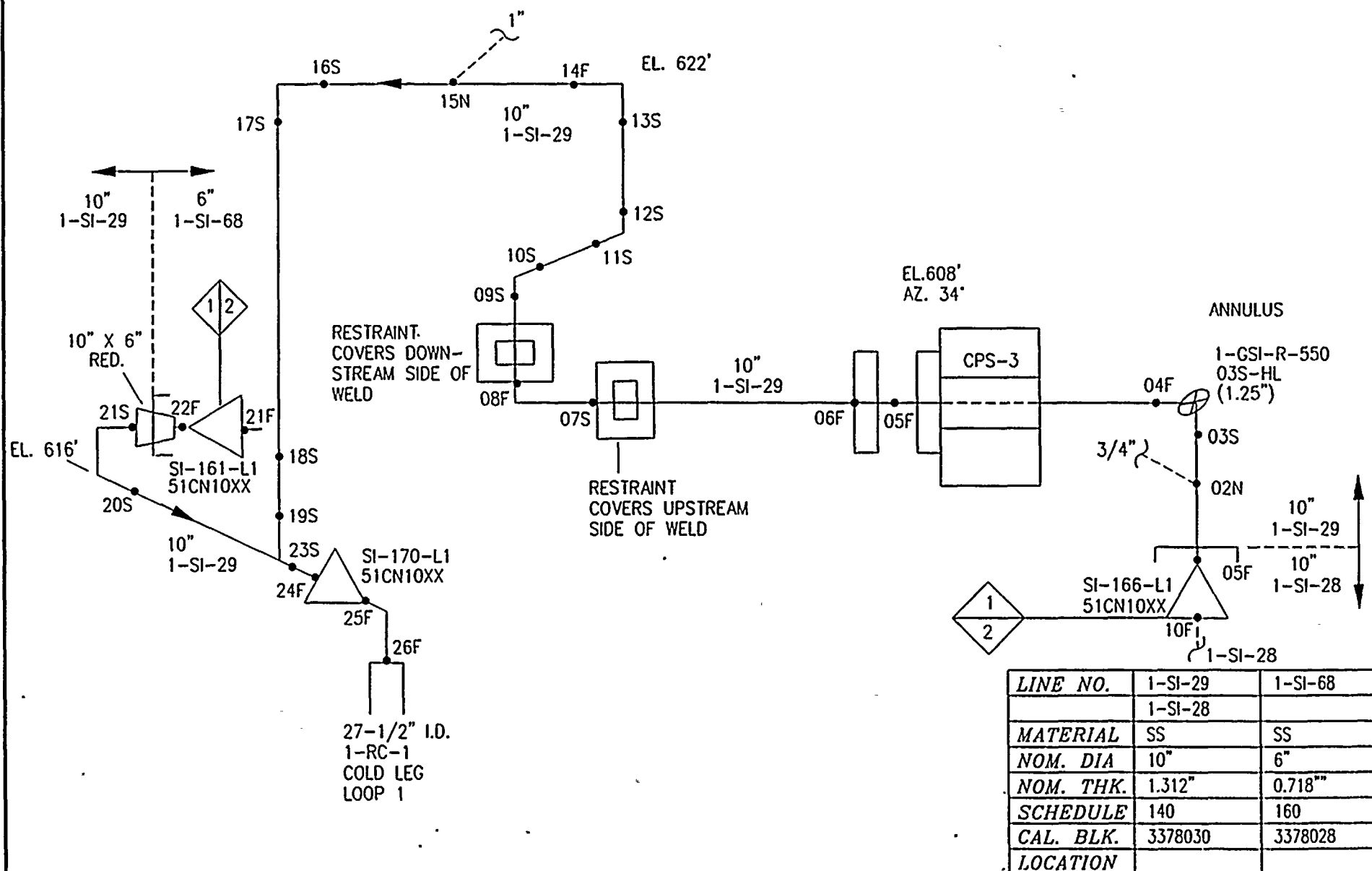
LINE NO.	1-SI-27
MATERIAL	SS
NOM. DIA	6"
NOM. THK.	0.718"
SCHEDULE	160
CAL. BLK.	3378028(6-SS-160-.71)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-52 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-27, R16
 FLOW DIAGRAM: 1-5143

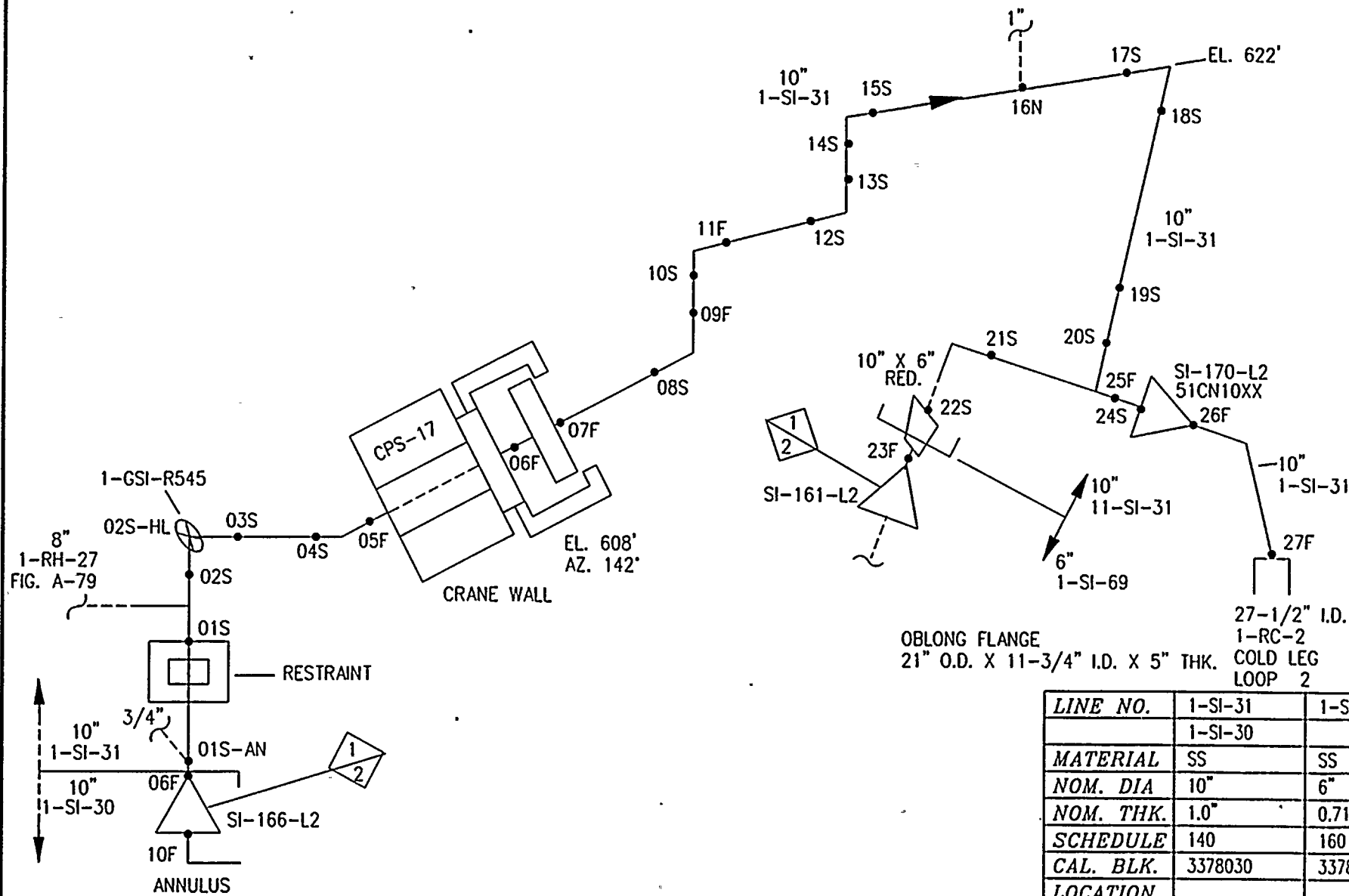
A-53



D. C. COOK, UNIT 1

FIG. A-53 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-29
FLOW DIAGRAM: 1-5143



OBLONG FLANGE
21" O.D. X 11-3/4" I.D. X 5" THK.

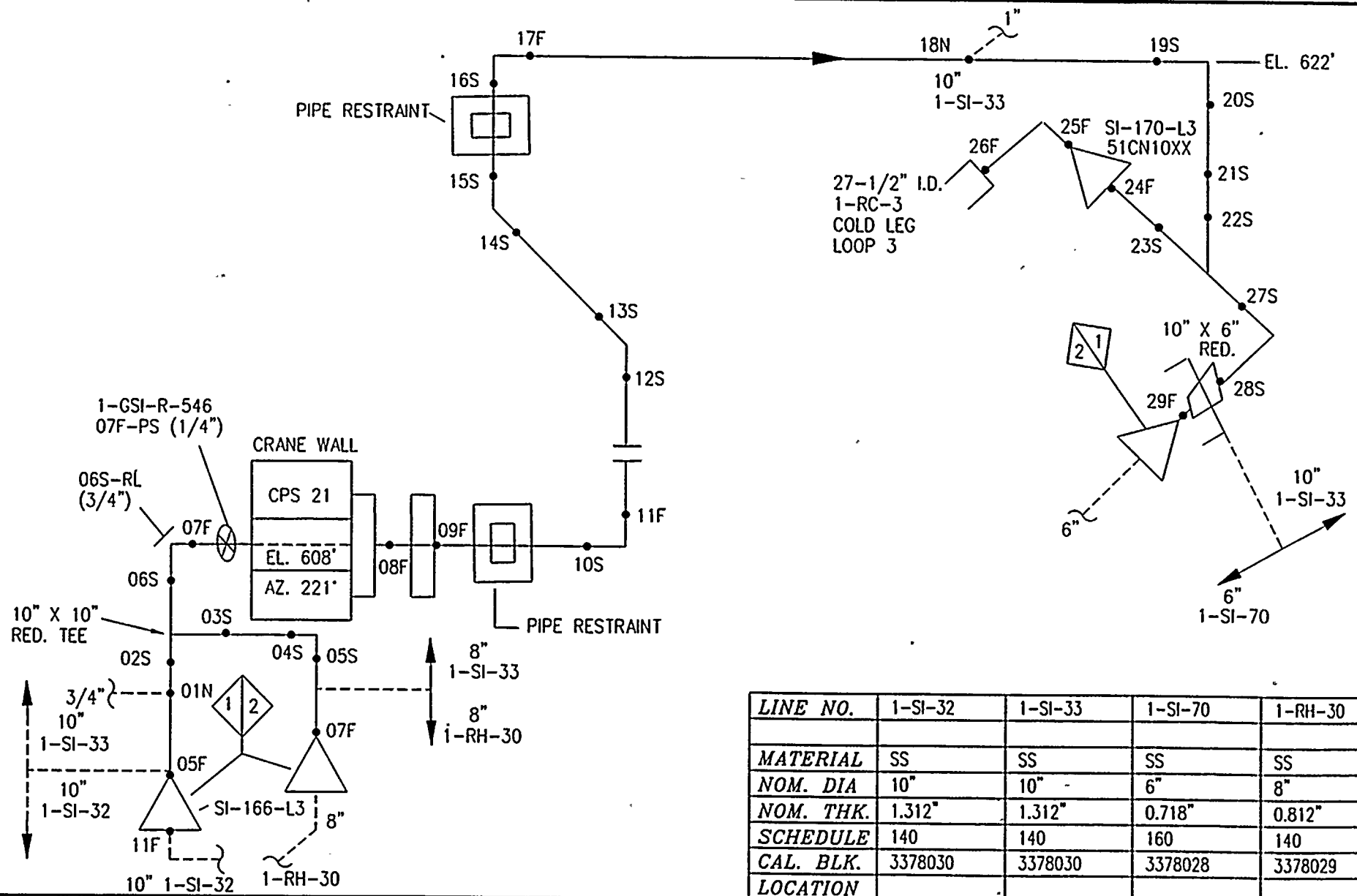
LINE NO.	1-SI-31	1-SI-69
	1-SI-30	
MATERIAL	SS	SS
NOM. DIA	10"	6"
NOM. THK.	1.0"	0.718"
SCHEDULE	140	160
CAL. BLK.	3378030	3378028
LOCATION		

D. C. COOK, UNIT 1

FIG. A-54 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-31
FLOW DIAGRAM: 1-5143

A-55

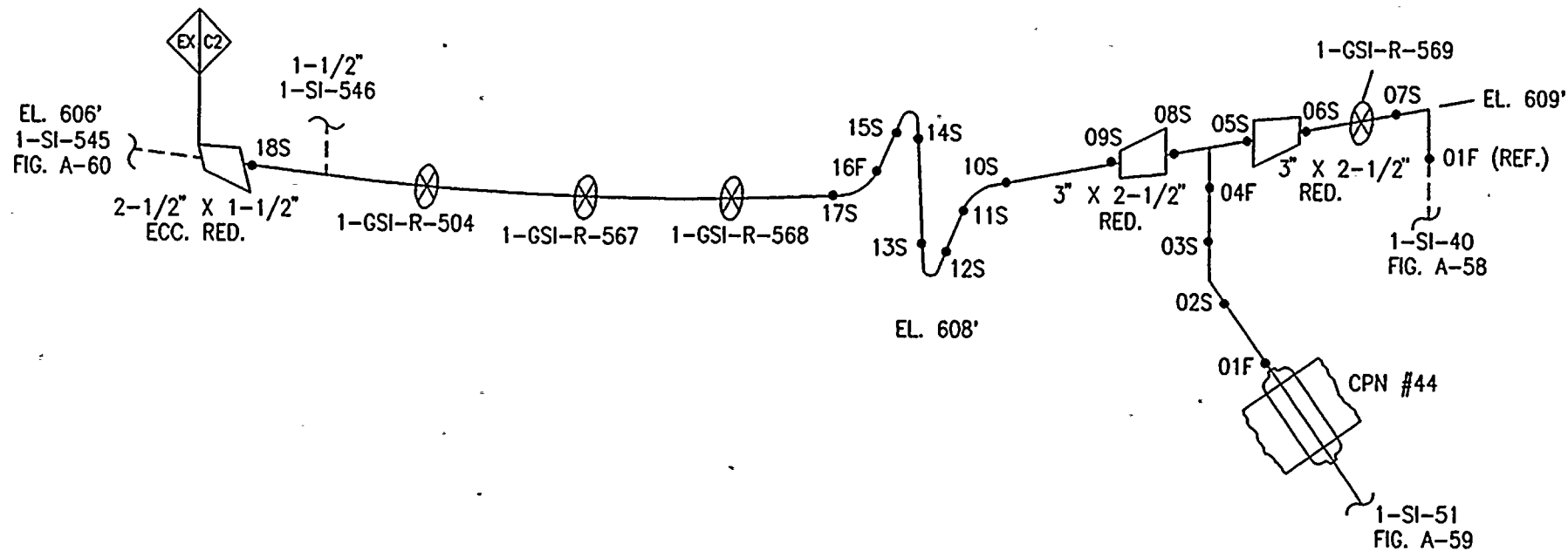


LINE NO.	1-SI-32	1-SI-33	1-SI-70	1-RH-30
MATERIAL	SS	SS	SS	SS
NOM. DIA	10"	10"	6"	8"
NOM. THK.	1.312"	1.312"	0.718"	0.812"
SCHEDULE	140	140	160	140
CAL. BLK.	3378030	3378030	3378028	3378029
LOCATION				

D. C. COOK, UNIT 1

FIG. A-55 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP1-SI-33
FLOW DIAGRAM: 1-5143



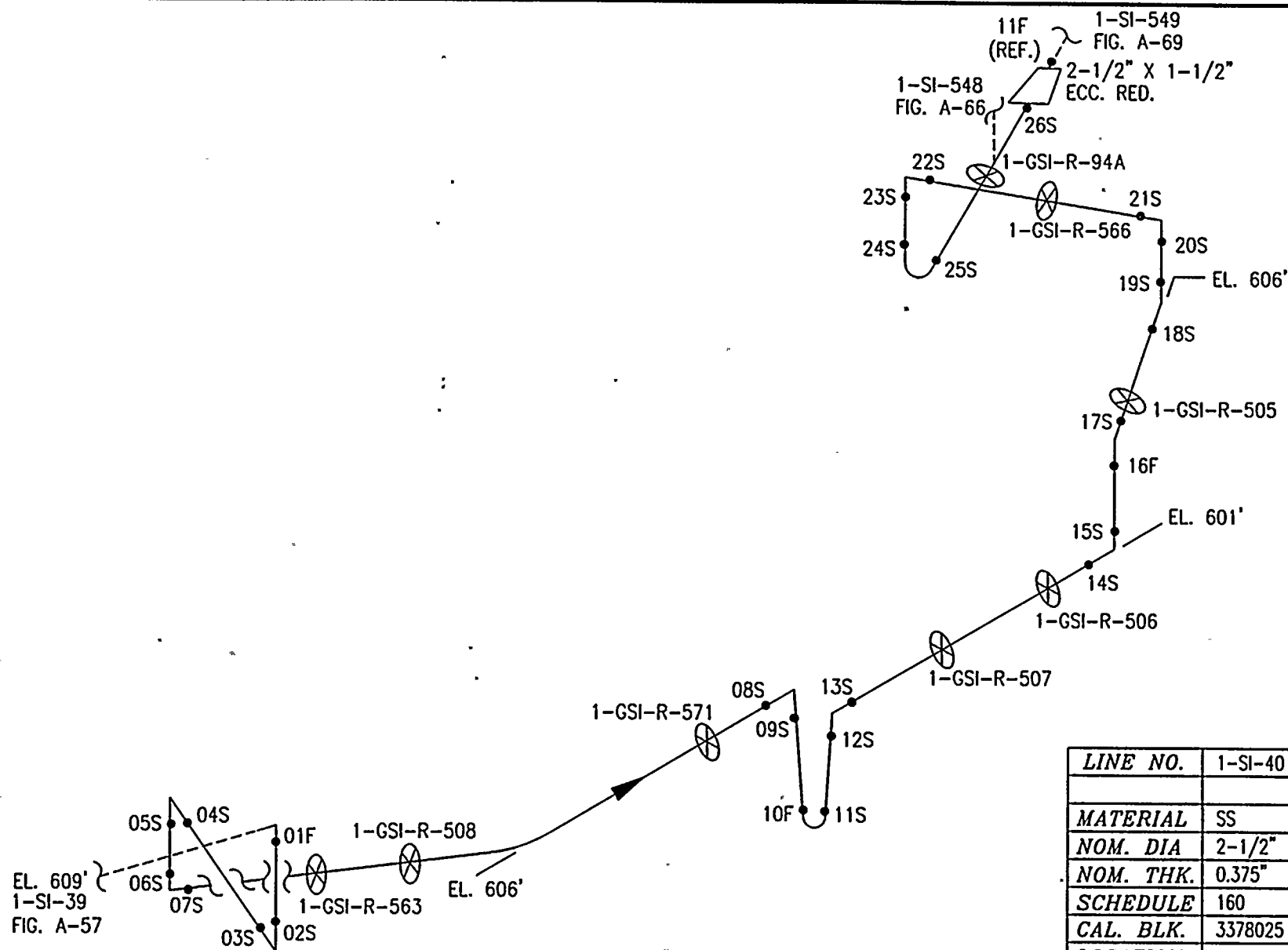
LINE NO.	1-SI-39	
MATERIAL	SS	
NOM. DIA	3"	2-1/2"
NOM. THK.	0.438"	0.203"
SCHEDULE	160	40
CAL. BLK.	3378026	15-DCC
LOCATION		

D. C. COOK, UNIT 1

FIG. A-57 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-39

FLOW DIAGRAM: 1-5142

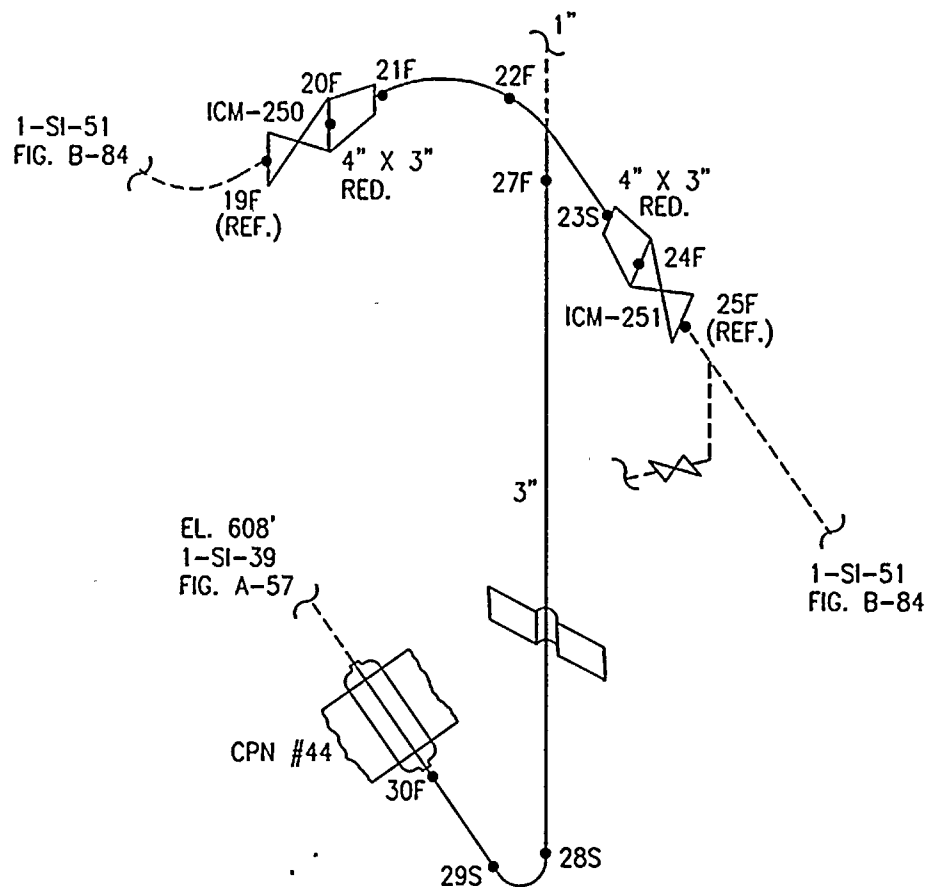


D. C. COOK, UNIT 1

FIG. A-58 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-40
FLOW DIAGRAM: 1-5142

A-59



LINE NO.	1-SI-51	
MATERIAL	SS	
NOM. DIA	4"	6"
NOM. THK.	0.438"	0.71"
SCHEDULE	120	160
CAL. BLK.	3378027	3378028
LOCATION		

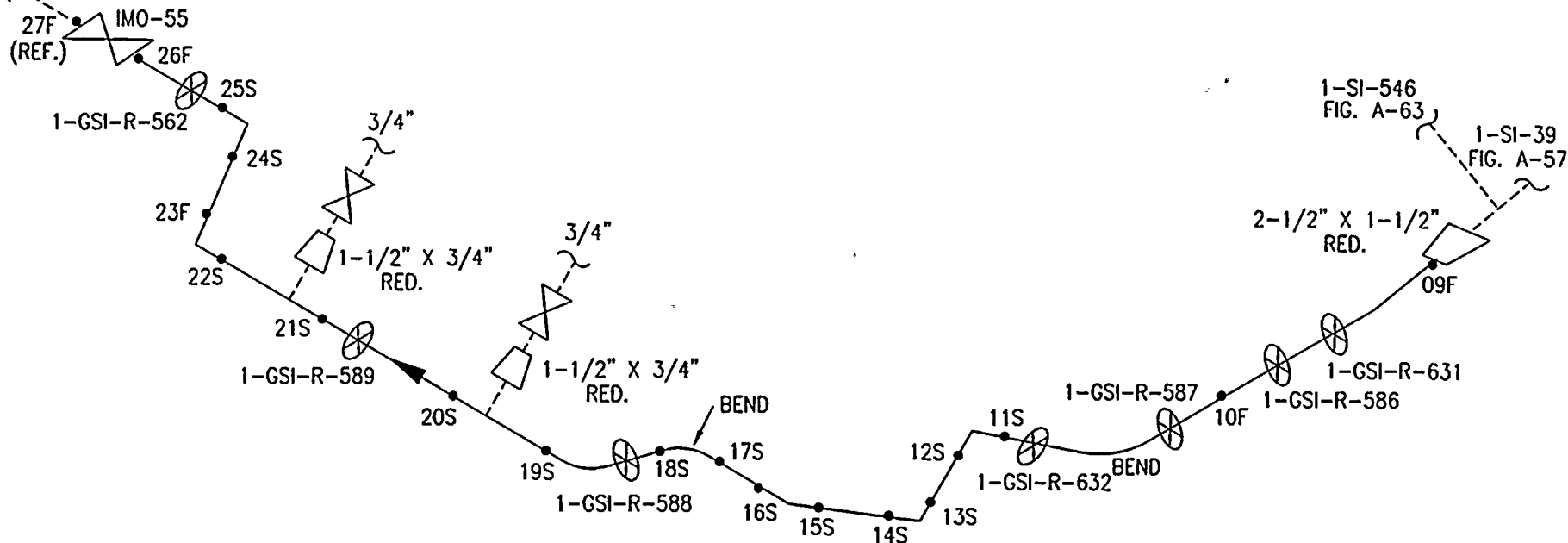
D. C. COOK, UNIT 1

FIG. A-59 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-51, SHI. 2 OF 2
FLOW DIAGRAM: 1-5142

A-60

1-SI-545
CONT'D ON
FIG. A-61



LINE NO.	1-SI-545
MATERIAL	SS
NOM. DIA	1-1/2"
NOM. THK.	0.281"
SCHEDULE	160
CAL. BLK.	N/A
LOCATION	

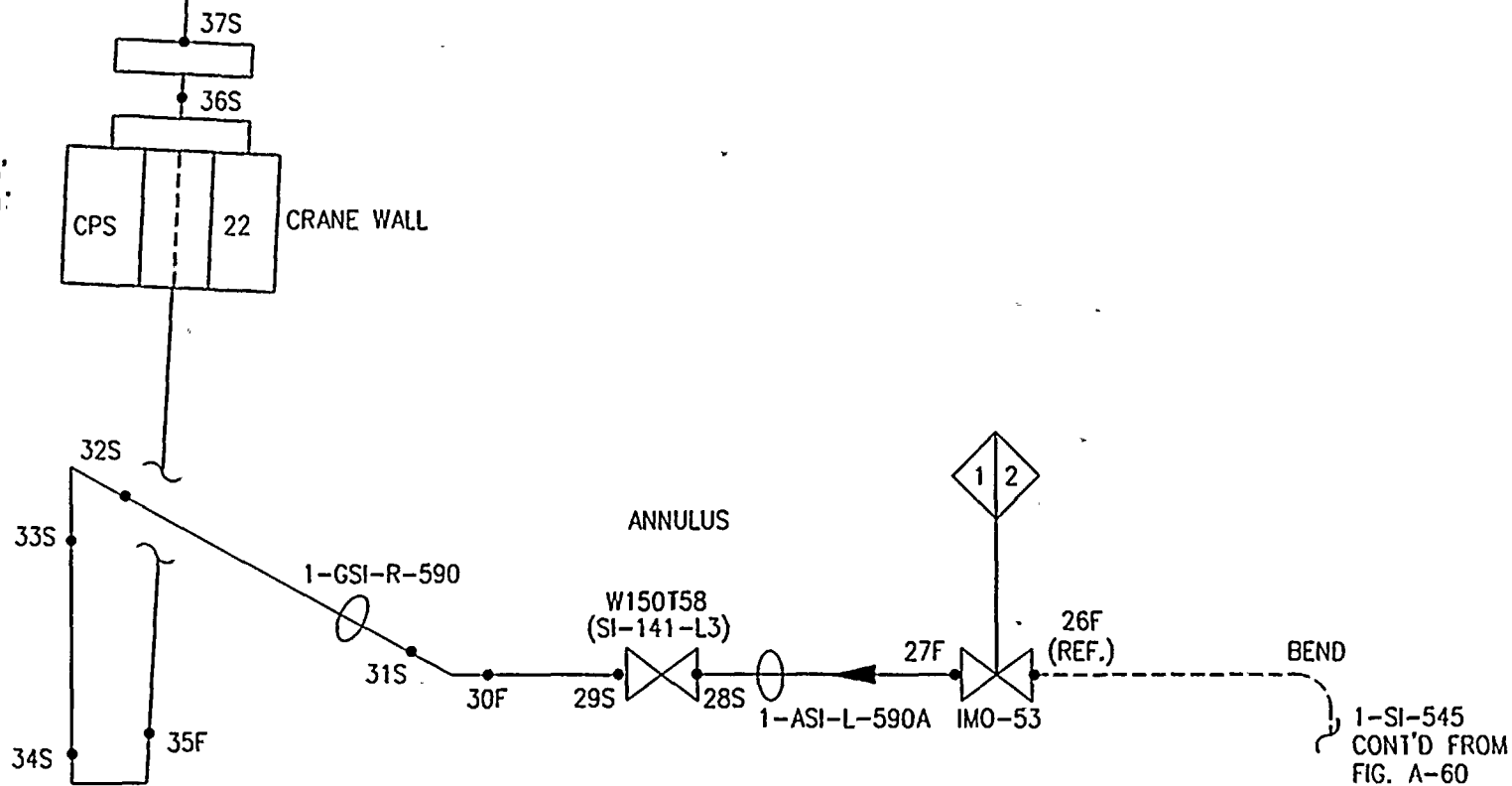
D. C. COOK, UNIT 1

FIG. A-60 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-545, L1.3 & L4.7
FLOW DIAGRAM: 1-5142

2-SI-545
CONT'D ON
FIG. A-58

EL. 605'
AZ. 221'

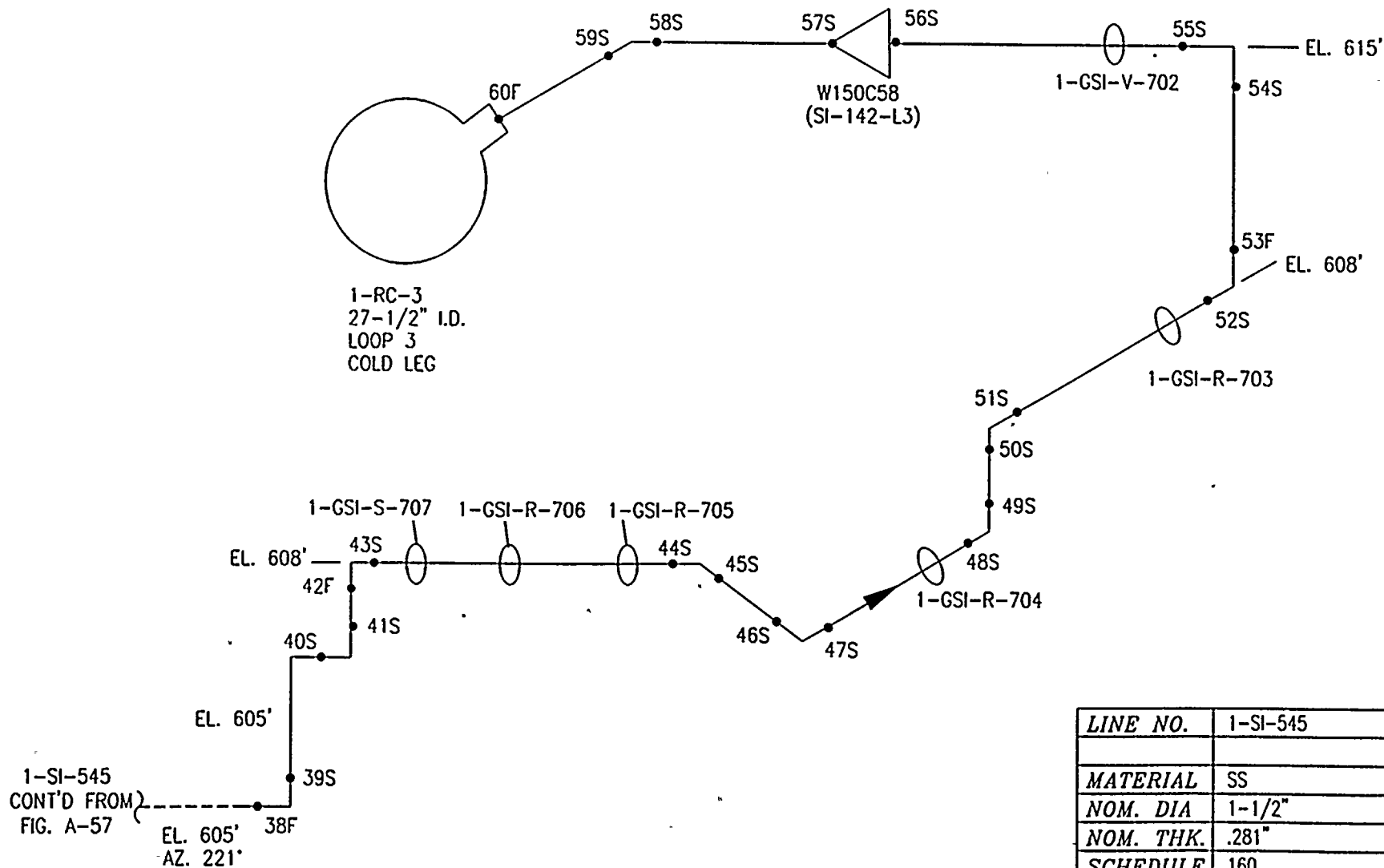


LINE NO.	1-SI-545
MATERIAL	SS
NOM. DIA	1-1/2"
NOM. THK.	.281"
SCHEDULE	160
CAL. BLK.	1.5-SS-160-.281-1-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. A-61 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-545
FLOW DIAGRAM: 1-5142

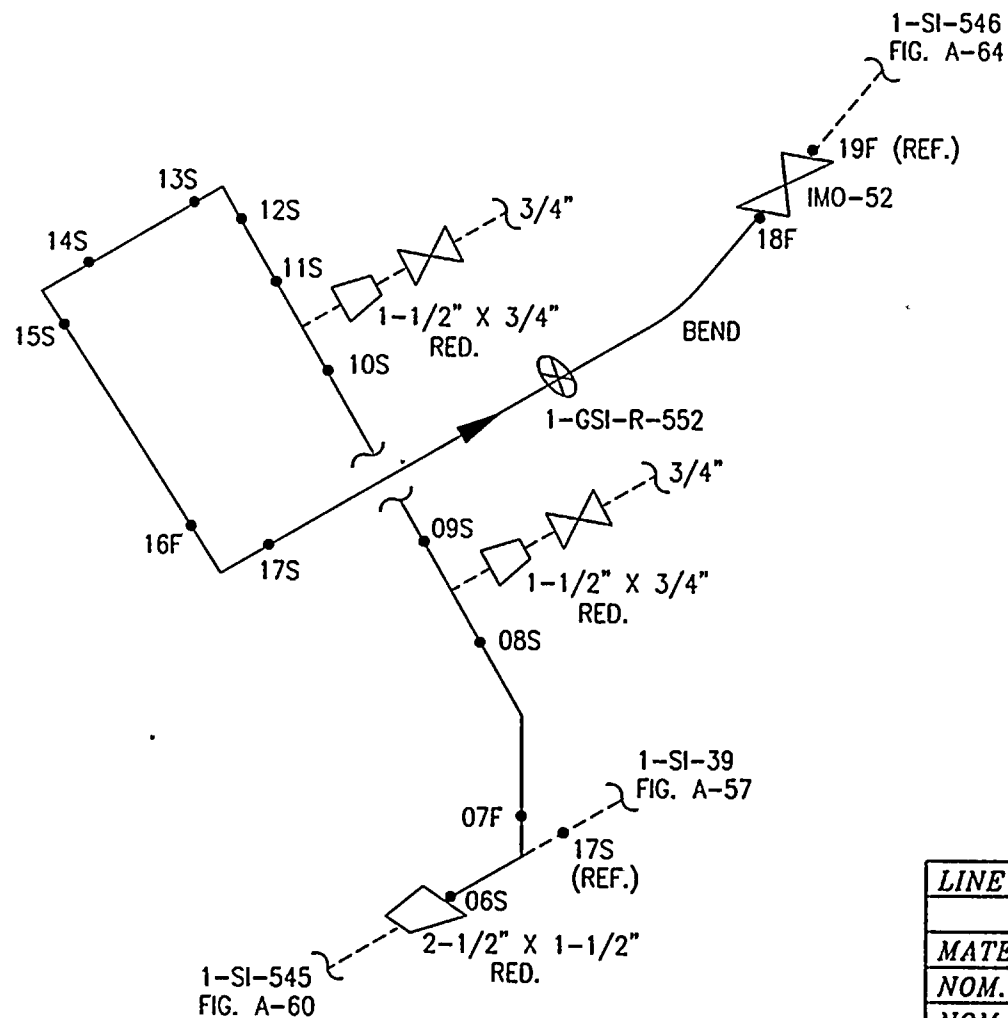


LINE NO.	1-SI-545
MATERIAL	SS
NOM. DIA	1-1/2"
NOM. THK.	.281"
SCHEDULE	160
CAL. BLK.	1.5-SS-160-.281-1-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. A-62 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-545
 FLOW DIAGRAM: 1-5128/1-5142

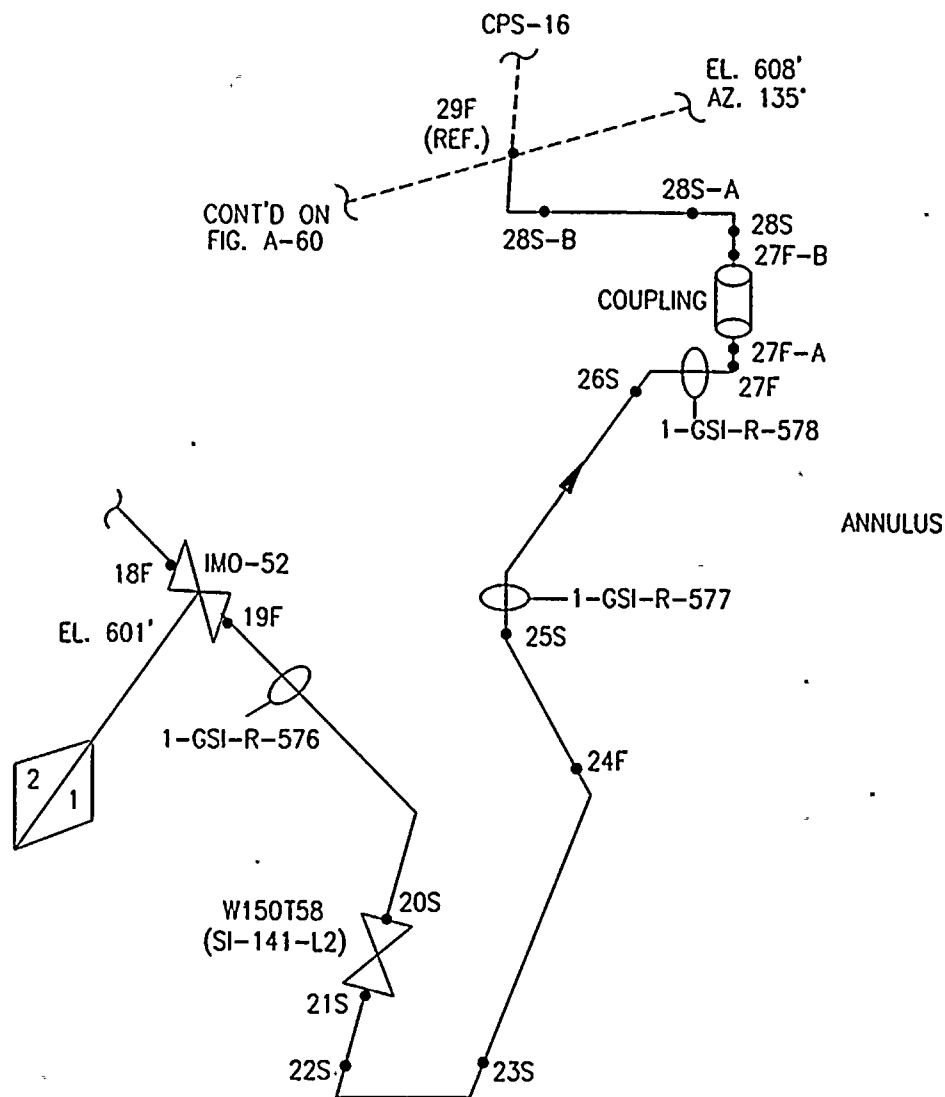


LINE NO.	1-SI-546
MATERIAL	SS
NOM. DIA	1-1/2"
NOM. THK.	0.281"
SCHEDULE	160
CAL. BLK.	N/A
LOCATION	

D. C. COOK, UNIT 1

FIG. A-63 SAFETY INJECTION SYSTEM

 REF. DRAWING: AEP 1-SI-546, L1.6
 FLOW DIAGRAM: 1-5142



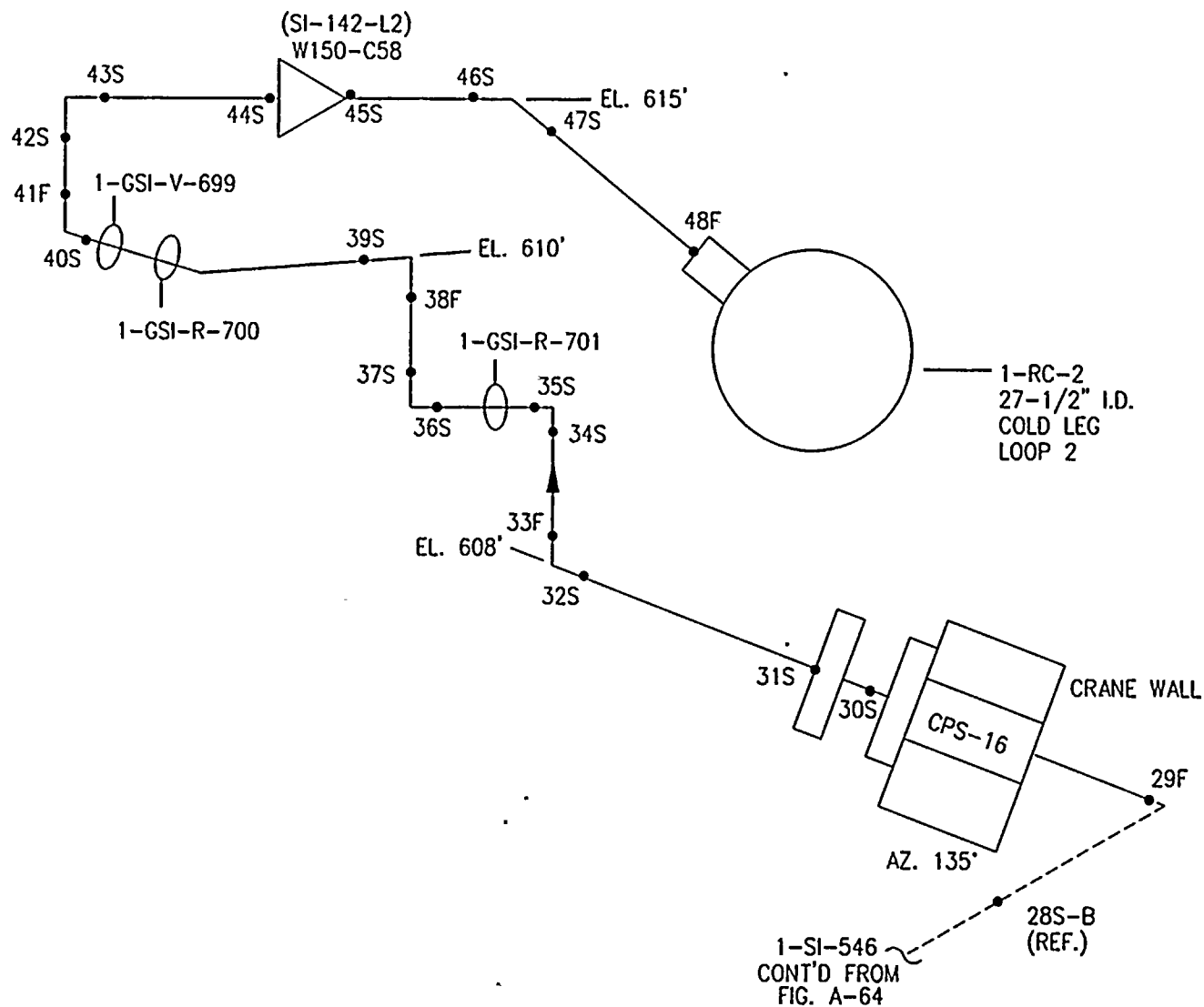
LINE NO.	1-SI-546
MATERIAL	SS
NOM. DIA	1-1/2"
NOM. THK.	0.281"
SCHEDULE	160
CAL. BLK.	1.5-SS-160-.281-1-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. A-64 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-546

FLOW DIAGRAM: 1-5128/1-5142

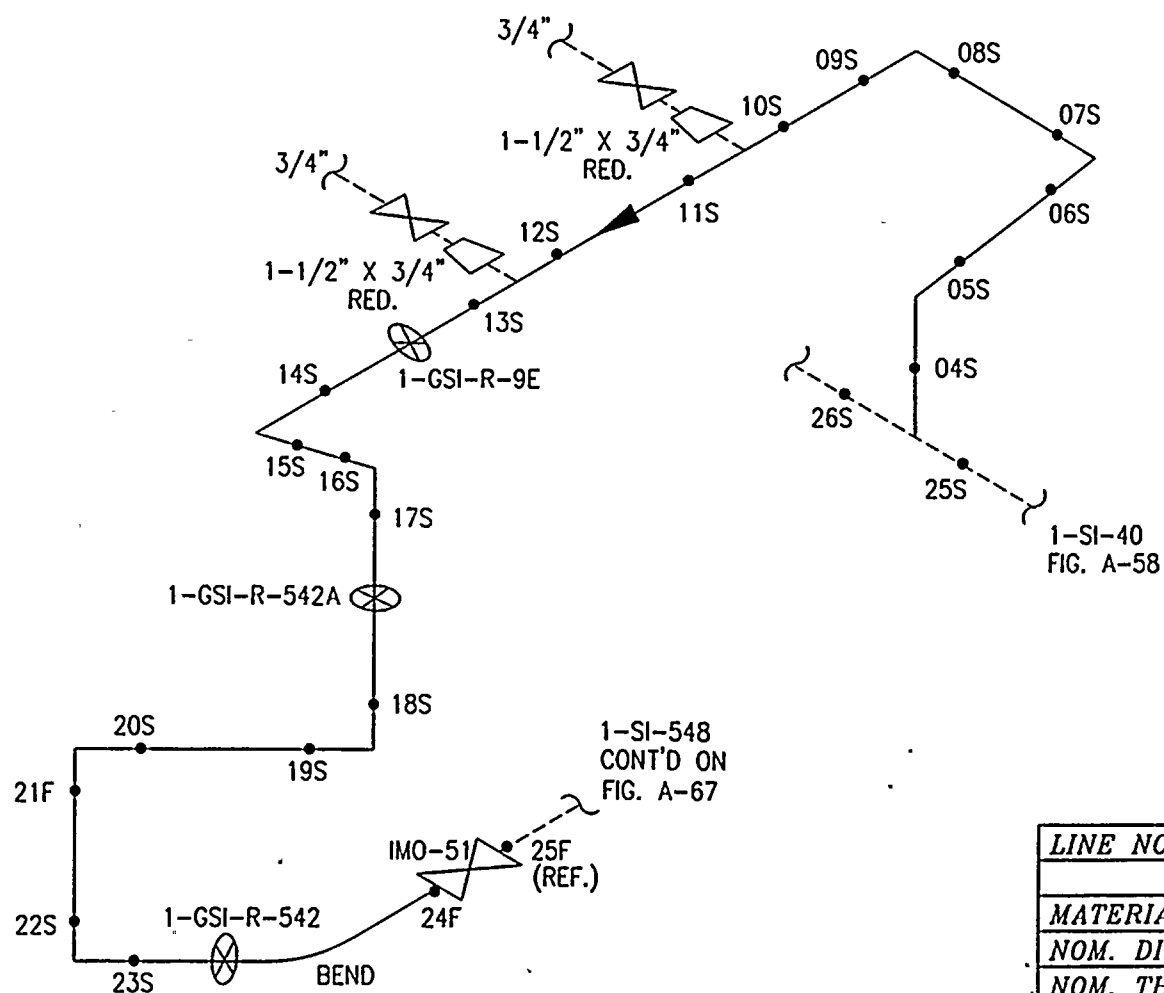


LINE NO.	1-SI-546
MATERIAL	SS
NOM. DIA	1-1/2"
NOM. THK.	0.281"
SCHEDULE	160
CAL. BLK.	1.5-SS-160-.281-1-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. A-65 SAFETY INJECTION SYSTEM

 REF. DRAWING: AEP 1-SI-546
 FLOW DIAGRAM: 1-5128/1-5142

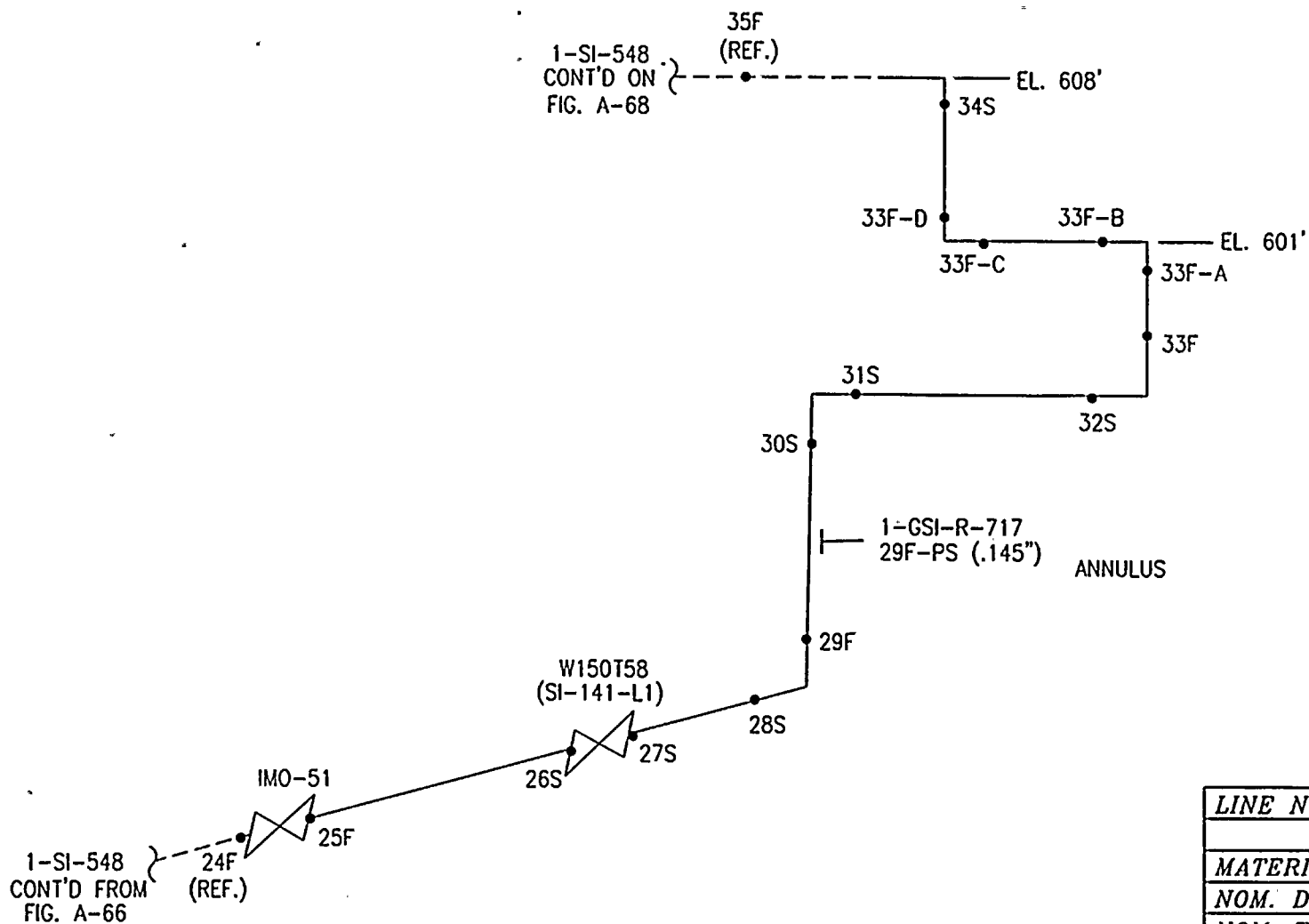


LINE NO.	1-SI-548
MATERIAL	SS
NOM. DIA	1-1/2"
NOM. THK.	0.281"
SCHEDULE	160
CAL. BLK.	N/A
LOCATION	

D. C. COOK, UNIT 1

FIG. A-66 SAFETY INJECTION SYSTEM

 REF. DRAWING: AEP 1-SI-548, L1.6
 FLOW DIAGRAM: 1-5142

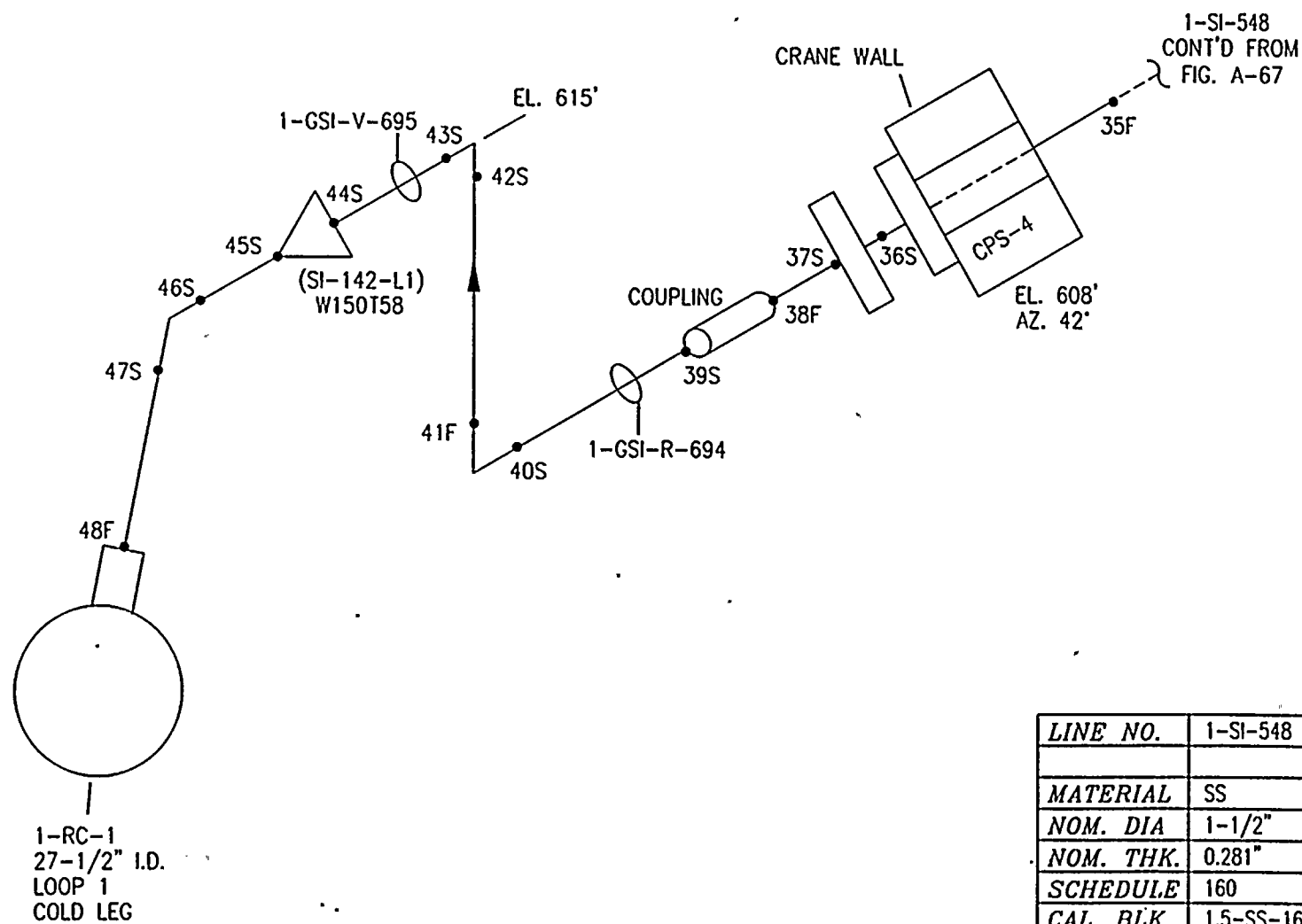


LINE NO.	1-SI-548
MATERIAL	SS
NOM. DIA	1-1/2"
NOM. THK.	0.281"
SCHEDULE	160
CAL. BLK.	1.5-SS-160-.218-1-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. A-67 SAFETY INJECTION SYSTEM

 REF. DRAWING: ACP 1-SI-548
 FLOW DIAGRAM: 1-5142



LINE NO.	1-SI-548
MATERIAL	SS
NOM. DIA	1-1/2"
NOM. THK.	0.281"
SCHEDULE	160
CAL. BLK.	1.5-SS-160-.281-1-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. A-68 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-548
 FLOW DIAGRAM: 1-5128/1-5142

A-69

1-SI-549
CONT'D ON
FIG. A-70

20F

1-GSI-R-503

15S 14S
13F 12S
16S 17S
18S 19S

1-GSI-R-635

11F

2-1/2" X 1-1/2"
RED.

1-SI-40
FIG. A-58

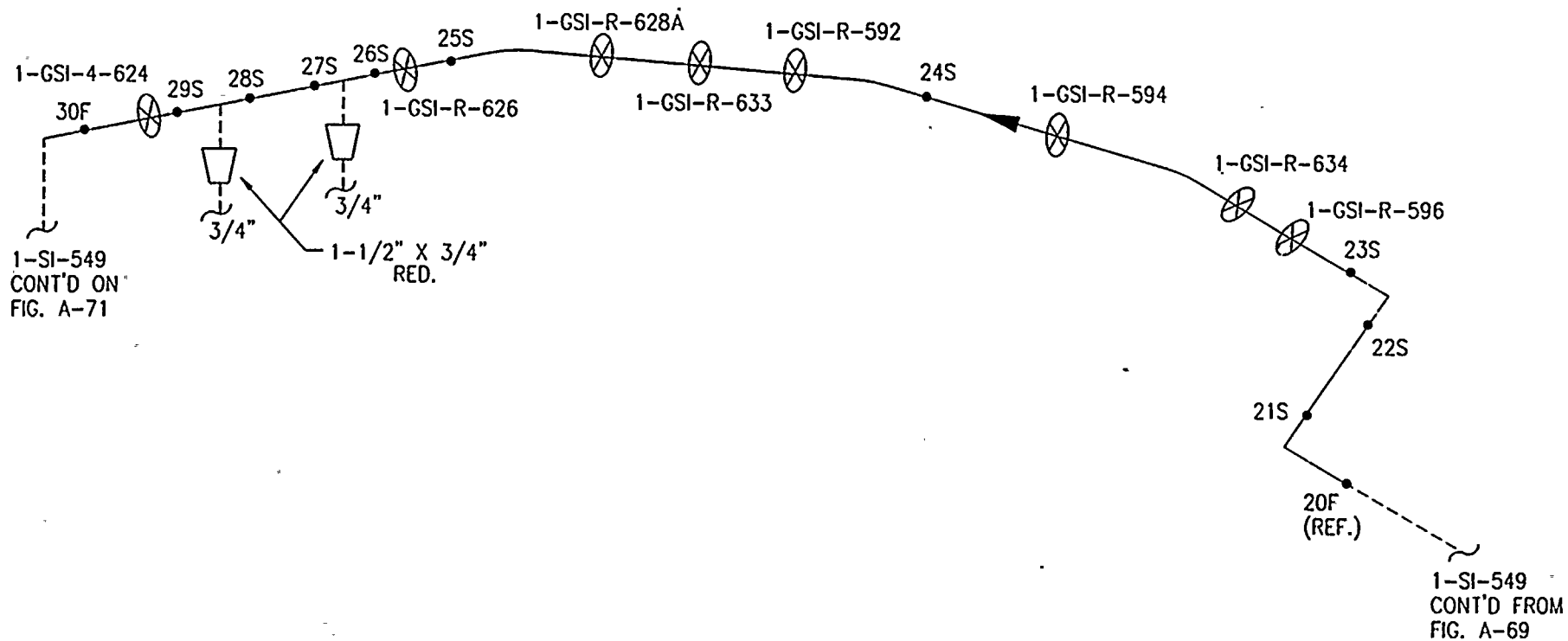
LINE NO.	1-SI-549
MATERIAL	SS
NOM. DIA	1-1/2"
NOM. THK.	0.281"
SCHEDULE	160
CAL. BLK.	N/A
LOCATION	

D. C. COOK, UNIT 1

FIG. A-69 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-549, L1.3
FLOW DIAGRAM: 1-5142

A-70

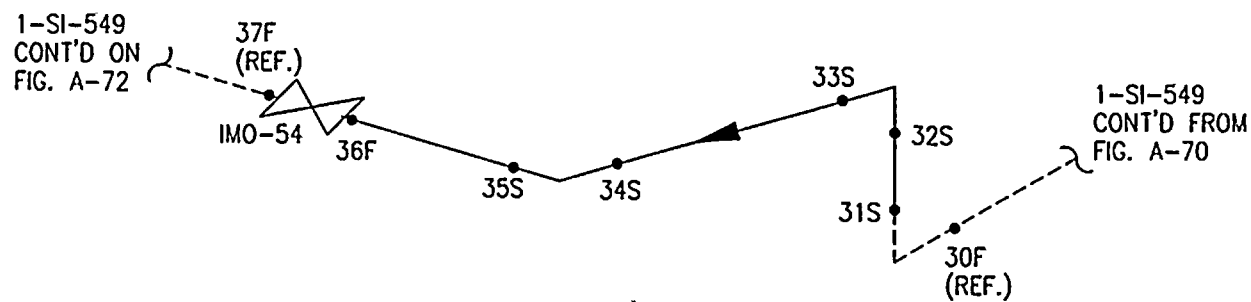


LINE NO.	1-SI-549
MATERIAL	SS
NOM. DIA	1-1/2"
NOM. THK.	0.281"
SCHEDULE	160
CAL. BLK.	N/A
LOCATION	

D. C. COOK, UNIT 1

FIG. A-70 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-549, L4.7
FLOW DIAGRAM: 1-5142

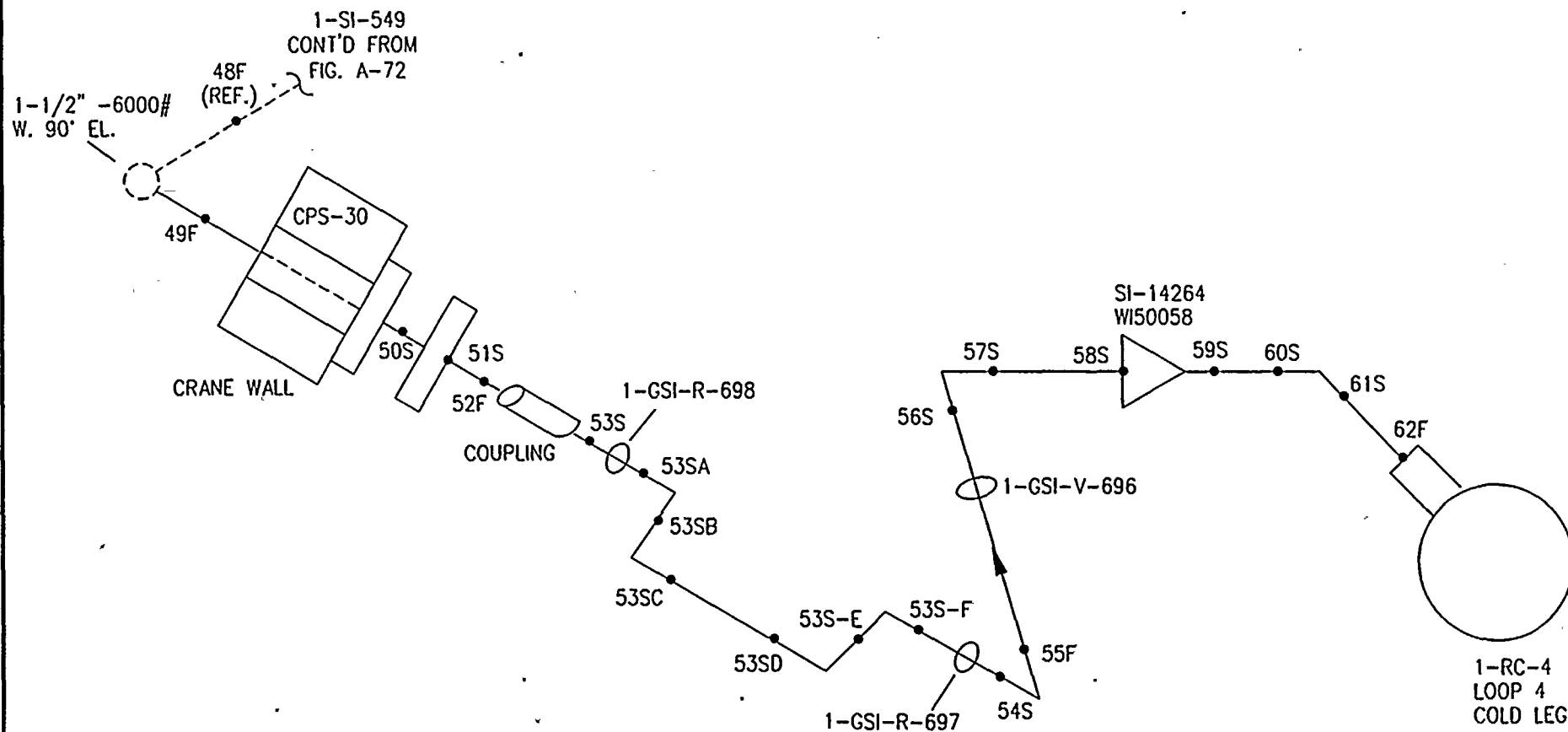


LINE NO.	1-SI-549
MATERIAL	SS
NOM. DIA	1-1/2"
NOM. THK.	0.281"
SCHEDULE	160
CAL. BLK.	N/A
LOCATION	

D. C. COOK, UNIT 1

FIG. A-71 SAFETY INJECTION SYSTEM

 REF. DRAWING: AEP 1-SI-549, L8.13
 FLOW DIAGRAM: 1-5142



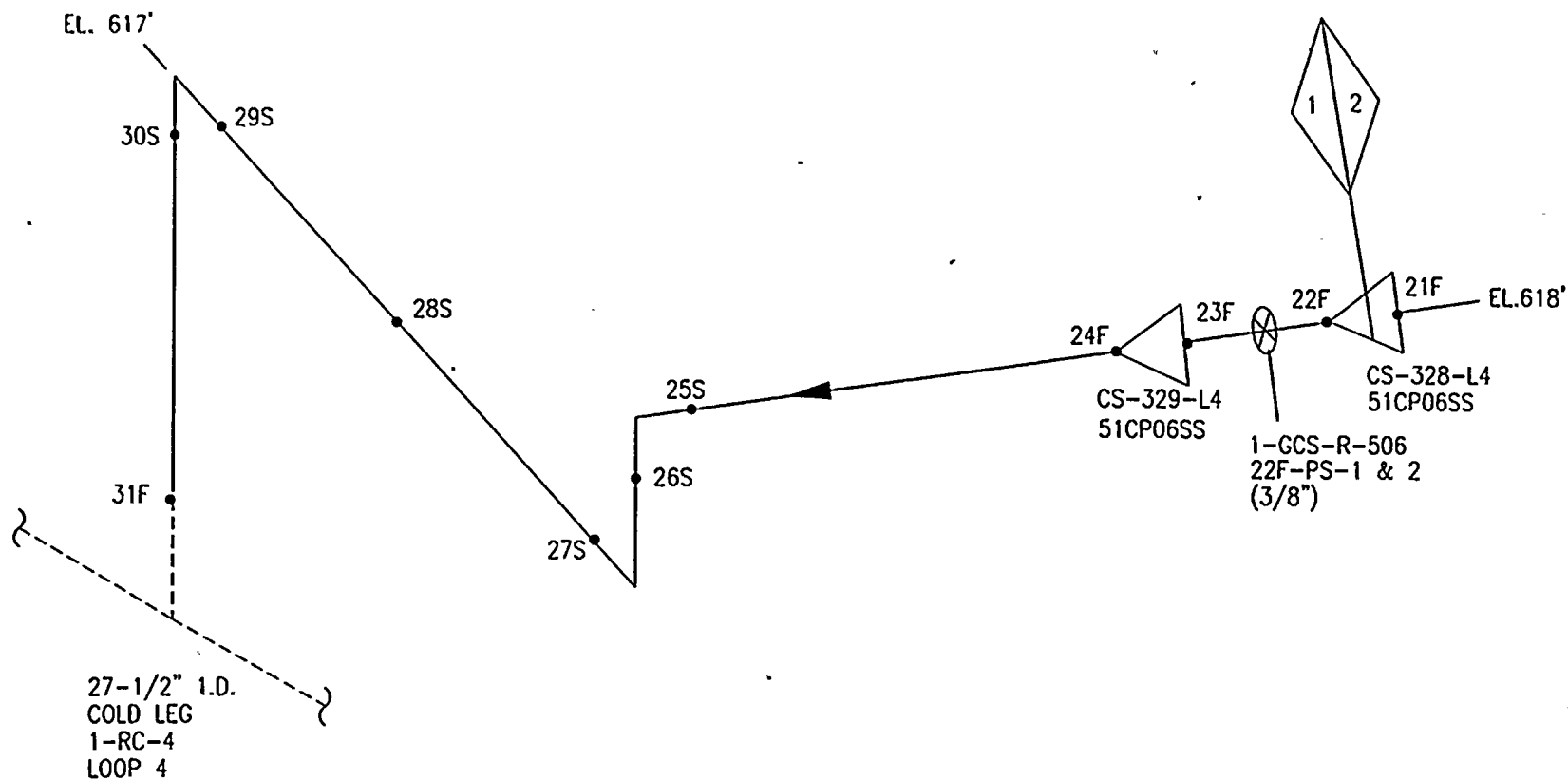
LINE NO.	1-SI-549
MATERIAL	SS
NOM. DIA	1-1/2"
NOM. THK.	0.281"
SCHEDULE	160
CAL. BLK.	1.5-SS-160-.281-1-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. A-73 SAFETY INJECTION SYSTEM

REF. DRAWING: AEP 1-SI-549
 FLOW DIAGRAM: 1-5128

A-74



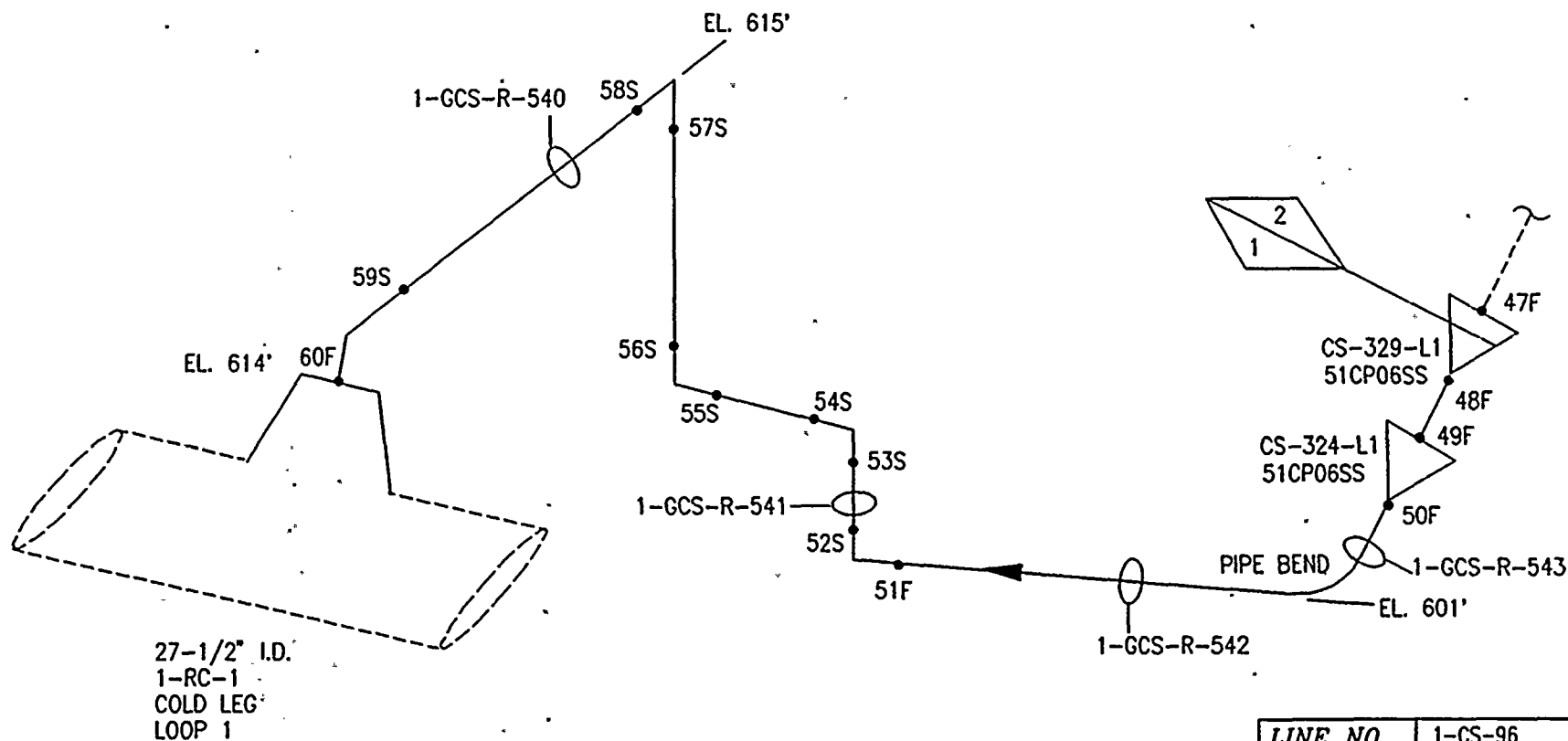
LINE NO.	1-CS-92
MATERIAL	SS
NOM. DIA	3"
NOM. THK.	0.438"
SCHEDULE	160
CAL. BLK.	3378026(3-SS-160-.430)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-74 CHEMICAL AND VOLUME CONTROL SYSTEM

REF. DRAWING: AEP 1-CS-92
FLOW DIAGRAM: 1-5128

A-75

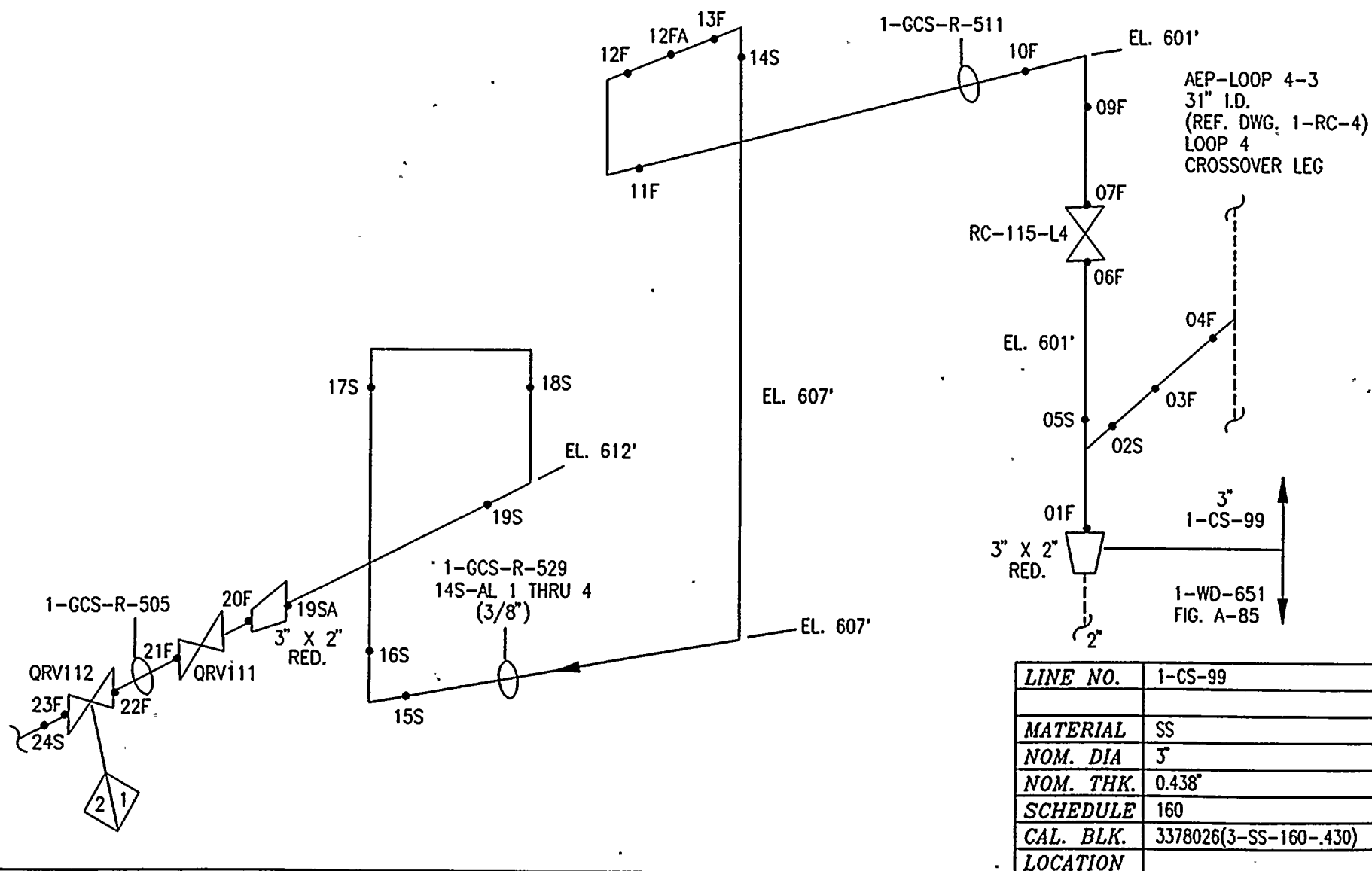


LINE NO.	1-CS-96
MATERIAL	SS
NOM. DIA	3"
NOM. THK.	0.438"
SCHEDULE	160
CAL. BLK.	3378026(3-SS-160-.430)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-75 CHEMICAL AND VOLUME CONTROL SYSTEM

REF. DRAWING: AEP 1-CS-96
FLOW DIAGRAM: 1-5128

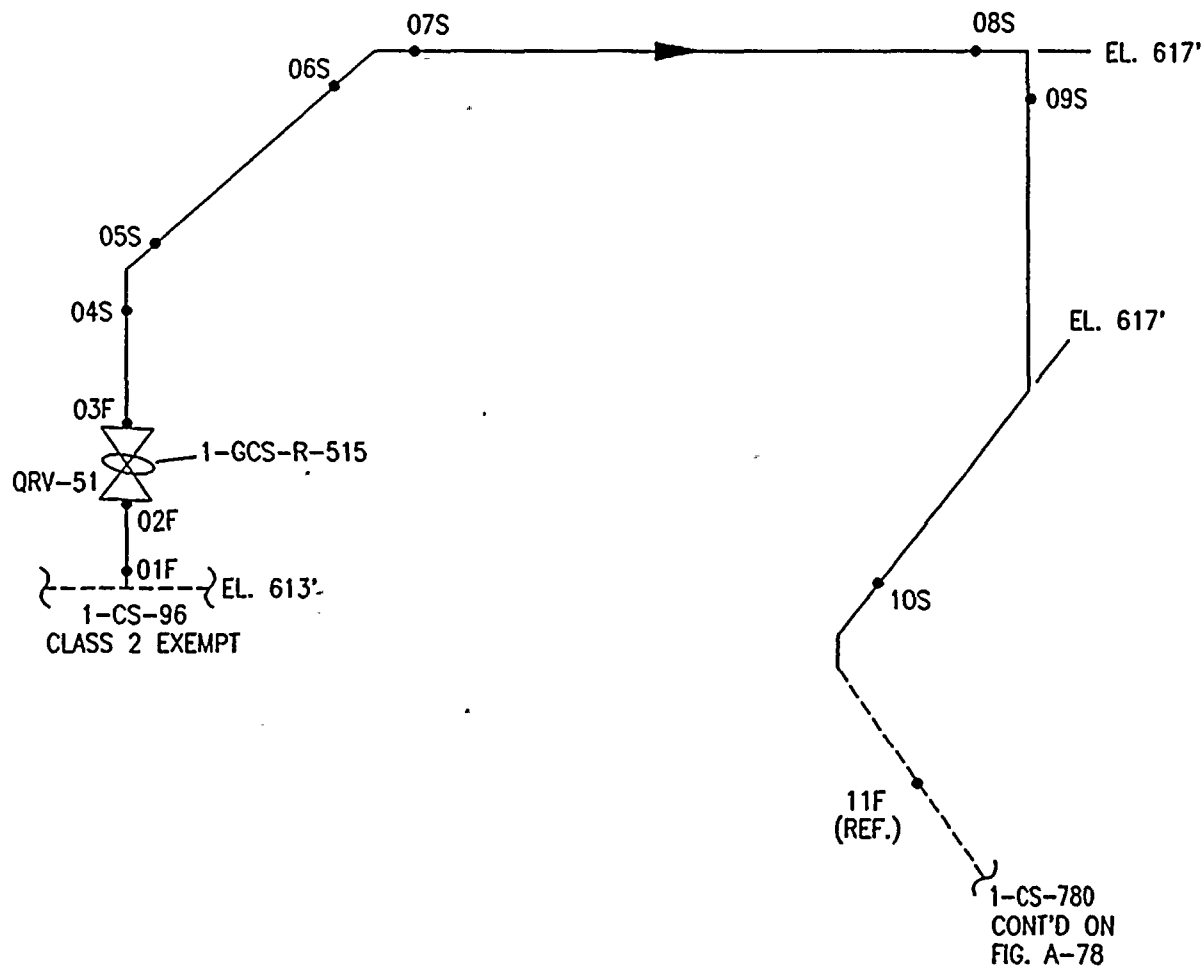


D. C. COOK, UNIT 1

FIG. A-76 CHEMICAL AND VOLUME CONTROL SYSTEM

REF. DRAWING: AEP 1-CS-99
 FLOW DIAGRAM: 1-5128/1-5129

A-77



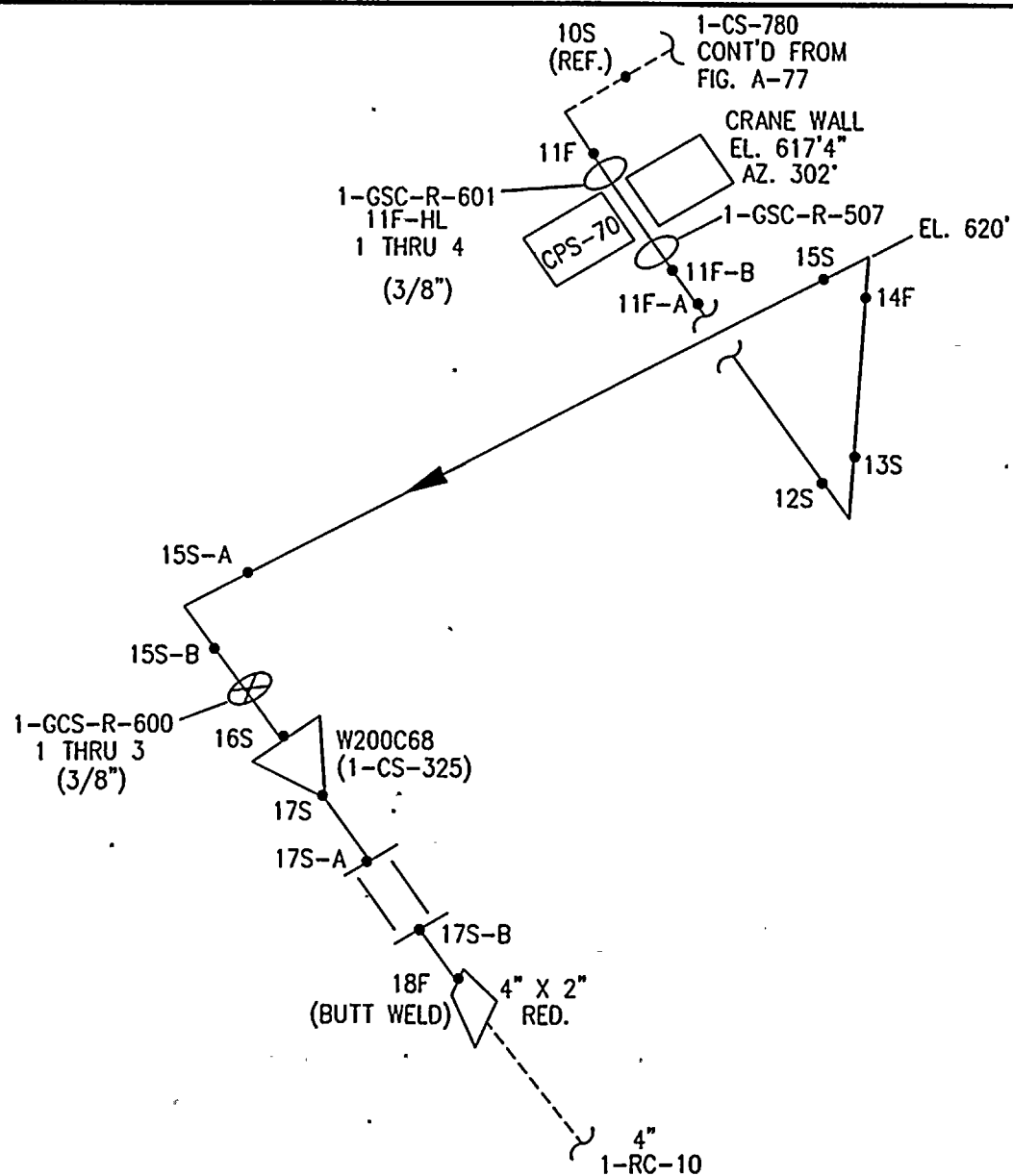
LINE NO.	1-CS-780
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	0.344"
SCHEDULE	160
CAL. BLK.	2-SS-160-.344-6-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. A-77 CHEMICAL AND VOLUME CONTROL SYSTEM

REF. DRAWING: AEP 1-CS-780

FLOW DIAGRAM: 1-5129



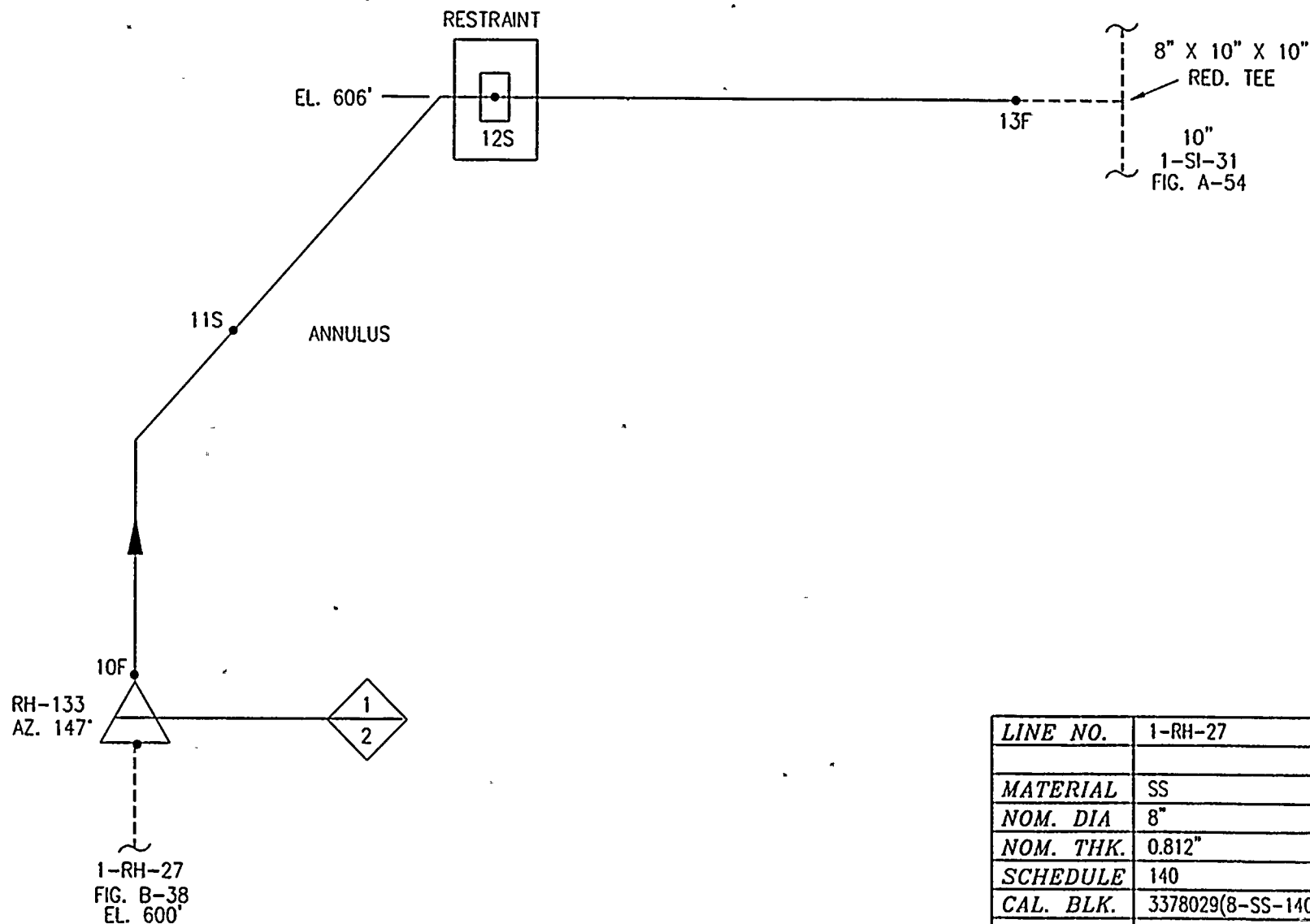
LINE NO.	1-CS-780
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	0.344"
SCHEDULE	160
CAL. BLK.	2-SS-160-.344-6-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. A-78 CHEMICAL AND VOLUME CONTROL SYSTEM

REF. DRAWING: AEP 1-CS-780
 FLOW DIAGRAM: 1-5128A

A-79

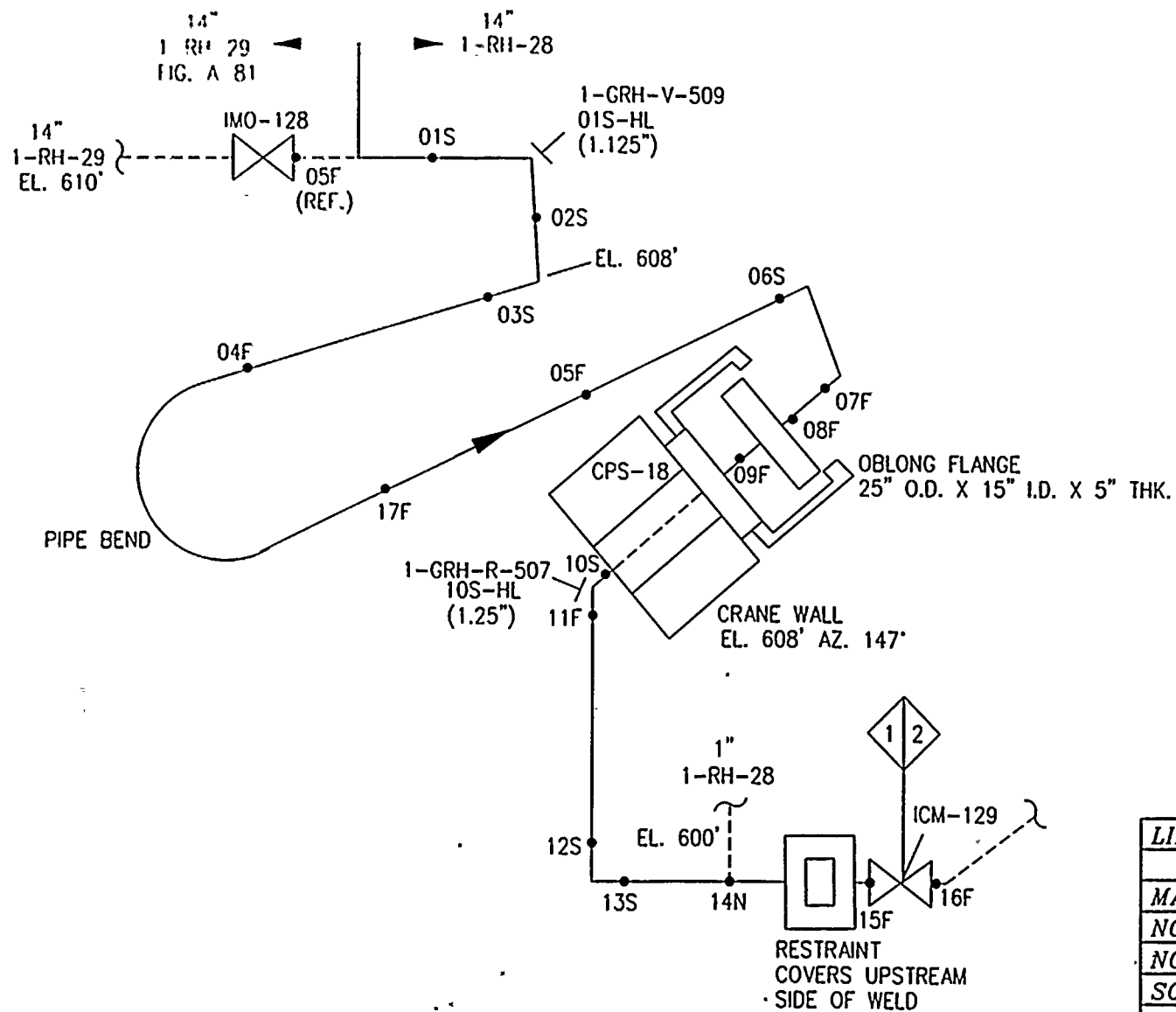


LINE NO.	1-RH-27
MATERIAL	SS
NOM. DIA	8"
NOM. THK.	0.812"
SCHEDULE	140
CAL. BLK.	3378029(8-SS-140-.81)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-79 RESIDUAL HEAT REMOVAL SYSTEM

REF. DRAWING: AEP 1-RH-27
FLOW DIAGRAM: 1-5143



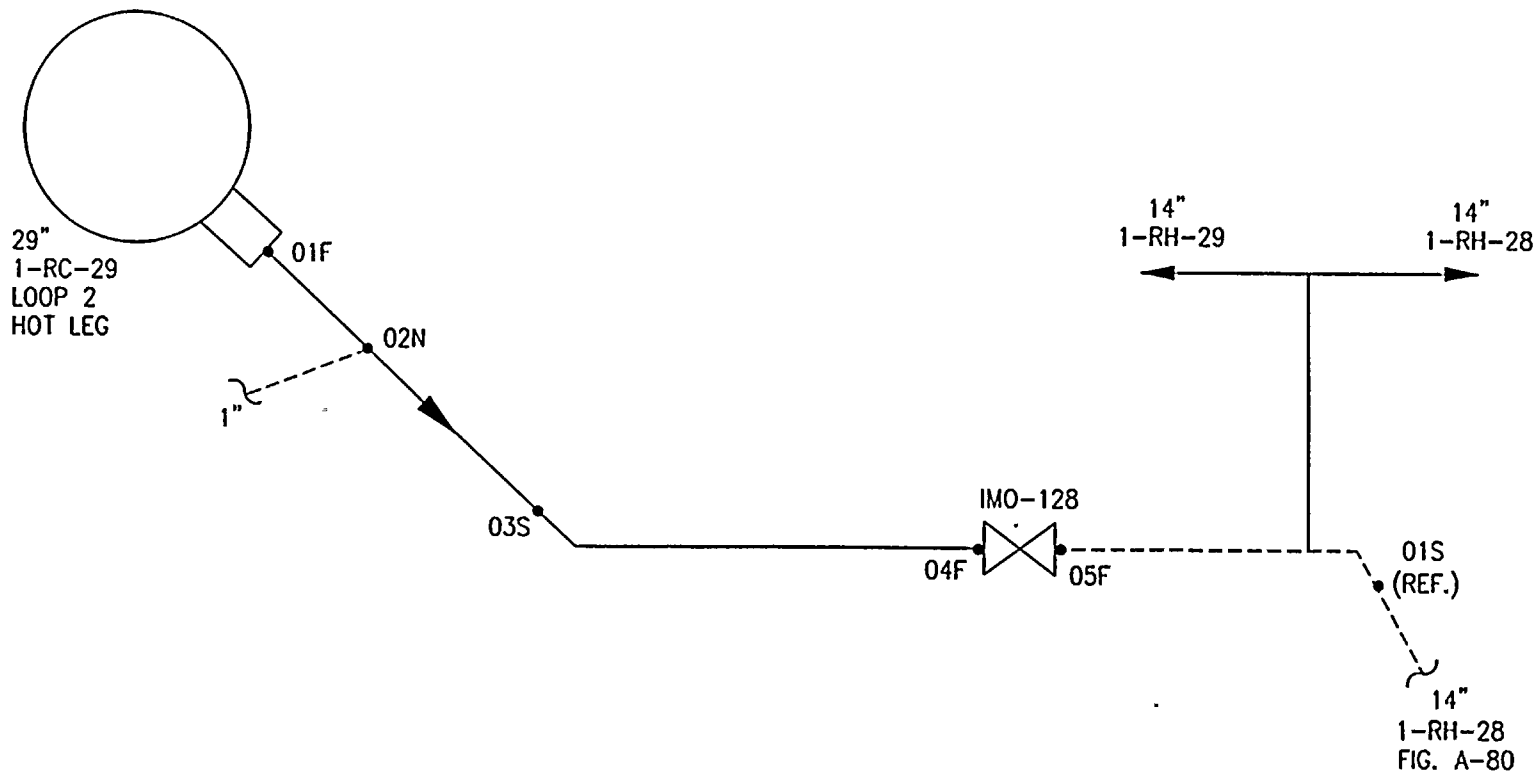
LINE NO.	1-RH-28
MATERIAL	SS
NOM. DIA	14"
NOM. THK.	1.406"
SCHEDULE	160
CAL. BLK.	3378032(14-SS-160-1.406)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-80 RESIDUAL HEAT REMOVAL SYSTEM

REF. DRAWING: AEP 1-RH-28

FLOW DIAGRAM: 1-2-5143



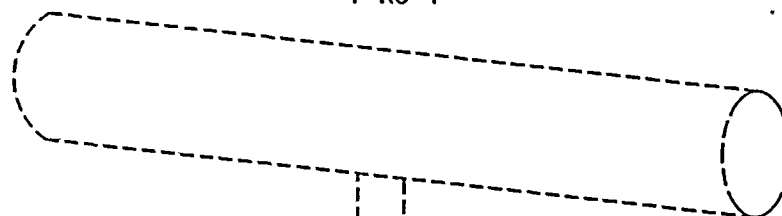
LINE NO.	1-RH-29
MATERIAL	SS
NOM. DIA	14"
NOM. THK.	1.406"
SCHEDULE	160
CAL. BLK.	3378032(14-SS-160-1.406)
LOCATION	

D. C. COOK, UNIT 1

FIG. A-81 RESIDUAL HEAT REMOVAL SYSTEM

REF. DRAWING: AEP 1-RH-29
FLOW DIAGRAM: 1-5128

LOOP 1
CROSSOVER LEG
1-RC-1



01F

02S

W200T58

03S

04S

W200T58

05S

1-WD-640

(LOW PRESSURE)

2"

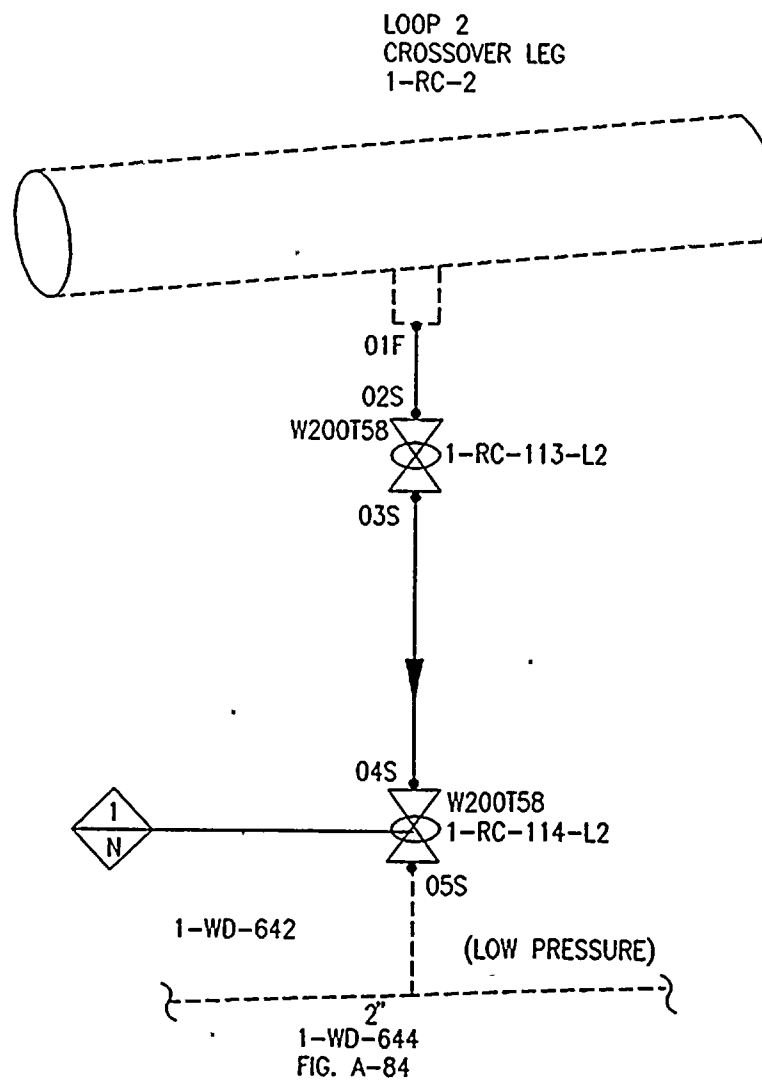
1-WD-651
FIG. A-85

LINE NO.	1-WD-640
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	N/A
SCHEDULE	N/A
CAL. BLK.	N/A
LOCATION	

D. C. COOK, UNIT 1

FIG. A-82 WASTE DISPOSAL SYSTEM

REF. DRAWING: AEP 1-WD-640
FLOW DIAGRAM: 1-5128

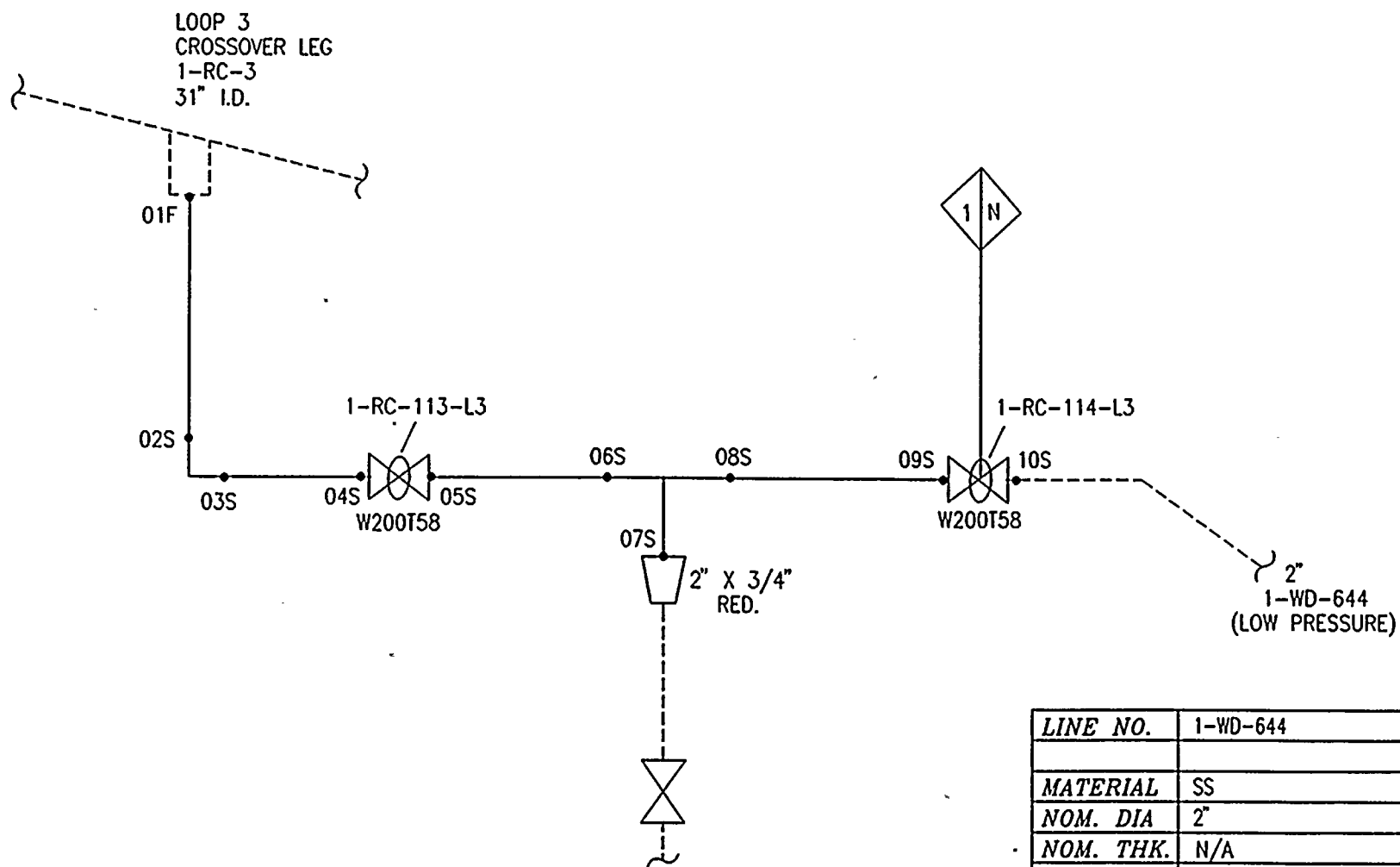


LINE NO.	1-WD-642
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	N/A
SCHEDULE	N/A
CAL. BLK.	N/A
LOCATION	

D. C. COOK, UNIT 1

FIG. A-83 WASTE DISPOSAL SYSTEM

REF. DRAWING: AEP 1-WD-642
FLOW DIAGRAM: 1-5128

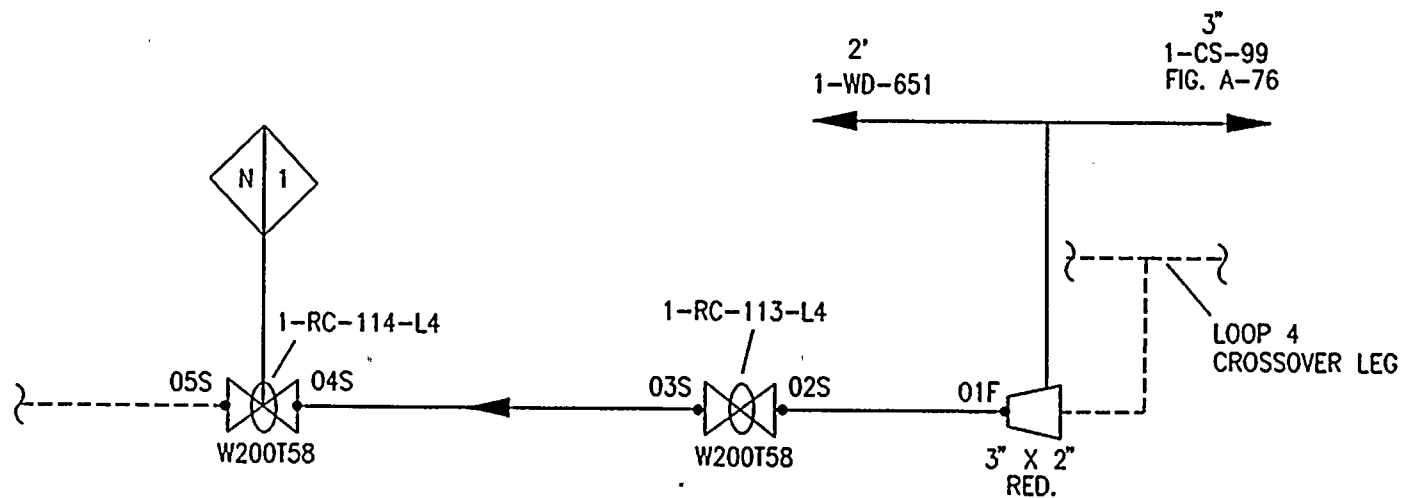


LINE NO.	1-WD-644
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	N/A
SCHEDULE	N/A
CAL. BLK.	N/A
LOCATION	

D. C. COOK, UNIT 1

FIG. A-84 WASTE DISPOSAL SYSTEM

REF. DRAWING: AEP 1-WD-644
FLOW DIAGRAM: 1-5128

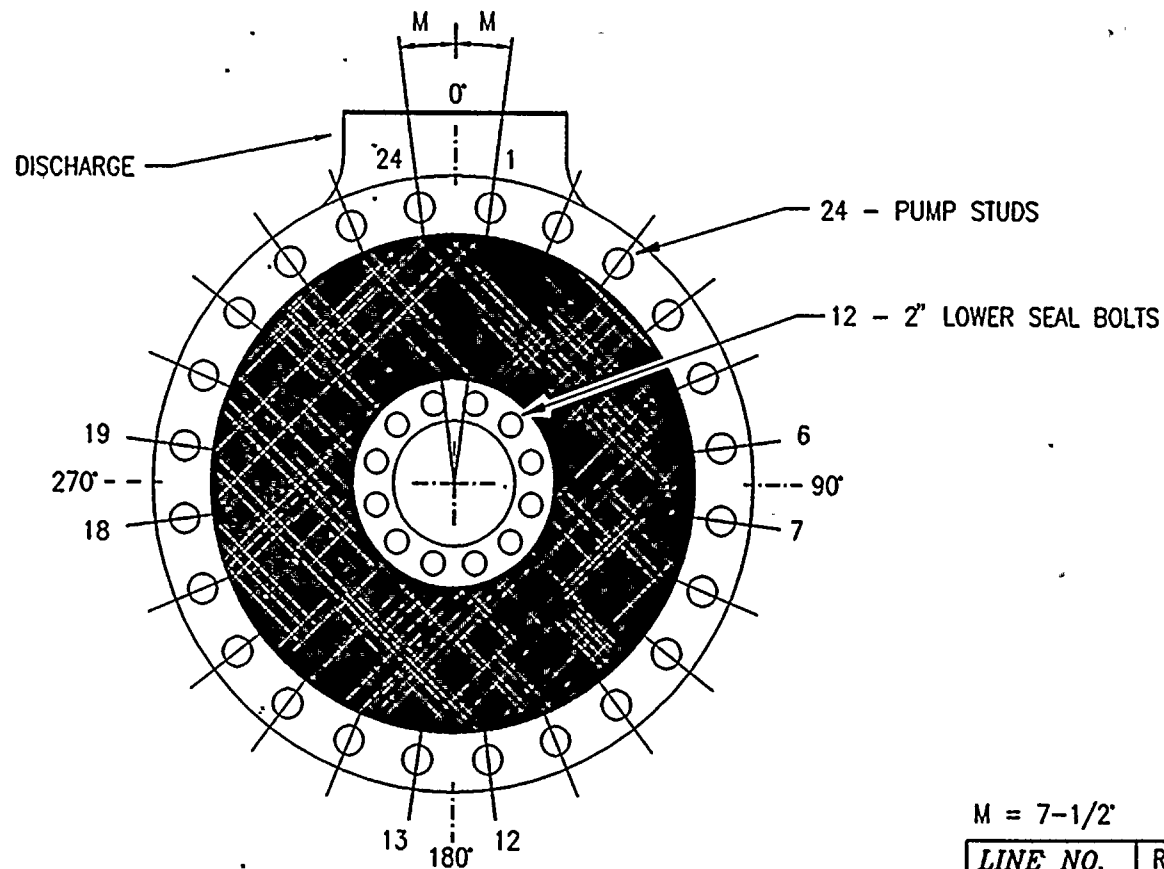


LINE NO.	1-WD-651
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	N/A
SCHEDULE	N/A
CAL. BLK.	N/A
LOCATION	

D. C. COOK, UNIT 1

FIG. A-85 WASTE DISPOSAL SYSTEM

 REF. DRAWING: AEP 1-WD-651
 FLOW DIAGRAM: 1-5128



$$M = 7-1/2'$$

LINE NO.	RCP - STUDS	LOWER SEAL BOLTS
MATERIAL	SA-193	
NOM. DIA	4.32"	
NOM. THK.	XX	XX
SCHEDULE	XX	XX
CAL. BLK.	3378042	N/A
LOCATION	XX	XX

D. C. COOK, UNIT 1

FIG. A-86 TYPICAL REACTOR COOLANT PUMP STUD AND LOWER SEAL BOLT LOCATION

APPENDIX B
WELD IDENTIFICATION FIGURES - CLASS 2

APPENDIX B

WELD IDENTIFICATION FIGURES - CLASS 2

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B-13	Line 1-SI-3*	5143/5144	B-13
B-14	Line 1-SI-4*	5143	B-14
B-15	Line 1-SI-20*	5143	B-15
B-16	Line 1-SI-21*	5143	B-16
B-17	Line 1-SI-24*	5143	B-17
B-18	Line 1-SI-25*	5143	B-18
B-19	Line 1-SI-28*	5143	B-19
B-20	Line 1-SI-30*	5143	B-20
B-21	Line 1-SI-32*	5143	B-21
B-22	Line 1-SI-34*	5143	B-22
B-23	Line 1-SI-68*	5143	B-23
B-24	Line 1-SI-69*	5143	B-24
B-25	Line 1-SI-70*	5143	B-25
B-26	Line 1-SI-71*	5143	B-26
B-27	Line 1-RH-1	5143	B-27
B-28	Line 1-RH-2	5143	B-28
B-29	Line 1-RH-3	5143	B-29
B-30	Line 1-RH-4	5143	B-30
B-31	Line 1-RH-5	5143	B-31
B-32	Line 1-RH-6	5143	B-32
B-33	Line 1-RH-7	5143	B-33
B-34	Line 1-RH-8	5143	B-34
B-35	Line 1-RH-9	5143	B-35
B-36	Line 1-RH-10	5143	B-36
B-37	Line 1-RH-11	5143	B-37
B-38	Line 1-RH-27	5143	B-38
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B-40	Line 1-RH-30	5143	B-40

*Designated as Part of the High Pressure Safety Injection System

APPENDIX B
WELD IDENTIFICATION FIGURES - CLASS 2

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B-52	Line 1-FW-13	5106	B-52
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B-54	Line 1-FW-16	5105	B-54
B-55	Line 1-FW-17	5106A	B-55
B-56	Line 1-FW-18	5106A	B-56
B-57	Line 1-FW-26	5106A	B-57
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B-63	Line 1-MS-6	5105	B-63
B-64	Line 1-MS-7	5105	B-64
B-65	Line 1-MS-10	5105	B-65
B-66	Line 1-MS-11	5105	B-66
B-67	Line 1-MS-14	5105	B-67
B-68	Line 1-MS-15	5105	B-68
B-69	Line 1-MS-189	5105	B-69
B-70	Line 1-MS-190	5105	B-70
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APPENDIX B

WELD IDENTIFICATION FIGURES - CLASS 2

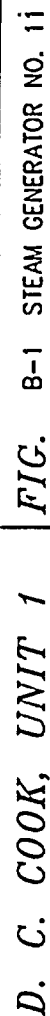
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B-83	Line 1-SI-19	5142	B-83
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B-93	Line 12-CS-131	1-5129	B-93
B-94	Line 1-CS-132	1-5129	B-94
B-95	Line 1-CS-747	1-5129/1-5129A	B-96
B-96	Line 1-CS-748	1-5129/1-5129A	B-97
B-97	Line 1-CS-747A	1-5129/1-5129A	B-98
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*Designated as Part of the High Pressure Safety Injection System

	Bend		Penetration of Wall, Floor, etc.
	Branch Connection, Requires Examination With Branch Line Shown in Detail		Pipe Lug(s)
	Branch Connection, Requires Examination With Branch Line Shown on Another Isometric		Spring Hanger
	Branch Connection, Does Not Require Examination		Pipe Restraint, Not Welded
	Butt Weld		Pipe Restraint
	Cap		Pipe Support, Welded
	Cat Walk		Whip Restraint
	Class Boundary		Pump
	Class X Class Y		Reducer
	Coupling, Socket Weld		A X B
	Coupling, Butt and Socket Weld		Socket Weld
	Elbow		Tee
	Flange		Valve, Relief
	Flow Direction		Valve, Check
	Line Break		Valve, Check
	Line Continuation		Valve, Globe
			Valve, Other

SYMBOLS FOR WELD IDENTIFICATION



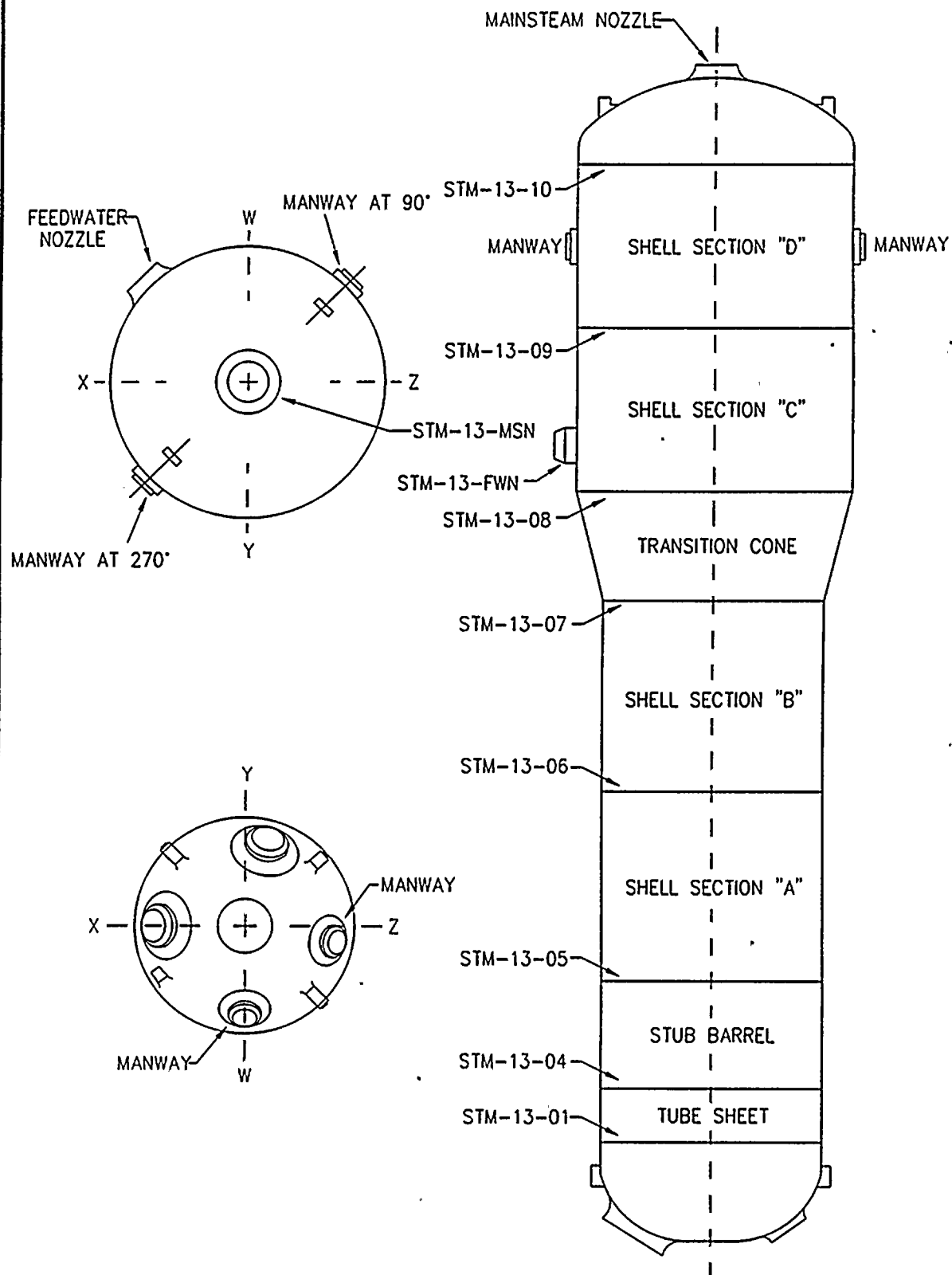


FIG. B-3 STEAM GENERATOR NO. 13

D. C. COOK, UNIT 1

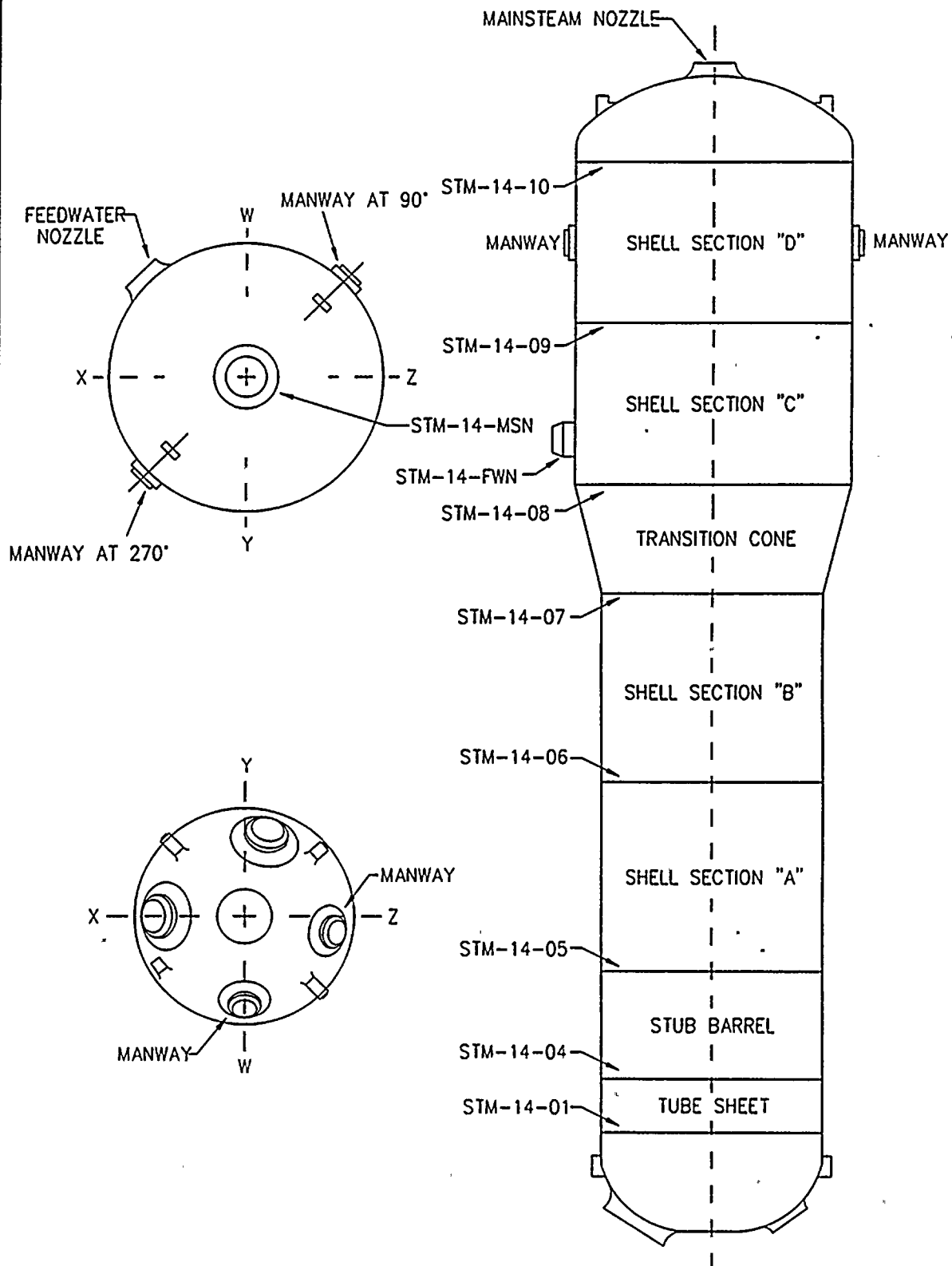
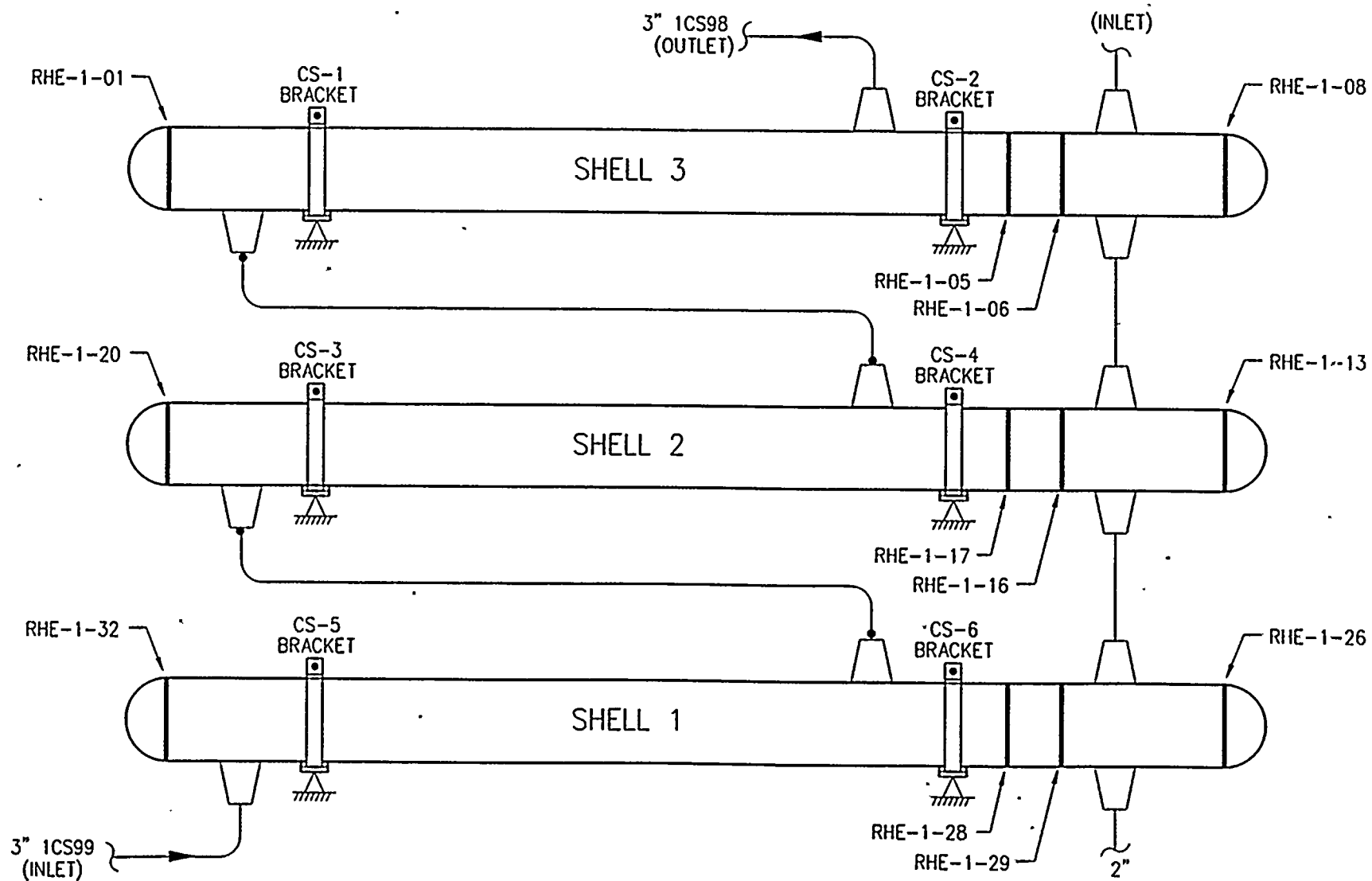


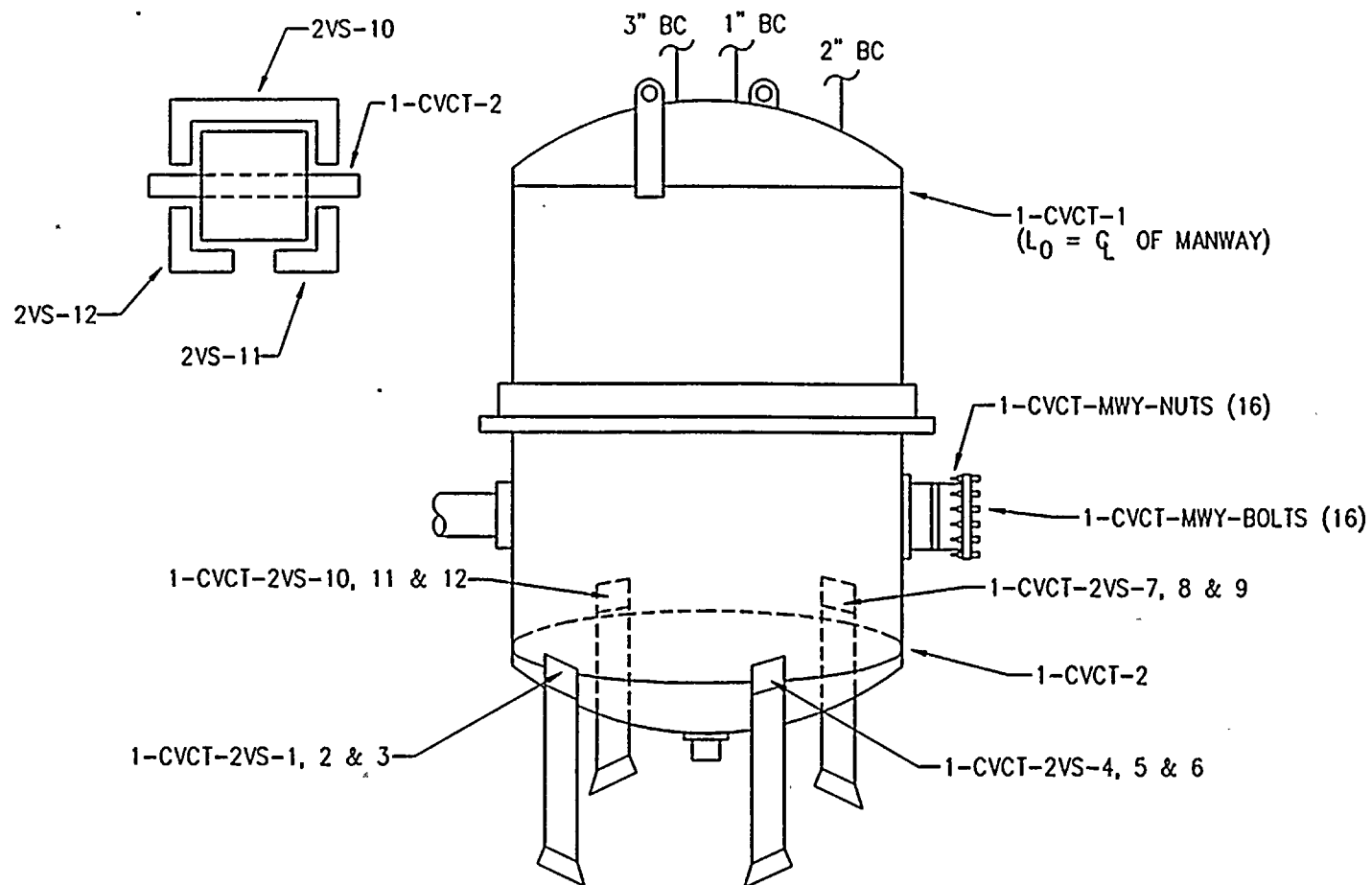
FIG. B-4 STEAM GENERATOR NO. 14

D. C. COOK, UNIT 1



D. C. COOK, UNIT 1

FIG. B-5 REGENERATIVE HEAT EXCHANGER

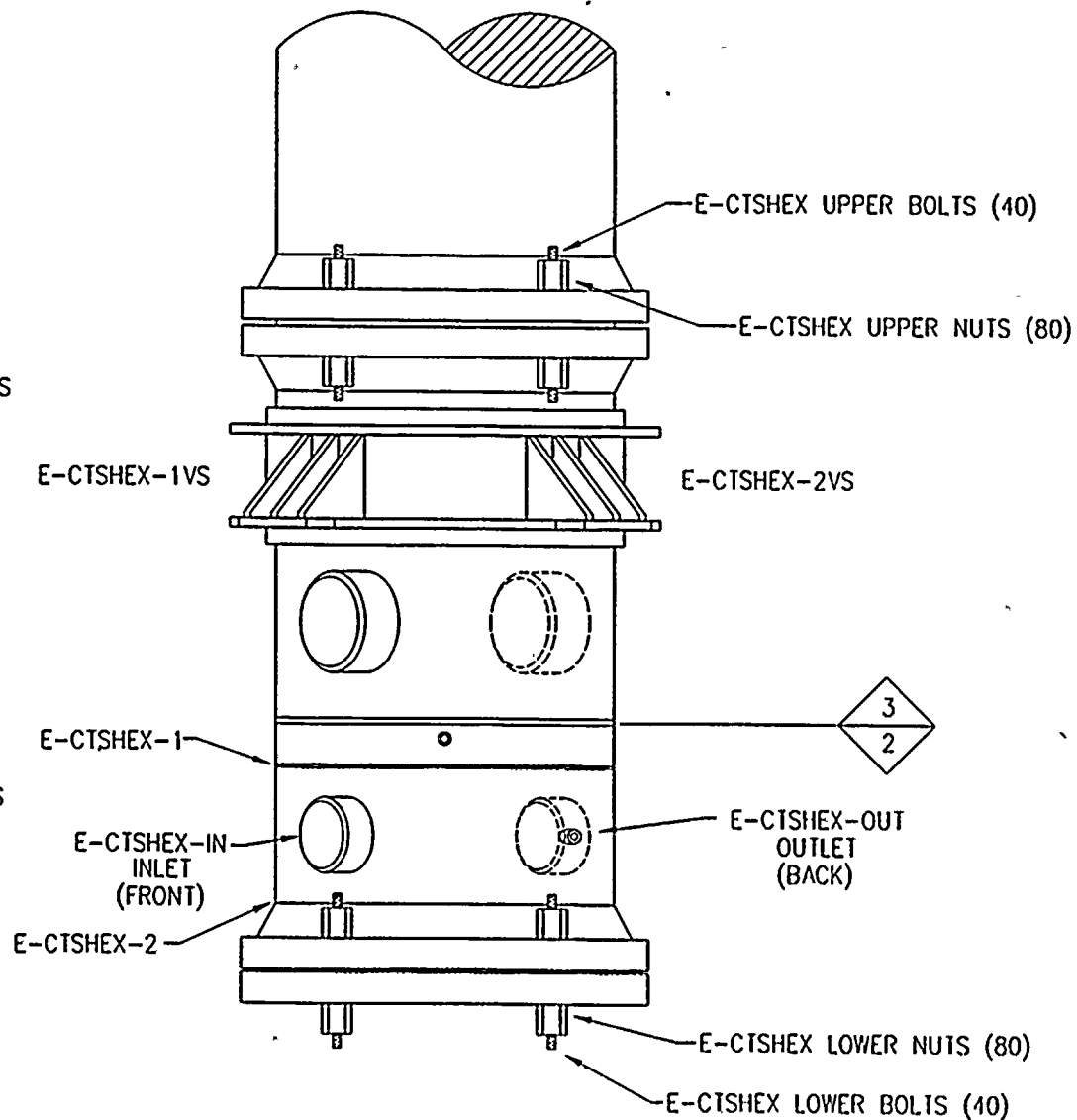
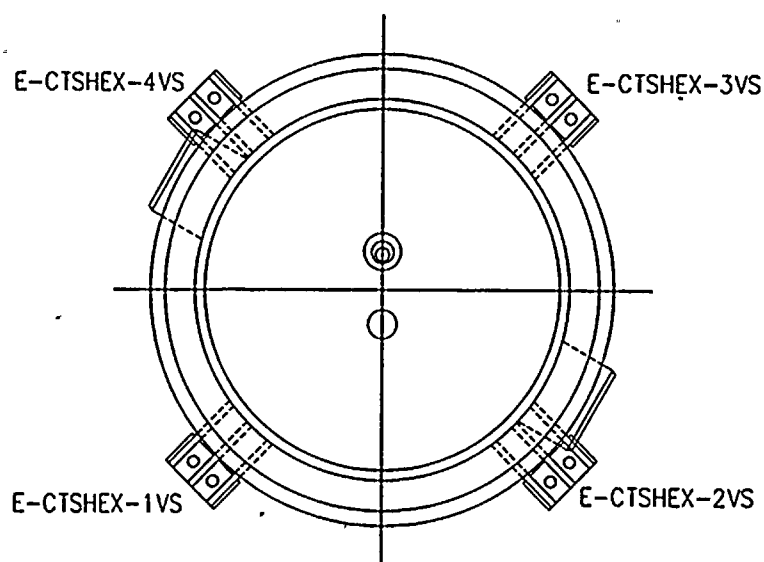


CALIBRATION BLOCK
PL-.312-SS-23-DCC

D. C. COOK, UNIT 1

FIG. B-6 CHEMICAL AND VOLUME CONTROL TANK

B-7

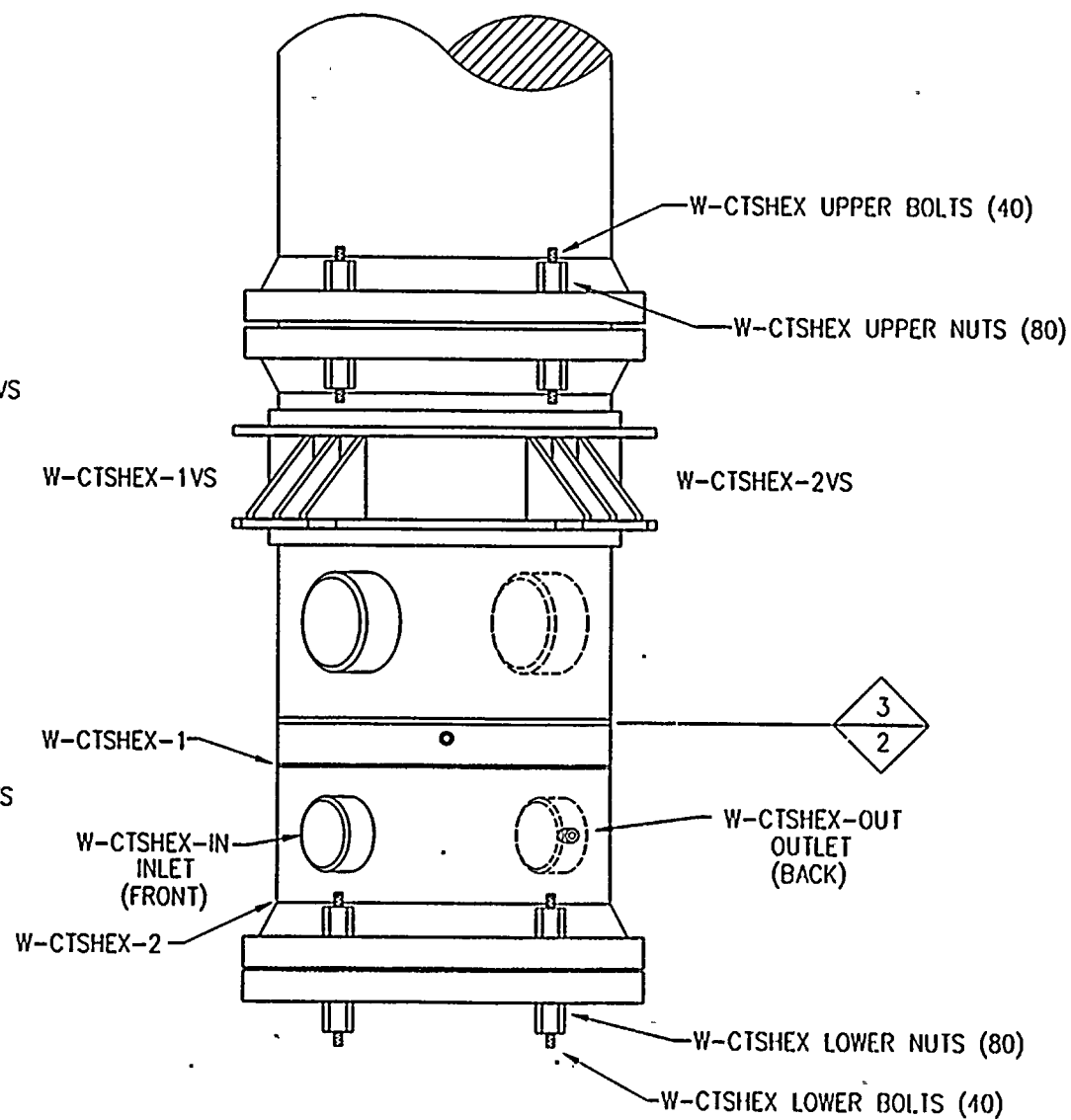
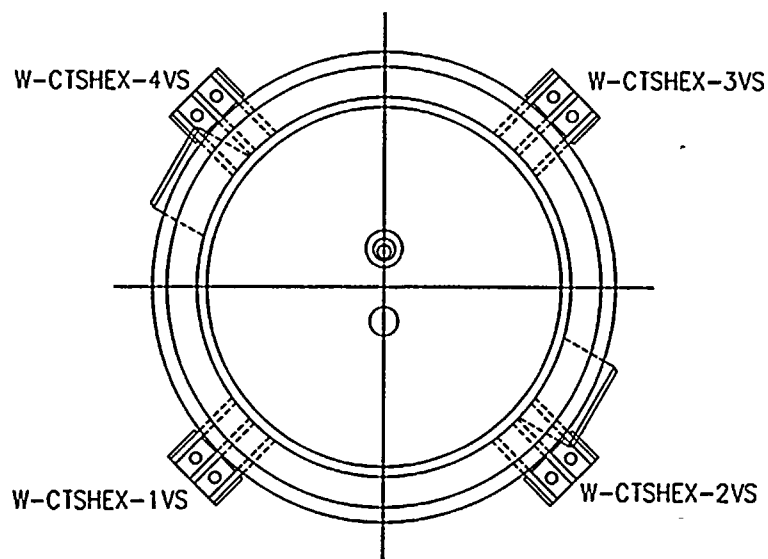


CALIBRATION BLOCK
PL-.500-SS-25-DCC

D. C. COOK, UNIT 1

FIG. B-7 CTS HEAT EXCHANGER (EAST)

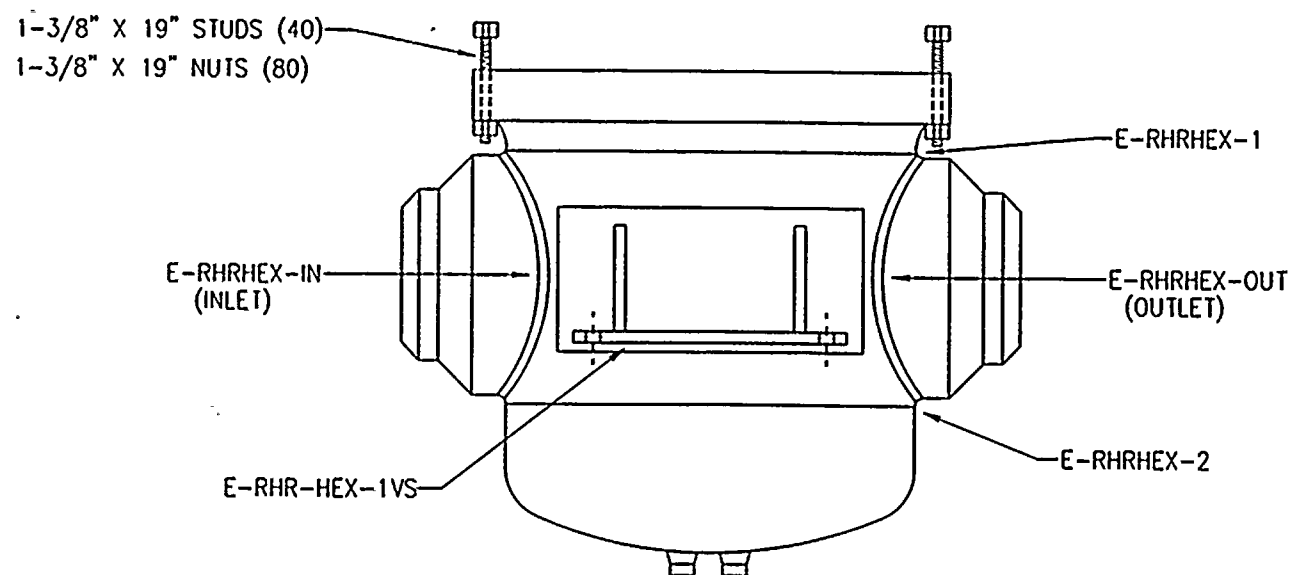
B-8

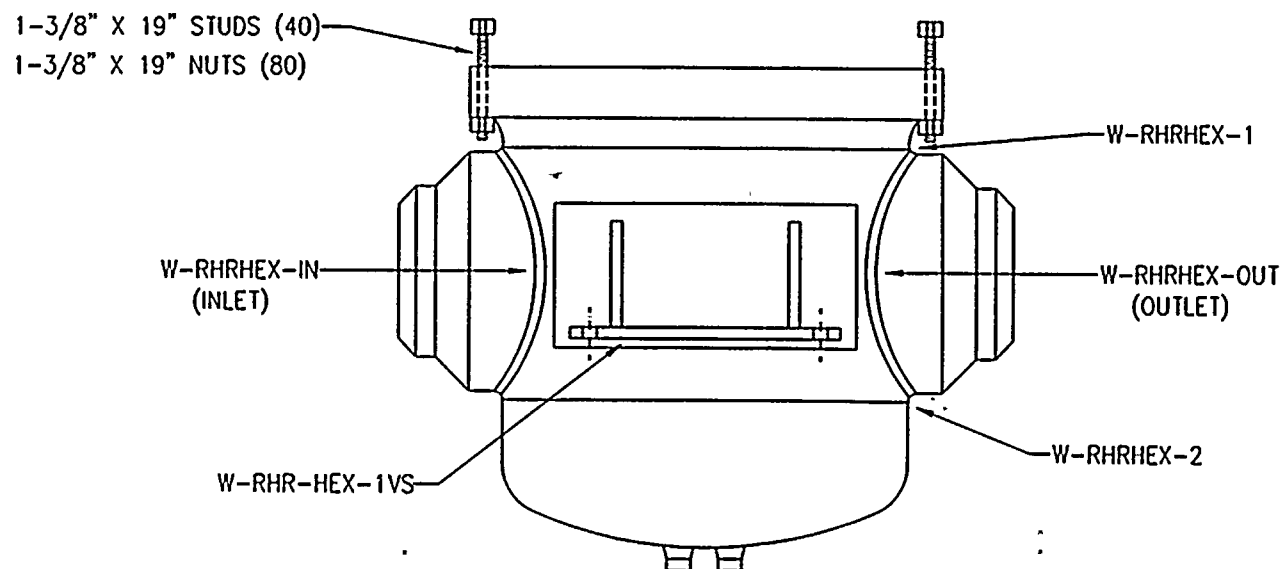


CALIBRATION BLOCK
PL-500-SS-25-DCC

D. C. COOK, UNIT 1

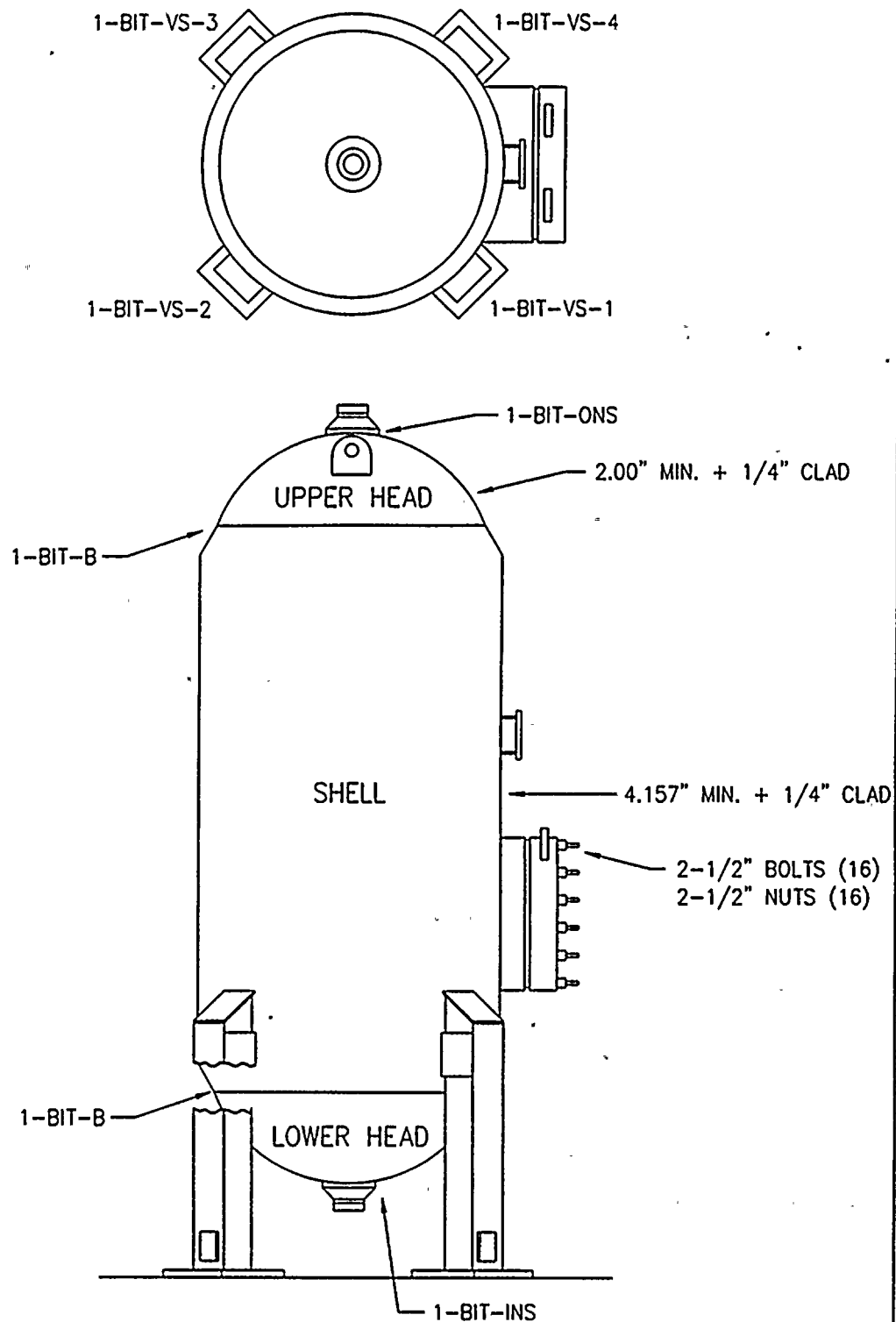
FIG. B-8 CTS HEAT EXCHANGER (WEST)





D. C. COOK, UNIT 1

FIG. B-10 RESIDUAL HEAT REMOVAL HEAT EXCHANGER (WEST)



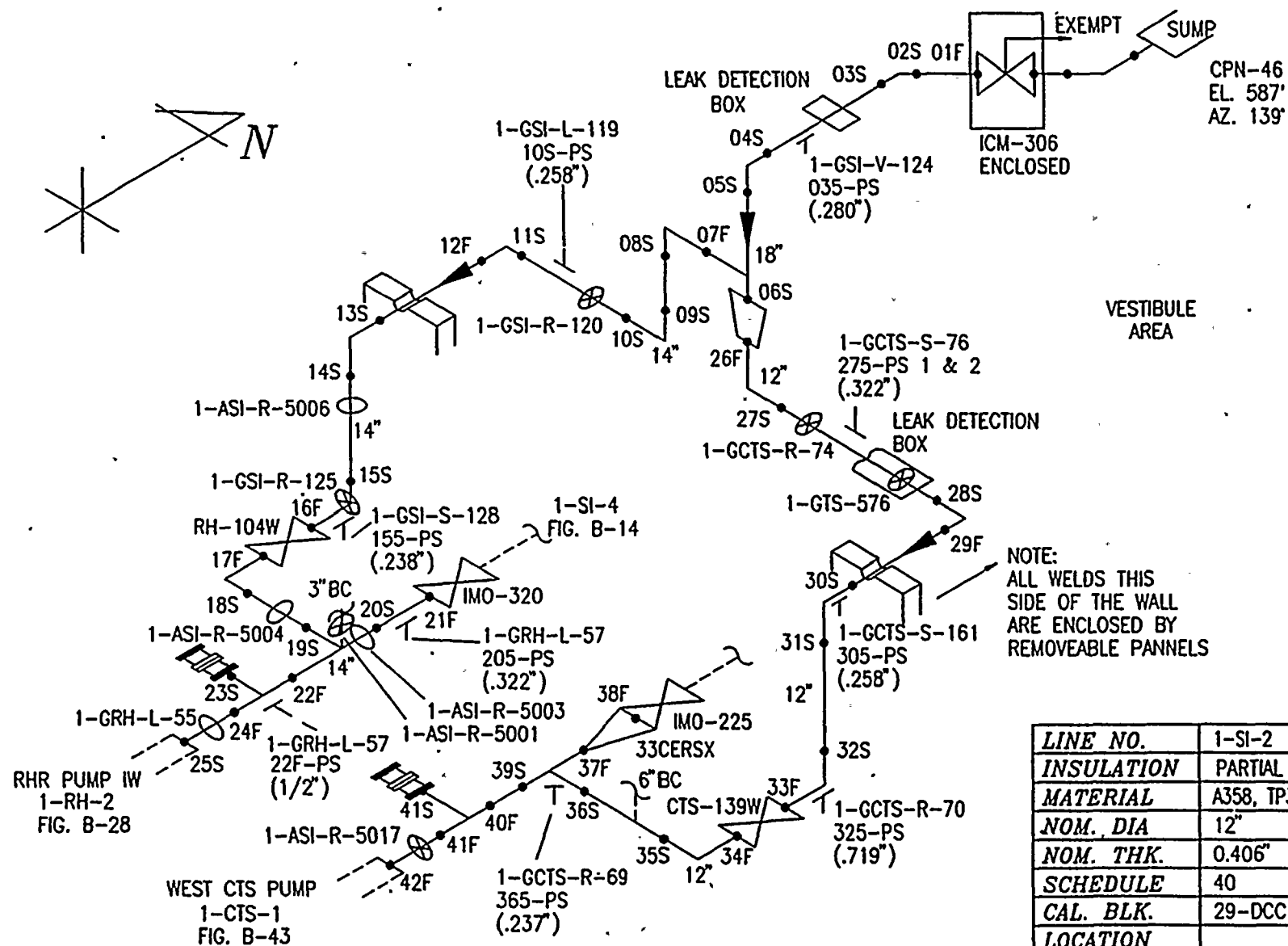
HEAD & SHELL MATERIAL
SA-264 (ASTM A-516 GR. 70)

CLADDING
ASTM A-240 (TYPE 304I)

CALIBRATION BLOCK
UNKNOWN

FIG. B-11 BORON INJECTION TANK

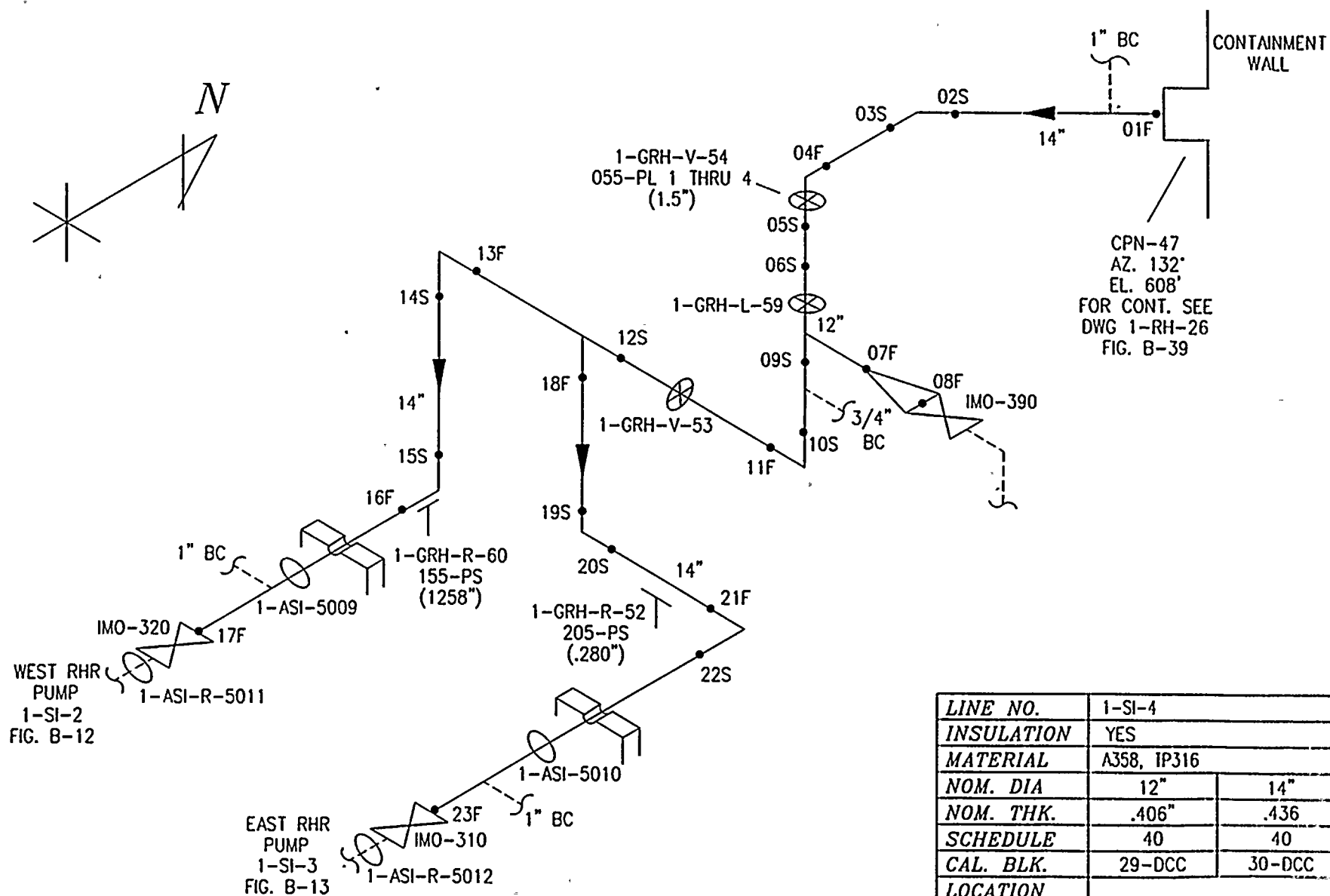
D. C. COOK, UNIT 1



D. C. COOK, UNIT 1

FIG. B-12 EMERGENCY CORE COOLING SYSTEM

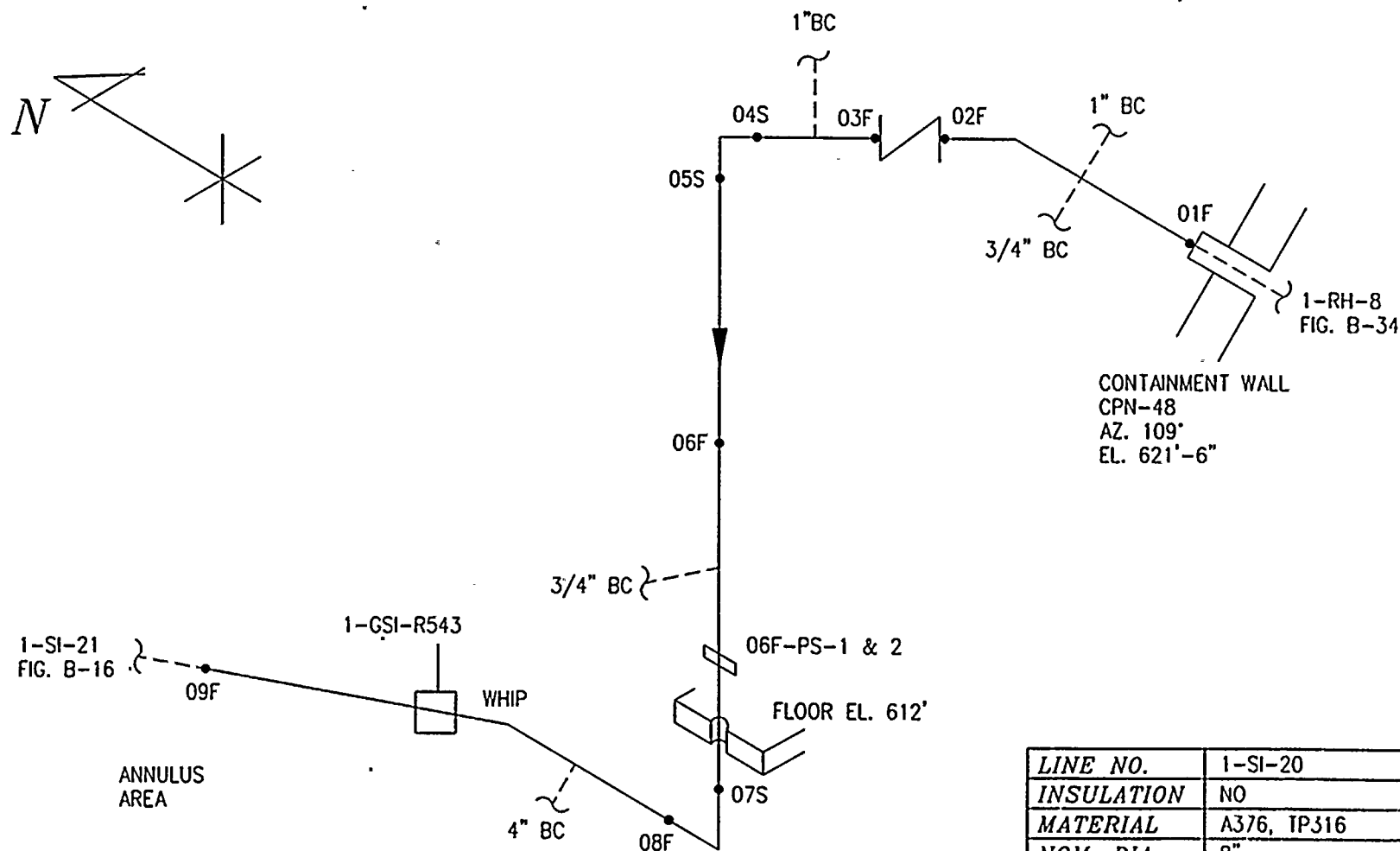
REF. DRAWING: AEP. 1-SI-2
FLOW DIAGRAM: 1-5143



D. C. COOK, UNIT 1

FIG. B-14 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-SI-4
 FLOW DIAGRAM: 1-5143

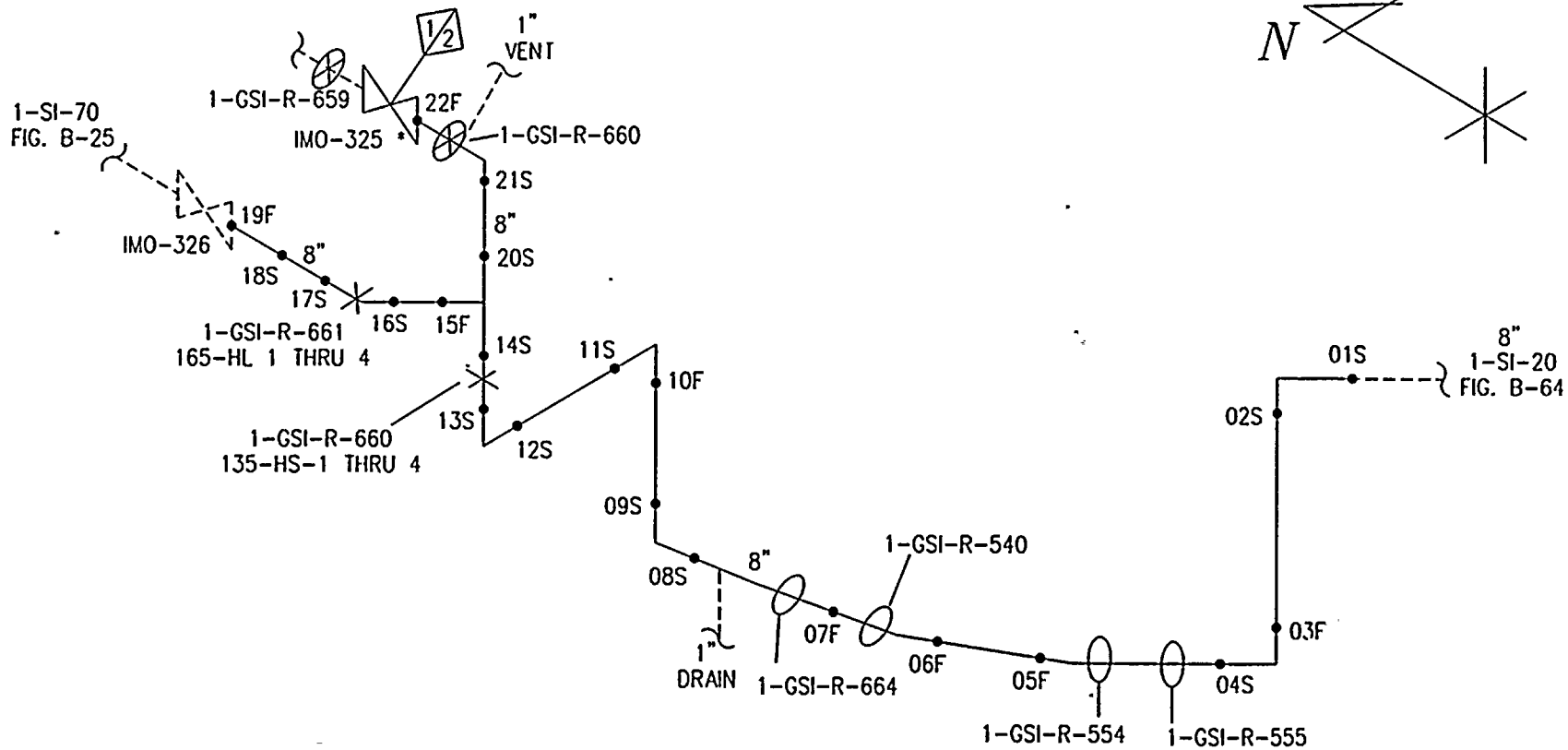


LINE NO.	1-SI-20
INSULATION	NO
MATERIAL	A376, IP316
NOM. DIA	8"
NOM. THK.	0.812"
SCHEDULE	140
CAL. BLK.	3378029 (8-SS-140-.81)
LOCATION	

D. C. COOK, UNIT 1

FIG. B-15 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-SI-20
FLOW DIAGRAM: 1-5143



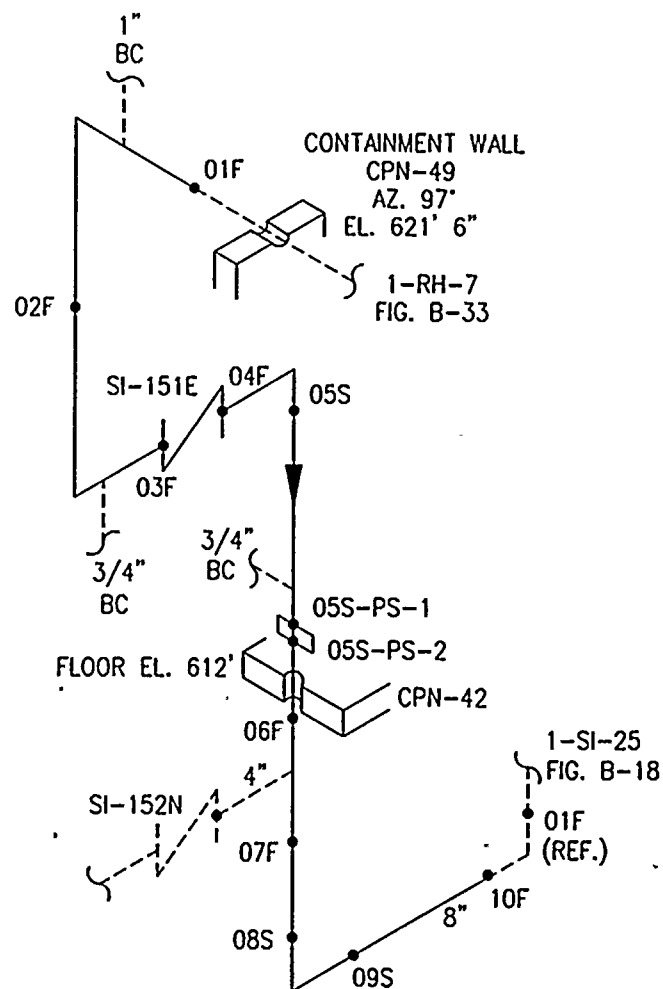
ANNULUS

LINE NO.	1-SI-21
INSULATION	
MATERIAL	A376, IP316
NOM. DIA	8"
NOM. THK.	0.812"
SCHEDULE	140
CAL. BLK.	3378029 (8-SS-140-.81)
LOCATION	

D. C. COOK, UNIT 1

FIG. B-16 EMERGENCY CORE COOLING SYSTEM

 REF. DRAWING: AEP 1-SI-21
 FLOW DIAGRAM: 1-5143



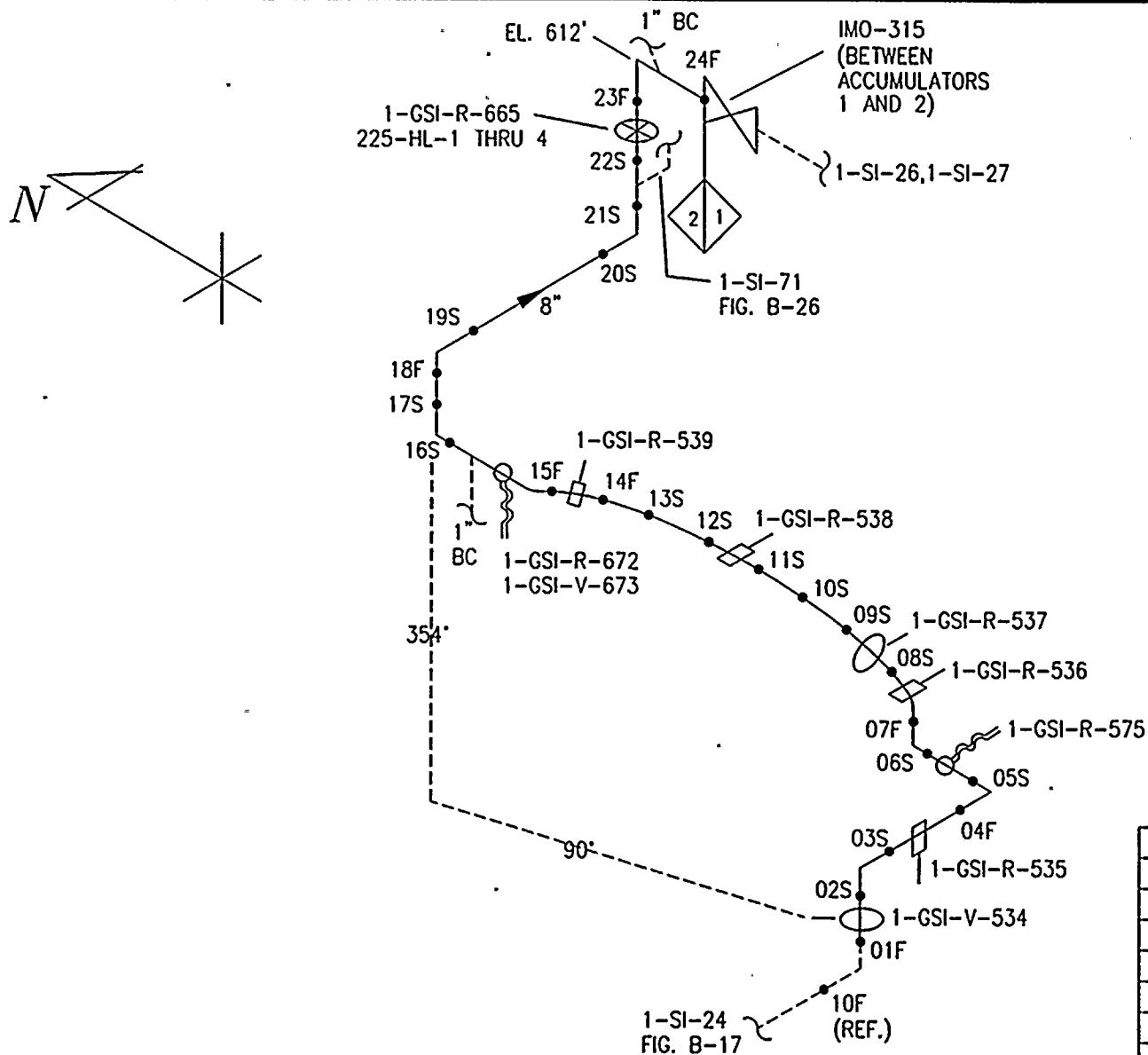
LINE NO.	1-SI-24
INSULATION	
MATERIAL	A376, TP316
NOM. DIA	8"
NOM. THK.	0.812"
SCHEDULE	140
CAL. BLK.	3378029 (8-SS-140-.81)
LOCATION	

D. C. COOK, UNIT 1

FIG. B-17 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-SI-24

FLOW DIAGRAM: 1-5143

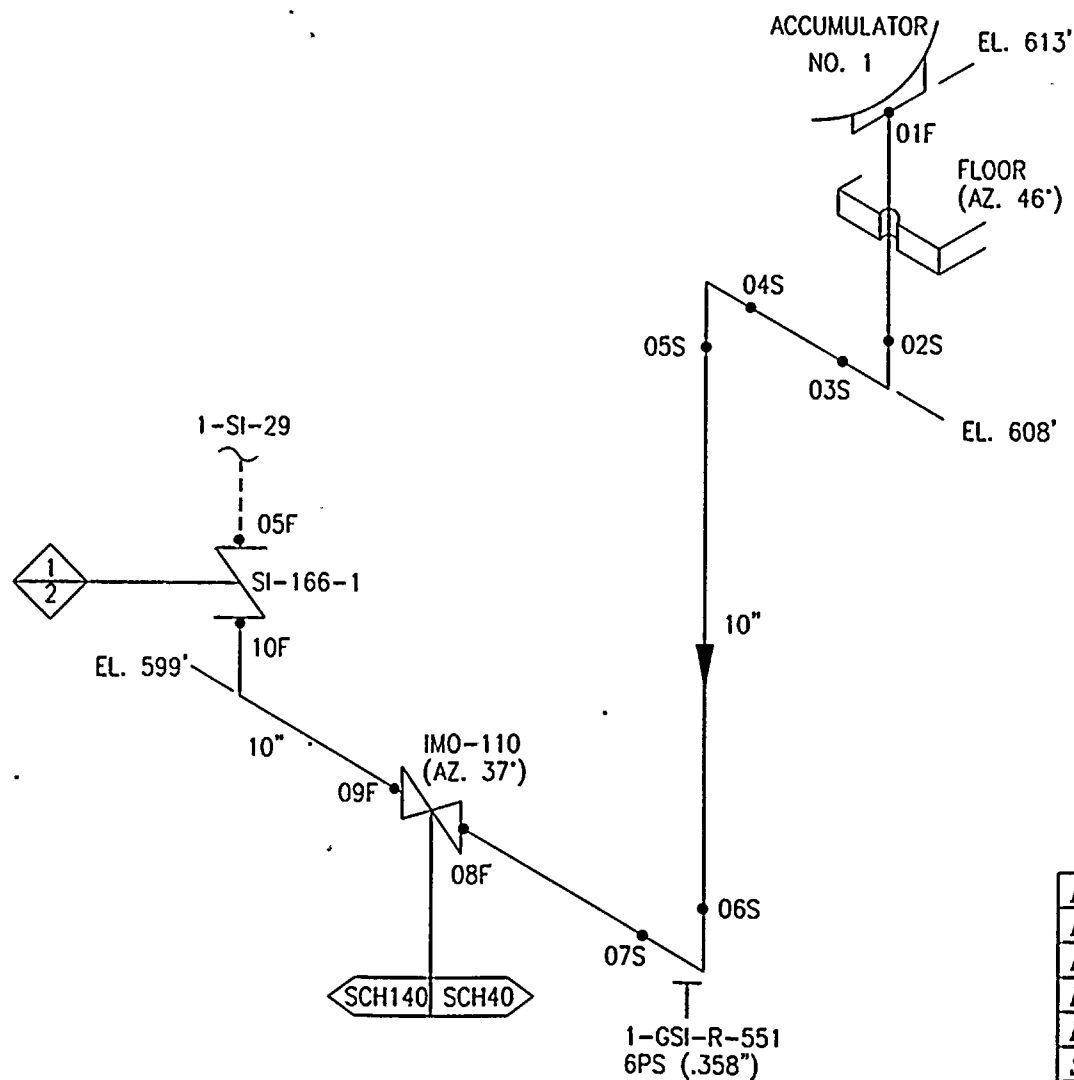


LINE NO.	1-SI-25
INSULATION	NO
MATERIAL	A376, TP316
NOM. DIA	8"
NOM. THK.	0.812"
SCHEDULE	140
CAL. BLK.	3378029 (8-SS-140-.81)
LOCATION	

D. C. COOK, UNIT 1

FIG. B-18 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-SI-25
 FLOW DIAGRAM: 1-5143



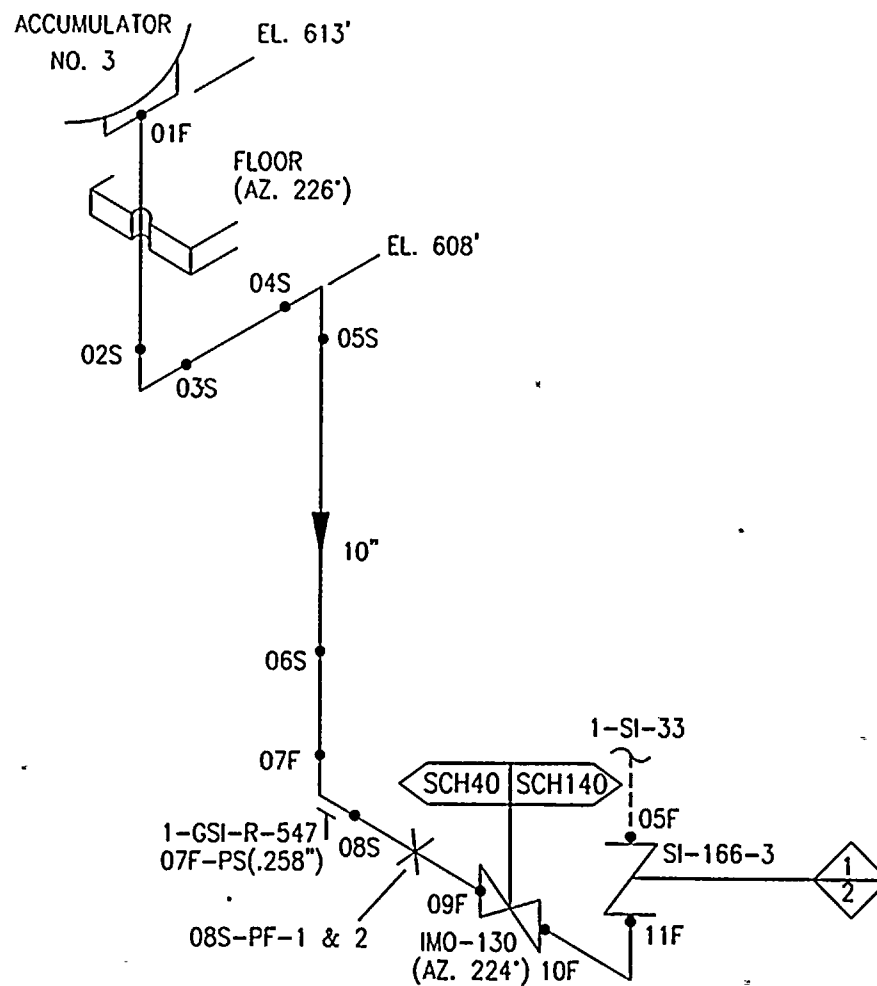
LINE NO.	1-SI-28	
INSULATION	NO	
MATERIAL	SS 316	
NOM. DIA	10"	10"
NOM. THK.	0.365"	1.0"
SCHEDULE	40	140
CAL. BLK.	3378030	26-DCC
LOCATION		

D. C. COOK, UNIT 1

FIG. B-19 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-SI-28

FLOW DIAGRAM: 1-5143

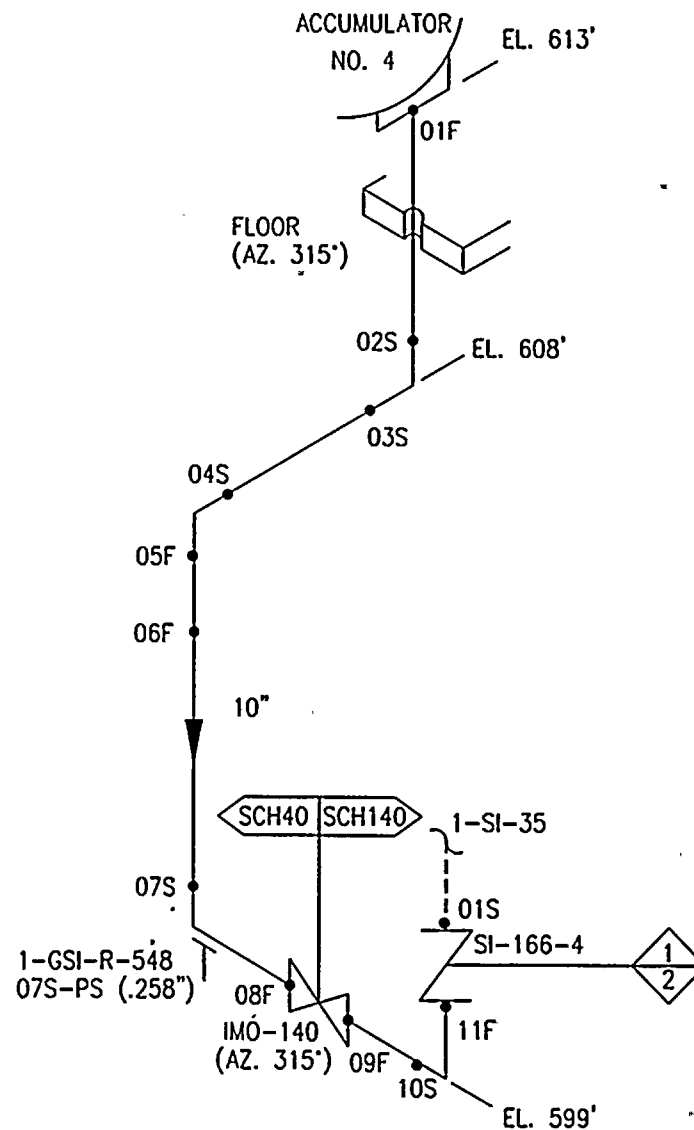


LINE NO.	1-SI-32	
INSULATION	NO	
MATERIAL	SS 316	
NOM. DIA	10"	10"
NOM. THK.	0.365"	1.0"
SCHEDULE	40	140
CAL. BLK.	3378030	26-DCC
LOCATION		

D. C. COOK, UNIT 1

FIG. B-21 EMERGENCY CORE COOLING SYSTEM

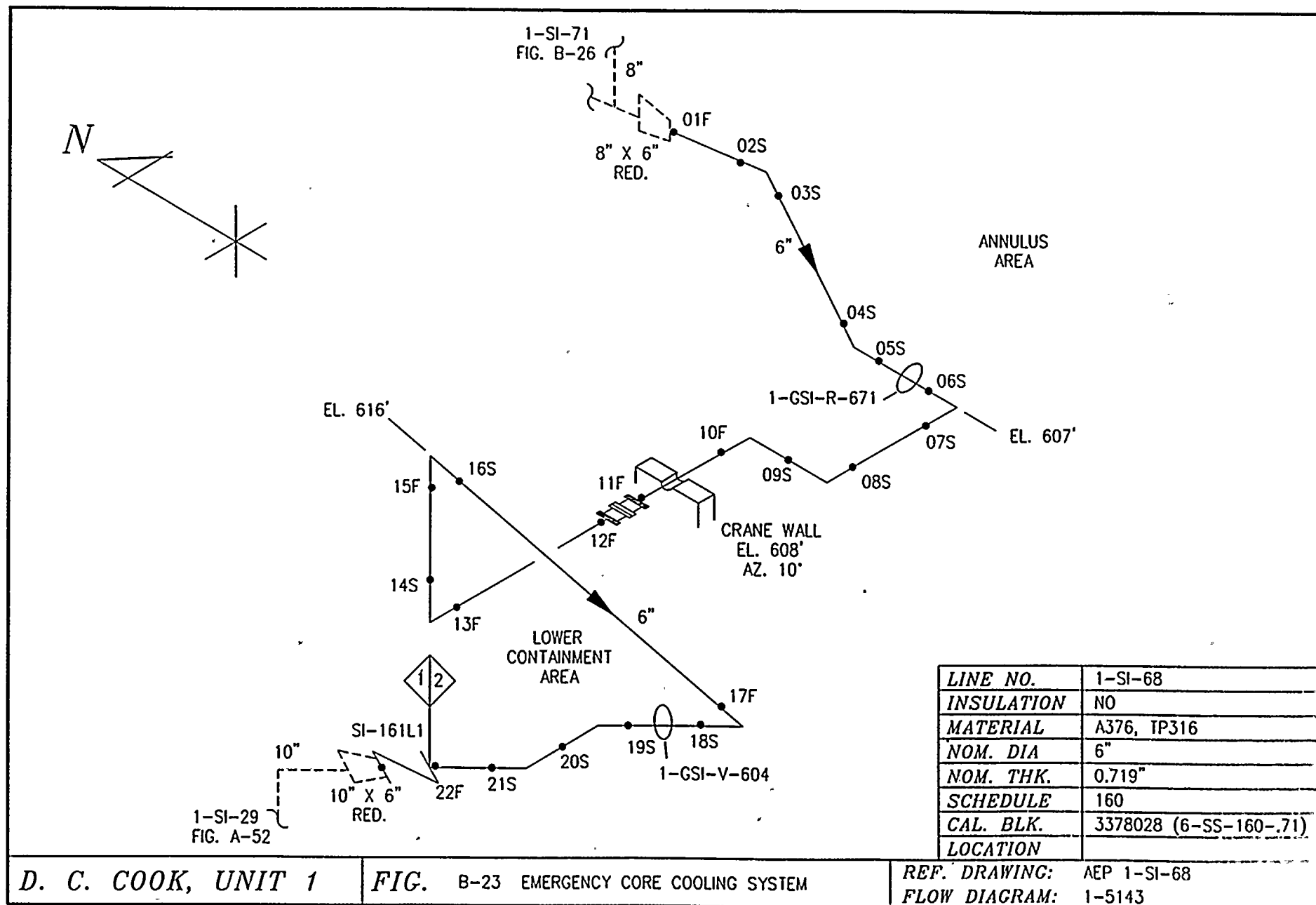
 REF. DRAWING: AEP 1-SI-32
 FLOW DIAGRAM: 1-5143

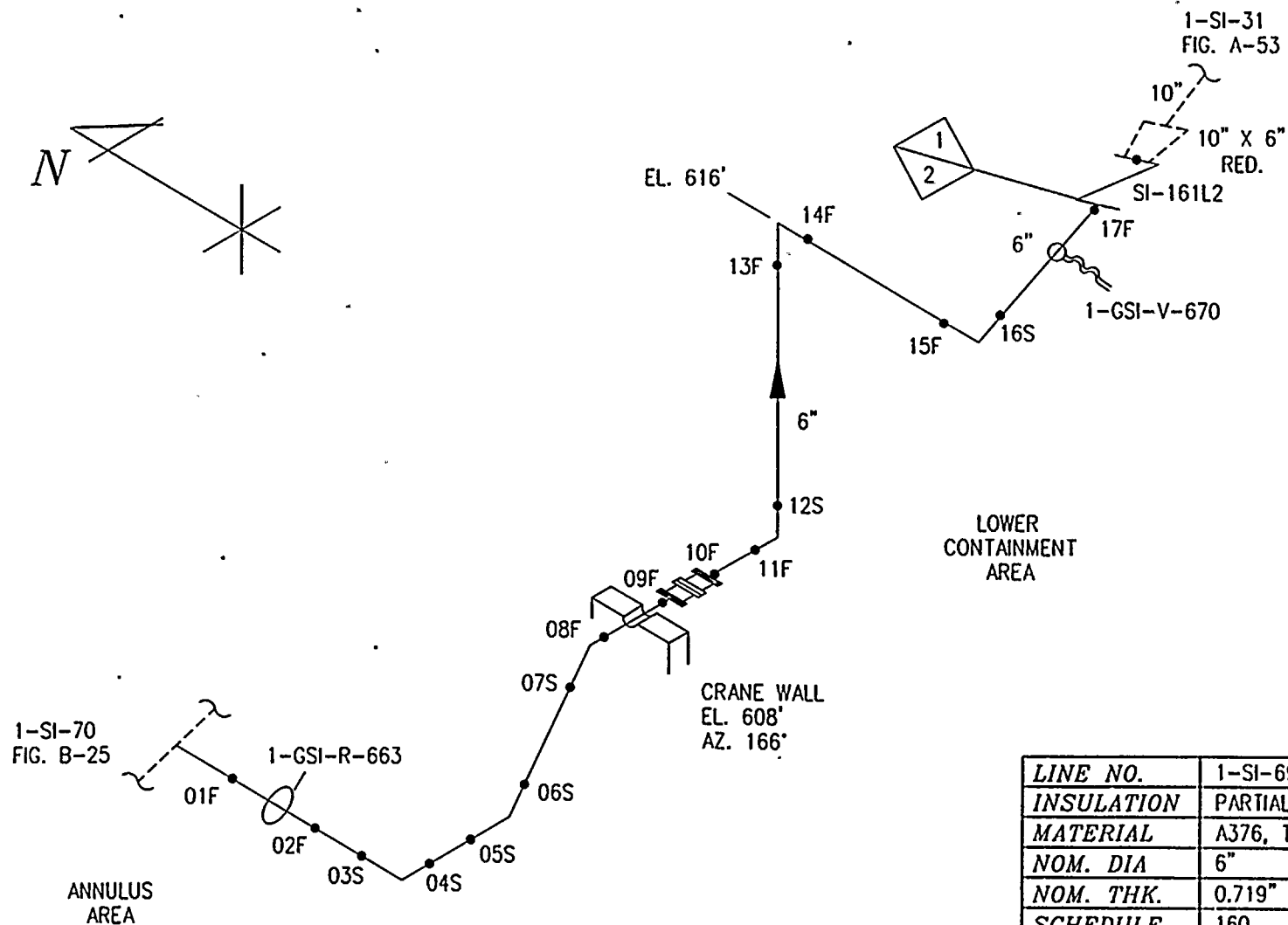


LINE NO.	1-SI-34	
INSULATION	NO	
MATERIAL	SS 316	
NOM. DIA	10"	10"
NOM. THK.	0.365"	1.0"
SCHEDULE	40	140
CAL. BLK.	3378030	26-DCC
LOCATION		

FIG. B-22 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING:	AEP 1-SI-34
FLOW DIAGRAM:	1-5143



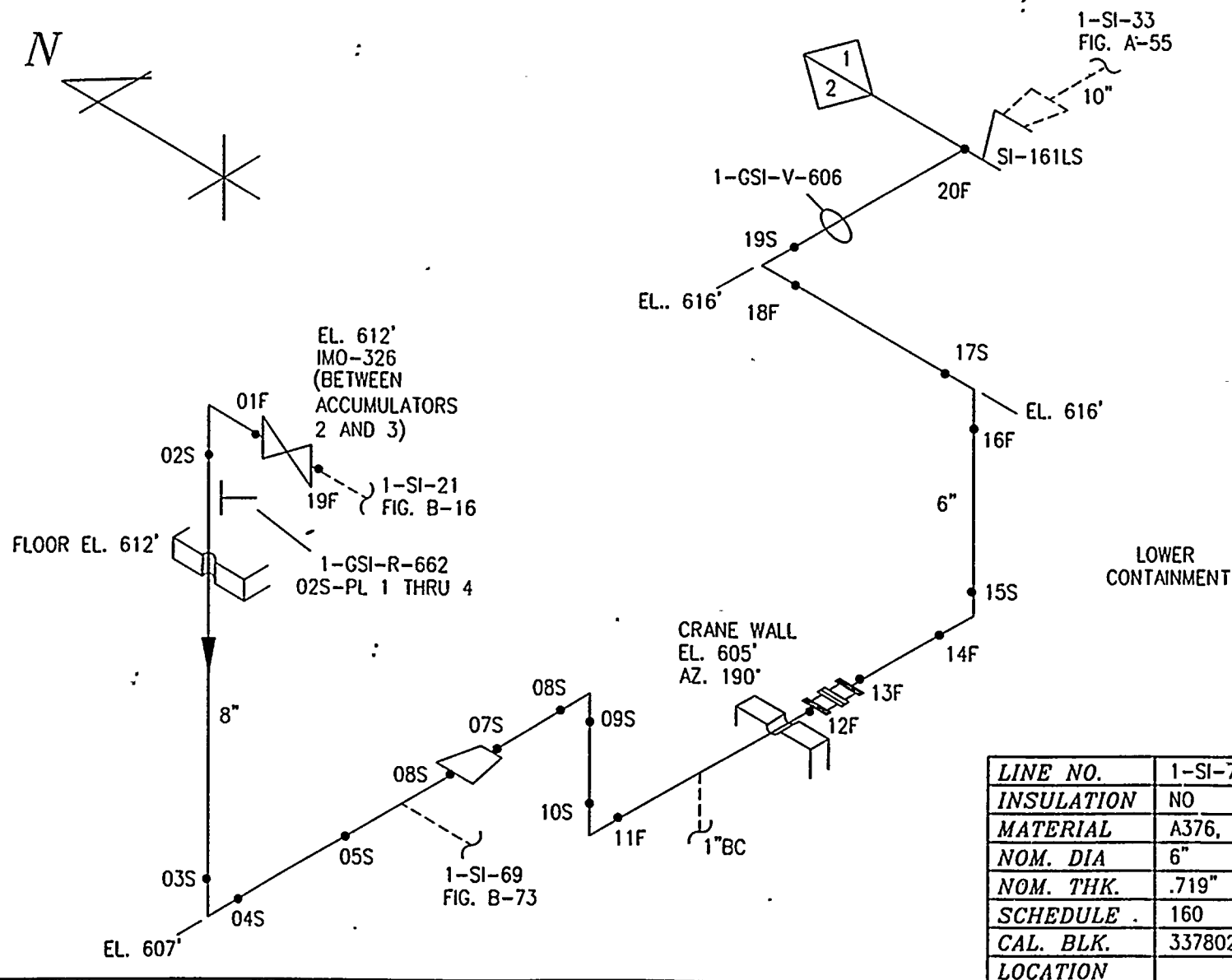


LINE NO.	1-SI-69
INSULATION	PARTIAL
MATERIAL	A376, TP316
NOM. DIA	6"
NOM. THK.	0.719"
SCHEDULE	160
CAL. BLK.	3378028 (6-SS-160-.71)
LOCATION	

D. C. COOK, UNIT 1

FIG. B-24 EMERGENCY CORE COOLING SYSTEM

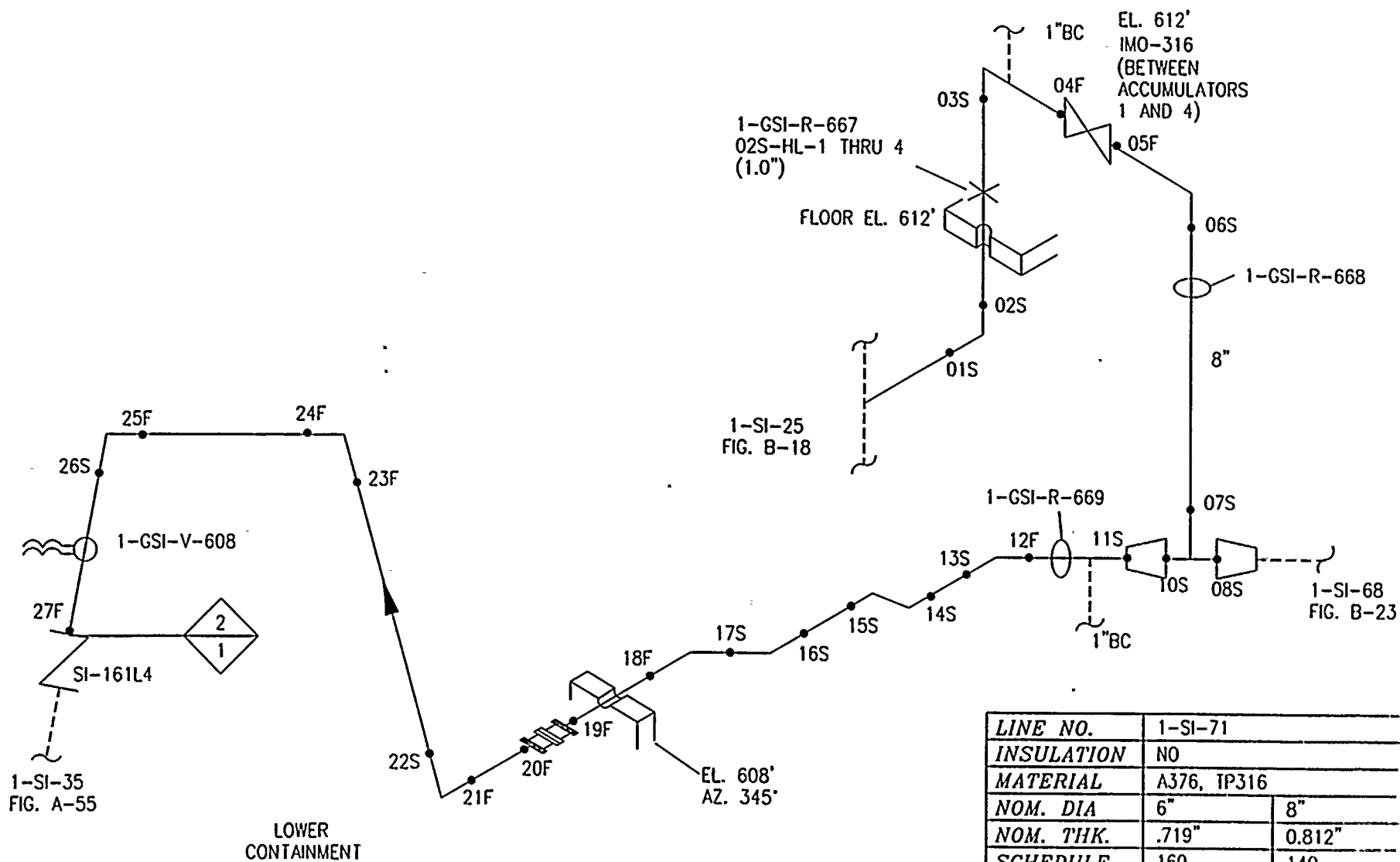
REF. DRAWING: AEP 1-SI-69
 FLOW DIAGRAM: 1-5143



D. C. COOK, UNIT 1

FIG. B-25 EMERGENCY CORE COOLING SYSTEM

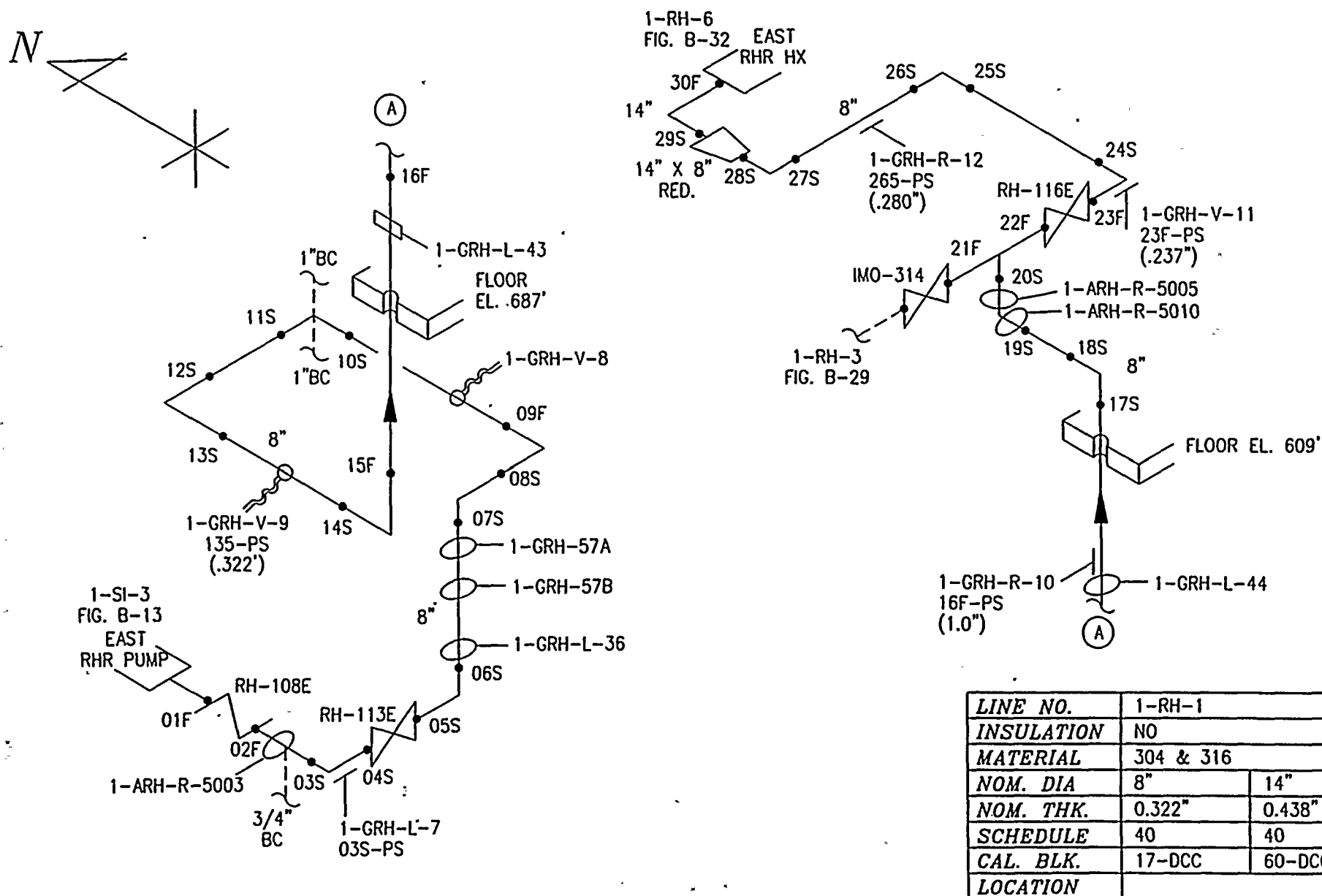
REF. DRAWING: AEP 1-SI-70
FLOW DIAGRAM: 1-5143



D. C. COOK, UNIT 1

FIG. B-26 EMERGENCY CORE COOLING SYSTEM

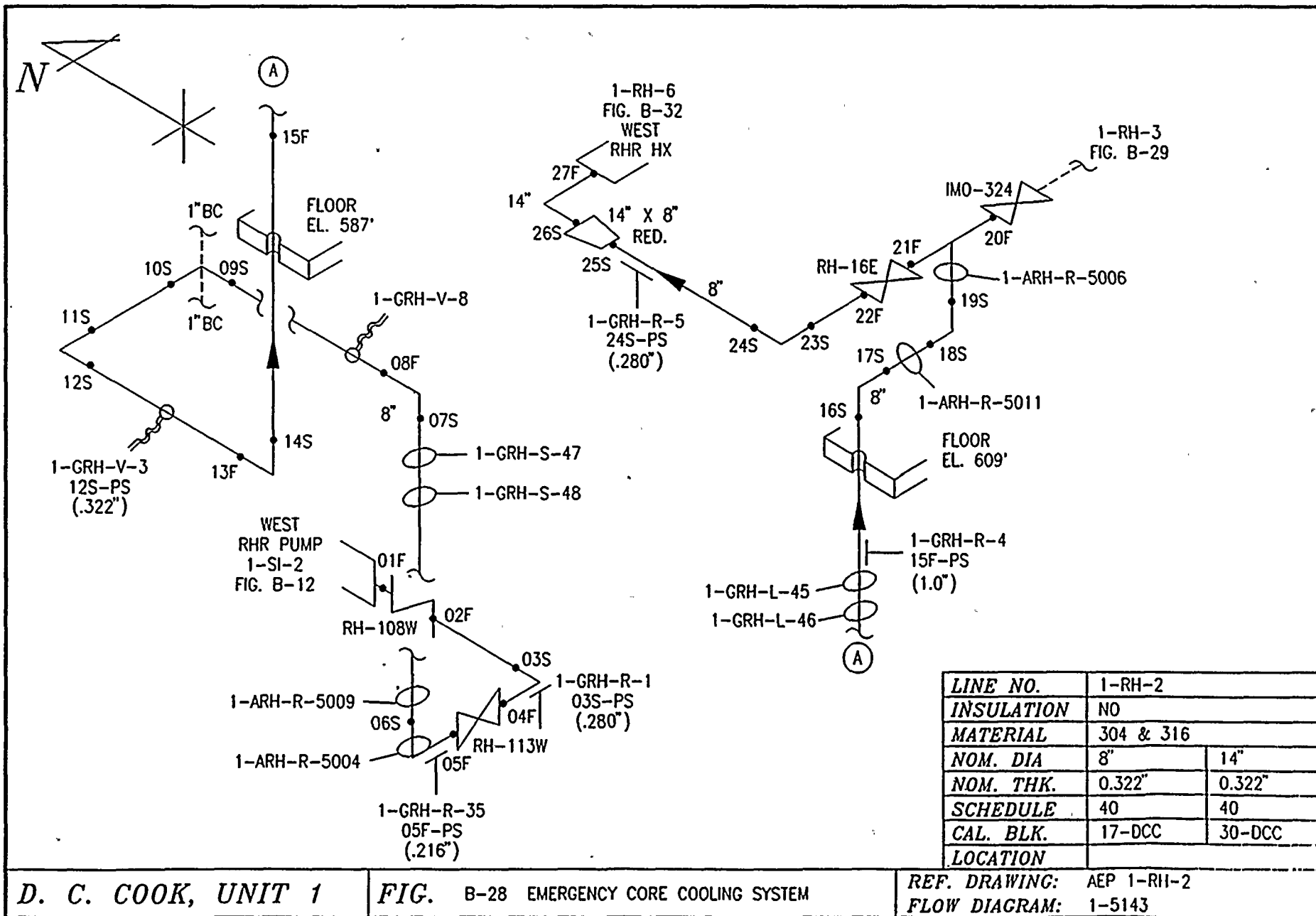
REF. DRAWING: AEP 1-SI-71
FLOW DIAGRAM: 1-5143

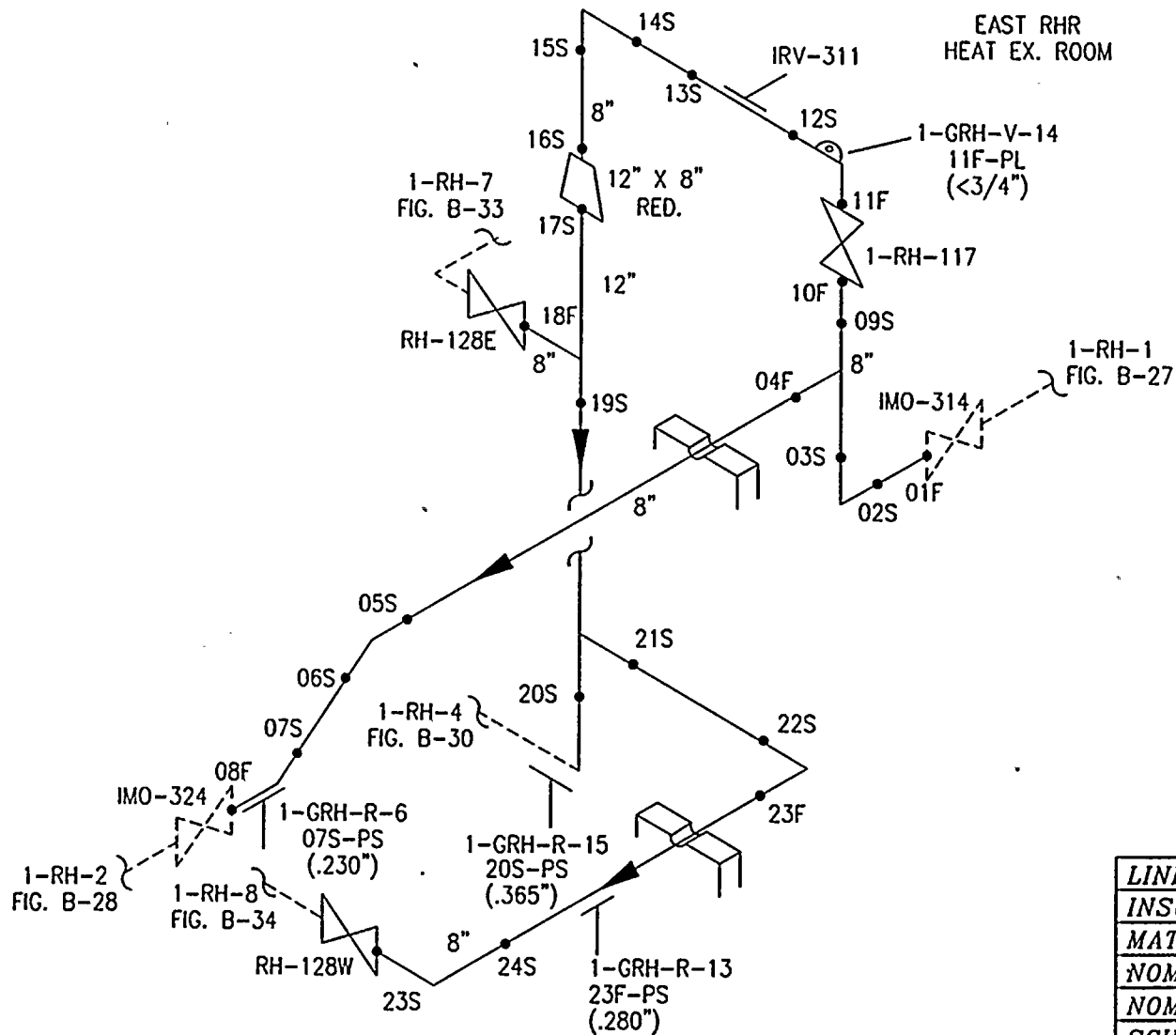


D. C. COOK, UNIT 1

FIG. B-27 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-RH-1
FLOW DIAGRAM: 1-5143





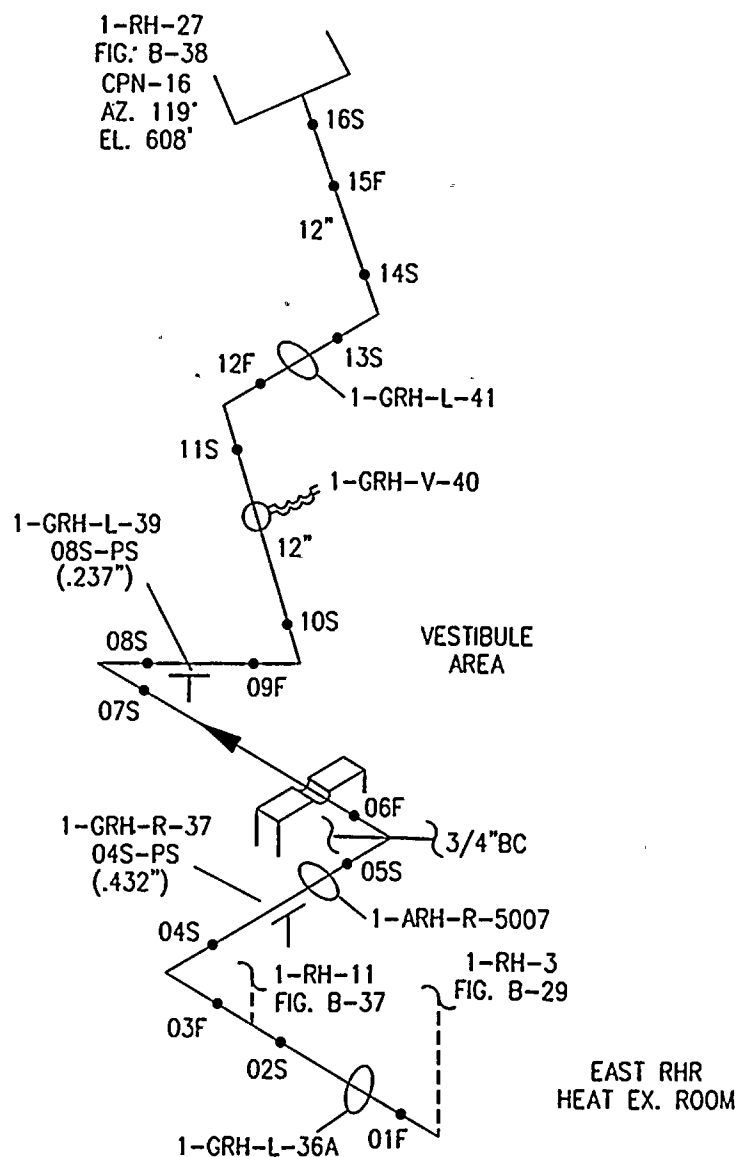
LINE NO.	1-RH-3	
INSULATION	NO	
MATERIAL	316 & 304	
NOM. DIA	8"	12"
NOM. THK.	0.322"	0.406"
SCHEDULE	40	40
CAL. BLK.	17-DCC	29-DCC
LOCATION		

D. C. COOK, UNIT 1

FIG. B-29 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING:	AEP 1-RH-3
FLOW DIAGRAM:	1-5143

B-30

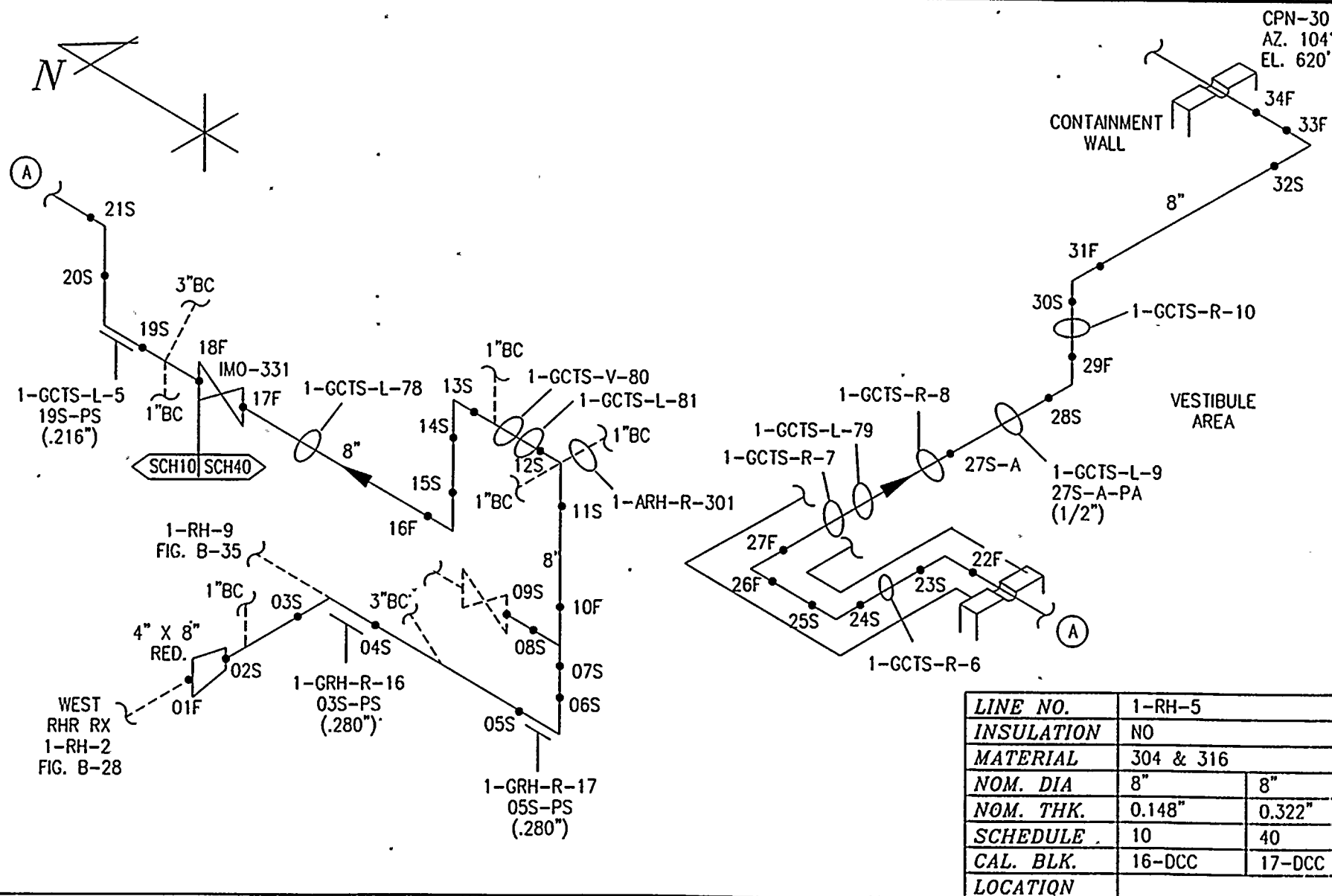


LINE NO.	1-RH-4
INSULATION	YES
MATERIAL	A376, TP316
NOM. DIA	12"
NOM. THK.	0.406"
SCHEDULE	40
CAL. BLK.	29-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. B-30 EMERGENCY CORE COOLING SYSTEM

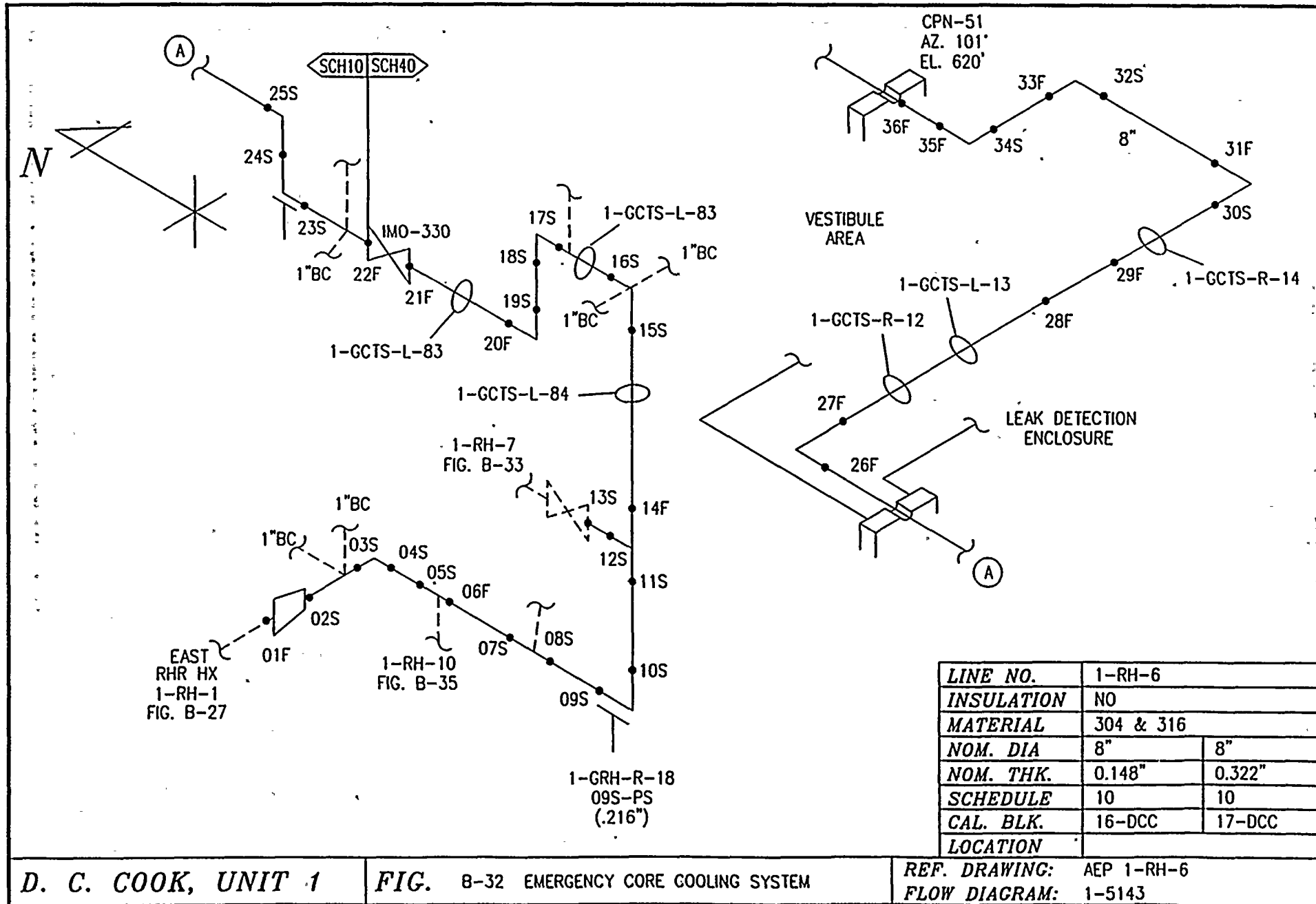
REF. DRAWING: AEP 1-RH-4
FLOW DIAGRAM: 1-5143



D. C. COOK, UNIT 1

FIG. B-31 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING:	AEP 1-RH-5
FLOW DIAGRAM:	1-5143

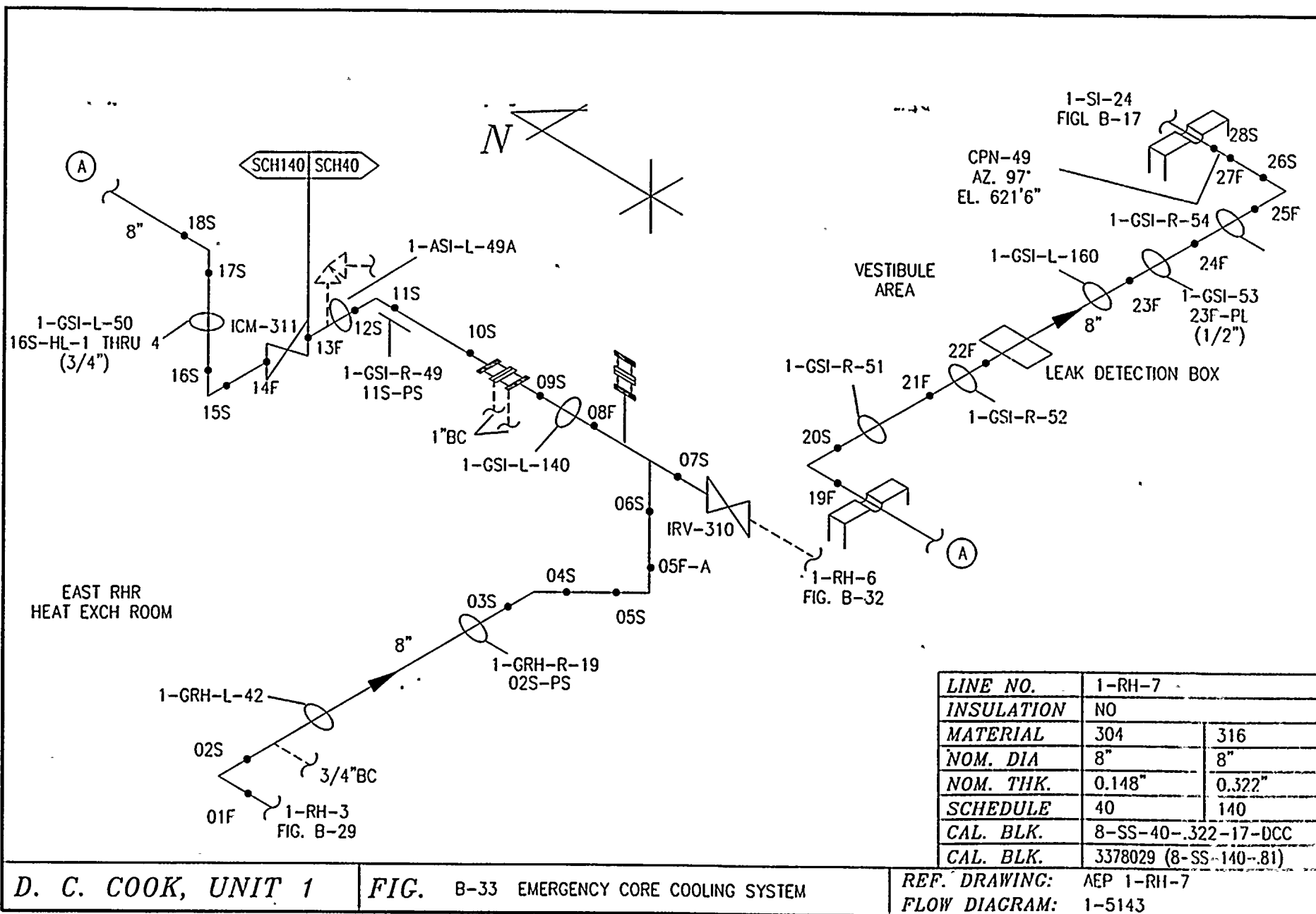


D. C. COOK, UNIT 1

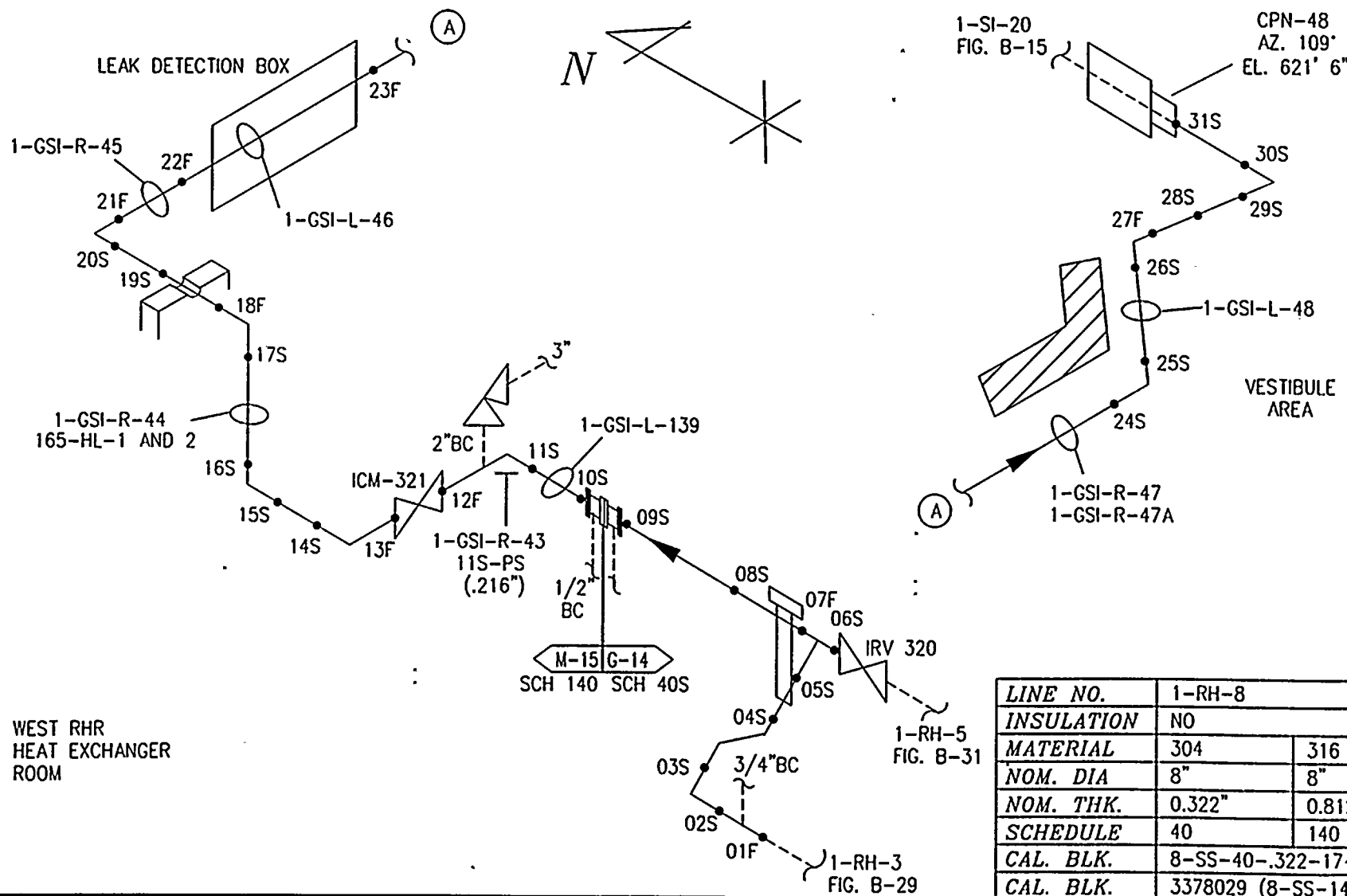
FIG. B-32 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-RH-6
FLOW DIAGRAM: 1-5143

B-33



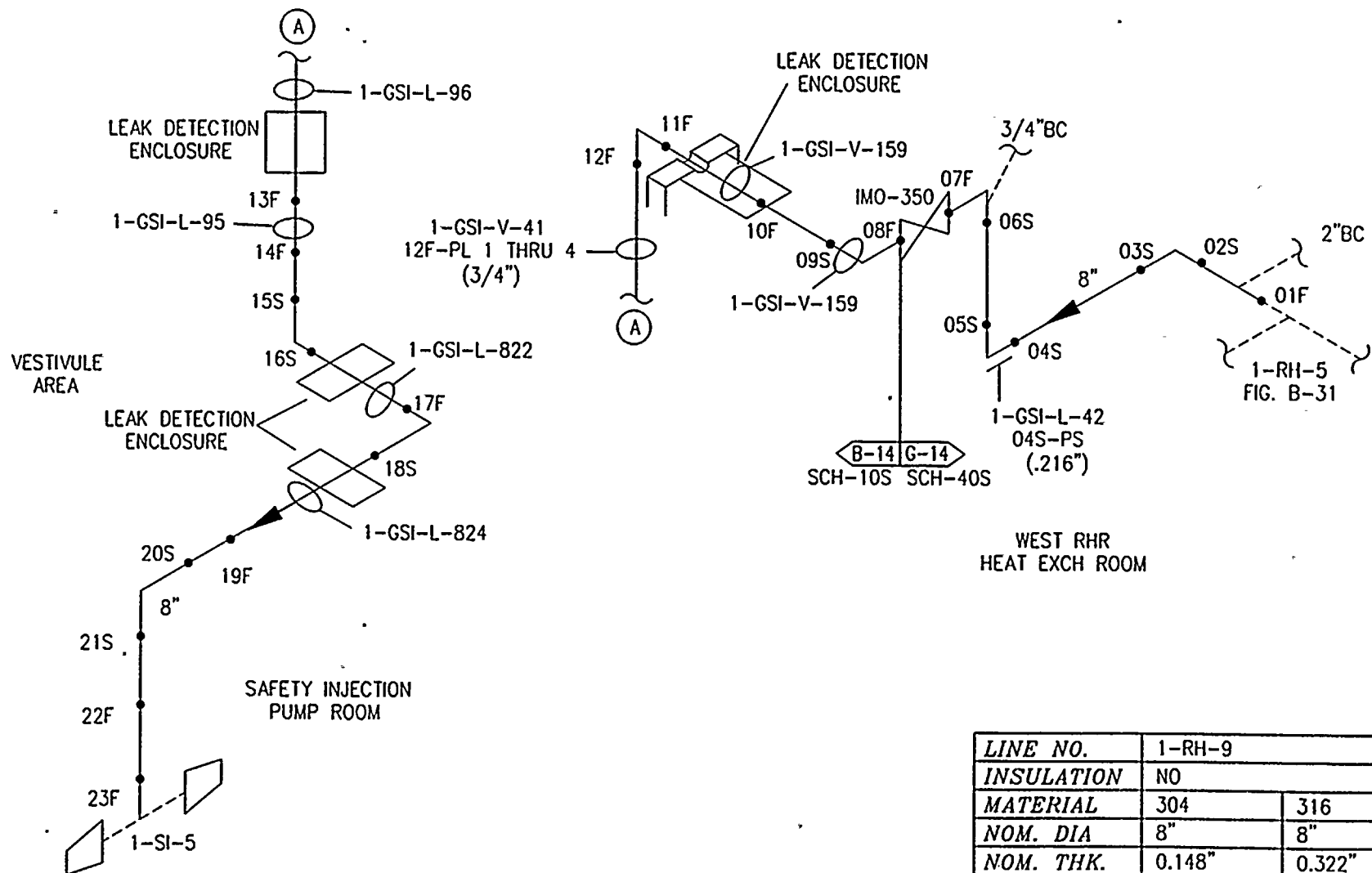
B-34



D. C. COOK, UNIT 1

FIG. B-34 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-RH-8
FLOW DIAGRAM: 1-5143

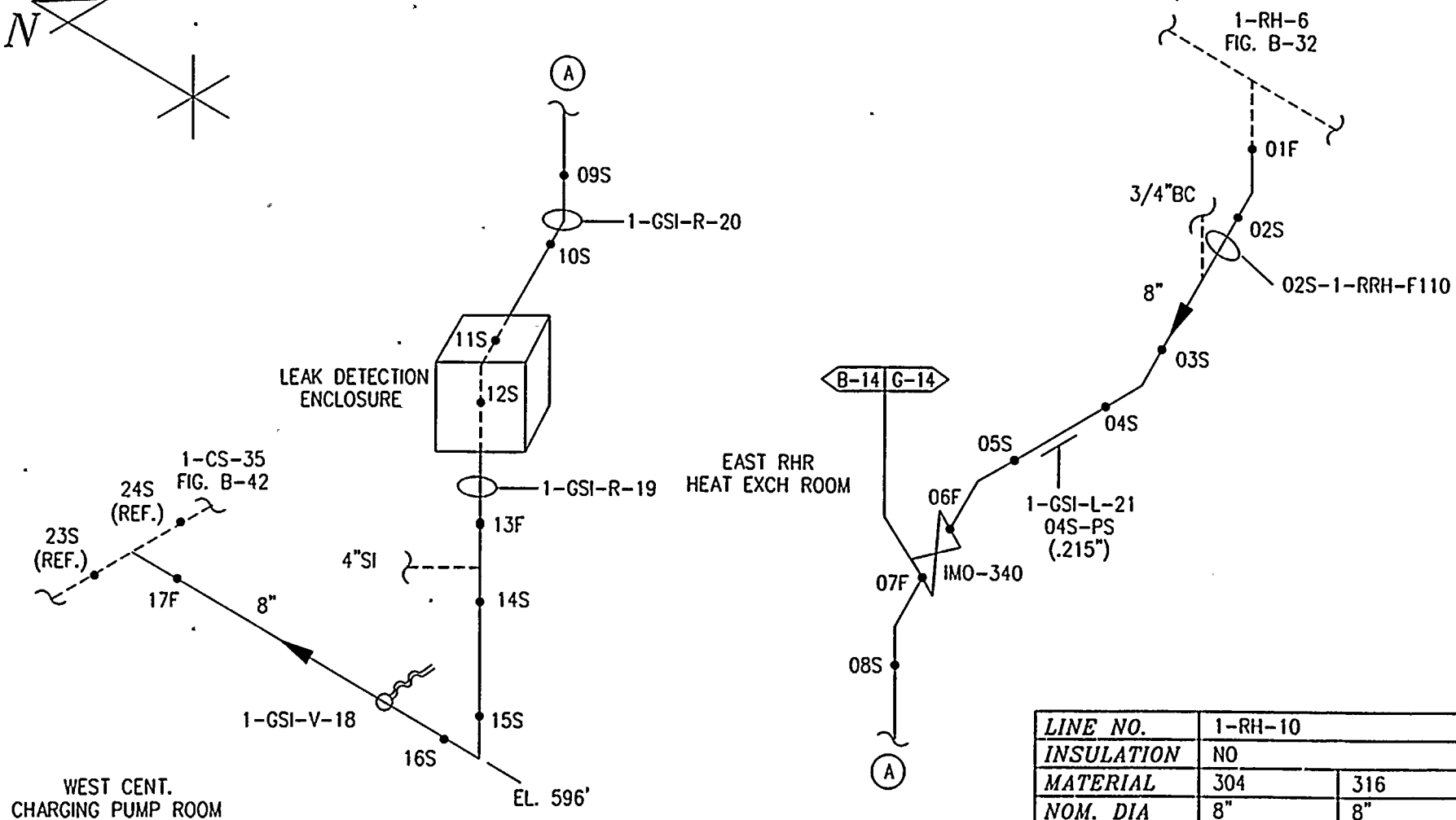
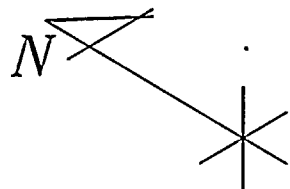


D. C. COOK, UNIT 1

FIG. B-35 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-RH-9

FLOW DIAGRAM: 1-5143

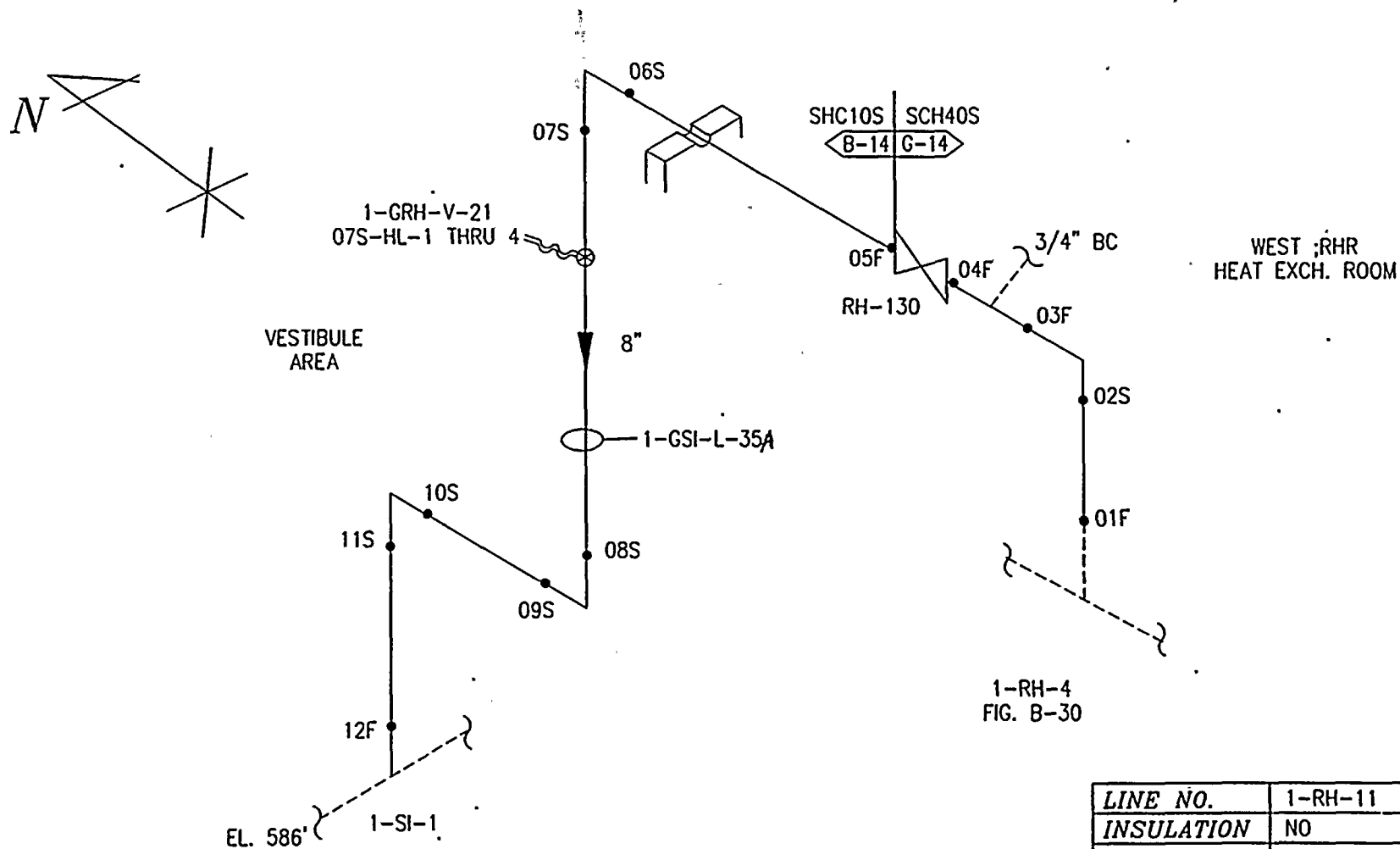


LINE NO.	1-RH-10	
INSULATION	NO	
MATERIAL	304	316
NOM. DIA	8"	8"
NOM. THK.	0.148"	0.322"
SCHEDULE	10	40
CAL. BLK.	16-DCC	17-DCC
LOCATION		

D. C. COOK, UNIT 1

FIG. B-36 EMERGENCY CORE COOLING SYSTEM

 REF. DRAWING: AEP 1-RH-10
 FLOW DIAGRAM: 1-5143



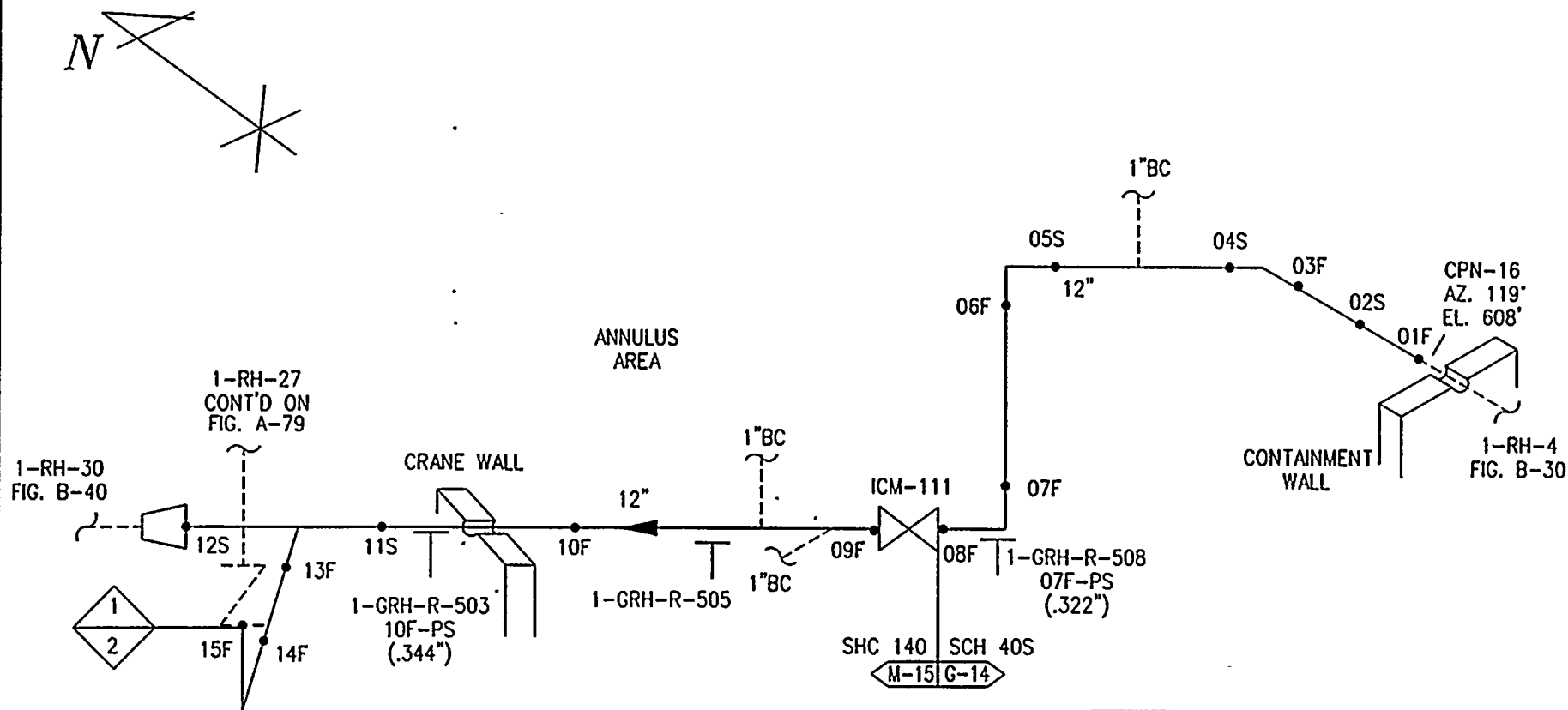
LINE NO.	1-RH-11	
INSULATION	NO	
MATERIAL	304	316
NOM. DIA	8"	8"
NOM. THK.	0.148"	0.322"
SCHEDULE	10	40
CAL. BLK.	16-DCC	17-DCC
LOCATION		

D. C. COOK, UNIT 1

FIG. B-37 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-RH-11
FLOW DIAGRAM: 1-5143

B-38

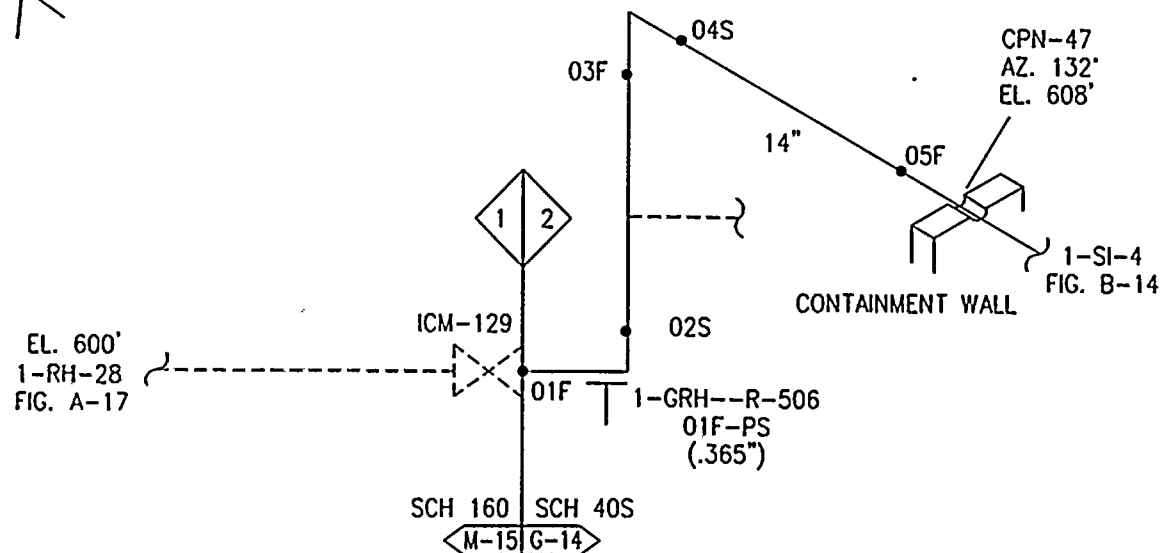
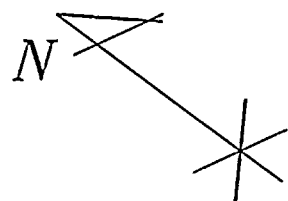


LINE NO.	1-RH-27	
INSULATION	NO	
MATERIAL	316	
NOM. DIA	12"	8"
NOM. THK.	0.406"	0.322"
SCHEDULE	40	40
CAL. BLK.	12-SS-40-.406-29-DCC	
CAL. BLK.	3378031 (12-SS-150-1.31)	

D. C. COOK, UNIT 1

FIG. B-38 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-RH-27
FLOW DIAGRAM: 1-5143

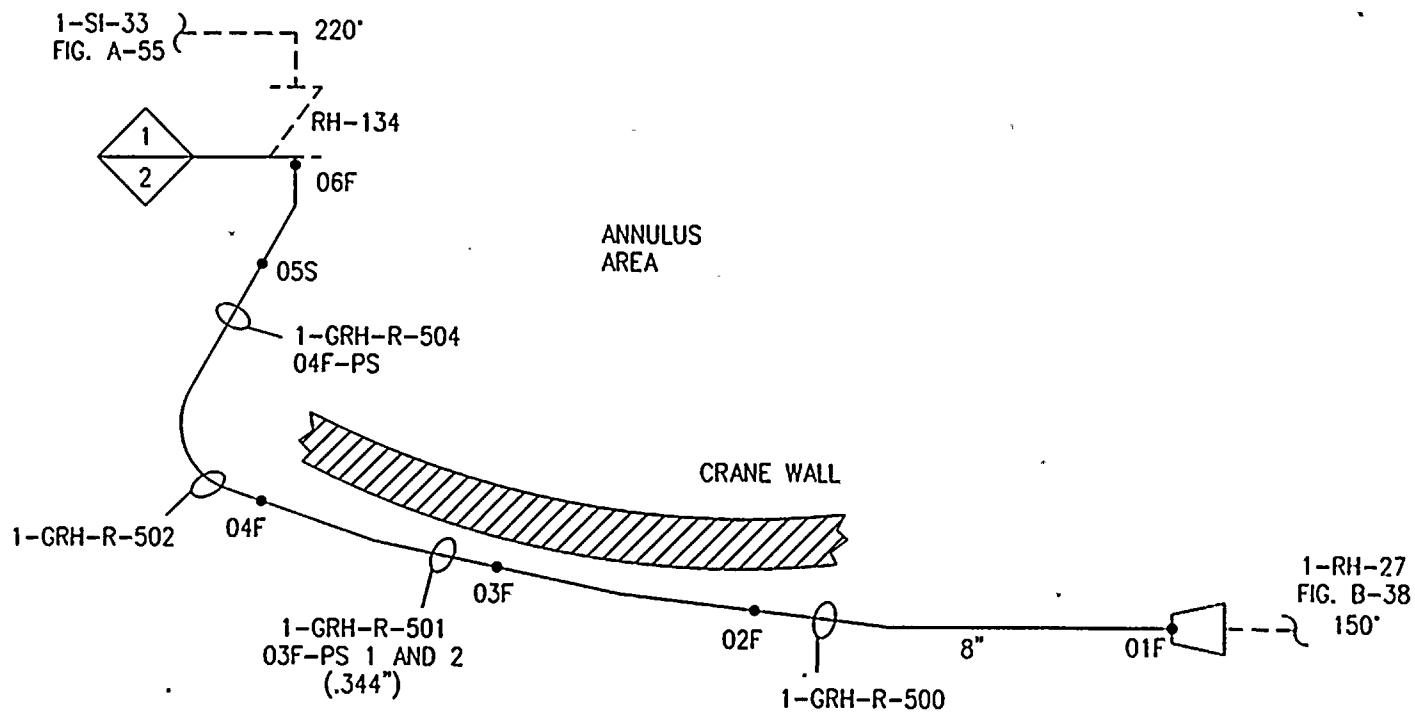
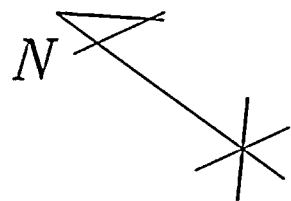


LINE NO.	1-RH-28
INSULATION	NO
MATERIAL	316
NOM. DIA	14"
NOM. THK.	0.438"
SCHEDULE	40
CAL. BLK.	14-SS-40-.438-30-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. B-39 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-RH-28
FLOW DIAGRAM: 1-5143



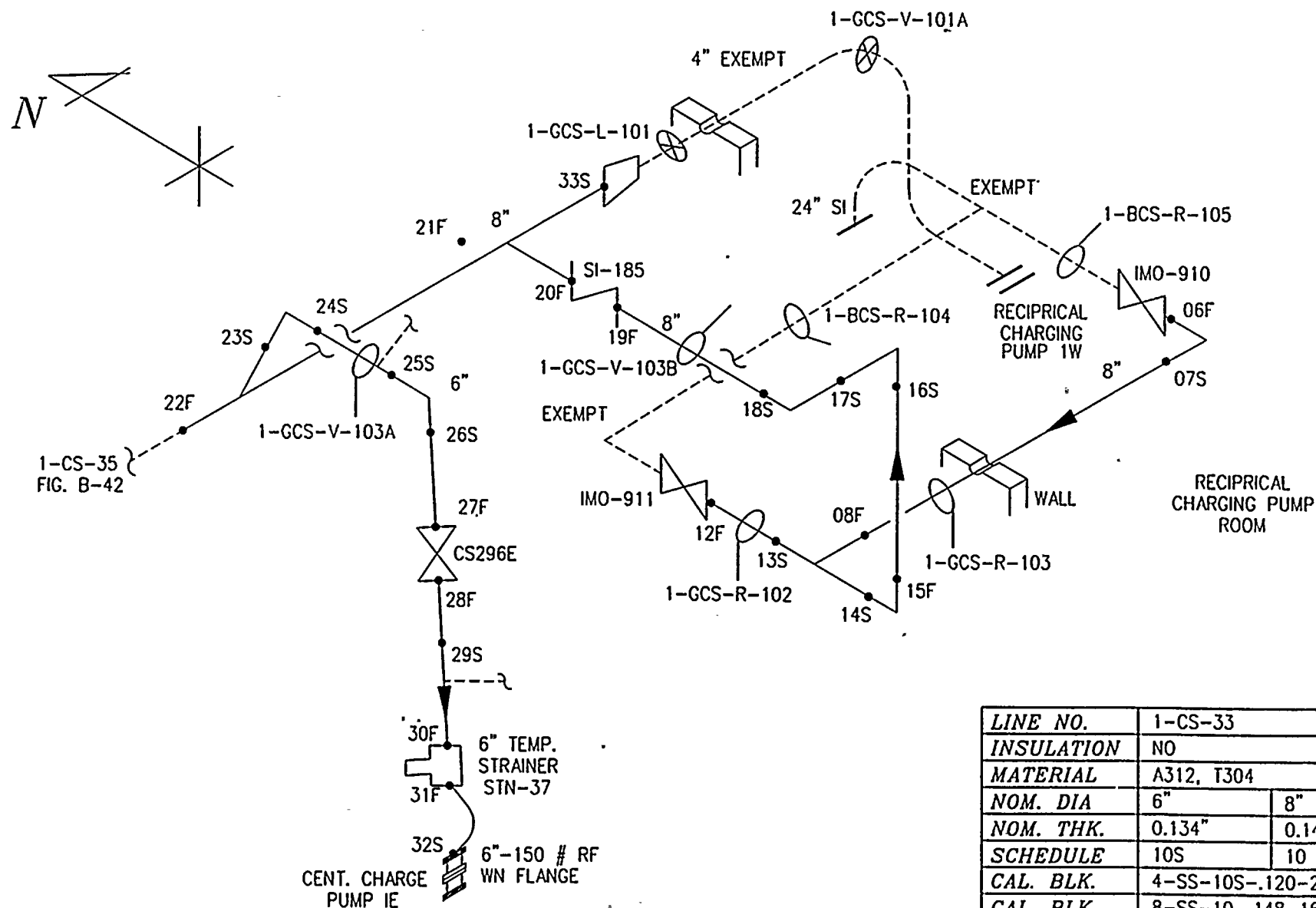
LINE NO.	1-RH-30
INSULATION	YES
MATERIAL	A376, TP316
NOM. DIA	8"
NOM. THK.	0.812"
SCHEDULE	140
CAL. BLK.	3378029 (8-SS-140-.81)
LOCATION	

D. C. COOK, UNIT 1

FIG. B-40 EMERGENCY CORE COOLING SYSTEM

 REF. DRAWING: AEP 1-RH-30
 FLOW DIAGRAM: 1-5143

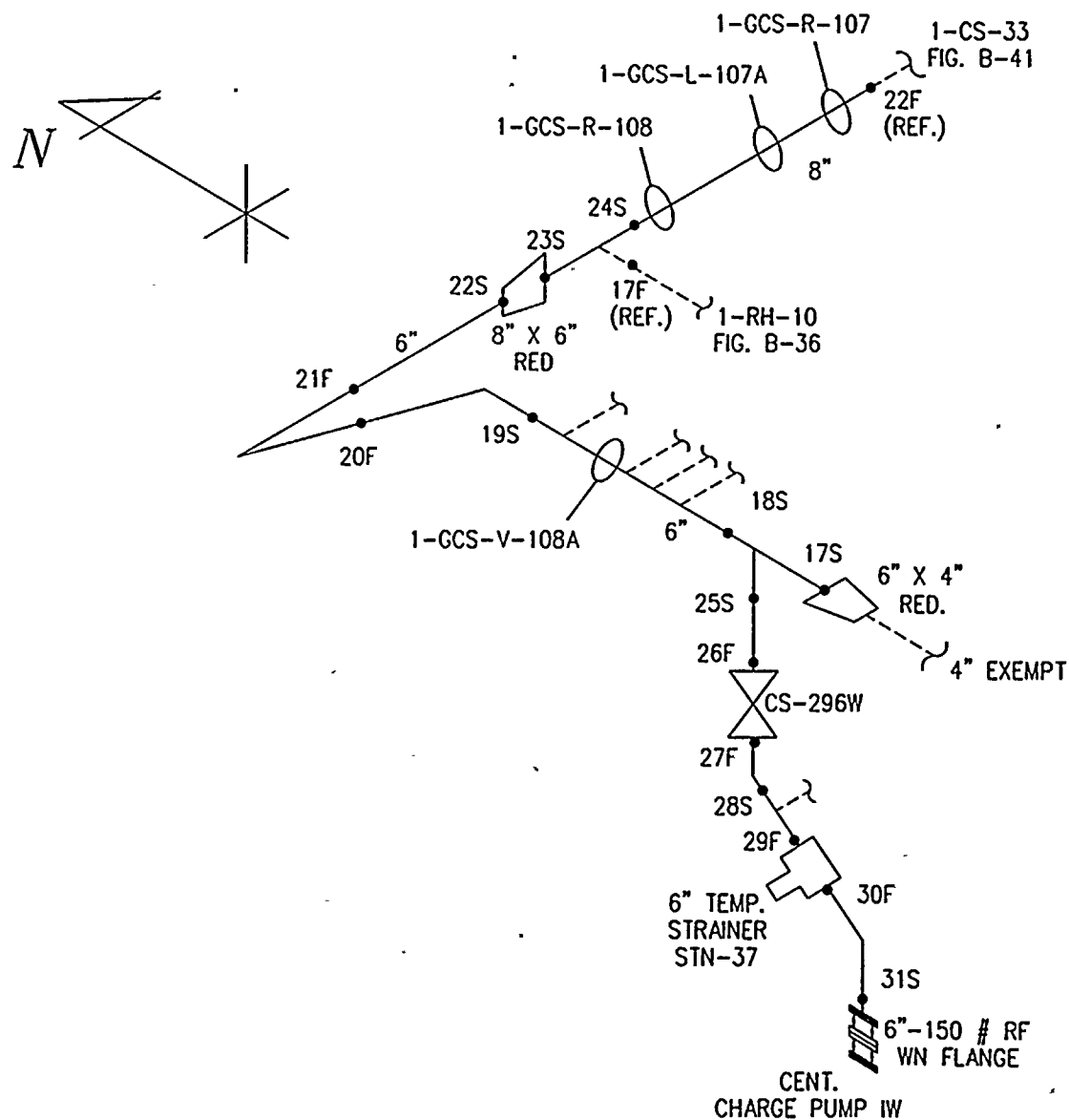
B-41



D. C. COOK, UNIT 1

FIG. B-41 CHEMICAL AND VOLUME CONTROL SYSTEM

REF. DRAWING: AEP 1-CS-33
FLOW DIAGRAM: 1-5129

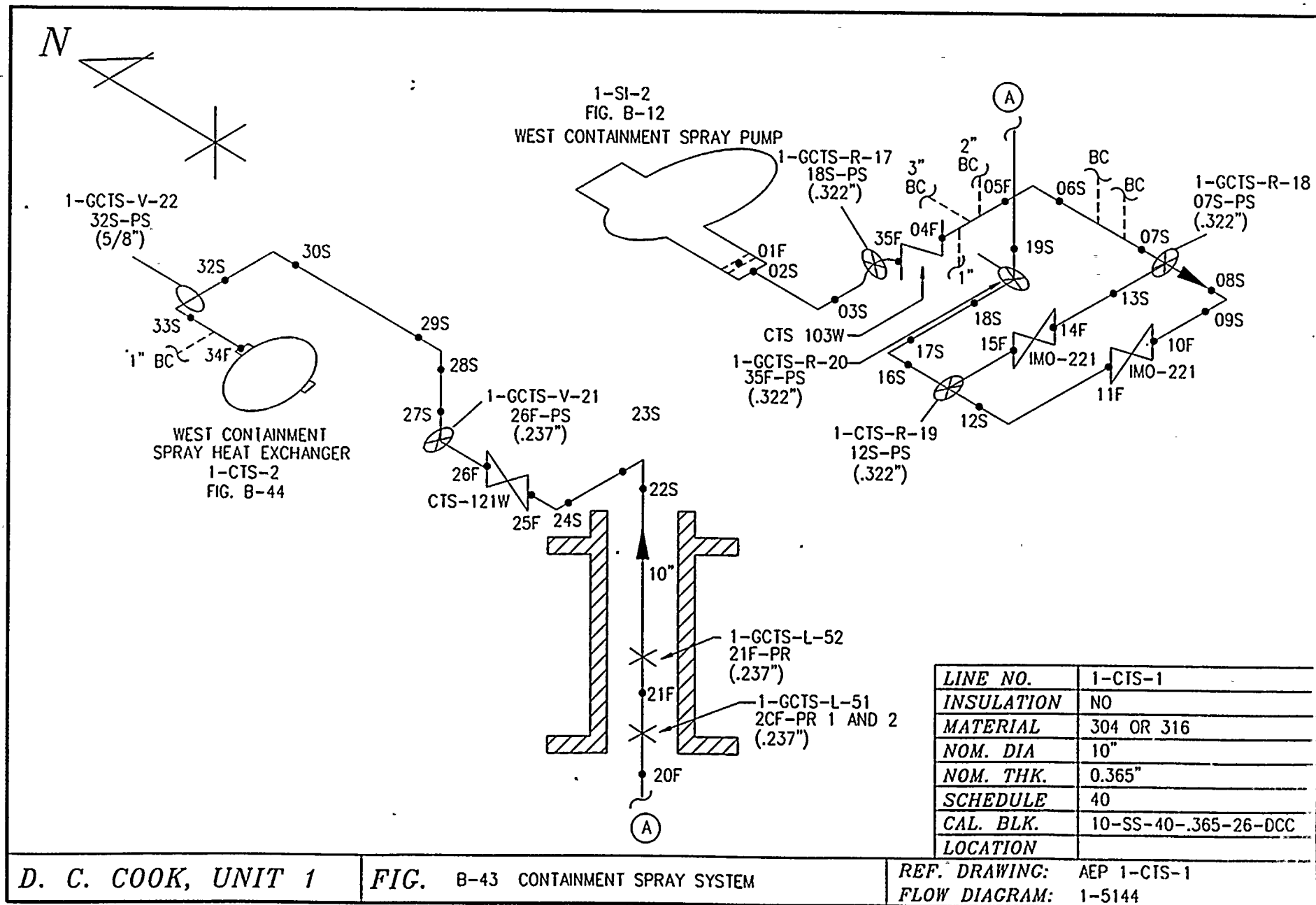


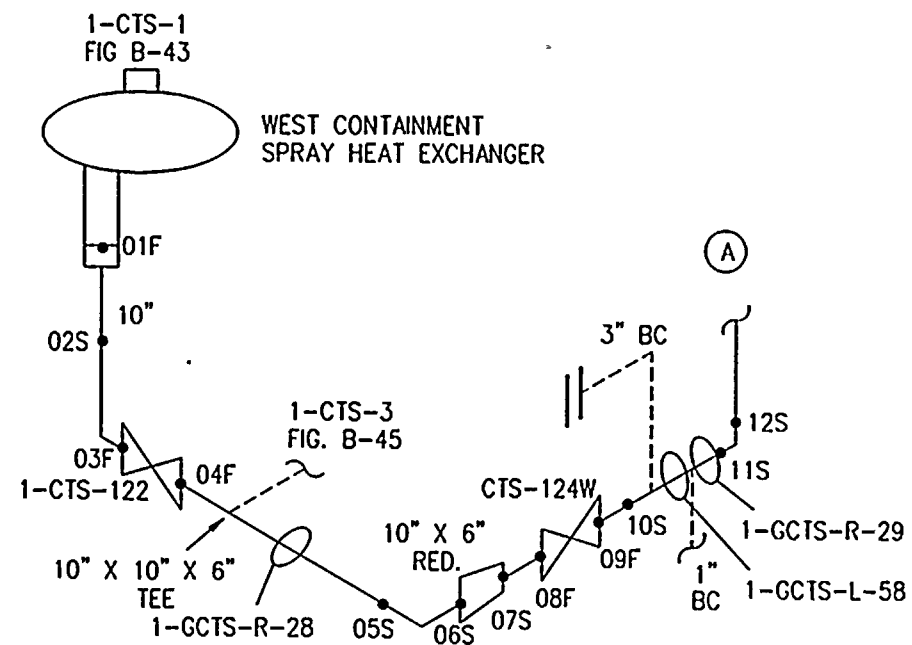
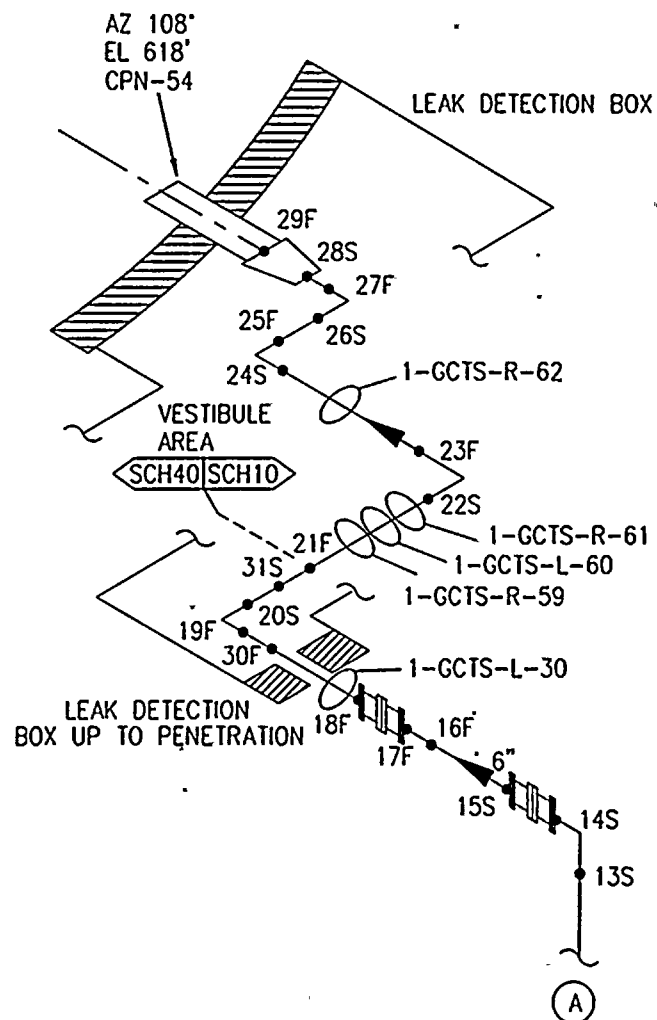
LINE NO.	1-CS-35	
INSULATION		
MATERIAL	A312, T304	
NOM. DIA	6"	8"
NOM. THK.	0.134"	0.148"
SCHEDULE	10	40
CAL. BLK.	6-SS-10S-.134-21-DCC	
CAL. BLK.	8-SS-40-.322-17-DCC	

D. C. COOK, UNIT 1

FIG. B-42 CHEMICAL AND VOLUME CONTROL SYSTEM

 REF. DRAWING: AEP 1-CS-35
 FLOW DIAGRAM: 1-5129



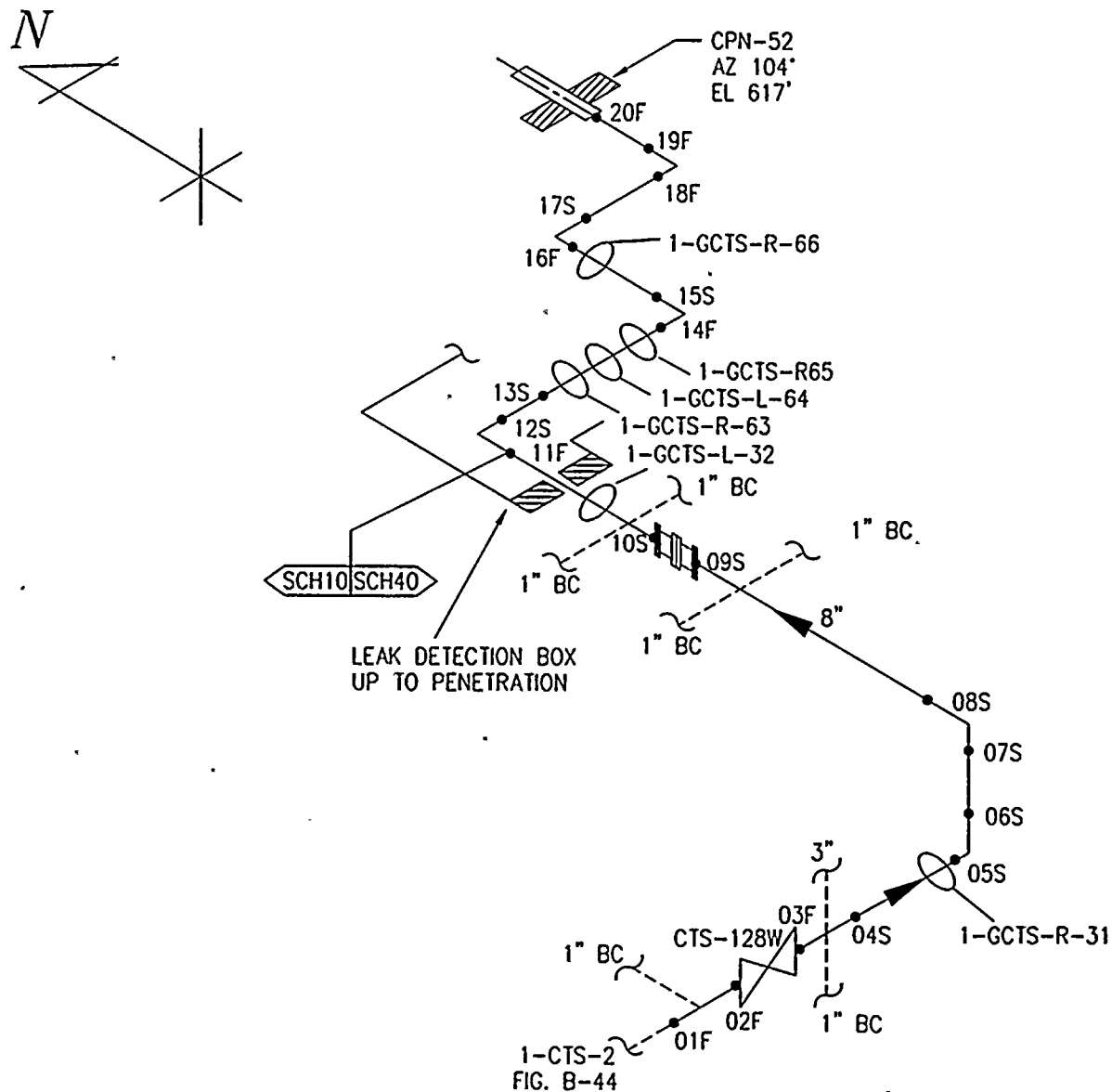


LINE NO.	1-CTS-2		
INSULATION	NO		
MATERIAL	A312, TP304		
NOM. DIA	6"	6"	10"
NOM. THK.	0.134"	0.280"	0.365"
SCHEDULE	10S	40	40
CAL. BLK.	21-DCC	28-DCC	26-DCC
LOCATION			

D. C. COOK, UNIT 1

FIG. B-44 CONTAINMENT SPRAY SYSTEM

REF. DRAWING: AEP 1-CTS-2
FLOW DIAGRAM: 1-5144

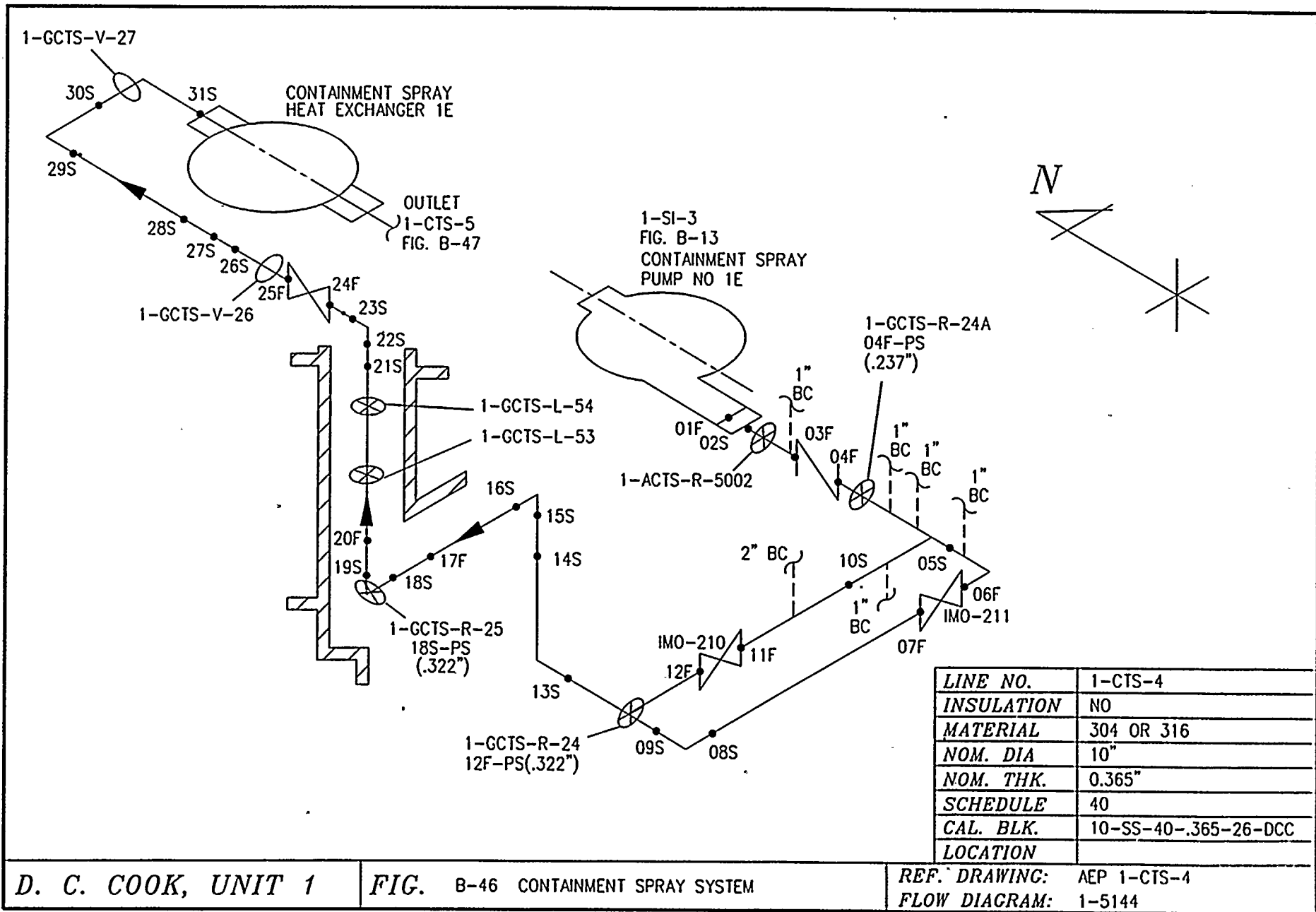


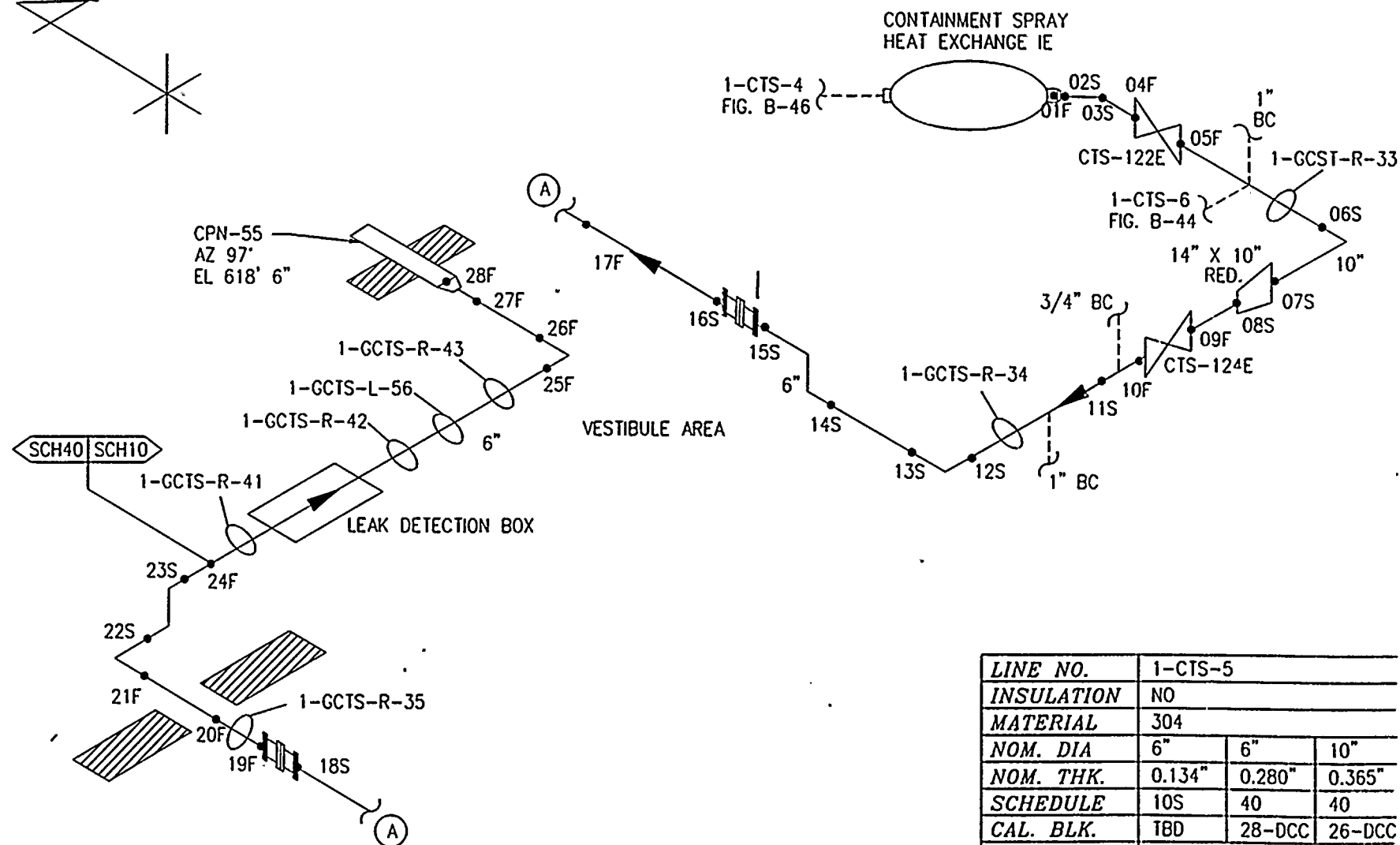
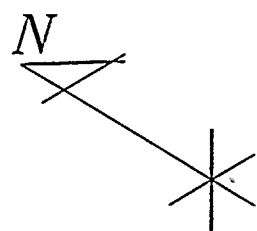
LINE NO.	1-CTS-3	
INSULATION	NO	
MATERIAL	A312, TP304	
NOM. DIA	8"	8"
NOM. THK.	0.148"	0.322"
SCHEDULE	10	40
CAL. BLK.	16-DCC	17-DCC
LOCATION		

D. C. COOK, UNIT 1

FIG. B-45 CONTAINMENT SPRAY SYSTEM

 REF. DRAWING: AEP 1-CTS-3
 FLOW DIAGRAM: 1-5144





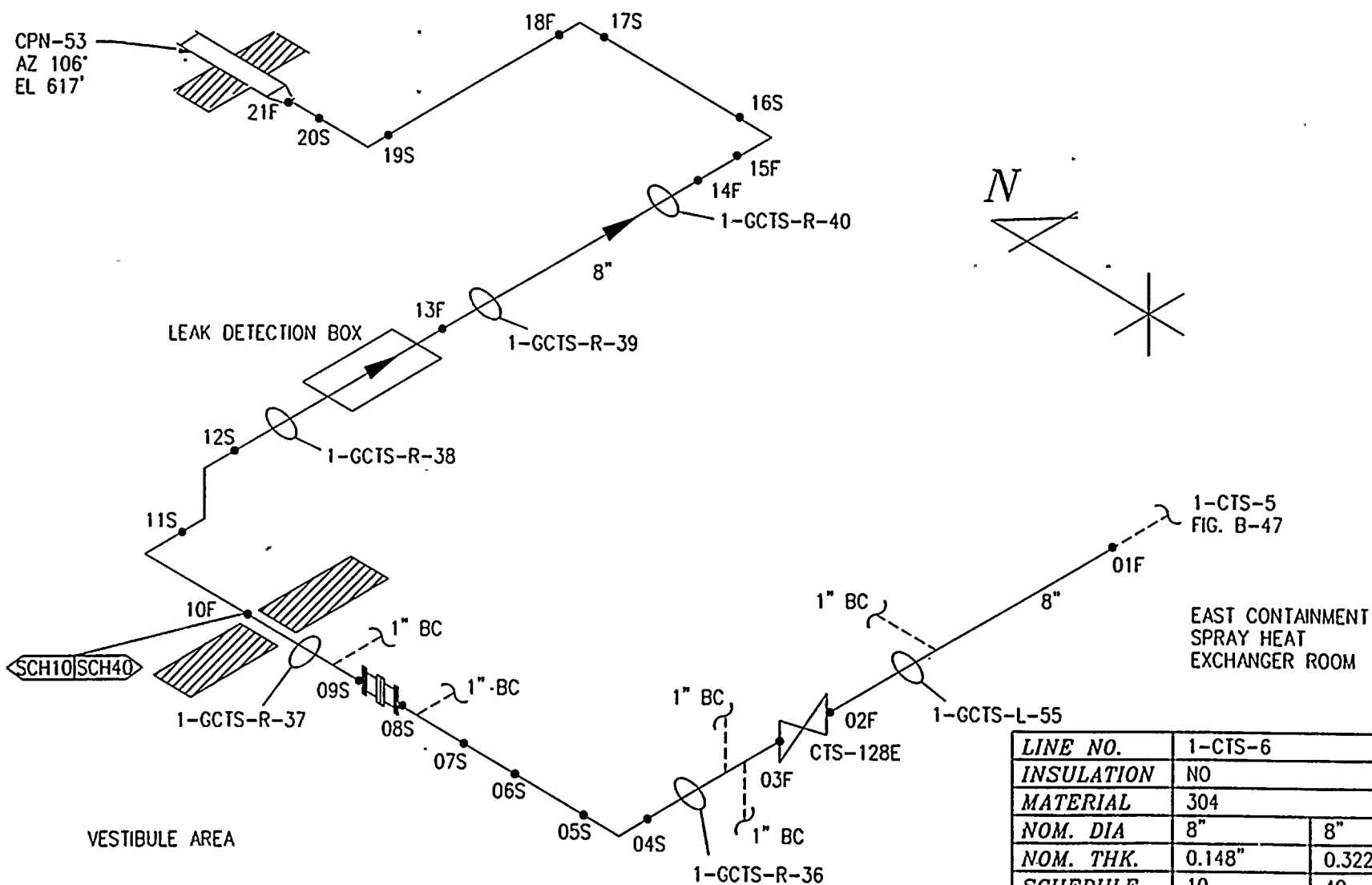
LINE NO.	1-CTS-5		
INSULATION	NO		
MATERIAL	304		
NOM. DIA	6"	6"	10"
NOM. THK.	0.134"	0.280"	0.365"
SCHEDULE	10S	40	40
CAL. BLK.	1BD	28-DCC	26-DCC
LOCATION			

D. C. COOK, UNIT 1

FIG. B-47 CONTAINMENT SPRAY SYSTEM

REF. DRAWING: AEP 1-CTS-5

FLOW DIAGRAM: 1-5144

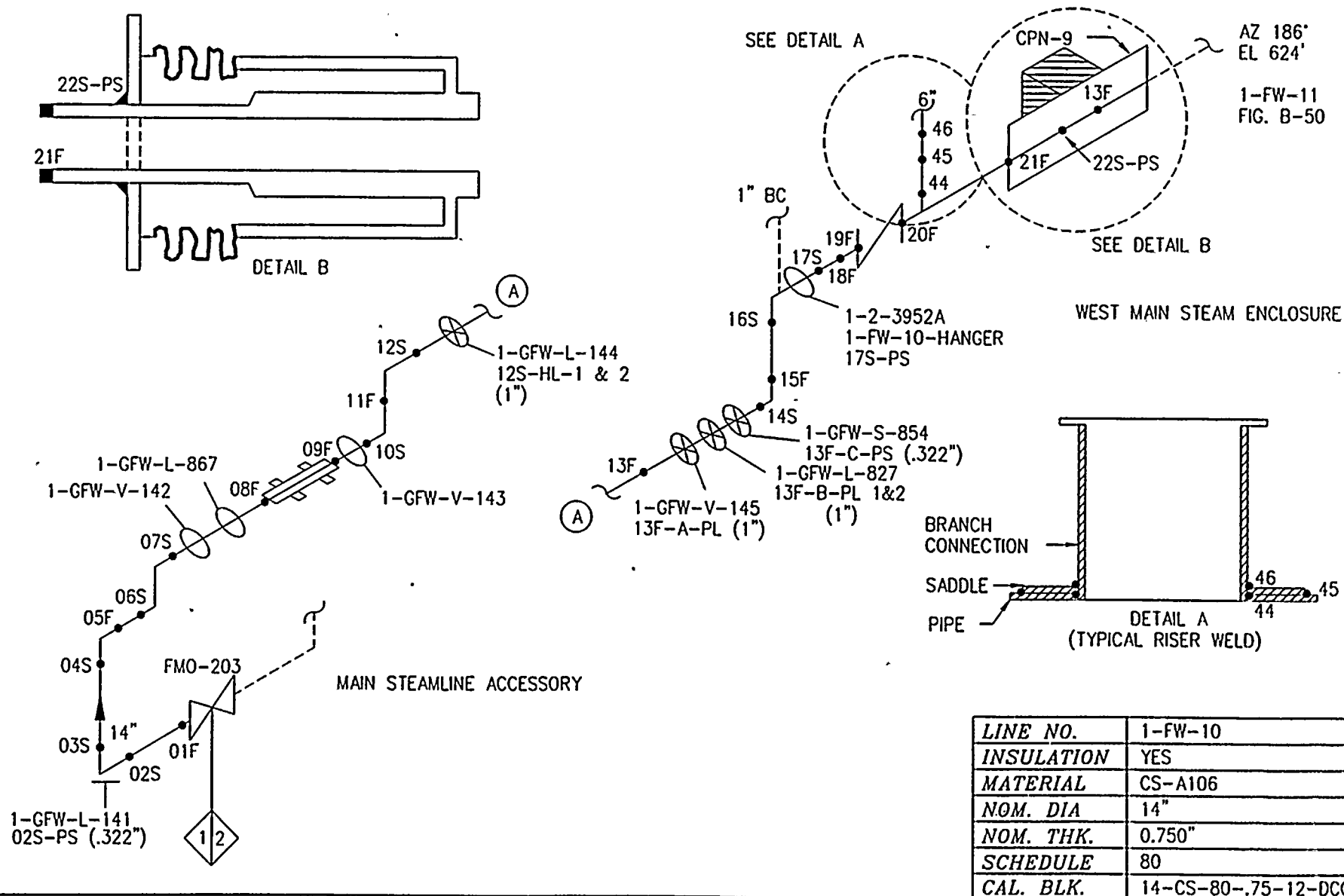


LINE NO.	1-CTS-6	
INSULATION	NO	
MATERIAL	304	
NOM. DIA	8"	8"
NOM. THK.	0.148"	0.322"
SCHEDULE	10	40
CAL. BLK.	16-DCC	17-DCC
LOCATION		

D. C. COOK, UNIT 1

FIG. B-48 CONTAINMENT SPRAY SYSTEM

REF. DRAWING: AEP 1-CTS-6
FLOW DIAGRAM: 1-5144

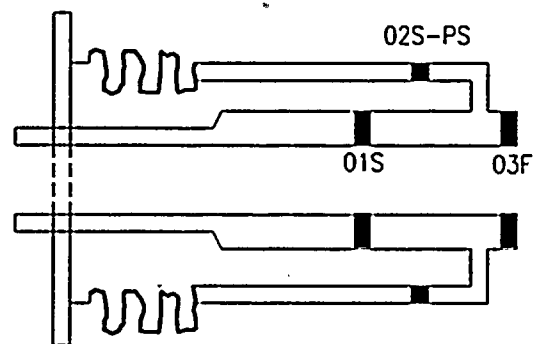


D. C. COOK, UNIT 1

FIG. B-49 BLOCK VALVE TO CONTAINMENT PENETRATION

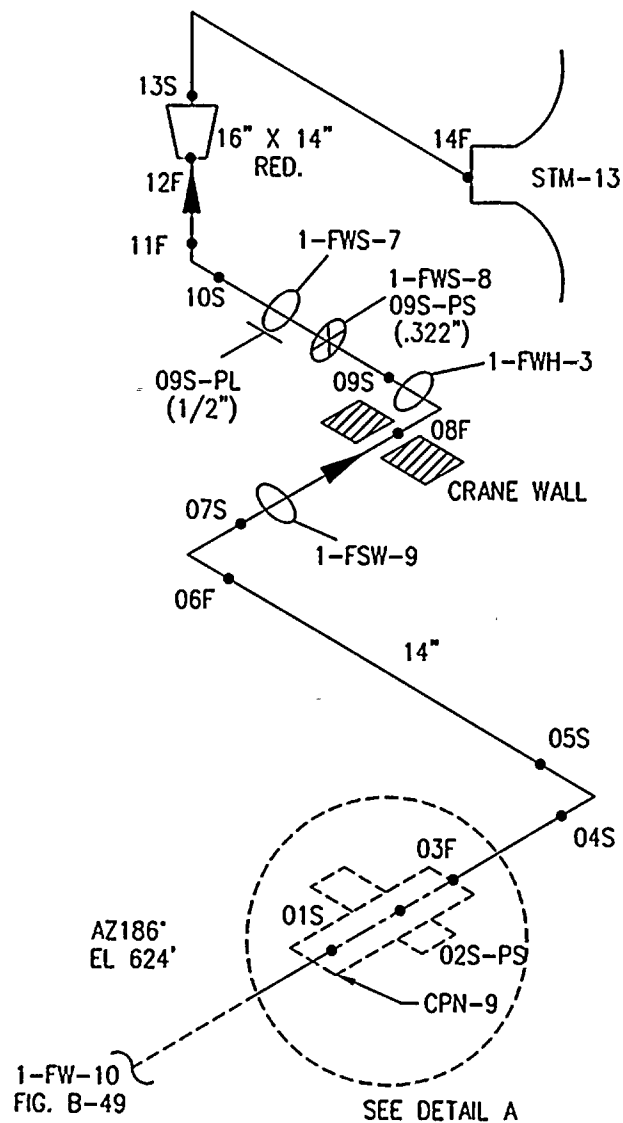
REF. DRAWING: AEP 1-FW-10

FLOW DIAGRAM: 1-5106



DETAIL A

LOWER CONTAINMENT

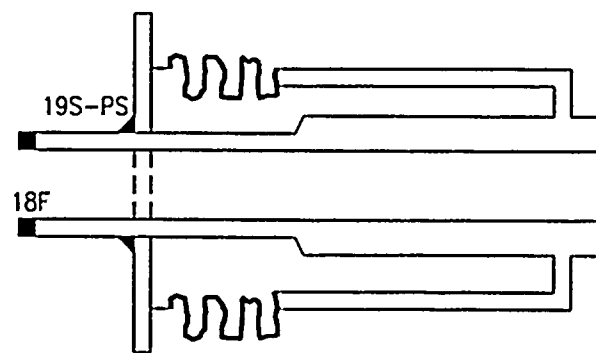


LINE NO.	1-FW-11	
INSULATION	YES	
MATERIAL	CS-A106	
NOM. DIA	14"	16"
NOM. THK.	0.750"	0.844"
SCHEDULE	80	***
CAL. BLK.	12-DCC	IBD
LOCATION		

D. C. COOK, UNIT 1

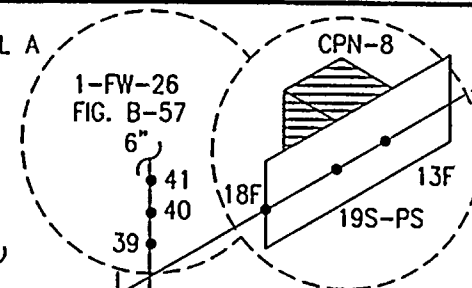
FIG. B-50 CONTAINMENT PENETRATION TO STEAM GEN. 13

REF. DRAWING: AEP 1-FW-11
FLOW DIAGRAM: 1-5106



DETAIL B

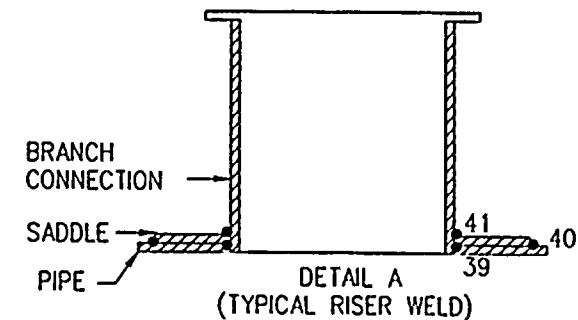
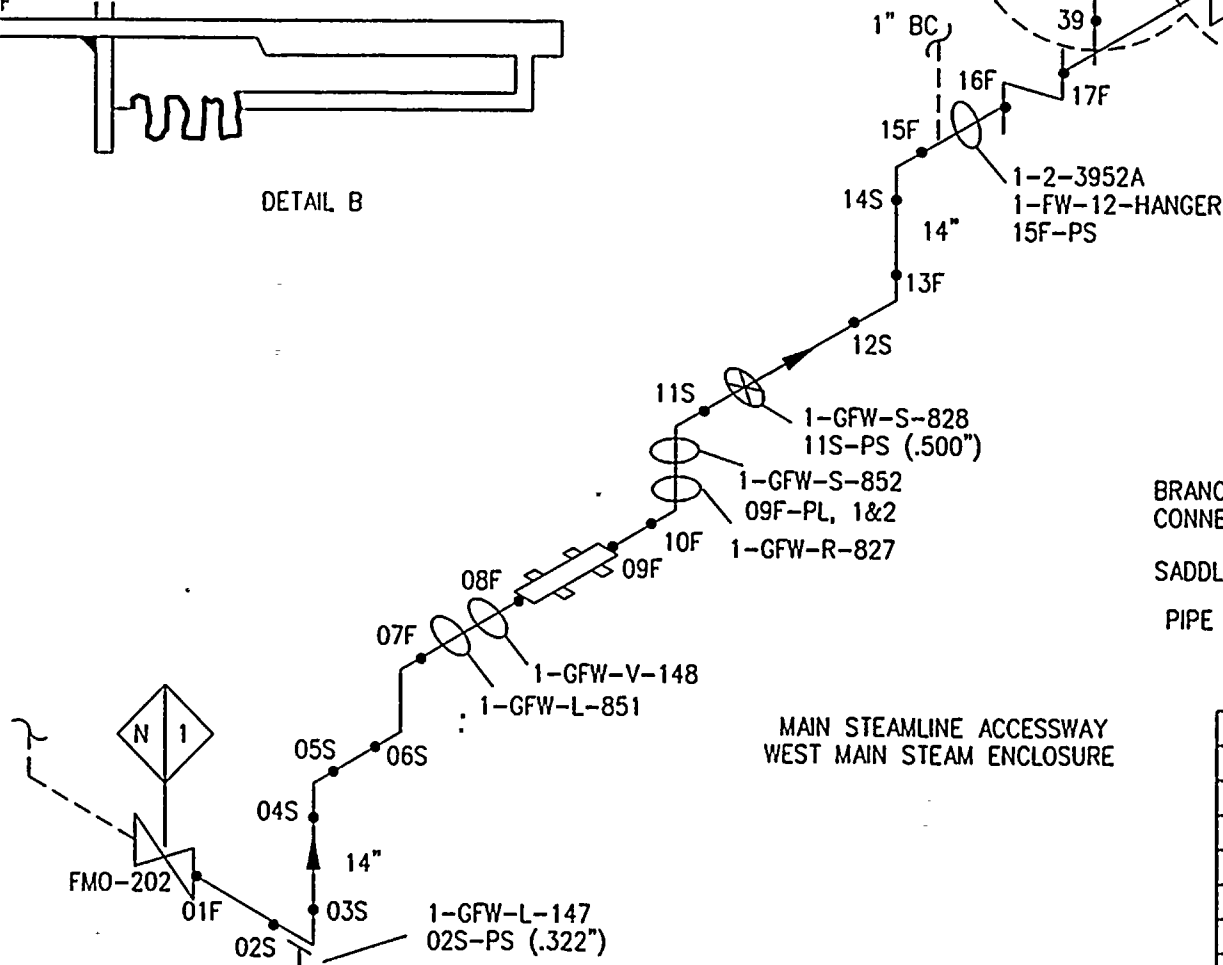
SEE DETAIL A



SEE DETAIL B

AZ 175°
EL 624'

1-FW-13
FIG. B-52

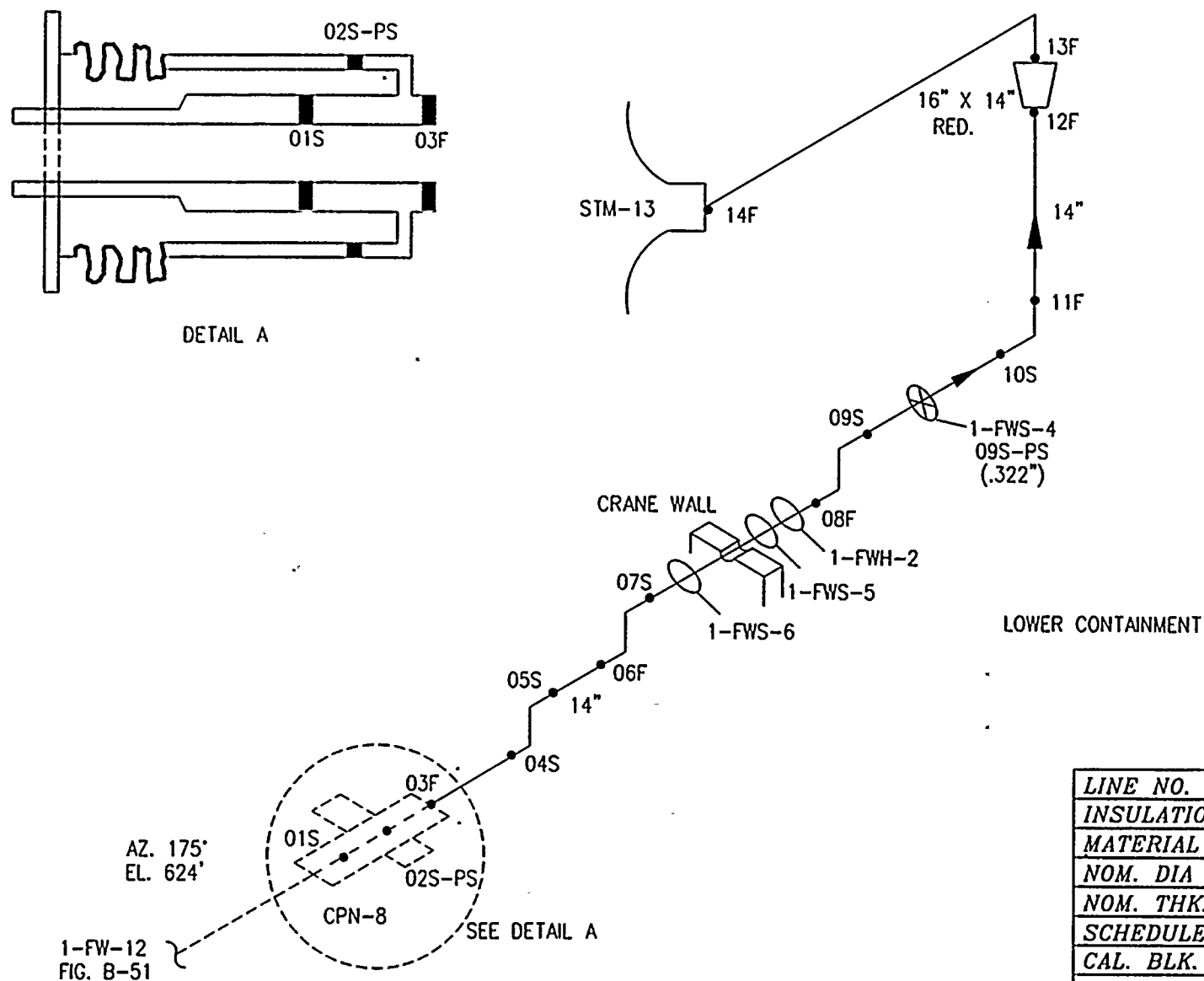


LINE NO.	1-FW-12
INSULATION	YES
MATERIAL	CS-A106
NOM. DIA	14"
NOM. THK.	0.750"
SCHEDULE	80
CAL. BLK.	14-CS-80-.75-12-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. B-51 BLOCK VALVE TO CONTAINMENT PENETRATION

REF. DRAWING: AEP 1-FW-12
FLOW DIAGRAM: 1-5106

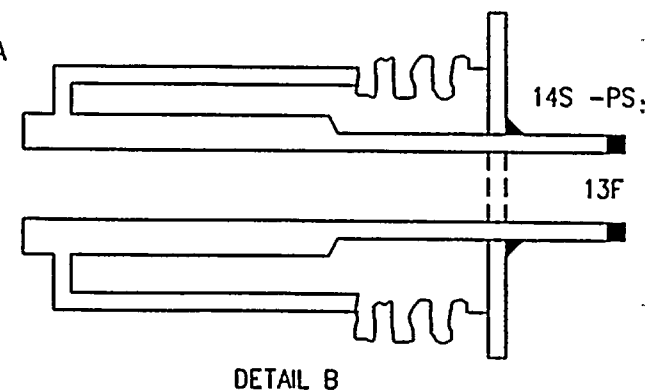
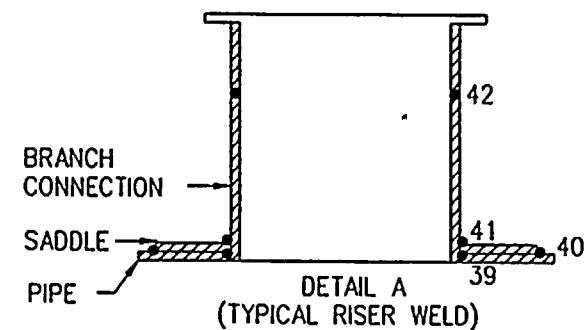
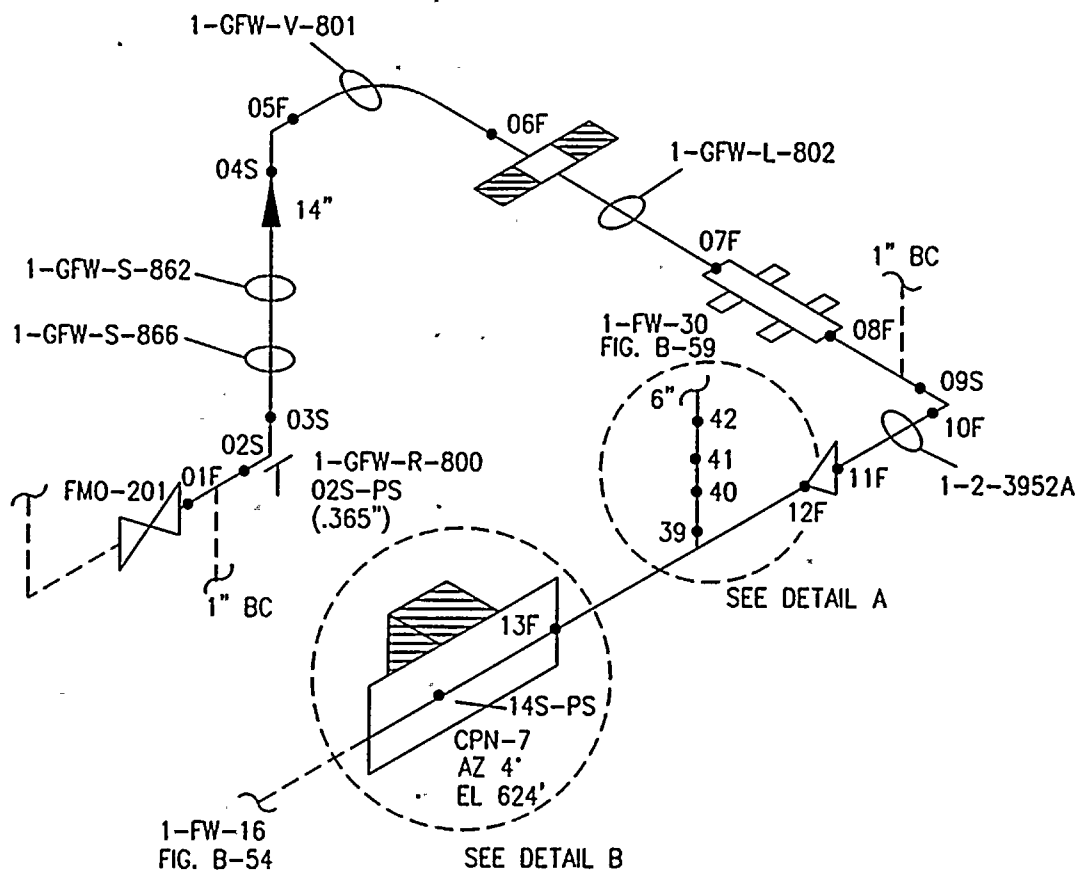


LINE NO.	1-FW-13	
INSULATION	YES	
MATERIAL	CS-A106	
NOM. DIA	14"	16"
NOM. THK.	0.750"	0.750"
SCHEDULE	80	80
CAL. BLK.	12-DCC	12-DCC
LOCATION		

D. C. COOK, UNIT 1

FIG. B-52 CONTAINMENT PENETRATION TO STEAM GEN. 12

 REF. DRAWING: AEP 1-FW-13
 FLOW DIAGRAM: 1-5106



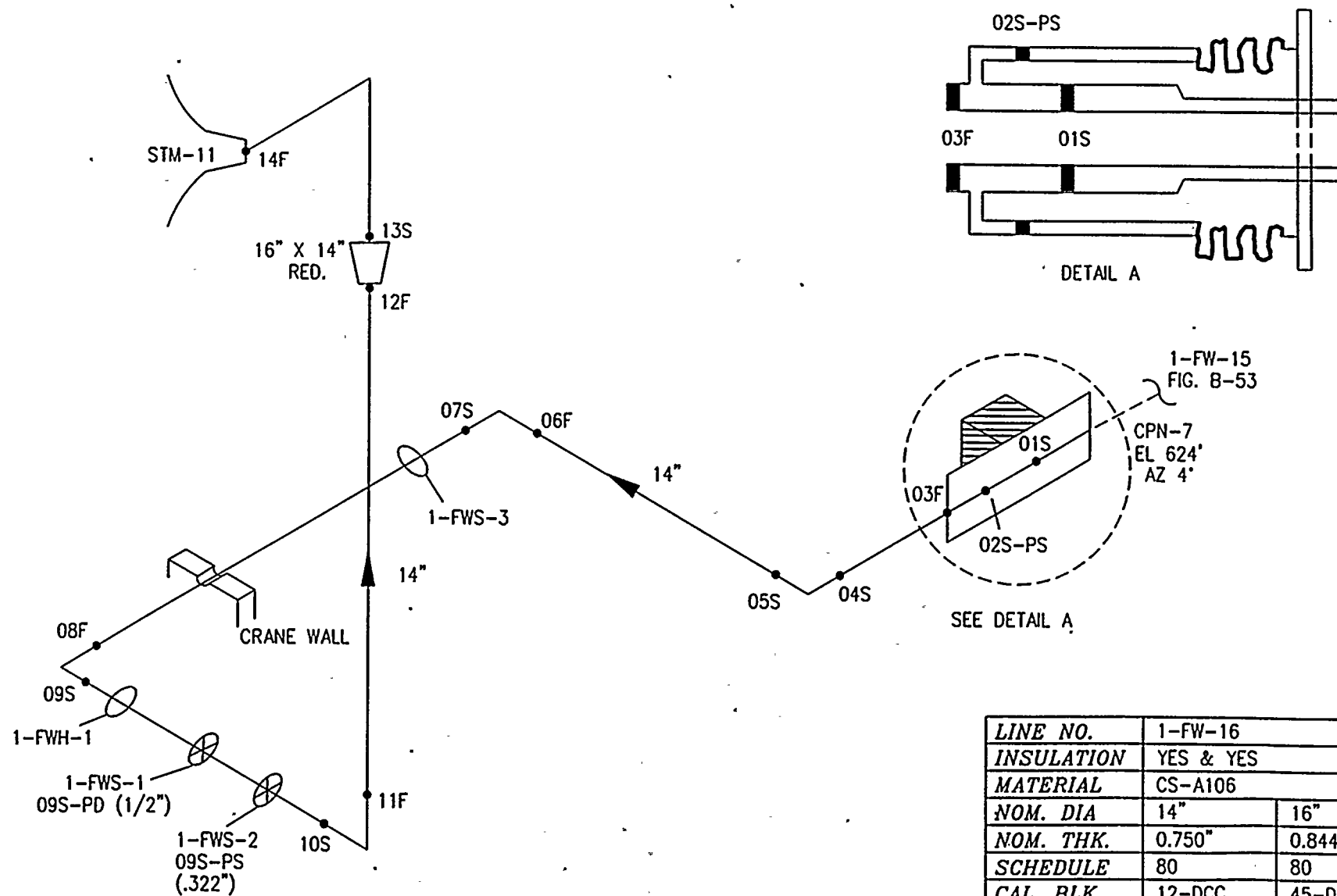
LINE NO.	1-FW-15	
INSULATION	YES & NO	
MATERIAL	CS-A106	
NOM. DIA	6"	14"
NOM. THK.	0.432"	0.750"
SCHEDULE	80	80
CAL. BLK.	13-DCC	12-DCC
LOCATION		

D. C. COOK, UNIT 1

FIG. B-53 BLOCK VALVE TO CONTAINMENT PENETRATION

 REF. DRAWING: AEP 1-FW-15
 FLOW DIAGRAM: 1-5106

B-54



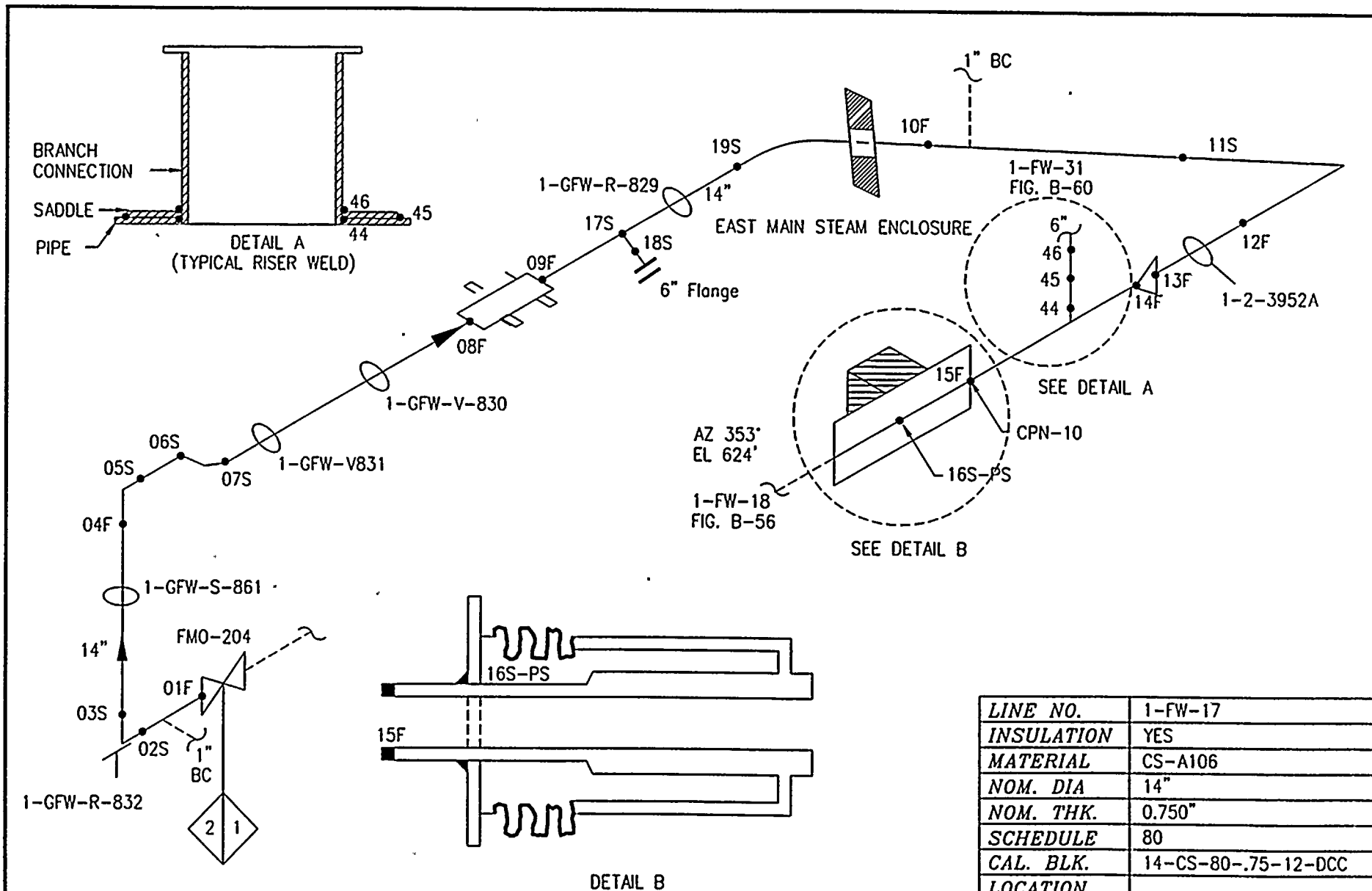
LINE NO.	1-FW-16	
INSULATION	YES & YES	
MATERIAL	CS-A106	
NOM. DIA	14"	16"
NOM. THK.	0.750"	0.844"
SCHEDULE	80	80
CAL. BLK.	12-DCC	45-DCC
LOCATION		

D. C. COOK, UNIT 1

FIG. B-54 CONTAINMENT PENETRATION TO STEAM GEN. 11

REF. DRAWING: AEP 1-FW-16
FLOW DIAGRAM: 1-5106

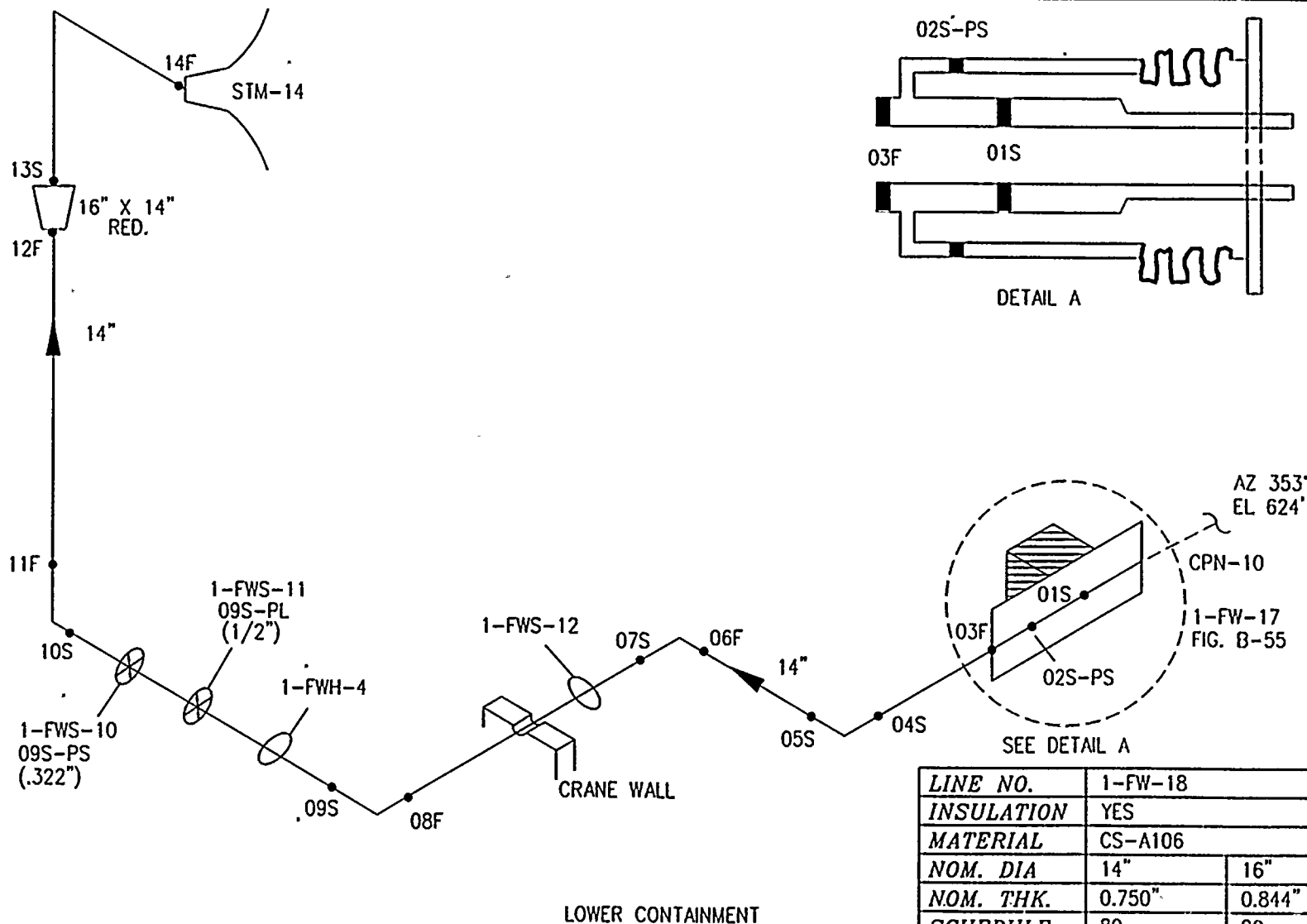
B-55



D. C. COOK, UNIT 1

FIG. B-55 BLOCK VALVE TO CONTAINMENT PENETRATION

REF. DRAWING: AEP 1-FW-17
FLOW DIAGRAM: 1-5106A

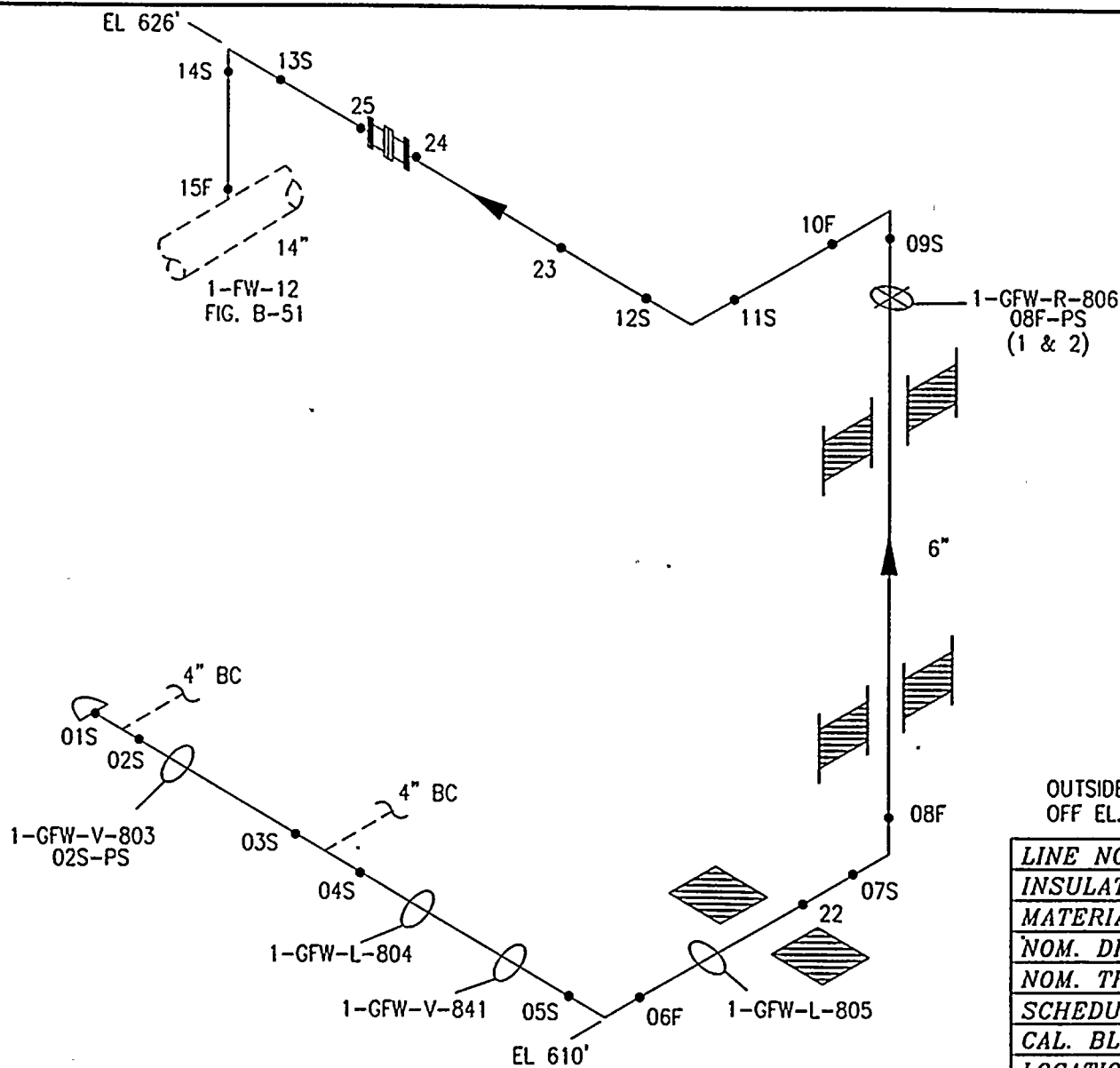


LINE NO.	1-FW-18	
INSULATION	YES	
MATERIAL	CS-A106	
NOM. DIA	14"	16"
NOM. THK.	0.750"	0.844"
SCHEDULE	80	80
CAL. BLK.	12-DCC	45-DCC
LOCATION		

D. C. COOK, UNIT 1

FIG. B-56 CONTAINMENT PENETRATION TO STEAM GEN. 14

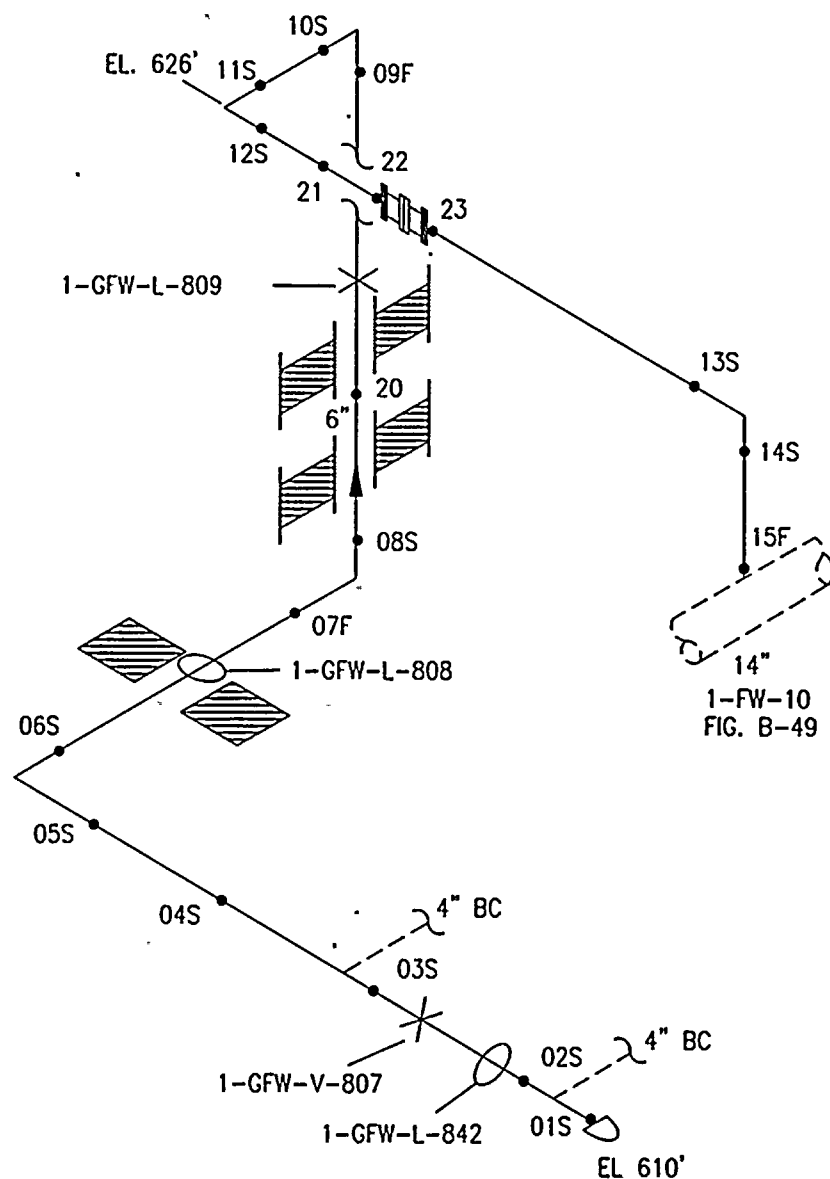
 REF. DRAWING: AEP 1-FW-18
 FLOW DIAGRAM: 1-5106A



D. C. COOK, UNIT 1

FIG. B-57 AUXILIARY FEEDWATER SYSTEM

REF. DRAWING: AEP 1-FW-26
 FLOW DIAGRAM: 1-5106A

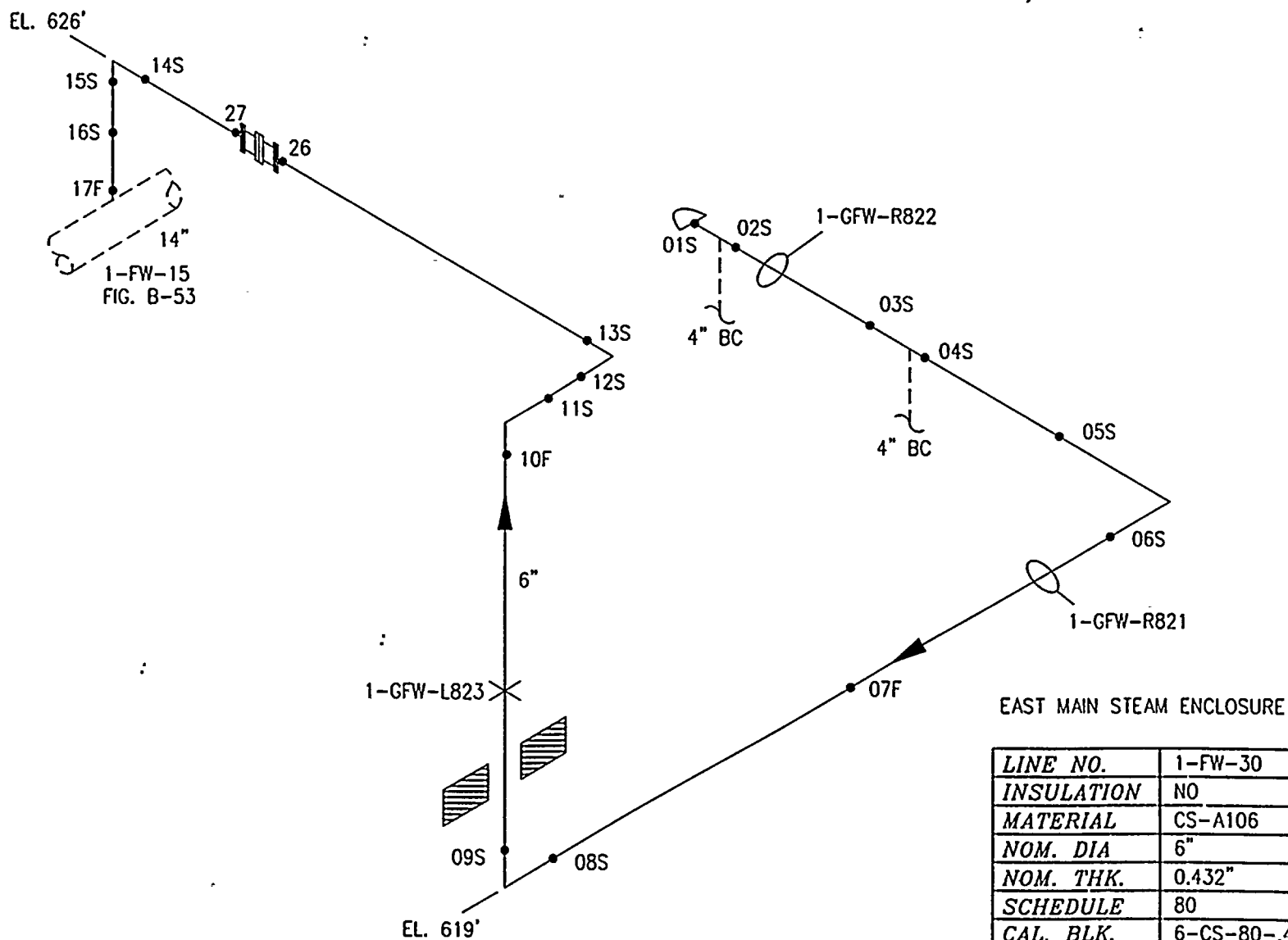


D. C. COOK, UNIT 1

FIG. B-58 AUXILIARY FEEDWATER SYSTEM

REF. DRAWING: AEP 1-FW-27
 FLOW DIAGRAM: 1-5106A

B-59

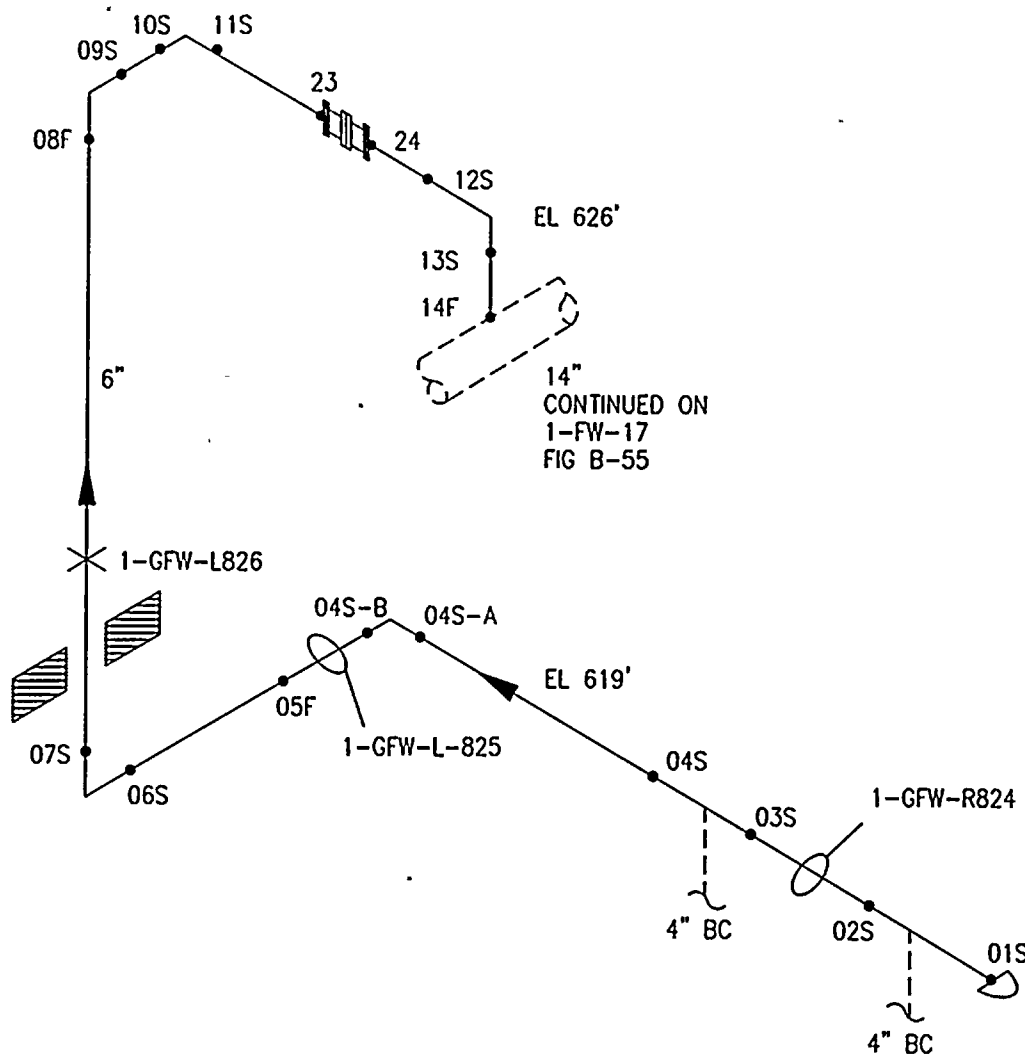


D. C. COOK, UNIT 1

FIG. B-59 AUXILIARY FEEDWATER SYSTEM

REF. DRAWING: AEP 1-FW-30
FLOW DIAGRAM: 1-5106A

B-60



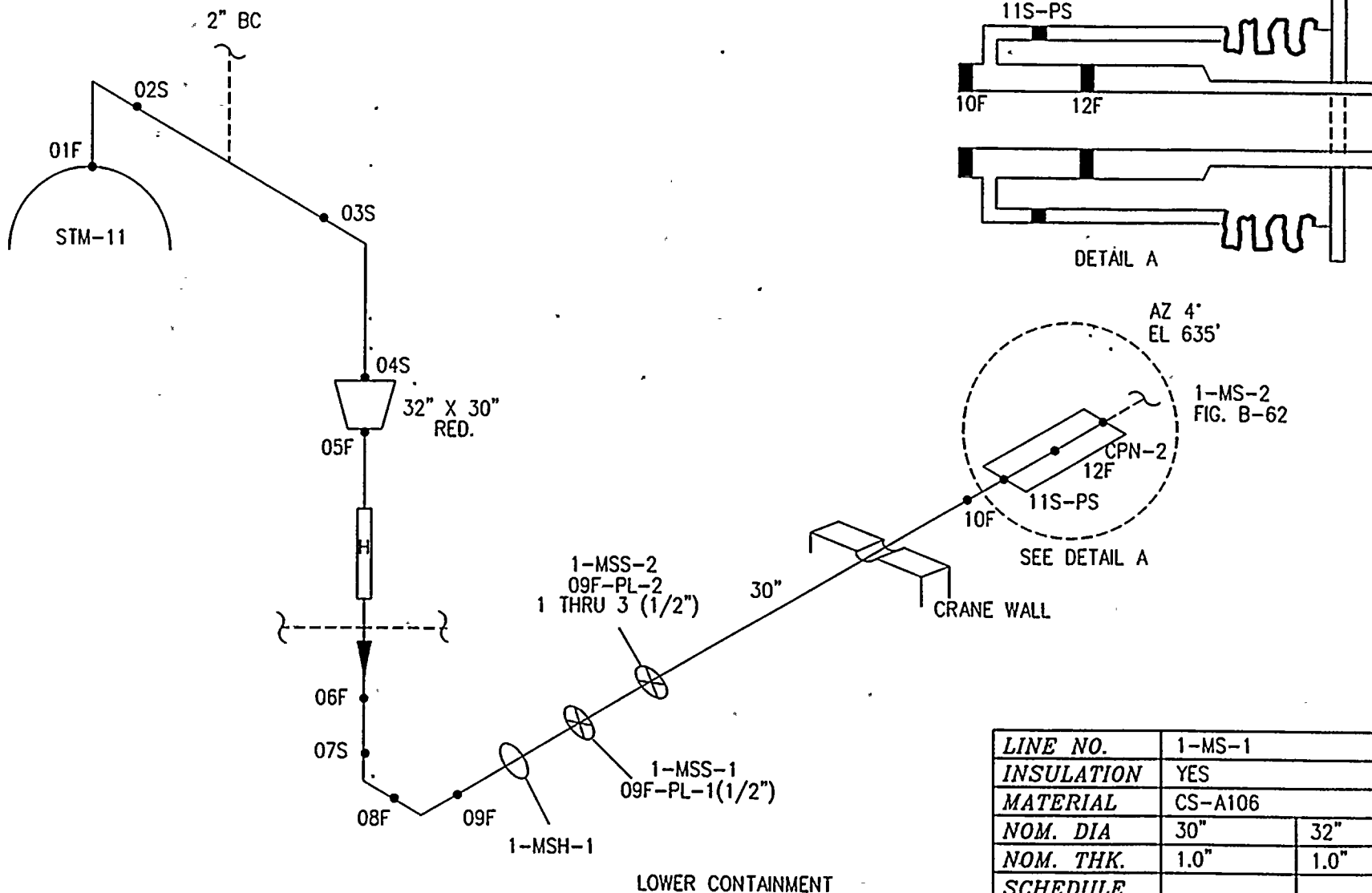
EAST MAINSTEAM ENCLOSURE

LINE NO.	1-FW-31
INSULATION	NO
MATERIAL	CS-A106
NOM. DIA	6"
NOM. THK.	0.432"
SCHEDULE	80
CAL. BLK.	6-CS-80-.432-13-DCC
LOCATION	EAST MAIN STEAM ENCLOSURE

D. C. COOK, UNIT 1

FIG. B-60 AUXILIARY FEEDWATER SYSTEM

REF. DRAWING: AEP 1-FW-31
FLOW DIAGRAM: 1-5106A



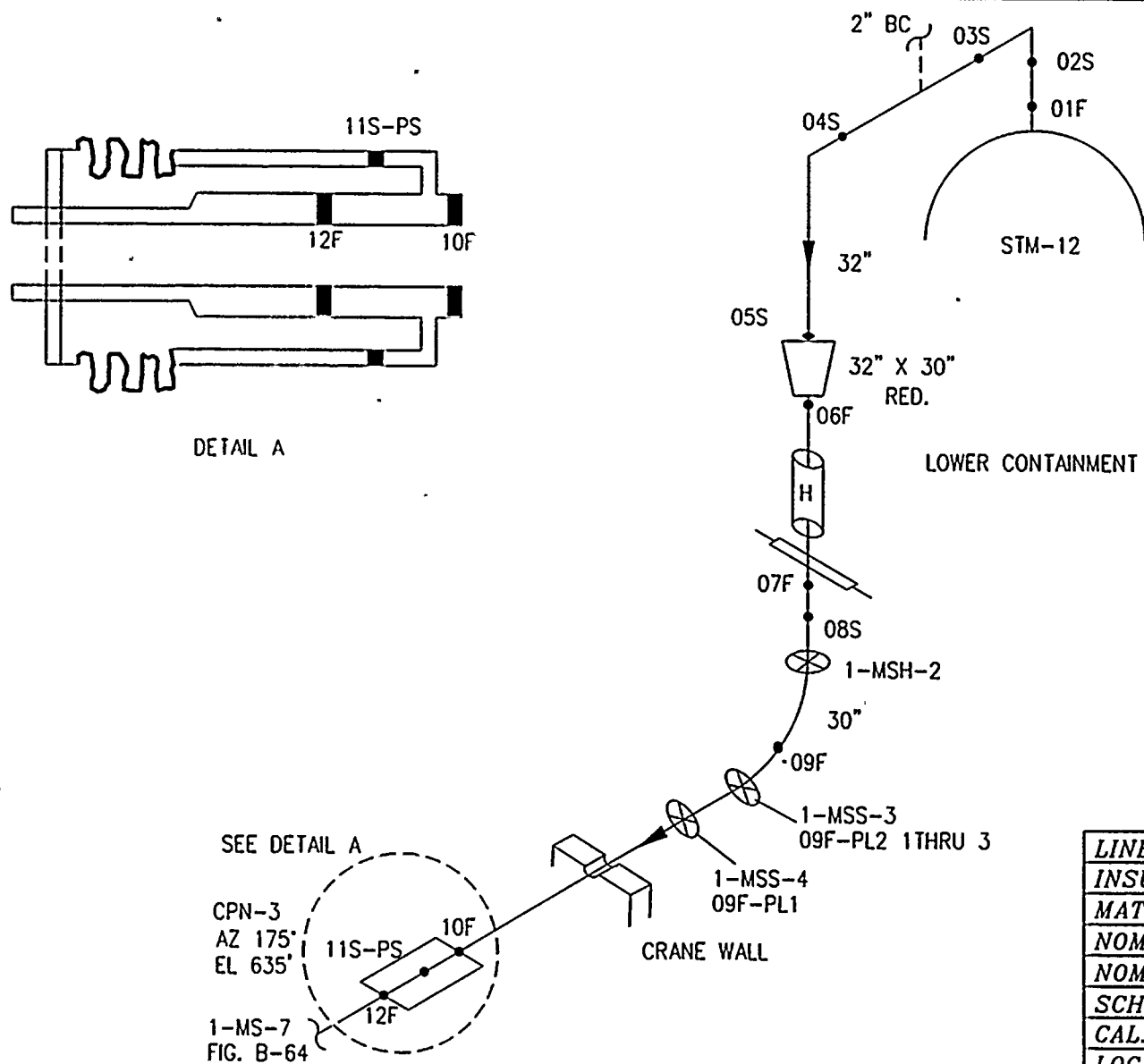
LINE NO.	1-MS-1	
INSULATION	YES	
MATERIAL	CS-A106	
NOM. DIA	30"	32"
NOM. THK.	1.0"	1.0"
SCHEDULE		
CAL. BLK.	30-CS-X-1.0-38-DCC	
LOCATION	LOWER CONTAINMENT	

D. C. COOK, UNIT 1

FIG. B-61 STEAM GENERATOR 11 TO PENETRATION

 REF. DRAWING: AEP 1-MS-1
 FLOW DIAGRAM: 1-5105

LINE NO.	1-MS-2	
INSULATION	YES	
MATERIAL	CS-A106	
NOM. DIA	6"	30"
NOM. THK.	0.432"	1.0"
SCHEDULE	80	
CAL. BLK.	13-DCC	38-DCC
LOCATION		

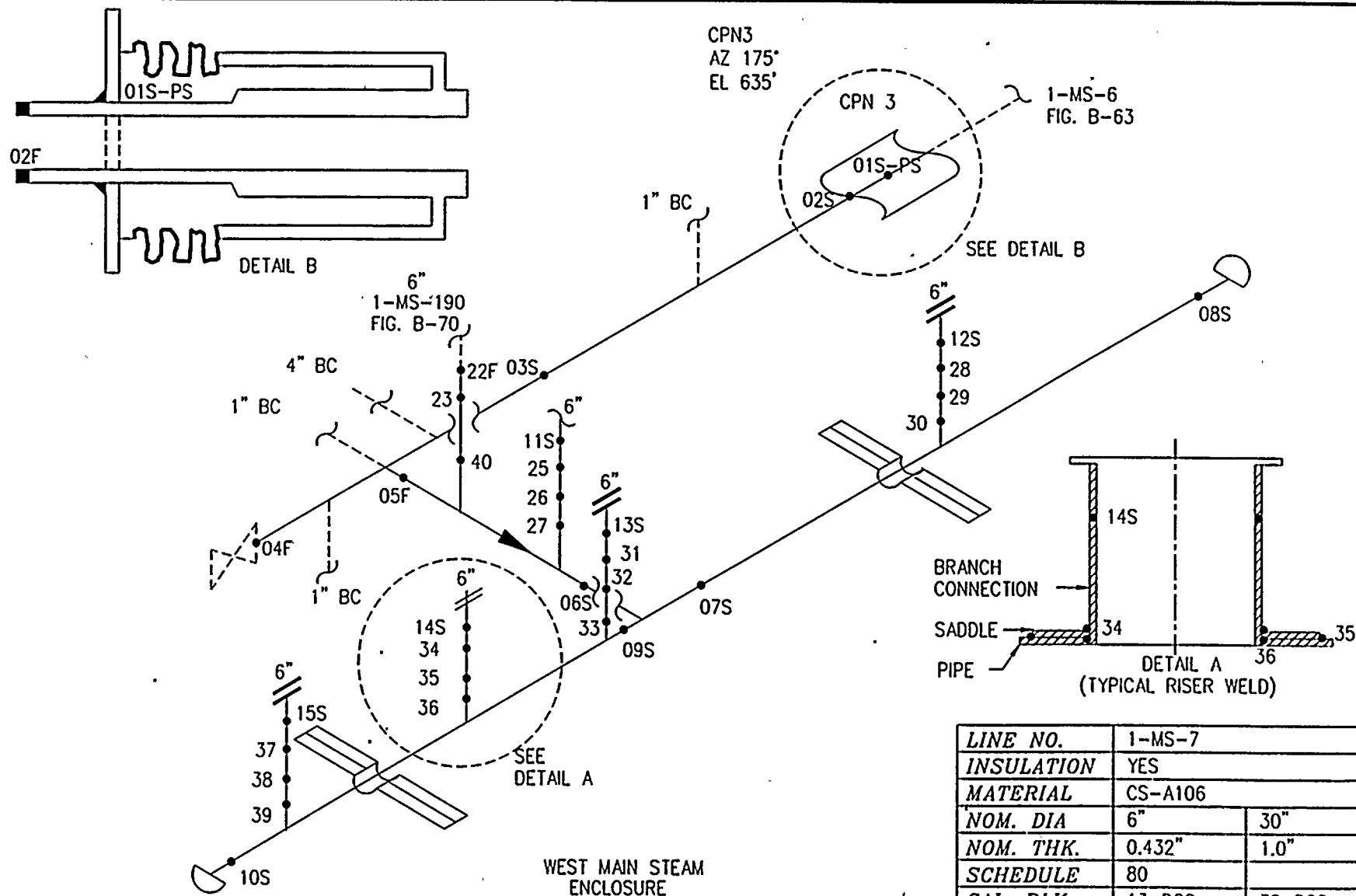


LINE NO.	1-MS-6	
INSULATION	YES	
MATERIAL	CS-A106	
NOM. DIA	30"	32"
NOM. THK.	1.0"	1.0"
SCHEDULE		
CAL. BLK.	30-CS-X-1.0-38-DCC	
LOCATION		

D. C. COOK, UNIT 1

FIG. B-63 STEAM GENERATOR 12 TO PENETRATION

REF. DRAWING: AEP 1-MS-6
FLOW DIAGRAM: 1-5105

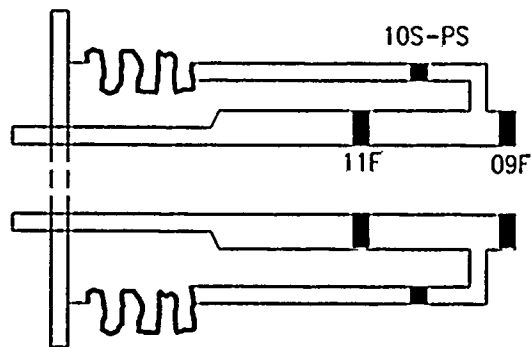


LINE NO.	1-MS-7	
INSULATION	YES	
MATERIAL	CS-A106	
NOM. DIA	6"	30"
NOM. THK.	0.432"	1.0"
SCHEDULE	80	
CAL. BLK.	13-DCC	38-DCC
LOCATION		

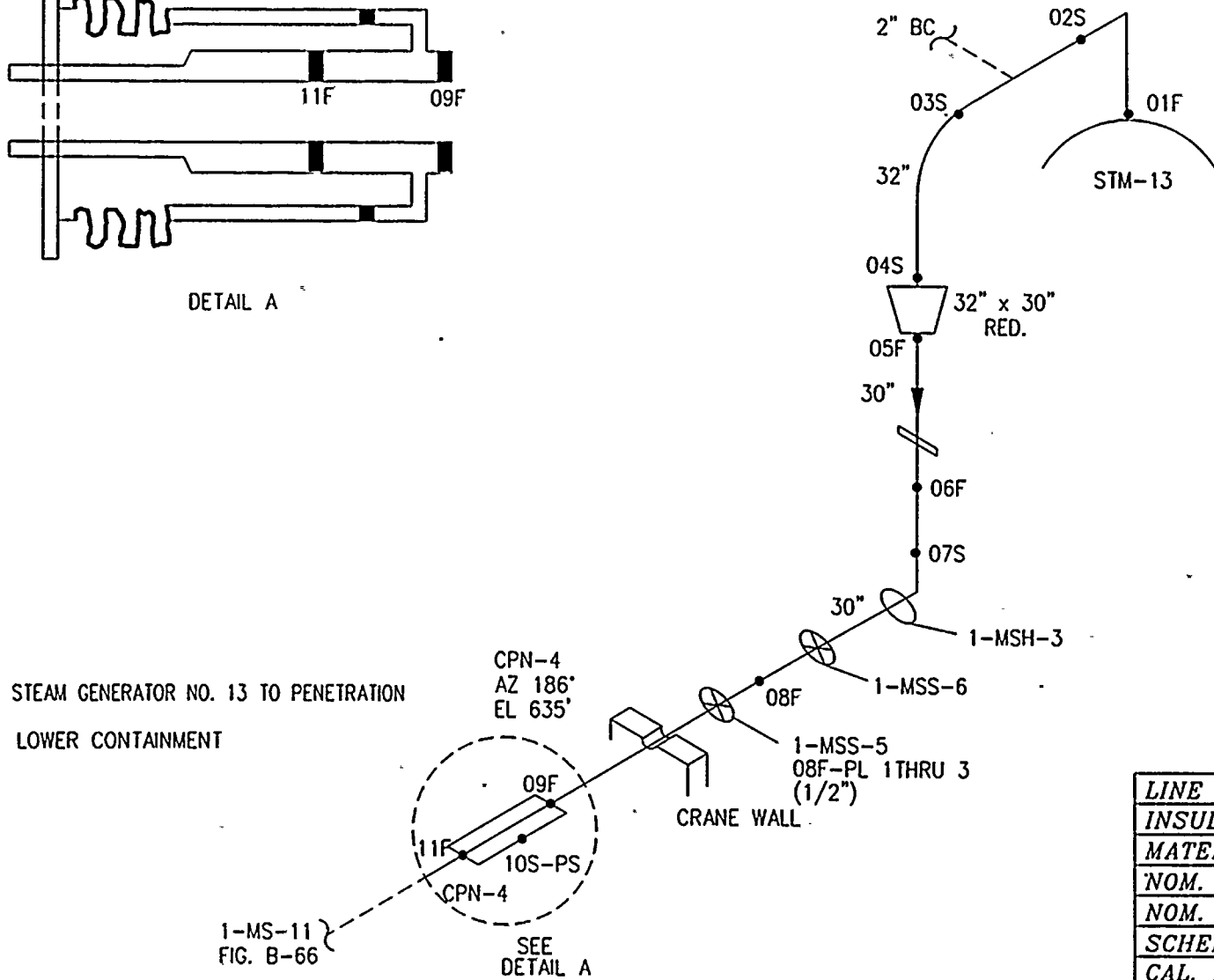
D. C. COOK, UNIT 1

FIG. B-64 SAFETY VALVE HEADER

REF. DRAWING: AEP 1-MS-7
FLOW DIAGRAM: 1-5105



DETAIL A



LINE NO.	1-MS-10	
INSULATION	YES	
MATERIAL	CS-A106	
NOM. DIA	30"	32"
NOM. THK.	1.0"	1.0"
SCHEDULE		
CAL. BLK.	30-CS-X-1.0-38-DCC	
LOCATION	LOWER CONTAINMENT	

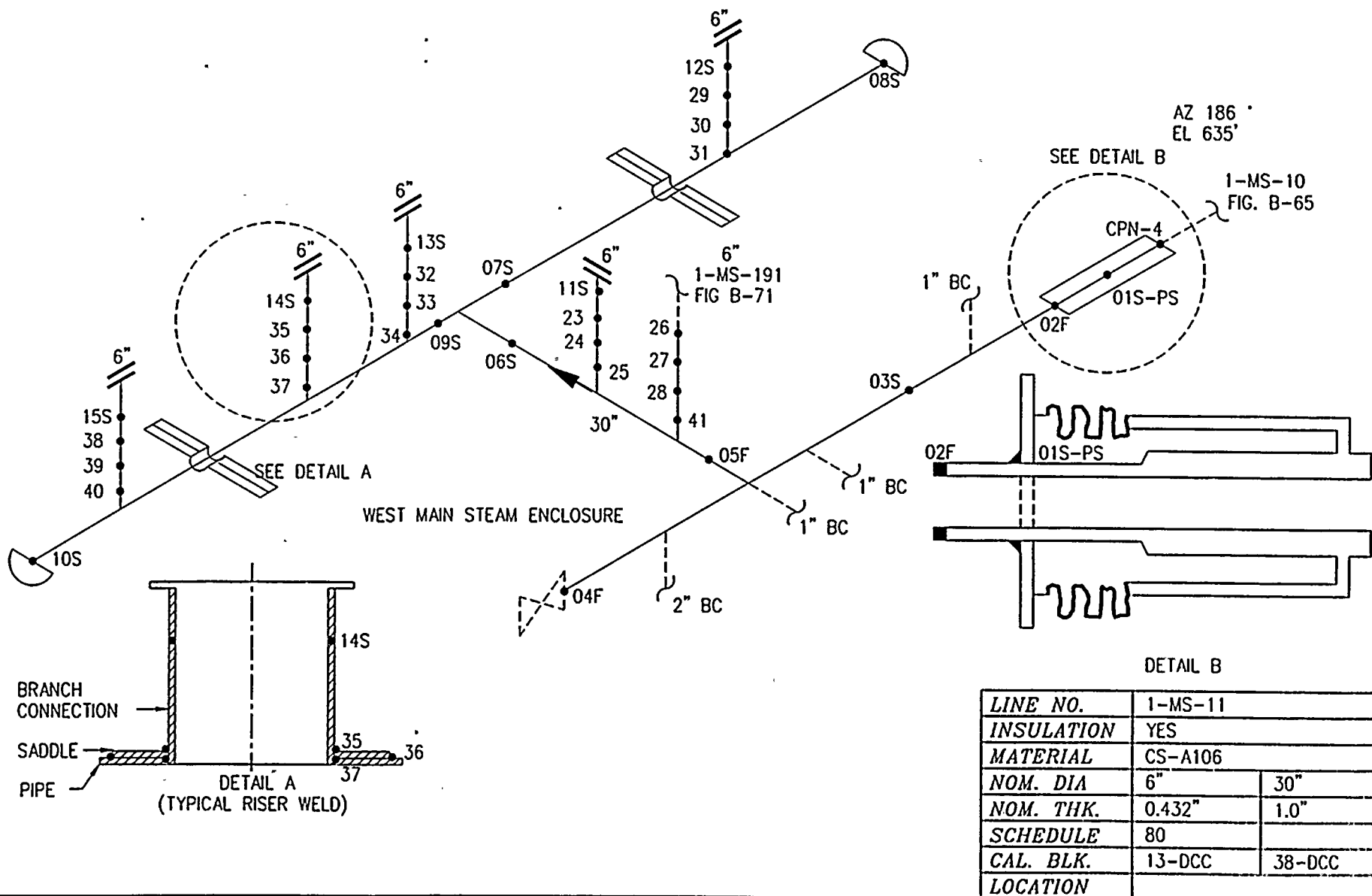
D. C. COOK, UNIT 1

FIG. B-65 STEAM GENERATOR 13 TO PENETRATION

REF. DRAWING: AEP 1-MS-10

FLOW DIAGRAM: 1-5105

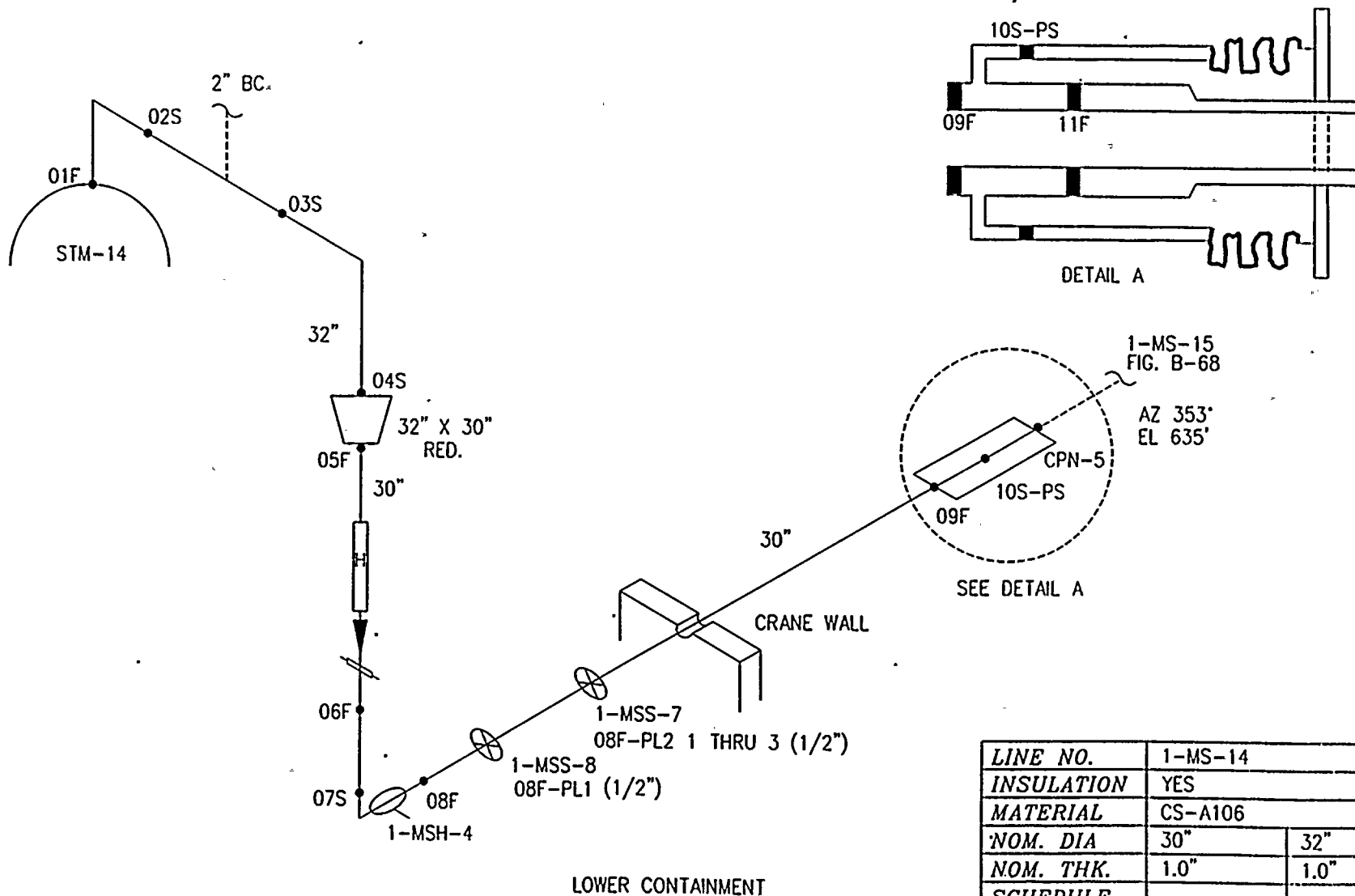
B-66



D. C. COOK, UNIT 1

FIG. B-66 SAFETY VALVE HEADER

REF. DRAWING: AEP 1-MS-11
FLOW DIAGRAM: 1-5105

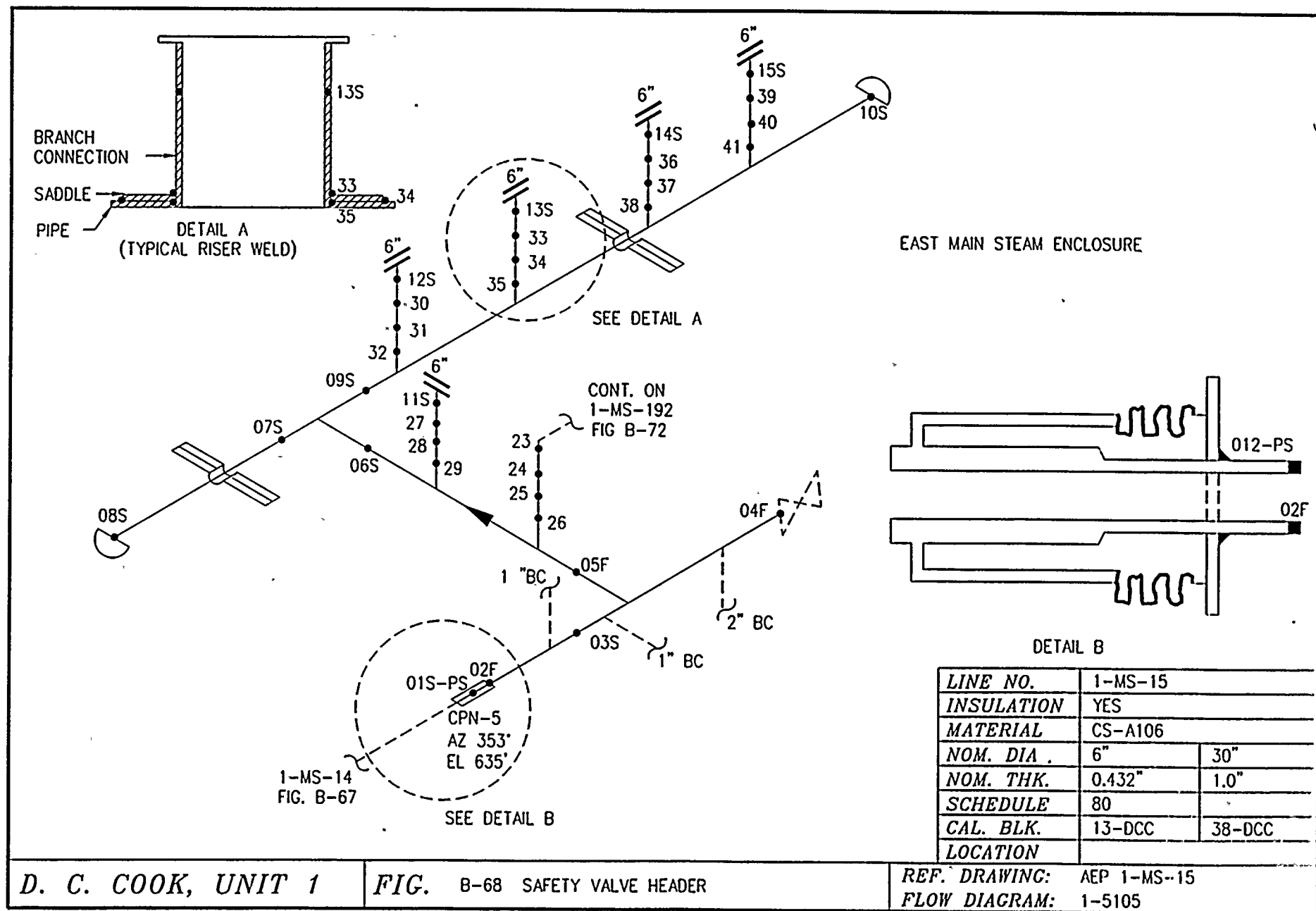


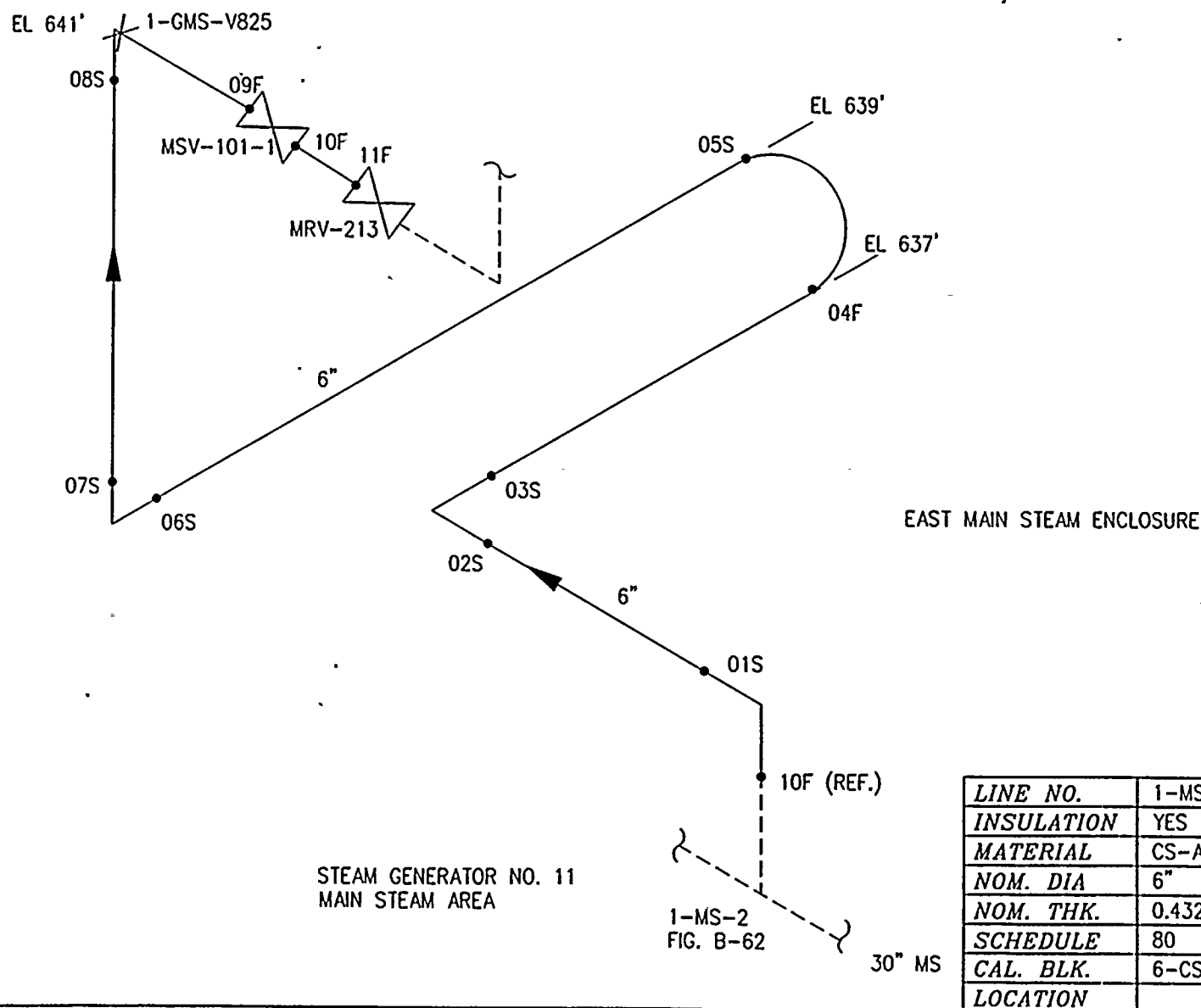
LINE NO.	1-MS-14	
INSULATION	YES	
MATERIAL	CS-A106	
NOM. DIA	30"	32"
NOM. THK.	1.0"	1.0"
SCHEDULE		
CAL. BLK.	30-CS-X-1.0-38-DCC	
LOCATION		

D. C. COOK, UNIT 1

FIG. B-67 STEAM GENERATOR 14 TO PENETRATION

REF. DRAWING: AEP 1-MS-14
FLOW DIAGRAM: 1-5105

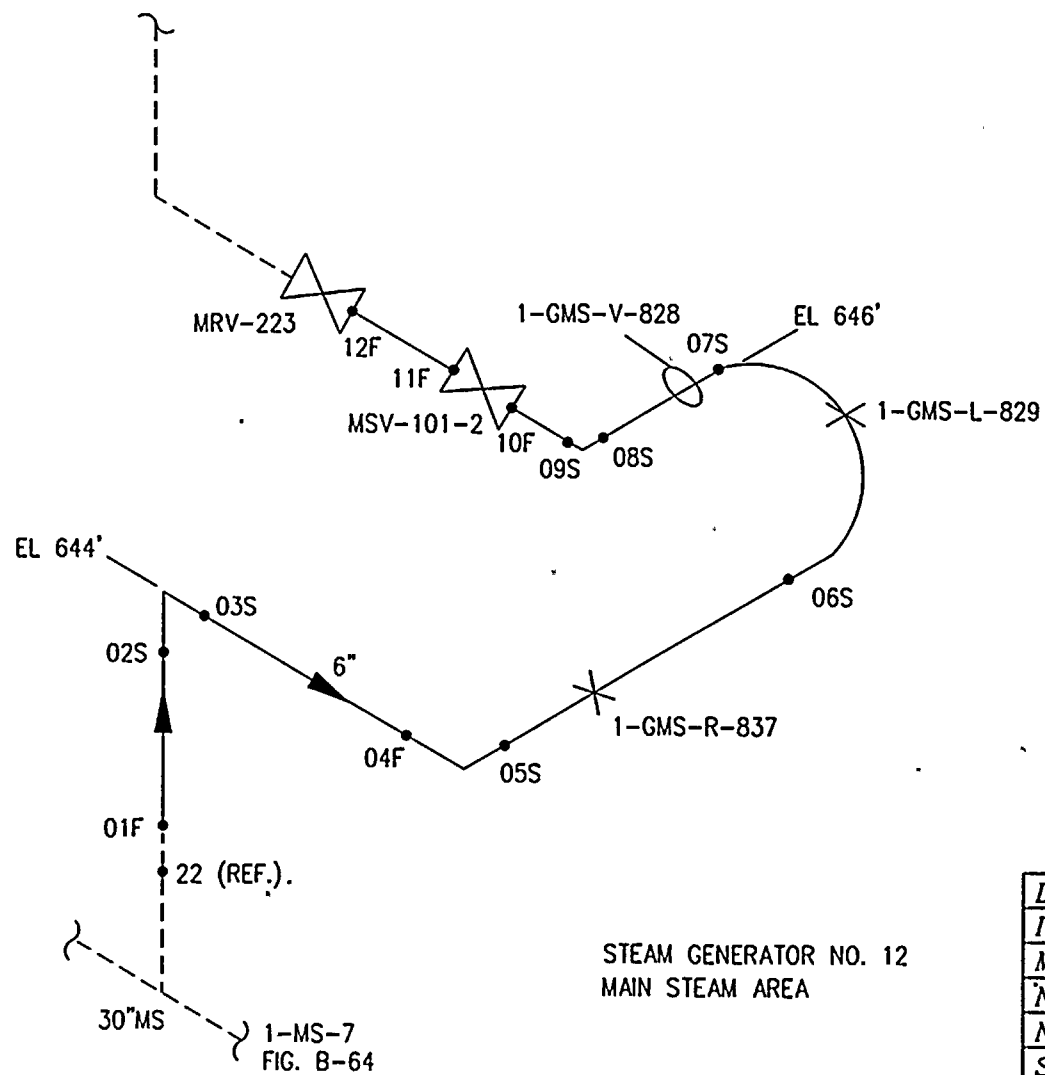




D. C. COOK, UNIT 1

FIG. B-69 AUXILIARY MAIN STEAM SYSTEM

REF. DRAWING: AEP 1-MS-189
 FLOW DIAGRAM: 1-5105

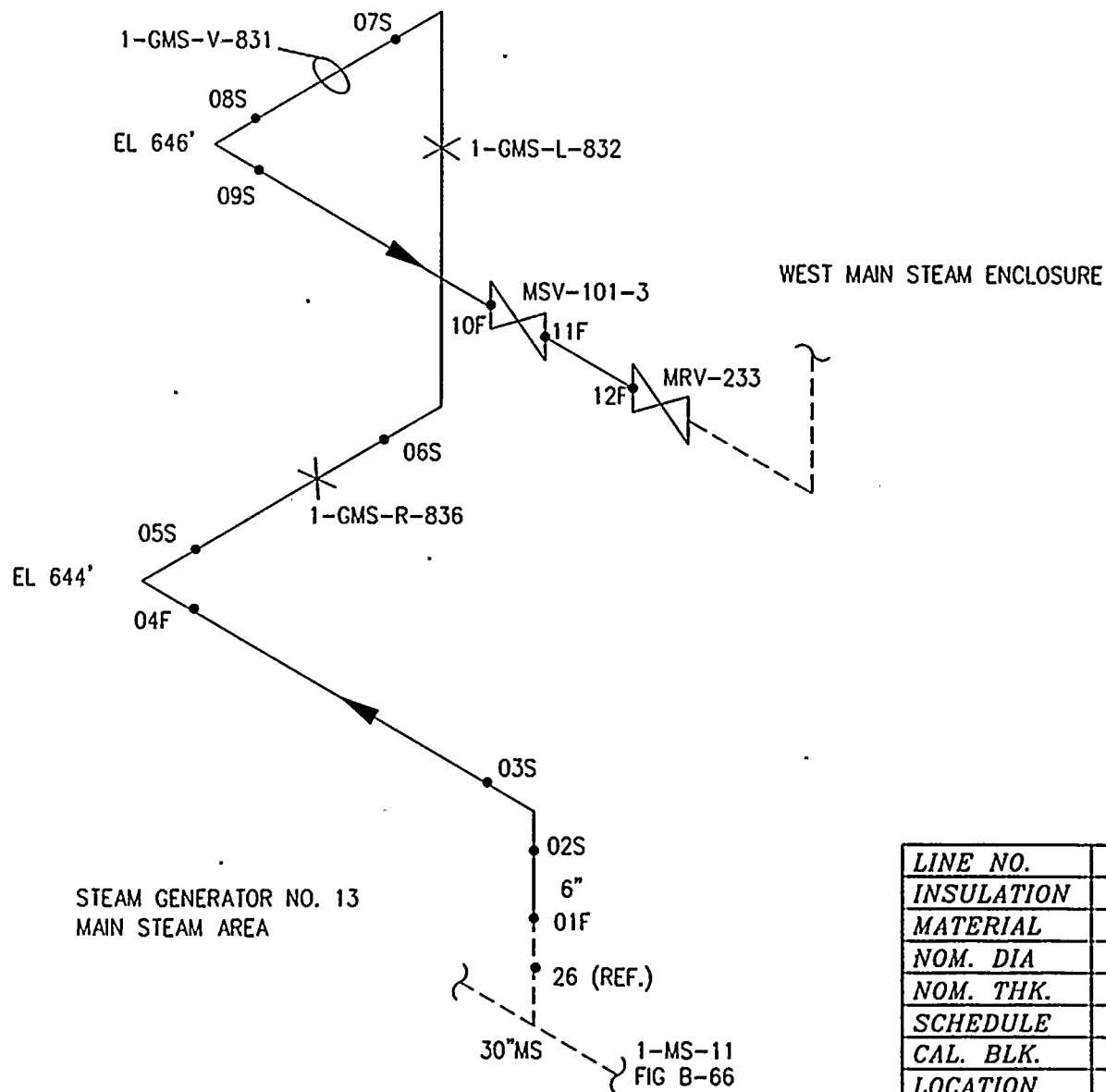


LINE NO.	1-MS-190
INSULATION	YES
MATERIAL	CS-A106
NOM. DIA	6"
NOM. THK.	0.432"
SCHEDULE	80
CAL. BLK.	6-CS-80-.432-13-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. B-70 AUXILIARY MAIN STEAM SYSTEM

REF. DRAWING: AEP 1-MS-190
 FLOW DIAGRAM: 1-5105

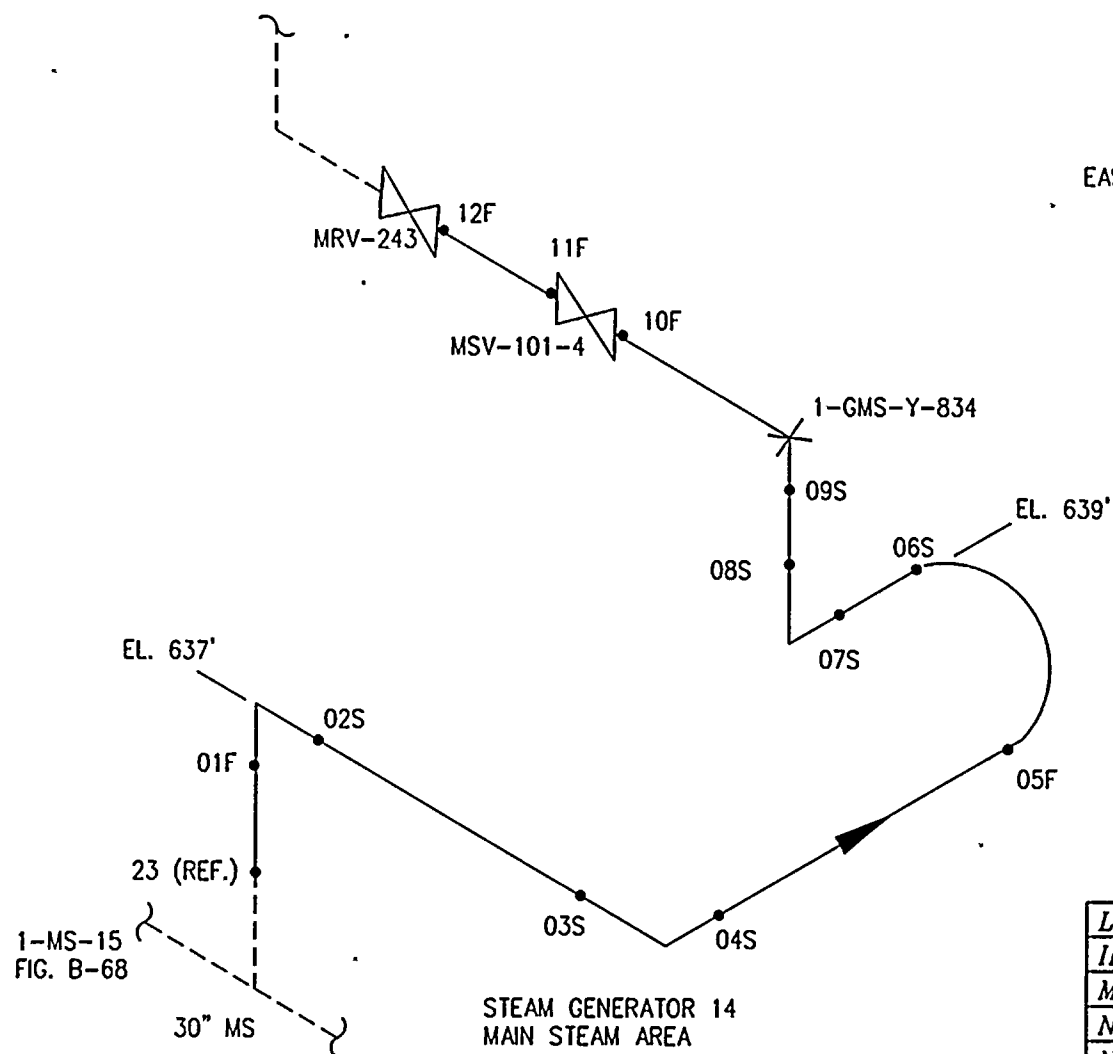


LINE NO.	1-MS-191
INSULATION	YES
MATERIAL	CS-A106
NOM. DIA	6"
NOM. THK.	0.432"
SCHEDULE	80
CAL. BLK.	6-CS-80-.432-13-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. B-71 AUXILIARY MAIN STEAM SYSTEM

 REF. DRAWING: AEP 1-MS-191
 FLOW DIAGRAM: 1-5105



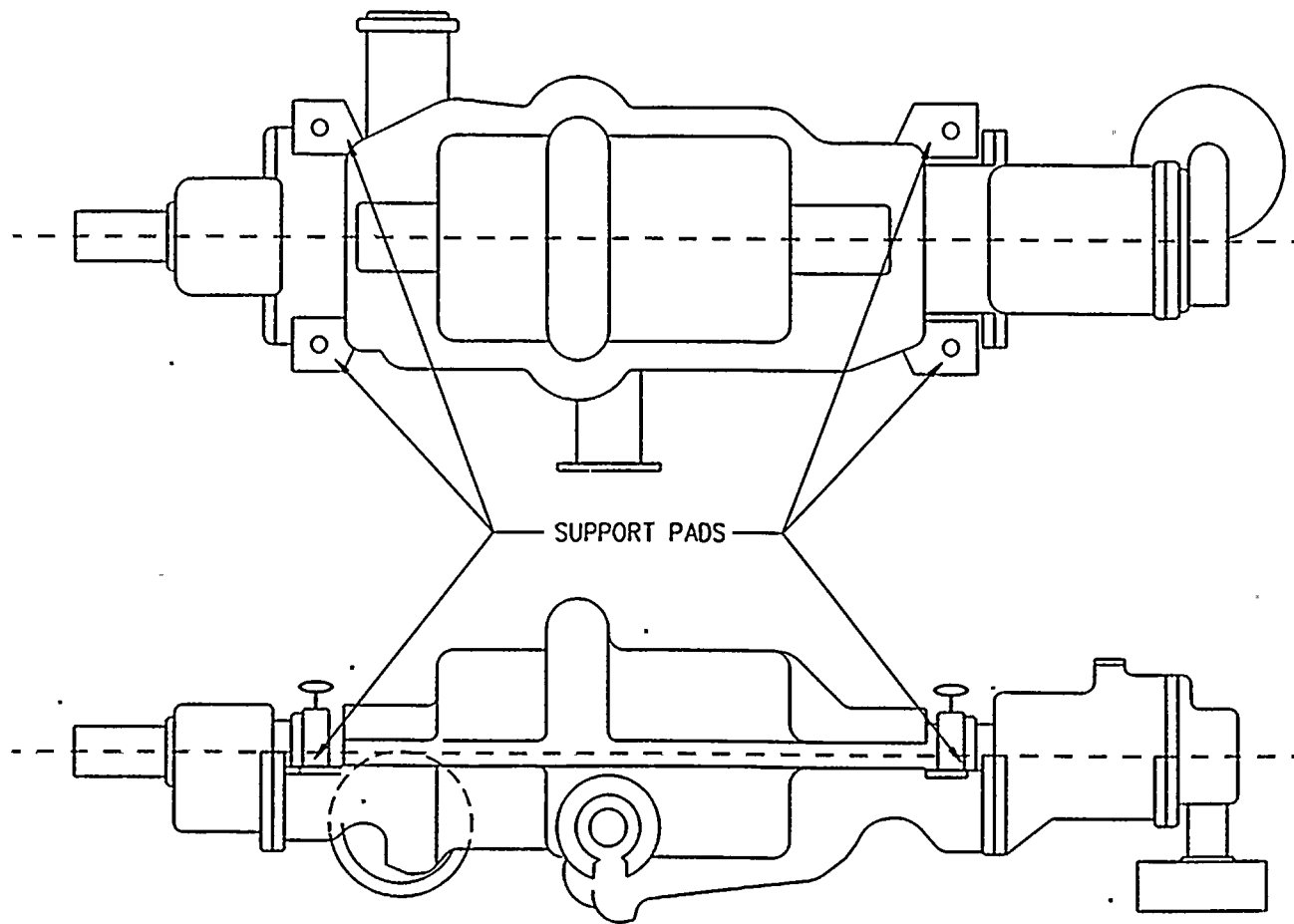
EAST MAIN STEAM ENCLOSURE

LINE NO.	1-MS-192
INSULATION	YES
MATERIAL	CS-A106
NOM. DIA	6"
NOM. THK.	0.432"
SCHEDULE	80
CAL. BLK.	6-CS-80-.432-13-DCC
LOCATION	

D. C. COOK, UNIT 1

FIG. B-72 AUXILIARY MAIN STEAM SYSTEM

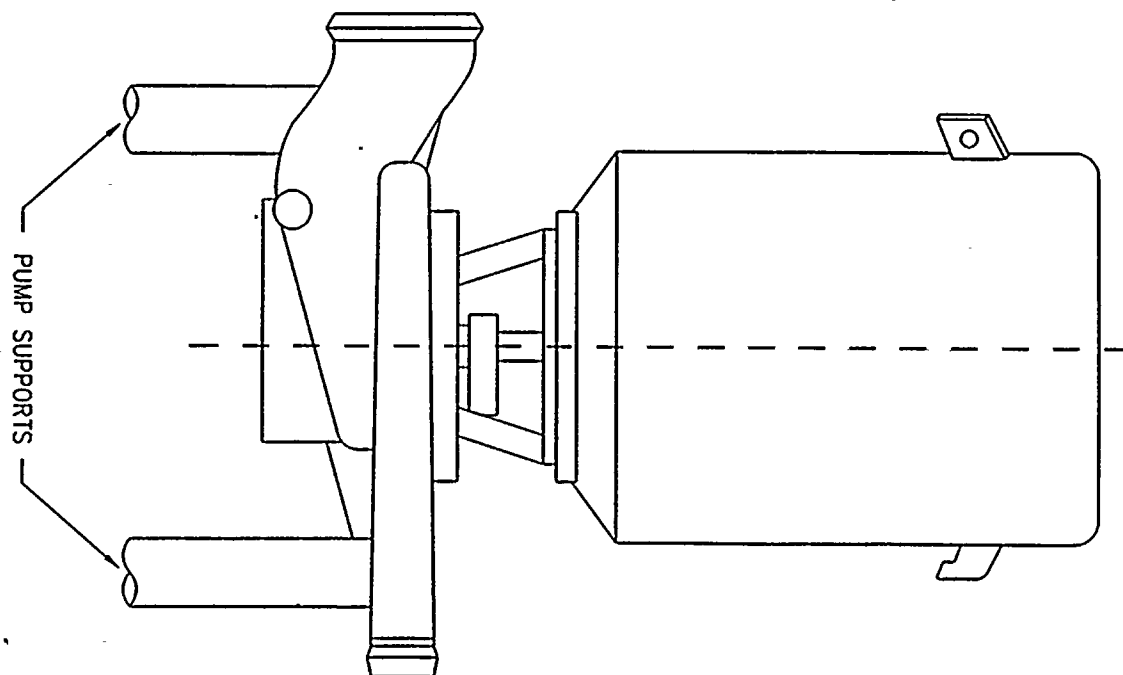
REF. DRAWING: AEP 1-MS-192
 FLOW DIAGRAM: 1-5105



D. C. COOK, UNIT 1

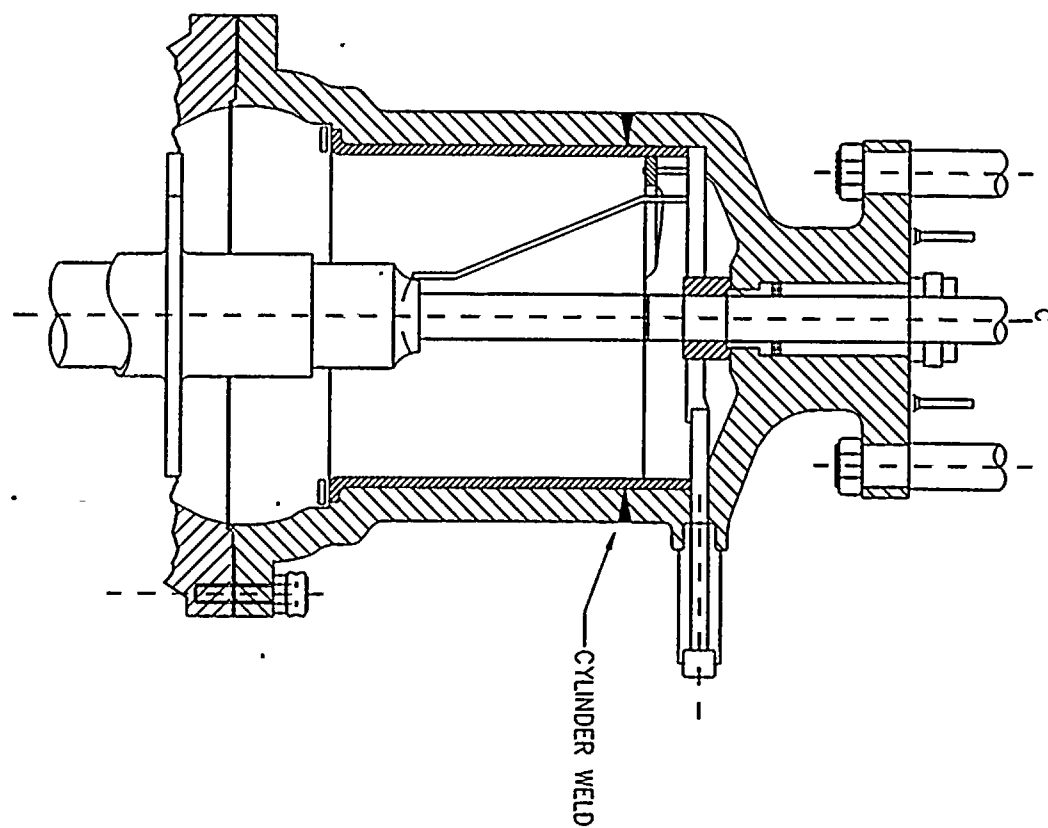
FIG. B-73 SAFETY INJECTION PUMP

B-74



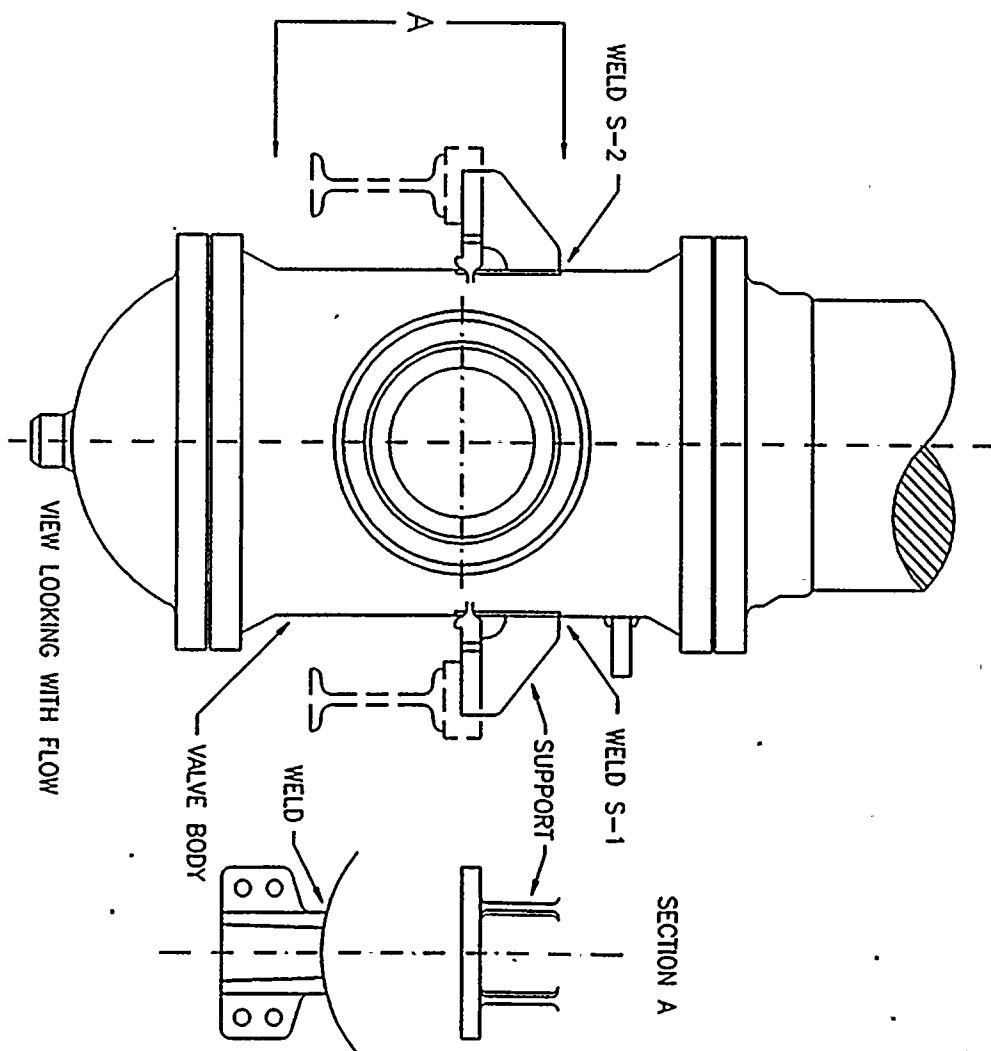
D. C. COOK, UNIT 1

FIG. B-74 RESIDUAL HEAT REMOVAL PUMP



D. C. COOK, UNIT 1

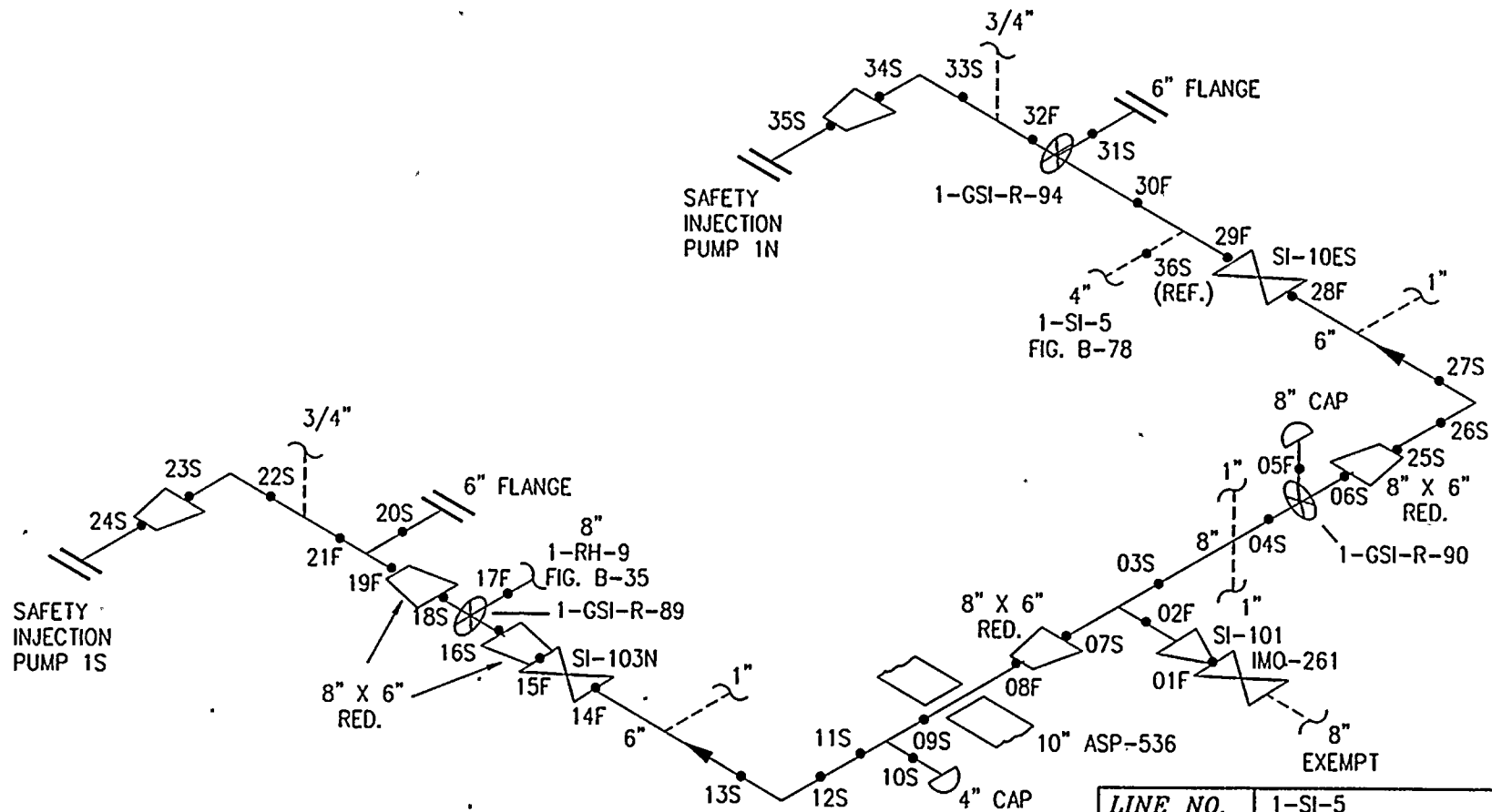
FIG. B-75 MAIN STEAM ISOLATION VALVE



D. C. COOK, UNIT 1

FIG. B-76 MAIN STEAM ISOLATION VALVE (CONT'D)

B-77

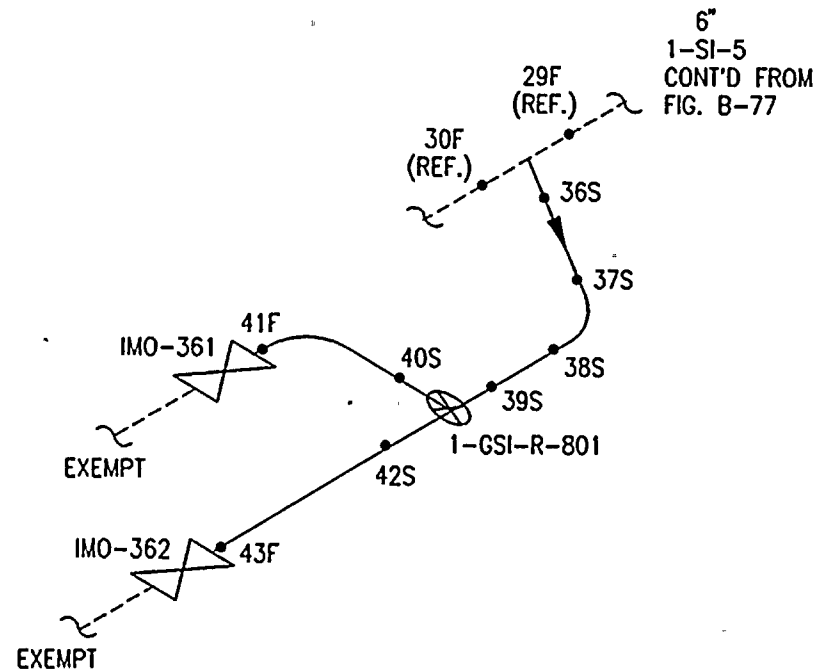


LINE NO.	1-SI-5		
MATERIAL	SS	SS	SS
NOM. DIA	4"	6"	8"
NOM. THK.	0.120"	0.280"	0.148"
SCHEDULE	10S	40	10
CAL. BLK.	21-DCC	28-DCC	16-DCC
LOCATION			

D. C. COOK, UNIT 1

FIG. B-77 EMERGENCY CORE COOLING SYSTEM

 REF. DRAWING: AEP 1-SI-5, SHI. 1 OF 2
 FLOW DIAGRAM: 1-5142



LINE NO.	1-SI-5
MATERIAL	SS
NOM. DIA	4"
NOM. THK.	0.120"
SCHEDULE	10S
CAL. BLK.	21-DCC
LOCATION	

D. C. COOK, UNIT 1

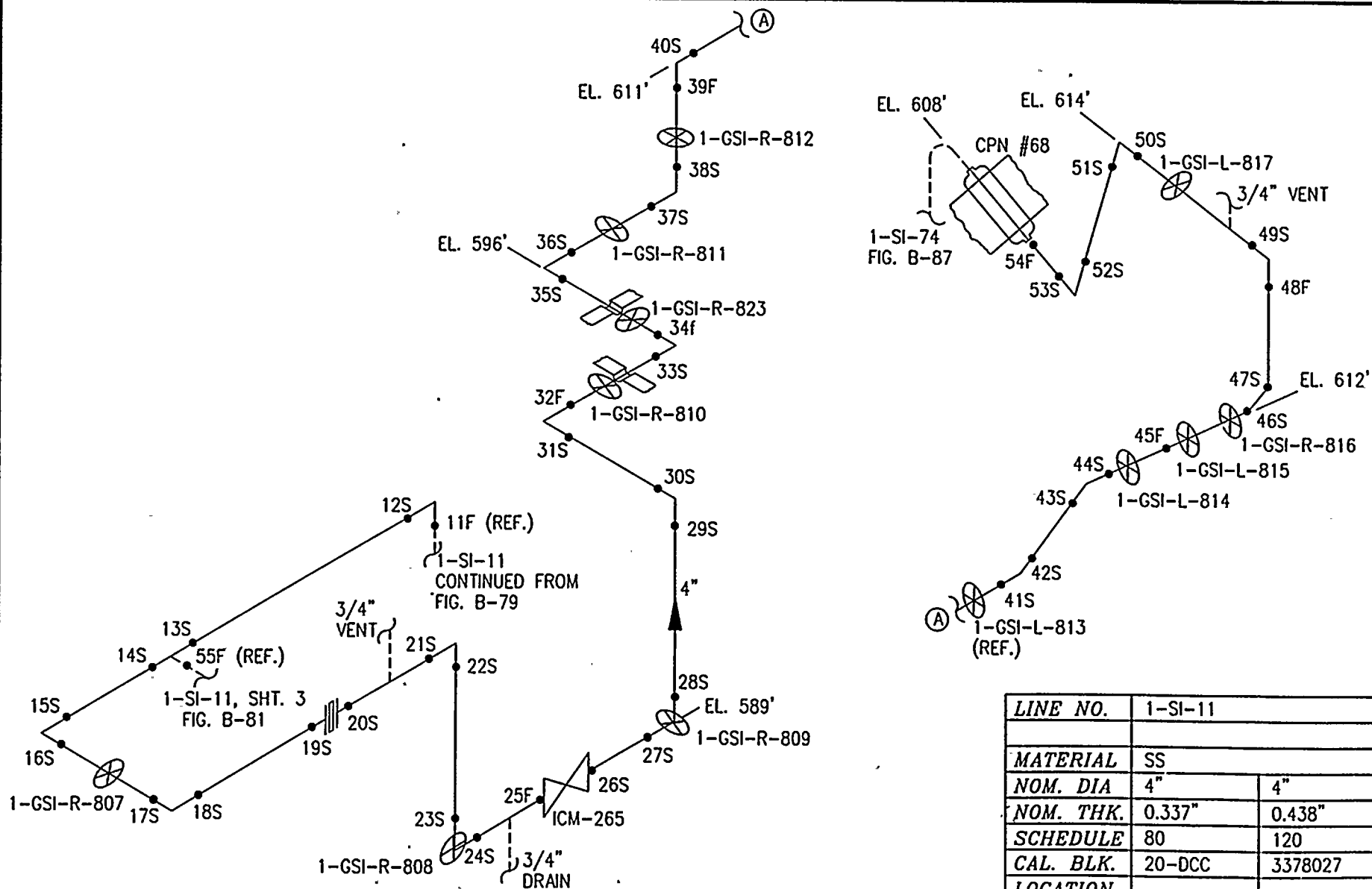
FIG. B-78 EMERGENCY CORE COOLING SYSTEM (CONT'D)

REF. DRAWING: AEP 1-SI-5, SHI. 2 OF 2
 FLOW DIAGRAM: 1-5142

[illegible]

<i>LINE NO.</i>	1-SI-11
	1-SI-11A
<i>MATERIAL</i>	SS
<i>NOM. DIA</i>	4"
<i>NOM. THK.</i>	0.377"
<i>SCHEDULE</i>	80
<i>CAL. BLK.</i>	20-DCC
<i>LOCATION</i>	

REF. DRAWING:	AEP 1-SI-11, SHT. 1 OF 3
FLOW DIAGRAM:	1-5142

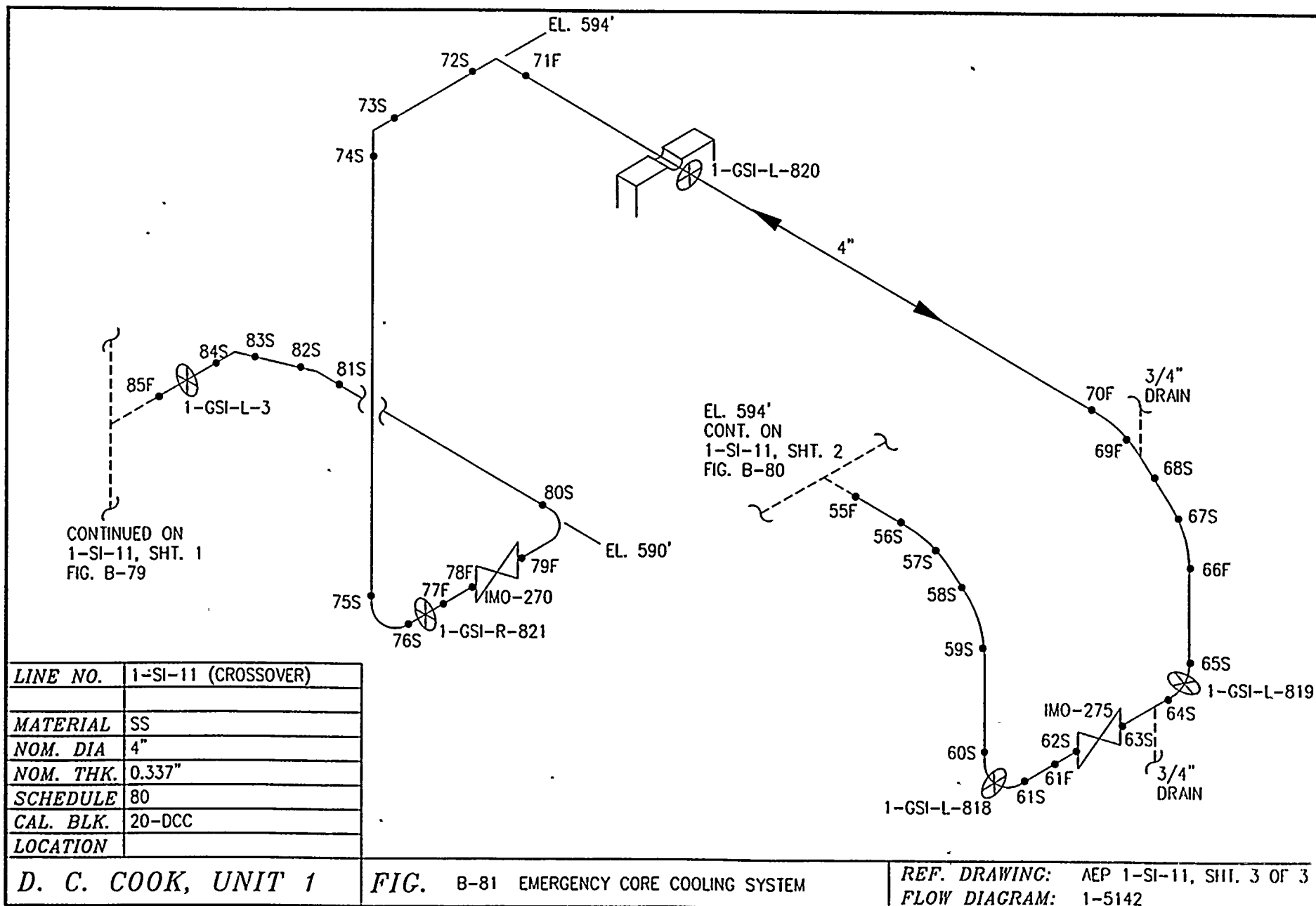


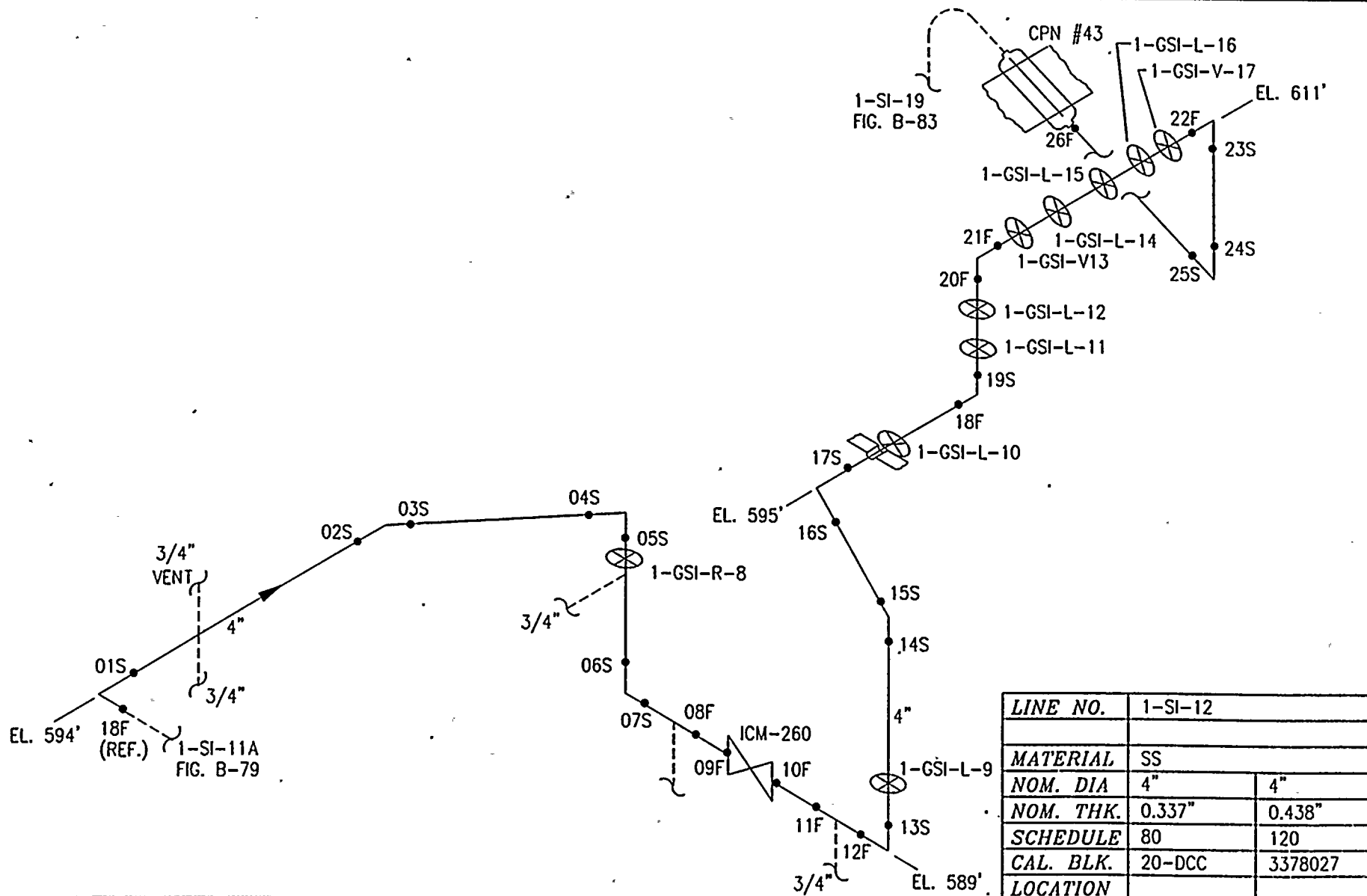
LINE NO.	1-SI-11	
MATERIAL	SS	
NOM. DIA	4"	4"
NOM. THK.	0.337"	0.438"
SCHEDULE	80	120
CAL. BLK.	20-DCC	3378027
LOCATION		

D. C. COOK, UNIT 1

FIG. B-80 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-SI-11, SHT. 2 OF 3
FLOW DIAGRAM: 1-5142

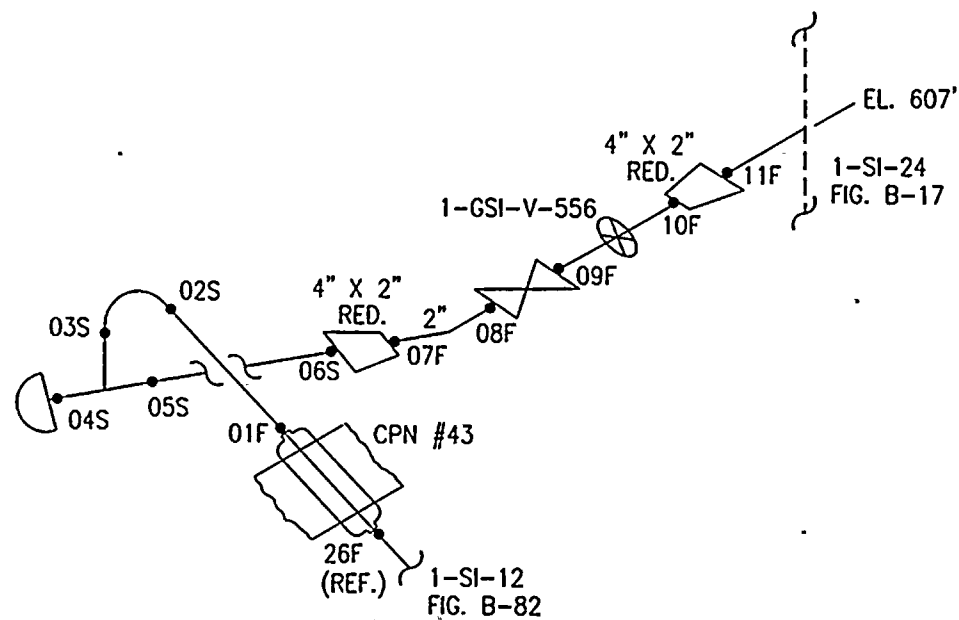




D. C. COOK, UNIT 1

FIG. B-82 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-SI-12
FLOW DIAGRAM: 1-5142



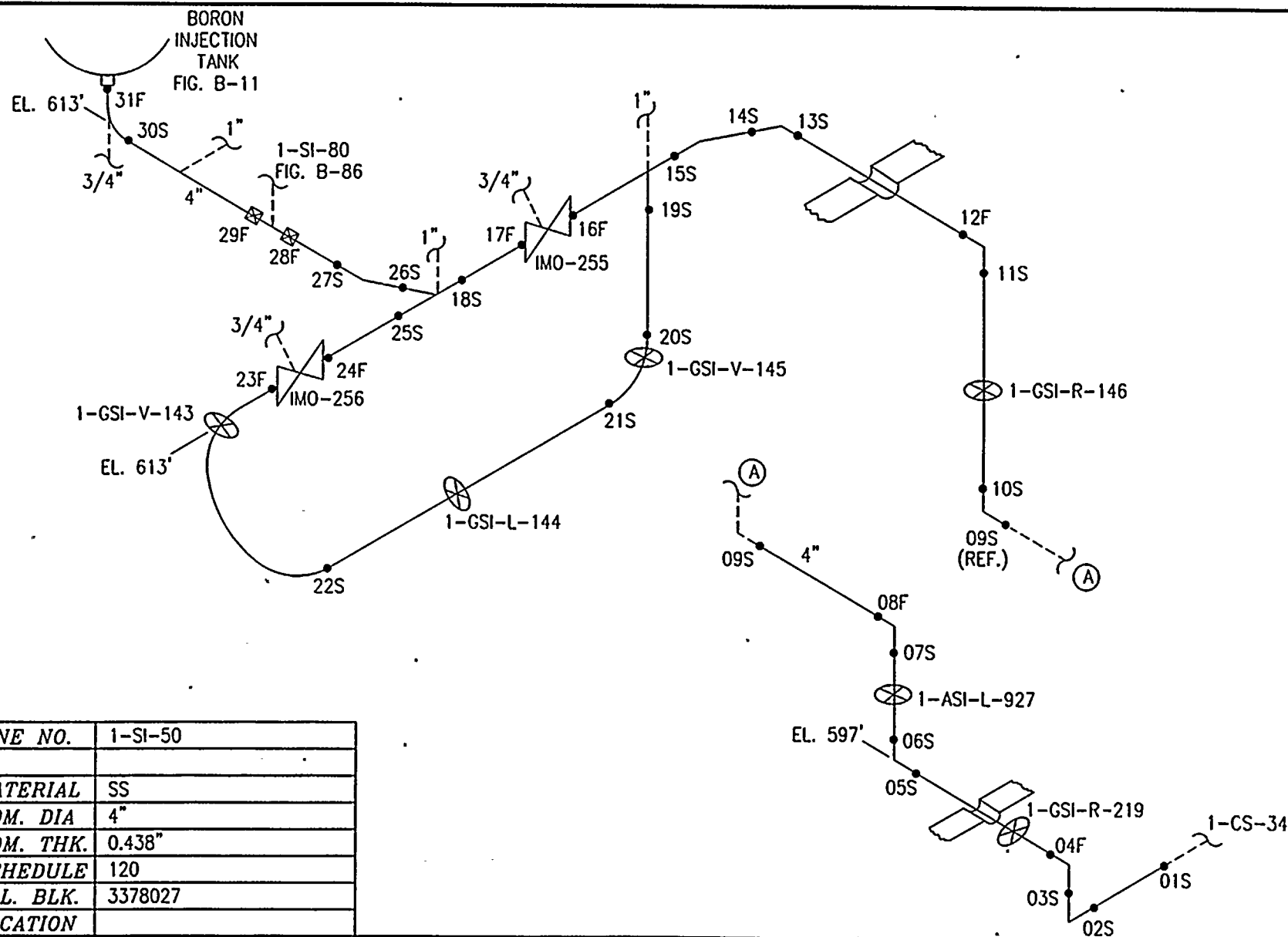
LINE NO.	1-SI-19	
MATERIAL	SS	
NOM. DIA	4"	2"
NOM. THK.	0.438"	0.344"
SCHEDULE	120	160
CAL. BLK.	3378027	N/A
LOCATION		

D. C. COOK, UNIT 1

FIG. B-83 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-SI-19

FLOW DIAGRAM: 1-5142



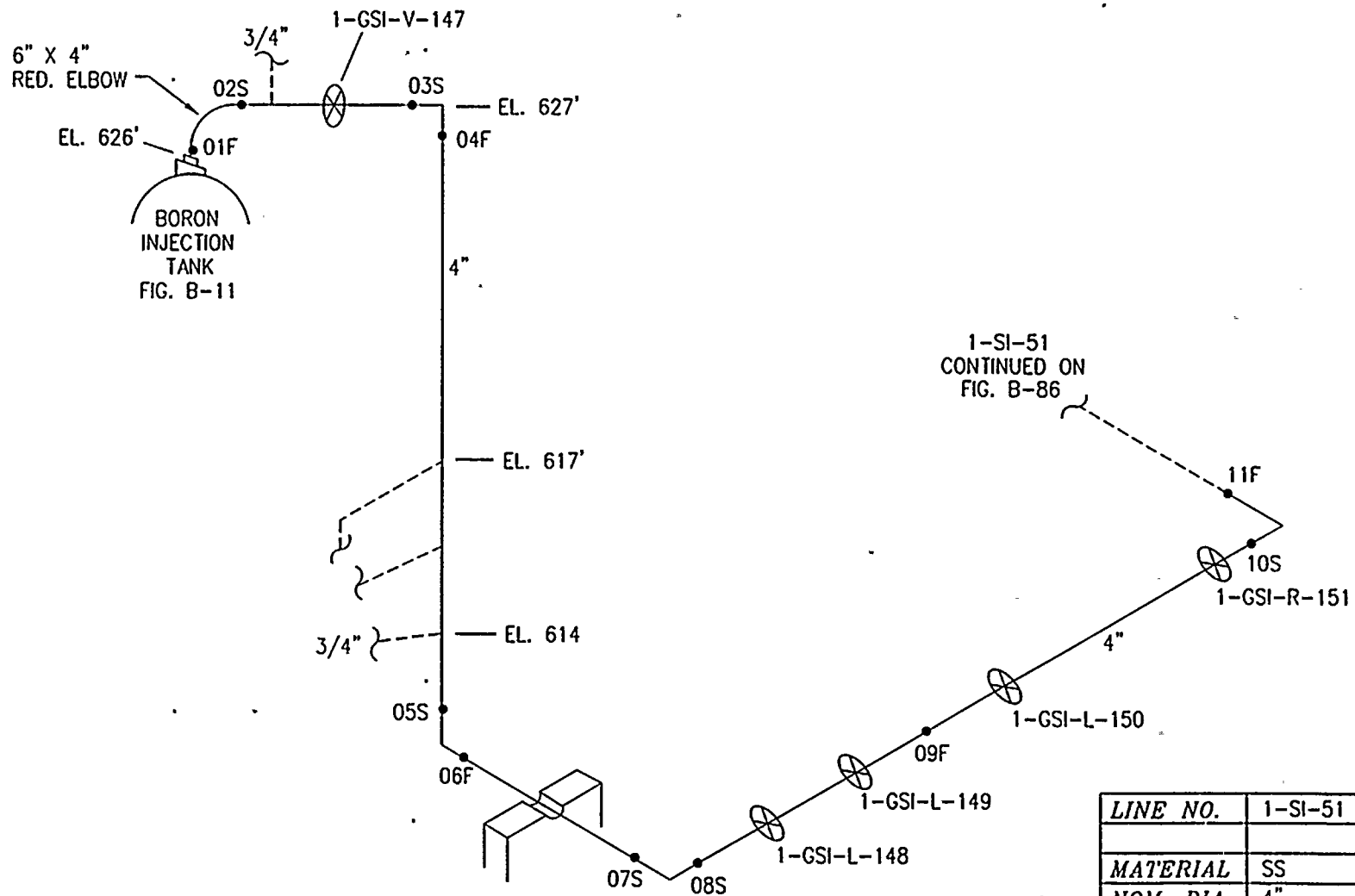
LINE NO.	1-SI-50
MATERIAL	SS
NOM. DIA	4"
NOM. THK.	0.438"
SCHEDULE	120
CAL. BLK.	3378027
LOCATION	

D. C. COOK, UNIT 1

FIG. B-84 EMERGENCY CORE COOLING SYSTEM

 REF. DRAWING: AEP 1-SI-50
 FLOW DIAGRAM: 1-5142

B-85

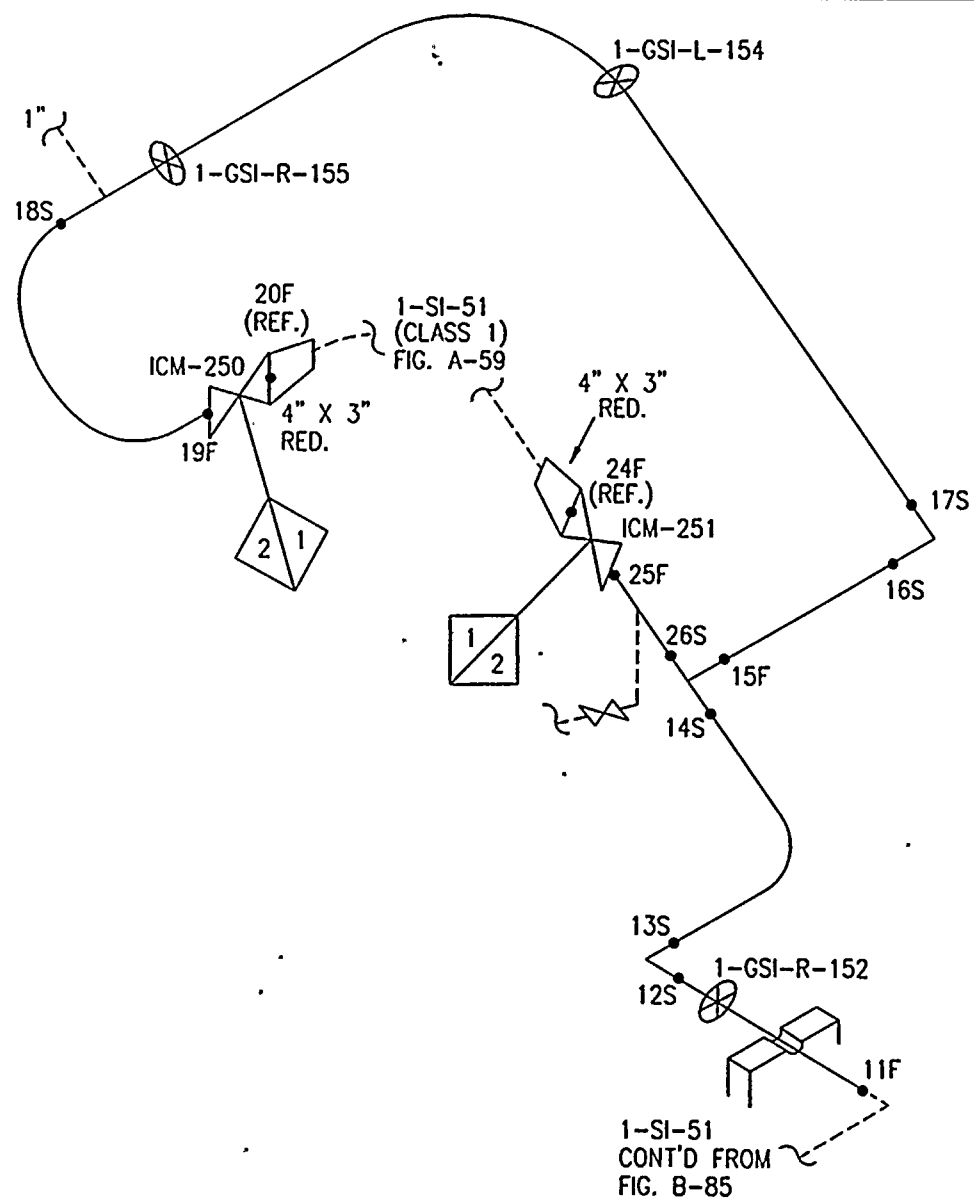


LINE NO.	1-SI-51
MATERIAL	SS
NOM. DIA	4"
NOM. THK.	0.438"
SCHEDULE	120
CAL. BLK.	3378027
LOCATION	

D. C. COOK, UNIT 1

FIG. B-85 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-SI-51, SHI. 1 OF 2
FLOW DIAGRAM: 1-5142



LINE NO.	1-SI-51	
MATERIAL	SS	
NOM. DIA	4"	6"
NOM. THK.	0.438"	0.710"
SCHEDULE	120	160
CAL. BLK.	3378027	3378028
LOCATION		

D. C. COOK, UNIT 1

FIG. B-86 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING: AEP 1-SI-51, SH. 2 OF 2
FLOW DIAGRAM: 1-5142

CONTINUED ON
1-SI-20
FIG. B-15

*NOTE: THERE IS NO
REFERENCE TO 1-SI-74
ON B-15.

21F 4" 20S 19S 18S 17S 16F 15F 14F 13F 12F 11F 10S 09S 08S 07S 06S 05S 04S 03S 02S 01F 54F

1-GSI-R-558

CPN #68

1-SI-11
FIG. B-80

EL. 607'

4" X 2" RED.

4" X 2" RED.

4"

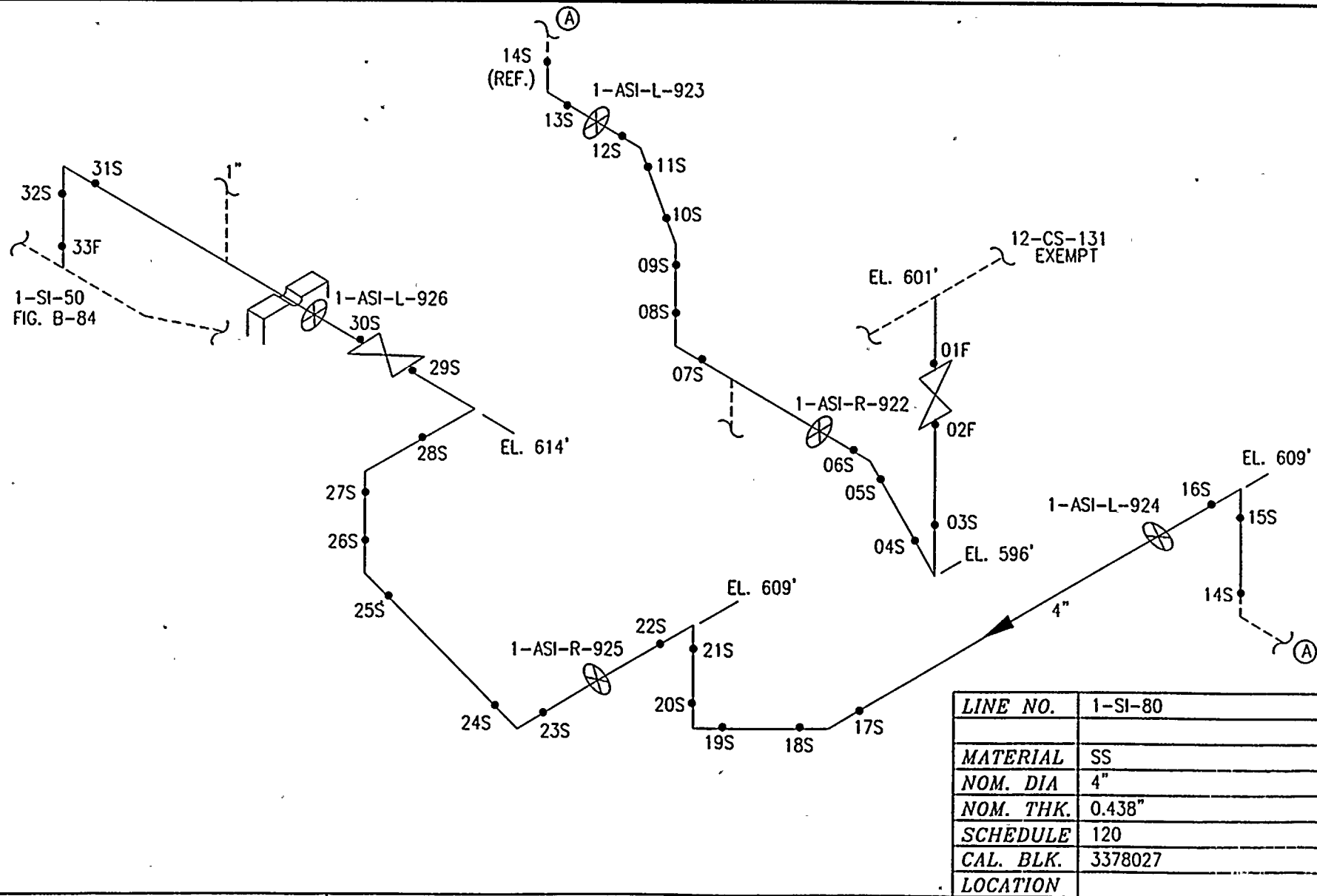
1"

2"

LINE NO.	1-SI-74	
MATERIAL	SS	SS
NOM. DIA	4"	2"
NOM. THK.	0.438"	0.344"
SCHEDULE	120	160
CAL. BLK.	3378027	6-DCC
LOCATION		

FIG. B-87 EMERGENCY CORE COOLING SYSTEM

REF. DRAWING:	AEP 1-SI-74
FLOW DIAGRAM:	1-5142



D. C. COOK, UNIT 1

FIG. B-88 EMERGENCY CORE COOLING SYSTEM

 REF. DRAWING: AEP 1-SI-80
 FLOW DIAGRAM: 1-5142/1-5129

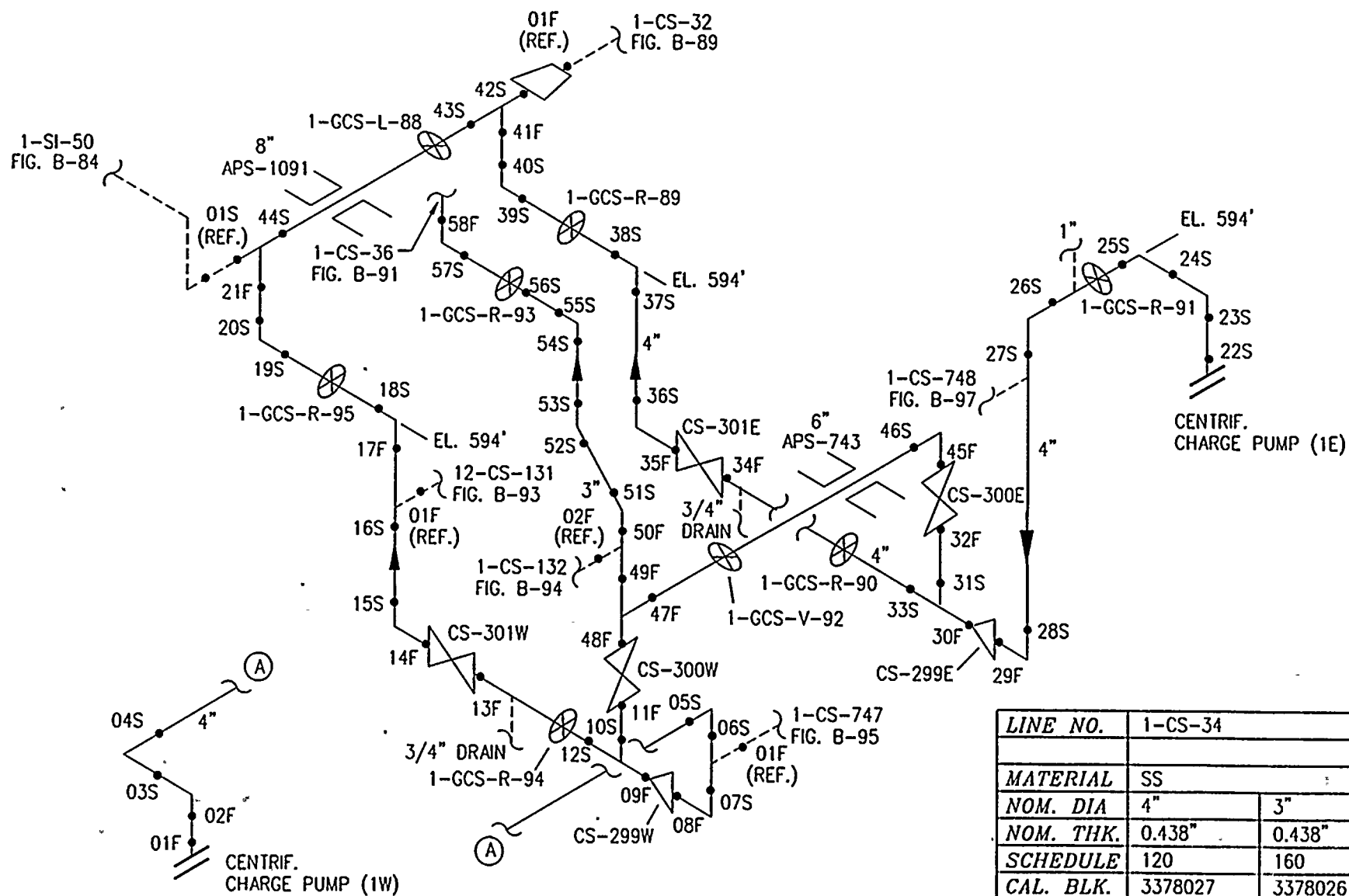
The diagram illustrates a process flow for Line No. 1-CS-32. The system includes several pumps (GCS-R-87, GCS-R-235, GCS-L-216, GCS-R-82, ACS-L-236, ACS-L-921, GCS-L-237B, GCS-R-80, GCS-R-79, GCS-L-237, GCS-R-237A, GCS-L-234, QVR-251, CS-302, CS-303, CS-306, CS-305), control valves (01F, 02F, 01S, 03S, 04S, 05S, 06S, 07S, 08S, 09S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 28S, 29S, 30S, 31S, 32S, 33S, 34S, 35S, 36S, 37S, 38S, 39S, 40S, 41S, 42S, 43S), and other components like a reciprocating charge pump discharge, pulsation damper, and a QMO-200. The piping is 3 inches nominal diameter, 0.438 inches nominal thickness, and Schedule 160. The line is made of SS (Stainless Steel). The schedule is 160. The line number is 1-CS-32.

LINE NO.	1-CS-32
MATERIAL	SS
NOM. DIA	3"
NOM. THK.	0.438"
SCHEDULE	160

LINE NO.	1-CS-32
MATERIAL	SS
NOM. DIA	3"
NOM. THK.	0.438"
SCHEDULE	160
CAL. BLK.	3378026
LOCATION	

REF. DRAWING:	AEP 1-CS-32
FLOW DIAGRAM:	1-5129

B-90

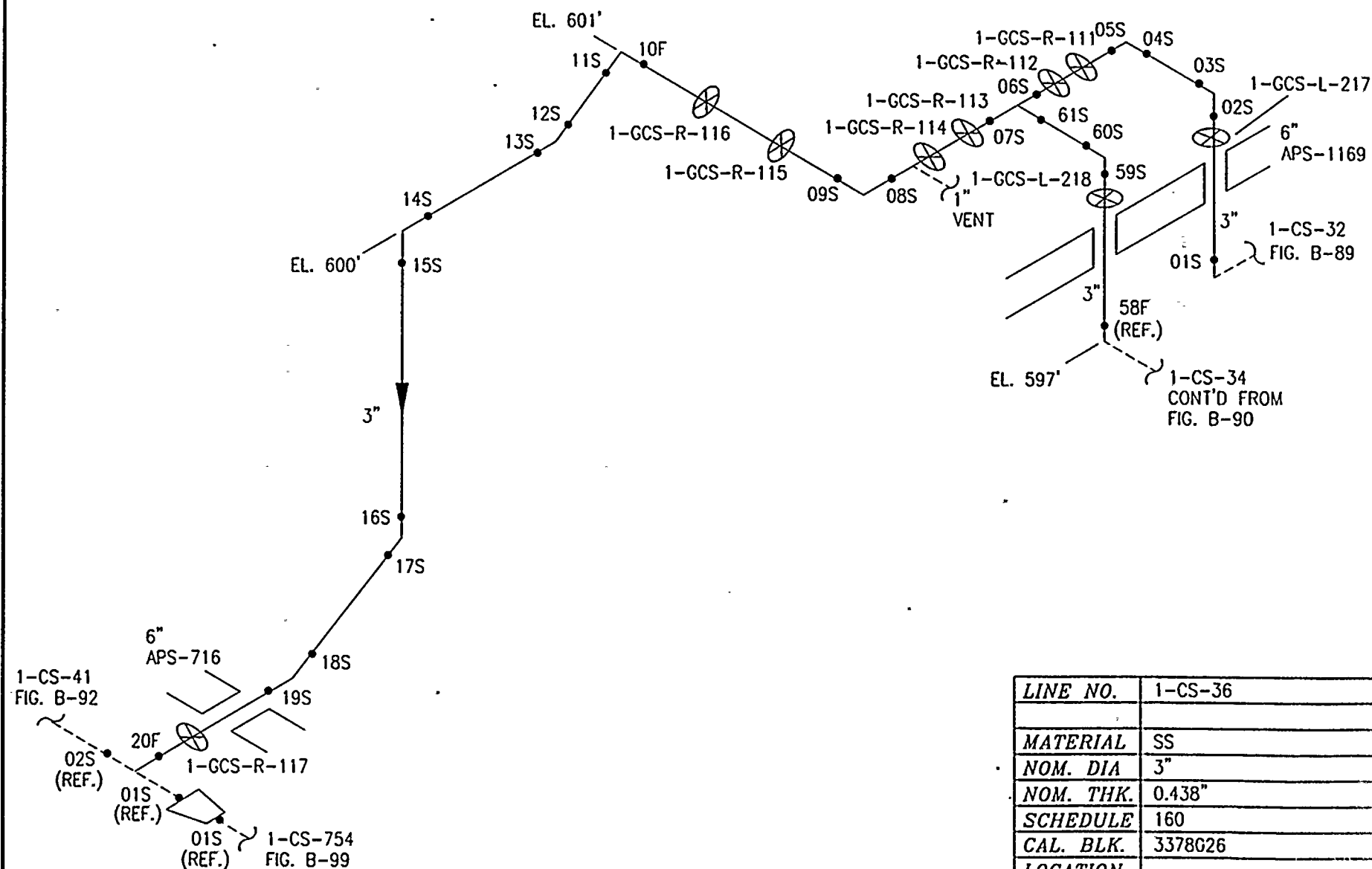


LINE NO.	1-CS-34	
MATERIAL	SS	
NOM. DIA	4"	3"
NOM. THK.	0.438"	0.438"
SCHEDULE	120	160
CAL. BLK.	3378027	3378026
LOCATION		

D. C. COOK, UNIT 1

FIG. B-90 CHEMICAL AND VOLUME CONTROL SYSTEM

REF. DRAWING: AEP 1-CS-34
FLOW DIAGRAM: 1-5129

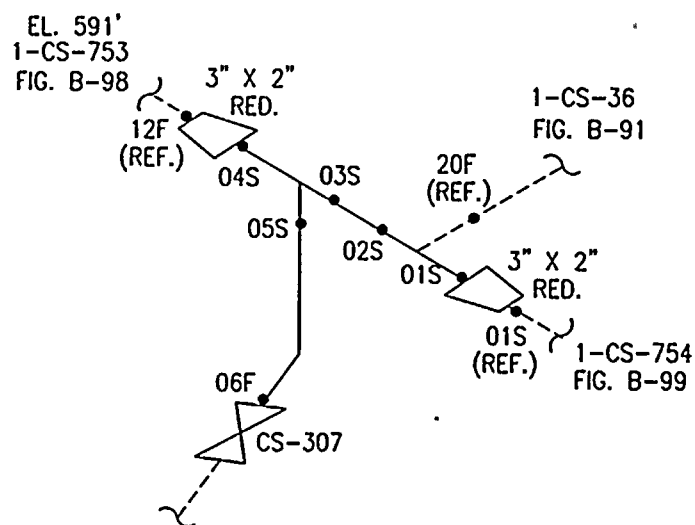


LINE NO.	1-CS-36
MATERIAL	SS
NOM. DIA	3"
NOM. THK.	0.438"
SCHEDULE	160
CAL. BLK.	3378026
LOCATION	

D. C. COOK, UNIT 1

FIG. B-91 CHEMICAL AND VOLUME CONTROL SYSTEM

REF. DRAWING: AEP 1-CS-36
 FLOW DIAGRAM: 1-5129



LINE NO.	1-CS-41
MATERIAL	SS
NOM. DIA	3"
NOM. THK.	0.438"
SCHEDULE	160
CAL. BLK.	3378026
LOCATION	

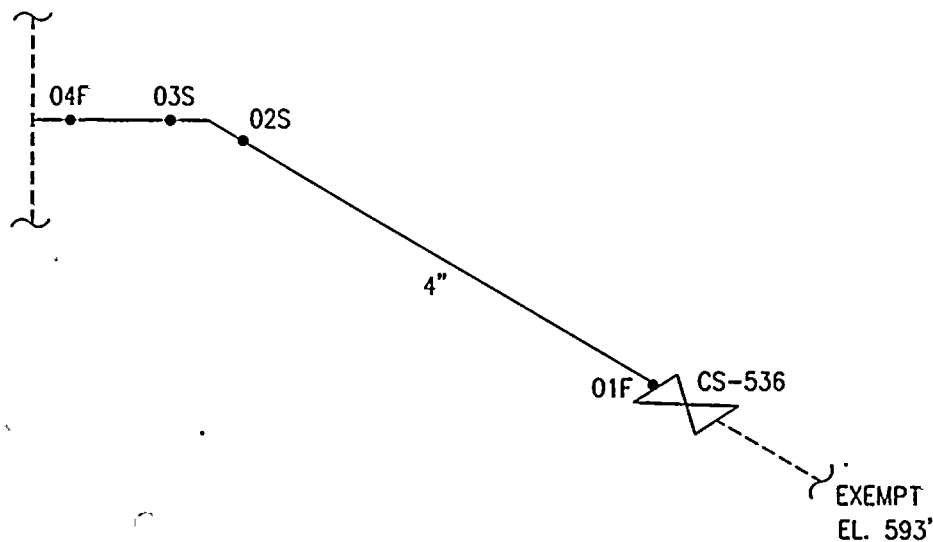
D. Ç. COOK, UNIT 1

FIG. B-92 CHEMICAL AND VOLUME CONTROL SYSTEM

 REF. DRAWING: AEP 1-CS-41
 FLOW DIAGRAM: 1-5129

B-93

1-CS-34
FIG. B-90



LINE NO.	12-CS-131
MATERIAL	SS
NOM. DIA	4"
NOM. THK.	0.438"
SCHEDULE	120
CAL. BLK.	3378027
LOCATION	

D. C. COOK, UNIT 1

FIG. B-93 CHEMICAL AND VOLUME CONTROL SYSTEM

REF. DRAWING: AEP 12-CS-131, SHEET 1
FLOW DIAGRAM: 1-5129

B-94

1-CS-34
FIG. B-90

02F

01F CS-535

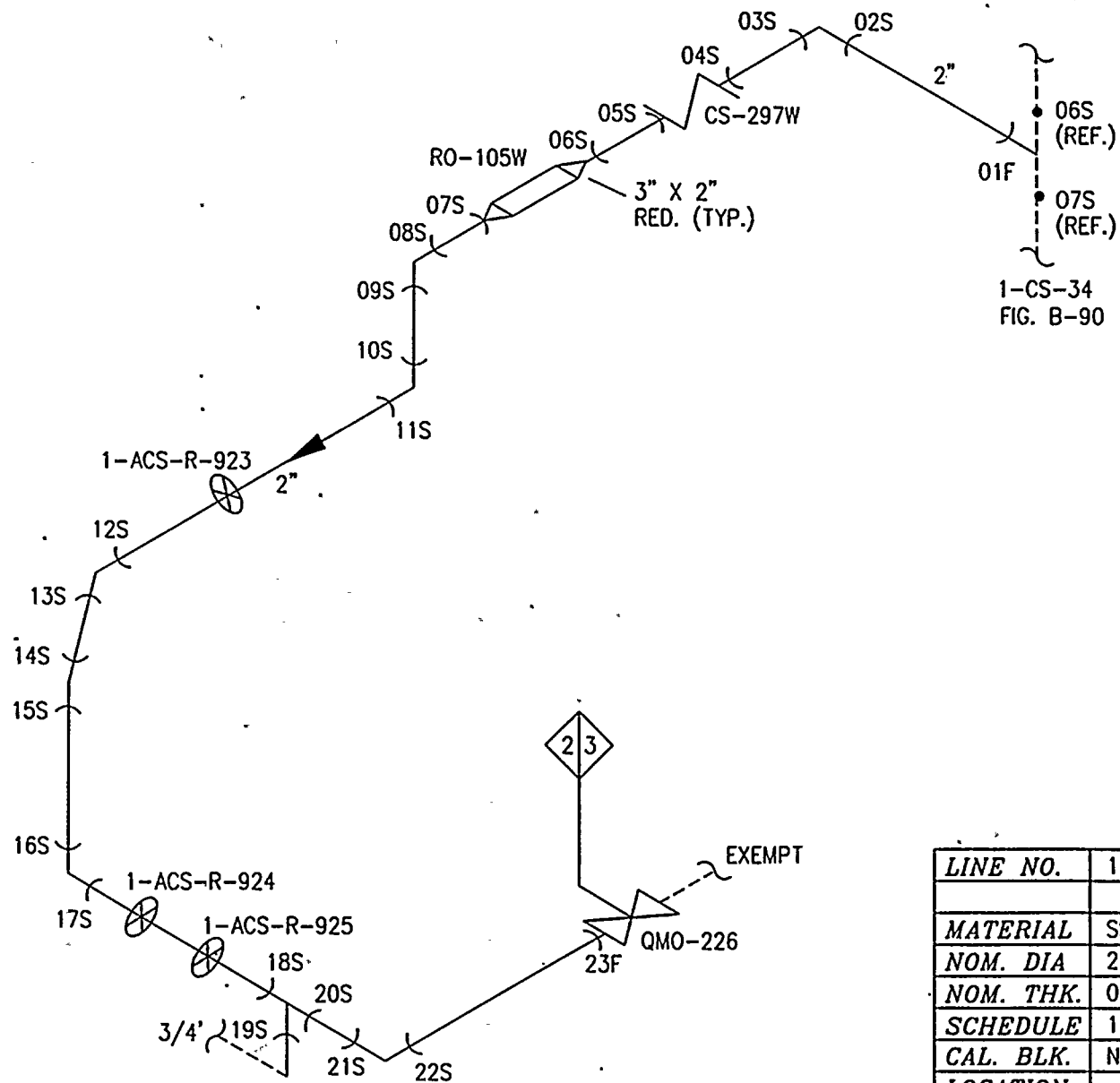
EXEMPT

LINE NO.	1-CS-132
MATERIAL	SS
NOM. DIA	3"
NOM. THK.	0.438"
SCHEDULE	160
CAL. BLK.	3378026
LOCATION	

D. C. COOK, UNIT 1

FIG. B-94 CHEMICAL AND VOLUME CONTROL SYSTEM

REF. DRAWING: AEP 1-CS-132
FLOW DIAGRAM: 1-5129

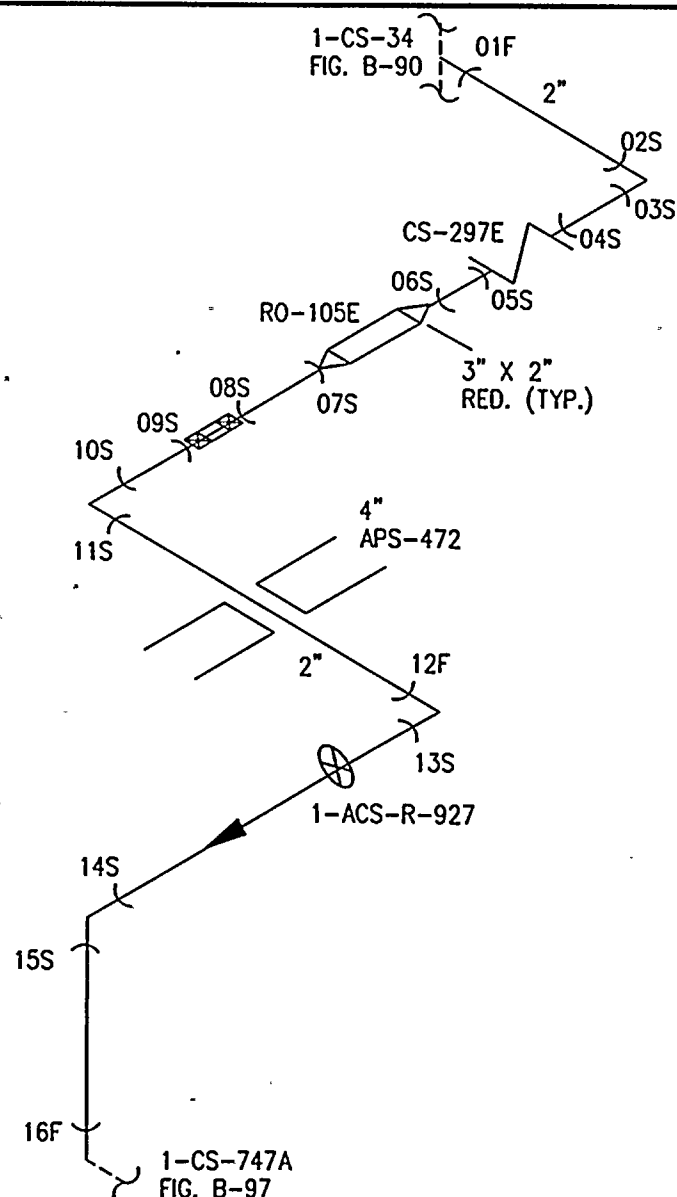


LINE NO.	1-CS-747
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	0.344"
SCHEDULE	160
CAL. BLK.	N/A
LOCATION	

D. C. COOK, UNIT 1

FIG. B-95 CHEMICAL AND VOLUME CONTROL SYSTEM

 REF. DRAWING: AEP 1-CS-747, SHT. 1
 FLOW DIAGRAM: 1-5129 & 1-5129A

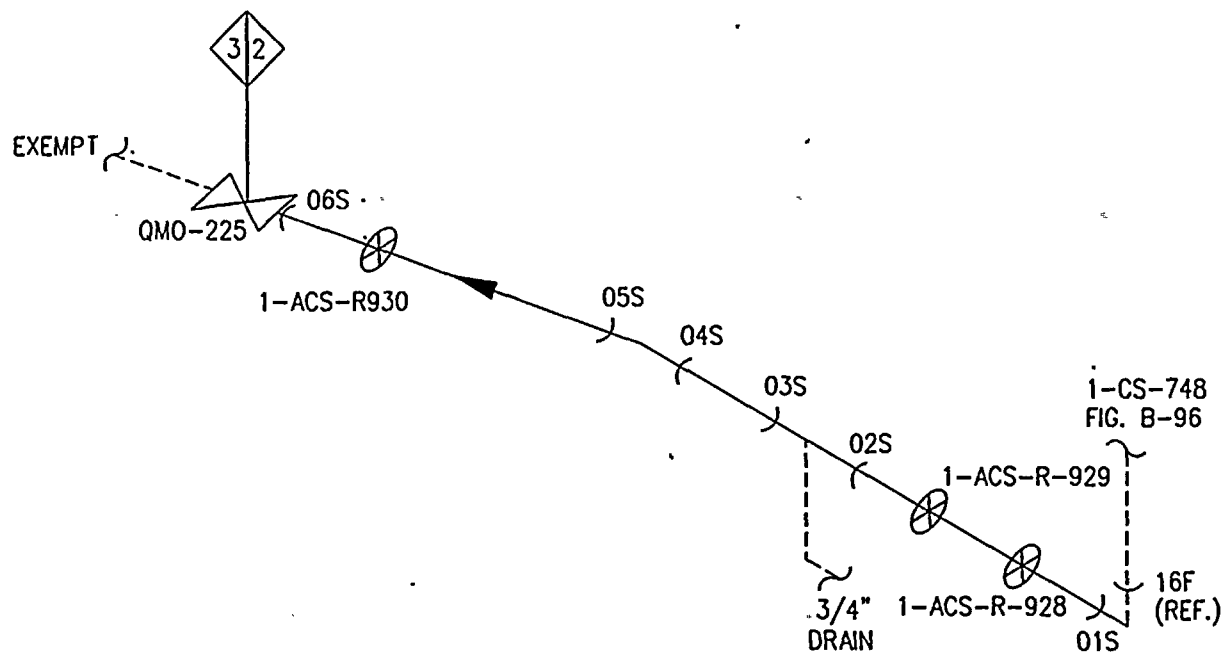


LINE NO.	1-CS-748
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	0.344"
SCHEDULE	160
CAL. BLK.	N/A
LOCATION	

D. C. COOK, UNIT 1

FIG. B-96 CHEMICAL AND VOLUME CONTROL SYSTEM

 REF. DRAWING: AEP 1-CS-748L1
 FLOW DIAGRAM: 1-5129 & 1-5129A

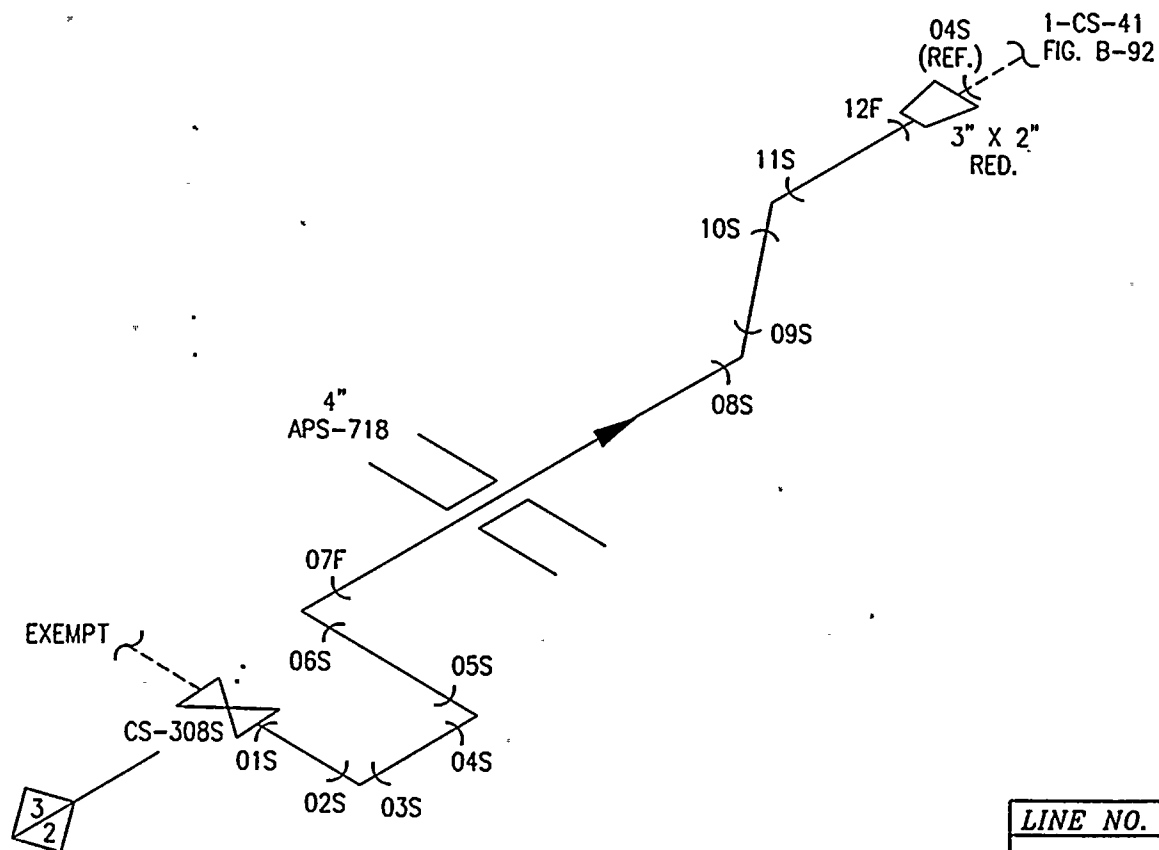


LINE NO.	1-CS-747A
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	0.344"
SCHEDULE	160
CAL. BLK.	N/A
LOCATION	

D. C. COOK, UNIT 1

FIG. B-97 CHEMICAL AND VOLUME CONTROL SYSTEM

 REF. DRAWING: AEP 1-CS-747, SH. 2
 FLOW DIAGRAM: 1-5129 & 1-5129A

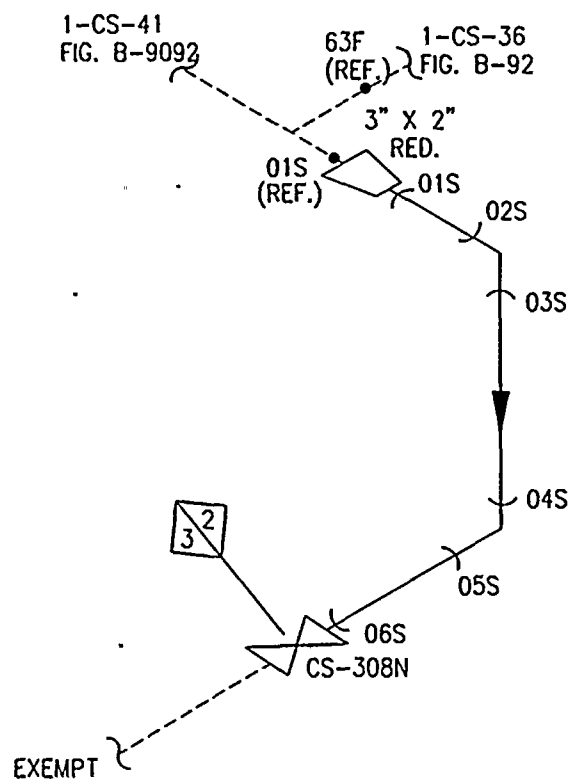


LINE NO.	1-CS-753
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	0.344"
SCHEDULE	160
CAL. BLK.	N/A
LOCATION	

D. C. COOK, UNIT 1

FIG. B-98 CHEMICAL AND VOLUME CONTROL SYSTEM

 REF. DRAWING: AEP 1-CS-753, L1.4
 FLOW DIAGRAM: 1-5129



LINE NO.	1-CS-754
MATERIAL	SS
NOM. DIA	2"
NOM. THK.	0.344"
SCHEDULE	160
CAL. BLK.	N/A
LOCATION	

D. C. COOK, UNIT 1

FIG. B-99 CHEMICAL AND VOLUME CONTROL SYSTEM

 REF. DRAWING: AEP 1-CS-754, I.I.8
 FLOW DIAGRAM: 12-5129-2

APPENDIX C
ULTRASONIC CALIBRATION BLOCK DRAWINGS/SKETCHES
AND CERTIFICATIONS

APPENDIX C

ULTRASONIC CALIBRATION BLOCK DRAWINGS/SKETCHES AND CERTIFICATIONS

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11-CSCL-5-DCC	D-3378 055C	C-15
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NS-CSCL-7-DCC	D-3378 058B	C-27
IR-CSCL-8-DCC	D-3378 059B	C-33
37-CCSS-X-3.0-9-DCC	D-3378-066C	C-39
7-.750-8-CS-10-DCC	C-3378-067C	C-45
8-SS-X-1.4-11-DCC	D-3378 070	C-51
14-CS-80-.750-12-DCC	D-3378 043A	C-55
6-CS-80-.432-13-DCC	D-3378 060A	C-59
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8-SS-40-.322-17-DCC	D-3378 075	C-73
12-SS-40S-.375-18-DCC	D-3378 079A	C-77
18-SS-40S-.375-19-DCC	D-3378 080A	C-81
4-SS-80-.337-20-DCC	D-3378-081	C-85
4-SS-10S-.120-21-DCC	D-3378-082	C-89
PL-3.0-CS-22-DCC	D-3378-083A	C-93
PL-.312-SS-23R-DCC	D-3378-606	C-101
IR-CSCL-24-DCC	D-3378 085B	C-105
PL-.500-SS-25-DCC	D-3378-086B	C-117
10-SS-40-.365-26-DCC	D-3378-087	C-121
PL-1.000-SS-27-DCC	D-3378 601	C-125
6-SS-40-.280-28-DCC	D-3378 603A	C-129
12-SS-40-.406-29-DCC	D-3378 602B	C-133
14-SS-40-.438-30-DCC	D-3378 604A	C-137
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18-SS-40-.562-32-DCC	D-3378-607	C-147
IR-CS-33-DCC	D-3378-608B	C-151

*Block IR-CSCL-3-DCC superseded (see Blocks 24-DCC and 33-DCC).

APPENDIX C
ULTRASONIC CALIBRATION BLOCK DRAWINGS/SKETCHES
AND CERTIFICATIONS

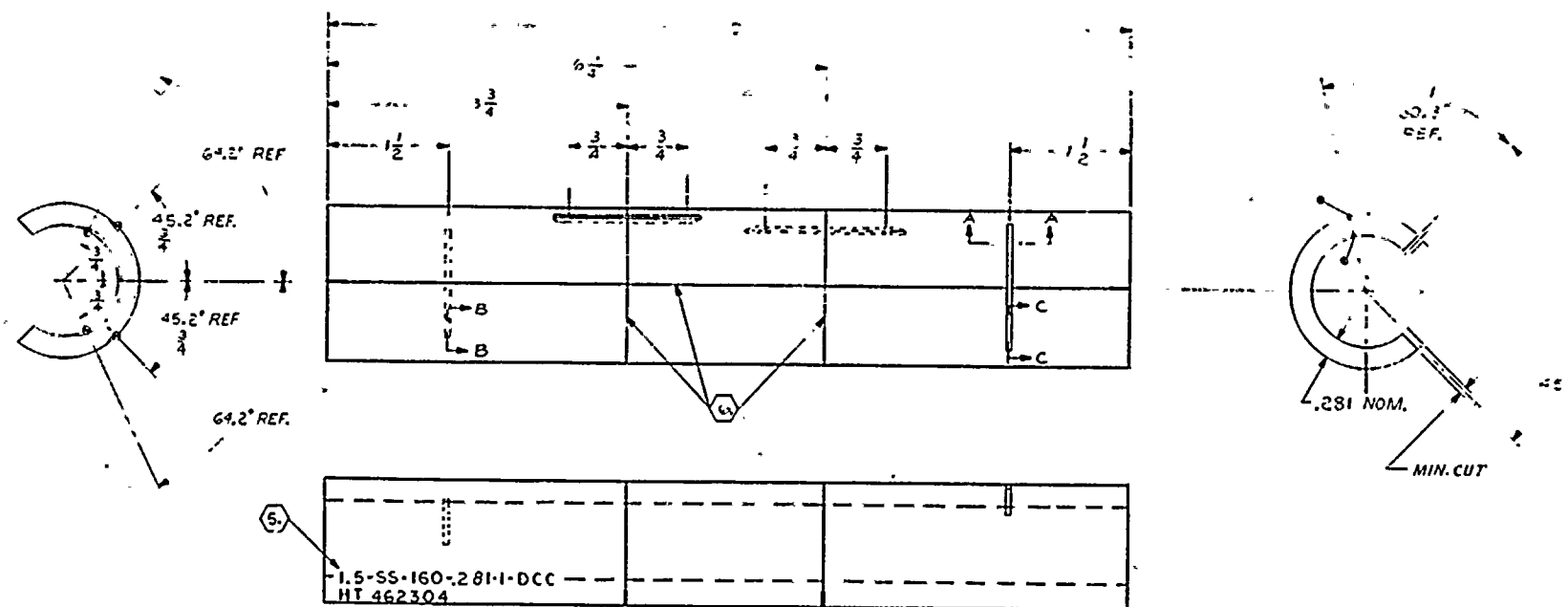
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29ID-SE-2.738-39-DCC	D-3378-621A	C-183
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BC-10/27.5-SS-43-DCC	D-3378-618	C-205
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16-CS-80-.844-45-DCC	D-3378-620	C-213
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RV-2 (7-inch Vessel Block)	74-3481-2	C-225
RV-3 (5-inch Vessel Block)	74-3481-3	C-227
3378021 (Vessel Upper Head)**	D-3378 021B	C-229
3378025 (2.5-SS-160-.370)	C-3378 025A	C-231
3378026 (3-SS-160-.430)	C-3378 026A	C-235
3378027 (4-SS-120-.430)	C-3378 027A	C-239
3378028 (6-SS-160-.71)	C-3378 028A	C-243
3378029 (8-SS-140-.81)	C-3378 029A	C-245
3378030 (10-SS-140-1.0)	C-3378 030A	C-247
3378031 (12-SS-160-1.31)**	C-3378 031	C-251
3378032 (14-SS-160-1.40)**	C-3378 032	C-253
3378033 (Main Reactor Coolant)**	C-3378 033	C-255
3378036 (OD Inner Radius)**	D-3378 036A	C-257
3378037 (Vessel Stud)	D-3378 037B	C-259
3378038 (Vessel Nuts)	B-3378 038	C-265
3378042 (Pump Stud)	D-3378 042B	C-269

* Block 35-DCC does not exist.

**Certification not available

C-1






SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION STANDARDS

CALIBRATION STANDARD 1.5-SS-160-.281-1-DCC IS
HEREBY CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE
WITH SECTION IX 1974 EDITION OF THE ASME BOILER AND
PRESSURE VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS
CALIBRATION STANDARD IS SUBSTANTIATED WITH THE ATTACHED
CHEMICAL ANALYSIS REPORT FOR SA 376, TP 304
IN ACCORDANCE WITH THE MATERIALS SPECIFICATION SECTION II
OF THE ASME BOILER AND PRESSURE VESSEL CODE

 June 28, 1977
(SIGNATURE) (DATE)


 (713) 464-7445
 TELEX 752-172

RILEY

CORPORATION 1060 WITTE ROAD
 HOUSTON, TEXAS 77035

MILL TEST REPORT

No. 277

DATE	OUR SHIPMENT NO.	DATE SHIPPED	REFERENCE	YOUR ORDER NO.
6-16-77	277 ELC	6-16-77	Ron	1774

JUN 21 1977
 RECEIVED (10)

TO:

Energy Specialists
 Houston, Texas

ATTN: Mr. Jack Buckley

S&RI	
P. O.	357866W
P. R.	67660
LOG	OLM-A

ITEM	DESCRIPTION	SPECIFICATIONS	MANUFACTURED BY
------	-------------	----------------	-----------------

1. 1 1/2" Sch 160 x 12" Seamless A-376, T-304 Pipe

ITEM	CHEMICAL ANALYSIS									
	HEAT NO.	CARBON	MANG.	PHOS.	SUL.	SIL.	CHROME	NICKEL	MOLY	CU.

1.	462304	.002	1.23	.021	.005	.63	18.3	9.1	-	-
----	--------	------	------	------	------	-----	------	-----	---	---

ITEM	MECHANICAL TESTS	YIELD PSI	TENSILE	ELONGATION	REDUCTION	HARDNESS
------	------------------	-----------	---------	------------	-----------	----------

1.		48,200	91,400	48		
----	--	--------	--------	----	--	--

I HEREBY CERTIFY THAT THE ABOVE FIGURES ARE
 CORRECT AS CONTAINED IN THE RECORDS OF THE CORPORATION

- Cherik B. Bailey
 SIGNATURE

SOUTHWEST RESEARCH INSTITUTE

INSPECTION AND TEST RESULTS

DRAWING NUMBER:	JOB REQUEST NO.	DATE:	PART NUMBER / PART NAME
C-3379034	10926	6-24-77	1 1/2 Pipe Ultrasonic Calibration Block

TYPE OF INSPECTION OR TEST PERFORMED:	
Dimensional Only	

INSPECTION / TEST RESULTS: (ATTACH DATA SHEETS AS NECESSARY)
--

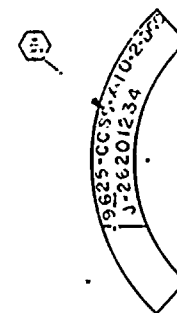
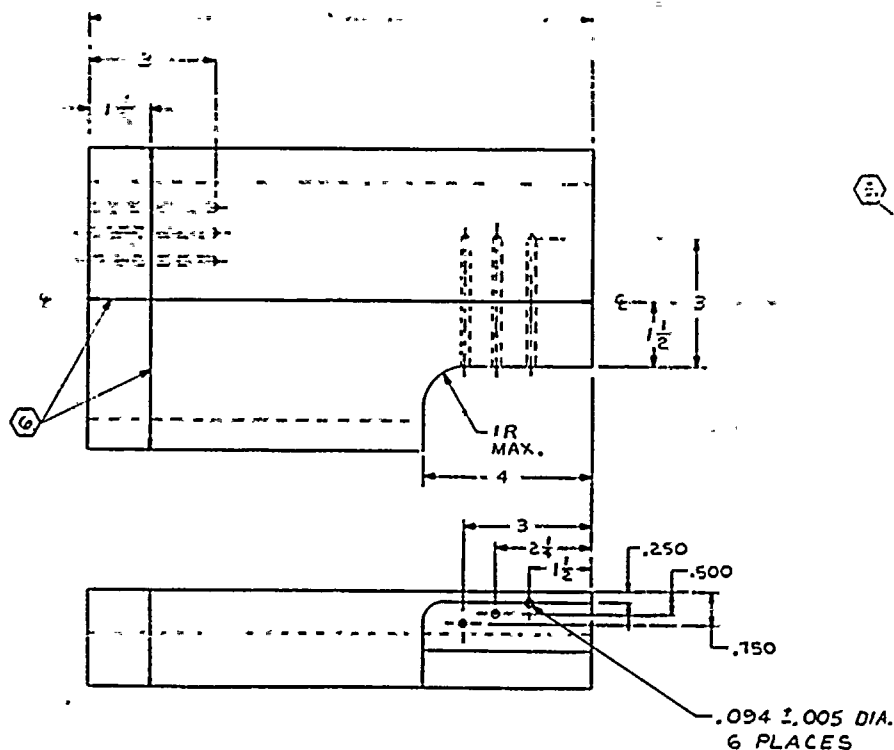
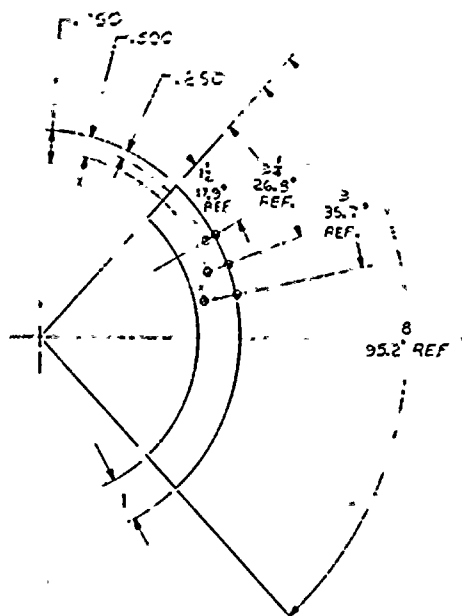
NUMBER OF ARTICLES INSPECTED OR TESTED	NUMBER OF CONFORMING ARTICLES	NUMBER OF ARTICLES REJECTED
1	1	0

NATURE OF DEFECTS OBSERVED:

BASIC CAUSES FOR ARTICLE REJECTION:

INSPECTION PERFORMED BY:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> 11 QA </div>	<div style="display: flex; justify-content: space-between;"> <div style="border-bottom: 1px solid black; width: 80%;"></div> <div style="text-align: right;"> 6-24-77 (DATE) </div> </div>
(SIGNATURE)		

C-5



1. MAKE FROM SA451, CPF 8M, HEAT No. J-26201234.
2. SCRIBE CENTERLINES .003 TO .005 WIDE & DEEP WHERE NOTED. STEEL STAMP OR MILL CUT, AN INDEX MARK AT ENDS OF EACH CENTERLINE AS SHOWN, 1/32 X 1/32 X 1/4 LONG.
3. STEEL STAMP ID. No. AND HEAT No. AS SHOWN, ON SURFACE INDICATED, IN CHARACTERS 3/16 MIN. HEIGHT.
4. MATERIAL FOR BLOCK MUST BE FREE OF:
PIPE SEAM WELDS.
FABRICATION OR REPAIR WELDS,
ANY LAMINAR INDICATIONS WHICH MAY AFFECT
ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
5. ID AND OG. SURFACES TO BE FREE OF TOOL MARKS.
6. DEBURR AND BREAK SHARP EDGES.
7. DIMENSIONS ARE IN INCHES.
- NOTES:

LET	DCN NR	DATE	CHK	DESIGN OF	PROJ. MGR	QA MGR
				SUPV		

REVISIONS

TOLERANCES UNLESS NOTED		QASH	NO	PART NAME	MATERIAL
DECIMALS	±.010	INT	RECD		
FRACTIONS	± 1/16			PARTS LIST	
ANGLES				NEXT ASSEMBLED	
FINISH	125			SOUTHWEST RESEARCH INSTITUTE	
APPROVED	DATE			QUALITY ASSURANCE SYSTEMS AND ENGINEERING DIVISION	
DESIGN	6-17-77			SAN ANTONIO, TEXAS	
DRAWN BY	6-17-77			REGENERATIVE HEAT EXCHANGER CALIB. BLOCK	
CHECKED BY	6-17-77			COOK	
DATE	6-17-77			SHEET 1	
SCALE	1/2			C-3378035	

9.625-CCSS-X-1.0-2-DCU

PHONE 312 / 865-0400

2671 GARDNER ROAD, BROADVIEW, ILLINOIS 60153

CHARLES C. KAWIN COMPANY

METALLURGICAL LABORATORIES

CHEMISTS • MECHANICAL TESTING • METALLOGRAPHERS • CONSULTANTS

MAILING ADDRESS / P.O. BOX 310 / MAYWOOD, ILLINOIS 60153

Southwest Research Institute

DATE: 7-24-75

DESCRIPTION:

Attn: Mr. R. L. Edwards

Letter 7-21-75

Lab. #51 to 53

SAMPLE IDENT.	C	Mn	Si	P	S	Ni	Cr	Mo	Cu	Mg	Al	V		
JAYS' CPF&M J-26201234 Stainless Steel	.07	.77	.60	.024	.017	10.20	20.69	2.52						
J-26078901 Stainless Steel	.06	.84	.61	.023	.023	9.90	20.30	2.55						
J-CS-XX-1-5-45SLC Carbon Steel	.21	.78	.26	.005	.026	.01	.01	.01						

CHARLES C. KAWIN COMPANY



LABORATORIES - BROADVIEW, ILL. AND BUFFALO, N.Y.

QUALITY CONTROL INSPECTION REPORT

no. 2

Contract No. 741760 Item Calibration Block
 P/N P337P035 Qty len NSN SR.

		Acc	Ret			Acc	Ret			Acc	Ret
1	.750	✓		16	.250	✓		31			
2	.500	✓		17	.500	✓		32			
3	.250	✓		18	.750	✓		33			
4	1 1/2	✓		19	1 1/2	✓		34			
5	2 1/4	✓		20	3	✓		35			
6	3	✓		21	4 13/16	✓		36			
7	8	✓		22				37			
8	1	✓		23				38			
9	3	✓		24				39			
10	1 1/2	✓		25				40			
11	1 R. MAX	✓		26				41			
12	4	✓		27				42			
13	3	✓		28				43			
14	2 1/4	✓		29				44			
15	1 1/2	✓		30				45			

Tolerances on Dimensions
 (unless otherwise specified)

Fractions ± 1/16
 .X ± 0.0
 .XX ± 0.0
 .XXX ± 0.0
 Ang. ±

Number of Samples 1
 Number ACCEPTED 1
 Number REJECTED 0

Number and Types of Defects found:

Corrective Action Taken:

LOT: ACCEPTED

Signed REJECTED

Date 7 July 77

Page 1 of 1

6-9



1. DIMENSIONS ARE IN INCHES. DRILL AND REAM
 2. BREAK SHARP EDGES AND REMOVE ALL BURRS. .125±.005 DIA
 3. TOP AND BOTTOM SURFACES TO BE FREE OF TOOL MARKS. x 3.0 DEEP MIN
 4. ULTRASONIC EXAMINATION TO BE PERFORMED IN ACCORDANCE WITH 3 PLACES
 ASME SECTION 5, 1971 ARTICLE 23, SA578 INCLUDING ACCEPTANCE
 STANDARD LEVEL 1 AND SUPPLEMENTARY REQUIREMENTS S1 PRIOR TO MACHINING.

- PL-3.0-CSCL-4-DCC

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

Calibration block PL-3.0-CSCL-4-DCC is hereby classified as P-Number 3 group 3 in accordance with Section IX 1983 Edition of the ASME Boiler and Pressure Vessel Code. The P-Number classification for this calibration block is substantiated with the attached mill test report for SA508, CL2, Ht 3P-2870 and meets the block material requirements of Section XI, Appendix III, III-3411 of the ASME Boiler and Pressure Vessel Code.

Design Criteria

The original design and modification for the above calibration block incorporates the requirements of Sections V and XI, 1983 Edition of the ASME Boiler and Pressure Vessel Code. The design also meets American Electric Power purchase order and quality assurance requirements.

Attachments

- Mill Test Report
- Preliminary UT Data Sheets (See Note)
- Dimensional Data Sheets
- Final UT Acceptance Data Sheets
- Drawing D-3378-066 Rev. C

Robert L. Edwards

Sr. Research Engineer
Title

September 1, 1995
Date

PHONE: 312/865-0400

2671 GARDNER RD., BROADVIEW, ILL.

CHARLES C. KAWIN COMPANY

METALLURGICAL LABORATORIES

CHEMISTS • MECHANICAL TESTING • METALLOGRAPHERS • CONSULTANTS

MAILING ADDRESS / P.O. BOX 310 / MAYWOOD, ILLINOIS 60153

Southwest Research Institute
8500 Culebra
San Antonio, Texas 78284
Attn: R. Edwards, Dept 17

DATE OF REPORT: 1-20-77

DESCRIPTION:

~~9020PR45506~~

REQ/PO PR45506

REPORT OF MECHANICAL TESTS

SAMPLE IDENTIFICATION	DIAM. IN INCHES	YIELD STRENGTH LBS. PER SQ. IN.	TENSILE STRENGTH LBS. PER SQ. IN.	ELONGATION IN IN.	ELONGATION PER CENT	REDUCTN OF AREA PER CENT	BRINELL 3000 KG LOAD	ROCKWELL HARDNESS	IMPACT TESTS

Lab #73

REPORT OF CHEMICAL ANALYSIS

SAMPLE IDENTIFICATION	SI	MN	C	P	S	NI	CR	MO	CU	NG	AL
Log #0556A Carbon Steel	.29	.66	.22	.010	.010	.75	.37	.63			

SPECIFICATION
 Specification
 Forging(s) included in this shipment was (were) process controlled and identified
 DATE

DESCRIPTION OF FORGINGS

FORGING HARDNESS IS WITHIN SPECIFIED RANGE OF

Mechanical property acceptance of listed forgings based on results from
 Integral Rocking Ring Test Forgery
 which conforms to material specifications listed above are tabulated below

APPLICABLE WITH
 Equipment certified to MIL-STD-883C
 Free from continuous casting
 Micro structure satisfactory
 Free from cast structure

Code	Serial	Blank Material Report No.	Test Identity	Yield Str. KSI	Ultimate Strength KSI	% Elong.	% Red. of Area	DHN	S	KSI	Temp. at Test F.	Hours at Load	Clamp	% Red. of Area
------	--------	---------------------------	---------------	----------------	-----------------------	----------	----------------	-----	---	-----	------------------	---------------	-------	----------------

***ASTM A-308-64 Class 2 as modified by code case 1332-1 and 1538 addition
 ASME code section III article 3 including all addenda through February 1969
 as modified by P.O.

Magnetic particle inspected per Ladish Procedure 107 M-2 dated 5-13-69
 approved on Change Order #6. Results satisfactory.

***Austenitized 1640°F. ±10°F., hold at color for 6 hours, cold water quenched,
 Re-austenitized 1570°F. ±10°F., hold at color for 6 hours, cold water quenched,
 tempered 1240°F. ±10°F., hold at color for 14 hours, cold water quenched.

Heat treated in accordance with Ladish Procedure No. HTP-35 Rev. O, dated 6-6-69,
 approved per Change Order No. 7.

Impact tested per Ladish Procedure No. I.T.P.-15 Rev. O, dated 6-6-69
 approved per Change Order No. 7.

I DO NOT FEAR
 V - VIOLENCE
 S - SWEATH
 C - COMBAT
 MATERIAL AND
 THIS REPORT IS
 AND ACCEPTED
 TIONS INVOLVE
 I HEREBY CERTIFY
 BEST OF MY KNOWLEDGE
 LIEF THIS MATERIAL
 REPORT IS TRUE
 SWORN AND SUBSCRIBED
 ME THIS
 MY COMMISSION

(Continued on page 2)

CODE	MILL	HEAT NO.	STOCK SIZE	GRAIN SIZE	HARDENABILITY	CHEMISTRY REPORT
RAY	LES	3P-2870				
.21	.67	.005 .009	.28 .75 .30 .61	.01 .01 .01 .03	.007 .00	.01 .01 (Sheet)
.23	.61	.005 .010	.25 .70 .32 .59	.03 .03		.01 (Ladle)

cc: L. Harrison (1)
 Purch. Dept.
 With Shipment (1)

C-12

BLANKET NOTARIZED REPORT NUMBER

Code	Serial	Blank Notarized Report No. Ds. Yr. No.	Test Identity	Yield Str. KSI % of St.	Ultimate Strength KSI	% Elong. IN	% Red. Of Area	BHN	S R	KSI	Temp. of Test ° F.	Hours of Load	% Elong. IN	% Red. Of Area	SYNOPSIS OF TESTS KSI AFTER _____ HOURS
------	--------	--	---------------	-------------------------	-----------------------	-------------	----------------	-----	-----	-----	--------------------	---------------	-------------	----------------	---

Ultrasonic tested per (L) Procedure 9036 dated 2-9-66 with modification 1-1-69 dated 2-3-69 and amendment to I.S. #32 dated 6-6-69 approved per Charge Order 123, satisfactory. Report attached.

AAY	195	Location 0"	62.8	85.9	27	69		
		Grain Size: Prod. 6						
		V-Notch Impacts +10°F:	Ft. Lbs.		Lot.	Prod.	Mils	S. F. Max
			49.5		20			20
			14.0		14			18
			39.0		33			16
		V-Notch Impacts +40°F:	34.0		29			18
			55.0		44			30
			60.0		51			35
AAY	195	Location 100"	67.2	89.2	26	70		
		Grain Size: Prod. 7						
		V-Notch Impacts +10°F:	Ft. Lbs.		Lot.	Prod.	Mils	S. F. Max
			70.0		67			67
			89.3		47			67
			67.8		50			33
		V-Notch Impacts +40°F:	115.0		71			52
			91.5		67			52
			71.0		50			52

CODE	MILL	HEAT NO.	STOCK SIZE	GRAIN SIZE	HARDENABILITY	CHEMISTRY REPORT'S N°

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(10) HOLE LOCATION IS BASED ON CLADDING THICKNESS AT LOCATION INDICATED PLUS ONE-HALF OF HOLE DIAMETER.

(11) THIS HOLE TO BE LOCATED TWENTY TO THE CLAD LINE.

(12) CLAD OVERLAY MAY BE HAND GROUNDED OR MACHINED TO DUPLICATE VESSEL CLADDING.

3. OVERLAY CLADDING IN ACCORDANCE WITH S-W-R1 WP3-300-2, REV. 0

6. ULTRASONIC EXAMINATION TO BE PERFORMED IN ACCORDANCE WITH ASME SECTION V, 1971 ARTICLE 23, 3.8.7.8 INCLUDING ACCEPTANCE STANDARDS LEVEL 2 AND SUPPLEMENTARY REQUIREMENTS 31 PRIOR TO MACHINING.

(1) MAKE FROM S4608 CLX HEAT NO. 3P-2970 S-W-R2 RIR# 0556A.

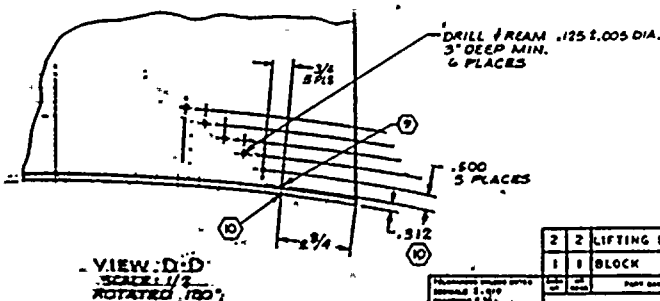
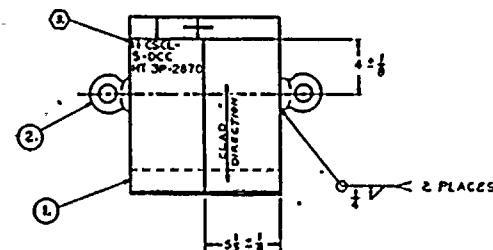
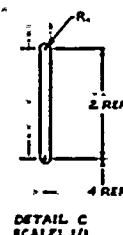
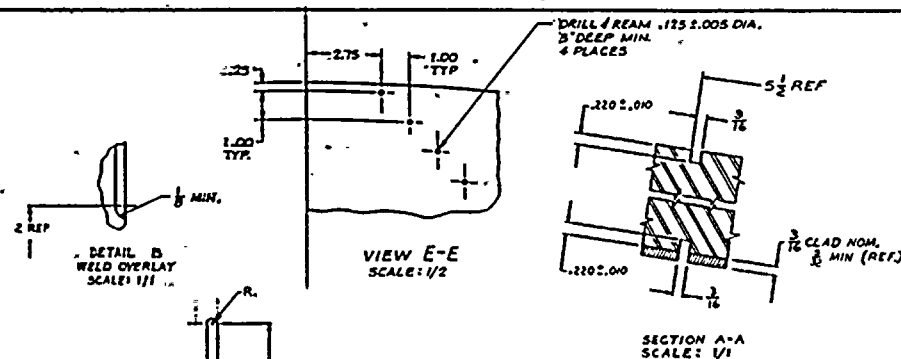
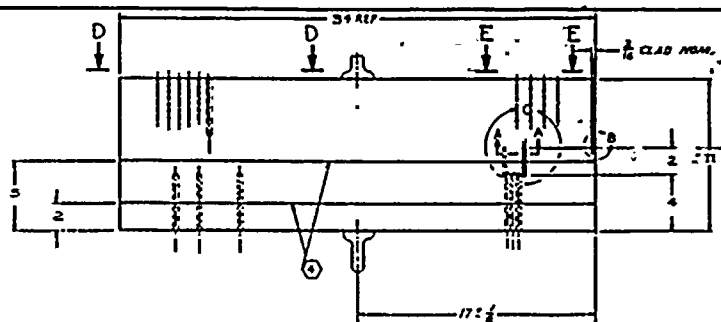
(2) SCRIBE CENTERLINES AS SHOWN .003 TO .005 WIDE X .003 TO .005 DEEP. STEEL STAMP OR MILL CUT AN INCH MARK AT EACH END OF CENTERLINE, AS SHOWN, WITH 1/16 LONG.

(3) STEEL STAMP STANDARD ID. NO. AND HEAT NO., AS SHOWN, ON SURFACE INDICATED, IN CHARACTERS 3/16 MIN. HEIGHT.

2. MATERIAL FOR STANDARD TO BE FREE OF FABRICATION OR REPAIR WELDS AND LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.

1. BREAK SHARP EDGES AND REMOVE BURRS.

NOTES:



11-C5CL-5-DCC

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK 11-CSCL-5-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 3 GROUP 3 IN ACCORDANCE WITH
SECTION IX 1983 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA508 CL2, Ht 3P-2870 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design for the above calibration block incorporates the requirements of
Section V and Section XI, 1983 Edition, Summer 1983 Addenda of the ASME
Boiler and Pressure Vessel Code. The design also meets SwRI nondestructive
testing procedure requirements and tolerances.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-055B

Revised 5/17/88


Robert L. Edwards

SIGNATURE

Lead Engineer

TITLE

5/20/88

DATE

PHONE: 312/863-0400

2671 GARDNER RD., BROADVIEW, ILL.

CHARLES C. KAWIN COMPANY

METALLURGICAL LABORATORIES

CHEMISTS • MECHANICAL TESTING • METALLOGRAPHERS • CONSULTANTS

MAILING ADDRESS / P.O. BOX 310 / MAYWOOD, ILLINOIS 60153

Southwest Research Institute
8500 Culebra
San Antonio, Texas 78284
Attn: R. Edwards, Dept 17

DATE OF REPORT: 1-20-77

DESCRIPTION:

~~XPO70PR45506~~

REQ/PO PR45506

REPORT OF MECHANICAL TESTS

SAMPLE IDENTIFICATION	DIAM. IN INCHES	YIELD STRENGTH LBS. PER SQ. IN.	TENSILE STRENGTH LBS. PER SQ. IN.	ELONGATION ON IN.	ELONGATION PER CENT	REDUCTION OF AREA PER CENT	BRINELL 3000 KG LOAD	ROCKWELL HARDNESS	IMPACT TESTS

Lab #73

REPORT OF CHEMICAL ANALYSIS

SAMPLE IDENTIFICATION	SI	MN	C	P	S	NI	CR	MO	CU	MG	AL
Log #0556A Carbon Steel	.29	.66	.22	.010	.010	.75	.37	.63			

Specification: 88000 Below Forging(s) included in this shipment was (were) process controlled and identified per 300 and 310 DATE 1

CONDITION OF FORGINGS

See See Below

DRIVING HARDNESS IS WITHIN SPECIFIED RANGE OF:

Forgings produced per titanium alloy process sheet

APPLICABLE WILL

Mechanical property acceptance of listed forgings based on results, from

Forgings fluorescent penetrant inspected

Equipment certified to ASTM

Integral heat treating per forging.

Welding performed per print

Free from continuous casting

Material proof tested

Micro structure satisfactory

Which conforms to material specifications listed above are tabulated below

Forgings magnetic particle inspected

Free from cast structure

Code	Serial	Blank Material Report Mo. Do. Yr. No.	Test Identity	Yield Str. KSI % of	Ultimate Strength KSI	% Elong. IN	% Red. OF Area	DHN	S R	KSI	Temp. of Test ° F.	Hours at Load	% Elong. IN	% Red. OF Area
------	--------	--	------------------	------------------------	--------------------------	----------------	-------------------	-----	--------	-----	-----------------------	------------------	----------------	-------------------

***ACTIN A-808-64 Class 2 as modified by code case 1332-1 and 1338 edition
ASME code section III article 3 including all addenda through Function 1999
as modified by P.O.

Magnetic particles inspected per Ladish Procedure 107 M-2 dated 5-13-69
approved on Change Order #6. Results satisfactory.

***Austenitized 1600°F. ±10°F., hold at color for 6 hours, cold water quenched,
Re-austenitized 1500°F. ±10°F., held at color for 6 hours, cold water quenched;
tempered 1200°F. ±10°F., held at color for 14 hours, cold water quenched.

Heat treated in accordance with Ladish Procedure No. HIP-33 Rev. 0, dated
6-6-69, approved per Change Order No. 7.

Tensile tested per Ladish Procedure No. I.T.P.-15 Rev. 0, dated 6-6-69
approved per Change Order No. 7.

(Continued on page 2)

CODE		MILL	HEAT NO.			STOCK SIZE			GRAIN SIZE		HARDENABILITY				CHEMISTRY REPORT			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
ANY	LES	3P-2870J																
21	67	.005	.009	.20	.75	.30	.61	.01	.01	.01	.03	.007	.00	.01	.01	(Chart		
23	61	.005	.010	.25	.70	.32	.59	.03	.		.03				.01	(Ladish		

cc: L. Harrison (1)
Purch. Dept.
With Shipment (7)

Specification	Quantity(s) included in this shipment was (were) previously controlled and identified	DATE
300 to 310	300 and 310	11

ADDITION OF FORGINGS:

החל מהיום

IRGING HARDNESS IS WITHIN SPECIFIED RANGE OF:

mechanical property acceptance of listed forgings based on results, from

Արեւշտ. հոգի վերջ լուս Բռնցիւրդ.

Itch conforms to material specifications listed above and tabulated below:

Forgings produced per titanium alloy process sheet

110.

Foreign fluorescent penicillin inspected

Welding performed per print

Material proof tested

Forgings magnetic particle inspected

APPLICABLE WITH *

Equipment certified to MIL-STD-883C

Free from continuing cost:

Micro structural analysis

1. Free from soil structure

1

Code	Serial	Blank Motorized Report				Test Identity	Yield Str. KSI		Ultimate Strength KSI	Elong. IN	% Red. Of Area	BHN	S R	KSI	Temp. of Test F.	Hours at Load	Elong. IN	% Red. Of Area	KSI
		Mo.	Do.	Yr.	No.		% of												

ASACIA A-308-64 Class 2 as modified by code case 1332-1 and 1938 edition
ASME code section III article 3 including all addenda through December 1959
as modified by P.O.

Magnetic particle inspected per Indian Procedure 107 14-2 dated 5-13-60 approved on Change Order #6. Results satisfactory.

Re-austenitized 1640°F. $\pm 10^\circ\text{F.}$, held at color for 6 hours, cold water quenched;
Re-austenitized 1500°F. $\pm 10^\circ\text{F.}$, held at color for 6 hours, cold water quenched;
tempered 1240°F. $\pm 10^\circ\text{F.}$, held at color for 14 hours, cold water quenched.

Heat-treated in accordance with Indian Procedure No. ITP-35 Rev. 0, dated 6-6-69, approved per Change Order No. 7.

Impact tested per Ladish Procedure No. I.T.P.-15 Rev. O, dated 6-6-59
approved per Change Order No. 7.

• DIE HOTT FLA
V. V. HOTT
S. S. HOTT
E. COMBINATION

MATERIAL AND
THIS REPORT IS
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THESEBY CEN
BEST OF MY CO
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REPORT IS TAL

سید

JOHN AND JILL

WE TINS

17.-----

NY COMMISSION

(Continued on page 2)

CODE	MILL	HEAT NO.	STOCK SIZE			GRAIN SIZE			HARDENABILITY					CHEMISTRY REPORT	
C	M	D	S	SI	RI	GR	PS	CU	TA	SN	V	H		CI	CR
AAV	USS	3P-28703													
21	.67	.005	.009	.20	.75	.30	.61	.01	.01	.01	.03	.007	.00	.01	.01 (Chart
23	.61	.005	.010	.25	.70	.32	.59	.03	.		.03				.01 (Lad

cc: L. Harrison (;
Erich, Dept.

With Shipment . (3)

DOSCO, INC.
P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220
QUALITY CONTROL INSPECTION REPORT

SWRI
P. O. _____
P. R. PO 72330
K. O. 0707

Contract No. 732859 Item Calib. Bloc K
1/4 D3378055 Qty 1 ea NSN 5112 1
11-C5CL-5-000

		Age	Rel			Age	Rel			Age	Rel
1	5	✓		16	220 ± 0.10	✓		31			
2	2	✓		17	$3/16$	✓		32			
3	2	✓		18	$3/16$	✓		33			
4	4	✓		19	$3/16$	✓		34			
5	$8\frac{1}{4}$	✓		20	220 ± 0.10	✓		35			
6	$5\frac{1}{2}$	✓		21	437 ± 0.05	✓		36			
7	$2\frac{3}{4}$	✓		22				37			
8	95R	✓		23				38			
9	84R	✓		24				39			
10	$28\frac{7}{16}$	✓		25				40			
11	$5\frac{1}{2}$	✓		26				41			
12	2-750	✓		27				42			
13	5-500	✓		28				43			
14	P. 250	✓		29				44			
15	2	✓		30				45			

Tolerances on Dimensions
(unless otherwise specified)

Fractions $\pm \frac{1}{16}$
.X \pm _____
.XI \pm _____
.XXX \pm 0.10
Ang. \pm _____

Number of Samples 1
Number ACCEPTED 1
Number REJECTED 0

Number and Types of Defects found:

Corrective Action Taken:

LOT: ACCEPTED

REJECTED

Signed G. J. Paul

Date 29 Sep 77

Page 1 of 1

3733 PITLUK
P.O. Box 3452
San Antonio, Texas 78211
(512) 924-4734



HERCO
Aircraft Machine, Inc.

NO.2

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 88-0053 ITEM CALIBRATION Block
P/N D-3378055 (8) QTY. 1 ea NSN 580009

		ACC	REJ			ACC	REJ			ACC	REJ
1	3/4	✓		16				31			
2	DRILL & Ream ⁶ _{Ass}	✓		17				32			
3	2 3/4	✓		18				33			
4	.500 Res ⁵ _{Ass}	✓		19				34			
5				20				35			
6				21				36			
7				22				37			
8				23				38			
9				24				39			
10				25				40			
11				26				41			
12				27				42			
13				28				43			
14				29				44			
15				30				45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS ± 1/16 ANGLES ± 2

.X ± 1
.XX ± .010
.XXX ±

BARI	
2.0.	N/A
P. B.	580009
100	2535

NUMBER OF SAMPLES 1
NUMBER OF ACCEPTED 1
NUMBER OF REJECTED

PAGE OF

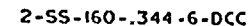
REMARKS:

LOT: ACCEPTED ✓
REJECTED

SIGNED Engine L. L.

DATE May 6, 1988

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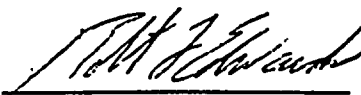
1. Name of the person or organization 2. Address 3. City 4. State 5. Zip		6. Date 7. Time		8. Subject 9. Remarks	
10. Name of the person or organization 11. Address 12. City 13. State 14. Zip		15. Date 16. Time		17. Subject 18. Remarks	



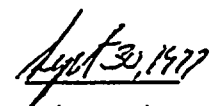
SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION STANDARDS

CALIBRATION STANDARD 2-SS-160-.344-6-DCC IS
HEREBY CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE
WITH SECTION IX 1974 EDITION OF THE ASME BOILER AND
PRESSURE VESSEL CODE . THE P - NUMBER CLASSIFICATION FOR THIS
CALIBRATION STANDARD IS SUBSTANTIATED WITH THE ATTACHED
CHEMICAL ANALYSIS REPORT FOR SA376 TYP316 HT.07439
IN ACCORDANCE WITH THE MATERIALS SPECIFICATION SECTION II
OF THE ASME BOILER AND PRESSURE VESSEL CODE



(SIGNATURE)



(DATE)

P.O. 37082SW
 B. R. 67234
 LMS 0669AB

Allegheny Ludlum Steel Corporation
 Watervliet, New York 12189

2" 3/16" T

CERTIFICATE OF TEST

Invoice #A-1918

<u>Customer</u>	<u>Customer Order No.</u>	<u>Mill Order No.</u>	<u>Date Shipped</u>
Capitol Pipe & Steel Products, Inc.	61215-00-N	0-0-97366	9/13/72

Product Description

Allegheny Stainless Steel Type 316 cold finished Extruded seamless Pipe to
 ASTM-A-376 and ASME SA-376 plain ends

Size 2" Sch 160 2.375" O.D. x .343" wall 17/24 FT R/L

Flattening Test OK

Hydrostatic Test (psi) 2500psi OK. Time 5 seconds

Heat Treatment "Extrusion Anneal -1- Selas"

Date of last Furnace calibration 6/17/72

Southwest Research
 PO 37082SW
 SO HQ-2110-A
 Item 1
 P.O. Item B

Chemical Analysis

Heat No.	C	Mn	P	S	Si	Cr	Ni	Mo	Cu	Co	
07182	.060	1.63	.027	.027	.59	16.65	13.26	2.20	.27	.18	(Ladle)
	.063	1.65	.027	.027	.58	16.74	13.38	2.22	.27	.18	(Check)
07439	.064	1.61	.024	.022	.48	17.32	13.36	2.14	.24	.18	(Ladle)
	.066	1.65	.024	.021	.49	17.46	13.38	2.15	.25	.19	(Check)
07491	.052	1.59	.029	.027	.50	17.26	13.30	2.33	.20	.19	(Ladle)
	.056	1.63	.029	.025	.52	17.21	13.23	2.32	.22	.19	(Check)

Physical Properties

Heat No.	Yield Strength	Tensile Strength	Elong. %	R. A. %	Hardness	Lot #
07182	42,100	81,400	53.0		RB 82/83	01-007
07182	38,800	83,800	56.0		RB 82/83	01-008
07182	37,300	83,200	57.0		RB 82/83	01-009
07182	39,700	82,600	60.0		RB 86/87	01-007
07182	34,900	81,200	59.0		RB 79/83	01-008
07439	38,600	83,400	56.0		RB 80/82	01-009
07439	36,600	82,400	59.0		RB 79/81	01-010
07439	36,600	82,400	59.0		RB 79/81	01-010
07491	37,000	80,000	59.0		RB 83/84	01-011
07439	41,900	85,400	54.0		RB 83/85	01-012

Subscribed and Sworn to before me

This Date Sept. 19, 1972
James M. Taylor
 Notary Public

Analyses and Results Certified as above
 Allegheny Ludlum Steel Corporation
 Division of Allegheny Ludlum Industries, Inc.

F. P. Moore
 9/19/72 F D Moore
 Chief Test Engineer

DOSCO, INC.
P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220
QUALITY CONTROL INSPECTION REPORT

no. 2

Contract Hrs. 732847 Item Calib. Block
P/N 13378053 Qty 1 ea NSN 51001
2-SS-160-.344-6-DCC

		Acc	Ret			Acc	Ret			Acc	Ret
1	3/4	✓		16				31			
2	3/4	✓		17				32			
3	1 1/2	✓		18				33			
4	3 3/4	✓		19				34			
5	6 1/4	✓		20				35			
6	3/4	✓		21				36			
7	3/4	✓		22				37			
8	1 1/2	✓		23				38			
9	15/16	✓		24				39			
10	2 R. MAX.	✓		25				40			
11	5 R. MAX.	✓		26				41			
12	.034 ± .003	✓		27				42			
13	.062 typ	✓		28				43			
14				29				44			
15				30				45			

Tolerances on Dimensions
(unless otherwise specified)

Fractions ± 1/16
.X ± ✓
.X1 ± ✓
.XXX ± .010
Ang. ± 1°

Number of Samples 1
Number ACCEPTED 1
Number REJECTED 0

Number and Types of Defects found:

Corrective Action Taken:

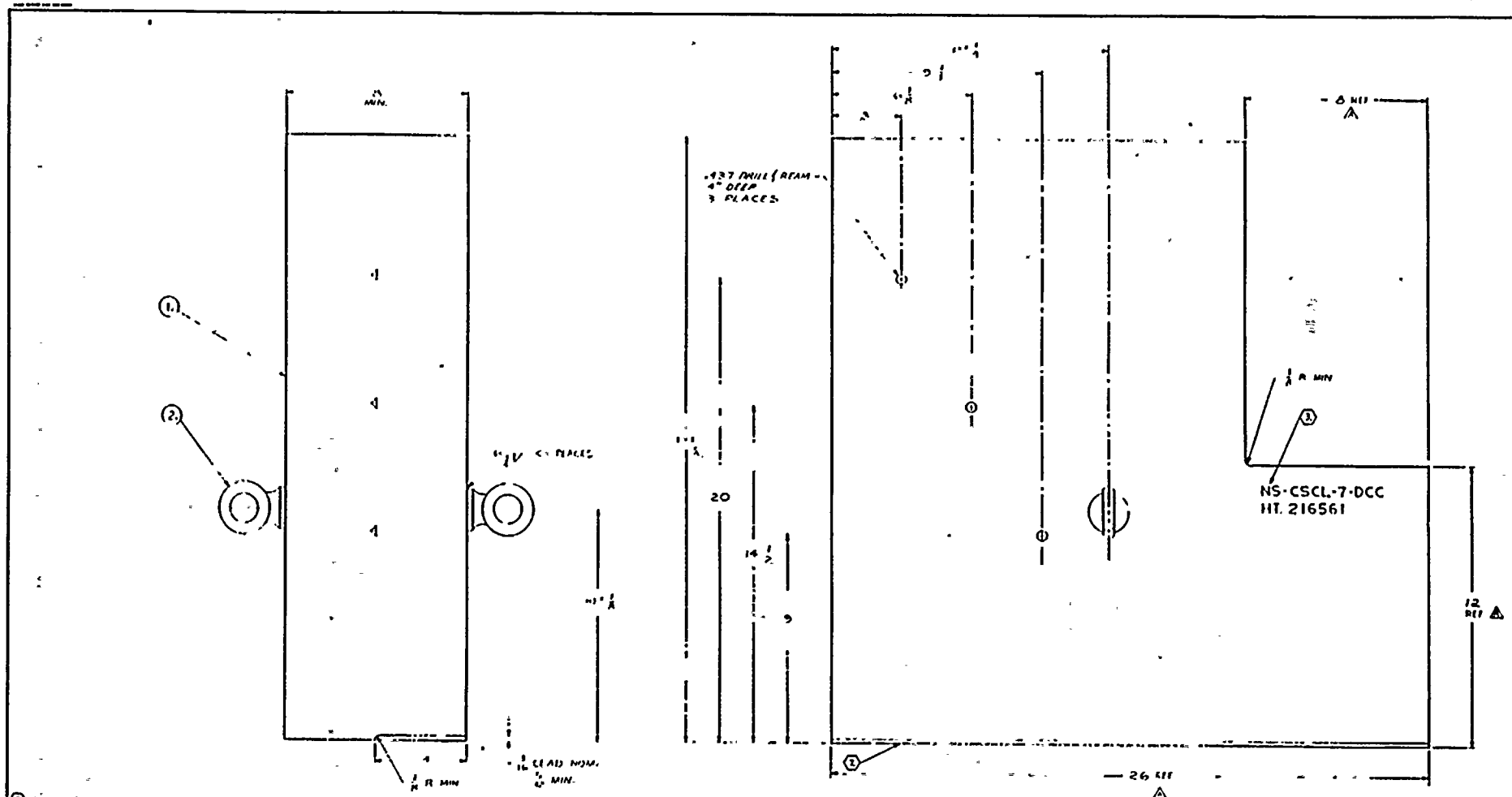
LOT: ACCEPTED

REJECTED

Signed J. D. Bailey
Date 6 Sept 77

Page 1 of 1

C-27



① OVERLAY CLADDING IN ACCORDANCE WITH SAE AMS-900-2, REV. O.

② ULTRASONIC EXAMINATION TO BE PERFORMED IN ACCORDANCE WITH ASTM E165, 1971 ARTICLE 23, SASTB INCLUDING ACCEPTANCE STANDARD II VII T AND SUPPLEMENTARY REQUIREMENTS 51 PRIOR TO MACHINING.

③ MAKE FROM SASTB CLX HEAT NO. 216561 WARE MARK NO. 0111A 1/4

④ STEEL STAMP STANDARD ID. NO. AND HEAT NO., AS SHOWN, ON SURFACE INCL. AT 11, IN CHARACTERS 3/16 MIN. HEIGHT.

⑤ MATERIAL FOR STANDARD TO BE FREE FABRICATION OR REPAIR WELDS AND LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATION.

⑥ BREAK SHARP EDGES AND REMOVE BURRS.

NOTES:

NS-CSCL-7-DCC

1974		1975		1976		1977		1978		1979		1980		1981		1982		1983		1984		1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996		1997		1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		2020		2021		2022		2023		2024		2025		2026		2027		2028		2029		2030		2031		2032		2033		2034		2035		2036		2037		2038		2039		2040		2041		2042		2043		2044		2045		2046		2047		2048		2049		2050		2051		2052		2053		2054		2055		2056		2057		2058		2059		2060		2061		2062		2063		2064		2065		2066		2067		2068		2069		2070		2071		2072		2073		2074		2075		2076		2077		2078		2079		2080		2081		2082		2083		2084		2085		2086		2087		2088		2089		2090		2091		2092		2093		2094		2095		2096		2097		2098		2099		2100		2101		2102		2103		2104		2105		2106		2107		2108		2109		2110		2111		2112		2113		2114		2115		2116		2117		2118		2119		2120		2121		2122		2123		2124		2125		2126		2127		2128		2129		2130		2131		2132		2133		2134		2135		2136		2137		2138		2139		2140		2141		2142		2143		2144		2145		2146		2147		2148		2149		2150		2151		2152		2153		2154		2155		2156		2157		2158		2159		2160		2161		2162		2163		2164		2165		2166		2167		2168		2169		2170		2171		2172		2173		2174		2175		2176		2177		2178		2179		2180		2181		2182		2183		2184		2185		2186		2187		2188		2189		2190		2191		2192		2193		2194		2195		2196		2197		2198		2199		2200		2201		2202		2203		2204		2205		2206		2207		2208		2209		2210		2211		2212		2213		2214		2215		2216		2217		2218		2219		2220		2221		2222		2223		2224		2225		2226		2227		2228		2229		2230		2231		2232		2233		2234		2235		2236		2237		2238		2239		2240		2241		2242		2243		2244		2245		2246		2247		2248		2249		2250		2251		2252		2253		2254		2255		2256		2257		2258		2259		2260		2261		2262		2263		2264		2265		2266		2267		2268		2269		2270		2271		2272		2273		2274		2275		2276		2277		2278		2279		2280		2281		2282		2283		2284		2285		2286		2287		2288		2289		2290		2291		2292		2293		2294		2295		2296		2297		2298		2299		2300		2301		2302		2303		2304		2305		2306		2307		2308		2309		2310		2311		2312		2313		2314		2315		2316		2317		2318		2319		2320		2321		2322		2323		2324		2325		2326		2327		2328		2329		2330		2331		2332		2333		2334		2335		2336		2337		2338		2339		2340		2341		2342		2343		2344		2345		2346		2347		2348		2349		2350		2351		2352		2353		2354		2355		2356		2357		2358		2359		2360		2361		2362		2363		2364		2365		2366		2367		2368		2369		2370		2371		2372		2373		2374		2375		2376		2377		2378		2379		2380		2381		2382		2383		2384		2385		2386		2387		2388		2389		2390		2391		2392		2393		2394		2395		2396		2397		2398		2399		2400		2401		2402		2403		2404		2405		2406		2407		2408		2409		2410		2411		2412		2413		2414		2415		2416		2417		2418		2419		2420		2421		2422		2423		2424		2425		2426		2427		2428		2429		2430		2431		2432		2433		2434		2435		2436		2437		2438		2439		2440		2441		2442		2443		2444		2445		2446		2447		2448		2449		2450		2451		2452		2453		2454		2455		2456		2457		2458		2459		2460		2461		2462		2463		2464		2465		2466		2467		2468		2469		2470		2471		2472		2473		2474		2475		2476		2477		2478		2479		2480		2481		2482		2483		2484		2485		2486		2487		2488		2489		2490		2491		2492		2493		2494		2495		2496		2497		2498		2499		2500		2501		2502		2503		2504		2505		2506		2507		2508		2509		2510		2511		2512		2513		2514		2515		2516		2517		2518		2519		2520		2521		2522		2523		2524		2525		2526		2527		2528		2529		2530		2531		2532		2533		2534		2535		2536		2537		2538		2539		2540		2541		2542		2543		2544		2545		2546		2547		2548		2549		2550		2551		2552		2553		2554		2555		2556		2557		2558		2559		2560		2561		2562		2563		2564		2565		2566		2567		2568		2569		2570		2571		2572		2573		2574		2575		2576		2577		2578		2579		2580		2581		2582		2583		2584		2585		2586		2587		2588		2589		2590		2591		2592		2593		2594		2595		2596		2597		2598		2599		2600		2601		2602		2603		2604		2605		2606		2607		2608		2609		2610		2611		2612		2613		2614		2615		2616		2617		2618		2619		2620		2621		2622		2623		2624		2625		2626		2627		2628		2629		2630		2631		2632		2633		2634		2635		2636		2637		2638		2639		2640		2641		2642		2643		2644		2645		2646		2647		2648		2649		2650		2651		2652		2653		2654		2655		2656		2657		2658		2659		2660		2661		2662		2663		2664		2665		2666		2667		2668		2669		2670		2671		2672		2673		2674		2675		2676		2677		2678		2679		2680		2681		2682		2683		2684		2685		2686		2687		2688		2689		2690		2691		2692		2693		2694		2695		2696		2697		2698		2699		2700		2701		2702		2703		2704		2705		2706		2707		2708		2709		2710		2711		2712		2713		2714		2715		2716		2717		2718		2719		2720		2721		2722		2723		2724		2725		2726		2727		2728		2729		2730		2731		2732		2733		2734		2735		2736		2737		2738		2739		2740		2741		2742		2743		2744		2745		2746		2747		2748		2749		2750		2751		2752		2753		2754		2755		2756		2757		2758		2759		2760		2761		2762		2763		2764		2765		2766		2767		2768		2769		2770		2771		2772		2773		2774		2775		2776		2777		2778		2779		2780		2781		2782		2783		2784		2785		2786		2787		2788		2789		2790		2791		2792		2793		2794		2795		2796		2797		2798		2799		2800		2801		2802		2803		2804		2805		2806		28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SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION STANDARDS

CALIBRATION STANDARD NS-CSCL-7-DCC IS
HEREBY CLASSIFIED AS P-NUMBER 3 GROUP 3 IN ACCORDANCE
WITH SECTION IX 1974 EDITION OF THE ASME BOILER AND
PRESSURE VESSEL CODE . THE P - NUMBER CLASSIFICATION FOR THIS
CALIBRATION STANDARD IS SUBSTANTIATED WITH THE ATTACHED
CHEMICAL ANALYSIS REPORT FOR SA508 CLII, HT 216561
IN ACCORDANCE WITH THE MATERIALS SPECIFICATION SECTION II
OF THE ASME BOILER AND PRESSURE VESSEL CODE .


(SIGNATURE)

Sept 30, 1977
(DATE)



Cleveland Forge Inc.

P. O. Box 1038 Cleveland, Texas 77327
Telephone (713) 592-8769

38923SW
69495

CUSTOMER'S ORDER No
38923.SW

DATE
3-20-77

JOB ORDER No
4382

SOLD TO Southwest Research Institute
P. O. Box 28510
San Antonio, Texas

SHIPPED TO Southwest Research Institute
8500 Culebra
San Antonio, Texas

QUANTITY	DESCRIPTION
1	Material: A-508-Class 2 Rough to finish: 8" x 26" x 26"

CHEMICAL ANALYSIS

	HEAT NO.	MILL	C	MN	PHOS	SUL	SIL	NI	CR	MO	CU		
1	216561	Sharon	.18	.76	.012	.014	.25	.72	.38	.65			
2													
3													
4													
5													

PHYSICAL PROPERTIES

	YIELD STRENGTH LBS./SQ. IN.	TENSILE STRENGTH LBS./SQ. IN.	ELONG. IN.	RED. OF AREA %	DRINELL	CHARPY TYPE	LAT. EXPANS. IN.	SHEAR FRAC.	TEST TEMP.
1	63,000	94,000	24.5	50.2					
2									
3									
4									
5									

HEAT TREATMENT

	HEAT TREAT	TEMP.	TIME AT TEMP.	AUSTENITE GRAIN SIZE	FERRITE GRAIN SIZE
1	Norm	1650°	6 Hrs.		
2	Temp	1100°	12 Hrs.		
3					
4					
5					

SUBSCRIBED AND SWORN TO BEFORE ME

461-36-9765

THIS 20 DAY OF September 19 77

[Signature]
NOTARY PUBLIC

I certify that this is a true copy of original test sheet now on file at the Office of Cleveland Forge Inc., and that this steel was manufactured and forged in the United States of America

BY *[Signature]*



Cleveland Forge Inc.

P. O. Box 1038 Cleveland, Texas 77327
Telephone (713) 592-8769

CUSTOMER'S ORDER No
15122 SW

DATE
8-23-77

JOB ORDER No
Your stock

SOLD TO

Southwest Research Institute
P. O. Box 28510
San Antonio, Texas 78284

SHIPPED TO

Cleveland Forge
Pelican Road
Cleveland, Texas

QUANTITY	DESCRIPTION
1	Material: A-508 - Class II 12" x 12" Billet Wt. 3677 your stock Approx. Wt. After 1 piece on your order 35122-SW - 3677#

CHEMICAL ANALYSIS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
HEAT NO.	MILL	C	MN	PHOS	SUL	SIL	NI	CR	MO	CU				
216-52	Sharon	.18	.76	.012	.014	.25	.72	.38	.65					
2														
3														
4														
5														

PHYSICAL PROPERTIES

1	2	3	4	5	6	7	8	9	10	11	12
YIELD STRENGTH LBS/SQ. IN.	TENSILE STRENGTH LBS/SQ. IN.	ELONG. IN. IN.	RED. OF AREA %	BRINELL	CHARPY FT LBS		LAT. EXPAN. IN.	SHEAR FRAC.	TEST TEMP. °F		
1											
2											
3											
4											
5											

HEAT TREATMENT

1	2	3	4	5	6	7
HEAT TREAT	TEMP. °F	TIME AT TEMP.	AUSTENITE GRAIN SIZE	FERRITIC GRAIN SIZE		
1						
2						
3						
4						
5						

SUBSCRIBED AND SWORN TO BEFORE ME

461-36-9765

THIS 23 DAY OF August 1977

[Signature]
NOTARY PUBLIC

I certify that this is a true copy of original test sheet now on file at the office of Cleveland Forge Inc. and that this steel was manufactured and forged in the United States of America.

BY

[Signature]

DOSCO, INC.
P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220
QUALITY CONTROL INSPECTION REPORT

no. 2

Contract No. 73.2909

Item CALIBRATION BLOCK

Part D-3378058

Qty 1 EA

For SOUTHWEST RESEARCH INSTITUTE

		Acc	Ret			Acc	Ret			Acc	Ret
1	8 MIN	8%		16	1/8 MIN	✓		31			
2	10 ± 1/8	✓		17	12 REF	11%		32			
3	1/4 WELD 2 PLACES	✓		18	26 REF	26%		33			
4	4	✓		19	PAI PER NOTE 3	✓		34			
5	3/16 CLND	✓		20				35			
6	9	✓		21				36			
7	14 1/2	✓		22				37			
8	20	✓		23				38			
9	26 REF	25 3/32		24				39			
10	437 VILL + 16714 4" DP SPL	✓		25				40			
11	3	✓		26				41			
12	6 1/8	✓		27				42			
13	9 1/4	✓		28				43			
14	12 ± 1/8	✓		29				44			
15	8 REF	7 1/4		30				45			

Tolerances on Dimensions
(unless otherwise specified)

Fractions ± 1/16
X ± 7
XX ± 0.030
XXX ± 7
Ang. ± —

Number of Samples 1
Number ACCEPTED 1
Number REJECTED —

Number and Types of Defects Found:

Corrective Action Taken:

LOT: ACCEPTED
REJECTED
Signed Bob Fender
Date 1 Oct 77

Page 1 of 1

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SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK IR-CSCL-8-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 3 GROUP 3 IN ACCORDANCE WITH
SECTION II 1983 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA508 CL2, Ht 3P-2870 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

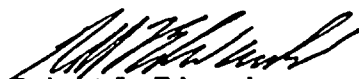
DESIGN CRITERIA

The design for the above calibration block incorporates the requirements of
Section V and Section XI, 1983 Edition, Summer 1983 Addenda of the ASME
Boiler and Pressure Vessel Code. The design also meets SwRI nondestructive
testing procedure requirements and tolerances.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-059B

Revised 5/17/88


Robert L. Edwards

SIGNATURE

Lead Engineer

TITLE

5/20/88

DATE

PHONE 312/865-0400

2672 GARDNER RD., BROADVIEW, ILL.

CHARLES C. KAWIN COMPANY

METALLURGICAL LABORATORIES

CHEMISTS • MECHANICAL TESTING • METALLOGRAPHERS • CONSULTANTS
MAILING ADDRESS / P.O. BOX 310 / MAYWOOD, ILLINOIS 60153

Southwest Research Institute
8500 Culebra
San Antonio, Texas 78284
Attn: R. Edwards, Dept 17

DATE OF REPORT: 1-20-77

DESCRIPTION:

~~XP070PR45506~~

REQ/PO PR45506

REPORT OF MECHANICAL TESTS

SAMPLE IDENTIFICATION	DIAM. IN INCHES	YIELD STRENGTH LBS. PER SQ. IN.	TENSILE STRENGTH LBS. PER SQ. IN.	ELONGATION ON IN.	ELONGATION PER CENT	REDUCTN OF AREA PER CENT	BRINELL 3000 KG LOAD	ROCKWELL HARDNESS	IMPACT TESTS

Lab #73

REPORT OF CHEMICAL ANALYSIS

SAMPLE IDENTIFICATION	SI	MN	C	P	S	NI	CR	MO	CU	NG	AL
Log #0556A Carbon Steel	.29	.66	.22	.010	.010	.75	.37	.63			

DATE

2025-01-01

228

309

ಅಂಕ 112

APPLICABLE WITH

Equipment certified to MIL-STD-883C

1100 from continuous collection

Micro structure satisfactory

Forgings magnetic particle inspected

1744-
1751/62

* DID NOT REA

Y = Y.101CH

5: 520711
6: 520711

E 076000! 1981

DATE: 12/12/2005
TIME: 1:13:05 PM

**THIS LISTED BY
AND DESCRIBED**

על שם ה' אלהינו

With Shipment . (3)

BLANKET NOTARIZED REPORT NUMBER

Code	Serial	Blank Notarized Report No.	Da.	Yr.	No.	Test Identity	Yield Str. KSI % of St.	Ultimate Strength KSI	% Elong. IN	% Red. Of Area	BHN	S R	KSI	Temp. of Test ° F.	Hours of Load	% Elong. IN	% Red. Of Area	SYNOPSIS OF TESTS KSI AFTER 1 HOUR
------	--------	----------------------------	-----	-----	-----	---------------	----------------------------	-----------------------	----------------	-------------------	-----	--------	-----	-----------------------	------------------	----------------	-------------------	---------------------------------------

Ultrasonic tested per (L) Procedure 9036 dated 2-9-66 with instruction 100-100-100 dated 2-3-69 and amendment to L.S. #32 dated 6-6-69 approved per Charge: (blank) satisfactory. Report also recd.

AAV 195 Location 0" 62.8 83.9 27 69
Grain Size: Fied. 6
V-Notch Impacts +10°F: 49.5 40 50
14.0 14 10
39.0 33 16
V-Notch Impacts +40°F 34.0 29 18
53.0 44 30
60.0 51 20

AAV 195 Location 130° 67.2 89.2 26 70
Grain Size: Fied. 7
V-Notch Impacts +10°F 70.0 61 51
59.3 47 37
67.3 50 33
V-Notch Impacts +40°F 115.0 71 50
67.5 67 35
67.0 59 30

CODE	MILL	HEAT NO.	STOCK SIZE	GRAIN SIZE	HARDENABILITY	CHEMISTRY REPORT'S N.Y.

DOSCO, INC.
P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220
QUALITY CONTROL INSPECTION REPORT

no. 2

Contract Nbr 732866 Item Calib Block
P/N D3378059 Qty 1 ea NSN 54121

		Acc	Rej			Acc	Rej			Acc	Rej
1	6	✓		16				31			
2	4	✓		17				32			
3	3	✓		18				33			
4	2	✓		19				34			
5	0.32	✓		20				35			
6	2R	✓		21				36			
7	5.32 - 5.38K	✓		22				37			
8	2	✓		23				38			
9	.950	✓		24				39			
10	1.825	✓		25				40			
11	2.610	✓		26				41			
12				27				42			
13				28				43			
14				29				44			
15				30				45			

Tolerances on Dimensions
(unless otherwise specified)

Fractions $\pm \frac{1}{16}$
.X \pm _____
.XX \pm _____
.XXX \pm .010
Ang. \pm _____

Number of Samples 1
Number ACCEPTED 1
Number REJECTED 0

Number and Types of Defects Found:

Corrective Action Taken:

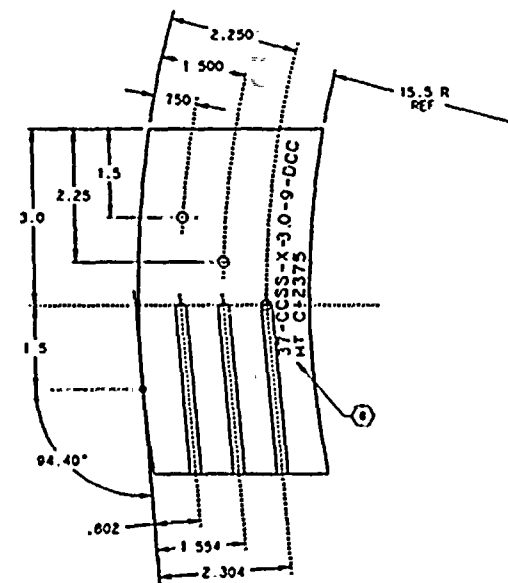
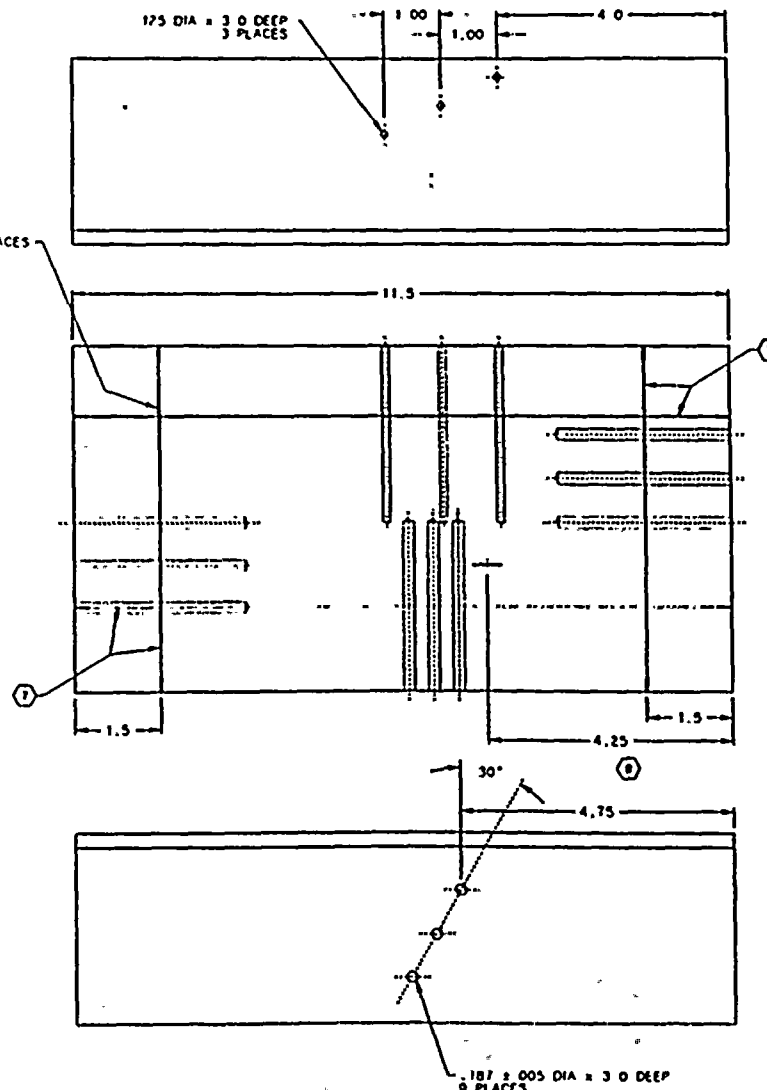
LOT: ACCEPTED

REJECTED

Signed A. Payler

Date 27 Sept 77

Page 1 of 1



NOTES:

1. DIMENSIONS ARE IN INCHES.
2. DEBURR AND BREAK SHARP EDGES.
3. DO NOT MACHINE OR ALTER I.D. OR O.D. SURFACES.
4. I.D. AND O.D. SURFACES ARE TO BE FREE OF TOOL MARKS.
5. MATERIAL FOR BLOCK MUST BE FREE OF:
 - WELD BEAM WELDS.
 - FABRICATION OR REPAIR WELDS.
 - ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
6. STEEL STAMP I.D. NO. AND HEAT NO. AS SHOWN ON SURFACE INDICATED, IN CHARACTERS 3/16 MIN HEIGHT.
7. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STAMP OR MILL CUT AND INK MARK AT ENDS OF EACH CENTERLINE AS SHOWN, 1/32 x 1/32 x 1/4 LONG.
8. MAKE FROM SA351, CF8M, HEAT NO. C-2375, SWRI RIC NO. 38, MATERIAL SUPPLIED BY D C COOK.
9. AS-BUILT NOTCH LOCATION

C	10038	8/31/73	RLR	8/31/73	8/31/73	RL
B	10048	8/3/73	RLR	8/16/73	8/16/73	RL
A	1971	10/26/73	JFC	ALL	10/26/73	CR
WFO	000000	00-00	00-00	00-00	00-00	00-00

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

Calibration block 37-CCSS-X-3.0-9-DCC is hereby classified as P-Number 8 group 1 in accordance with Section IX 1983 Edition of the ASME Boiler and Pressure Vessel Code. The P-Number classification for this calibration block is substantiated with the attached mill test report for SA351, CF8M, HtC-2375 and meets the block material requirements of Section XI, Appendix III, III-3411 of the ASME Boiler and Pressure Vessel Code.

Design Criteria

The original design and modification for the above calibration block incorporates the requirements of Sections V and XI, 1983 Edition of the ASME Boiler and Pressure Vessel Code. The design also meets American Electric Power purchase order and quality assurance requirements.

Attachments

- Mill Test Report
- Preliminary UT Data Sheets
- Dimensional Data Sheets
- Final UT Acceptance Data Sheets
- Nonconformance Report
- Drawing D-3378-066 Rev. C


Robert L. Edwards

Sr. Research Engineer
Title

September 1, 1995
Date

U. S. PIPE AND FOUNDRY COMPANY
Industrial Products ~~STEELWORKS~~ DIVISION
 BURLINGTON, NEW JERSEY

D 3378-066

CERTIFICATE OF CHEMICAL ANALYSIS

DATE 11/29/72

TO WHOM IT MAY CONCERN:

We do hereby certify that the analysis of the material described below conforms to that shown on this sheet.

Westinghouse Electric Corporation

Customer Atomic Power Division

Customer's Order No. 546-CUG-86013-V

Material ASTM A-351 Grade CF8M

Our Order No. LE 08508

[illegible]

Sworn and subscribed to
before me this 29th day
of November 19 72

of November 19 1972
Kenneth P. Voth
 Notary Public

[Signature]
Chief Inspector
Industrial Products Division

D3378-066.

EU-203

1.P.D.
EXH.D.

CERTIFICATE OF PHYSICAL PROPERTIES

WORKING DRAWING

Date 11/29/72

To Whom It May Concern:

We do hereby certify that the following mechanical property values have been determined by standard testing procedures.

Westinghouse Electric Corporation

Customer: Atomic Power Division

Customer's Order No. 546-GHC-86013 VII

Material: ASTM A-351 Grade CF8M

Our Order No. 117 08508

No. Test	Heat Number	Date Shipped	Yield Strength	Ultimate Strength	Elong.	R. A.	Brinell Hardness
ROOM TEMPERATURE							
1	C-1919		42,460 <	79,620	45.0	62.0	202
1	C-2375		38,960 ✓	80,220 ✓	47.0 ✓	71.2	228
ELEVATED TEMPERATURE (650°F.)							
1	C-1919		22,000	65,250	38.0	55.5	
1	C-2375		22,900 ✓	64,500	41.0	55.5	

R 12-12-72

Sworn and subscribed to
before me this 29th day
of November 1972

Notary Public

UNITED STATES PIPE & FOUNDRY COMPANY

Chief Inspector
Industrial Products Division

D3378-066

DIVISION OF

THERMO NATIONAL INDUSTRIES, INC.

100-34 JOHNSON STREET • NEWARK, NEW JERSEY 07105

TELEPHONE (201) 637-3032 • (212) 257-0267

METAL TREATING

CERTIFICATION

CUSTOMER

US PIPE & FOUNDRY
BUPLINGTON, N.J.

ATTENTION:

MRS S. MURRAY

Gentlemen:

This certifies that the above parts were treated by us as follows:

☐ CARBURIZED

Temperature (°F.)
Time (hours)
Case Depth
Medium
Case Core
Hardness

☐ HARDENED

Temperature (°F.) Hrs.
Quench Medium
Temper Temp. (°F.) Hrs.
Retemper (°F.) Hrs.
Hardness

☐ NITRIDED

Stage 1, Temp. (°F.)
Time (Hrs.)
Stage 2, Temp. (°F.)
Time (Hrs.)

Nitrided Depth

☐ SOLUTION TREATED

Temperature (°F.)
Time (Hrs.)
Quench Medium
Condition

☐ OTHER HEAT TREATMENT

Temp. (°F.) Time (Hrs.)
Tufftride per AMS 2755
Micro X
Normalize
Stress Rel.
Anneal
Sub-Zero
☐ BRAZED or ☐ SOLDERED
Copper
Silver
Aluminum Dip

☐ MAGNAFLUXED

No. of Pieces Checked
No. of Pieces Passed
Comments

☐ AGED

Temperature (°F.)
Time (Hrs.)
Condition

☐ GENERAL INFORMATION

Inspection Method
Inspection Percentage Spot 10% 100%
Atmosphere
Furnace No. Type
Specs MIL-H-6875 MIL-H-6088
MIL-H-6090 MIL-C-7701
Other

☐ REMARKS

2050-4HRT ATHT
WATER QUENCH
AGITATE IN TANK
USE TEST SPRAY ON TO

Subscribed and Sworn to before me this

20 day of MAY 1972

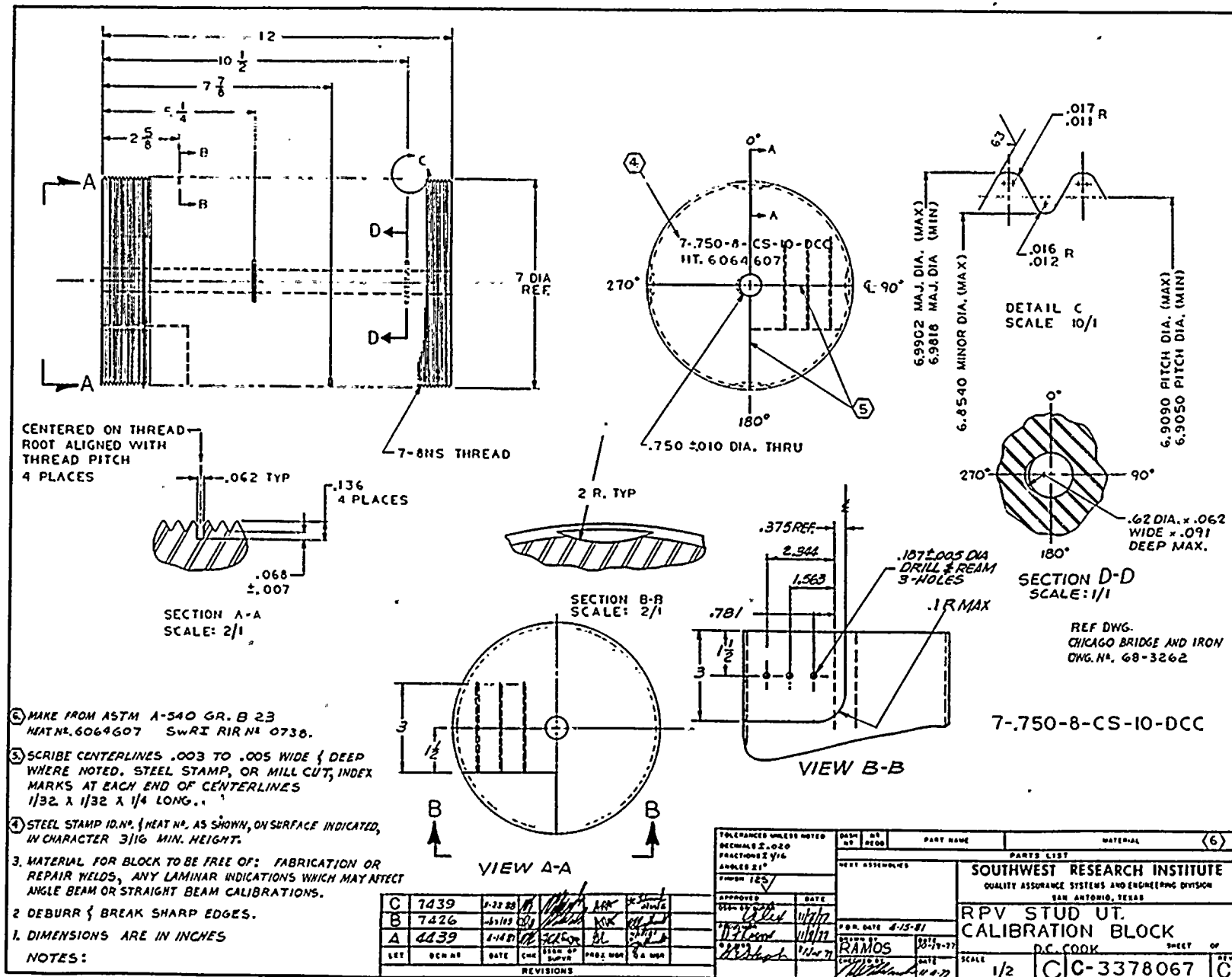
Notary Public of New Jersey

My Commission Expires

Very truly yours,

LM/METAL TREATING

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SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK 7-.750-8-CS-10-DCC IS HEREBY
CLASSIFIED AS P-NUMBER *N/A GROUP IN ACCORDANCE WITH
SECTION IX 1983 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA 540 GRB23, Ht 6064607 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design modification for the above calibration block incorporates the examination requirements of Section XI, 1983 edition, Summer 1983 Addenda and Code Case N-375-2 of the ASME Boiler and Pressure Vessel Code. The design also compiles with SwRI nondestructive testing procedure requirements.

*SA 540 bolting material does not have a P-number classification in accordance with Section IX of the ASME Boiler and Pressure Vessel Code.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI) N/A
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) C-3378-067C

Revised 11/23/88

Robert L. Edwards

SIGNATURE

Lead Engineer

TITLE

11/23/88

DATE



ALLEN-FRY STEEL COMPANY

5524 ALCOA AVENUE - LOS ANGELES, CALIFORNIA 90058
TELEPHONE 582-0611

No. 024942

CERTIFIED TEST REPORT

SOUTHWEST RESEARCH
6220 CULEBRA ROAD
SAN ANTONIO, TX 72284

SHIP TO

DUNS 00-795-2859

SHIP TO	
P. C.	4349354
P. R.	77069
LOG	0738

ORDER NUMBER	CUSTOMER'S ORDER NUMBER	ORDER DATE	ENTERED BY	PARTIAL SHIPMENT	COMPLETE ORDER	SHIP TO SAME AS SOLD TO UNLESS OTHERWISE NOTED
	PO84349354	11-1-77	WEILAND	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

MILL SOURCE	COLOR	SIZE & DESCRIPTION
Republic	Yellow	Ladle Vacuum Degassed HR E-4340 Norm & Temp Cond E-1 MILS 5000D And 1 AMS 6415H

CHEMICAL ANALYSIS AMS 2301															
HEAT NO.	C	MN	P	SU	SI	CR	NI	MO	VA	AL	SE	TI	CU	CB	COD
6064607	.40	.74	.008	.015	.30	.78	1.76	.22		.032			.10		

PHYSICAL PROPERTIES													HARDENABILITY		
	YIELD. LBS./SQ. IN.	TENSILE STRENGTH LBS./SQ. IN.	ELONG % IN IN.	RED OF AREA %	BRINELL	ROCK. WELL	KHN SIZE GRAIN	D DUKES	M ACRO	M MICRO	C H R		6	20	32
Freq. .00 Rev. .00					207/ 187			7	0%				55	54	43

SUBSCRIBED AND SWORN TO BEFORE ME
OFFICIAL SEAL
MICHAEL CHANOWYZ
THIS 25th DAY OF JULY 1977
NOTARY PUBLIC
IN AND FOR THE COUNTY OF LOS ANGELES, STATE OF CALIFORNIA

THE ALLEN-FRY STEEL CO. CERTIFIES THAT THIS IS A TRUE COPY
OF THE ORIGINAL MILL TEST REPORT NOW ON FILE AND THAT THE
SPECIALTY METAL COVERED BY THIS TEST REPORT WAS MELTED IN
A STEEL MANUFACTURING FACILITY LOCATED IN THE UNITED
STATES OR ITS POSSESSIONS

BY Donald E. Mackay
AUTHORIZED CERTIFICATION CLERK



Capitol Heat Treating Co., Inc.

CERTIFICATION

CUSTOMER: Southwest Research Institute
8500 Culebra
San Antonio, Texas 78284

11118 B NORTH LAMAR
AUSTIN, TEXAS 78733

SWRI
P. O. 44136 SW
P. B. 77182
LOG 0746 A

THIS IS TO CERTIFY THAT THE MATERIAL WAS PROCESSED PER SPECIFICATION NO. MIL-H-6875

DATE 11/23/77	INVOICE NUMBER 010308	CUSTOMER P. O. NO. 44136SW	OTHER
QUANTITY	PART NUMBER	PART NAME	
1		Threaded Stud	

MATERIAL SPECIFICATIONS 4340

RESULTS ARE AS FOLLOWS:

UTS	HARDNESS 305 - 322 HRN
YIELD	OTHER
% ELONGATION	

Capitol Heat Treating Co., Inc.

BY Dorothy M. [Signature]

DOSCO, INC.
P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220
QUALITY CONTROL INSPECTION REPORT

no. 2

Contract Nrn. 732981 Item Calib. Block.
P/N 0.337 8067 (REV 0) QTY 1 ea NSN 5111 R.1
7-750-8-CS-10-ACC

		Acc	Rej.		Acc	Rej.		Acc	Rej.
1	2 5/8	✓		16			31		
2	5 1/4	✓		17			32		
3	7 7/8	✓		18			33		
4	10 1/2	✓		19			34		
5	12	✓		20			35		
6	750 ± 0.00	✓		21			36		
7	I.R. Typ.	✓		22			37		
8	.136	✓		23			38		
9	0.68 ± 0.07	✓		24			39		
10	0.62 Typ.	✓		25			40		
11				26			41		
12				27			42		
13				28			43		
14				29			44		
15				30			45		

Tolerances on Dimensions
(unless otherwise specified)

Fractions ± 1/16
.X ± _____
.XI ± _____
.XXX ± 0.00
Ang. ± 1°

Number of Samples 1
Number ACCEPTED 1
Number REJECTED 0

Number and Types of Defects Found:

SWRI
R. 032027
P. R.
LOG 0745

Corrective Action Taken:

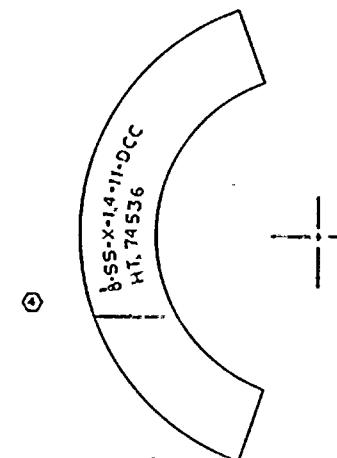
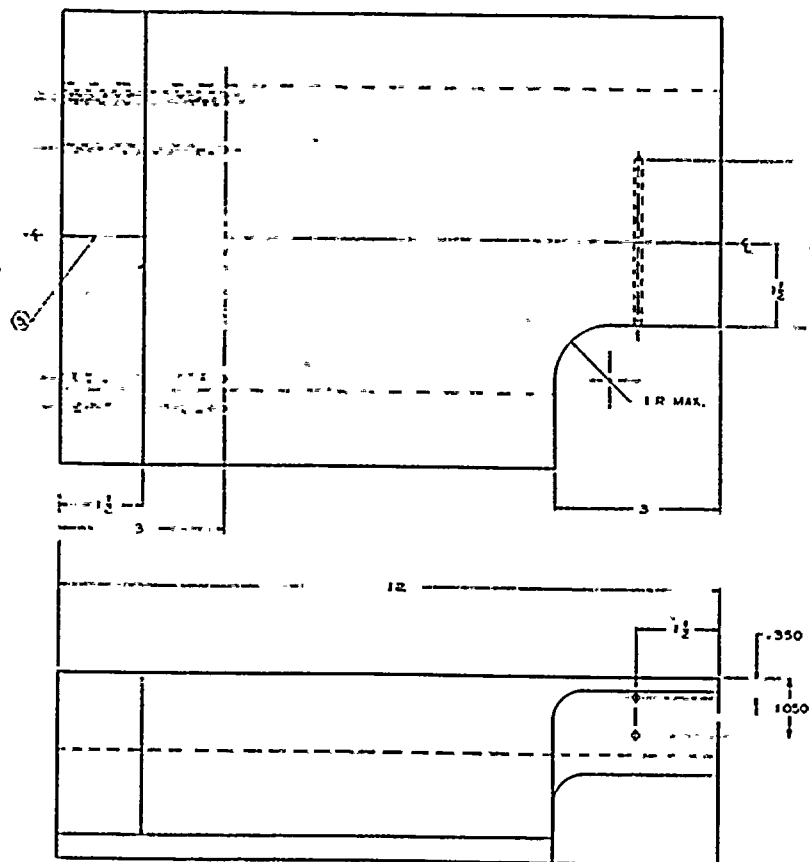
LOT: ACCEPTED

REJECTED

Signed J. P. Haulley
Date 14 Dec 77

Page 1 of 1

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6. MAKE FROM SA182, OR F 316L MT. 74536
S-W 1/2 100 MT. 0054 A.
 3. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP
WHERE SHOWN. STEEL STAMP, OR MILL CUT, AN INDEX
MARK AT ENDS OF EACH CENTERLINE AS SHOWN.
1/32 X 1/32 X 1/4 LONG.
 4. STEEL STAMP ID NO. AND HEAT NO. ON SURFACE
INDICATED, IN CHARACTERS 3/16 MIN. HEIGHT.
 3. MATERIAL FOR BLOCK MUST BE FREE OF:
PIPE BEAM WELDS, FABRICATION AND REPAIR WELDS,
ANY LAMINAR INDICATIONS WHICH MAY AFFECT
ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
 2. DEBURR AND BREAK SHARP EDGES.
 6. DIMENSIONS ARE IN INCHES
- NOTES:

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION STANDARDS

CALIBRATION STANDARD 8-SS-X-1.4-11-DCC IS
HEREBY CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE
WITH SECTION ~~IX~~ 1974 EDITION OF THE ASME BOILER AND
PRESSURE VESSEL CODE THE P-NUMBER CLASSIFICATION FOR THIS
CALIBRATION STANDARD IS SUBSTANTIATED WITH THE ATTACHED
CHEMICAL ANALYSIS REPORT FOR SA 182 F 316L, Ht. 74536
IN ACCORDANCE WITH THE MATERIALS SPECIFICATION SECTION II
OF THE ASME BOILER AND PRESSURE VESSEL CODE

Design Criteria:

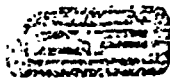
Designed to the requirements of the 1974 Edition of Section XI and the Summer 1975 Appendix III to Section XI of the ASME Boiler and Pressure Vessel Code.

Revised 8/29/78


(SIGNATURE)

August 29, 1978

(DATE)



Cleveland Forge Inc. *PELICAN RD.*

P. O. Box 1038

Cleveland, Texas 77327

713-443-6132

Telephone (713) 592-8769

CUSTOMER'S ORDER No

5558

DATE

4/14/78

JOB ORDER No

5558

SOLD
TO

SOUTH WEST RESEARCH SHIPPED
TO

QUANTITY	DESCRIPTION
1	MATL: ASTM A182 F316-L SS 8 1/2 x 5 1/2 x 12.

SWRI

P. O. *51014 SW*

P. R. *108853*

LOG *D854*

CHEMICAL ANALYSIS

74536	TOSLYN	016	1.59	0.31	0.04	4.47	17.41	16.40	2129	.31	.31
-------	--------	-----	------	------	------	------	-------	-------	------	-----	-----

PHYSICAL PROPERTIES

HEAT TREATMENT

SEL ANN	1800°	2 HRS			

SUBSCRIBED AND SWORN TO BEFORE ME

WITNESSES: *21* DAY OF *April* 19 *78*
Signature
NOTARY PUBLIC

I certify that this is a true copy of original test sheet now on file at the office of Cleveland Forge Inc. and that this steel was manufactured and forged in the United States of America

BY *Signature*

DOSCO, INC.
P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220
QUALITY CONTROL INSPECTION REPORT

no. 2

Contract Nrn 733302 Item Calib Block
P/N 8-SS-X 1.4-11-DEC Qty 120 NSN 54121

		Acc. Ret		Acc. Ret		Acc. Ret
1	1.050	✓	16	1R MAX	✓	31
2	.700	✓	17	3	✓	32
3	.750	✓	18	12	✓	33
4	1 1/2	✓	19	1 1/2	✓	34
5	2 1/2	✓	20	.350	✓	35
6	3 1/2	✓	21	1.050	✓	36
7	10	✓	22			37
8	4R	✓	23			38
9	1.400	✓	24			39
10	1 1/2	✓	25			40
11	.125 ± .005	✓	26			41
12	1 1/2	✓	27			42
13	3	✓	28			43
14	3	✓	29			44
15	1 1/2	✓	30			45

Tolerances on Dimensions
(unless otherwise specified)

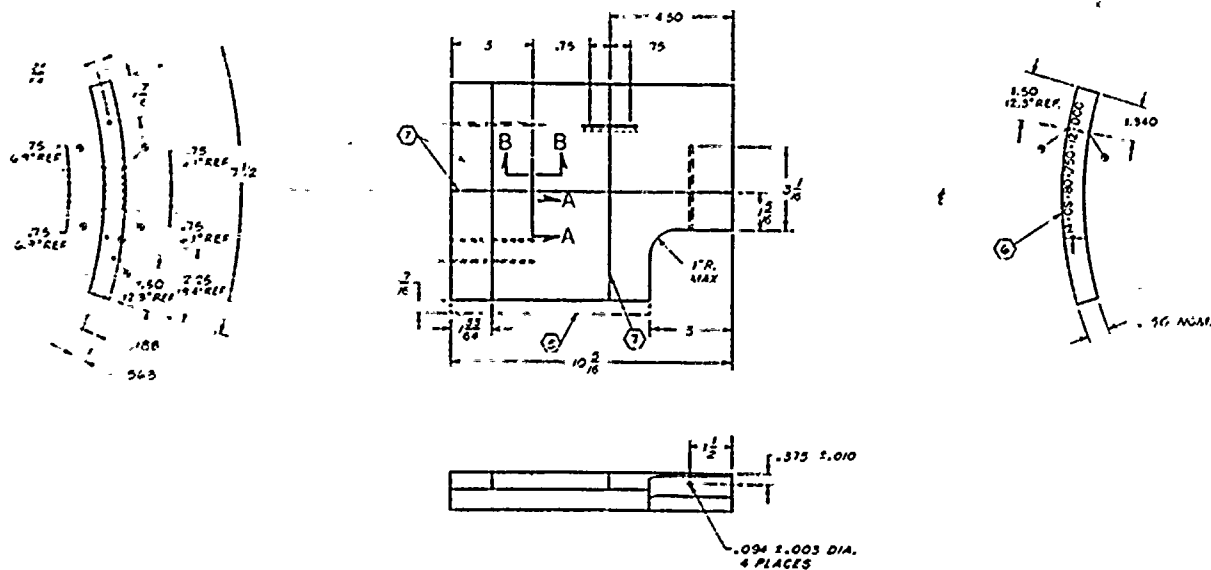
Number and Types of Defects Found:

Fractions ± 1/16 SWRI
.X ± R.O. 32862
.XX ± P. R.
.XXX ± .010 LOG 0859 Corrective Action Taken:
Ang. ± 5°

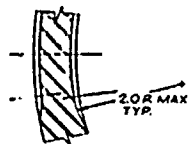
Number of Samples 1
Number ACCEPTED 1
Number REJECTED 0

Lot: ACCEPTED
 REJECTED
Signed A. Daulley
Date 19 May 78

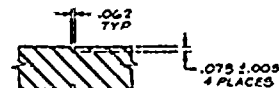
Page 1 of 1



1. BREAK SHARP EDGES AND DEBUR
2. ALL DIMENSIONS ARE TAKEN FROM FIELD NOTES EXCEPT DEPTH OF SLEE CHILLED HOLE.
3. ALL DIMENSIONS \pm .005 IN NEAREST 1/16"
4. MATERIAL FOR BLECK MUST BE FREE OF PIPE SEAM WELDS, FABRICATED OR REPAIR WELDS, LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE OR STRAIGHT BEAM CALIBRATIONS.
5. SAMPLE REMOVED FOR CHEMICAL ANALYSIS.
6. STEEL STAMP I.D. ON SURFACE OF INS. HEIGHT.
7. SCRIBE CENTERLINES .005 TO .0025 WIDE AND DEEP WHERE SHOWN. STEEL STAMP OR MILL CUT AN INLET MARK AT ENDS OF EACH CENTERLINE 1/32 X 1/32 X 1/16 LONG.
8. MARK FROM 4" PIPE ASME ASME 3B.B.



SECTION A-A
SCALE: 1/1



SECTION B-B
SCALE: 1/1

14-00000 90-750-12-000

THE FOLLOWING IS A SUMMARY OF THE INFORMATION CONTAINED IN THE REPORT OF THE FIELD OFFICE ON THE SUBJECT OF: JOHN EDGAR HOOVER		DATE: 10-10-68		PAGE: 1	
REPORT OF: SA [redacted]		DATE: 10-10-68		PAGE: 1	
SUBJECT: JOHN EDGAR HOOVER		DATE: 10-10-68		PAGE: 1	
TITLE: JOHN EDGAR HOOVER		DATE: 10-10-68		PAGE: 1	
OFFICE: MEMPHIS		DATE: 10-10-68		PAGE: 1	
REPORT OF: SA [redacted]		DATE: 10-10-68		PAGE: 1	
SUBJECT: JOHN EDGAR HOOVER		DATE: 10-10-68		PAGE: 1	
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OFFICE: MEMPHIS		DATE: 10-10-68		PAGE: 1	
REPORT OF: SA [redacted]		DATE: 10-10-68		PAGE: 1	
SUBJECT: JOHN EDGAR HOOVER		DATE: 10-10-68		PAGE: 1	
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OFFICE: MEMPHIS		DATE: 10-10-68		PAGE: 1	
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OFFICE: MEMPHIS		DATE: 10-10-68		PAGE: 1	
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TITLE: JOHN EDGAR HOOVER		DATE: 10-10-68		PAGE: 1	
OFFICE: MEMPHIS		DATE: 10-10-68		PAGE: 1	
REPORT OF: SA [redacted]					



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK 14-CS-80-.750-12-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 1 GROUP 1 IN ACCORDANCE WITH
SECTION II 1983 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA 106 GRB IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design modification (1/4" & 3/4" end-drilled hole and notches)
to the above calibration block, complies with requirements of Sections
V and XI, 1983 Edition, Summer 1983 Addends of the ASME Boiler and
Pressure Vessel Code. The design also complies with SwRI's non-
destructive testing procedure requirements.

*No material certifications or documentation were provided by American
Electric Power to SwRI for this block

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-043-A
Revised 11/29/88

SIGNATURE
Robert Edwards

Lead Engineer

TITLE

Nov, 29, 1988

DATE

PHONE: 312 / 865-0400

2671 GARDNER ROAD, BROADVIEW, ILLINOIS 60153

CHARLES C. *K*AWIN COMPANY

METALLURGICAL LABORATORIES

CHEMISTS • MECHANICAL TESTING • METALLOGRAPHERS • CONSULTANTS

MAILING ADDRESS • P.O. BOX 310 / MAYWOOD, ILLINOIS 60153

DATE OF REPORT 9/14/79

DESCRIPTION

Southwest Research Institute
P.O. Box 28510
San Antonio, TX 78284
Attn: R. Edwards

PO PR166818
SwRI Po 81855

REPORT OF MECHANICAL TESTS

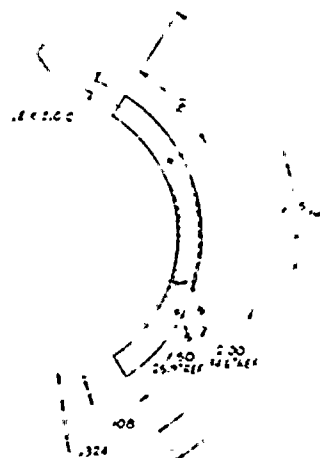
SAMPLE IDENTIFICATION	DIAM. IN INCHES	YIELD STRENGTH LBS PER SQ. IN	TENSILE STRENGTH LBS PER SQ. IN	ELONGATION ON IN	ELONGATION PER CENT	REDUCTION OF AREA PER CENT	BRIWELL 3000 K G. LOAD

Lab #105

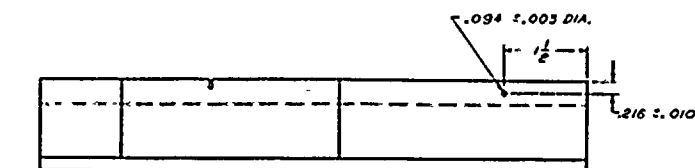
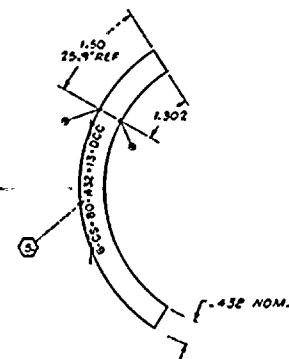
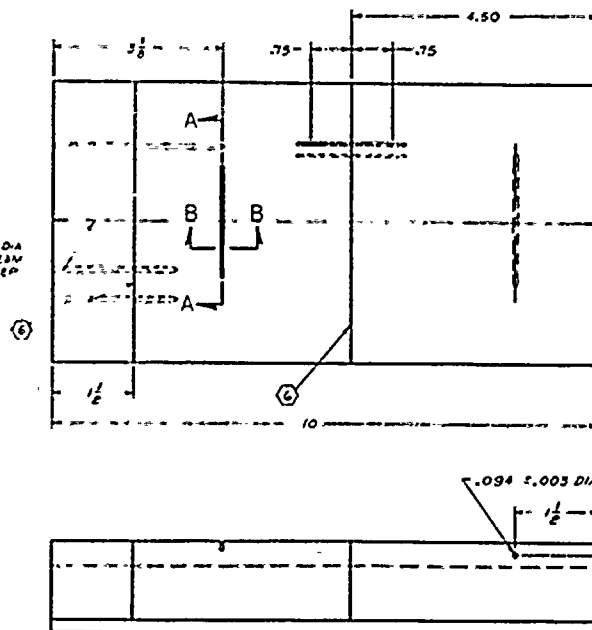
REPORT OF CHEMICAL TESTS

SAMPLE IDENTIFICATION	Si	Mn	C	P	S	NI	Cr	Mo	Cu	Mg	Al	V
Sample 14-CS-80-.750-12-DCC 9/5	.23	.68	.26	.008	.025							

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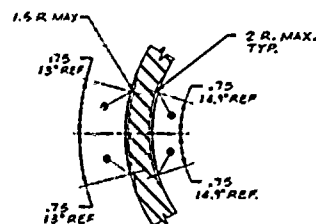


.004 ±.003 DIA.
DRILL / REAM
2.25 DEEP
4 PLACES

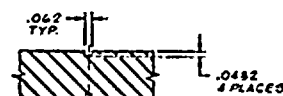


NOTES:

1. ALL DIMENSIONS ARE TAKEN FROM FIELD NOTES EXCEPT DIM OF SEE DRILLED HOLE.
2. ALL DIMENSIONS IN INCHES TO NEAREST .004".
3. BREAK SHARP EDGES AND CORNERS.
4. MATERIAL FOR BLOCK MUST BE FREE OF PIPE SEAM WELDS, FABRICATION OR REPAIR WELDS, LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE OR STRAIGHT BEAM CAL BRATONS.
5. STEEL STAMP I.D. ON SURFACE SHOWN IN CHARACTERS 2" MIN. HEIGHT.
6. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE SHOWN. STEEL STAMP FOR MILL CUT AN INDEX MARK AT ENDS OF EACH CENTERLINE 1/32" ± 1/32" LONG.
7. MAKE FROM 6" PIPE ASME A-106 GR.B. SCH. 80



SECTION A-A
SCALE: 1/1



SECTION B-B
SCALE: 2/1

6-CS-80-432-13-DCC

FOLLOWING DIMENSIONS		PART NAME		PART NO.	
DIMENSIONS		6-CS-80-432-13-DCC		SOUTHWEST RESEARCH INSTITUTE	
DIMENSIONS		6-CS-80-432-13-DCC		QUALITY ASSURANCE SYSTEMS AND ENGINEERING DIVISION	
DIMENSIONS		6-CS-80-432-13-DCC		SAN ANTONIO, TEXAS	
DIMENSIONS		6-CS-80-432-13-DCC		AUX. FEEDWATER CAL. BLK	
DIMENSIONS		6-CS-80-432-13-DCC		DC COOK 122	
DIMENSIONS		6-CS-80-432-13-DCC		DATE 1/11	
DIMENSIONS		6-CS-80-432-13-DCC		C/D-3378 060	



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK 6-CS-80-.432-13-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 1 GROUP 1 IN ACCORDANCE WITH
SECTION IX 1983 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA 106 GRB IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design modification (1/4x3/4t end-drilled hole and notches) to the above calibration block, complies with the requirements of Sections V and XI, 1983 Edition, Summer 1983 Addenda of the ASME Boiler and Pressure Vessel Code. The design also complies with SwRI's nondestructive testing procedure requirements.

*No material certifications or documentation were provided by American Electric Power to SwRI for this Block.

ATTACHMENTS

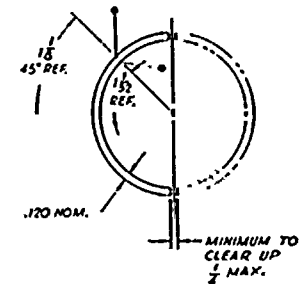
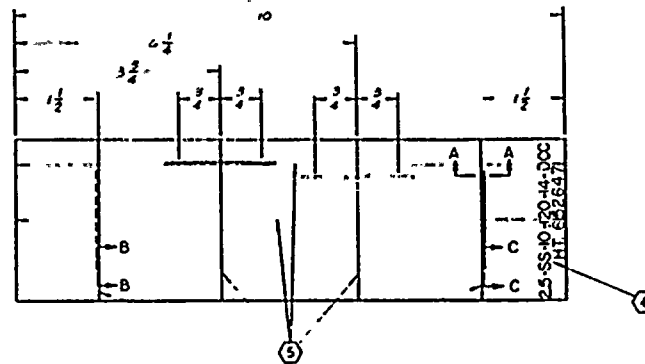
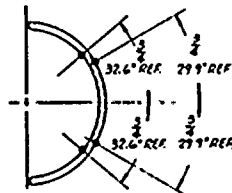
MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378060A



Robert Edwards

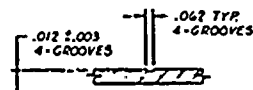
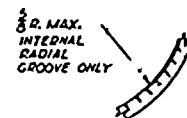
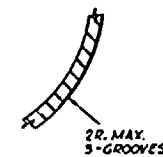
Lead Engineer
TITLE

Nov. 29, 1988
DATE



NOTES:

- 1.
2. DEBURR AND BREAK SHARP EDGES.
3. MATERIAL FOR BLOCK MUST BE FREE OF:
PIPE SEAM WELDS, FABRICATION OR REPAIR WELDS,
ANY LAMINAR INDICATIONS WHICH MAY AFFECT
ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
4. STEEL STAMP ID. N° AND HEAT N° AS SHOWN, ON
SURFACE INDICATED, IN CHARACTERS 5/16 MIN. HEIGHT.
5. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE
NOTED. STEEL STAMP OR MILL CUT AN INDEX MARK AT
ENDS OF EACH CENTERLINE AS SHOWN, 1/32 ± 1/32 ± 1/16 LONG.
6. MAKE FROM 2 1/2 INCH, SCHEDULE 10, ASTM A-312 TP 304
SUS 316 LUG N-1122A, HT N° 652647.

SECTION A-A
SCALE: 2/1SECTION B-B
SCALE: 2/1SECTION C-C
SCALE: 2/1

2.5-SS-10-120-14-DCC

PART NAME		PART NUMBER		PART DATE		PART SIZE	
2 1/2 PIPE ULTRASONIC CALIBRATION BLOCK		25-SS-10-120-14-DCC		25-SS-10-120-14-DCC		25-SS-10-120-14-DCC	
MATERIAL		SOUTHWEST RESEARCH INSTITUTE		QUALITY ASSURANCE DEPARTMENT		REVISION	
2 1/2 PIPE ULTRASONIC CALIBRATION BLOCK		25-SS-10-120-14-DCC		25-SS-10-120-14-DCC		25-SS-10-120-14-DCC	
DATE		25-SS-10-120-14-DCC		25-SS-10-120-14-DCC		25-SS-10-120-14-DCC	
C: D-5378 076		25-SS-10-120-14-DCC		25-SS-10-120-14-DCC		25-SS-10-120-14-DCC	



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION STANDARDS

CALIBRATION STANDARD 2.5-SS-10-.120-14-DCC IS
HEREBY CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE
WITH SECTION IX 1974 EDITION OF THE ASME BOILER AND
PRESSURE VESSEL CODE THE P-NUMBER CLASSIFICATION FOR THIS
CALIBRATION STANDARD IS SUBSTANTIATED WITH THE ATTACHED
CHEMICAL ANALYSIS REPORT FOR SA 312 type 304, Ht. 652647
IN ACCORDANCE WITH THE MATERIALS SPECIFICATION SECTION II
OF THE ASME BOILER AND PRESSURE VESSEL CODE

(SIGNATURE)

Oct. 8, 1979

(DATE)

86501

4404 WINDFERN ROAD
HOUSTON, TEXAS 77041
(713) 460-4140
HOUSTON



KILSBY TUBESUPPLY COMPANY

STEEL AND ALUMINUM TUBING AND PIPE

SALES
ORDER
NO.

H 15598

ACCT. NUMBER 57690	TERRITORY 70	BRANCH 51/54	TAX 40
DATE ORDERED 1/12/79			
DATE SHIPPED 9/12			
CUSTOMER ORDER NO. 80824 SW			
INVOICE NO.			
S O L D SOUTHWEST RESEARCH INSTITUTE 6220 CULEBRA RD SAN ANTONIO, TX 78206			
CREDIT OR BUYER CO. <i>Jack</i>			
PAGE 01			
PREPAID <input checked="" type="checkbox"/> COLLECT <input checked="" type="checkbox"/> PPD SHG <input type="checkbox"/>			

PO # 56-37760

CERTIFIED TEST REPORT

ITEM	QUANTITY	MATERIAL - SIZE - SPECIFICATION	MANUFACTURER	HEAT/LOT
		STAINLESS PIPE TYPE 304 FF A&P, ASTM A-312 ASME SA-312 2 1/2" SCH 10S x 20'	TRENT TUBE	652647

CHEMICAL ANALYSIS IN PERCENT

C	MN	P	S	SI	CR	NI	MO	TI	CB-TA	CU	CO		
.06	1.66	.031	.019	.70	18.50	8.89	.16			.07	.20		

MECHANICAL PROPERTIES AND TESTS

ULTIMATE TENSILE PSI	YIELD STRENGTH PSI	ELONG IN 2" %	HARDNESS	HYDRO TEST F3	BEND	FLNGE	FLARE	FLAT	CORR EMER	EDDY	SONIC	GRAIN SIZE	SURFACE DECARB OTHER
86,757	44,818	61	RB 75/77					OK					

We hereby certify that the above material has been inspected and tested in accordance with applicable specifications and has met all the requirements thereof; the above test results are a true copy of the data furnished us by the producing mill or the data resulting from tests performed in approved laboratories.

80824 SW
166814
11-2A

KILSBY TUBESUPPLY COMPANY

BY *James C. King*
Authorized Signature

C-63

P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220
QUALITY CONTROL INSPECTION REPORT

no. 2

Contract Nbr 735 432 Item 2 1/2" Pipe Col. Black
P/N 2.5-55-10-120-14-125 QTY 125 NSN 5410 P.T
H.T. 652647
Dwg. D.5378-076 10/9/79

		Acc	Rej		Acc	Rej		Acc	Rej
1	3/4	✓		16	1 1/8	✓		31	
2	3/4	✓		17	1 1/8	✓		32	
3	3/4	✓		18				33	
4	3/4	✓		19				34	
5	0.12 ± .003	✓		20				35	
6	.062	✓		21				36	
7	10	✓		22				37	
8	6 1/4	✓		23				38	
9	3 3/4	✓		24				39	
10	1 1/2	✓		25				40	
11	3/4	✓		26				41	
12	3/4	✓		27				42	
13	3/4	✓		28				43	
14	3/4	✓		29				44	
15	1 1/2	✓		30				45	

Tolerances on Dimensions
(unless otherwise specified)

REMARKS:

Fractures ± 1/16 S&RI
.X ± R. O. 39565
.XI ± P. R.
.XX ± .010 LCC 1141A
Ang. ± 0.30'

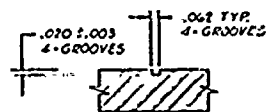
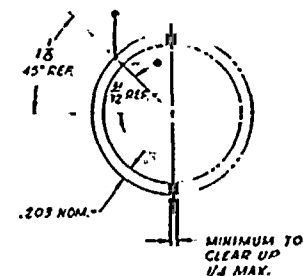
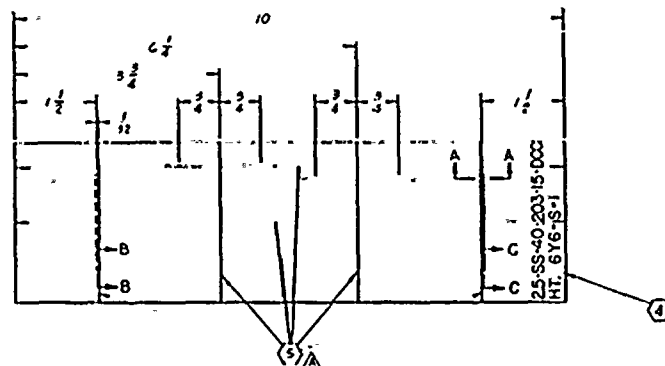
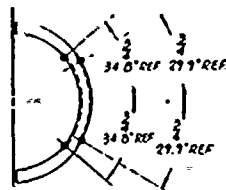
Number of Samples 1
Number ACCEPTED 1
Number REJECTED 0

LOT: ACCEPTED
 REJECTED
Signed W. J. R. R. R.
Date 8 Oct 79

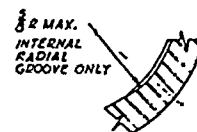
Page 1 of 1

NOTES:

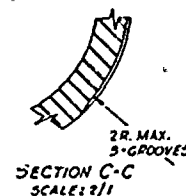
1. DIMENSIONS ARE IN INCHES.
2. DEBURR AND BREAK SHARP EDGES.
3. MATERIAL FOR BLOCK MUST BE FREE OF:
PIPE SEAM WELDS, FABRICATION OR REPAIR WELDS,
ANY LAMINAR INDICATIONS WHICH MAY AFFECT
ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
4. STEEL STAMP ID N° AND HEAT N° AS SHOWN, ON
SURFACE INDICATED, IN CHARACTERS $\frac{3}{16}$ MIN. HEIGHT.
5. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE
NOTED. STEEL STAMP OR MILL CUT AN INDEX MARK AT
ENDS OF EACH CENTERLINE AS SHOWN, $\frac{1}{32} \pm \frac{1}{32} = \frac{1}{4}$ LONG
6. MAKE FROM 2 $\frac{1}{2}$ PIPE, SCHEDULE 40, ASTM A-312 TP 304
SWEET LOG N° 11159, HT. N° 676-5-1.



SECTION A-A
SCALE: 2/1



SECTION B-B
SCALE: 2/1



SECTION C-C
SCALE: 2/1

2.5-SS-40-203-15-DCC

DOCUMENT IDENTIFIED BY ORIGINAL 1-040 DATE 1/14/68 PAGE 10 OF 9-7 FORM 10-7		DATE TIME PAGE NUMBER		2278 1157 10/11/68
SEARCHED INDEXED SERIALIZED FILED		1-11-68 1-11-68 1-11-68 1-11-68		1-11-68 1-11-68 1-11-68 1-11-68
A 1-11-68 1-11-68 1-11-68 1-11-68		1-11-68 1-11-68 1-11-68 1-11-68		1-11-68 1-11-68 1-11-68 1-11-68



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION STANDARDS

CALIBRATION STANDARD 2.5-SS-40-.203-15-DCC IS
HEREBY CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE
WITH SECTION ~~IX~~ 1974 EDITION OF THE ASME BOILER AND
PRESSURE VESSEL CODE THE P-NUMBER CLASSIFICATION FOR THIS
CALIBRATION STANDARD IS SUBSTANTIATED WITH THE ATTACHED
CHEMICAL ANALYSIS REPORT FOR SA 312 type 304, Ht. 6Y6-S-1
IN ACCORDANCE WITH THE MATERIALS SPECIFICATION SECTION II
OF THE ASME BOILER AND PRESSURE VESSEL CODE

(SIGNATURE)

October 4, 1979

(DATE)

Inspection Certificate

RECEIVED

JAN 20 1977 TOA-SEIKI Co., Lt

Chigasaki Plant.

For Messrs. (Kilby Tube Supply Co.,)

Date 24 December, 1975

KILBY TUBESUPPLY CO.

Chief of Inspection Dept.

Order No.	75-0447-21		Description	Stainless Steel Welded Pipes.		Size		
Contract No.	75-0447-21		Material	TP-304		Spec. Finish	To be specified	
Chemical Composition (%)								
Component	C	Si	Mn	P	S	Ni	Cr	Article
Heat No. Spec.	20.08	20.75	22.00	20.040	20.030	8.00-11.00	18.00-20.00	Article
Heat No. Spec.	6Y6-S-5	0.05	0.45	1.10	0.033	0.010	9.65	18.21
Heat No. Spec.	6Y6-S-5	0.05	0.50	1.22	0.033	0.007	9.10	18.21
Heat No. Spec.	6Y6-S-1	0.05	0.51	1.17	0.033	0.007	9.10	18.05
Mech. Prop.								
Specimen Size (mm)		Y.P. or T.S. (0.2%)		T.S.	Elong.	Broken	Fracture	Hardness
Dia. x Thick Width x Thick		Gauge Length		Psi	Psi	%	Part	Test
Heat No. Spec.				30,000	75,000	35		(HRD)
Heat No. Spec.	1/2" x 1/2"	2"		70,400	86,000	67.1	A	Good
Heat No. Spec.	"	2"		70,500	85,100	62.3	A	Good
Heat No. Spec.	"	2"		70,100	87,800	61.7	A	Good
Mech. Prop.								
Flattening Test		Flange Test		Reverse Flattening Test		Reverse Bend Test		Hydrostatic Test
Good		Good		Good		Good		Good
SwRI		P. O.		P. R.		LOG		
80874SW		1668V4		1115B				
Remarks								
Finish; Type; A-21-A 312 AMP/OR SA 312 Corrosion Test As Per MIL-P-1144B Applicable; Good. Dimension & Surface Condition; Good.								

C-67

DOSCO, INC.
P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220
QUALITY CONTROL INSPECTION REPORT

no. 2

Contract No. 73 5460 Item 2 1/2 Pipe ultrasonic Cal. Blk
P/N 2.5-SS-40:203-15-DIG Qty NSH SWRI
0-3378-077

		Ang	Rad		Acc	Rad		Acc	Rad
1	1 1/2	/		16			31		
2	3 3/4	/		17			32		
3	6 1/4	/		18			33		
4	10	/		19			34		
5	3/4	/		20			35		
6	3/4	/		21			36		
7	1 1/2	/		22			37		
8	1 1/2	/		23			38		
9	1203	/		24			39		
10	.0203003	/		25			40		
11	.062	/		26			41		
12	5/8	/		27			42		
13				28			43		
14				29			44		
15				30			45		

Tolerances on Dimensions
(unless otherwise specified)

REMARKS:

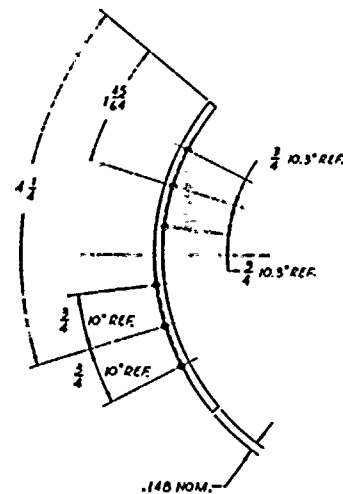
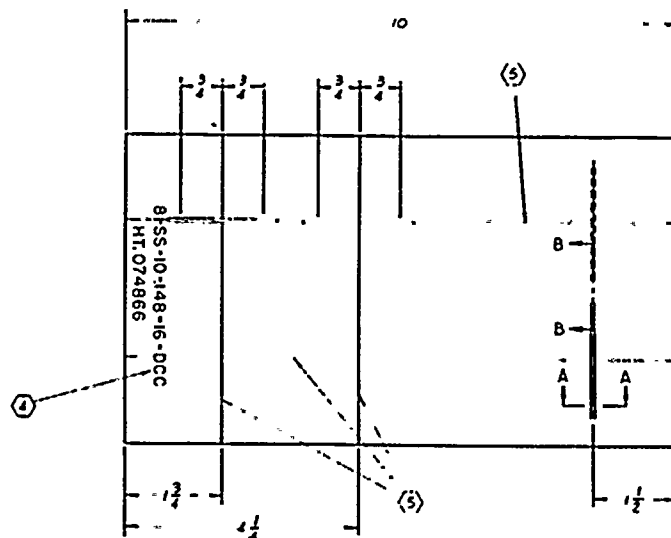
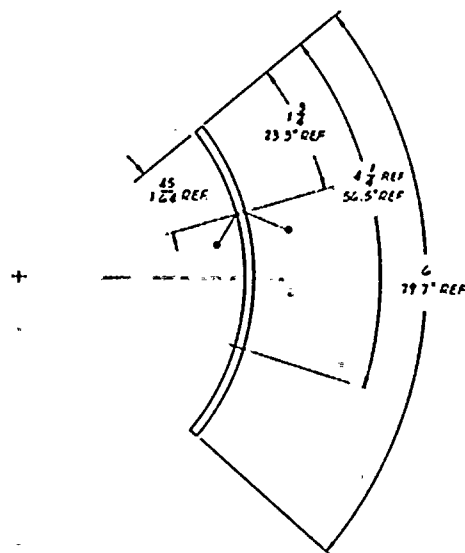
Fractions $\pm \frac{1}{16}$
.X $\pm .010$
.XX $\pm .010$
.XXX $\pm .010$
Ang. $\pm 0^{\circ} 30'$

SWRI
R. O. 39544
P. R. -
LOG 1119A

Number of Samples _____
Number ACCEPTED _____
Number REJECTED _____

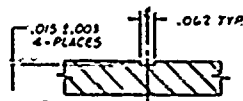
LOT: ACCEPTED
REJECTED
Signed [Signature]
Date 19-25-79

Page 1 of 1

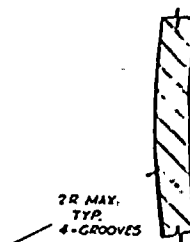


NOTES:

1. DIMENSIONS ARE IN INCHES.
2. BREAK ALL SHARP EDGES AND REMOVE BURRS.
3. MATERIAL FOR BLOCK TO BE FREE OF:
FABRICATION OR REPAIR WELDS, RIFE SEAM WELDS,
AND LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE
BEAM OR STRAIGHT BEAM CALIBRATIONS.
4. STEEL STAMP ID N° AND HEAT N° AS SHOWN, ON SURFACE
INDICATED, IN CHARACTERS $\frac{3}{16}$ MIN. HEIGHT.
5. SCRIBE CENTERLINES .003 TO .005" WIDE AND DEEP WHERE
NOTED. STEEL STAMP OR MILL CUT AN INDEX MARK AT EACH
END OF CENTERLINES AS SHOWN, $1/32 \pm 1/32$, $1/4$ LONG.
6. MAKE FROM 2" PIPE, SCHEDULE 10, ASTM A-312 TY 304,
HEAT N° 01946, SWK1 LOG N° 0358 D.



SECTION A-A
SCALE: 4/1



SECTION B-B
SCALE: 4/1

8-SS-10 -148-16-DCC

OPERATING DATA SHEET DRAWING NO. 0-000 DATE 12-20-50 SCALE 1/2" = 1'-0" SHEET 1 OF 1	PROJECT NAME 32378 31ST	OPERATOR [Signature]
FIELD NO. 32378 DATE 12-20-50 TIME 1:30 PM LOCATION 32378 31ST SURVEYOR [Signature] CHECKED [Signature] APPROVED [Signature]	SOUTHWEST RESEARCH INSTITUTE DIVISION OF AERONAUTICS, RESEARCH AND EDUCATIONAL PURPOSES 8 PIPE ULTRASONIC CALIBRATION BLOCK O.C. CASE NO. 32378 DATE 12-20-50	
C. D. 32378-01	[Signature]	



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION STANDARDS

CALIBRATION STANDARD 8-SS-10-.148-16-DCC IS
HEREBY CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE
WITH SECTION IX 1974 EDITION OF THE ASME BOILER AND
PRESSURE VESSEL CODE THE P-NUMBER CLASSIFICATION FOR THIS
CALIBRATION STANDARD IS SUBSTANTIATED WITH THE ATTACHED
CHEMICAL ANALYSIS REPORT FOR SA 312 type 304, Ht. 074866
IN ACCORDANCE WITH THE MATERIALS SPECIFICATION SECTION II
OF THE ASME BOILER AND PRESSURE VESSEL CODE

(SIGNATURE)

Oct. 2, 1979

(DATE)

USCO, INC.
P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220
QUALITY CONTROL INSPECTION REPORT

no. 2

Contract No. 7.3.5461 Item 8" ultrasonic Cal. S.C.
P/N R-55-10-142-16-DCC QTY 1 EA NSN SWRI
D-3378-078

		Age	R-1		Age	R-1		Age	R-1
1	1 45/64	/	16	.148	/	31			
2	1 3/4	/	17			32			
3	6	/	18			33			
4	3/4	/	19			34			
5	3/4	/	20			35			
6	10	/	21			36			
7	1 3/4	/	22			37			
8	0.15 ± .003	/	23			38			
9	062	/	24			39			
10	4 1/2	/	25			40			
11	1 1/2	/	26			41			
12	1 45/64	/	27			42			
13	4 1/4	/	28			43			
14	3/4	/	29			44			
15	3/4	/	30			45			

Tolerances on Dimensions
(unless otherwise specified)

REMARKS:

Pre-tensions ± 1/16 S.S.R.I.
.X ± .010 L. O. 39544
.XX ± .010 F. R.
.XXX ± .010 L.C. 1119B
Ang. ± 0° 30'

Number of Samples 1
Number ACCEPTED 1
Number REJECTED 0

LOT: ACCEPTED
Signed D. L. [Signature]
Date 7-2-5-79

Page 1 of 1

TUBULAR PRODUCTS IN CARBON STEEL, ALLOY STEEL, STAINLESS STEEL AND ALUMINUM

CERTIFICATE
OF TEST

TUBESALES.

175 TUBEWAY

FOREST PARK, GEORGIA 30050
(404) 381-5050

0358B

SOUTHWEST RESEARCH INST

S&RI
P. O. <u>12045 SW</u>
P. R. <u>16022</u>
LCG <u>0358B</u>

STOMER ORDER NO. 12045 SW PT 2 INVOICE NO. 5-42753 DATE 12-04-75

ID NUMBER 2 QUANTITY 2'0"

ECIFICATION A 312 GRADE WELD 304

EF 8 SCH 10

MANUFACTURER SWEPCO HEAT NO. 074866

LTER GRAIN SIZE

CHEMICAL ANALYSIS											
C	MN	P	S	SI	TI	CU/TA	MO	NI	CR	CU	CO
0050	1820	0.021	0.017	0.650				0.8	950	18370	
ULTIMATE STRENGTH P.S.I.		YIELD POINT P.S.I.		% ELONGATION IN 2"		ROCKWELL B HARDNESS		BRINELL		HARDENABILITY	
84998		48293		53		81					
										FREQ.	

THE FOLLOWING TESTS HAVE BEEN PERFORMED SATISFACTORILY.

Test Legend

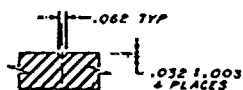
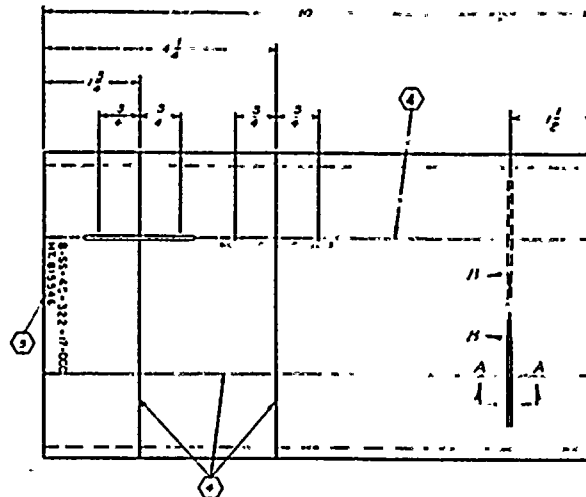
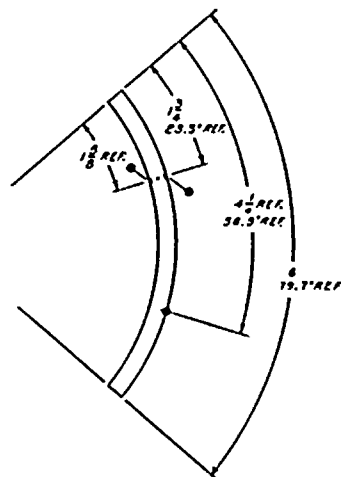
1 Dye Penetrant 3 Ultrasonic 5 X-Ray 7 Microscopic 9 Flattening 11 Flaring 13 Crushing 15 Macro Etch
2 Eddy Current 4 Corrosion 6 Embrittlement 8 Bending 10 Decarburization 12 Hydrostatic 14 Flanging 16 Reverse Bend

I CERTIFY THE ABOVE TEST INFORMATION TO BE CORRECT
AS CONTAINED IN THE RECORDS OF THE COMPANY

TUBESALES
[Signature]
BY
AUTHORIZED TEST DEPARTMENT CLERK

NOTES:

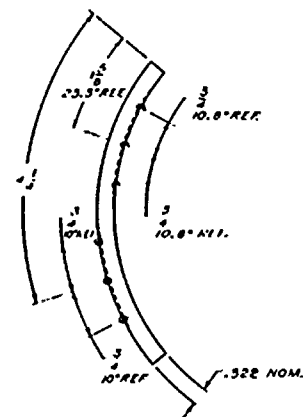
- 1.
2. MATERIAL FOR BLOCK TO BE FREE OF:
FABRICATION OR REPAIR WELDS,
PIPE SEAM WELDS,
ANY LAMINAR INDICATIONS WHICH MAY AFFECT
ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
3. STEEL STAMP ID. NO. AND HEAT NO., AS SHOWN, ON
SURFACE INDICATED IN CHARACTERS 3/16 MIN. HEIGHT.
4. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP
WHERE NOTE, STEEL STAMP, OR MILL CUT, AN INDEX
MARK AT EACH OF CENTERLINES AS SHOWN,
1/32 T 1/32 S 1/4 LONG.
5. MAKE FROM 8" PIPE, SCHEDULE 40 ASTM A-312 TYPE 316
HEAT NO. 815546 SWR1 LOG NO. 1125C.
6. BREAK ALL SHARP EDGES AND REMOVE BURRS.



SECTION A-A
SCALE 1/2" = 1'-0"



SECTION B B
SCALE: 2/1



8-SS-40- 322-17- DCC

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION STANDARDS

CALIBRATION STANDARD 8-SS-40-.322-17-DCC IS
HEREBY CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE
WITH SECTION IX 1974 EDITION OF THE ASME BOILER AND
PRESSURE VESSEL CODE THE P-NUMBER CLASSIFICATION FOR THIS
CALIBRATION STANDARD IS SUBSTANTIATED WITH THE ATTACHED
CHEMICAL ANALYSIS REPORT FOR SA 312 type 316, Ht. 815546
IN ACCORDANCE WITH THE MATERIALS SPECIFICATION SECTION II
OF THE ASME BOILER AND PRESSURE VESSEL CODE

(SIGNATURE)

Oct. 8, 1979

(DATE)



Armco Steel Corporation
Advanced Materials Division
P. O. Box 23068, 13835 Beaumont Hwy.
Houston, Texas 77028
Phone: 713-458-1770

TEST REPORT

857/55

OUR SHIPMENT NO.	DATE SHIPPED	DATE OF REPORT	YOUR ORDER NO.	REFERENCE
KILSBY TUBESUPPLY CO 4404 WINDFERN RD HOUSTON, TX 77041	5-22-78	5-22-78	H6405	HS8-55

ITEM	DESCRIPTION	SPECIFICATIONS
23.	8.625" OD x .322" wall x 20' R/L T316 As Welded Annealed & Pickled	ASTM A-312

Heat Analysis		CHEMICAL ANALYSIS								N
ITEM	HEAT NO.	C	MN	P	S	SI	Cr	NI	Mo	
23.	815546	.055	1.62	.030	.018	.65	17.82	11.29	2.05	.050

		MECHANICAL TESTS						
ITEM	HEAT NO.	UTS (PSI)	YS (PSI)	% EL.	% R.A.	HDNS.	HYDRO (PSI)	BENDS
23.	815546	84,400	47,100	54		RB85	1200	

We certify that all materials supplied on this order meet the requirements of the ordering specifications.

SUBI
P. O. 80787450
P. R. 166814
107 11250

KILSBY
THESE TEST REPORTS APPLY TO

Subscribed and Sworn to Before Me

5-22-78

P. O. NO. MARY A. LEVILLÉ
Notary Public in and for Harris County, Texas
My Commission Expires November 30, 1978
BONDED BY Alexander & Co., Inc., Lawyers Surety Corp.

The Chemical Analyses and Mechanical are Correct as Contained in the Record

M. Levillé

[Signature]

WJW, INC.
P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220
QUALITY CONTROL INSPECTION REPORT

no. 2

Contract No. 735491 Item 8" Pipe Ultrasonic Cal. BPK.
P/N 855-40-322-17-000 Qty 1 ea NSN 5W RI
3378-075

		Acc. Ret.		Acc. Ret.		Acc. Ret.
1	1 5/8	/	16		31	
2	1 3/4	/	17		32	
3	1 3/4	/	18		33	
4	4 1/4	/	19		34	
5	3/4	/	20		35	
6	3/4	/	21		36	
7	10	/	22		37	
8	1 1/2	/	23		38	
9	.062	/	24		39	
10	.032 ± .003	/	25		40	
11	4 1/4	/	26		41	
12	3/4	/	27		42	
13	.322 NOM.	/	28		43	
14			29		44	
15			30		45	

Tolerances on Dimensions
(unless otherwise specified)

REMARKS:

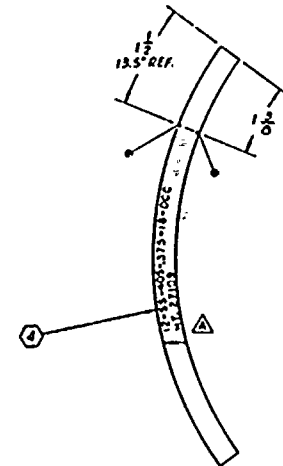
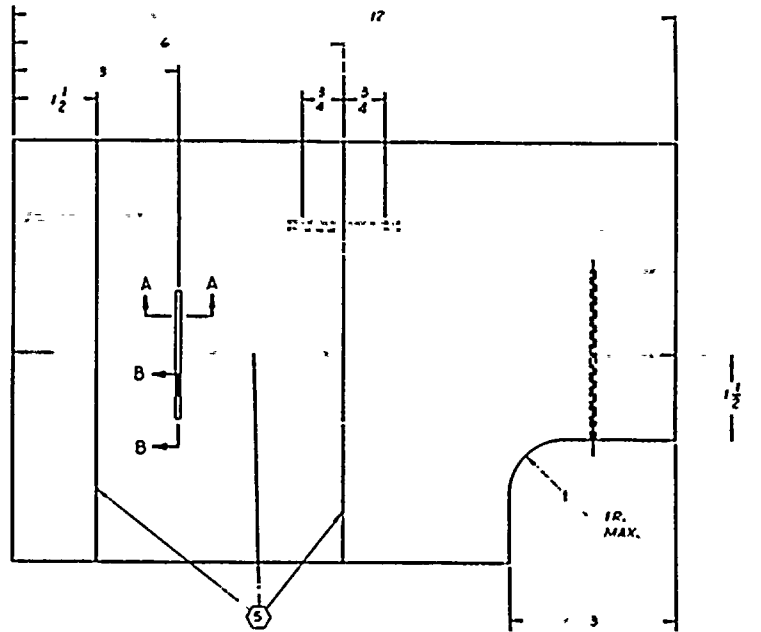
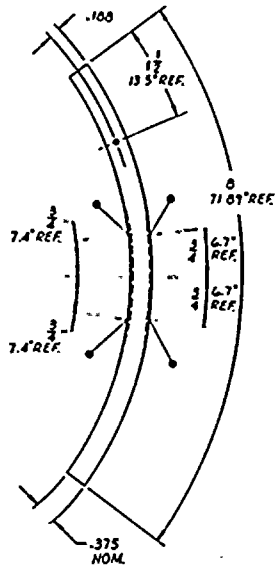
Fractions ± 1/16 S.W. R. I.
.X ± .010 A. O. 39565
.XX ± .010 P. R. -
.XXX ± .010 L. C. 1141B
Ang. ± 0° 30'

Number of Samples 1
Number ACCEPTED 1
Number REJECTED 0

LOT: ACCEPTED
Signed J. Foreman
Date 10-8-79

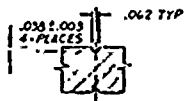
Page 1 of 1

C-77



NOTES:

2. BREAK SHARP EDGES AND DEBURR.
3. MATERIAL FOR BLOCK MUST BE FREE OF PIPE SEAM WELDS, FABRICATION OR REPAIR WELDS, LAMINAR INCLUSIONS WHICH MAY AFFECT ANGLE OR STRAIGHT BEAM CALIBRATIONS.
4. STEEL STAMP I.D. \pm HEAT N° ON SURFACE INDICATED IN CHARACTERS 3/16 MIN. HEIGHT.
5. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE SHOWN STEEL STAMP OR MILL CUT AN INDEX MARK AT ENDS OF EACH CENTERLINE $1/32 = 1/32 = 1/16$ LONG.
6. MAKE FROM 12" PIPE SCHEDULE 40, ASTM A-512 TP 316 HEAT N° 27109 SWEL LOG N° 1115D.



SECTION A-A
SCALE: 2/1



SECTION B B
SCALE: 2/1

— .094 ± .005 DIA.
2-HOLES

12-SS-40S-375-18-DCC

FBI LABORATORY DIVISION 400 ... WASHINGTON, D.C. 20535	CASE NO. 100-443887-11	PART NAME ...	MATERIAL ...
ANALYST J. E. ... DATE 10/1/77	REFERENCE NO. ...	SOUTHWEST RESEARCH INSTITUTE DIVISION OF ... 12" PIPE ULTRASONIC CALIBRATION BLOCK	...
...



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION STANDARDS

CALIBRATION STANDARD 12-SS-40S-.375-18-DCC IS
HEREBY CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE
WITH SECTION IX 1974 EDITION OF THE ASME BOILER AND
PRESSURE VESSEL CODE THE P-NUMBER CLASSIFICATION FOR THIS
CALIBRATION STANDARD IS SUBSTANTIATED WITH THE ATTACHED
CHEMICAL ANALYSIS REPORT FOR SA 312 type 316, Ht. 27109
IN ACCORDANCE WITH THE MATERIALS SPECIFICATION SECTION II
OF THE ASME BOILER AND PRESSURE VESSEL CODE

(SIGNATURE)

Oct. 2, 1979

(DATE)



Stainless Steel Tubing

CRUCIBLE INC-TRENT TUBE DIVISION

EAST TROY, WISCONSIN 53120

TEST REPORT

CUSTOMER ORDER NO. 64 86347 CPO. DATE RATING ENTRY DATE SHIP MARKS MILL ORDER NO. 6T3 31129-9-0
KILH3UA KILH3UA

KILSBY TUBESUPPLY COMPANY
4404 NORTH WINDFERN
HOUSTON, TEXAS

KILSBY TUBESUPPLY COMPANY
4404 NORTH WINDFERN
HOUSTON, TEXAS

77041

77041

SPECIAL INSTRUCTIONS

SHIPPING NOTICE

12.750 X .375 K00172400 4 130 50.026 LB/FT SOURCE

F.O.B. S/P
TERMS: 30-1/2-10

FEET 42.5
NET 2,085
PCS 2
GROSS 2,085
BDLS
COMPLETE SHIP
B/L# C-020284
DATE 23-AUG-79
ABF PPD

TRENTWELD STAINLESS STEEL TUBING

ASTM A312 CERT ASME SA312 MILP-1144D
TYPE 316 L Corrosion Only

ASTM A-262 Practice E - OK

08/27/79
WANTED
PROMISED

REPORT OF TESTS

CHEMICAL ANALYSIS

HEAT#	C	MN	P	S	SI	NI	CR	N	MO	TI
27109	.027	1.71	.029	.014	.65	11.20	16.80	.048	2.12	.00

MECHANICAL AND NDE TESTS

HEAT#	TENSILE	YIELD	ELONG	HARD	FLAT	FLAT	RFLT	RBND	UT	XRAY	DYE	H
27109	80,800	39,300	57%	B-78								

REMARKS

ANNEALED AT 1950 F IN A CONTINUOUS FURNACE FOR A MINIMUM OF 10 MINUTES, W/
QUENCHED. COOLED DOWN TO 800 F OR BELOW AT A MAXIMUM OF 3 MINUTES.

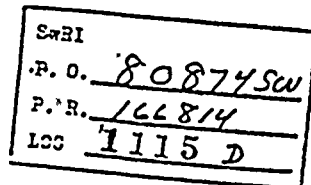
WE HEREBY CERTIFY THIS REPORT
TO BE TRUE AND CORRECT ACCORDING
TO THE RECORDS IN POSSESSION
OF THIS CORPORATION
CRUCIBLE INC TRENT TUBE DIVISION

SWORN TO & SUBSCRIBED BEFORE ME

MY COMMISSION EXPIRES: _____

SIGNED: D. Orlston

NOTARY



SEP 4 1979

DOSCO, INC.
P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220
QUALITY CONTROL INSPECTION REPORT

no. 2

Contract No. 735468 Item 12" Calibration Block
P/N 12-55-405-.375-18-DC Qty 1 NSN SECRET
HT 27104 Desig. D-3378-079

		Acc	Ret		Acc	Ret		Acc	Ret
1	1 3/8	✓		16	3/4	✓		31	
2	1 1/2	✓		17	3/4	✓		32	
3	3	✓		18	3/4	✓		33	
4	1 1/2	✓		19	3/4	✓		34	
5	3	✓		20	B	✓		35	
6	1 1/2	✓		21	1 1/2	✓		36	
7	1.185	✓		22	1.80	✓		37	
8	1.093	✓		23	0.62	✓		38	
9	3/4	✓		24	0.39	✓		39	
10	12	✓		25				40	
11	6	✓		26				41	
12	3/4	✓		27				42	
13	3	✓		28				43	
14	1 1/2	✓		29				44	
15	1.355	✓		30				45	

Tolerances on Dimensions
(unless otherwise specified)

REMARKS:

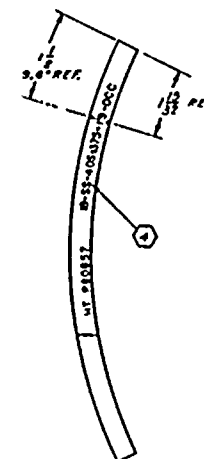
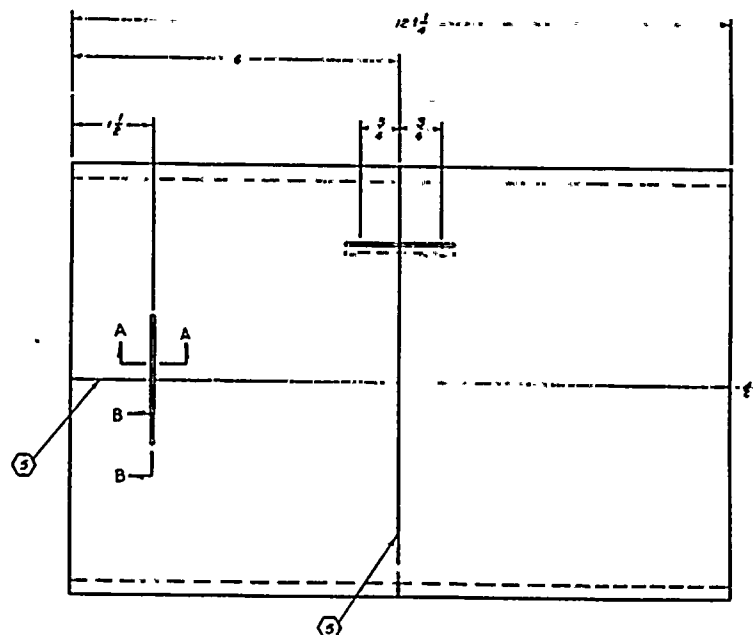
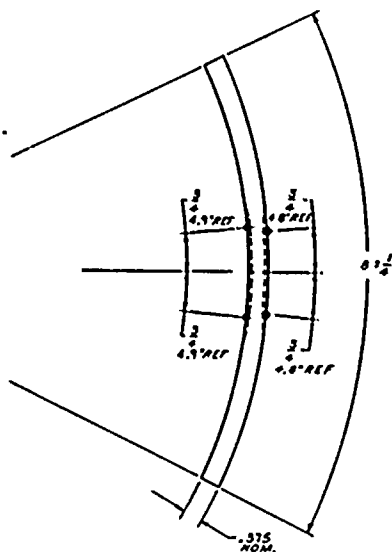
Fractions ± 1/16
.X ± —
.XX ± —
.XXX ± .010
Ang. ± 0°30'

SWRI	
R.O.	39549
P. R.	
LOG	12123

Number of Samples 1
Number ACCEPTED 1
Number REJECTED 0

LOT: ACCEPTED
REJECTED
Signed Walter S. [Signature]
Date 27 Sep 79

Page 1 of 1



NOTES:

1. DEBURR AND BREAK SHARP EDGES.
2. MATERIAL FOR BLOCK MUST BE FREE OF:
PIPE SEAM WELDS, FABRICATION OR REPAIR WELDS,
ANY LAMINAR INDICATIONS WHICH MAY AFFECT
ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
3. STEEL STAMP ID. NO. AND HEAT NO. AS SHOWN, ON
SURFACE INDICATED, IN CHARACTERS 3/16 MIN. HEIGHT.
4. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP
WHERE NOTED. STEEL STAMP, OR MILL CUT, AN INDEX
MARK AT ENDS OF EACH CENTERLINE AS SHOWN,
1/32 X 1/32 X 1/4 LONG.
5. MAKE FROM 18" PIPE, SCHEDULE 40S, ASTM A-312 TP316 SECTION A-A
HEAT N° P000831, SWRI LOG. N° 1110E.

~~TOP~~ .062 TYP
 .038 ± .005

SECTION B-B

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION STANDARDS

CALIBRATION STANDARD 18-SS-40S-.375-19-DCC IS
HEREBY CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE
WITH SECTION IX 1974 EDITION OF THE ASME BOILER AND
PRESSURE VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS
CALIBRATION STANDARD IS SUBSTANTIATED WITH THE ATTACHED
CHEMICAL ANALYSIS REPORT FOR SA 312 type 316, Ht. P80857
IN ACCORDANCE WITH THE MATERIALS SPECIFICATION SECTION II
OF THE ASME BOILER AND PRESSURE VESSEL CODE

(SIGNATURE)

Oct. 2, 1979

(DATE)

BRISTOL METALS Inc.

Subsidiary of Synalloy Corp.

BRISTOL, TENNESSEE 37620

TEST REPORT

SOLD TO
KILSBY TUBESUPPLY COMPANY4404 WINDFERN RD
HOUSTON, TX 77041KILSBY TUBESUPPLY COMPANY
4404 WINDFERN RD
HOUSTON, TX 77041

Date 12-18-78

Cust Order No. R374

Shop Order No. 9471-E

Heat No. P80857

Quantity	Description	Specification
6'3"	18" IPS Sch. 40s A-312 T-316ELC s/s Pipe Length Tolerance +1/4-1/16"	

CHEMICAL ANALYSIS


Carbon	Mang	Phos	Sul	Sil	Chromo	Nickel	Moly	Cu	Co
.014	1.40	.024	.008	.62	17.47	11.09	2.25	.15	.23

MECHANICAL TESTS

Tensile Psi	Yield Psi	Elongation %	Reduction	Hardness
91,000	50,600	48		HBL7C
Hydro Test (PSIG)	520		Tension Test — yes	
			Flattening Test — yes	0.8087454
			Bend Test — no	166814
Radiographic Test	N/A		Annealed at 1950° F Min. and Water Quenched — yes	1110E

We Certify this Report to be True and Correct,
to the Best of Our Knowledge and Belief.

BRISTOL METALS Inc.



DOSCO, INC.
P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220
QUALITY CONTROL INSPECTION REPORT

no. 2

Contract No. 735462 Item 18" Pipe 210Thru-hole Gal. SDR
P/N 18-SS-405-375-19-DCC QTY NSN SWRI
D-3378-080

		Acc. Req.		Acc. Req.		Acc. Req.
1	3/4	/	16		31	
2	8"	/	17		32	
3	1 1/2	/	18		33	
4	6	/	19		34	
5	3/4	/	20		35	
6	12	/	21		36	
7	002	/	22		37	
8	.038	/	23		38	
9	1 1/2	/	24		39	
10	1 5/32	/	25		40	
11			26		41	
12			27		42	
13			28		43	
14			29		44	
15			30		45	

Tolerances on Dimensions
(unless otherwise specified)

REMARKS:

Fractures ± 1/16 SWRI
X ± 0.10 39544
XX ± 0.10 —
XXX ± 0.10 1119C
Any. ± —

Number of Samples 1
Number ACCEPTED 1
Number REJECTED 0

LOT: ACCEPTED
REJECTED
Signed [Signature]
Date 9-25-79

Page 1 of 1



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION STANDARDS

CALIBRATION STANDARD 4-SS-80-.337-20-DCC IS
HEREBY CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE
WITH SECTION IX 1974 EDITION OF THE ASME BOILER AND
PRESSURE VESSEL CODE THE P-NUMBER CLASSIFICATION FOR THIS
CALIBRATION STANDARD IS SUBSTANTIATED WITH THE ATTACHED
CHEMICAL ANALYSIS REPORT FOR SA 312 type 316, Ht. 05502
IN ACCORDANCE WITH THE MATERIALS SPECIFICATION SECTION II
OF THE ASME BOILER AND PRESSURE VESSEL CODE

(SIGNATURE)

Oct. 8, 1979

(DATE)



AL Tech Specialty Steel Corporation

Willowbrook Avenue, Dunkirk, N.Y. 14048

CERTIFICATE
OF TEST

PURCHASE ORDER NO. AND DATE	NOT BEFORE	INQUIRY NO. AND DATE	ACCEPTING MILL	MILL ORDER NO.	DATE SHIPPED	INVOICE NO.
8-93401	11/17/78		WATERVLIET	0-0-98900	3/28/79	E-191627

TUBE SALES
175 TUBEWAY

FOREST PARK

GA

30050

S
H
I
P
T
O

TUBE SALES
175 TUBEWAY

FOREST PARK

GA

30050

PRODUCT SPECIFICATIONS

AL TECH STAINLESS STEEL TYPE 316H .04-.08 CARBON
EXTRUDED SEAMLESS PIPE TO ASTM A-312-77 ASME SA-312
CORROSION TESTED TO MIL-P-1144-D

ITEM	DESCRIPTION	QUANTITY	POUNDS	C/P	TEST PCS.	COPIES SOLD TO	C	P	COPIES SHIP TO	C	P
1	T 4.5000 .3370 12/19						3	3		2	2

CHEMICAL ANALYSIS

STANDARD ELEMENTS & PERCENTAGES

ADDITIONAL ELEMENTS

HEAT NO.	C	MN	P	S	SI	CR	NI	AL	MO	CU	Co
05502	.055	1.62	.023	.021	.33	17.39	12.77	-	2.25	.15	.18 (LADLE)
	.057	1.64	.022	.021	.32	17.34	12.75	-	2.25	.14	.18 (CHECK)

PHYSICAL PROPERTIES

STEEL MELTER - AL TECH, WATERVLIET, NY

HEAT NO.	TENSILE PSI	YIELD PSI	ELONG %	BRINELL / ROCKWELL	TEST NO.
05502	83,430	41,400	46.0	Rb82/83	01-001

THIS CERTIFICATE APPLIES TO
SOUTHWEST RESEARCH INST.

81987 SW

9-29097

1'0"

CHECKED

9/26/79

INTERGRANULAR CORROSION TEST: OK
FLATTENING TEST: OK
HYDROSTATIC TEST: OK

W. B. ACKERMAN
W. B. ACKERMAN, TEST ENGINEER 3/28/79

ANALYSES AND RESULTS CERTIFIED AS ABOVE

AL TECH SPECIALTY STEEL CORPORATION

C-87

no. 2

		Acc	Ret		Acc	Ret		Acc	Ret
1	1 1/2	/		16			31		
2	3 3/4	/		17			32		
3	6 1/4	/		18			33		
4	10	/		19			34		
5	3/4	/		20			35		
6	1 1/2	/		21			36		
7	.034 ⁺ .003	/		22			37		
8	.062	/		23			38		
9	1 49/64	/		24			39		
10				25			40		
11				26			41		
12				27			42		
13				28			43		
14				29			44		
15				30			45		

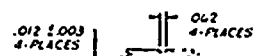
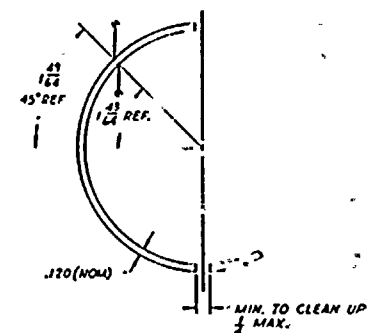
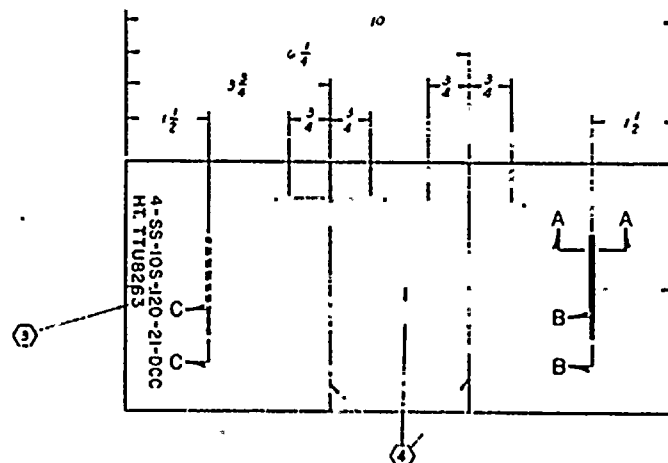
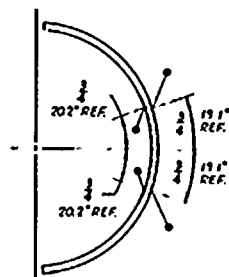
REMARKS:

LOT: ACCEPTED
RESPECTED
Signed: J. L. R. [Signature]
Date: 10-8-79

C-88

NOTES:

1. DEBURR AND BREAK SHARP EDGES.
2. MATERIAL FOR BLOCK TO BE FREE OF:
PIPE SEAM WELDS,
ANY LAMINAR INDICATIONS WHICH MAY AFFECT
ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS,
FABRICATION OR REPAIR WELDS.
3. STEEL STAMP ID N° AND HEAT N° AS SHOWN, ON
SURFACE INDICATED, IN CHARACTERS 3/16 MIN HEIGHT.
4. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP
WHERE HOT-SET STEEL STAMPS OR MILL CUT AN INDEX
MARK AT ENDS OF EACH CENTERLINE AS SHOWN
1/32" x 1/4" x 1/4" LONG.
5. MAKE ARCH NO 1712, SCHEDULE 10S, SA 312 GR 304
HTL N° 1714-A, 1/2" WIDE LOG N° 1103C.



SECTION A-A
SCALE: 2/1

26' MAX
3-6 GROOVES



SECTION B B
744 24



SECTION C-C
DATE: 2/1

4-SS-105-120-21-DCC

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION STANDARDS

CALIBRATION STANDARD 4-SS-10S-.120-21-DCC IS
HEREBY CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE
WITH SECTION IX 1974 EDITION OF THE ASME BOILER AND
PRESSURE VESSEL CODE . THE P - NUMBER CLASSIFICATION FOR THIS
CALIBRATION STANDARD IS SUBSTANTIATED WITH THE ATTACHED
CHEMICAL ANALYSIS REPORT FOR SA 312 type 304, Ht. TTU8263
IN ACCORDANCE WITH THE MATERIALS SPECIFICATION SECTION II
OF THE ASME BOILER AND PRESSURE VESSEL CODE

(SIGNATURE)

Oct 4, 1979

(DATE)

S. 500-37769

HT. NBR. TTU8263
MILL SHEET

80-S-0350

Yokohama Steel Tube Co. Ltd.

1-1-1 Higashi Yoko, Tsurumi-ku, Yokohama, Japan

Date 12 Aug. 1977

77-2100

Vessel: HISSHO IWAI & CO., LTD.

USD5100

Mill Sheet No.

Material: Seamless Austenitic Stainless Steel Pipes

Rule: ASTM A 312-TP 304

ASME SA312

Vessel No.	Order Size			Quantity		Total Length	Total Weight	Charge No.	Chemical Analysis %							
	Outside Dia	Wall Thickness	Unit Length	Number of Bundles	Number of Pieces				C	Si	Mn	P	S	Cu	Ni	Cr
									≤	≤	≤	≤	≤		8.00	18.00
									.06	.75	2.00	0.040	0.030		11.00	20.00
10-6	4" HB	SC10	17-24'		51		2669	TTU8263	.05	.51	1.75	.029	.007		9.35	18.45
	4.500" x 1.20" WALL															

Vessel No.	Test No.	Description of Test														Remarks	Note
		Yield Point kg/mm ²	Tensile Strength kg/mm ²	Gauge Length mm	Elongation %	Bending DX	Flattening H=	Expansion D=	Flange D=	Flaring D=	Reverse Flattening	Hardness	Hydrostatic kg/cm ²	Surface & Dimension			
		min	min	mm	min												
		21	53	50.8	35		meet						55.1			Mil-P-1144	
		28.2	58.4	"	59.3		good						good	good		COR-Test	
		40.109	83.064										704#			good	

Q. C. REVIEWED
9/26/77 PJL

35-01995-S

35-11890

Yokohama Steel Tube Co. Ltd.

T. Morinaga
Chief of Inspection Division

Signature

DOSCO, INC.
P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220
QUALITY CONTROL INSPECTION REPORT

no. 2

Contract No. 735484 Item 4" Pipe ultrasonic Cal RIK
P/N 4-55-105-120-21-DCC Qty 1EA NSN SWRI.
D-3378-082

		Age	Rei		Age	Rei		Age	Rei
1	1 1/2		16			31			
2	3 3/4		17			32			
3	6 1/4		18			33			
4	3/4		19			34			
5	10		20			35			
6	3/4		21			36			
7	1 1/2		22			37			
8	1 49/64		23			38			
9	.120		24			39			
10	.012		25			40			
11	.062		26			41			
12			27			42			
13			28			43			
14			29			44			
15			30			45			

Tolerances on Dimensions
(unless otherwise specified)

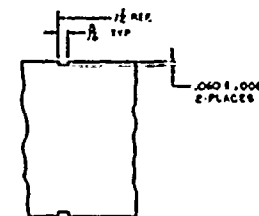
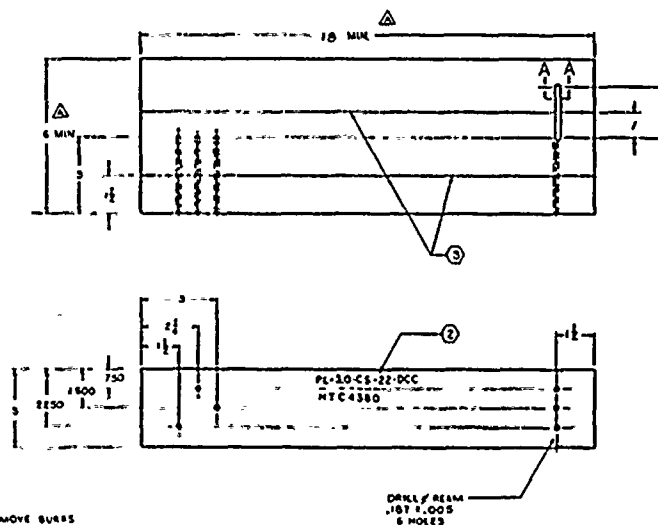
REMARKS:

Fractions	±	1/16	SWRI	
.X	±	.010	R. O.	39558
.XX	±	.010	P. R.	
.XXX	±	.010	LOG	1129
Ang.	±			

Number of Samples 1
Number ACCEPTED 1
Number REJECTED 0

LOT: ACCEPTED
REJECTED
Signed [Signature]
Date

Page of

[illegible]

SECTION A-A
SCALE 1/1

PL - 30-CS-22-DCC

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION STANDARDS

CALIBRATION STANDARD PL-3.0-CS-22-DCC IS
HEREBY CLASSIFIED AS P-NUMBER 3 GROUP 3 IN ACCORDANCE
WITH SECTION IX 1974 EDITION OF THE ASME BOILER AND
PRESSURE VESSEL CODE . THE P - NUMBER CLASSIFICATION FOR THIS
CALIBRATION STANDARD IS SUBSTANTIATED WITH THE ATTACHED
CHEMICAL ANALYSIS REPORT FOR SA 533 Gr. B, Ht. C4380
IN ACCORDANCE WITH THE MATERIALS SPECIFICATION SECTION II
OF THE ASME BOILER AND PRESSURE VESSEL CODE

(SIGNATURE)

June 6, 1980

(DATE)

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.

CUSTOMER P.O.

77705-1

6735 SHEET 3

DP 9574 DC

DATE: 9-7-74

FILE NO. 1540-02-0.

CONSIGNEE:

Chicago Bridge & Iron Co
 Boyles, Ala. 35202

MATERIAL WAS MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATIONS

CBIN MS-51-1 Rev. 7 1974 Except Para. 6.0 QAS-51 Rev. 4 DTD 10/22/73 SA-533 GR. B CL. 1 ASME Code
 Sect. 2 & 3 CL. 1 1971 Edition Thru Summer 1973 Addenda

WELD TEST O.K.

NOVOCENEITY TEST

Sheet #1 of 4

CHEMICAL ANALYSIS

MELT NO.	C	Mn	P	S	Cu	Si	Ni	Cr	Mo	V	Ti	Al	X	Grain Size
C4380 CHECK	19	1.30	012 013	011	06 07	23	63		56	00		018	VIP STEEL Slab #2	7-8 7-8

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 2"	% R.A.	BHN	IMPACTS			DESCRIPTION
C4380	2	695 648	855 825	23 29						1- 5-11/16" x 178-1/2 x 248-1.
LOC. TEMP.		V-NOTCH IMPACTS			LATERAL EXPANSION IN INCHES				FRACTURE APPEARANCE % SHEAR	
TC	+40°F. Trans.	60	72	62			.048	.058	.046	50-50-50
CC	+40°F. Long.	68	69	75			.058	.062	.061	60-60-60
EC	+40°F. Trans.	54	73	72			.045	.058	.058	60-60-60
EC	+40°F. Long.	84	71	83			.062	.050	.065	80-80-80

SWI
 P.O. 54097
 P.R. 115728
 LRG 0841

6/51

These certify that above information is correct.

SUPERVISOR TESTING

[Signature]

CHASER.
Chicago Bridge & Iron Co.
Mr. S.E. Wiggin, Buyer

LUKENS STEEL COMPANY
COATESVILLE, PA. 19320
TEST CERTIFICATE

DATE, 9-7-74
CONSIGNEE
Chicago Bridge & Iron Co.
Boyles, Ala. 35202

MILL ORDER NO. 77705-1
CUSTOMER P.O. 6735 SHEET 3

WAS MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATIONS

SAME

TESTED TEST O.K. HOMOGENEITY TEST

Sheet #2 of 4

CHEMICAL ANALYSIS

TEST NO	C	Mn	P	S	Cu	Si	Ni	Cr	Mo	V	Ti	Al	B		

PHYSICAL PROPERTIES

TEST NO	SLAB NO.	YIELD PSI T100	TENSILE PSI T100	% ELONG. IN	% R.A.	BHN	IMPACTS			DESCRIPTION	
34380	2									.17.1 P. 3 54047 P. R. 115728 L00 0561	
		TRANS. V-NOTCH IMPACT TRANSITION CURVE								FRACTURE APPEARANCE % SHEAR	
TEMP.		RESULTS					LATERAL EXPANSION IN INCHES				
-12°F.		103	101	102			.077	.075	.078	99-99-99	
-100°F.		94	85	102			.072	.070	.078	70-70-70	
-80°F.		72	69	84			.066	.052	.054	50-50-50	
-60°F.		43	50	47			.036	.040	.034	40-40-40	
-40°F.		22	14	14			.010	.009	.015	1-1-1	
-100°F.		9	10	11			.005	.006	.006	1-1-1	

certify the above information is correct.

SUPERVISOR TESTING

W. H. Kline

CHASER,
Chicago Bridge & Iron Co.
15 Mr. S.E. Wiggin, Buyer

LUKENS STEEL COMPANY
COATESVILLE, PA. 19320
TEST CERTIFICATE

DATE: 9-7-74 FILE NO. 1540-02-04
CONSIGNEE: Chicago Bridge & Iron Co.
Boyles, Ala. 35202

MILL ORDER NO. 77705-1
CUSTOMER P.O. 6735 SHEET 3

WAS SEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATIONS

SAME

TEST O.K. HOMOGENEITY TEST

Sheet #3 of 4

CHEMICAL ANALYSIS

TEST NO.	C	Mn	P	S	Cu	Si	Ni	Cr	Mo	V	Ti	Al	B		

S&RI
P. O. 54047
P. R. 115728
LQG 0861

PHYSICAL PROPERTIES

TEST NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG IN	% R.A.	BHN	IMPACTS	DESCRIPTION
54380	2							

TOP OF PLATE

DROP TEMP	WEIGHT TRANSITION	CURVE RESULTS
+10°F.		No Break
-10°F.		2 No Break
-20°F.		Break
-30°F.		Break
-50°F.		Break

NDT is -20°F.

BOTTOM OF PLATE

DROP TEMP	WEIGHT TRANSITION	CURVE RESULTS
+10°F.		No Break
-10°F.		2 No Break
-20°F.		Break
-30°F.		Break
-50°F.		Break

NDT is -20°F.

Reference Temp. -20°F.

SUP. REVISOR TESTED *[Signature]*

Chicago Bridge & Iron Co.
15 Mr. S.E. Wiggin, Buyer

LUKENS STEEL COMPANY
COATESVILLE, PA. 19320
TEST CERTIFICATE

DATE: 9-7-74 FILE NO: 1540-02-04
CONSIGNEE: Chicago Bridge & Iron Co.
Boyles, Ala. 35202

MILL ORDER NO. 77705-1
CUSTOMER P.O. 6735 SHEET 3

ALL MATERIALS MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATIONS

SAME

END TEST

HOMOGENEITY TEST

Sheet #1 of 1

CHEMICAL ANALYSIS

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

PHYSICAL PROPERTIES

TEST NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN	% R.A.	BHN	IMPACTS	DESCRIPTION
H.T. Procedure - LS-102 DTD 2/21/69 Rev. 14 DTD 3/21/74								
Plate and TENS tests heated 1630-1670°F., held 5 hrs. and 45 minutes and water quenched (time in HHHHHH quench tank - 23 minutes), then tempered 1250-1270°F., held 6 hrs. and 20 minutes and water quenched (time in quench tank - 24 minutes).								
Plate and tests stress relieved by heating to 1030-1060°F., held 3 hrs. and 10 minutes and air cooled.								
Tests stress relieved by heating within a rate of 100°F. per hr. to 1150°F., held 50 hrs. and furnace cooled within a rate of 100°F. per hr. to 600°F.								
U.T. Testing was not performed by LUKENS STEEL CO.								

SWRI
P.O. 54047
P.R. 715728
LOG 0861

We hereby certify the above information is correct.

SUPERVISOR TESTING

L. H. G. Line

DOSCO, INC.
P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220
QUALITY CONTROL INSPECTION REPORT

no. 2

Contract No. 735874 Item Calibration Block
P/N PL-310-CS-22-DCB QTY 1ea NSN 5441
Dwg. D 3378-083 "A"

		Acc. Ret.			Acc. Ret.			Acc. Ret.
1	3	✓	16	3/16 top	✓	31		
2	2.250	✓	17	.060 ± .006	✓	32		
3	1.500	✓	18			33		
4	.750	✓	19			34		
5	1 1/2	✓	20			35		
6	2 1/4	✓	21			36		
7	3	✓	22			37		
8	1 1/2	✓	23			38		
9	3	✓	24			39		
10	6 min.	✓	25			40		
11	18 min.	✓	26			41		
12	1	✓	27			42		
13	2	✓	28			43		
14	1 1/2	✓	29			44		
15	.187 ± .005	✓	30			45		

Tolerances on Dimensions
(unless otherwise specified)

Fractions ± 1/16 S&RI
.X ± 0.001 43153
.XX ± 0.002 P. R. 1270
.XXX ± 0.010 LOG
Ang. ± 1

Number of Samples 1
Number ACCEPTED 1
Number REJECTED 0

REMARKS:

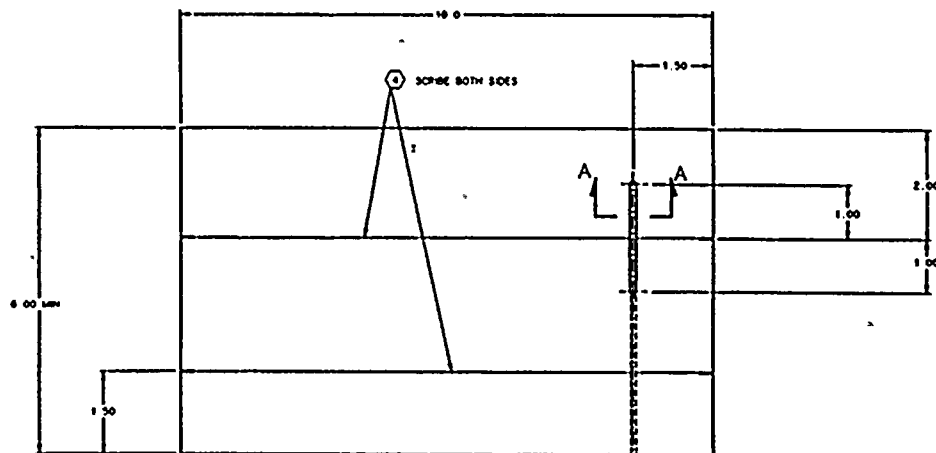
LOT: ACCEPTED

REJECTED

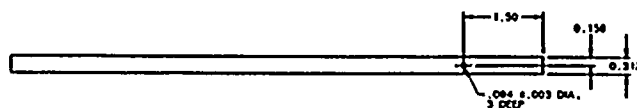
Signed J. J. Paul
Date June 80

Page 1 of 1

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PI - 312-SS-238-OCC MF 75082



NOTES.

- 1 DEBURR AND BREAK SHARP EDGES
2. MATERIAL FOR BLOCK TO BE ULTRASONICALLY EXAMINED IN ACCORDANCE WITH S-RI NUCLEAR PROJECTS OPERATING PROCEDURE 1X-FE-120 LATEST REVISION.
- 3 STEEL STAMP I.D. NO. AND HEAT NO. AS SHOWN ON SURFACE INDICATED IN CHARACTERS 3/16 IN. HEIGHT.
- 4 SCRIBE CENTERLINES .003-.005. WIDE AND DEEP WHERE NOTED. STEEL STAMP OR MILL CUT. AND INDEX MARK AT ENDS OF EACH CENTERLINE. AS SHOWN. 1/32 x 1/32 x 1/4 LONG.
- 5 MAKE FROM ASME S4240 GR. 304. S-RI LOG NO. 2082
DATE FROM 75082.



SECTION A-A
SCALE 2/1

PL-.312-SS-23R-DCC

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK PL-312-SS-23R-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE WITH
SECTION II 1980 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA240 GR304. HT 75082 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design for the above calibration block incorporates the requirements of
Section V, 1980 Edition of the ASME Boiler & Pressure Vessel Code. The design
also meets SwRI nondestructive testing procedure requirements and tolerances.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-606

Robert L. Edwards

SIGNATURE

Lead Engineer

TITLE

July 2, 1987

DATE

Certificate of Analysis and Tests

Division of Avesta Inc.

SOLD TO

AVESTA STAINLESS INC.
2 HEIGHTS BONDED WAREHOUSE
90 HIRSCH
HOUSTON TX 77020

SHIP TO SAME AS INVOICE COMPANY

MTR-OK
9-11-55

BY: *mp*

.....ORDER NUMBER.....

59631 6

CUSTOMER
CODE
416004

DATE
AUG. 14, 1955

DATE OF ORDER & DATE 07/00/01	QUANTITY 1	SPECIFICATION RANDOM	REMARKS
----------------------------------	---------------	-------------------------	---------

ITEM	QTY	DESCRIPTION	QUANTITY ORDERED	REMARKS
6	1	.500 X 96.0000 X 240.0000 RANDOM ASME SA-240-80 83ED, S84 ADD ASTM A-240-84A ACS-766C	1	BY AVESTA STAINLESS, INC. CUSTOMER: <i>W. J. Burckhardt</i> YOUR P.O. <i>277</i> DATE: <i>8-20-55</i> ITEM I.O. <i>1</i> OUR INV. NO. <i>F-20030</i>

PLATES & TEST PCS SOLUTION ANNEALED @ 1950 DEGREES FARENHEIT MINIMUM.
IMMEDIATELY COOLED OR RAPIDLY COOLED BY AIR
100% RULLED, ANNEALED & PICKLED (HRAP)

HEAT NUMBER	HARDNESS	PEELS	YIELD STRENGTH 102.5 PER SQ IN	TENSILE STRENGTH 102.5 PER SQ IN	ELONG % IN 2"	BEND	RED AREA %	INTERGRANULAR CORROSION	GRAIN SIZE	REMARKS
75082	81	1	41000	82600	59.0	OK	61.9	OK	02-2A	LENGTH 254
75083	82	1	41000	82600	52.0	OK	61.9	OK	01-1A	LENGTH 253
75082	83	1	41000	82600	59.0	OK	61.9	OK	02-2B	LENGTH 254
75082	79	1	43200	85400	52.0	OK	65.0	OK	03-3A	LENGTH 251
75082	86	1	43000	82700	50.5	OK	63.0	OK	01-1AX	LENGTH 256
90458	81	1	43500	85200	52.5	OK	64.5	OK	03-3A	LENGTH 249

HEAT NO	C	Mn	P	S	Si	Cr	Ni	Co	Mo	Nb	Cu	Fe	Al	V	W
75082	.040	1.840	.028	.014	.640	18.220	8.250	.140	.220	.130	.081				
75083	.040	1.840	.028	.014	.640	18.220	8.250	.140	.220	.130	.081				
75082	.040	1.840	.028	.014	.640	18.220	8.250	.140	.220	.130	.081				
75082	.027	1.824	.029	.013	.470	18.174	8.190	.120	.300	.210	.086				
75082	.040	1.840	.028	.014	.640	18.220	8.250	.140	.220	.130	.081				
90458	.045	1.470	.028	.001	.430	18.100	8.100	.220	.320	.300	.030				

Ingersoll Steel
Division of Avesta Inc.
101 P.O. Box 100

STATE OF INDIANA
COUNTY OF HENRY

By *C. J. Burckhardt*

WITNESSES: *W. J. Burckhardt* and *W. J. Burckhardt*

DATE	7-26-77
INITIALS	W. J. Burckhardt
TIME	2:08 PM

W. J. Burckhardt

C-103

3733 PITLUK
P.O. Box 3452
San Antonio, Texas 78211
(512) 924-4734



HERCO
Aircraft Machine, Inc.

NO. 2

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 87-0139 ITEM S.S. PLATE CALIBRATION BLOCK
P/N D-3378-606 QTY. 1 ea NSN R.O. 75424

		ACC	REJ			ACC	REJ			ACC	REJ
1	10.0	✓		16				31			
2	SCRIBE BOTH SIDES	✓		17				32			
3	1.50	✓		18				33			
4	6.00 MIN	✓		19				34			
5	1.50	✓		20				35			
6	1.00	✓		21				36			
7	2.00	✓		22				37			
8	1.00	✓		23				38			
9	STEEL STAMP	✓		24				39			
10	1.50	✓		25				40			
11	.094 ± .003 DIA X 3 DEEP	✓		26				41			
12	.156	✓		27				42			
13	.312	✓		28				43			
14	.12 ^W X 2.00 L	✓		29				44			
15	.031 ± .005	✓		30				45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS ± —

ANGLES ± —

.X ± .1

±.01

.XX ± .03

R.O. 75424

.XXX ± .015

±.02
LSS 2433 B

NUMBER OF SAMPLES 1

NUMBER OF ACCEPTED 1

NUMBER OF REJECTED —

REMARKS:

LOT: ACCEPTED ✓

REJECTED

SIGNED [Signature]

DATE 6/26/87



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK IR-CSCL-24-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 1 GROUP 2 IN ACCORDANCE WITH
SECTION II 1983 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA 216 Gr. WCC, Ht. BL763 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design for the above calibration block has been revised to incorporate the requirements of Section XI (1983 Edition, Summer 1983 Addenda) and Section V (1983 Edition, Summer 1983 Addenda) of the ASME Boiler and Pressure Vessel Code. The design also meets SwRI nondestructive testing procedure requirements and tolerances.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-085B
Welding Electrode Certifications, Heat No.'s 616495, 06514, and 616716
Postweld Heat Treat Certification

*Revised 9/9/88


Robert L. Edwards

SIGNATURE

Lead Engineer

TITLE

Sept. 9, 1988

DATE

1. STEEL CASTINGS, INC.
 P. O. BOX 100
 CHICAGO, ILL. 60601
 TEL. 312-467-1711

LABORATORY REPORT

DATE 7-17-61

FROM: CHICAGO, ILL. 60601
 TO: CHICAGO, ILL. 60601
 BY: CHICAGO, ILL. 60601

HEAT METAL SPECIFICATIONS
 EL783 ASTM A216 GR. 400
 PATTERN 6-11-18-TEST-BLOCK
 PO NUMBER 21733-54

C	MN	SI	P	S
.180	.850	.400	.024	.003

HEAT METAL SPECIFICATIONS

EL783 ASTM A216 GR. 400

TENSILE STRENGTH	YIELD POINT	ELONG- ATION	RED. OF AREA
71500	55200	26.80	46.20

6-11-18-TEST-BLOCK

NO STEEL CASTINGS, INC.
 METALLURGICAL DEPARTMENT

George W. Williams
 AUTHORIZED SIGNATURE

21733
 256335

3733 PITLUK
P.O. Box 3452
San Antonio, Texas 78211
(512) 924-4734



HERCO
Aircraft Machine, Inc.

NO. 2

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 88-0100

ITEM CALIBRATION BLOCK

P/N D 3378 085 (B)

QTY. 1 ea

NSN TCO. 606713

		ACC	REJ			ACC	REJ			ACC	REJ
1	2"	✓		16	5 NOTCHES 2" RAD	✓		31	4"	✓	
2	2 1/4 R	✓		17	3 NOTCHES 2" RAD	✓		32	2	✓	
3	.200	✓		18	.353 ± .005	✓		33	18 ± 1/2	✓	
4	3 NOTCHES 2" RAD	✓		19	.103 REF	✓		34			
5	.328 ± .005	✓		20	2.025	✓		35			
6	3.250	✓		21	2.000	✓		36			
7	5.410	✓		22	2.000	✓		37			
8	7.500	✓		23	9.000	N/A		38			
9	27°	✓		24	8.442	✓		39			
10	5	✓		25	10.130	✓		40			
11	16 ± 1/2	✓		26	11.825	✓		41			
12	22°	✓		27	13.575	✓		42			
13	11°	✓		28	15.250	✓		43			
14	.062 TYP	✓		29	2	✓		44			
15	.406 ± .005	✓		30	8" MIN	✓		45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS: 1/16

.X = /
.XX = ± .010
.XXX = /

ANGLES: 0° 30'

DATE	<u>7/6/42</u>
P. O.	<u>606713</u>
P. R.	<u>2590</u>

REMARKS:

NUMBER OF SAMPLES 1

NUMBER OF ACCEPTED 1

NUMBER OF REJECTED _____

PAGE _____ OF _____

LOT: ACCEPTED ✓

REJECTED _____

SIGNED [Signature]

DATE Aug. 26, 1988

3733 PITLUK
PO Box 3452
San Antonio, Texas 78211
(512) 924-4734



HERCO
Aircraft Machine, Inc.

NO. 2

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 87-0162 ITEM CALIBRATION Block
P/N D 3378 085 Rev A QTY. 1 ea NEW R.O 75454

		ACC	REJ			ACC	REJ			ACC	REJ
1	.156 ± .005	✓		16				31			
2	2" RAD .152 ± .005	✓		17				32			
3	8.442	✓		18				33			
4	10.130	✓		19				34			
5	.062 TYP	✓		20				35			
6				21				36			
7				22				37			
8				23				38			
9				24				39			
10				25				40			
11				26				41			
12				27				42			
13				28				43			
14				29				44			
15				30				45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS = 1/16"

ANGLES = 0°30'

.X = 7
.XX = 7 ± .010
.XXX = 7

ENRI
P. O. 75454
P. R. 2445
LOG

NUMBER OF SAMPLES 1
NUMBER OF ACCEPTED 1
NUMBER OF REJECTED 0

REMARKS:

Old two Notches

LOT: ACCEPTED ✓

REJECTED

SIGNED Eugene L. E.

DATE 7/24/87

Bishop Machine & Tool Co. Inc.

-13-

QUALITY CONTROL INSPECTION REPORT

Contract No.: R/O 57262 Item OD. Manual Inner Radius
UT Calibration Svc.
 P/N D-3378-085 QTY 1 ea NSN JR12775
ID# 1R-CSCL-24-DCC

	Acc	Rej		Acc	Rej		Acc	Rej
1	✓		16	✓		31	✓	
2	✓		17	✓		32		
3	✓		18	✓		33		
4	✓		19	✓		34		
5	✓		20	✓		35		
6	✓		21	✓		36		
7	✓		22	✓		37		
8	✓		23	✓		38		
9	✓		24	✓		39		
10	✓		25	✓		40		
11	✓		26	✓		41		
12	✓		27	✓		42		
13	✓		28	✓		43		
14	✓		29	✓		44		
15	✓		30	✓		45		

Tolerances on Dimensions
(unless otherwise specified)

Fractions per part

.X = _____

.XX = _____

.XXX = _____

Number of Samples 0

Number ACCEPTED 1

Number REJECTED 0

Number and Types of Defects Found:

SWRI

R. O. 57262

P. R. _____

LOG 1642

Corrective Action Taken: _____

LOT: ACCEPTED ☒

REJECTED ☐

Signed Mike Rudgatz

Date 8-24-82

CSS-308
WELDING PRODUCTS DIVISION

WILLIAMS WELDING
P.O. Box 1522 • 222 Glenview Road • York, Pa. 17403

CSS-308	11/79	Your Order No. 1044
WELDERS SUPPLY CO		Marked For
SAN ANTONIO TX 78238		Our Order No. 64016
		Date Shipped 06/14/82

Material Description and Specifications				
Item	Weight, lb.	Size, in.	Chem. Composition	Notes
1	60	1/8	E308-16	AC-DC
2	60	5/32		

Heat No.	Lot No.	Specifications
68041	2526725	AWS A5.4-78; ASME A5.4
616495	2426547	

Typical Deposit Chemistry												
Item	% C	% Mn	% P	% S	% Si	% Cr	% Ni	% Mo	% Cu	% Ti	% Nb	Ferrite
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2	.06	1.0	.022	.015	.40	20.2	9.6	.15	.10			7 FN
3												
4												
5												
6												

Typical Deposit Mechanical Properties			
Item	Tensile, psi	Yield, psi	Elong., %
1			
2	86,000	65,000	45
3			
4			
5			
6			

For Information: 5/32" OCT needs to be used in the vertical and overhead position.

SARI
P. O. 21703 SW
P. R. 268350
LOS 1610

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

Henry V. [Signature]

MATERIAL TEST REPORT
Welding Products Division



CSS-309
Alamo Welding Supply
1735 South Alamo
San Antonio, TX 78204

11/79

Your Order No. 7588
Marked For
Our Order No. V4512
Date Shipped

Material Description and Specifications												
Item	Weight, lb.	Size, in.	Classification					Coating				
1	60	5/32	E309-16					AC-DC				
2												
3												
4												
5												
6												

Item	Heat No.	Lot No.	Specification									
1	06514	2306070	AWS A5.4-78; ASME SFA5.4									
2												
3												
4												
5												
6												

Typical Deposit Chemistry												
Item	%C	%Mn	%P	%S	%Si	%Cr	%Ni	%Mo	%Cu	%V	%Cb+Ta	Ferrite
1	.07	1.0	.022	.015	.35	23.4	12.5	.15	.11			7 FN
2												
3												
4												
5												
6												

Typical Deposit Mechanical Properties				
Item	Tensile, psi	Yield, psi	%Elong.	Charpy V-Notch Impact, ft. lb.
1	88,000	67,000	37	5/32" DCT needs the following statement: The 5/32" DCT electrode is not recommended for use in the vertical and overhead positions
2				
3				
4				
5				
6				

For Notarization

SERI
P. C. 1155-85 SW
P. R. 202093
LOG 1429

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

TELEDYNE MCKAY

Barry Childers 2/2/81

CSS-308
MATERIAL TEST REPORT
 Welding Products Division

THE EDVAYE MCKAY
 P.O. Box 1509 • 350 Graham Road • York, Pa. 17405

CSS-308

11/79

WELDERS SUPPLY COMPANY
 SAN ANTONIO, TEXAS

Your Order No.
 Marked For

07/22/82

Our Order No.
 Date Shipped

Material Description and Specifications

Weight, lb.	Size, in.	Classification	Coating
60	3/16	E308-15 E308-16 E308-16	DC Line AC-DC DCT

Heat No.	Lot No.	Specification
616716	2426538	AWS A5.4-78; ASME SFA5.4 AWS A5.4-73; ASME SFA5.4 AWS A5.4-78; ASME SFA5.4

Typical Deposit Chemistry

%C	%Mn	%P	%S	%Si	%Cr	%Ni	%Mo	%Cu	%Ti	%Nb-Ta	Ferrite
.05	1.6	✓	✓	✓	✓	✓	✓	✓	✓	✓	7 FN
.05	1.0	.022	.015	.40	20.2	9.6	.15	.10			7 FN
.05			.75	20.5							10 FN

Typical Deposit Mechanical Properties

Yield, psi	Tensile, psi	Elongation, %	Charpy V-notch Impact, ft.lb.
85,000	65,000	45	5/32" DCT needs the following statement: The 5/32" DCT electrode is not recommended for use in the vertical and overhead positions

For Information

QWRI
 P.O. 23858
 P.R. 268378
 L1 1300

We hereby certify that the above conditions have been classified in accordance with the listed specifications and conform to all applicable requirements thereof.

THE EDVAYE MCKAY

Becky Childers

WAREHOUSE COPY - 1
-1031

EARLE M. JORGENSEN CO.

60-050-73

INVOICE NUMBER	10
-------------------	----

5311 STEEL DE
P.O. BOX 1421
HOUSTON, TX 77001

CUSTOMER ORDER - REQ. NO.	DATE ENTERED 06/10/86	BY PD	ORDERED BY JH	RESALE
---------------------------	--------------------------	----------	------------------	--------

TO: DIRECT RESEARCH INSTITUTE
P.O. BOX 32710
SAN ANTONIO, TX 78228

TO: SAN ANTONIO, TX
TEST REPORT

Dick Foley JUN 10 1986

CERTIFICATE OF CONFORMANCE

ITEM #	QUANTITY	DESCRIPTION / SIZE / COLOR MARK	LOCATION
1	1 pc	30" HX 14" FL HSTH 4249	
11	120	5/16 TH X 5-1/2" X 10-1/2" FLAME CUT BURN TO SIZE 41060 <i>Bring mate to shipping</i>	

We hereby certify that the material covered by this report will meet the applicable requirements described herein, including any specifications forming a part of the description.

EARLE M. JORGENSEN CO.

BY *Jim Murr*
STOCK RECORDS SUPERVISOR

SUBSCRIBED AND SWORN TO BEFORE ME

THIS _____ DAY OF _____ 19____

NOTARY PUBLIC

MY COMMISSION EXPIRES _____

SERI	
P. O.	208945W
P. R.	286437
LOG	1606

FORM 88-A1 (1/77)

4106'0

Ingersoll Johnson Steel Co. *5/16 tllk*

Division of A. Johnson & Co., Inc.

Certificate of Analysis and Tests

304

00645-2
MFG CLASS 26

SOLD TO
EARLE M. JORGENSEN COMPANY
P. O. BOX 1900
SCHLAUMBURG

IL 60194

SHIP TO
EARLE M. JORGENSEN COMPANY
1900 MITCHELL BLVD.
SCHLAUMBURG

IL 60194

DELIVERY NOT ACCEPTED AFTER 12 NOON
YOUR ORDER NO. B272

TEST REPORTS WITH SHIPMENT REQUIRED

IISC ORDER NO. 00645-03

4505-10

DATE SHIPPED: 3-31-81

716 J04 FIN 1 .3125 X 96.0000 X 240.0000 MIN RL ASTM A-240 ASME SA-240 QQ-S-766C
HRAIP AMS-5513 MIL-S-5059

PHYSICAL TEST PLATES & TEST PCS SOLUTION ANNEALED 1900 DEG. F MIN. THEN WATER QUENCHED OR RAPIDLY COOLED BY AIR

HEAT NUMBER	HARDNESS RB	PIECES	YIELD STRENGTH 102.5 PSI SQ. IN.	TENSILE STRENGTH 102.5 PSI SQ. IN.	ELONG % IN 2"	BEND	RED. AREA %	INTERGRANULAR CORROSION	GRAIN SIZE	REMARKS
41060	86	1	42,900	84,200	63.0	ac	650	OK		QBX2406

SAMI

P. O. 208975W

P. H. 286437

LOG 1606

CHEMICAL COMPOSITION (WHEN CALLED FOR BY SPECIFICATIONS)

HEAT NO.	C	Mn	P	S	Si	Cr	Ni	Co	Mo	N	Cu/Te	Ti	V	W
41060	0.57	1.86	0.017	0.009	.59	18.71	8.27	.10	.09	.09	0.92			

Ingersoll Johnson Steel Co.

Box 370
Castro, Indiana 47302

STATE OF INDIANA
COUNTY OF HENRY

Subscribed And Sworn To Before Me This

31

Day of

APR 2 1981

1981

1981

Ingersoll Johnson Steel Co.

Ingersoll Johnson Steel Co.

NOLTEX INDUSTRIES

Page 7.4

QUALITY CONTROL INSPECTION REPORT

no. 2

Contract P.O. 21744 SW Item S.S. Plate Calibration Block
D-3378-084 qty 1 NSN _____
PL-312-SS-23-DEC

Accep. Rej.			Accep. Rej.			Accep. Rej.		
1	6min	✓	16			31		
2	1 1/2	✓	17			32		
3	10 ± 1/8	✓	18			33		
4	Ⓢ scribe both sides		19			34		
5	1 1/2	✓	20			35		
6	2	✓	21			36		
7	1	✓	22			37		
8	1	✓	23			38		
9	1 1/2	✓	24			39		
10	.156	✓	25			40		
11	.312	✓	26			41		
12	.094 ± .003d 3" deep	✓	27			42		
13	.031 ± .005	✓	28			43		
14	1/8 em x 2" long	✓	29			44		
15			30			45		

Tolerances on Dimensions
(unless otherwise specified)

REMARKS:

Fractions	± 1/16	S&RI
.X	± .010	P. O. 21744 SW
.XX	± —	P. R. 286347
.XXX	± —	LOG 1615
Ang.	± —	

No. of samples 1
 No. accepted 1
 No. rejected 0

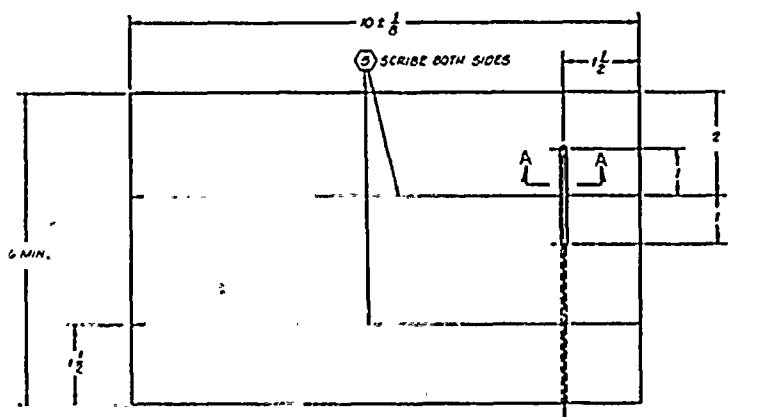
LOT:

ACCEPTED

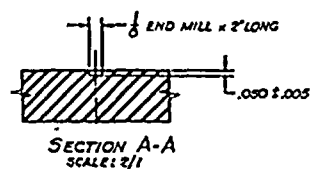
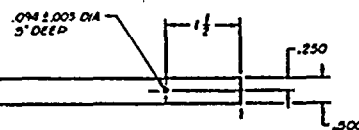
REJECTED

Signed Robert L. Walker
 Date 24 JUNE 82

Page ___ of ___



PL-500-SS-25-DCC HT 42041



NOTES:

1. DIMENSIONS ARE IN INCHES.
2. DEBURR AND BREAK SHARP EDGES.
3. MATERIAL FOR BLOCK MUST BE FREE OF:
 - FABRICATION OR REPAIR WELDS,
 - ANY LAMINAR INDICATIONS WHICH MAY AFFECT
 - ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
- ④ STEEL STAMP I.D. NO. AND HEAT NO. AS SHOWN ON SURFACE INDICATED, IN CHARACTERS $3/16$ MIN. HEIGHT.
- ⑤ SCRIIBE CENTERLINES $.003 \pm .005$ WIDE AND DEEP WHERE NOTED. STEEL STAMP OR MILL CUT, AN INDEX MARK AT ENDS OF EACH CENTERLINE, AS SHOWN. $1/32 \times 1/32 \times 1/4$ LONG.
- ⑥ MAKE FROM ASME SA240 GR.304 316 RT LOG NO 1636 HEAT NO 42041.

PL-500-SS-25-DCC

ASME SA240 GR.304 316 RT LOG NO 1636 HEAT NO 42041

ITEM	QTY	DESCRIPTION	REMARKS
1	1	PL-500-SS-25-DCC	
2	1	PL-500-SS-25-DCC	
3	1	PL-500-SS-25-DCC	
4	1	PL-500-SS-25-DCC	
5	1	PL-500-SS-25-DCC	
6	1	PL-500-SS-25-DCC	
7	1	PL-500-SS-25-DCC	
8	1	PL-500-SS-25-DCC	
9	1	PL-500-SS-25-DCC	
10	1	PL-500-SS-25-DCC	

SOUTHWEST RESEARCH INSTITUTE		QUALITY ASSURANCE DIVISION AND ENGINEERING DEPARTMENT	
S.S. PLATE ULTRASONIC CALIBRATION BLOCK		PART NO. C D-3378-086	
REVISION		DATE	
BY		DATE	
CHECKED		DATE	
APPROVED		DATE	



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK PL-.500-SS-25-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE WITH
SECTION IX 1977 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA 240 Gr. 304, Ht. 42041 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design for the above calibration block incorporates the requirements of
Section XI (1977 Edition, Summer 1978 Addenda) and Section V (1977 Edition,
Summer 1978 Addenda) of the ASME Boiler & Pressure Vessel Code. The design
also meets SwRI nondestructive testing procedure requirements and tolerances.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-086 B

REVISED: 11/9/82

SIGNATURE Robert L. Edwards

Project Phase Manager November 9, 1982

TITLE

DATE

SOUTHWEST RESEARCH INST.

P.O. Box 28510

SAN ANTONIO, TEXAS 78284

WESTBROOK METALS

San Antonio, Texas

ALUMINUM, BRASS, STAINLESS
Sheet, plate, Bars, Shapes, Pipe & Tube
ROUND STEEL TUBING
Mechanical & Pressure - Carbon & Alloy

Date: 9-21-82 Order No. 27810SW

Our Invoice No. 57751

CERTIFICATION OF MATERIAL

Item	Quantity	Type of Material
1.	1	STN/ls T-304 PCT. 1/2 x 8 x 12
2.		
3.		
4.		
5.		

TEST REPORTS (If Applicable)

Item	Heat No.	Tensile P.S.I.	Yield P.S.I.	Hardness LB	Elong. in 2"	Specification
1.	42041	85,000	43,200	86	62	ASTM A240
2.						
3.						
4.						
5.						

Item	Cr.	Ni.	C.	Mn.	Phos.	Sul.	Sil.	Moly.	B.C.	Cu.	Other
1.	18.32	8.09	.044	1.75	.030	.009	.48	.03	.09	.33	.096
2.											
3.											
4.											
5.											

URI
P. O. 27810SW
P. R. 294266
LCC 2556

Stephen Pettit
Authorized Signature

Siles
Title

Bishop Machine & Tool Co. Inc.

-13-

QUALITY CONTROL INSPECTION REPORT

Contract No.: R/O 57555 Item 55 Plate U.T. Calibration Block
 P/N D-3378-086-B QTY 1 ea NSN JR12854
 ID# PL-500-55-25-200

	Acc	Rej		Acc	Rej		Acc	Rej
1	✓		16			31		
2	✓		17			32		
3	✓		18			33		
4	✓		19			34		
5	✓		20			35		
6	✓		21			36		
7	✓		22			37		
8	✓		23			38		
9	✓		24			39		
10	✓		25			40		
11	✓		26			41		
12	✓		27			42		
13	✓		28			43		
14	✓		29			44		
15	✓		30			45		

Tolerances on Dimensions
 (unless otherwise specified)

Fractions _____
 .X ± _____
 .XX ± _____
 .XXX ± _____

Q. R. I. _____
 A. O. 57555
 P. R. _____
 L. O. 1679

Number of Samples 0
 Number ACCEPTED 1
 Number REJECTED 0

Sci #3396

Number and Types of Defects Found:

None

Corrective Action Taken:

LOT: ACCEPTED ☒

REJECTED ☐

Signed Mike Ridgway

Date 10-29-82

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK 10-SS-40-.365-26-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE WITH
SECTION II 1977 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA 312 Gr. 316L, Ht. 880555 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design for the above calibration block incorporates the requirements of Appendix III, Section XI (1977 Edition, Summer 1978 Addenda) and Article 5 Section V (1977 Edition, Summer 1978 Addenda) of the ASME Boiler & Pressure Vessel Code. The design also meets SwRI nondestructive testing procedure requirements and tolerances.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - OC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-087

SIGNATURE Robert L. Edwards

Project Phase Manager June 30, 1983

TITLE

DATE

SWEP CO TUBE CORPORATION

100 WILSON AVENUE • PO BOX 448 • CLIFTON, NEW JERSEY 07015

NEW YORK OFFICE: NEWARK, N.J. 07102

WILSON TUBESUPPLY
8408 WILSON DRIVE
NEWTON, TEXAS
77041

Shipped
to

NAME

ACCOUNT	CODE
KILHOE	04/21/79
1	FAST DIVISION - NEW YORK
2	PRODUCTS DIVISION - NEW YORK
3	FITTINGS DIVISION - NEW YORK

QUANTITY	DESCRIPTION	UNIT	PRICE	TOTAL
105.708	SWEP CO FF GRADE WELDED PIPE T-316-ELC TO ASTM A-312-79A & ASME-SA-312-79A, CORR TESTED PER MIL-P-1144-D, ANNEALED & PICKLED.			
40.479	2 PCS 10" S/40S HT 990535			
48.541	2 PCS 12" S/40S HT 990535			
39.708	2 PCS 12" S/40S HT 990535 - 2 B/L'S ATTACHED - WEIGHT 6520#			

Consider our policy that we are complying by all equal employment opportunity regulations.

CHEMICAL ANALYSIS									
Element	C	Fe	Mn	P	S	Si	Al	Cr	Ni

TRANSVERSE TENSION TEST SATISFACTORY
FLATTENING TESTS SATISFACTORY
HYDRO ITEM 1-1057, 2-849, 3-353, 4-735 PSI.
MIN. SATISFACTORY.

013	1.700	.034	.015	.52	12.30	16.70	2.12	.14	42600	79600	57.
014	1.700	.035	.002	.58	11.21	17.29	2.18	.30	39000	31000	52.
015	1.700	.032	.023	.59	11.10	17.17	2.06	.03	44507	29055	42.
016	1.700	.035	.014	.62	10.91	17.36	2.10	.22	39700	34200	57.

DOSCO, INC.
P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220

NO. 2

QUALITY CONTROL INSPECTION REPORT

Contract No. 83272 Item Calibration Block
P/N 10-55-40-.365-26-DCC Qty 1 ea NSN SWRI
D-3378-087

		Acc	Rej			Acc	Rej			Acc	Rej
1	.273	✓		16	1 13/32	✓		31			
2	1 1/2	✓		17	1 1/2	✓		32			
3	3/4	✓		18	1 1/2	✓		33			
4	3/4	✓		19	3/4	✓		34			
5	5 3/8	✓		20	3/4	✓		35			
6	.365	✓		21	1 2 1/8	✓		36			
7	.091	✓		22	3/4	✓		37			
8	1 1/2	✓		23	3/4	✓		38			
9	8 ± 1/8	✓		24	8	✓		39			
10	.062 ± .003	✓		25	4	✓		40			
11	.062	✓		26	1/2	✓		41			
12	.037 ± .003	✓		27	3/4	✓		42			
13	2 R. MAX	✓		28				43			
14	3/4	✓		29				44			
15	3/4	✓		30				45			

Tolerances on Dimensions
(unless otherwise specified)

REMARKS:

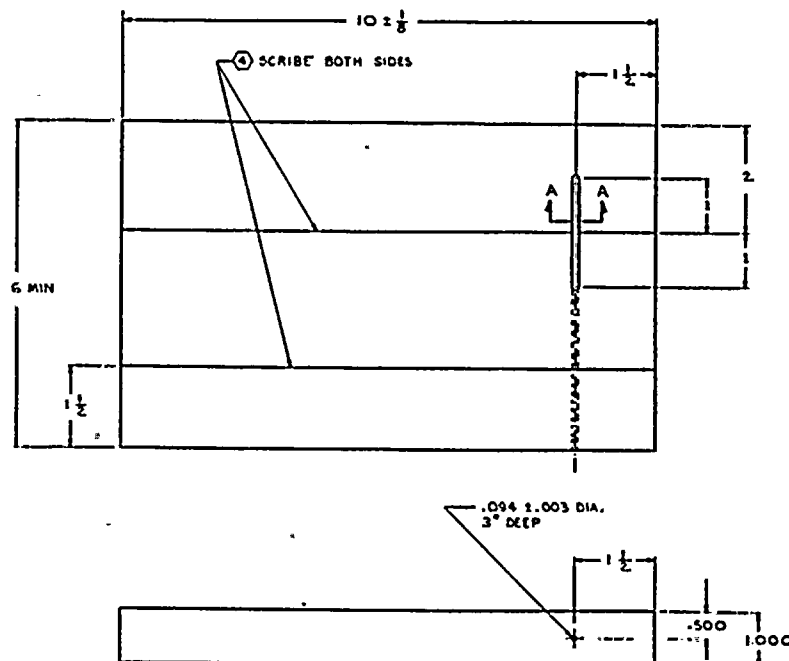
Fractions	+	1/16	SWRI	
.X	+		R. O. 60929	
.XX	+		P. R.	
.XXX	+	.010	LOG 1796	
Aug.	+	1"		

Number of Samples _____
Number ACCEPTED _____
Number REJECTED _____

LOT: ACCEPTED

REJECTED
Signed [Signature]
Date JUL 8 1993

Page 1 of 1

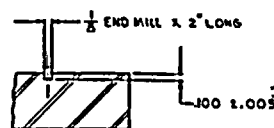


PL-1000-SS-27-DCC HT. F30553

PL-1000-SS-27-DCC

NOTES:

- 1 DEBURR AND BREAK SHARP EDGES.
- 2 MATERIAL FOR BLOCK MUST BE FREE OF: FABRICATION OR REPAIR WELDS. ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
- 3 STEEL STAMP ID NO. AND HEAT NO. AS SHOWN ON SURFACE INDICATED, IN CHARACTERS 3/16 MIN. HEIGHT.
- 4 SCRIBE CENTERLINES .003 - .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP OR MILL CUT, AN INDEX MARK AT ENDS OF EACH CENTER LINE, AS SHOWN, 1/32 X 1/32 X 1/4 LONG.
- 5 MAKE FROM ASME SA240 OR 304, SWRZ LOG NO. 1878 HEAT NO. F30553



SECTION A-A
SCALE: 1/2

EXCEPT AS NOTED OTHERWISE, ALL DIMENSIONS, TOLERANCES, AND FINISHES ARE TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS, INC. (ASME) SPECIFICATION FOR THE FABRICATION OF STEEL PLATE, SA-240, TYPE 304, SWRZ, LOG NO. 1878, HEAT NO. F30553.

DESIGNATION	PL-1000-SS-27-DCC	REV	5	DATE	7/27/77
QUANTITY	1	BY	J. RAMOS	CHECKED	J. RAMOS
SOUTHWEST RESEARCH INSTITUTE QUALITY ASSURANCE DIVISION AND ENGINEERING GROUP SAN ANTONIO, TEXAS					
SS PLATE ULTRASONIC CALIBRATION BLOCK					
D.C. CODE					
C D-3378 601					



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK PL-1.000-SS-27-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE WITH
SECTION II 1977 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA 240 Gr. 304, Ht. F30553 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design for the above calibration block incorporates the requirements of Section XI (1977 Edition, Summer 1979 Addenda) and Article 5 Section V (1977 Edition, Summer 1979 Addenda) of the ASME Boiler & Pressure Vessel Code. The design also meets SwRI nondestructive testing procedure requirements and tolerances.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - OC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-601

SIGNATURE Robert L. Edwards

Research Engineer

TITLE

December 6, 1983

DATE

P.O. Box 1976
Baltimore, Maryland 21203
Telephone (301) 288 2000



EASTERN STAINLESS STEEL COMPANY

DIVISION OF Eastmet CORPORATION
CERTIFIED MATERIAL TEST REPORT

SHIP ALLIED METALS INC
TO: 2220 CANADA DRY DCX 18038
HOUSTON TX 77023

MAIL ALLIED METALS, INC.
TO: P. O. BOX 18038
HOUSTON, TX

We certify that all of the test results and the statements of performance operations recorded here are in compliance with the ordered material specifications and the applicable material requirements.

MANIFEST NO.

2816

DATE

093083

77023

J. S. Foley
QUALITY CONTROL DEPARTMENT
09/30/83

SALES ORDER: Y 36466				CUSTOMER'S P.O. NO.: 9735				M- 1	S-	O-
ITEM	HEAT NO.	M.P.O.	TYPE	FINISH	GAUGE	WIDTH/O.D.	LENGTH/I.D.	PIECES	GROSS	NET
19	F20581	132676	304	NO. 1 71	0.8750	72.0000	82.5000	1	1,538	1,538
20	F30553	192121	304	NO. 1	1.0000	96.0000	131.0000	1	3,726	3,726
21	F39608	93253	304	NO. 1	1.2500	96.0000	132.0000	1	4,664	4,664
22	F33253	60004	304	NO. 1	2.0000	77.0000	56.0000	1	4,312	4,312
31	P30798	28563	316L	NO. 1 3/16	0.3750	70.0000	143.0000	1	1,147	1,147

MTR-OK
with 10-11
BY *Rumrutt*

MATERIAL SPECIFICATIONS AND REQUIREMENTS

SPECS ASTM A240-81A ASME SA240-582
MATERIAL FREE FROM MERCURY CONTAMINATION

MINIMUM SOLUTION ANNEALING TEMPERATURE 1900 F

HEAT NO.	TYPE	C %	MN %	P %	S %	SI %	CR %	NI %	CU %	TI %	CB+TA %	MO %	CO %	N %
F20581	304	.030	1.67	.022	.014	.58	18.11	8.18	.27			.44	.13	.067
F30553	304	.045	1.64	.020	.013	.51	18.16	8.22	.14			.19	.18	.073
F39608	304	.045	1.44	.022	.013	.54	18.13	8.12	.19			.19	.10	.067
F33253	304	.050	1.67	.020	.010	.79	18.00	8.30	.20			.31	.15	.072
P30798	316L	.010	1.65	.021	.021	.46	17.44	11.24	.13			2.29	.24	.060

Serial
P.O. 20095
F.R. 320688
LQQ 1828

CORROSION TEST CODES

CODE DESCRIPTION
A. ASTM A262-PRACTICE 'A' (OXALIC)
B. ASTM A262-PRACTICE 'B' (STREICH)
C. ASTM A262-PRACTICE 'C' (HUEY)
D. ASTM A262-PRACTICE 'E' (CUCUS04)
E. QQS-766 (CUS04)

		TRANSVERSE OR FRONT						LONGITUDINAL OR BACK						CORROSION TEST (MAG. PERM.)			SOLUTION ANNEAL			
HEAT NO.	M.P.O.	TENSILE PSI	YIELD PSI	ELONG %	HARDNESS	BEND	R/A %	TENSILE PSI	YIELD PSI	ELONG %	HARDNESS	BEND	R/A %	GR	C	CODE	RESULT	TEST	TIME MINUTES	TEMP. ° F
120581	32676	88000	50400	58	HB 167	G	65									E	SAT			
10553	92121	85900	41700	62	HB 170		66													
139608	93253	80000	42200	64	HB 149		68													
13253	60004	84500	43400	62	HB 158		64													
10798	28563	7700	45900	50	HB 150	G	63							6		AE	SAT			

DOSCO, INC.
P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220
QUALITY CONTROL INSPECTION REPORT

no. 2

Contract No. 83392 Item Cal. B&K.
P/N PL-1000-SS-27-DCC Qty 1 ea NSN SWRI
D-33TB-601

		Age	Rad		Age	Rad		Age	Rad
1	1 1/2	✓		16			31		
2	6	✓		17			32		
3	10 ± 1/8	✓		18			33		
4	1 1/2	✓		19			34		
5	1	✓		20			35		
6	2	✓		21			36		
7	.094 ± .003	✓		22			37		
8	1 1/2	✓		23			38		
9	.500	✓		24			39		
10	1.000	✓		25			40		
11	1/8	✓		26			41		
12	2	✓		27			42		
13	100 ± .005	✓		28			43		
14	2 1/2	✓		29			44		
15				30			45		

Tolerances of Dimensions
(unless otherwise specified)

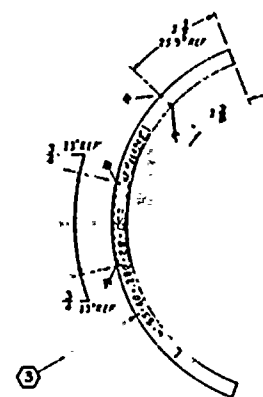
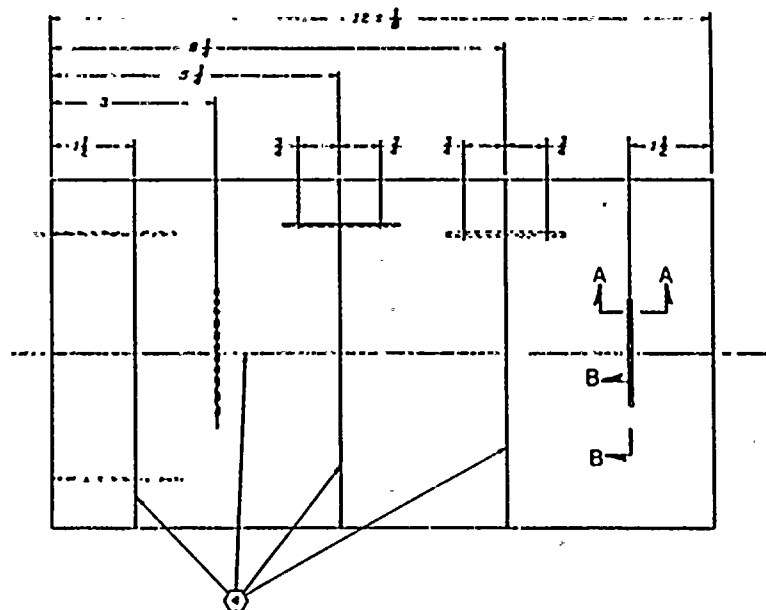
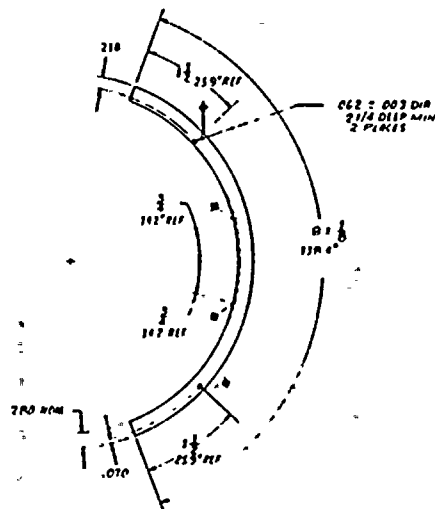
REMARKS:

Fractions ± 1/16 S. F. 61.011
.X ± S. F. 1832
.XX ± S. F.
.XXX ± .010 S. F.
Ang. ±

Number of Samples 1
Number ACCEPTED 1
Number REJECTED 0

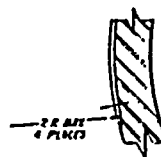
LOT:
Signed J. P. [Signature]
Date NOV 17 1961

Page 1 of 1



NOTES:

1. DEBURR AND BREAK SHARPEDES.
2. MATERIAL FOR BLOCK TO BE FREE OF: FABRICATION OR REPAIR WELDS, PIPE SEAM WELDS, ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANY ANGLE BEAM OR STRAIGHT BEAM CALIBRATIONS.
3. STEEL STAMP ID, HP AND HEAT # ON SURFACE INDICATED IN CHARACTERS 3/16 INK HEIGHT.
4. STRIKE CENTERLINE .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP OR ALICUT AN IMPRINT AT EACH END OF CENTERLINE AS SHOWN 1/32 X 1/32 X 1/4 LONG.
5. MAKE FROM C PIPE, SCHEDULE 40, SA 312 GR 304, HEAT # 461905, S-R1 LOG # 1968A

SECTION A-A
SCALE: 2/1SECTION B-B
SCALE: 2/1

6-SS-40-280-28-DCC

SOUTHWEST RESEARCH INSTITUTE		PART NAME		DATE	
6" PIPE ULTRASONIC CALIBRATION BLOCK		6-SS-40-280-28-DCC		1/1/76	
DE COOK		1/1/76		1/1/76	
1/1		C		D-3378 603 A	



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

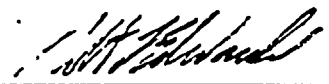
CALIBRATION BLOCK 6-SS-40-.280-28-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE WITH
SECTION II 1977 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA312 GR 304, Ht 464905 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design for the above calibration block incorporates the requirements of Appendix III, including Supplement 7, Section XI (1983 Edition) and Article 5 Section V (1983 Edition) of the ASME Boiler & Pressure Vessel Code. The design also meets SwRI nondestructive testing procedure requirements and tolerances.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-603-A



Robert L. Edwards

SIGNATURE

Sr. Research Engineer April 24, 1985

TITLE

DATE

QUALITY CONTROL INSPECTION REPORT

ITEM Calibration Block.

O/N D 3378-603A

D/N D 3378-6034 ACC RET			ACC RET			ACC RET		
1	.210	✓	16	3/4	✓	31		
2	1 1/2	✓	17	3/4	✓	32		
3	^{20L} .062 ± .003 ²⁰ ✓ - .062 - 29 MIN.	✓	18	3/4	✓	33		
4	8 ± 8	✓	19	1 1/2	✓	34		
5	3/4	✓	20	SCREW	✓	35		
6	3/4	✓	21	.062 TYP	✓	36		
7	1 1/2	✓	22	.028 ± .003 ²² ✓	✓	37		
8	.070	✓	23	2 R. MAX ²³ ✓	✓	38		
9	.280 BOM.	✓	24	STEEL STAMP	✓	39		
10	1 1/2	✓	25	3/4	✓	40		
11	3	✓	26	3/4	✓	41		
12	5 1/4	✓	27	1 1/2	✓	42		
13	8 1/4	✓	28	1 3/8	✓	43		
14	1.2 ± 8	✓	29			44		
15	3/4	✓	30			45		

**TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)**

EXPOSURE

FRACTIONS $\pm \frac{1}{6}$ ANGLES \pm —

.x
 .xx
 .xxx

+
 -
 +
 -
 +
 -

.010

NUMBER OF SAMPLES /

NUMBER AC0024520

NUMBER REQUESTED

SWR:
P. O. 64713
P. R. _____
LOG 1977 A

NOT: ACCEPTED

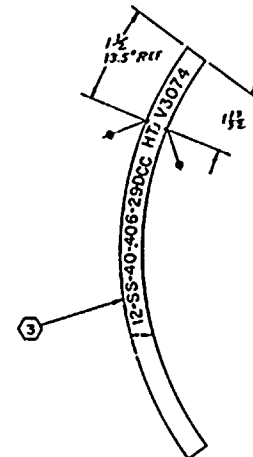
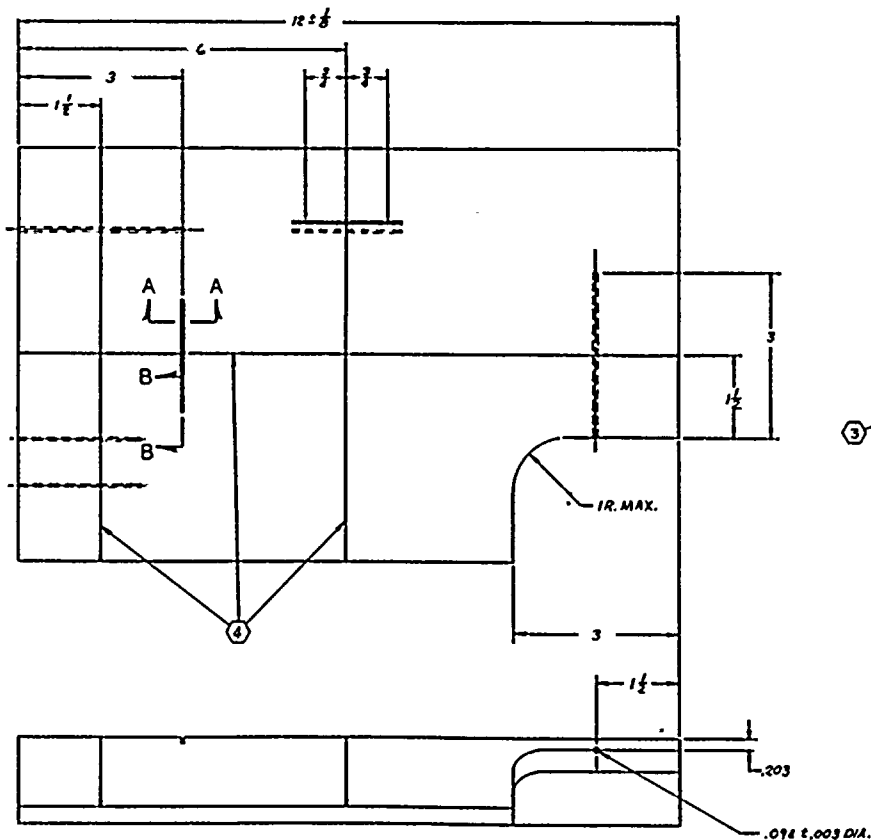
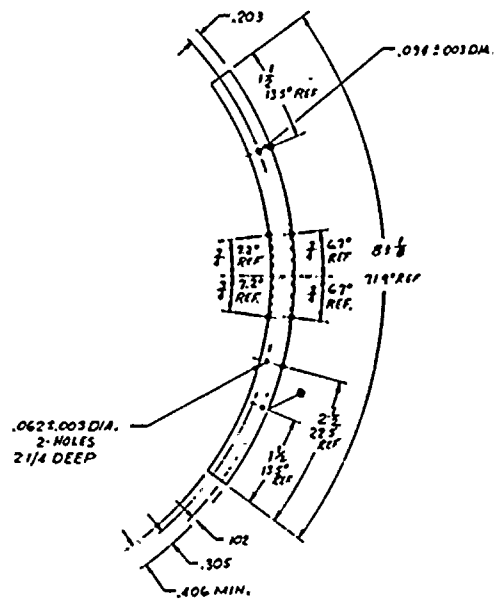
संज्ञा

SIGNED *Bob Parker*

DATE 4-18-85

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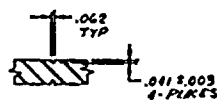
C-133



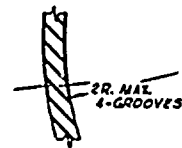
12-SS-40-406-29-DCC

- NOTES:**

1. BREAK SHARP EDGES AND DEBURR.
2. MATERIAL FOR BLOCK TO BE FREE OF:
PIPE SEAM WELDS, FABRICATION OR REPAIR
WELDS; ANY LAMINAR INDICATIONS WHICH
MAY AFFECT ANGLE BEAM OR STRAIGHT
BEAM CALIBRATIONS.
3. STEEL STAMP ID. 1 HEAT N° ON SURFACE INDICATED
IN CHARACTERS 3/16 MIN. HEIGHT.
4. SCRIBE CENTERLINES .003 TO .005 WIDE
AND DEEP WHERE SHOWN. STEEL STAMP OR MILL
CUT AN INDEX MARK AT ENDS OF EACH CENTERLINE
1/32 ± 1/32 ± 1/4 LONG.
5. MAKE FROM 12" PIPE, SCH. 80S, SA312 CL304
HEAT N° V3074, SWRI LOG N° 1980. MACHINE FROM
ID. OF PIPE TO OBTAIN .406 WALL THICKNESS REQUIRED.



SECTION A-A
SCALE: 1/1



SECTION B-B
SCALE: 1/1

REPORT NUMBER PROJECT NUMBER TITLE DATE	NAME GRADE PART NAME PART NUMBER	PART NAME PART NUMBER
REPORT NUMBER PROJECT NUMBER TITLE DATE	NAME GRADE PART NAME PART NUMBER	PART NAME PART NUMBER



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK 12-SS-40-.406-29-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE WITH
SECTION II 1977 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA312 GR304, HT V30704 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design for the above calibration block incorporates the requirements of Appendix III, including Supplement 7, Section XI (1983 Edition) and Article 5 Section V (1983 Edition) of the ASME Boiler & Pressure Vessel Code. The design also meets SWRI nondestructive testing procedure requirements and tolerances.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SWRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SWRI)
DRAWING (SWRI) D-3378-602-C

SIGNATURE
Robert L. Edwards

Project Phase Mgr.

TITLE

June 3, 1985

DATE

SWEPSCO TUBE CORPORATION

Swepeco

ONE CLIFTON BOULEVARD • P.O. BOX 448 • CLIFTON, NEW JERSEY 07015

REMIT TO **NEWARK, N.J. 07101**
P.O. BOX 12983

PHONE: N.J. 201-778-3000
TWX NO. 710-989-7028
TELEX NO. 133-321

SOLD TO
TUBESALES
P.O. BOX 4498
HOUSTON, TEXAS
77210

SHIPPED TO
TUBESALES
HOUSTON, TX

ACCOUNT	CODE	INVOICE DATE	INVOICE NO.
TBLHOU1		10/11/83	022714
1		TERMS: FOR CLIFTON, N.J.	
2		TUBE DIVISION - % 10 - NET 30	
3		PRODUCTS DIVISION - % 10 - NET 30	
4		FITTINGS DIVISION - % 10 - NET 30	

VIA	COMPLETE <input type="checkbox"/>	PARTIAL <input type="checkbox"/>	PREPAY & ENCL. <input type="checkbox"/>	PREPAY <input checked="" type="checkbox"/>	COLLECT <input type="checkbox"/>	BILL NO.	CURT. ORDER NUMBER
1164-3-							HT-3-10333
ORDER	BACK ORDERED <input checked="" type="checkbox"/>	DESCRIPTION	QTY. SHIPPED				
1	0	1 PCS HT V30704 ← - WEIGHT 1315# - 1 PC 12" SCH 80S X 20' R/L	20.104				

SWBI
 P. O. 61156
 P. R. 424421
 LOG 1980

er certifies that he is abiding by all equal employment opportunity regulations.

ZEROS INDICATE NO TESTS HAVE BEEN MADE FOR PRESENCE OF THESE ELEMENTS											
CHEMICAL ANALYSIS											
NUMBER	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	Van	Other

TRANSVERSE TENSION TEST SATISFACTORY
 FLATTENING TESTS SATISFACTORY
 HYDRO TESTED AT 981 PSI MIN SATISFACTORY

0704	.020	1.610	.018	.016	.61	8.66	18.01	.19	.17	38500	88300	57.	153
CU	.10	N	.056										

TEST REPORTS
 ACCEPTABLE *blawel*
 10/27/83 3-10333

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

I hereby certify these tests are correct to the best of my knowledge --
 SWEPSCO TUBE CORPORATION

copy to and Subscribed to before me
 day of 10/11/83

DOSCO, INC.
P. O. BOX 20227
4900 HIGHWAY 90 EAST
SAN ANTONIO, TEXAS 78220

NO. 2

QUALITY CONTROL INSPECTION REPORT

Contract No. 85043 Item Cal Bolk
P/N 12-33-40-.406-29-DCC Qty 1 ea NSN SWAI
1-3378-6023

		Acc	Rel		Acc	Rel		Acc	Rel
1	2 1/4	/		16	1 1/2	/		31	062
2	062±003	/		17	3	/		32	1 1/2
3	406 min.	/		18	6	/		33	1 13/32
4	305	/		19	12±1/8	/			
5	±02	/		20	3/4	/		35	
6	1 1/2	/		21	3/4	/		36	
7	2 1/2	/		22	3	/		37	
8	8±1/8	/		23	1 1/2	/		38	
9	3/4	/		24	1 R. max	/		39	
10	3/4	/		25	3	/		40	
11	3/4	/		26	1 1/2	/		41	
12	3/4	/		27	203	/		42	
13	1 1/2	/		28	094±003	/		43	
14	203	/		29	2 R. max	/		44	
15	094	/		30	041±003	/		45	

Tolerances or Dimensions:
(unless otherwise specified)

REMARKS:

Fractions: ± 1/16
X ±
.XX ±
.XXX ± 0/0
Ang. ±

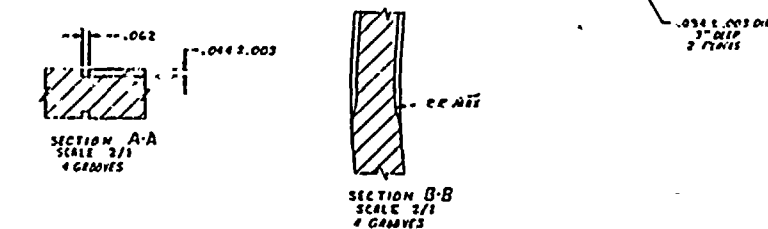
SWAI
R. O. 66762
P. R. —
LOG 1999

Number of Samples 1
Number ACCEPTED 1
Number REJECTED 0

LOT:

ACCEPTED
REJECTED
Signed [Signature]
Date MAY 28 1985





- 1 BREAK SHARP EDGES & REMOVE BURRS.
- 2 MATERIAL FOR BLOCK MUST BE FREE OF:
PIPE SEAM WELDS, FABRICATION OR REPAIR WELDS,
ANY LAMINAR INDICATIONS WHICH MAY AFFECT ANGLE BEAM
OR STRAIGHT BEAM CALIBRATIONS.
- 3 STEEL STAMP ID NO AND HEAT NO ON SURFACE INDICATED,
IN CHARACTERS 3/16 MIN. HEIGHT.
- 4 SCRIBE CENTERLINES .002 TO .005 WIDE AND DEEP
WHERE NOTED. STEEL STAMP OR MILL CUT AN INDEX MARK
AT ENDS OF EACH CENTERLINE AS SHOWN, 1/32 ± 1/32
± 1/4 LONG.
- 5 MAKE FROM 14" PIPE, SCH 40, SA 312 GR 304.
HEAT NO V10.572, S.W.R1 LOG NO 190CB.

14-SS-40-438-30-DCC

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK 14-SS-40-.438-30-DCC IS HERESY
CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE WITH
SECTION II 1977 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA312 GR 304, Ht V10572 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design for the above calibration block incorporates the requirements of Appendix III, including Supplement 7, Section XI (1983 Edition) and Article 5 Section V (1983 Edition) of the ASME Boiler & Pressure Vessel Code. The design also meets SwRI nondestructive testing procedure requirements and tolerances.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-604-A


Robert L. Edwards

Sr. Research Engineer April 24, 1985
TITLE DATE

KILSBY - FORENTS
CERTIFICATION OF COMPLIANCE
We hereby certify that the following product conforms
to the applicable specifications shown on this
purchase order.

Customer _____

Cust P.O. _____

KRSO WEATHER NEWS SERVICE

Qty. _____

Date DATE 9/4/81

Date DATE 9/4/81

OUR ORDER NO. K1665-1
$$805 = .500.$$

this 4th day of September 1981

SARI

..P. #. — 39751

P. R. 424217

128 . 1968/3

SWEPÇO TUDE CORP.

Alenchen Zatis

Dorothy Latus-

HERCO MFG. COMPANY
3621 S. W. MILITARY DRIVE
SAN ANTONIO TX. 78211

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 85-859 ITEM CALIBRATION BLOCK

P/N 455-40-438-30-DCC QTY. 1EA NSN N/A
D/N D-3378-604-A

		ACC	REJ			ACC	REJ			ACC	REJ
1	.219	✓		16	6	✓		31	STEEL SHANK	✓	
2	1 1/2	✓		17	12 ± 1/8	✓		32	1 1/2	✓	
3	3/4	✓		18	3/4	✓		33	1 29/64	✓	
4	3/4	✓		19	3/4	✓		34			
5	3/4	✓		20	3	✓		35			
6	3/4	✓		21	1 1/2	✓		36			
7	8	✓		22	1 R MAX.	✓		37			
8	2 1/2	✓		23	3	✓		38			
9	1 1/2	✓		24	SCRIBE E	✓		39			
10	.110	✓		25	1 1/2	✓		40			
11	.328	✓		26	.219	✓		41			
12	.438 NOM.	✓		27	.094 ± .003 3/4	✓		42			
13	.062 ± .003 DIA 3/4	✓		28	1 R MAX.	✓		43			
14	1 1/2	✓		29	.044 ± .003	✓		44			
15	3	✓		30	.062	✓		45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS ± 1/6 ANGLES ± —

.X +
.XX + .010
.XXX +

NUMBER OF SAMPLES 1
NUMBER ACCEPTED 1
NUMBER REJECTED —

SWRI
P. O. 64713
P. E. —
LOG 1977 C

REMARKS:

LOT: ACCEPTED ✓
REJECTED —

SIGNED B. B. Lash
DATE 4-19-85

Technical drawing of a flywheel assembly. The drawing includes the following dimensions and features:

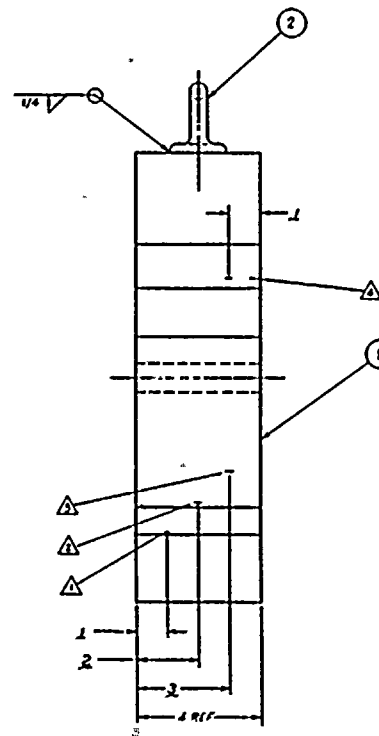
- Overall width: $16 \pm \frac{1}{8}$
- Overall height: $10 \pm \frac{1}{8}$
- Top horizontal dimension: 14.500
- Top vertical dimension: $9 \pm \frac{1}{8}$
- Left side feature: 1.000 DRILL-THRU
- Internal dimensions: $.075$, 2 , 30° , $\frac{1}{4} \pm \frac{1}{8} R$, 3 mils, 9.437 DIA., 1 , 1 , 1 , 1.675
- Callouts: A , B , C , D , E , F , G , H , I , J , K , L , M , N , O , P , Q , R , S , T , U , V , W , X , Y , Z
- Text: RC-FLYWHEEL-CS-31-DCC HT. C4079

-.100 R. & .375 W. 2 PLACES

.200 REF

.100 REF

.375



NOTES:

1. REMOVE BURRS AND BREAK SHARP EDGES.
2. MATERIAL FOR BLOCK TO BE ULTRASONICALLY EXAMINED IN ACCORDANCE WITH SWRI NDT PROCEDURE 15-FE-170-2.
3. STEEL STAMP 10 NO., HEAT NO. AND MATERIAL SPECIFICATIONS ON SURFACE INDICATED IN CHARACTERS 3/16 MIN. HEIGHT.
4. MAKE FROM SA533, GR. B, HEAT NO. C4079, SWRI RIC NO 114 MATERIAL PROVIDED BY SWRI.
5. NUMBERS IN TRIANGLES ARE NOTCH IDENTIFICATIONS, NOTINES TO BE MACHINED BY FDM.

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK RC-Flywheel-CS-31-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 3 GROUP 3 IN ACCORDANCE WITH
SECTION IX 1980 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA533GRB. HT C4079 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design for the above calibration block incorporates the requirements of
Section XI, 1980 Edition and Section V, 1980 Edition of the ASME Boiler &
Pressure Vessel Code. The design also meets SwRI nondestructive testing
procedure requirements and tolerances.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-605-B


Robert L. Edwards

SIGNATURE

Lead Engineer

TITLE

July 2, 1987

DATE

RIC 114

PURCHASER.

Babcock & Wilcox Co.
Barberton, Ohio 44203

LUKENS STEEL COMPANY
COATESVILLE, PA. 19320

TEST CERTIFICATE

DATE. 12-19-74 FILE NO. 0602-02-02
CONSIGNEE:

~~B7151~~
B7172

MILL ORDER NO.

79266-1

CUSTOMER PO

319404AL

HP 121874 JW

MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATIONS

SA-533 Gr. B Cl. 1 ASME Code Section 2 & 3 Cl. 2 1971 Edition thru Summer 1971 Addenda

REND TEST O.K. HOMOGENEITY TEST

CONF. #520-0018-A5-03-0

CHEMICAL ANALYSIS

MELT NO.	C	Mn	P	S	Cu	Si	Ni	Cr	Mo	V	Ti	Al	B	
C4079	20	1.34	012	015		22	61	17	55					

WIP STEEL

PROCESSED
TEST REPORT SECTION

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD ST. 4700	TENSILE ST. 4700	% ELONG. 4700	% RA.	BHN	IMPACTS	DESCRIPTION
C4079	2 E	EX801 EX758	970 950	24 24				1 - 3-3/4" x 73 x 108-1/2

NPG-CE MATERIALS ENGINEERING

☐ COND. ACCEPT. _____

SIGNED _____ DATE _____

☒ APPROVED

SIGNED *[Signature]* DATE 1-11-75

Plate and tests heated to 1625°F./1675°F., held 1 hr. per inch min., and water quenched to 400°F., then tempered 1280°F., held 1 hr. per inch min., and water quenched.

Mill Inspection by EAW.

Length is major direction of rolling.

I hereby certify the above information is correct.

WATERMARK TESTING

[Signature]

C-143

SOUTHWEST RESEARCH INSTITUTE

INSPECTION AND TEST RESULTS

DRAWING NUMBER:	JOB REQUEST NO.	DATE:	PART NUMBER / PART NAME
D-3378-605B	—	—	FLYWHOLE Calibration Block
TYPE OF INSPECTION OR TEST PERFORMED:			
Dimensional (Notch Depth only)			
$\Delta .099$ $\Delta .100$ $\Delta .095$ $\Delta .100$			
INSPECTION / TEST RESULTS: (ATTACH DATA SHEETS AS NECESSARY)			
NUMBER OF ARTICLES INSPECTED OR TESTED		NUMBER OF CONFORMING ARTICLES	NUMBER OF ARTICLES REJECTED
/		/	0
NATURE OF DEFECTS OBSERVED:			
None			
BASIC CAUSES FOR ARTICLE REJECTION:			
INSPECTION PERFORMED BY:		6-2-87	
(SIGNATURE)		(DATE)	

SWRI FORM PM-19-0

3733 PITLUK
P.O. Box 3452
San Antonio, Texas 78211
(512) 924-4734



HERCO
Aircraft Machine, Inc.

NO. 2

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 87-0130 ITEM FLY WHEEL CALB. Black
P/N D 3378-605(A) QTY. 1 ea NGN R.O. 75412

		ACC	REJ			ACC	REJ			ACC	REJ
1	16 ± 1/8	✓		16				31			
2	14.500	✓		17				32			
3	1.000 DRILL THRO	✓		18				33			
4	.875	✓		19				34			
5	2.	✓		20				35			
6	1/4 ± 1/32 R	✓		21				36			
7	9.437 DIA	✓		22				37			
8	.8	✓		23				38			
9	30°	✓		24				39			
10	1	✓		25				40			
11	.875	✓		26				41			
12	16 ± 1/8	✓		27				42			
13	STEEL STAMP	✓		28				43			
14				29				44			
15				30				45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS: 1/16 ANGLES: 0.5°

.X ± 7
.XX ± .010
.XXX ± 7

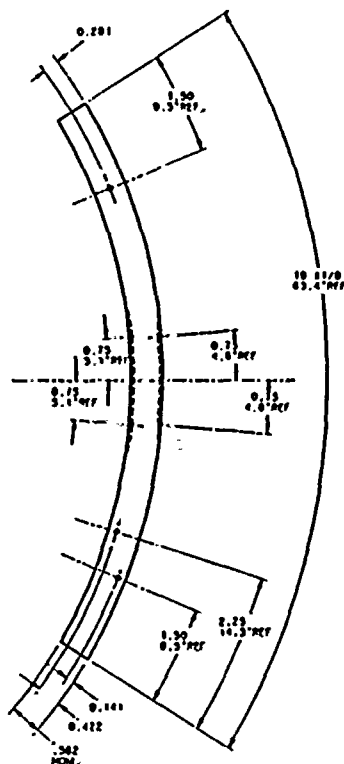
SERI	
R.O.	<u>75412</u>
P. R.	<u>7</u>
LOG	<u>2428</u>

NUMBER OF SAMPLES 1
NUMBER OF ACCEPTED 1
NUMBER OF REJECTED 0

REMARKS:

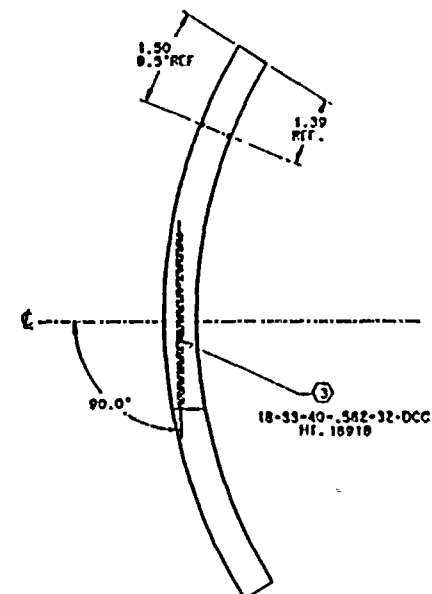
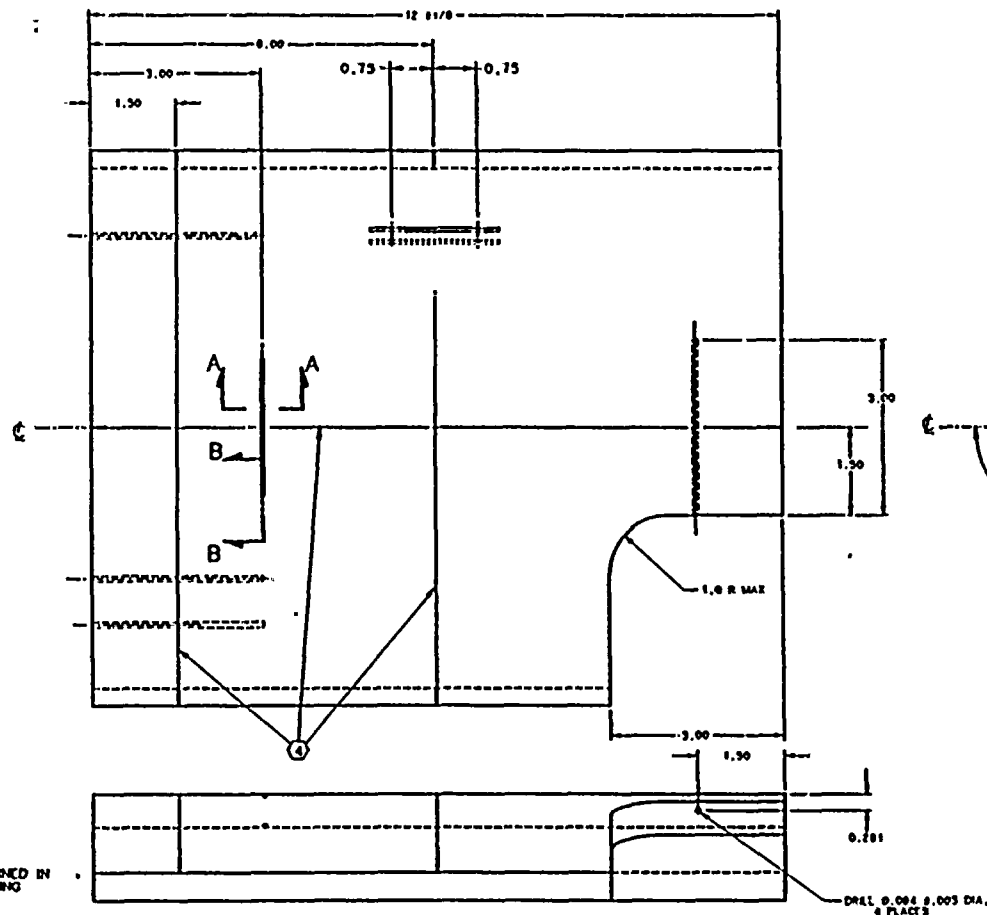
LOT: ACCEPTED ✓
REJECTED 00
SIGNED [Signature]
DATE

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NOTES:

1. REMOVE BURRS AND BREAK SHARP EDGES.
2. MATERIAL FOR BLOCK TO BE ULTRASONICALLY EXAMINED IN ACCORDANCE WITH 3-WM NUCLEAR PROJECTS OPERATING PROCEDURE 14-FC-120 LATEST REVISION.
3. STEEL STAMP ID, NO. AND HT. NO. AS SHOWN, ON SURFACE INDICATED, IN CHARACTERS 3/16 MIN. HEIGHT.
4. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP, OR MILL CUT AN INDEX MARK AT ENDS OF EACH CENTERLINE AS SHOWN. 1/32x1/32x1/4 LONG.
5. MAKE FROM 18" PIPE. SCHEDULE 40. ASTM A358. GR. 318 HT. NO. 16918. S. S. LOG NO. 2427

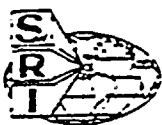


18-SS-40-.562-32-DCC

SECTION A-A

SECTION B-B

1. <input type="checkbox"/> RECEIVED 2. <input type="checkbox"/> RECEIVED 3. <input type="checkbox"/> RECEIVED 4. <input type="checkbox"/> RECEIVED 5. <input type="checkbox"/> RECEIVED 6. <input type="checkbox"/> RECEIVED 7. <input type="checkbox"/> RECEIVED 8. <input type="checkbox"/> RECEIVED 9. <input type="checkbox"/> RECEIVED 10. <input type="checkbox"/> RECEIVED 11. <input type="checkbox"/> RECEIVED 12. <input type="checkbox"/> RECEIVED 13. <input type="checkbox"/> RECEIVED 14. <input type="checkbox"/> RECEIVED 15. <input type="checkbox"/> RECEIVED 16. <input type="checkbox"/> RECEIVED 17. <input type="checkbox"/> RECEIVED 18. <input type="checkbox"/> RECEIVED 19. <input type="checkbox"/> RECEIVED 20. <input type="checkbox"/> RECEIVED 21. <input type="checkbox"/> RECEIVED 22. <input type="checkbox"/> RECEIVED 23. <input type="checkbox"/> RECEIVED 24. <input type="checkbox"/> RECEIVED 25. <input type="checkbox"/> RECEIVED 26. <input type="checkbox"/> RECEIVED 27. <input 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SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK 18-SS-40-.562-32-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 8 GROUP 1 IN ACCORDANCE WITH
SECTION IX 1980 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA358 GR316. HT 16918 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design for the above calibration block incorporates the requirements of
Section XI, 1980 Edition and Section V, 1980 Edition of the ASME Boiler &
Pressure Vessel Code. The design also meets SwRI nondestructive testing
procedure requirements and tolerances.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-607


Robert L. Edwards

SIGNATURE

Lead Engineer

TITLE

July 2, 1987

DATE

TEST REPORT
THE YOUNGSTOWN WELDING & ENGINEERING CO.
 3700 OAKWOOD AVE.
 YOUNGSTOWN, OHIO 44509



CUSTOMER:

CUSTOMER ORDER NO.: P-9799W
 YW&E CONTRACT NO.: 1131
 DATE: 10-17-73

MATERIAL: Type 316 Stainless Steel

SPECIFICATION: ASTM A-358, Class I

ITEM	HEAT NO.	QUANTITY	DESCRIPTION
2	16918	1 pc	18" XPS Schedule 40 TOTAL FOOTAGE: 20'1-3/4"

Q/A REVIEWED BY *[Signature]*
 DATE 10-11-87

CHEMICAL COMPOSITION

ITEM	C	Mn	P	S	Si	Cr	Ni	Zn	Mo	Fe	Cu	Ti	Ph	Co
	.051	1.74	.027	.019	.70	16.60	11.60		2.32					

THESE MILL TEST REPORTS APPLY TO
 YOUR P. O. # *28404*
 TIoga PIPE SUPPLY CO., INC.

PHYSICAL TESTS

ITEM	TENSILE STRENGTH, PSI	YIELD PSI	% ELONG.	% R.A.	HARDNESS	SEMI TEST	FLATT. TEST	PSI HYDRO	X-RAY
	83,333	44,444	57	59	B77-81	OK	OK	1250	100% Section I ASME

SWRI
 P. O. *28404*
 P. R. *537631*
 LCG *2427*

Sworn and subscribed to before me

this _____ day of _____, 19____

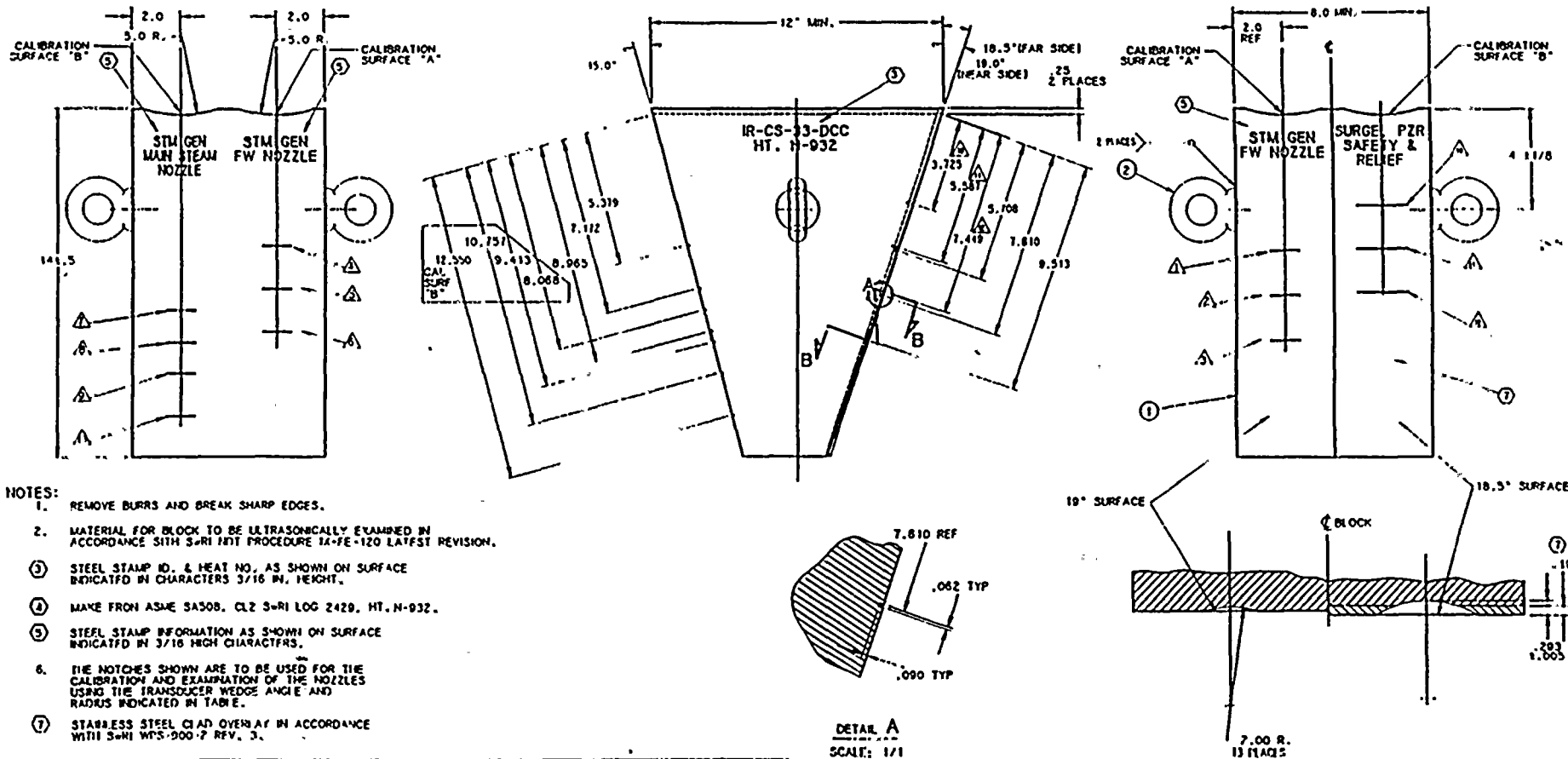
We hereby certify that the above items have been inspected and tested in accordance with and have met all the requirements of the specifications shown, including data furnished us by the producing mill.

THE YOUNGSTOWN WELDING & ENGINEERING CO.

By *[Signature]*

THIS REPORT NOTARIZED ONLY WHEN REQUIRED

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DASH NO.	NOZZLE IDENTIFICATION	EXAMINATION ANGLE	WEDGE RADIUS	BLOCK ANGLE	CALIB SURFACE	NOTCH NO'S Δ	TRANSDUCER WEDGE PART NO.
1	FEEDWATER UNIT 122, S.G.	28°	5"	19°	A	1,2&3	D-14795-178
2	FEEDWATER UNIT 122, S.G.	30°	5"	15°	A	4,5&6	D-14795-103
3	MAIN STEAM UNIT 122, S.G.	30°	5"	15°	A&B	11,7,8,9&13	D-15795-103
4	SURGE NOZZLE UNIT 1, PZR	25°	2"	19.5°	B	10,11&12	D-14795-140
5	SURGE NOZZLE UNIT 2, PZR	28°	2"	19.5°	B	10,11&12	D-14795-184
6	SAFETY & RELIEF UNIT 2, PZR	25°	2.5"	19.5°	B	10,11&12	D-14795-106

DETAIL A
SCALE: 1/1

SECTION B-B
SCALE: 1/1

IR-CS-33-DCC

2 2 1 1		LEFT EYE BLOCK	MASTER-CAPR 83024128
1 1			(4)
SOUTHWEST RESEARCH INSTITUTE			
STIM GEN & PZR NOZZLE INNER RADIUS UT CALIBRATION BLOCK			
1/1		C	D-3378-608 B



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK IR-CS-33-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 3 GROUP 3 IN ACCORDANCE WITH
SECTION IX 1983 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA508CL2, HT N-932 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design for the above calibration block has been revised to incorporate the requirements of Section XI (1983 Edition, Summer 1983 Addenda) and Section V (1983 Edition, Summer 1983 Addenda) of the ASME Boiler and Pressure Vessel Code. The design also meets SwRI nondestructive testing procedure requirements and tolerances.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-608A
Welding Electrode Certifications, Heat No.'s 8E0812 and 8E2285
Postweld Heat Treat Certifications

*Revised September 9, 1988


Robert L. Edwards

SIGNATURE

Lead Engineer

TITLE

Sept. 9, 1988

DATE

CAL-TEX METALS

P.O. BOX 19250 • 51 TOWN & COUNTRY • HOUSTON, TEXAS 77024 • (713) 461-7266

CERTIFICATE OF TESTS—MILL PRODUCTS

Date June 18, 1987

S
O
L
D

T
O

Southwest Research
P.O. Drawer 28510
San Antonio, TX 78284

S
H
I
P

T
O

Southwest Research
6220 Culebra Road
San Antonio, TX 78284

Customer Order No.	Order No.	Specification
29447	881601	A-508 Class II
Heat Number	Quantity	Size
N-932	1	T.F. 8" Th X 12" W x 14" Lg

Description
of
Material

Heat Number	CHEMICAL ANALYSIS												
	C	MN	P	S	SI	CR	NI	MO	V	TI	AL	CU	CO
N-932	.21✓	.70✓	.010✓	.008✓	.20✓	.34✓	.75✓	.62✓	.01✓				
	B	CB	TA	CB & TA					SN	H	N	O	FE

Mill: I.R.I.

Heat Number	MECHANICAL PROPERTIES									
	Tensile PSI	2% Yield PSI	% Elong In	% Red Area	BHN	Stress PSI	Temp. °F	Hours	% Elong. In	G S
N-932	102,000	83,000	26	70.4	217					

Heat Treatment: Normalized, Quenched & Tempered

SWRI
P. O. <u>29447</u>
P. R. <u>537659</u>
LOG <u>2429</u>

THIS IS TO CERTIFY TO THE BEST OF OUR KNOWLEDGE AND BELIEF, THAT THE VALUES SHOWN ARE CORRECT AND TRUE AND THAT THE MATERIAL COMPLIES WITH THE REQUIREMENTS OF THE SPECIFICATIONS AND

McKenzie Goodner

3733 PITLUK
P.O. Box 3452
San Antonio, Texas 78211
(512) 924-4734



HERCO
Aircraft Machine, Inc.

NO. 2

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 87-0144 ITEM CALIBRATION BLOCK
P/N D 3378-608 QTY. 1 ea NSN RO 75432

		ACC	REJ			ACC	REJ			ACC	REJ
1	2.0	✓		16	STEEL STAMP	✓		31			
2	STEEL STAMP	✓		17	19.0°	✓		32			
3	5.0 R	✓		18	5.708	✓		33			
4	2.0	✓		19	7.610	✓		34			
5	5.0	✓		20	9.513	✓		35			
6	STEEL STAMP	✓		21	.25 2 PLCS	✓		36			
7	14 ± .5	✓		22	.062 TYP	✓		37			
8	10.757	✓		23	.090 TYP	✓		38			
9	9.413	✓		24	8.0 MIN	✓		39			
10	8.068	✓		25	STEEL STAMP	✓		40			
11	8.965	✓		26	2.00 R 9 PLCS			41			
12	7.172	✓		27				42			
13	5.379	✓		28				43			
14	15°	✓		29				44			
15	12° MIN	✓		30				45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS ± —

ANGLES ± 0.5°

.X ± .1

.XX ± .03

.XXX ± .015

SWRI
P.O. <u>75432</u>
P.R. <u>—</u>
LOG <u>2438</u>

NUMBER OF SAMPLES 1

NUMBER OF ACCEPTED 1

NUMBER OF REJECTED —

REMARKS:

LOT: ACCEPTED ✓

REJECTED

SIGNED Eugene R. G.

DATE 7/9/87

MATERIAL TEST REPORT
Welding Products Division



Welders Supply Co.
5406 Jackwood
San Antonio, TX 78238-1899

Your Order No. 5132
Marked For

Our Order No. 34270-01
Date Shipped 6/26/87

Material Description and Specifications

Item	Weight, lb.	Size, in.	Classification	McKay Designation
1	60	5/32	E309-16	309 AC-DC
2				
3				
4				
5				
6				

Item	Heat No.	Lot No.	Specification
1	8E0812	2679467	AWS A5.4-81; ASME SFA5.4
2			
3			
4			
5			
6			

Typical Chemistry Typical Weld Metal												Typical Ferrite
Item	% C	% Mn	% P	% S	% Si	% Cr	% Ni	% Mo	% Cu	% V	% Nb + Ta	
1	.07	1.0	.022	.015	.35	23.4	12.5	.15	.11			8 FN (DeLong)
2												
3												
4												
5												
6												

Typical Mechanical Properties					Charpy V-Notch Impact, ft.lb.
Item	Tensile, psi	Yield, psi	% Elong.		
1	88,000	67,000	37		
2					
3					
4					
5					
6					

SN: 29037
P. O. 374404
P. R. 2435 B
LC0

1f*

We hereby certify that the above product has been classified in accordance with the listed specifications and will meet the requirements of the applicable AWS filler metal specification, when tested in accordance with that specification.

TELEDYNE MCKAY

L. H. Smith
Authorized Signature

Form TM 410 Rev. 3 J04



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

Welders Supply Co.
5406 Jackwood
San Antonio, TX 78238

Att: Dale

Your Order No.
Marked For

Our Order No.
Date Shipped

B&RI

P. O. 63878

P. R. 548574

LOG 2542

Material Description and Specifications												
Item	Weight, lb.	Size, in	Classification	McKay Designation								
1	40	3/16"	E308L-16	308L AC-DC								
2												
3												
4												
5												
Item	Heat No.	Lot No.	Specification									
1	8E2285	XXXX	AWS A5.4-81; ASME SFA5.4									
2												
3												
4												
5												
Chemical Analysis: TYPICAL WELD METAL												
Item	% C	% Mn	% P	% S	% Si	% Cr	% Ni	% Mo	% Cu	% Co-Ti	% V	Typical Ferrite
1	.03	1.0	.022	.015	.40	20.2	9.8					7FN(DeLong)
2												
3												
4												
5												
Typical Mechanical Properties TYPICAL WELD METAL												
Item	Tensile, psi	Yield, psi	% El.	% RA	Charpy V-Notch Impact, ft. lb.							
1	83,000	64,000	45									
2												
3												
4												
5												

JLK

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

Sworn and Subscribed before me this _____ day of

19____

Notary Public

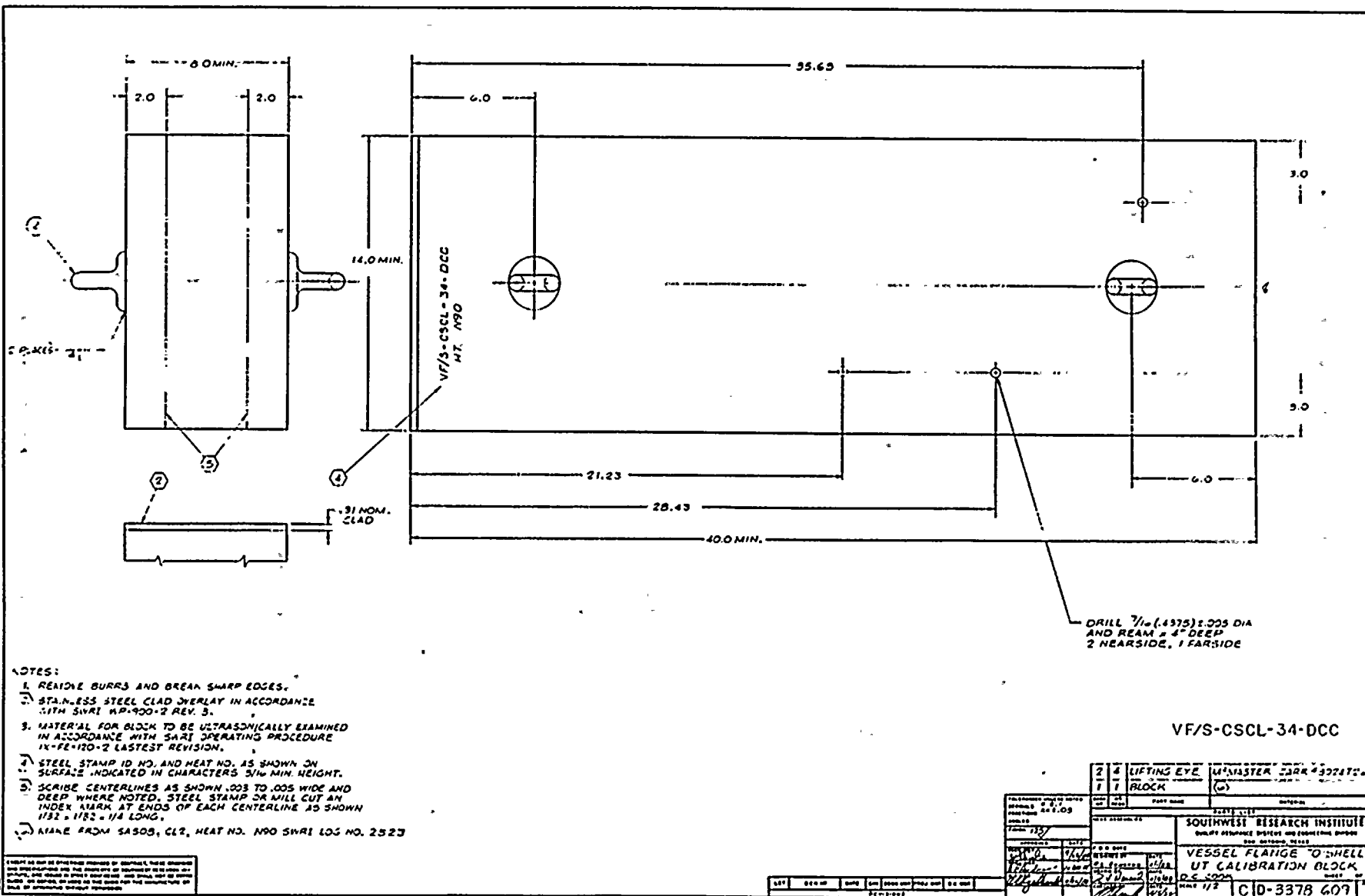
My commission expires _____ Spring Garden Twp. York Co.

TELEDYNE McKAY

[Signature]
Authorized Signature

Form TM-113B

C-157





SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK VF/S-CSCL-34-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 3 GROUP 3 IN ACCORDANCE WITH
SECTION II 1983 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA508 CL2. Ht N90 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design for the above calibration block incorporates the requirements of
Section V and Section XI, 1983 Edition, Summer 1983 Addenda of the ASME
Boiler and Pressure Vessel Code. The design also meets SwRI nondestructive
testing procedure requirements and tolerances.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-609
Welding Electrode Certifications
Postweld Heat Treat Certification

Robert L. Edwards

Lead Engineer

5/20/88

SIGNATURE

TITLE

DATE

C-T MANUFACTURING

P O BOX 19250
HOUSTON TEXAS 77024-9250
713 481-7286

CERTIFICATE OF TESTS—MILL PRODUCTS

Date April 15, 1988

S
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D

T
O

Southwest Research
P O Drawer 28510
San Antonio, TX 78284

S
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T
O

Southwest Research
6226 Cuiebra RD.
San Antonio, TX 78254

Customer Order No. 58265	Our Order No. 9432	Specification ASTM A-508 Class 11
Heat Number N90	Quantity 1	Size P.P. 8" THICK X 14" WIDE X 40" Long

Description
of
Material

Heat Number	CHEMICAL ANALYSIS													
	C	MN	P	S	SI	CR	NI	MO	V	TI	AL	CU	CO	
N90	.22	.70	.010	.006	.21	.36	.74	.63						
	B	CB	TA	CB & TA			SN	M	N.	O	FE			

Mill: Iri

Heat Number	MECHANICAL PROPERTIES								
	Tensile PSI	Yield PSI	% Elong in	% Red Area	BHN	Stress PSI	Temp °F	Modulus	% Elong in
N90	85,400	62,700	31.2	72.8	207				

Heat Treatment:

Normalized, Quenched, & Drawn

BWRI	
P. O.	58265
P. R.	579441
ECG	2523

THIS IS TO CERTIFY TO THE BEST OF OUR KNOWLEDGE
AND BELIEF THAT THE VALUES SHOWN ARE CORRECT
AND TRUE AND THAT THE MATERIAL COMPLIES WITH
THE REQUIREMENTS OF THE SPECIFICATIONS SHOWN

Handwritten signature

C-T MANUFACTURING

P O BOX 19250
HOUSTON TEXAS 77224-9250
713-461-7266

CERTIFICATE OF TESTS—MILL PRODUCTS

Date April 13, 1958

S
O
L
D
T
O

Southwest Research
P O Drawer 25510
San Antonio, TX 78284

S
H
I
P
T
O

Southwest Research
6220 Culebra RD.
San Antonio, TX 78284

Customer Order No 55755	Our Order No 9432	Specification ASTM A-508 Class 11
Heat Number V59	Quantity 1	Size T.F. 8" THICK X 14" WIDE X 40" LONG

Description
of
Material

Heat Number	CHEMICAL ANALYSIS												
	C	MN	P	S	SI	CR	NI	MO	V	TI	AL	CU	CO
V59	.22	.70	.010	.006	.21	.36	.74	.63				.22	
	B	CB	TA	CB & TA			SN	H	N	O	FE		

Mill: Int

Heat Number	MECHANICAL PROPERTIES							
	Tensile PSI	2 ¹ / ₂ % Yield PSI	% Elong in	% Red. Area	BHN	Stress PSI	Temp °F	% Elong in
V59	85,400	62,700	31.2	72.8	207			

Heat Treatment:

Normalized, Quenched, & Drawn

BWRI
P. O. 58265
P. R. 579441
LOG 2523

THIS IS TO CERTIFY TO THE BEST OF OUR KNOW-
LEDGE AND BELIEF THAT THE VALUES SHOWN ARE
TRUE AND THAT THE MATERIAL COMPLIES
WITH THE REQUIREMENTS OF THE SPECIFICATIONS.

[Signature]

MATERIAL TEST REPORT
Welding Products Division

TELEDYNE MCKAY

P.O. Box 1509 • 850 Grantley Road • York, PA 17405-1509

CSS-308L

WELDERS Supply

Your Order No.
Marked For

Our Order No.
Date Shipped

Material Description and Specifications

Item	Weight, lb.	Size, in.	Classification	McKay Designation
1	60/lbs	3/16"	E308L-15	308L DC Lime
2			E308L-16	308L AC-DC
3			E308L-16	308L DCT
4				
5				
6				

Item	Heat No.	Lot No.	Specification
1	8E0349	2679440	AWS A5.4-81; ASME SFA5.4
2			AWS A5.4-81; ASME SFA5.4
3			AWS A5.4-81; ASME SFA5.4
4			
5			
6			

Typical Chemistry												Typical Femite
Item	% C	% Mn	% P	% S	% Si	% Cr	% Ni	% Mo	% Cu	% V	% Co + Ta	
1	.030	1.4	.022	.015	.40	20.2	9.8	.15	.10			7 FN (Delong)
2		1.0										7 FN (Delong)
3					.75							10 FN (Delong)
4												
5												
6												

Typical Mechanical Properties					Charpy V-Notch Impact, ft.lb.		NOTE:
Item	Tensile, psi	Yield, psi	% Elong.				
1	83,000	64,000	45				DCT Electrodes are not recommended for use in the vertical and overhead positions.
2							
3							
4							
5							
6							

ENRI
P. O. 29037
P. R. 374404
LOG 2435 A

We hereby certify that the above product has been classified in accordance with the listed specifications and will meet the requirements of the applicable AWS filler metal specification, when tested in accordance with that specification.

TELEDYNE MCKAY

Paul Seale
Authorized Signature

-2-

Form TM-410 Rev. 3-2-84

MATERIAL TEST REPORT
Welding Products Division

TELEDYNE MCKAY

P.O. Box 1506 • 660 Granley Road • York, PA 17405-1506

CSS-309L

Welders Supply

Your Order No.
Marked For

Our Order No.
Date Shipped

2-10-87

Material Description and Specifications

Item	Weight, lb.	Size, in.	Classification	McKay Designation
1	<i>60</i>	<i>5/32</i>	E309L-16	309L AC-DC
2				
3				
4				
5				
6				

Item	Heat No.	Lot No.	Specification
1	<i>68846</i>	<i>3168629</i>	AWS A5.4-B1; ASME SFA5.4
2			
3			
4			
5			
6			

Typical Chemistry

Item	% C	% Mn	% P	% S	% Si	% Cr	% Ni	% Mo	% Cu	% V	% Nb+Ta	Typical Form
1	.035	1.0	.022	.015	.50	23.0	13.2	.15	.10			7 FN (DeLong)
2												
3												
4												
5												
6												

Typical Mechanical Properties

Item	Tensile, psi	Yield, psi	% Elong	Charpy V-Notch Impact, ft.lb.
1	79,000	64,000	41	
2				
3				
4				
5				
6				

We hereby certify that the above product has been classified in accordance with the listed specification and will meet the requirements of the applicable filler metal specification, when tested in accordance with that specification.

TELEDYNE MCKAY

[Signature]
Authorized Signature

-5-

P.O. *16629*
 P.O. *374281*
 L.S. *2388 B*

Form TM-410 Rev 6-87

3733 PITLUK
P.O. Box 3452
San Antonio, Texas 78211
(512) 924-4734



HERCO
Aircraft Machine, Inc.

NO. 2

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 88-0054 ITEM CALIBRATION BLOCK
P/N D 3378 609 QTY. 1ea NSN R.O. 62446

		ACC	REJ			ACC	REJ			ACC	REJ
1	8.0 MIN	✓		16				31			
2	2.0	✓		17				32			
3	2.0	✓		18				33			
4	14.0 MIN	✓		19				34			
5	STEEL STAMP	✓		20				35			
6	.31 CLAO NDM	✓		21				36			
7	35.63	✓		22				37			
8	21.23	✓		23				38			
9	28.43	✓		24				39			
10	40.0 MIN	✓		25				40			
11	3.0			26				41			
12	3.0			27				42			
13	DRILL & REAM ³ / ₁₆ PLES	✓		28				43			
14				29				44			
15				30				45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS ± ANGLES ±

.X ± .01

.XX ± .03

.XXX ±

NUMBER OF SAMPLES 1

NUMBER OF ACCEPTED 1

NUMBER OF REJECTED

PAGE OF

REMARKS:

LOT: ACCEPTED ✓

REJECTED

SIGNED Engineer L. J. [Signature]

DATE May 17, 1988

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4/ C[E- 1178-611



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK CSS/CCS-Nozz/Elbow-Mockup-36-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 8 (1) GROUP 1 (2) IN ACCORDANCE WITH
SECTION IX 1983 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA351 CF8A, Ht 25279-2
SA216 Gr WCC, Ht A852N IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The mockup design incorporates the requirements for qualification of NDT examination techniques and Section XI, 1983 Edition of the ASME Boiler and Pressure Vessel Code.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SWRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SWRI)
DRAWING (SWRI) E-3378-611C
Liquid Penetrant Data Sheets (Base material prior to welding)
Liquid Penetrant Data Sheets (After cladding, buttering, and final machining)
Welding Electrode Certifications
Postweld Heat Treat Certifications
Radiographic Inspection Report


Robert L. Edwards

SIGNATURE

Lead Engineer

TITLE

April 5, 1989

DATE

EISCO CORPORATION MATERIAL TEST REPORT

RIC 15C

CUSTOMER WESTINGHOUSE ELECTRIC		ITEM 31" IDx40 Ell	48-03547-73 MT NO. 25279-2
S.O. J6676197	P.O.	PATTERN X10421B	SERIAL NO.
MTC. SPEC. ASME SA351 GR CF8A-Section II 1977 Edition with addenda through Summer 1977			

MECHANICAL PROPERTIES

YIELD STR. 0.2% OFFSET PSI	36,400
ULTIMATE TENSILE STR PSI	91,850
ELONG. IN 2 INCHES - PERCENT	53
REDUCTION OF AREA - PERCENT	64
HARDNESS - BRINELL	
HARDNESS - ROCKWELL	
IMPACT FT. LBS. - CHARPY	

CHEMICAL ANALYSIS

CARBON	MANGANESE	SILICON	CHROMIUM	NICKEL	MOLYBDENUM	COPPER	SULPHUR	PHOSPHORUS	COBALT	FERRITE*
.22	.55	1.12	19.91	8.69			.014	.024	.11	

Acidified copper sulfate test for intergranular corrosion (Strauss)

No. specimens tested

Degree of bend

Results Satisfactory (no cracking)

Unsatisfactory (cracking)



Boiling nitric acid test (Huey)

Corrosion test. I.P.M.

I.P.Y.

Weldability bend test Degree

Results

REMARKS: *Ferrite calculated by Schoeter modification of the Schoeter diagram.

Applicable Code Case N 181

REVIEWED BY:



We certify that the foregoing is a true and correct report of the values obtained and that they comply with the requirements of the specification unless noted otherwise.

David R. Baithorn
QUALITY ASSURANCE REP.

3/50/75 9
DATE

KO STEEL CASTINGS, INC.
P. O. DRAWER V
SAN ANTONIO, TEXAS 78211
(512) 923-4591

LABORATORY REPORT
MADE IN U.S.A.

DATE 11/22

FOR: SOUTHWEST RESEARCH
6220 CULBERT
SAN ANTONIO

TX 78284

HEAT METAL SPECIFICATIONS
A8524 ASTM A216 GR. MCC
PATTERN D-SK-954
PD NUMBER 81939

C	MN	SI	P	S	CR	NI	CU	U	
.210	1.040	.350	.023	.023	.170	.100	.050	.110	.003

HEAT METAL SPECIFICATIONS
A8524 ASTM A216 GR. MCC

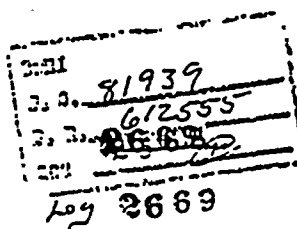
TENSILE STRENGTH	YIELD POINT	ELONGATION Z IN 2 INCHES	RED. OF AREA	BHN
77000	40200	30.00	56.40	156

D-SK-954

KO STEEL CASTINGS, INC.
METALLURGICAL DEPARTMENT

NORMALIZED & TEMPERED

Ed Garcia
AUTHORIZED SIGNATURE



For AEP PO # 07233-821-8X

McKay
Subcontract Engineer

MATERIAL TEST REPORT
Welding Products Division

TELEDYNE MCKAY

P. O. Box 1508 • 850 Granway Road • York, PA 17408-1508

CSS-308L <i>WELDERS Supply</i>				Your Order No. Marked For Our Order No. Date Shipped								
Material Description and Specifications												
Item	Weight, lb.	Size, in.	Classification	McKay Designation								
1	60 lbs	3/16"	E308L-15	308L GC L1me								
2			E308L-16	308L AC-DC								
3			E308L-16	308L DCT								
4												
5												
6												
Heat No. Lot No. Specification												
1	8E2323	3088430	AWS A5.4-81; ASME SFA5.4									
2			AWS A5.4-81; ASME SFA5.4									
3			AWS A5.4-81; ASME SFA5.4									
4												
5												
6												
Typical Chemistry												
Item	% C	% Mn	% P	% S	% Si	% Cr	% Ni	% Mo	% Cu	% V	% Co + Ti	Typical Temps 7 FH (Delong) 7 FH (Delong) 10 FH (Delong)
1		1.4										
2	.030	1.0	.022	.015	.40	20.2	9.8	.15	.10			
3					.75							
4												
5												
6												
Typical Mechanical Properties												
Item	Tensile, 0.2% Elong	Yield, 0.2% Elong	% Elong	Charpy V-Notch Impact, F.I.D.			NOTE: DCT Electrodes are not recommended for use in the vertical and overhead positions.					
1												
2	83,000	64,000	45									
3												
4												
5												
6												

3232
 P. O. *40125*
 P. R. *084500*
 LOG *2667 2*

We hereby certify that the above product has been classified in accordance with the listed specifications and will meet the requirements of the applicable AWS filler metal specification, when tested in accordance with that specification.

TELEDYNE MCKAY

Paul Steale
 Authorized Signature

-2-

Form TM-410 Rev. 8-78

3733 PITLUK
P.O. Box 3452
San Antonio, Texas 78211
(512) 924-4734



HERCO
Aircraft Machine, Inc.

NO.2

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 88-0157 ITEM CALIBRATION Block
P/N E-3378-611 B QTY. 1ea NSN R.D. 623804

		ACC	REJ			ACC	REJ			ACC	REJ
1	2.250	✓		16	.75	✓		31	.1875 Drill Ream 6 Fls	✓	
2	1.500	✓		17	1.50	✓		32	.75	✓	
3	.750	✓		18	1.50	✓		33	.75	✓	
4	1.50	✓		19	16.00	✓		34	2" R max TH	✓	
5	2.50	✓		20	Steel Stamp	✓		35	10.3° 4 68 Saws	✓	
6	3.50	✓		21	1.50	✓		36	10.3°	✓	
7	8.5	✓		22	.750	✓		37	.060 2 Pcs	✓	
8	4.75	✓		23	1.50	✓		38	.300 2 Pcs	✓	
9	3.00	✓		24	250	✓		39	2" R max TH	✓	
10	1.50	✓		25	Scribe Lines	✓		40	.50	✓	
11	.75	✓		26	.5 R	✓		41			
12	.75	✓		27	3.50	✓		42			
13	18.7	✓		28	2.50	✓		43			
14	15.50 C	✓		29	1.50	✓		44			
15	.75	✓		30	5.00	✓		45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS ±

ANGLES ± 0.5°

.X ± .1

.XX ± .06

.XXX ± .010

NUMBER OF SAMPLES 1

NUMBER OF ACCEPTED 1

NUMBER OF REJECTED

MSI
S. O. 86343
T. D. 623804
LOG 2781

REMARKS:

LOT: ACCEPTED ✓

REJECTED

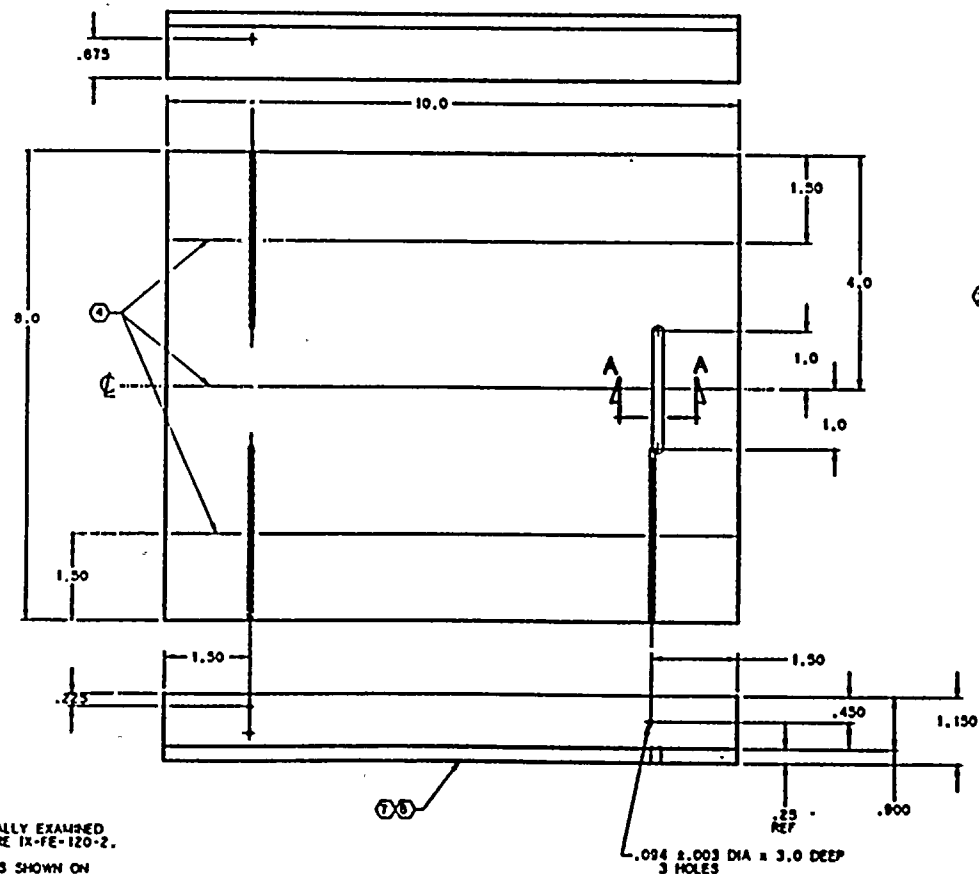
SIGNED [Signature]

DATE Feb 1, 1989

PAGE OF

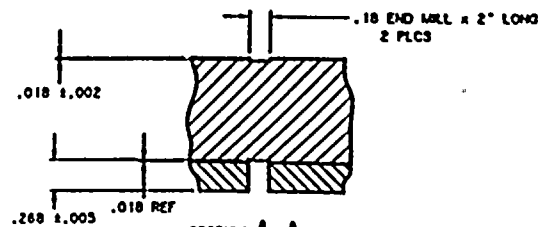
1015-

- 1 REMOVE HIRRS AND INEAK SHARP EDGES.
- 2 MATERIAL FOR PLOCK TO BE ULTRASONICALLY EXAMINED
IN ACCORDANCE WITH S-WR NOT PROCEDURE IX-FE-120-2.
- (3) STEEL STAMP I.D. No. AND HEAT No. AS SHOWN ON
SURFACE INDICATED, IN CHARACTERS 3/16 MIN HEIGHT.
- (4) SCRIBE CENTERLINES .003-.005 WIDE AND DEEP WHERE
NOTED. STEEL STAMP OR MILL CUT AN INDEX MARK AT
ENDS OF EACH CENTERLINE AS SHOWN, 1/32 x 1/32 x 1/4 LONG.
- (5) MAKE FROM FORDED ASIM A105 GR.2 S-WR LOG No. 2837
HEAT No. 30581.
- (6) STAINLESS STEEL CLAD OVERLAY IN ACCORDANCE
WITH S-WR WPS-900-2 REV4.
- (7) POSTWELD HEAT TREAT IN ACCORDANCE WITH S-WR NUCLEAR
PROJECTS OPERATING PROCEDURE IX-MS-102-0



PL-1. 150-CS-37-DCC
HT.No. 30561

PL-1.150-CS-37-DCC



SECTION A-A
SCALE: 2/1

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK PL-1.150-CS-37-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 1 GROUP 2 IN ACCORDANCE WITH
SECTION IX 1983 EDITION OF THE ASME' BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA105 Gr2. Ht 30561 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design for the above calibration block incorporates the requirements of Section V 1983 Edition. Summer 1983 Addenda of the ASME Boiler and Pressure Vessel Code. The design also meets SwRI nondestructive testing procedure requirements and tolerances.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-612
Welding Electrode Certifications
Postweld Heat Treat Certification


Robert L. Edwards

SIGNATURE

Lead Engineer

TITLE

March 22, 1989

DATE

3733 PITLUK
P.O. Box 3452
San Antonio, Texas 78211
(512) 924-4734



HERCO
Aircraft Machine, Inc.

NO. 2

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 89-0021 ITEM CAUBRATION Block
PIN D-3578-612 QTY. 120 NSN R.O. 633364

	ACC	REJ		ACC	REJ		ACC	REJ
1	✓		16	✓		31		
2	✓		17	✓		32		
3	✓		18	✓		33		
4	✓		19	✓		34		
5	✓		20	✓		35		
6	✓		21			36		
7	✓		22			37		
8	✓		23			38		
9	✓		24			39		
10	✓		25			40		
11	✓		26			41		
12	✓		27			42		
13	✓		28			43		
14	✓		29			44		
15	✓		30			45		

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS = ANGLES = 1.0°

.X = .1

.XX = .06

.XXX = .010

NUMBER OF SAMPLES 1

NUMBER OF ACCEPTED 1

NUMBER OF REJECTED

PAGE OF

REMARKS:

DATE	
P.O.	
P. H.	<u>633364</u>
LOG	

LOT: ACCEPTED ✓

REJECTED

SIGNED

DATE Feb 23, 1989

C-T MANUFACTURING

P.O. BOX 19250
HOUSTON, TEXAS 77224-9250
713-461-7266

CERTIFICATE OF TESTS—MILL PRODUCTS

Date November 18, 1988

S
O
L
D
T
O
Southwest Research
P. O. Drawer 28510
San Antonio, TX 78284

S
H
I
P
T
O
Southwest Research
6220 Culebra Road
San Antonio, TX 78284

Customer Order No.		Our Order No.		Specification	
R4500		9940		ASTM A-105 Normalized	
ITEM	QUANTITY	DESCRIPTION		MATERIAL	HEAT NUMBER
1	1	To Finish: 1-1/2" TH X 8" Wide X 10" Lg 84500 622504		ASTM A-105	30561
		Heat Treat: Normalized 1700°F for 2 hours			

CHEMICAL ANALYSIS													
ITEM	HEAT NO.	MILL	C	Mn	P	S	Ni	Cr	Mo	Si	Cu	Al	V
1	30561	CF & I	.27	1.13	.009	.002				.20			

PHYSICALS							
ITEM	TENSILE / PSI	2% YIELD / PSI	% ELONG IN	% RED AREA	F ₀		BHN
1	80,000	60,000	30.0	69.9			

THIS IS TO CERTIFY TO THE BEST OF OUR KNOWLEDGE
AND BELIEF THAT THE VALUES SHOWN ARE CORRECT
AND TRUE AND THAT THE MATERIAL COMPLIES WITH THE
REQUIREMENTS OF THE SPECIFICATIONS SHOWN.

TELEDYNE MCKAY
P. O. BOX 1509
YORK, PA. 17405-1309
DATE: 03/29/89

MATERIAL TEST REPORT
SOUTHWEST WELDING SUPPLY
ATTN BOB

CUST. ORDER #
MARKED FOR...
MCKAY ORDER NO....
DATE SHIPPED..... / /

MATERIAL DESCRIPTION AND SPECIFICATIONS

ITEM	WEIGHT	SIZE	CLASSIFICATION	MCKAY DESIGNATION
01	0	5/32	E309-16	309 AC-DC

ITEM	HEAT NO.	LOT NO.	BATCH NO.	SPECIFICATION
01	9A2442	2267813		AWS A5.4-81, ASME SFA5.4

ACTUAL CHEMISTRY:

ITEM	C	MN	P	S	SI	CR	NI	MO	N	CB
01	.070	.750	.023	.013	.390	23.350	12.770	.140		

ITEM	V	CU	H2O	TI	AR	CO	AS	SN	SD	W
01		.170								

FERRITE(S):

ITEM	WRC	DELONG	SCHAEFFLER	TENSILE	TYPICAL MECHANICALS- YIELD	REL
01		10.7		88,000	67,000	37

WE HEREBY CERTIFY THAT THE ABOVE PRODUCT HAS BEEN
CLASSIFIED IN ACCORDANCE WITH THE LISTED SPECIFICATIONS
AND CONFORMS TO ALL APPLICABLE REQUIREMENTS THEREOF.

Serial 98226
P. O. 623832
P. 2. 2080
100

Received 3/29/89 after request
2. mechanical properties (Sue)

James M. Minner
AUTHORIZED SIGNATURE

MATERIAL TEST REPORT

TELEDYNE MCKAY
P. O. BOX 1509
YORK, PA. 17405-1509

DATE: 03/29/89

SOUTHWEST WELDING SUPPLY
ATTN: BOB

CUST. ORDER #
MARKED FOR...
MCKAY ORDER NO....
DATE SHIPPED..... / /

MATERIAL DESCRIPTION AND SPECIFICATIONS

ITEM	WEIGHT	SIZE	CLASSIFICATION	MCKAY DESIGNATION
01	0	3/16	E308L-16	308L AC-DC

ITEM	HEAT NO.	LOT NO.	BATCH NO.	SPECIFICATION
01	8C2462	3188544		AWS A5.4-81, ASME SFA5.4

ACTUAL CHEMISTRY:

ITEM	C	MN	P	S	SI	CR	NI	MO	N	CD
01	.029	1.020	.040	.012	.340	19.520	10.180	.270		

ITEM	V	CU	H2O	TI	AR	CO	AS	SN	SR	W
01		.267								

FERRITE(S):

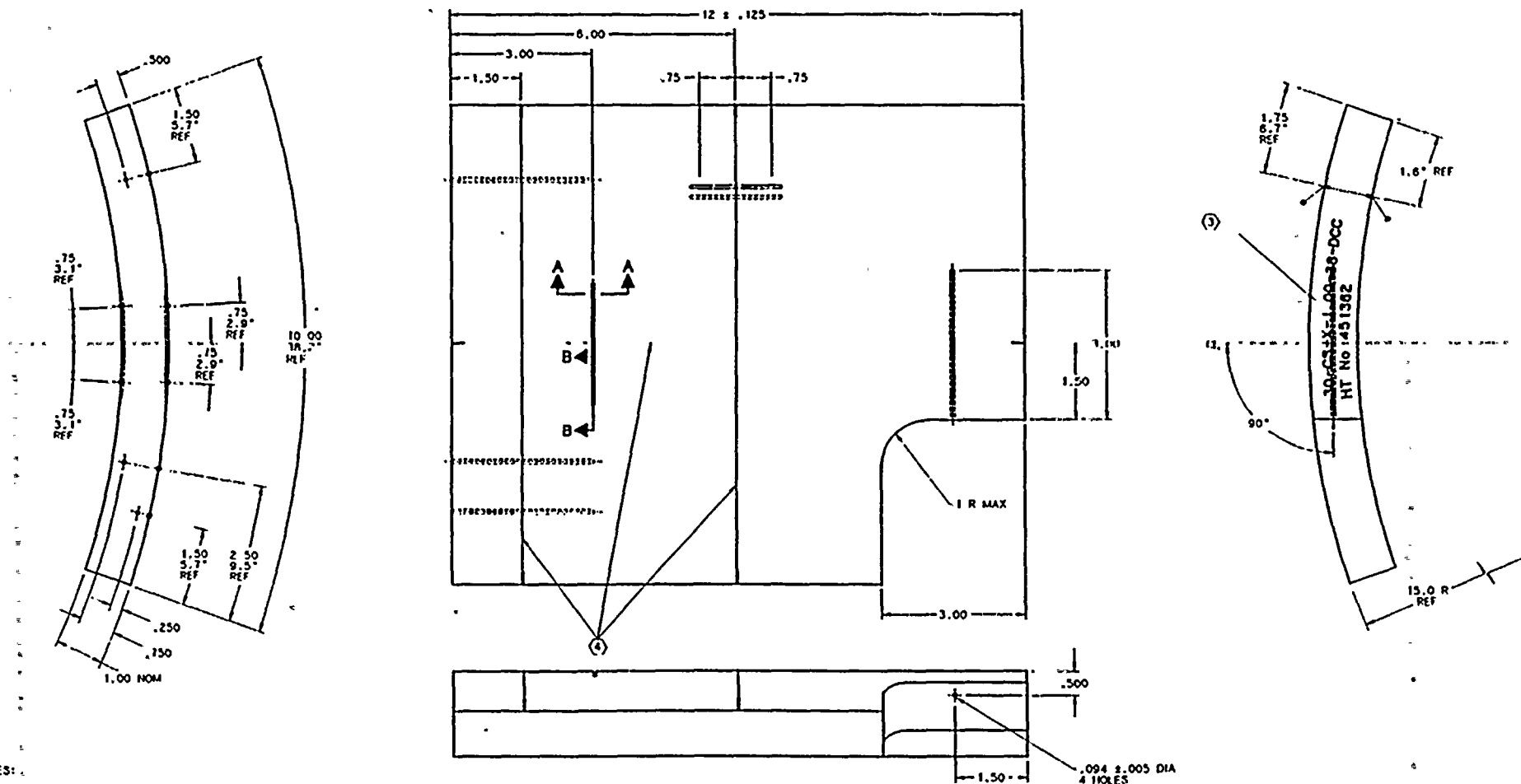
ITEM	WRC	DELONG	SCHAEFFLER	TYPICAL MECHANICALS		
01		6.8		TENSILE 83,000	YIELD 64,000	SEL 45

WE HEREBY CERTIFY THAT THE ABOVE PRODUCT HAS BEEN
CLASSIFIED IN ACCORDANCE WITH THE LISTED SPECIFICATIONS
AND CONFORMS TO ALL APPLICABLE REQUIREMENTS THEREOF

Serial	88345
E.O.	624889
D.O.	2090

Received 7/29/89 after
inspection in mechanical properties

James Minner
AUTHORIZED SIGNATURE



SECTION A-A
SCALE 1/4" = 1'

SECTION B-B
SCALE 1 / 1

30-CS-X-1,00-38-DCC

SOUTHWEST RESEARCH INSTITUTE

30" PIPE ULTRASONIC
CALIBRATION BLOCK

| | C̄ | D̄ - 3378 - 6 13 |



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK 30-CS-X-1.00-38-DCC IS HEREBY
CLASSIFIED AS P-NUMBER 1 GROUP 2 IN ACCORDANCE WITH
SECTION IX 1983 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
SA-106 Gr C, Ht 451362 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design for the above calibration block incorporates the requirements of Section XI, 1983 Edition, Summer 1983 Addenda and Section V, 1983 Edition, Summer 1983 Addenda of the ASME Boiler and Pressure Vessel Code. The design also meets SwRI nondestructive testing procedure requirements and tolerances.

The material identified on the attached mill test report meets the chemical and tensile (0.5" round) requirements for SA106 Gr C.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-613

Revised 9/25/90


Robert L. Edwards

SIGNATURE

Lead Engineer

TITLE

9/25/90

DATE

2571 CARMON ROAD, BROADVIEW, ELSON 6000

7-092510

CHEMISTS • MECHANICAL TESTING • METALLOGRAPHERS • CONSULTANTS

MAILING ADDRESS / P.O. BOX 310 / MAYWOOD, ILLINOIS 60153

9/25/90

ST 142312

8/8/90

Ref 713645

Sample Heat 451362

For D.C. Cook Block 38-DCC

PO 18028

I.D. No. 30-CS-X-1.00-38-DCC

[illegible]

3. 3. 55594
 2. 3. 71345
 300 3009

REPORT OF CHEMICAL TESTS

LAB 7 262 8723730													
SAMPLE IDENTIFICATION		Si	Mn	C	P	S	Ni	Cr	Mo	Cu	Mg	Al	V
SPECIMEN		.18	.80	.34 .31	.027	.019							

* - LESS THAN • NEB - NOT ENOUGH SAMPLE • P.P.M. - PARTS PER MILLION

*Recheck of carbon

CCX 139A Rev. 2/82

Author's address: Department of Mathematics, University of California, San Diego, La Jolla, CA 92037, U.S.A.
E-mail: shrawan@ucsd.edu

720 261 21 2543

కామవతి: ఇది చాలా బాగుంది. ఇది, నీ

Your order no
 /DATE RECEIVED NO

17
20

[illegible]

029/2352/9

THEORY

Abstract of Literature:

USE OF LIAISON

PERSONAL AND PRIVATE

Storeroom and Inventory Control

1. **Forme de l'œuvre :** roman, 198 pages, 12,50 €



1. ~~XXXXXXXXXX~~
 2. ~~XXXXXXXXXX~~
 3. ~~XXXXXXXXXX~~

Siemens AG
Siemens AG
Siemens AG

Abstract—

(നാലാം വാക്ക്)

ZUGA PIPE SUPPLY

TEL: 215-533-1645

Sep 17.90 16:11 No.129 P.03

Probe Nr. Seamless Pipe (Erzeuger-Nr.)	Probenbezeichnung Seamless distribution (Erzeuger-Nr.)	Seamless Yield strength (Min. 0.2% elongation)	Tensile strength (Min. 0.2% elongation)	Elongation Elongation At break	Flattening Reduction Section	Carbon content In % Analysis	Remarks Remarks Observations
Verfahren Diameter/Volume dimension	max. Q	PSI 40000	PSI 70100	12			
076430	1/2" ϕ	41200	73200	26	45		
075902	1/2" ϕ	45800	79000	25	46		
076553	1/2" ϕ	43700	79900	25	49		
076555	1/2" ϕ	41200	78000	28	50		
076557	1/2" ϕ	43700	79900	27	49		
Flattening-Test:		No objection					
Q = transverse							

Manufactured by ZUGA AG
 Manufactured by ZUGA AG
 Manufactured by ZUGA AG

Die genannten Anforderungen sind bei
 Herstellung (Herstellung) und beim
 Einbau (Einbau) zu beachten.

Düsseldorf 13, den 6.3.1981

3733 PITLUK
P.O. Box 3452
San Antonio, Texas 78211
(512) 924-4734



HERCO
Aircraft Machine, Inc.

NO.2

Block ID 30-CS-X-1.00-38-DCC

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 90-0353 ITEM CALIBRATION BLOCK
P/N D-3378-613 QTY. 1ea NBN REC 713597

		ACC	REJ			ACC	REJ			ACC	REJ
1	.500	✓		16	12 ± .125	✓		31	Steel Samp	✓	
2	1.50	✓		17	.75	✓		32	90°	✓	
3	.75	✓		18	.75	✓		33			
4	.75	✓		19	3.00	✓		34			
5	.75	✓		20	1.50	✓		35			
6	.75	✓		21	1" R MAX	✓		36			
7	10.00	✓		22	3.00	✓		37			
8	2.50	✓		23	.500	✓		38			
9	1.50	✓		24	DRILL 4 ACS	✓		39			
10	.250	✓		25	1.50	✓		40			
11	.750	✓		26	2" R MAX 4 ACS	✓		41			
12	1.00 Nom	✓		27	.100 ± .005	✓		42			
13	1.50	✓		28	.062 TYP	✓		43			
14	3.00	✓		29	SCRIBE LINES	✓		44			
15	6.00	✓		30	1.75	✓		45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS ± —

ANGLES ± .5°

.X ± .1

.XX ± .01

.XXX ± .005

.XXX ± .0005

NUMBER OF SAMPLES 1

NUMBER OF ACCEPTED 1

NUMBER OF REJECTED —

3921
E. S.
E. S. 713597
200 3007

REMARKS:

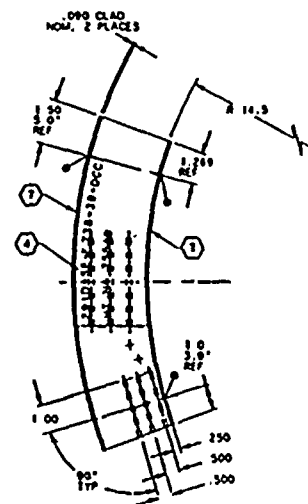
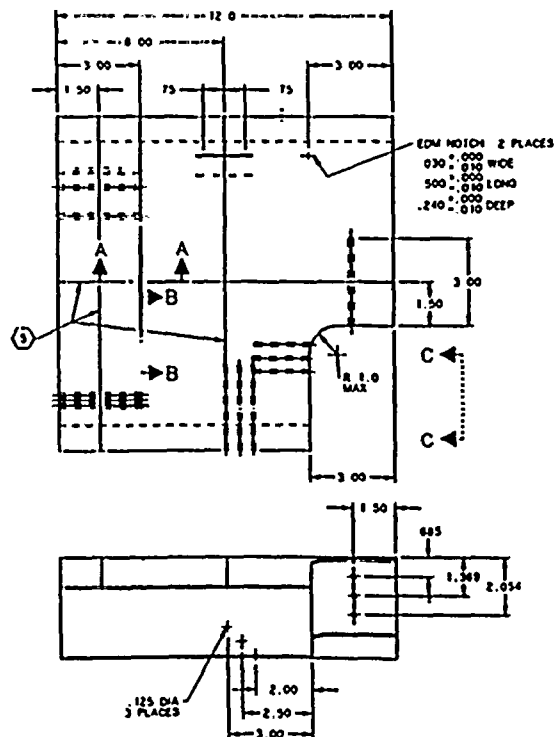
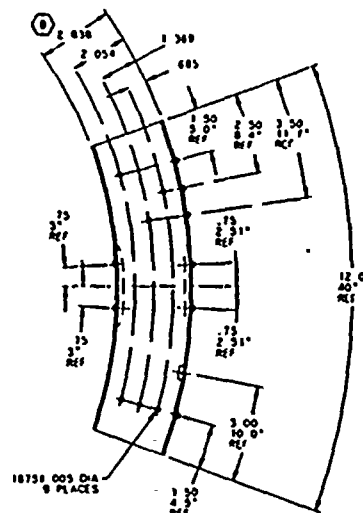
LOT: ACCEPTED ✓

REJECTED —

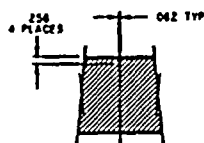
SIGNED Eugene L. G...

DATE Aug 8, 1990

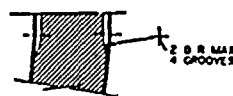
PAGE — OF —



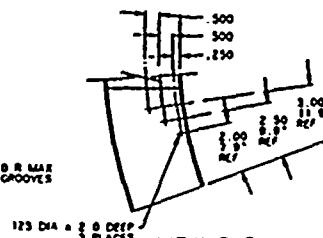
- NOTES
- 1 DIMENSIONS ARE IN INCHES
- 2 REMOVE BURRS AND BREAK SHARP EDGES
- 3 MATERIAL FOR BLOCK TO BE ULTRASONICALLY EXAMINED IN ACCORDANCE WITH SPMI NPP-UT-1, LATEST REVISION.
- 4 STEEL STAMP ID NO. AND HEAT NO. ON SURFACE LOCATED IN CHARACTERS 3/16" MIN HEIGHT.
- 5 SCORE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED STEEL STAMP OR MILL CUT AN IDENTIFY MARK AS ENDS OF EACH CENTERLINE AS SHOWN 1/32" x 1/32" x 1/4 LONG
- 6 MAKE FROM FORGED 34182 OR 3318 HEAT NO 25549 3-1/4" DIA NO. 3312.
- 7 I.D. AND O.D. TO BE CLAD IN ACCORDANCE WITH 3182-NPP-46. ULTRASONIC 308 SS WELD MATERIAL CLAD SURFACES TO REMAIN IN AS-WELDED CONDITION
- 8 ACTUAL AS-BUILT DIMENSION



SECTION A-A
SCALE 1/2"



SECTION B-B
SCALE 1/2"



VIEW C-C
SCALE 1/2

29ID-SE-2,738-39-DCC

SOUTH WEST RESEARCH INSTITUTE 11000 S. 28th Ave. Suite 100 Phoenix, AZ 85041 (602) 998-1100		SOUTH WEST RESEARCH INSTITUTE 11000 S. 28th Ave. Suite 100 Phoenix, AZ 85041 (602) 998-1100	
REACTOR COOLANT LOOP SAFE-END UI CAL BLOCK		REACTOR COOLANT LOOP SAFE-END UI CAL BLOCK	
C-3378-621		C-3378-621	



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

Calibration block 29ID-SE-2.738-39-DCC is hereby classified as P-Number 8 group 1 in accordance with Section IX 1983 Edition of the ASME Boiler and Pressure Vessel Code. The P-Number classification for this calibration block is substantiated with the attached mill test report for SA182F316, Ht25549 and meets the block material requirements of Section XI, Appendix III, III-3411 of the ASME Boiler and Pressure Vessel Code.

Design Criteria

The design for the above calibration block incorporates the requirements of Sections V and XI, 1983 Edition of the ASME Boiler and Pressure Vessel Code. The design also meets American Electric Power purchase order and quality assurance requirements.

Attachments

- Mill Test Report
- Duplicate Analysis
- Weld Material Certifications
- Preliminary UT Data Sheets
- Dimensional Data Sheets
- Final UT Acceptance Data Sheets
- Drawing D-3378-621 Rev. A

Robert L. Edwards

Sr. Research Engineer
Title

September 1, 1995
Date

C-T MANUFACTURING

P. O. BOX 19380
HOUSTON, TX 77254-8280
713-461-7288 • FAX 713-461-8324

CERTIFICATE OF TEST-MILL PRODUCTSDate August 15, 1995

S Southwest Research Institute
O T P. O. Drawer 28510
L O San Antonio, TX 78274
D

S Southwest Research Institute
H T 6220 Culebra Road
I O San Antonio, TX 78274
P

CUSTOMER ORDER NO.	OUR ORDER NO.	SPECIFICATION
68765	3395	ASTM A-182-F-316

ITEM	QUANTITY	DESCRIPTION	REFERENCE	HEAT NO.
1	2	12" Wide Section of 17.058" Radius on Outside Surface with 14.500" Radius Inside Surface (2.558" Minimum Wall Thickness) 12.00" in Length Reference: Drawing 3560 Heat Treatment: Solution Annealed @ 1900°F	A-182-F-316	25549

CHEMICAL ANALYSIS

ITEM	HEAT NO.	MILL	C	Mn	P	S	NI	Cr	Mo	Si	Cu	N
1	25549	Electroall	.016	1.79	.028	.022	10.42	16.64	2.16	.50		.077

PHYSICALS

ITEM	TENSILE / PSI	2% YIELD / PSI	% ELONG IN 2"	% RED AREA	BHN
1	85,500	37,500	60.0	74.0	

THIS IS TO CERTIFY TO THE BEST OF OUR KNOWLEDGE AND BELIEF THAT THE VALUES SHOWN ARE CORRECT AND TRUE AND THAT THE MATERIAL COMPLIES WITH THE REQUIREMENTS OF THE SPECIFICATIONS SHOWN

McKenzie Hardway

AUG 30 '95 13:37 CHARLES C. KAWIN 312-865-8438

PHONE 708/888-0400

P.1/1

2871 GARDNER ROAD, BROMFIELD ILLINOIS 60113



CHARLES C. KAWIN COMPANY
METALLURGICAL LABORATORIES

083013

MAILING ADDRESS / P.O. BOX 810 / MAYWOOD, ILLINOIS 60153

SOUTHWEST RESEARCH INST. 7010
P. O. DRAWER 28510
SAN ANTONIO TX 78284
R. L. EDWARDS

P. O. # 3935
DEDCR 08-28-95
STAINLESS STEEL SAMPLE

REPORT DATE: 08/29/95

LAB NO: 0828-021 / 01

JOB NO: 08/29 847

HEAT# 25549

CHEMICAL ANALYSIS

Si	.47	Mn	1.95	C	.025
P	.024	S	.024	Ni	10.31
Cr	16.90	Mo	2.29		

TEST METHODS: ASTM E 663 ; ASTM E 1019 ; ASTM E 1479 ;

DATE	
7. 8.	
7. 9.	285749
7. 10.	3317

G. A. INSPECTOR

PAGE 1 OF 1

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL,
WITHOUT THE WRITTEN APPROVAL OF THE CHARLES C. KAWIN CO.

CERTIFICATE OF ANALYSIS



CUSTOMER: WELDERS SUPPLY CO.
MARKED FOR:

ORDER NO: 168345
DATE: 10/06/94

TYPE: INFLUX 308L-T1

SIZE: .001/16

LOT NO: 322T8696 LBS SHIPPED: 162

HEAT NO:

SPECIFICATION: AWS A5.22-80

CLASS: E308LT-1

ACTUAL CHEMISTRY

ALL WELD METAL CHEMISTRY (%)

C	<.01✓
MN	1.44✓
P	0.029✓
S	<.01✓
SI	0.82✓
CU	0.25✓
CR	19.50✓
NI	9.84✓
MO	0.25✓
V	<.01✓
Ti	<.01✓
CO	<.01✓
AL	<.01✓

*Revised QA
B.W. Young
10/11/94*

W-249

FERRITE(S):

8 FN (MAGNE-GAGE)
8 FN (DE LONG)
6 FN (WRC)

HARDNESS:

HRC
HB

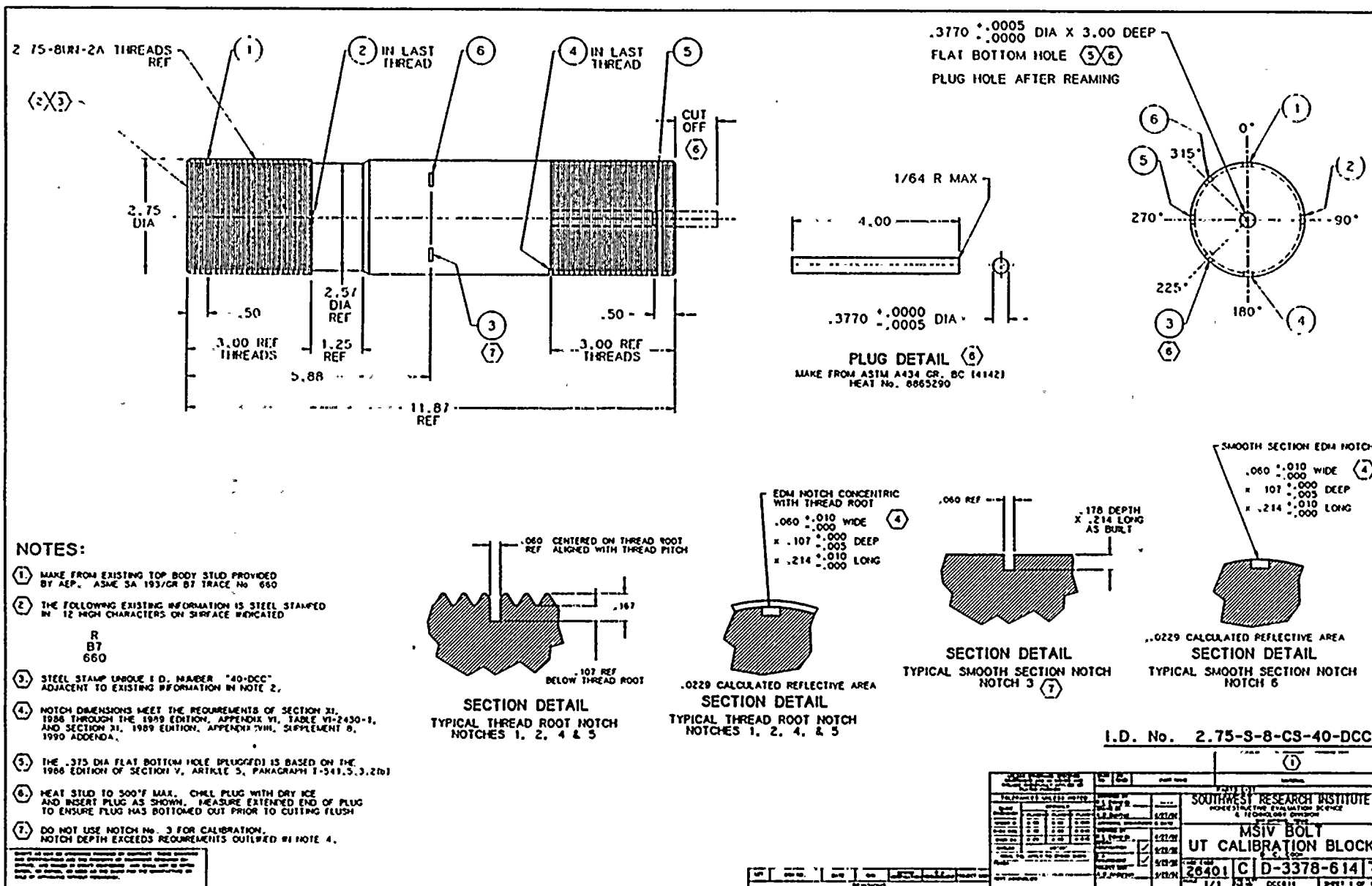
WE HEREBY CERTIFY THAT THE ABOVE PRODUCT HAS BEEN
CLASSIFIED IN ACCORDANCE WITH THE LISTED SPECIFICATION
AND CONFORMS TO ALL APPLICABLE REQUIREMENTS THEREOF.

FILLER METALS QUALITY ASSURANCE .
MCKAY WELDING PRODUCTS
101 TRADE SQUARE EAST
TROY, OHIO 45373

AUTHORIZED SIGNATURE

Gary Detweiler

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SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

Block ID No. 2.75-S-8-CS-40-DCC

Material specifications for nut and bolting material do not have a P-Number classification in accordance with Section IX of the Code. This is a verification that the calibration block was fabricated from material supplied by Indiana Michigan Power Company, D. C. Cook Nuclear Plant.

Design Criteria

The design for the above calibration block incorporates the requirements of Section XI, 1983, 1986 through the 1989 Edition, Appendix VI, Table VI-2430-1 and Appendix VIII, Supplement 8, 1990 Addenda. The design also meets Indiana Michigan Power Company, D. C. Cook Nuclear Plant's purchase order and quality assurance requirements.

Attachments

- Material Documentation
- Dimensional Inspection Reports
- Drawing (SwRI) D-3378-614

Signature

Sr. Research Engineer

Title

April 30, 1992

Date

COPY

CERTIFICATE OF CONFORMANCE



HOLDING THE
WORLD TOGETHER

Ronson Manufacturing, Inc.

9933 Chillicothe Road, Kirtland, OH 44094
(216) 256-1463

October 9, 1991

CUSTOMER Atwood & Morrill Company, Inc.

PURCHASE ORDER NO. 82209

ITEM (1) 20 Pcs. 2-3/4" -8 UN-2A x 11-25/32" Top Body Studs ✓
Dwg. # 34567-702 Rev. 00, Size C
Trace # 66Q ✓ Hardness: 285 BHN
Quench 3 Hrs. @ 1550°F - Oil
Temper 3 Hrs. @ 1120°F

SPECIFICATIONS * ASME SA 193, Grade B7; ✓
ASME Section III, Division 1,
Class 1
1989 Edition with No Addenda;
10CFR21

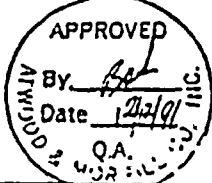
OUR ORDER NO 1966

THE MATERIAL PROVIDED HAS BEEN MANUFACTURED UNDER OUR QUALITY ASSURANCE
STANDARD OPERATING POLICIES & PROCEDURES MANUAL DATED 1 April 91
REV 11 AS AUDITED AND APPROVED BY Atwood & Morrill Company, Inc.

NO WELDING HAS BEEN PERFORMED.

WE CERTIFY THAT THE MATERIAL OR PRODUCT DESCRIBED IN THIS REPORT HAS BEEN
INSPECTED AND/OR TESTED AS STATED HEREIN AND THAT SUCH SPECIMENS OR SAMPLES
WERE TAKEN FROM THIS LOT OR QUANTITY DESCRIBED HEREIN, AND THAT THE MATERIAL OR
PRODUCT MEETS ALL APPLICABLE REQUIREMENTS, CERTIFICATIONS, PHYSICALS, AND
CHEMISTRY REPORTS ARE ON FILE FOR YOUR EXAMINATIONS.

WE CERTIFY THAT THE ABOVE MATERIAL IS FREE FROM MERCURY CONTAMINATION AND
THE ABOVE TESTS CONFORM TO THE REQUIREMENTS OF THE SPECIFICATION LISTED.



RONSON MANUFACTURING, INC.

By Sherri Tidy
Sherri Tidy, Asst. Q.A. Mgr.

CERTIFICATE OF TEST

EARLE M. JORGENSEN CO.

STEEL
5311 CLINTON DR

P.O. BOX 1421
HOUSTON, TX 77251

01/09/91

SELLSHIP DIST/DIST	INVOICE NUMBER	TR
H H	496568 WH	

CUSTOMER ORDER NUMBER	CUSTOMER PART NUMBER	ORDER DATE	
12039		01/07/91	H 9790

TEXAS TOOLMAKERS INCORPORATED
11411 EAST COKER LOOP
SAN ANTONIO TX 78216

S
H
I
P
T
O

TEXAS TOOLMAKERS INCORPORATED
11411 EAST COKER LOOP
SAN ANTONIO TX 78216

DESCRIPTION/SPECIFICATIONS
HFD1411 4142 CD HT RD ASTM A434 GR BC BRN GOLD
5/8 RD X 12' R/L
ASTM A434 GR BC

CHEMICAL ANALYSIS

MILL: REPUBLIC ENGINEERED STEELS, INC

HEAT NUMBER	C	MN	P	S	SI	CR	MO	V	SN	AL
8865290	.410	.90	.009	.028	.22	1.02	.22	.006	.007	.016
	TI	CB	CO	N	CA	NI	CU			
	.002	.004	.01	.0074	.0004	.13	.16			

MECHANICAL PROPERTIES

QUANTITY	YLD STR *	ULT TEN	% ELONG	% RED	HARDNESS	DEVELOPED
1 BAR	KSI	KSI	IN 2 IN	IN AREA	BHN	HARDNESS (RC)
	135.0	144.5	17.5	58.1	302	

* 0.2% Offset

G/S: 7

MATERIAL FREE OF MERCURY CONTAMINATION DURING MFG AND STORAGE ON

END-QUENCH HARDENABILITY (JOMINY - RC):

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
58	57	57	57	56	56	55	54	54	53	52	51	50	49	48
16	18	20	22	24	26	28	30	32						
47	44	43	40	40	39	38	37	36						

ASTM A434-81 GR BC

ASTM A 193-88 GRB7

ASTM A 331-87

The above data were transcribed from the manufacturer's certificate of test after verification for completeness and specification requirements of the information on the certificate. All test results remain on file subject to examination.

The willful recording of false, fictitious, or fraudulent statements in connection with this result may be punishable as a felony under Federal statutes.

JOEL RUSSO

MANAGER QUALITY ASSURANCE

FORM 91 Z (0285

TEXAS TOOLMAKERS, INC.
11411 E. COKER LOOP
SAN ANTONIO, TX 78216
(512) 494-3651

JOB # 14083
PART # D-3378-614

CUSTOMER SWRI
PART NAME MSIV-Belt UT CAL BLOCK

Req. # 823253
P.O. # 32076

[illegible]

INSPECTOR(S): Jack Royce _____

DATE: 5-1-42

ACCEPTED: ✓ REJECTED: BY: Jack B. [unclear]

DATE: 5-1-92

PAGE 1 OF 1

ULTRACUT EDM
 A Division of Bodic Industries Inc.
 2410 Executive Drive
 Garland, Texas 75041

Work Order #1042492-1

Sheet 1 of 2

INSPECTION REPORT

Date 04 / 28 / 52

Customer: SOUTHWEST RESEARCH INST.

P.O.#132107

Drawing #10-3378-614 REV -

I.D.#140-DCC

ITEM DESC	B/P ZONE	DRAWING DIMENSION	TOLERANCES ALLOWED	MEASURED DIMENSION	METHOD OF INSPECTION AND COMMENTS
NOTCH 1	0 DEG	.060	+.010 / -.000	.063	GAGE PIN
		.107	+.000 / -.005	.106	DEPTH MICROMETER
		.214	+.010 / -.000	OK	MIN/MAX GAGE
		.50	+.060 / -.060	.516	DIAL CALIPER
NOTCH 2	90 DEG	.060	+.010 / -.000	.063	GAGE PIN
		.107	+.000 / -.005	.105	DEPTH MICROMETER
		.214	+.010 / -.000	OK	MIN/MAX GAGE
		3.00	+.060 / -.060	2.994	DIAL CALIPER
NOTCH 3	225 DEG	.060	+.010 / -.000	.063	GAGE PIN
		.107	+.000 / -.005	.178	DEPTH MICROMETER
		.214	+.010 / -.000	OK	MIN/MAX GAGE
		5.88	+.060 / -.060	5.882	DIAL CALIPER
NOTCH 4	180 DEG	.060	+.010 / -.000	.063	GAGE PIN
		.107	+.000 / -.005	.106	DEPTH MICROMETER
		.214	+.010 / -.000	OK	MIN/MAX GAGE
		3.00	+.060 / -.060	2.902	DIAL CALIPER

Work Order #1042492-1'

Sheet 2 of 2

INSPECTION REPORT

Date 04 / 28 / 52.


CHINESE SOUTHWEST RESEARCH INST.

P.O. # 32107

D. 50-3378-614 REV -

I.D. # 40-DCC

[illegible]

DIMENSIONAL INSPECTION RECORD				Page <u>1</u> of <u>1</u>
Project No.: <u>17-4440</u>	Drawing / Part No.: <u>D-3378-614</u>	Part Name: <u>MSIV SOLE</u> <u>UT CALIBRATION BLOCK</u>	Procedure: <u>CP10-30-102</u>	
Serial No.: (Single Part) <u>2-75-3-8-05-40-000</u>	E.O.: <u>—</u>	Work Order <input type="checkbox"/> Job Card <input type="checkbox"/> MPS <input type="checkbox"/>	Location: <u>SWRI MACHINE SHOP</u>	
No. of Articles Inspected: <u>1</u>		DCMAO Required: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		NR (NA if None) <u>NA</u>
Drawing Zone	B/P Dim.	Accept	Reject	Comments
(1) W	.063	MAY 1 1992		CMM
(1) D	.104			MIC SWRI #1
(1) L	.2179			5056 0-1
(2) W	.063	MAY 1 1992		
(2) D	.104			
(2) L	.2189			
(3) W	.063	MAY 1 1992		
(3) D	.177			
(3) L	.2184			
(4) W	.063	MAY 1 1992		
(4) D	.105			
(4) L	.2188			
(5) W	.063	MAY 1 1992		
(5) D	.104			
(5) L	.2180			
(6) W	.064	MAY 1 1992		
(6) D	.177			
(6) L	.2193			
No. of Articles Accepted: <u>1</u>		No. of Articles Rejected: <u>0</u>		Inspector Signature: <div style="text-align: center;"></div>
				Date: <u>MAY 1 1992</u>

SA-2 Form 000-10-1

NOTES:

1. BREAK SHARP EDGES AND REMOVE ALL BURRS.
2. MATERIAL FOR BLOCK TO BE ULTRASONICALLY EXAMINED IN ACCORDANCE WITH SWRI NPOP US-1, LATEST REVISION.
3. STEEL STAMP ID NO. AND HEAT NO. ON SURFACE INDICATED IN CHARACTERS 3/16" HIGH HEIGHT.
4. SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP OR MILL CUT AN INDEX MARK AT ENDS OF EACH CENTERLINE AS SHOWN. 1/32 ± 1/32 ± 1/4 LONG.
5. MAKE FROM FORD STAINLESS STEEL ASTM A162, OR F316, HEAT NO. 94492, SWRI LOG NO. 3308A.

SECTION A-A
SCALE 1/1

SECTION B-B
SCALE 1/1

ID No. DC-4/27.5-S3-41-DCC

SOUTHWEST RESEARCH INSTITUTE
UNIVERSITY OF CALIFORNIA, SAN DIEGO
SAN DIEGO, CALIF. 92161
CUMULATIVE BLOCK - 4' BY 27.5"
22511C D-3378-616

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

Calibration block BC-4/27.5-SS-41-DCC is hereby classified as P-Number 8 group 1 in accordance with Section IX 1983 Edition of the ASME Boiler and Pressure Vessel Code. The P-Number classification for this calibration block is substantiated with the attached mill test report for SA18LF316, Ht94492 and meets the block material requirements of Section XI, Appendix III, III-3411 of the ASME Boiler and Pressure Vessel Code.

Design Criteria

The design for the above calibration block incorporates the requirements of Sections V and XI, 1983 Edition of the ASME Boiler and Pressure Vessel Code. The design also meets American Electric Power purchase order and quality assurance requirements.

Attachments

- Mill Test Report
- Duplicate Analysis
- Preliminary UT Data Sheets
- Dimensional Data Sheets
- Final UT Acceptance Data Sheets
- Drawing D-3378-616


Signature


Title


Date

C-T MANUFACTURING

P. O. BOX 1888
HOUSTON, TX 77264-8888
713-461-7288 • FAX 713-461-8334

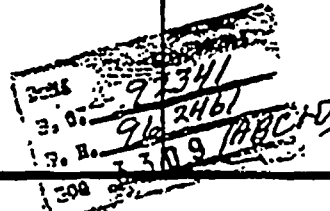
CERTIFICATE OF TEST-MILL PRODUCTS

Date July 27, 1995

S Southwest Research Institute
O T P. O. Drawer 28510
L O San Antonio, TX 78274
D

S Southwest Research Institute
H T 6220 Culebra Road
I O San Antonio, TX 78274
P

CUSTOMER ORDER NO.		OUR ORDER NO.	SPECIFICATION	
62341		3371	ASTM A-182-F-316	
ITEM	QUANTITY	DESCRIPTION	MATERIAL	HEAT NO.
1	1	Rough Machined Forgings to Finish 6.812" OD X 3.624" ID X 12.00" LG	A-182-F-316	94492
2	1	9.187" OD X 5.189" ID X 12.00" LG	A-182-F-316	94492
3	1	14.125" OD X 8.750" ID X 12.00" LG	A-182-F-316	94435
4	1	17.375" OD X 11.188" ID X 12.00" LG	A-182-F-316	94439
Heat Treatment: Solution Annealed @ 1950°F for 1 Hour				



CHEMICAL ANALYSIS

ITEM	HEAT NO.	MILL	C	Mn	P	S	Ni	Cr	Mo	Si	Cu
1	94492	6101	.02	1.68	.023	<.002	10.28	18.54	2.05	.39	.19
2	94492	6101	.02	1.68	.023	<.002	10.28	18.54	2.05	.39	.19
3	94435	6101	.02	1.63	.026	<.002	10.16	18.49	2.13	.37	.22
4	94439	6101	.056	1.65	.026	<.002	10.38	18.48	2.12	.42	.25

PHYSICALS

ITEM	TENSILE / PSI	2% YIELD / PSI	% ELONG IN 2"	% RED AREA	BHN
1	82,000	43,500	62.0	81.0	153/158
2	82,000	43,500	62.0	81.0	153/158
3	82,500	44,500	61.0	79.0	149
4	90,000	48,500	59.0	78.0	158

THIS IS TO CERTIFY TO THE BEST OF OUR KNOWLEDGE
AND BELIEF THAT THE VALUES SHOWN ARE CORRECT
AND TRUE AND THAT THE MATERIAL COMPLIES WITH THE
REQUIREMENTS OF THE SPECIFICATIONS SHOWN

Michael J. Henderson

Quality Control

PHONE: 708/888-8488

3271 CHASE ROAD, BENSINGTON, ILLINOIS 60015



CHARLES C. KAWIN COMPANY
METALLURGICAL LABORATORIES

082811

MAILING ADDRESS / P.O. BOX 518 / MAYWOOD, ILLINOIS 60153

SOUTHWEST RESEARCH INST. 7010
P.O. DRAWER 28510
SAN ANTONIO TX 78284
R.L. EDWARDS

P.O. # 3935
DESCR. 08-24-95

REPORT DATE: 08/28/95

LAB NO: 0825-083 / 01

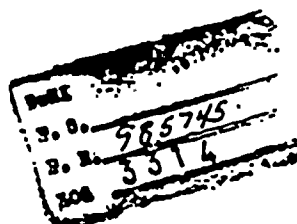
JOB NO: 08/28 848

HEAT# 94492 STAINLESS STEEL

CHEMICAL ANALYSIS

Si	.36	Mn	1.40	C	.026
P	.022	S	.002	NI	10.40
Cr	16.80	Mo	2.30		

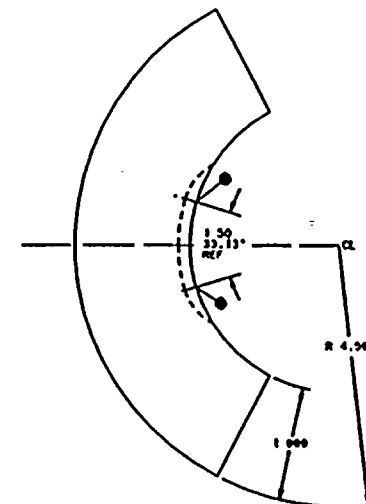
TEST METHODS: ASTM E 663 ; ASTM E 1019 ; ASTM E 1479 ; ASTM E 354 ;
NPT



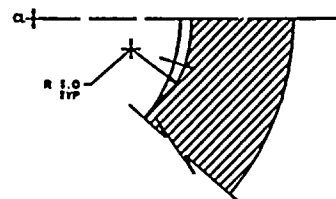
Charles C. Kawin
QA INSPECTOR

PAGE 1 OF 4

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL,
WITHOUT THE WRITTEN APPROVAL OF THE CHARLES C. KAWIN CO.



- 1 BREAK SHARP EDGES AND REMOVE ALL BURRS.
- 2 MATERIAL FOR BLOCK TO BE ULTRASONICALLY EXAMINED IN ACCORDANCE WITH SHW SPEC UT-1, LATEST REVISION.
- 3 STEEL STAMP ID NOS AND HEAT NOS ON SURFACE INDICATED IN CHARACTERS 3/16 IN HIGH.
- 4 SCORE CENTERFERS .003 TO .005 WIDE AND DEEP WHERE A STEEL MARK OR A STEEL MARK IS MADE AT ENDS OF EACH CENTERLINE AS SHOWN, 1/32 X 1/32 X 1/4 LONG.
- 5 MAKE FROM FORGED STEELLESS STEEL ASTM A102, OR F316, HEAT NO. 44452, SHW LOG NO. 33090.



10 No. BC-6/27,6-29-SS-42-DCC

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

Calibration block BC-6/27.5-29-SS-42-DCC is hereby classified as P-Number 8 group 1 in accordance with Section IX 1983 Edition of the ASME Boiler and Pressure Vessel Code. The P-Number classification for this calibration block is substantiated with the attached mill test report for SA182F316, Ht94492 and meets the block material requirements of Section XI, Appendix III, III-3411 of the ASME Boiler and Pressure Vessel Code.

Design Criteria

The design for the above calibration block incorporates the requirements of Sections V and XI, 1983 Edition of the ASME Boiler and Pressure Vessel Code. The design also meets American Electric Power purchase order and quality assurance requirements.

Attachments

- Mill Test Report
- Duplicate Analysis
- Preliminary UT Data Sheets
- Dimensional Data Sheets
- Final UT Acceptance Data Sheets
- Drawing D-3378-617A

Signature

Title

Date

C-T MANUFACTURING

P. O. BOX 10889
HOUSTON, TX 77244-0889
713-461-7288 • FAX 713-461-8834

CERTIFICATE OF TEST-MILL PRODUCTS

Date July 27, 1995

S Southwest Research Institute
O T P. O. Drawer 28510
L O San Antonio, TX 78274
D

S Southwest Research Institute
H T 6220 Culebra Road
I O San Antonio, TX 78274
P

CUSTOMER ORDER NO.		CUR ORDER NO.	SPECIFICATION	
62341		3371	ASTM A-182-F316	
ITEM	QUANTITY	DESCRIPTION	WAVE	HEAT NO.
1	1	Rough Machined Forgings to Finish: 6.812" OD X 3.624" ID X 12.00" LG	A-182-F316	94492
2	1	9.187" OD X 5.189" ID X 12.00" LG	A-182-F316	94492
3	1	14.125" OD X 8.750" ID X 12.00" LG	A-182-F316	94435
4	1	17.375" OD X 11.188" ID X 12.00" LG	A-182-F316	94439
Heat Treatment: Solution Annealed @ 1950°F for 1 Hour				

CHEMICAL ANALYSIS

ITEM	HEAT NO.	MILL	C	Mn	P	S	Ni	Cr	Mo	Si	Cu		
1	94492	6101	.02	1.66	.023	<.002	10.28	16.54	2.05	.39	.19		
2	94492	6101	.02	1.66	.023	<.002	10.28	16.54	2.05	.39	.19		
3	94435	6101	.02	1.63	.026	<.002	10.16	16.49	2.13	.37	.22		
4	94439	6101	.056	1.65	.026	<.002	10.38	16.48	2.12	.42	.25		

PHYSICALS

ITEM	TENSILE / PSI	2% YIELD / PSI	% ELONG IN 2"	% RED AREA	BHN	
1	82,000	43,500	62.0	81.0	153/156	
2	82,000	43,500	62.0	81.0	153/156	
3	82,500	44,600	61.0	79.0	149	
4	90,000	48,500	59.0	79.0	156	

THIS IS TO CERTIFY TO THE BEST OF OUR KNOWLEDGE
AND BELIEF THAT THE VALUES SHOWN ARE CORRECT
AND TRUE AND THAT THE MATERIAL COMPLIES WITH THE
REQUIREMENTS OF THE SPECIFICATIONS SHOWN

McBee L. L. L.

Quality Control

CHARLES C. KAWIN COMPANY
METALLURGICAL LABORATORIES

082811

MAILING ADDRESS / P.O. BOX 810 / MAYWOOD, ILLINOIS 60153

SOUTHWEST RESEARCH INST. 7010
P.O. DRAWER 28510
SAN ANTONIO TX 78284
R. L. EDWARDSP. O. # 3935
DESCR 08-24-95

REPORT DATE: 08/28/95

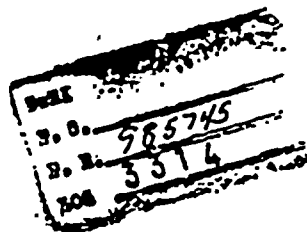
LAB NO: 0825-083 / 01

JOB NO: 08/28 #48

HEATS 94492 STAINLESS STEEL

CHEMICAL ANALYSIS

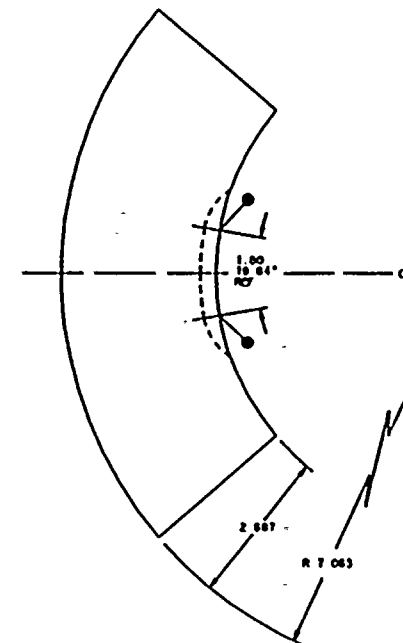
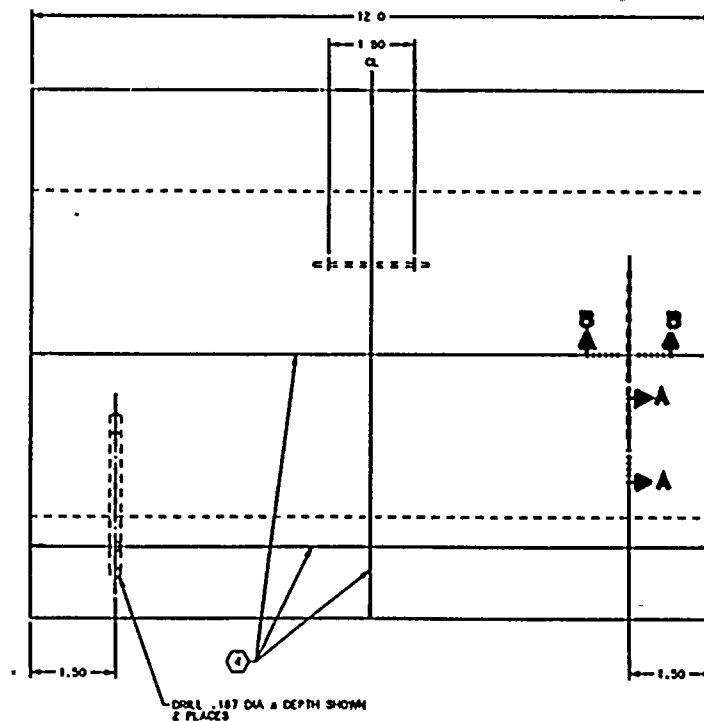
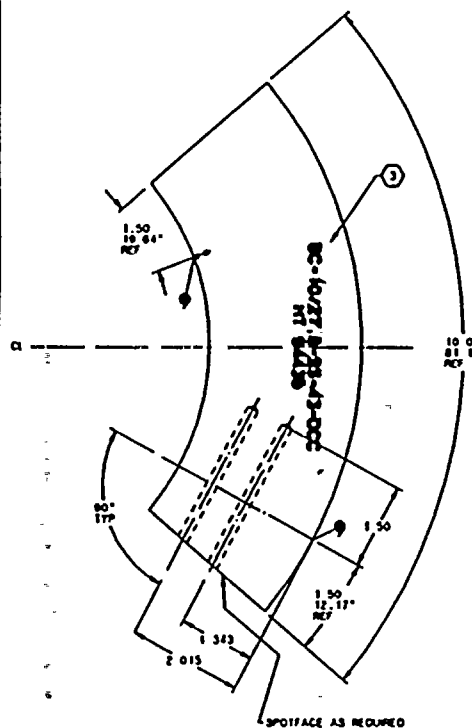
Si	.36	Mn	1.60	C	.026
P	.022	S	.002	Ni	10.48
Cr	16.80	Mo	2.30		

TEST METHODS: ASTM E 663 ; ASTM E 1019 ; ASTM E 1479 ; ASTM E 334 ;
NPT
QA INSPECTOR

PAGE 1 OF 4

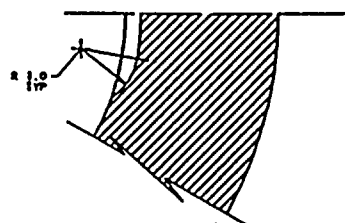
THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL,
WITHOUT THE WRITTEN APPROVAL OF THE CHARLES C. KAWIN CO.

C-205

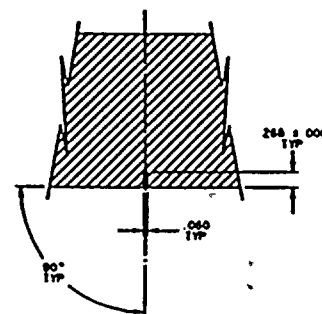


NOTES:

- 1 BREAK SHARP EDGES AND REMOVE ALL BURRS.
- 2 MATERIAL FOR BLOCK TO BE ULTRASONICALLY EXAMINED IN ACCORDANCE WITH SWI NPOU UT-1, LATEST REVISION.
- 3 STEEL STAMP ID NO. AND HEAT NO. ON SURFACE INDICATED IN CHARACTERS 3/16" MIN HEIGHT.
- 4 SCORE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP OR WIRE CUT AN INDEX MARK AT ENDS OF EACH CENTERLINE AS SHOWN, 1/32 X 1/32 X 1/4 LONG.
- 5 MAKE FROM FORGED STAINLESS STEEL, ASTM A182, OR F316 HEAT NO. 84435, SWI EOC No. 3300C.



SECTION A-A
SCALE 1/1



SECTION A-A
SCALE 1/1

ID No. BC-10/27.5-SS-43-DCC

PROJECT: BC-10/27.5-SS-43-DCC DRAWING: 1/1 DATE: 1/2/75 BY: [Signature] CHECKED: [Signature] APPROVED: [Signature]		SOUTHWEST RESEARCH INSTITUTE REGULATORY EVALUATION SERVICE & TECHNICAL SUPPORT 1725 1/1 1/25 1/25
PART: [Blank] MATERIAL: [Blank] FINISH: [Blank] TOLERANCES: [Blank] SURFACE: [Blank] THREADS: [Blank] KEY: [Blank]		BLOCK CONNECTION CLAMBER BLOCK - 15" x 27.5" 1/1 1/25 1/25



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

Calibration block BC-10/27.5-SS-43-DCC is hereby classified as P-Number 8 group 1 in accordance with Section IX 1983 Edition of the ASME Boiler and Pressure Vessel Code. The P-Number classification for this calibration block is substantiated with the attached mill test report for SA182F316, Ht94435 and meets the block material requirements of Section XI, Appendix III, III-3411 of the ASME Boiler and Pressure Vessel Code.

Design Criteria

The design for the above calibration block incorporates the requirements of Sections V and XI, 1983 Edition of the ASME Boiler and Pressure Vessel Code. The design also meets American Electric Power purchase order and quality assurance requirements.

Attachments

- Mill Test Report
- Duplicate Analysis
- Preliminary UT Data Sheets
- Dimensional Data Sheets
- Final UT Acceptance Data Sheets
- Drawing D-3378-618


Signature


Title


Date

C-T MANUFACTURING

P. O. BOX 12890
HOUSTON, TX 77224-0890
713-481-7288 • FAX 713-481-8834

CERTIFICATE OF TEST-MILL PRODUCTS

Date July 27, 1995

S Southwest Research Institute
O T P. O. Drawer 28510
L O San Antonio, TX 78274
D

S Southwest Research Institute
H-T 6220 Culebra Road
I O San Antonio, TX 78274
P

CUSTOMER ORDER NO.		OUR ORDER NO.	SPECIFICATION	
62341		3371	ASTM A-182-F-316	
ITEM	QUANTITY	DESCRIPTION	MATERIAL	HEAT NUMBER
		Rough Machined Forgings to Finish:		
1	1	6.812" OD X 3.624" ID X 12.00" LG	A-182-F-316	94492
2	1	9.187" OD X 5.189" ID X 12.00" LG	A-182-F-316	94492
3	1	14.125" OD X 8.750" ID X 12.00" LG	A-182-F-316	94435
4	1	17.375" OD X 11.168" ID X 12.00" LG	A-182-F-316	94439
Heat Treatment:				
Solution Annealed @ 1950°F for 1 Hour				
<div>62341 94439 94439 (ABC'D)</div>				

CHEMICAL ANALYSIS

ITEM	HEAT NO.	MILL	C	Mn	P	S	Ni	Cr	Mo	Si	Cu		
1	94492	6101	.02	1.68	.023	<.002	10.28	18.54	2.05	.39	.19		
2	94492	6101	.02	1.68	.023	<.002	10.28	18.54	2.05	.39	.19		
3	94435	6101	.02	1.63	.028	<.002	10.18	18.49	2.13	.37	.22		
4	94439	6101	.058	1.65	.028	<.002	10.38	18.48	2.12	.42	.28		

PHYSICALS

ITEM	TENSILE / PSI	2% YIELD / PSI	% ELONG IN 2"	% RED AREA	BHN	
1	82,000	43,500	62.0	81.0	153/158	
2	82,000	43,500	62.0	81.0	153/158	
3	82,500	44,500	61.0	79.0	149	
4	90,000	48,500	59.0	79.0	156	

THIS IS TO CERTIFY TO THE BEST OF OUR KNOWLEDGE
AND BELIEF THAT THE VALUES SHOWN ARE CORRECT
AND TRUE AND THAT THE MATERIAL COMPLIES WITH THE
REQUIREMENTS OF THE SPECIFICATIONS SHOWN

McBryde

Quality Control



CHARLES C. KAWIN COMPANY
METALLURGICAL LABORATORIES

MAILING ADDRESS / P.O. BOX 310 / MAYWOOD, ILLINOIS 60153

SOUTHWEST RESEARCH INST. 7010
P.O. DRAWER 28310
SAN ANTONIO TX 78284
R. L. EDWARDS

P. O. # 3935
DECR 08-24-75

REPORT DATE: 08/28/75

LAB NO: 0825-083 / 02

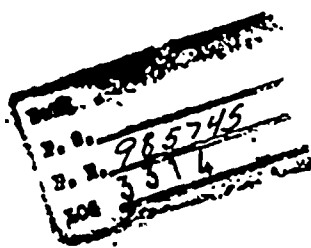
JOB NO: 08/28/049

HEAT# 94435 STAINLESS STEEL

CHEMICAL ANALYSIS

Si	.38	Mn	1.60	C	.021
P	.026	S	.002	Ni	10.50
Cr	16.55	Mo	2.47		

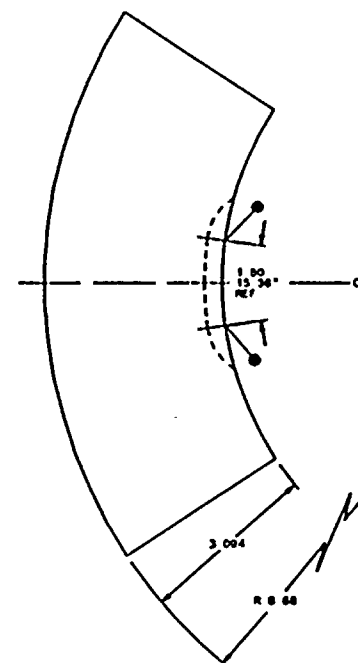
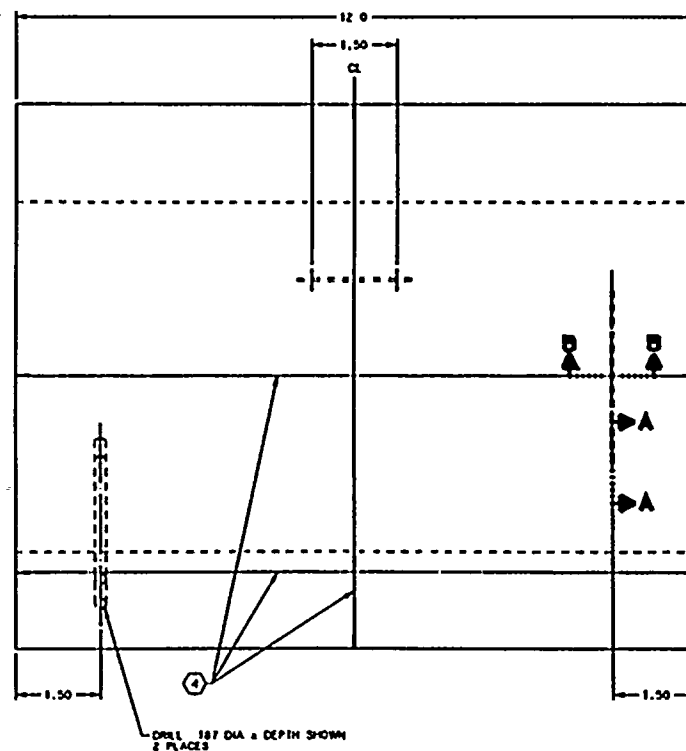
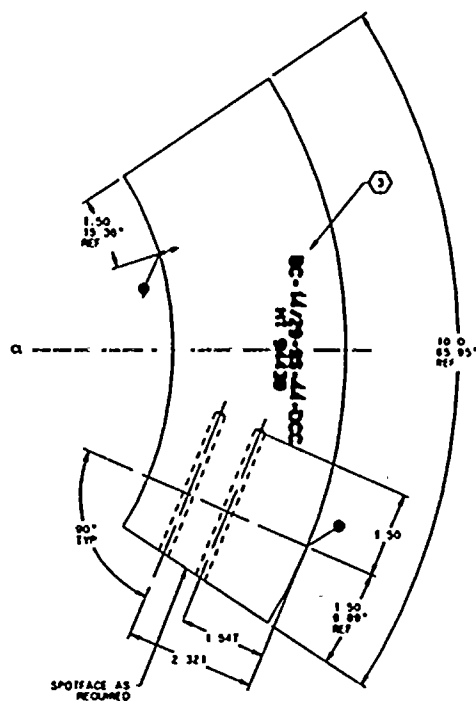
TEST METHODS: ASTM E 463 ; ASTM E 1019 ; ASTM E 1479 ; ASTM E 334 ;
NPT



Charles C. Kawin
QA INSPECTOR

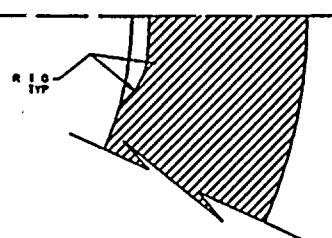
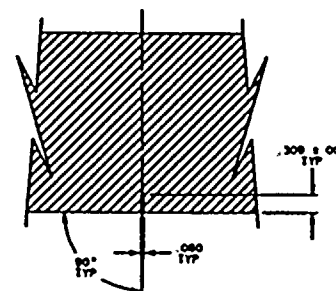
PAGE 2 OF 4

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL,
WITHOUT THE WRITTEN APPROVAL OF THE CHARLES C. KAWIN CO.



NOTES:

- 1 BREAK SHARP EDGES AND REMOVE ALL BURRS.
- 2 MATERIAL FOR BLOCK TO BE ULTRASONICALLY EXAMINED IN ACCORDANCE WITH SWS NPOU UT-1, LATEST REVISION.
- 3 STEEL STAMP ID NO. AND HEAT NO. ON SURFACE INDICATED IN CHARACTERS 3/16" MIN HEIGHT.
- 4 SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP OR GRI, CUT AN INDEX MARK AT ENDS OF EACH CENTERLINE AS SHOWN. 1/32 & 1/32 & 1/4 LONG.
- 5 MAKE FROM FORD STAINLESS STEEL ASTM A182, OR F316 HEAT No. 94430, SWS LOG No. 33060.

SECTION A-A
SCALE 1/1SECTION B-B
SCALE 1/1

ID No. BC-14/29-85-44-DCC

PROJECT NO. 14-29-85-44-DCC DRAWING NO. 14-29-85-44-DCC-1 DATE 10/1/85		SOUTHWEST RESEARCH INSTITUTE 6100 W. CENTRAL AVENUE GLENDALE, ARIZONA 85304	
DESIGNED BY: J. L. BROWN CHECKED BY: J. L. BROWN APPROVED BY: J. L. BROWN		MATERIAL: F316 STAINLESS STEEL HEAT TREAT: 1010°F MIN FINISH: 320 GRIT	
QUANTITY: 1 UNIT: EACH		PART NAME: 14-29-85-44-DCC-1 SCALE: 1/1	



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

Calibration block BC-14/29-SS-44-DCC is hereby classified as P-Number 8 group 1 in accordance with Section IX 1983 Edition of the ASME Boiler and Pressure Vessel Code. The P-Number classification for this calibration block is substantiated with the attached mill test report for SA182F316, Ht94439 and meets the block material requirements of Section XI, Appendix III, III-3411 of the ASME Boiler and Pressure Vessel Code.

Design Criteria

The design for the above calibration block incorporates the requirements of Sections V and XI, 1983 Edition of the ASME Boiler and Pressure Vessel Code. The design also meets American Electric Power purchase order and quality assurance requirements.

Attachments

- Mill Test Report
- Duplicate Analysis
- Preliminary UT Data Sheets
- Dimensional Data Sheets
- Final UT Acceptance Data Sheets
- Drawing D-3378-619

		
Signature	Title	Date

C-T MANUFACTURING

P. O. BOX 10880
HOUSTON, TX 77224-0880
713-461-7280 • FAX 713-461-8334

CERTIFICATE OF TEST-MILL PRODUCTS

Date July 27, 1995

S Southwest Research Institute
O T P. O. Drawer 28510
L O San Antonio, TX 78274
D

S Southwest Research Institute
H T 6220 Culebra Road
I O San Antonio, TX 78274
P

CUSTOMER ORDER NO.		OUR ORDER NO.	SPECIFICATION	
62341		3371	ASTM A-182-F-316	
ITEM	QUANTITY	DESCRIPTION	MATERIAL	TEST NUMBER
		Rough Machined Forgings to Finish:		
1	1	6.812" OD X 3.624" ID X 12.00" LG	A-182-F-316	94492
2	1	9.187" OD X 5.189" ID X 12.00" LG	A-182-F-316	94492
3	1	14.125" OD X 8.750" ID X 12.00" LG	A-182-F-316	94435
4	1	17.375" OD X 11.188" ID X 12.00" LG	A-182-F-316	94439
		Heat Treatment:		
		Solution Annealed @ 1950°F for 1 Hour		

DATE: 9/23/41
S. O.: 962461
P. O.: 3309 ABC-15

944341
962461
7309 ABCD

CHEMICAL ANALYSIS

ITEM	HEAT NO.	MILL	C	Mn	P	S	Ni	Cr	Mo	Si	Cu		
1	94492	6101	.02	1.66	.023	<.002	10.28	18.54	2.05	.39	.19		
2	94492	6101	.02	1.66	.023	<.002	10.28	18.54	2.05	.39	.19		
3	94435	6101	.02	1.63	.028	<.002	10.16	18.49	2.13	.37	.22		
4	94439	6101	.056	1.65	.028	<.002	10.38	18.48	2.12	.42	.25		

PHYSICALS

ITEM	TENSILE / PSI	2% YIELD / PSI	% ELONG IN 2"	% RED AREA	BHN	
1	82,000	43,500	62.0	81.0	153/158	
2	82,000	43,500	62.0	81.0	153/158	
3	82,500	44,500	61.0	79.0	149	
4	90,000	48,500	59.0	79.0	158	

THIS IS TO CERTIFY TO THE BEST OF OUR KNOWLEDGE
AND BELIEF THAT THE VALUES SHOWN ARE CORRECT
AND TRUE AND THAT THE MATERIAL COMPLIES WITH THE
REQUIREMENTS OF THE SPECIFICATIONS SHOWN

McFarlane

Quality Control



CHARLES C. KAWIN COMPANY
METALLURGICAL LABORATORIES

MAILING ADDRESS / P.O. BOX 310 / MAYWOOD, ILLINOIS 60153

SOUTHWEST RESEARCH INST. 7010
P.O. DRAWER 28510
SAN ANTONIO TX 78284
R. L. EDWARDS

P.O. # 3935
DESCR 08-24-75

REPORT DATE: 08/28/75

LAB NO: 0820-083 / 03

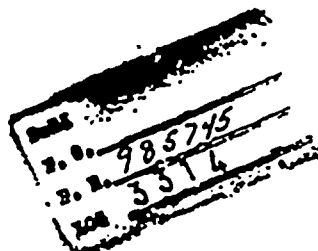
JOB NO: 08/28 #30

HEAT# 94439 STAINLESS STEEL

CHEMICAL ANALYSIS

Si	.41	Mn	1.64	C	.06
P	.027	S	.002	Ni	10.84
Cr	16.94	Mo	2.46		

TEST METHODS: ASTM E 663 ; ASTM E 1019 ; ASTM E 334 ; ASTM E 1479 ;
NPT



Charles C. Kawin
QA INSPECTOR

PAGE 3 OF 4

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL,
WITHOUT THE WRITTEN APPROVAL OF THE CHARLES C. KAWIN CO.

10 No. 16-CS-80-,644-18-DCC

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

Calibration block 16-CS-80-.844-45-DCC is hereby classified as P-Number 8 group 1 in accordance with Section IX 1983 Edition of the ASME Boiler and Pressure Vessel Code. The P-Number classification for this calibration block is substantiated with the attached mill test report for SA106 Gr B, Ht80050 and meets the block material requirements of Section XI, Appendix III, III-3411 of the ASME Boiler and Pressure Vessel Code.

Design Criteria

The design for the above calibration block incorporates the requirements of Sections V and XI, 1983 Edition of the ASME Boiler and Pressure Vessel Code. The design also meets American Electric Power purchase order and quality assurance requirements.

Attachments

- Mill Test Report
- Duplicate Analysis
- Preliminary UT Data Sheets
- Dimensional Data Sheets
- Final UT Acceptance Data Sheets
- Drawing D-3378-620

Signature

J. L. Research Engineer

Title

8/29/95

Date



U.S. STEEL GROUP
A unit of USX Corporation

TUBULAR PRODUCTS

PAGE 1 OF 2



JOB CONTRACT NO.

PO DATE

PURCHASE ORDER NO.

METALLURGICAL TEST REPORT

904

12334
12.07.36 (41)

USS TUBULAR PRODUCTS

DIXIE PIPE SALES INC
PO BOX 300650
HOUSTON TX 77230-0650

SHIPPER'S NO.

4635-USS

MILL ORDER NO.

INVOICE NO.

R16539

DS08593 07

VEHICLE

IDENTITY

ME30122

THIS IS TO CERTIFY THAT THE
PRODUCT DESCRIBED HEREIN HAS
MFG., SAMPLED, TESTED, AND/
OR INSPD. IN ACCORDANCE WITH
THE SPECIFICATION AND
FULFILLS REQUIREMENTS IN
SUCH RESPECTS.
APPROVED BY OFFICE OF:
D.B. DABKOWSKI MGR. MET. &
Q.A. USS TUBULAR PRODUCTS

M
A
I
L
T
O

DATE 02/17/94

MEETING ALL THE APPLICABLE REQUIREMENTS OF NACE SP01-75.

Mill Test Reports furnished by
DIXIE PIPE SALES, INC.

Apply to your Order No. 64657

Call 89857
E.O. 962463
E.O. 3304

ITEM NO	MATERIAL DESCRIPTION													MATERIAL	HEAT/ LOT NO.	MIN. HYDRO PSI	YIELD STRENGTH		TENSILE STRENGTH	ELONG. % IN 2"	GAGE WIDTH IN.	FLAT	BEND
	SIZE	WALL	SPECIFICATION & GRADE														PSI	PSI					
1	16	.844	API 5L GR. B 40TH ED. DTD 11/92.ASTM A53-90B/A106-91 GR. B. ASME SA53/SA106 GR. B 1992 EDITION 1992 ADDENDUM											SML	L80049	2770	54600	81900	39.0	1 1/2	OK		
7	16	.844	API 5L GR. B 40TH ED. DTD 11/92.ASTM A53-90B/A106-91 GR. B. ASME SA53/SA106 GR. B 1992 EDITION 1992 ADDENDUM											SML	L80050	2770	56000✓	81500✓	43.0✓	1 1/2✓	OK		
<i>accepted QA RD 7/19/95</i>																							
ITEM NO	HEAT NO.	TYPE	C	MN	P	S	SI	CU	NI	CR	MO	SH	AL	N	V	B	TI	CA	CO				
1	L80049	HEAT	25	99	010	009	25	01	01	13	08				001								
1	L80049	PROD	25	91	010	008	26	01	01	13	08				001								
1	L80050	HEAT	24	92	011	006	25	01	01	13	08				001								
1	L80050	PROD	24	92	010	006	26	01	01	13	08				001								
END OF DATA THIS SHEET *** ALL MELTING AND MANUFACTURING TOOK PLACE IN THE USA.																							

accepted
QA RD
7/17/95

HRB=83.0

HRB=84.0

C-215

PHONE 708/885-0400

2671 GARDNER ROAD, BROADVIEW, ILLINOIS 60153



CHARLES C. KAWIN COMPANY
METALLURGICAL LABORATORIES

MAILING ADDRESS / P.O. BOX 210 / MAYWOOD, ILLINOIS 60153

SOUTHWEST RESEARCH INST. 7010
P.O. DRAWER 28310
SAN ANTONIO TX 78284
R.L. EDWARDS

P.O. # 3935
DESCR 08-24-95

REPORT DATE: 08/28/95

LAB NO: 0825-083 / 04

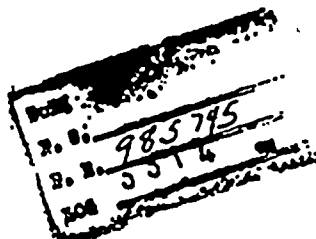
JOB NO: 08/28 851

HEAT# LB0050 CARBON STEEL

CHEMICAL ANALYSIS

Si	.29	Mn	.90	C	.26 / .25
P	.013	S	.007		

TEST METHODS: ASTM E 663 ; ASTM E 1019 ; ASTM E 1479 ;
NPT



Charles C. Kawin
Q. A. INSPECTOR

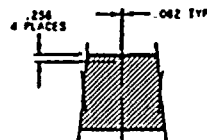
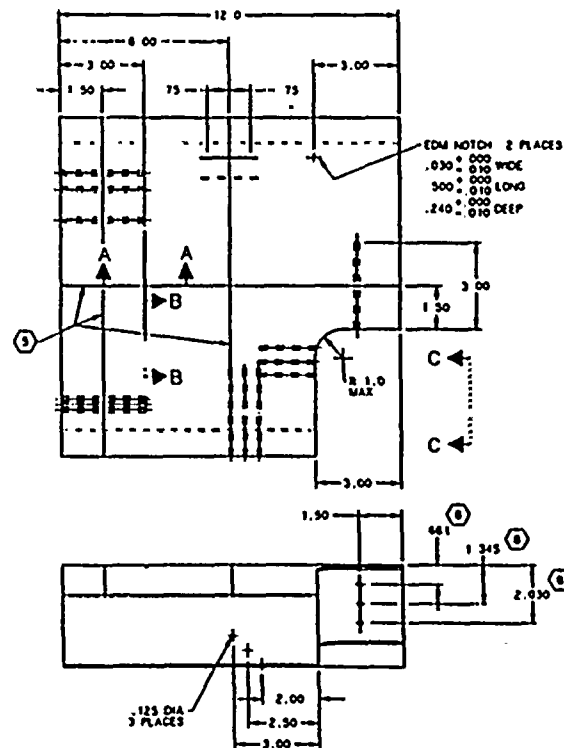
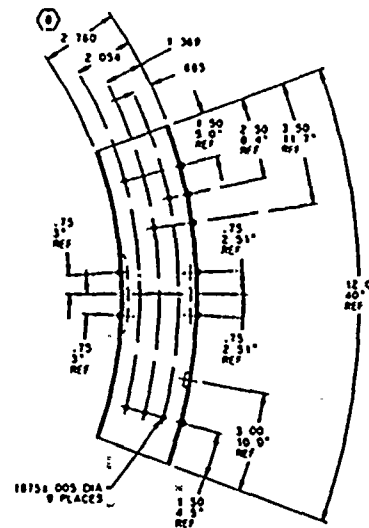
PAGE 4 OF 4.

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL,
WITHOUT THE WRITTEN APPROVAL OF THE CHARLES C. KAWIN CO.

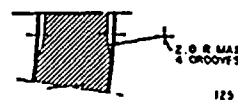
NOTES:

- 1 DIMENSIONS ARE IN INCHES
- 2 REMOVE BURRS AND BREAK SHARP EDGES.
- 3 MATERIAL FOR BLOCK TO BE ULTRASONICALLY EXAMINED IN ACCORDANCE WITH SAE J1949-UT-1, LATEST EDITION.
- 4 STEEL STAMP ID NO. AND HEAT NO. ON SURFACE INDICATED IN CHARACTERS 3/16" MIN HEIGHT.
- 5 SOME CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED STEEL STAMP OR MILL OUT AN INDEX MARK AT ENDS OF EACH CENTERLINE AS SHOWN. 1/32 = 1/32 = 1/4 LONG
- 6 MAKE FROM FORGED 3A152 GR F316, HEAT NO 25549, 3000 LBS NO 3312
- 7 I D AND O D TO BE CLAD IN ACCORDANCE WITH 3192-WPS-42 UTILIZING 308 SS WELD MATERIAL. CLAD SURFACE TO BE GRINDING/ MACHINED SMOOTH AFTER WELDING
- 8 ACTUAL AS-BUILT DIMENSIONS

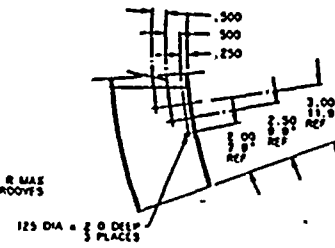
සමස්ත මිල මට්ටම මධ්‍යස්ථ මට්ටමට පත්වීමට ප්‍රමුඛව පැමිණීමට මිල ප්‍රතිපත්ති මගින් සහතික කර ඇති බවට සාක්ෂි සපුරා ඇත. මිල ප්‍රතිපත්ති මගින් සහතික කර ඇති බවට සාක්ෂි සපුරා ඇත. මිල ප්‍රතිපත්ති මගින් සහතික කර ඇති බවට සාක්ෂි සපුරා ඇත.



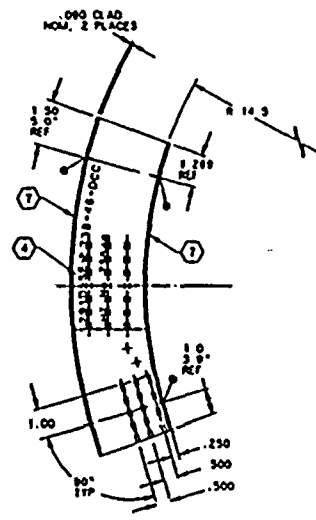
SECTION A-A
SCALE 1/2"



SECTION 8 B
PAGE 10



VIEW C C
SCALE 1/2



291D-SE-2.738-46-DCC

[illegible]



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

Calibration block 29ID-SE-2.738-46-DCC is hereby classified as P-Number 8 group 1 in accordance with Section IX 1983 Edition of the ASME Boiler and Pressure Vessel Code. The P-Number classification for this calibration block is substantiated with the attached mill test report for SA182F316, H125549 and meets the block material requirements of Section XI, Appendix III, III-3411 of the ASME Boiler and Pressure Vessel Code.

Design Criteria

The design for the above calibration block incorporates the requirements of Sections V and XI, 1983 Edition of the ASME Boiler and Pressure Vessel Code. The design also meets American Electric Power purchase order and quality assurance requirements.

Attachments

- Mill Test Report
- Duplicate Analysis
- Weld Material Certifications
- Preliminary UT Data Sheets
- Dimensional Data Sheets
- Final UT Acceptance Data Sheets
- Drawing D-3378-622 Rev. A

Robert L. Edwards

Sr. Research Engineer
Title

September 1, 1995
Date

C-T MANUFACTURING

P. O. BOX 18280
HOUSTON, TX 77234-8280
713-461-7208 • FAX 713-461-8334

CERTIFICATE OF TEST-MILL PRODUCTS

Date August 15, 1995

S Southwest Research Institute
O T P. O. Drawer 28510
L O San Antonio, TX 78274
D

S Southwest Research Institute
H T 6220 Culebra Road
I O San Antonio, TX 78274
P

CUSTOMER ORDER NO.		OUR ORDER NO.	SPECIFICATION	
68765		3395	ASTM A-182-F-316	
ITEM	QUANTITY	DESCRIPTION	ANTENNA	HEAT NO.
1	2	12" Wide Section of 17.058" Radius on Outside Surface with 14.500" Radius Inside Surface (2.558" Minimum Wall Thickness) 12.00" in Length Reference: Drawing 3580 Heat Treatment: Solution Annealed @ 1900°F	A-182-F-316	25549

CHEMICAL ANALYSIS

ITEM	HEAT NO.	MILL	C	Mn	P	S	NI	Cr	Mo	Si	Cu	N
1	25549	Electra	.016	1.79	.026	.022	10.42	16.64	2.16	.50		.077

PHYSICALS

ITEM	TENSILE / PSI	2% YIELD / PSI	% ELONG IN 2"	% RED AREA	BHN
1	85,500	37,500	60.0	74.0	

THIS IS TO CERTIFY TO THE BEST OF OUR KNOWLEDGE
AND BELIEF THAT THE VALUES SHOWN ARE CORRECT
AND TRUE AND THAT THE MATERIAL COMPLIES WITH THE
REQUIREMENTS OF THE SPECIFICATIONS SHOWN

McPhee

PHONE 708/986-0400

2871 GARDNER ROAD, BROADVIEW, ILLINOIS 60153



CHARLES C. KAWIN COMPANY
METALLURGICAL LABORATORIES

083013

MAILING ADDRESS / P.O. BOX 310 / MAYWOOD, ILLINOIS 60153

SOUTHWEST RESEARCH INST. 7010
P.O. DRAWER 28510
SAN ANTONIO TX 78284
R. L. EDWARDS

P. O. # 3935
DESCR 08-25-95
STAINLESS STEEL SAMPLE

REPORT DATE: 08/29/95

LAB NO: 0828-021 / 01

JOB NO: 08/29 #47

HEAT# 25549

CHEMICAL ANALYSIS

Si	.47	Mn	1.95	C	.025
P	.024	S	.024	Ni	10.31
Cr	16.90	Mo	2.29		

TEST METHODS: ASTM E 663 ; ASTM E 1019 ; ASTM E 1479 ;

5-281
7.2.
7.2. 285749
100 2 1 7


G. A. INSPECTOR

PAGE 1 OF 1

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL.
WITHOUT THE WRITTEN APPROVAL OF THE CHARLES C. KAWIN CO.

CERTIFICATE OF ANALYSIS



CUSTOMER: WELDERS SUPPLY CO.
MARKED FOR:

ORDER NO: 168345
DATE: 10/06/94

TYPE: INFLUX 308L-T1

SIZE: .03 1/16

LOT NO: 322T8696 LBS SHIPPED: 162

HEAT NO:

SPECIFICATION: AWS A5.22-80

CLASS: E308LT-1

ACTUAL CHEMISTRY

ALL WELD METAL CHEMISTRY (%)

C	<.01 ✓
MN	1.44 ✓
P	0.029 ✓
S	<.01 ✓
Si	0.82 ✓
CU	0.25 ✓
CR	19.50 ✓
NI	9.84 ✓
MO	0.25 ✓
V	<.01 ✓
Ti	<.01 ✓
CO	<.01 ✓
AL	<.01 ✓

Reviewed QA
Pro Young
10/11/94

W-249

FERRITE(S):

8 FN (MAGNE-GAGE)
8 FN (DE LONG)
6 FN (HRC)

HARDNESS:

HRC
HB

WE HEREBY CERTIFY THAT THE ABOVE PRODUCT HAS BEEN
CLASSIFIED IN ACCORDANCE WITH THE LISTED SPECIFICATION
AND CONFORMS TO ALL APPLICABLE REQUIREMENTS THEREOF.

FILLER METALS QUALITY ASSURANCE
MCKAY WELDING PRODUCTS
101 TRADE SQUARE EAST
TROY, OHIO 45373

AUTHORIZED SIGNATURE

Gary A. Sturges

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ISSUED FOR APPROVAL
CITY - 8-1-79
RETURN BY - 7-4-81
NOT RELEASED FOR FIDELIZATION

REF. SOUTHWEST RESEARCH INSTITUTE INC. 8 3118 011 0

Chicago Bridge & Iron Company

9. ULTRASONIC TESTING
CALIBRATION STD. BLOCK
BUCHANAN ENGINEERING POWER CO.
D.C. CUMMINGS PLANT

RV-

- 74-348



CHICAGO BRIDGE & IRON COMPANY
BIRMINGHAM MANUFACTURING
BIRMINGHAM, ALABAMA

CHEMICAL ANALYSIS - CONTRACT 74-3481

Test Block "Z"
Cuts Pc. 2-1 & 1-1
Base Metal

C	Mn	P	S	Si	Ni	Cr	Mo	Cb	Cu
.156	1.30	-	-	.25	.50	.07	.48	-	.15

Test Block "C"
Cuts Pc. 3-1 & 3-2
Base Metal

C	Mn	P	S	Si	Ni	Cr	Mo	Cb	Cu
.163	1.36	-	-	.27	.50	.07	.48	-	.15

Test Block "Z"
Cuts Pc. 2-1 & 1-1
O'Leay Weld

C	Mn	P	S	Si	Ni	Cr	Mo	Cb	Cu	Ferrite
.066	1.84	.016	.009	.43	9.40	18.40	.13	.01	.06	22

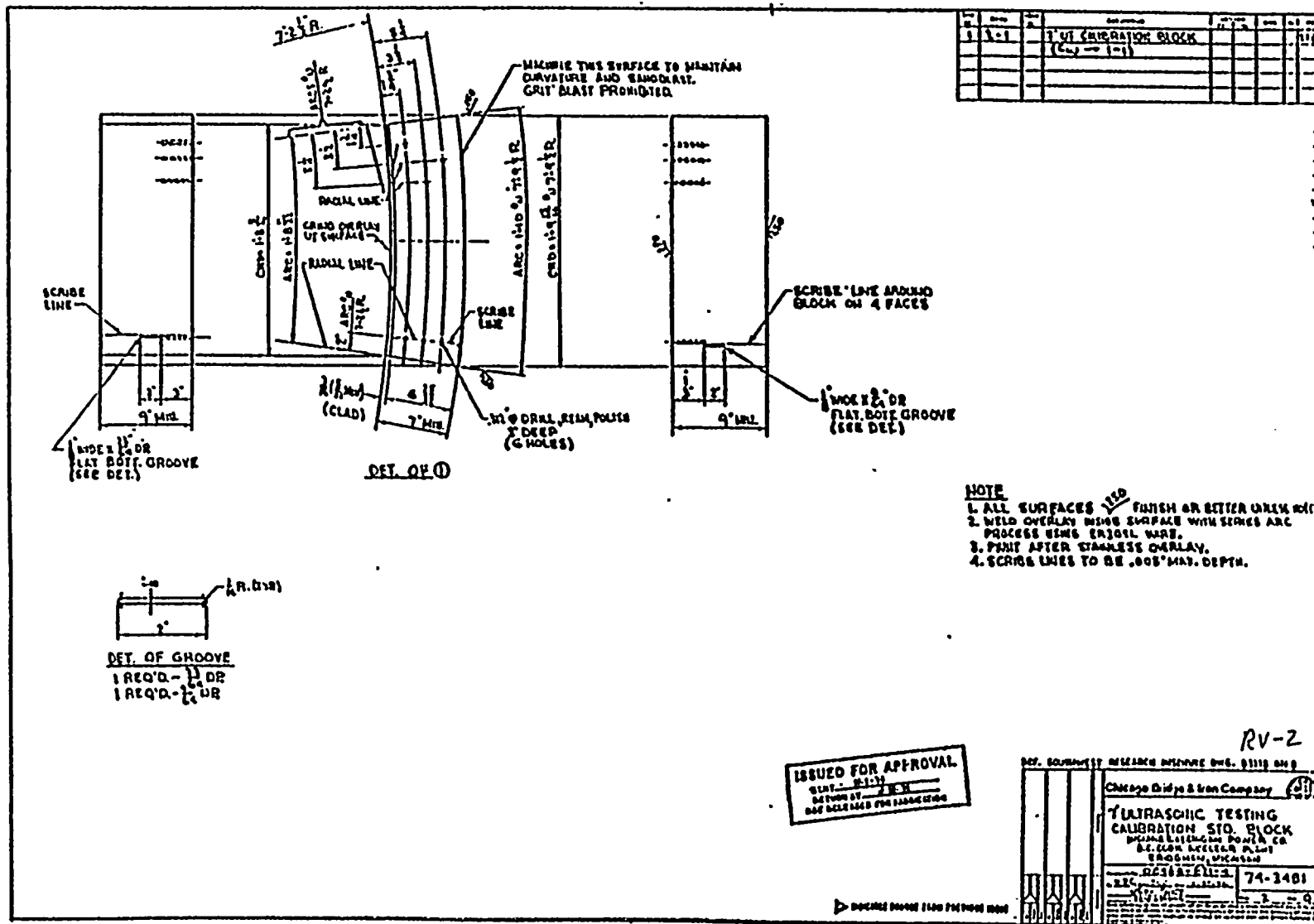
Test Block "C"
Cuts Pc. 3-1 & 3-2
O'Leay Weld

C	Mn	P	S	Si	Ni	Cr	Mo	Cb	Cu	Ferrite
.049	1.82	.017	.011	.50	10.70	19.75	.09	.01	.07	52

Thomas G. Doran

Thomas G. Doran
QA Coordinator
Birmingham Manufacturing
FEB. 7, 1975

C-225





CHICAGO BRIDGE & IRON COMPANY
BIRMINGHAM MANUFACTURING
BIRMINGHAM, ALABAMA

CHEMICAL ANALYSIS - CONTRACT 74-3481

Test Block "Z"
Cuts Pc. 2-1 & 1-1
Base Metal

C	Mn	P	S	Si	Ni	Cr	Mo	Cb	Cu
.156	1.30	-	-	.25	.30	.07	.48	-	.15

Test Block "C"
Cuts Pc. 3-1 & 3-2
Base Metal

C	Mn	P	S	Si	Ni	Cr	Mo	Cb	Cu
.163	1.36	-	-	.27	.30	.07	.48	-	.15

Test Block "Z"
Cuts Pc. 2-1 & 1-1
O'Leay Weld

C	Mn	P	S	Si	Ni	Cr	Mo	Cb	Cu	Ferrite
.066	1.84	.016	.009	.43	9.40	18.40	.13	.01	.06	22

Test Block "C"
Cuts Pc. 3-1 & 3-2
O'Leay Weld

C	Mn	P	S	Si	Ni	Cr	Mo	Cb	Cu	Ferrite
.049	1.82	.017	.011	.30	10.70	19.75	.09	.01	.07	32

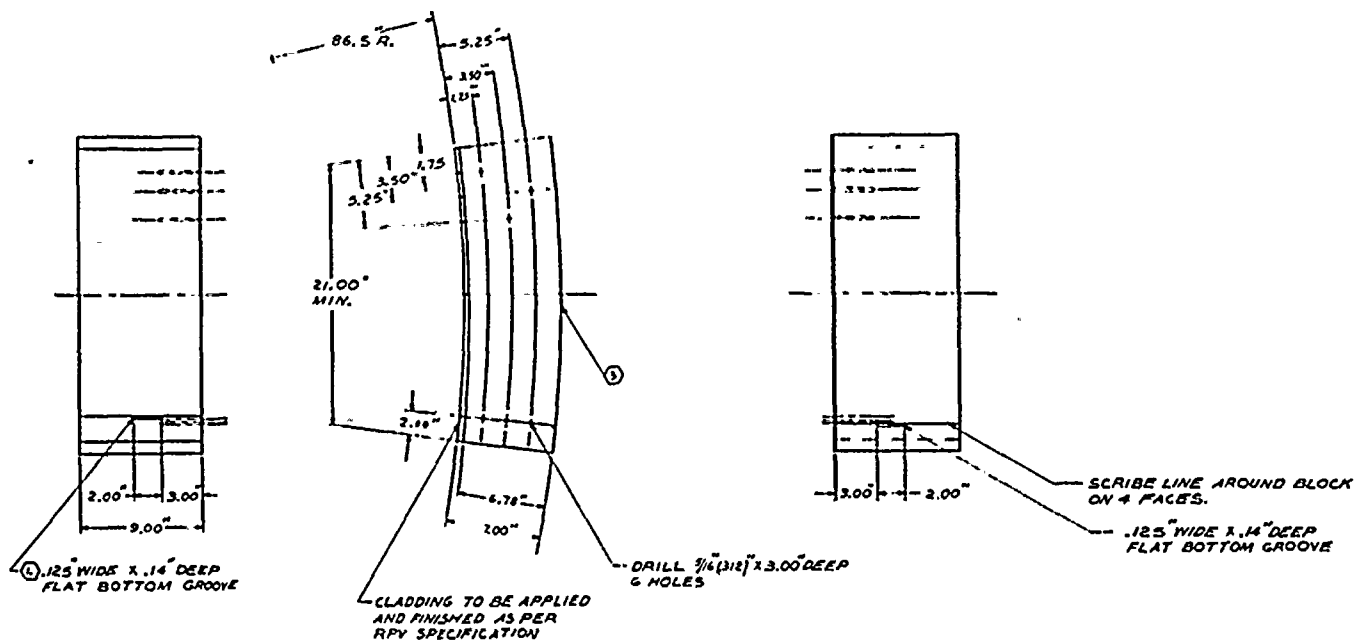
Thomas G. Doran

Thomas G. Doran
QA Coordinator
Birmingham Manufacturing

FEB. 7, 1975

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C-229

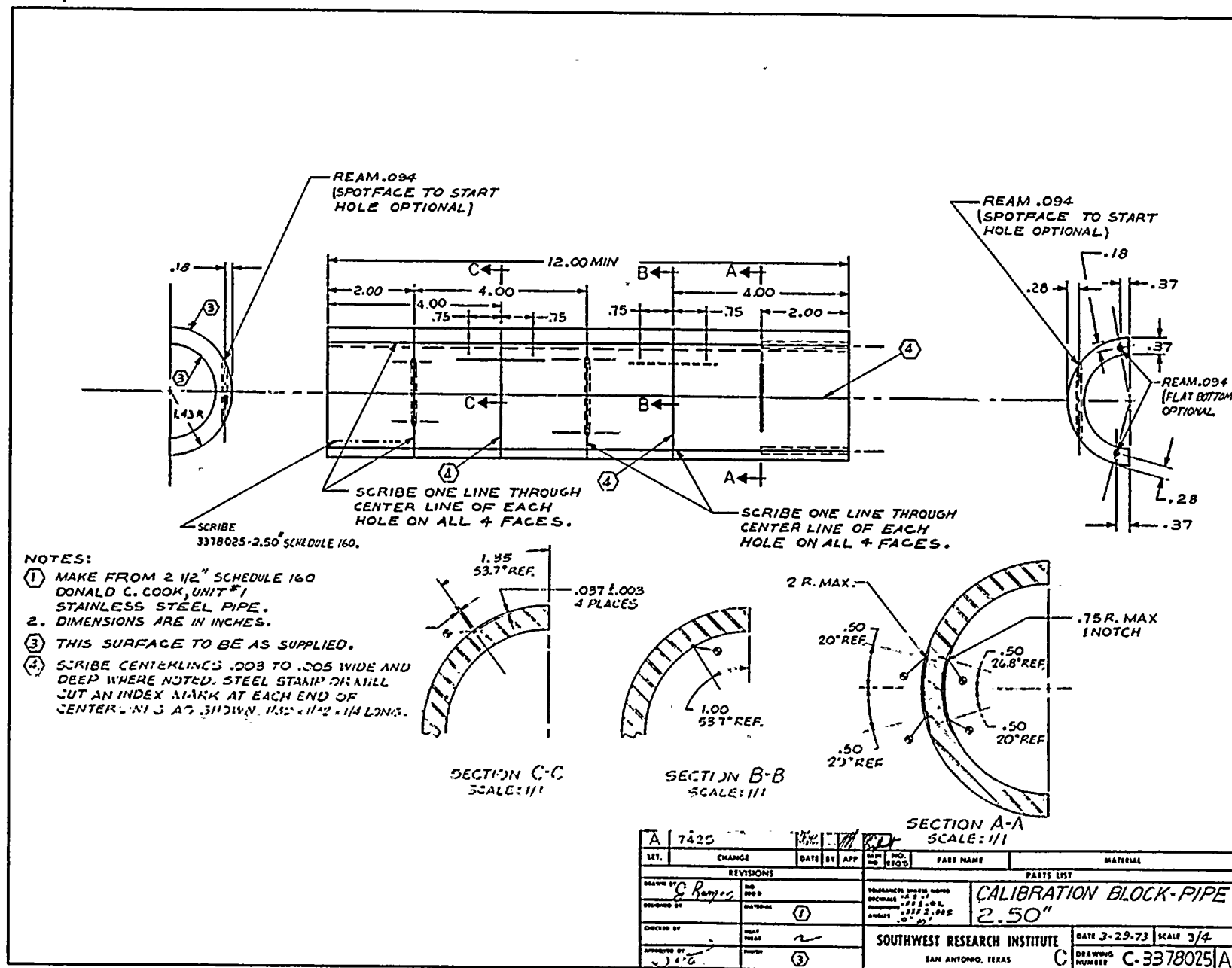


NOTES:

- ① DIMENSION IS DEPTH OF GROOVE IN BASE METAL.
- ② TAKE FROM VESSEL DROPOUT OF DONALD C. COOK UNIT #1.
- ③ SURFACE OF FINISH TO BE SAME AS OF VESSEL.
- ④ T. & L. + CLADDING (WHICH IS .218" NOMINAL).
- ⑤ T. & L. 7.00" (NOMINAL).

B		REDRAWN TO SCALE.		P-211		74	
DATE	DESIGNED	MADE	BY	DATE	REVISION	PART OF	
PLANTING				CALIBRATION			
②				UPPER HEAD			
③				BLOCK - VESSEL			
SOUTHWEST RESEARCH INSTITUTE						DATE 3-5-74	
SAC, JACKSON, MISSISSIPPI						D-3378021B	

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SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK 3378025 IS HEREBY
CLASSIFIED AS P-NUMBER * GROUP IN ACCORDANCE WITH
SECTION IX EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

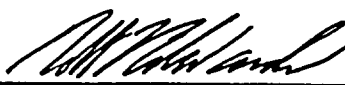
DESIGN CRITERIA

The design modification (add notches) to the above calibration block, 3378025, complies with the requirements of Sections V and XI, 1983 Edition, Summer 1983 Addenda of the ASME Boiler and Pressure Vessel Code. The design also complies with SwRI's nondestructive testing procedure requirements.

*No material certifications or documentation were provided by American Electric Power to SwRI for this block.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) C-3378025-A



Robert Edwards

SIGNATURE

Lead Engineer

TITLE

Nov. 29, 1988

DATE

6/21/71

ED 03445

MATERIAL **SILS STAINLESS PRESSURE PIPE.**

* SEE DELCIV

2.075"OD X .375"LI

* ASTM A 376 - TP 304 - & EXCEPT AS NOTED ON ORDER

SPRINT NO.
C 3378025

2 1/2" SCH 160

W. S. R.
W. S. R. Remond
SECRETARY OF DEFENSE

ADMINISTRATIVE

C-233

3733 PITLUK
P.O. Box 3452
San Antonio, Texas 78211
(512) 924-4734



HERCO
Aircraft Machine, Inc.

NO.2

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 88-0145 ITEM CALIBRATION Block
P/N C 3378015 REV A QTY. 1 ea NEW R.O

		ACC	REJ			ACC	REJ			ACC	REJ
1	4.00	✓		16	.50	✓		31			
2	.75	✓		17	.75R 1 NOTCH MAX	✓		32			
3	.75	✓		18				33			
4	.75	✓		19				34			
5	.75	✓		20				35			
6	4.00	✓		21				36			
7	2.00	✓		22				37			
8	SCRIBE LINES	✓		23				38			
9	1.35	✓		24				39			
10	.037 ± .003 HCS	✓		25				40			
11	1.00	✓		26				41			
12	2" R MAX	✓		27				42			
13	.50	✓		28				43			
14	.50	✓		29				44			
15	.50	✓		30				45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS ± —

ANGLES ± 0°30

.X ± .1

.XX ± .12

.XXX ± .005

INCH	
FEET	
FEET	62328
INCH	2671A

NUMBER OF SAMPLES 1

NUMBER OF ACCEPTED 1

NUMBER OF REJECTED —

PAGE OF

REMARKS:

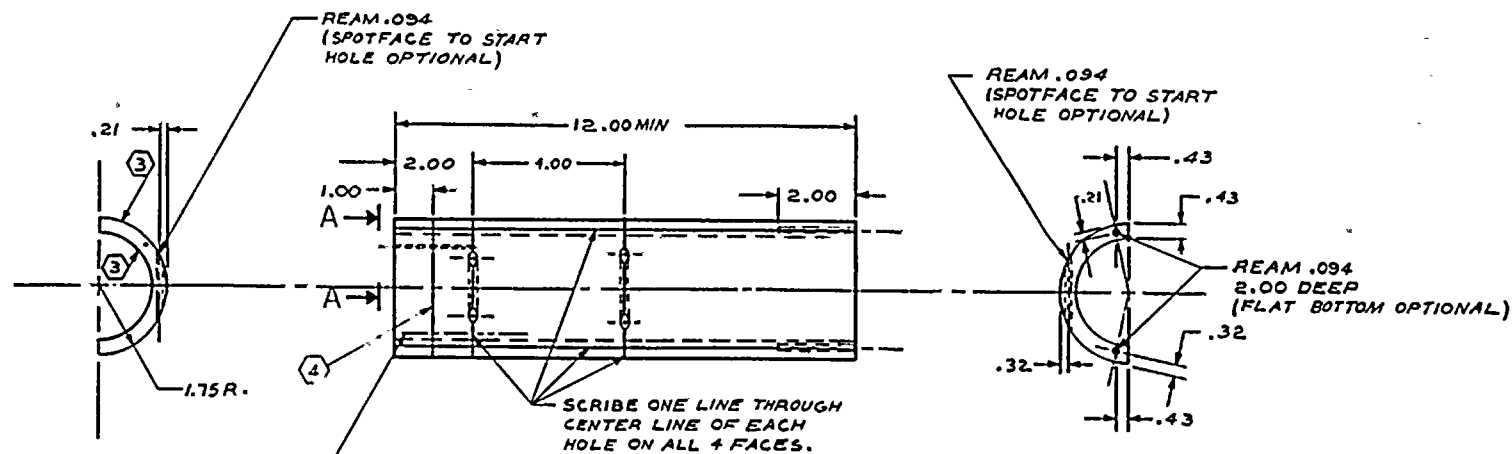
MODIFY ONLY

LOT# ACCEPTED ✓

REJECTED —

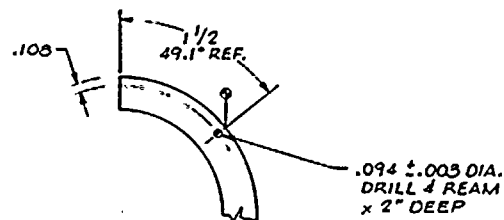
SIGNED [Signature]

DATE Nov 23, 1988



NOTES:

- ① MAKE FROM 3.00" SCHEDULE 160 DONALD G. COOK UNIT #1 STAINLESS STEEL PIPE.
- ② DIMENSIONS ARE IN INCHES.
- ③ THIS SURFACE FINISH TO BE AS SUPPLIED.
- ④ SCRIE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP OR MILL CUT AN INDEX MARK AT EACH END OF CENTERLINES AS SHOWN, 1/32 x 1/32 x 1/4 LONG.

VIEW A-A
SCALE: 1/1

A 7420		DATE	BY	APP.	REV.	PART NAME	MATERIAL
CHANGE		DATE	BY	APP.	REV.	PART NAME	MATERIAL
REVISIONS		PARTS LIST					
DESIGNED BY	NO. 1	QUANTITY		PRICE		CALIBRATION BLOCK PIPE	
DESIGNED BY	1	QUANTITY		PRICE		3.00"	
DESIGNED BY	1	QUANTITY		PRICE		3.00"	
DESIGNED BY	1	QUANTITY		PRICE		3.00"	
SOUTHWEST RESEARCH INSTITUTE		DATE 3-29-73		SCALE 1/2		DRAWING NUMBER C-3378026A	
SAN ANTONIO, TEXAS							



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK 3378026 IS HEREBY
CLASSIFIED AS P-NUMBER * GROUP IN ACCORDANCE WITH
SECTION IX EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
*
 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design modification (1/4t end-drilled hole) to the above calibration block, 3378026, complies with the requirements of Sections V and XI, 1983 Edition, Summer 1983 Addenda of the ASME Boiler and Pressure Vessel Code. The design also complies with SwRI's nondestructive testing procedure requirements.

*No material certifications or documentation were provided by American Electric Power to SwRI for this block.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT*
PRELIMINARY UT DATA SHEETS (SwRI) N/A
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC) (Modification only)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) C-3378-026A

R. L. Edwards

SIGNATURE

Lead Engineer

TITLE

11/23/88

DATE

INSPECTION AND TEST RESULTS

Drawing Number

C-3378026A

Job Request Number

16035

Date

11/23/88

Part Number and /or Part Name

3378026

Other Controlling Documents (P.O., Spec., Etc.)

N/A

Inspection or Test Performed:

Dimensional check - Modification only

Results: (Attach Data Sheets as Necessary)

Number of Articles Inspected or Tested: 1

Number of Conforming Articles: 1

Number of Articles Rejected: None

Nature of Defects Observed:

None

Basic Cause for Article Rejected:

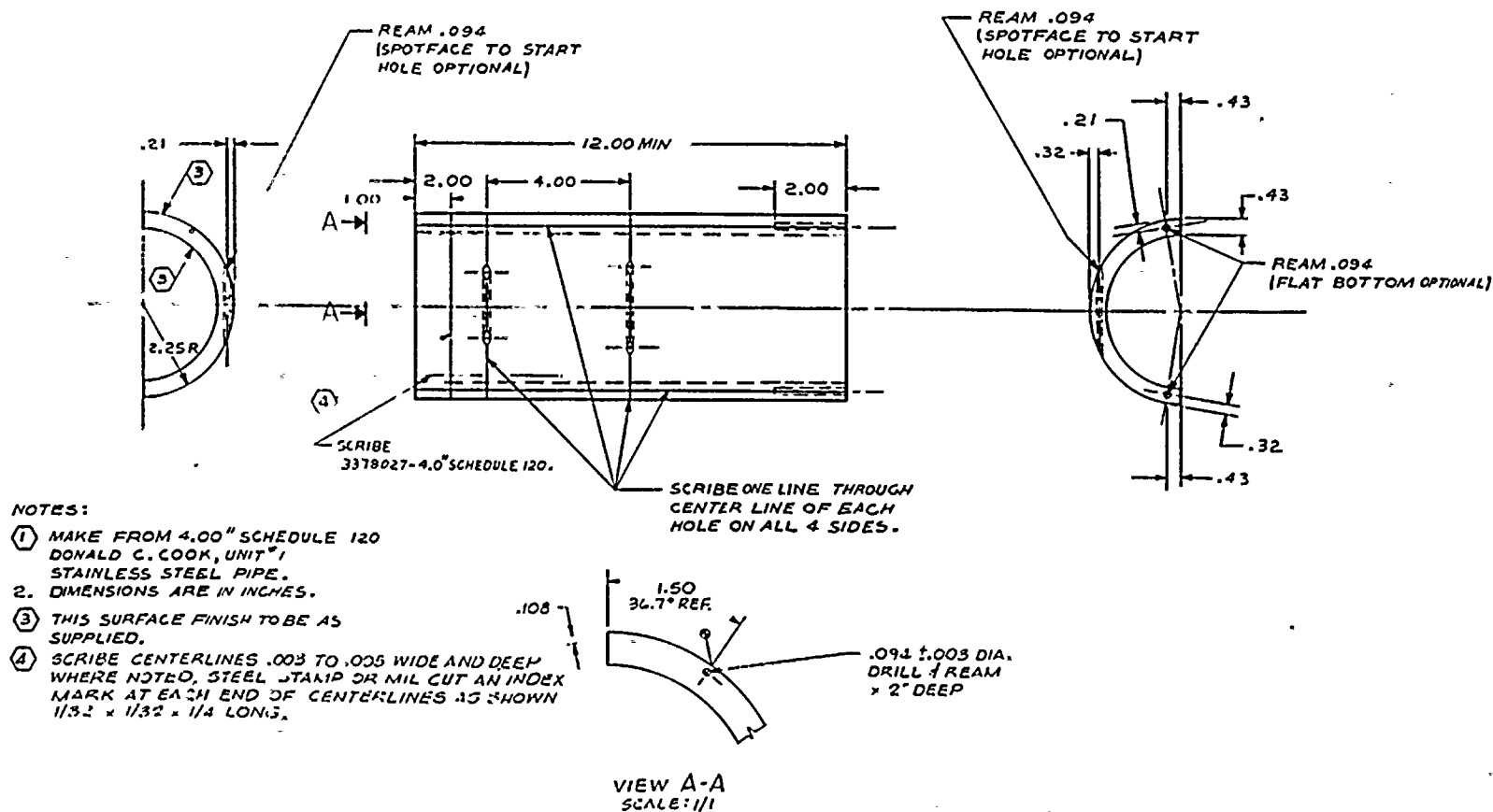
[Signature]

Inspectors Signature



SwRI FORM OA-22-1

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A 7421		DATE 11/11/73		APP. NO. REQD.		PART NAME		MATERIAL	
LET.	CHANGE	DATE	BY	APP.	NO.	REQD.			
REVISIONS						PARTS LIST			
DESIGNED BY J. Ramos		NO. 1		REVISIONS		CALIBRATION BLOCK PIPE			
APPROVED BY		NO. 1		REVISIONS		4.00			
CHECKED BY		NO. 1		REVISIONS					
APPROVED BY		NO. 1		REVISIONS					
SOUTHWEST RESEARCH INSTITUTE						DATE 3-29-73 SCALE 1/2			
SAN ANTONIO, TEXAS						C-3378027 A			

3733 PITLUK
P.O. Box 3452
San Antonio, Texas 78211
(512) 924-4734



HERCO
Aircraft Machine, Inc.

NO. 2

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 88-0145 ITEM CALIBRATION Block
P/N C 3378027 A QTY. 1ea NSN 20.623738

		ACC	REJ			ACC	REJ			ACC	REJ
1	SCRIBE LINES	✓		16				31			
2	.108	✓		17				32			
3	1.50	✓		18				33			
4	1094 ± .003 X 20	✓		19				34			
5				20				35			
6				21				36			
7				22				37			
8				23				38			
9				24				39			
10				25				40			
11				26				41			
12				27				42			
13				28				43			
14				29				44			
15				30				45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS ±

ANGLES ±

.X ± .1

.XX ± .02

.XXX ± .005

NUMBER OF SAMPLES 1

NUMBER OF ACCEPTED 1

NUMBER OF REJECTED

PAGE OF

REMARKS:

MODIFY ONLY

LOT: ACCEPTED ✓

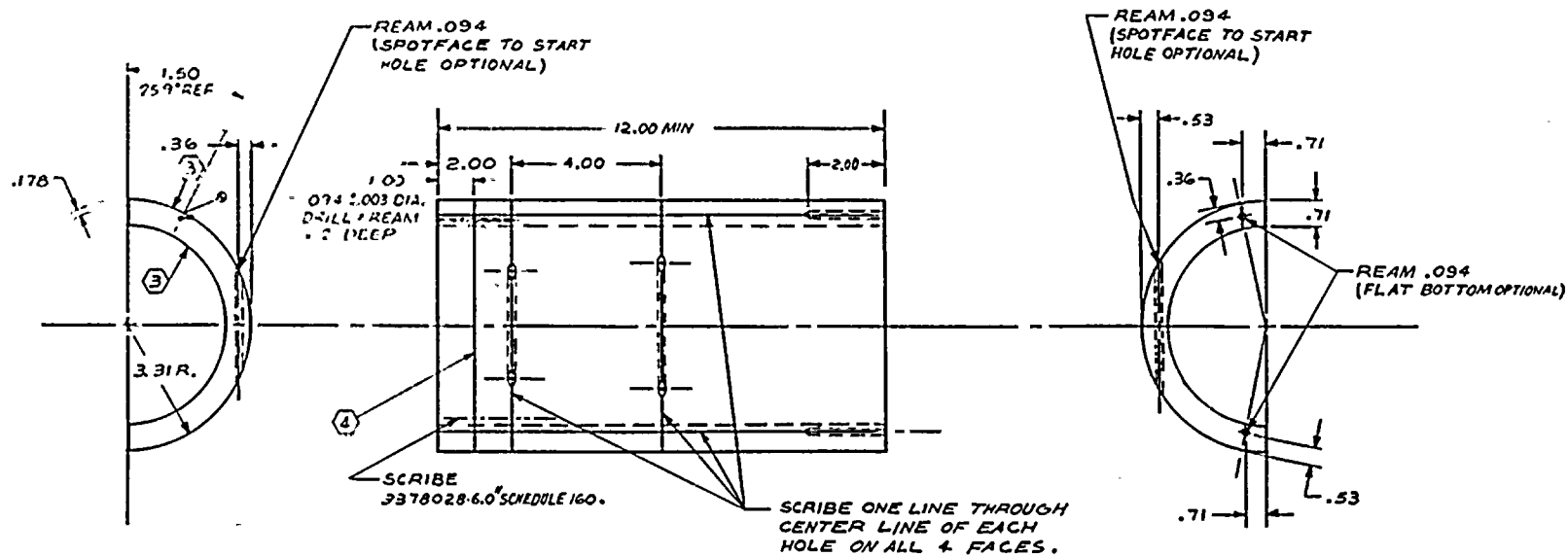
REJECTED

SIGNED Engineer L. J. [Signature]

DATE Nov 29, 1988

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C-243



NOTES:

- ① MAKE FROM 6.00 SCHEDULE 160 DONALD C. COOK,
UNIT #1 STAINLESS STEEL PIPE.
2. DIMENSIONS ARE IN INCHES.
- ③ THIS SURFACE FINISH TO BE AS SUPPLIED.
- ④ SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP
WHERE NOTED. STEEL STEEP OR MILL CUT AN INDEX
MARK AT EACH END OF CENTERLINES AS SHOWN
1/32 x 1/32 x 1/4 LONG.

A 7424		DATE		BY		APP.		PART NAME		MATERIAL	
CHANGE		DATE		BY		APP.		PART NAME		MATERIAL	
REVISIONS						PARTS LIST					
DRAWN BY <i>D. Ramos</i>						CALIBRATION BLOCK PIPE 6.00"					
CHECKED BY						DATE 3-29-73 SCALE 1/2					
DRAWN BY						DRAWING NUMBER C-3378028A					
SOUTHWEST RESEARCH INSTITUTE SAN ANTONIO, TEXAS											

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HERCO
Aircraft Machine, Inc.

NO. 2

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 88-0148 ITEM CALIBRATION BLOCK
P/N C 3378 028 A QTY. 1 ea MSN R.O. 623751

		ACC	REJ			ACC	REJ			ACC	REJ
1	.178	✓		16				31			
2	1.50	✓		17				32			
3	.094 ± .003 2 nd DP	✓		18				33			
4	1.00	✓		19				34			
5	SCRIBE LINE	✓		20				35			
6				21				36			
7				22				37			
8				23				38			
9				24				39			
10				25				40			
11				26				41			
12				27				42			
13				28				43			
14				29				44			
15				30				45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS ± —

ANGLES ± —

.X ± .1

.XX ± .02

.XXX ± .005

Q. N.
P. O.
P. N. <u>623751</u>
Q. N. <u>0148 A</u>

NUMBER OF SAMPLES 1

NUMBER OF ACCEPTED 1

NUMBER OF REJECTED —

PAGE OF

REMARKS:

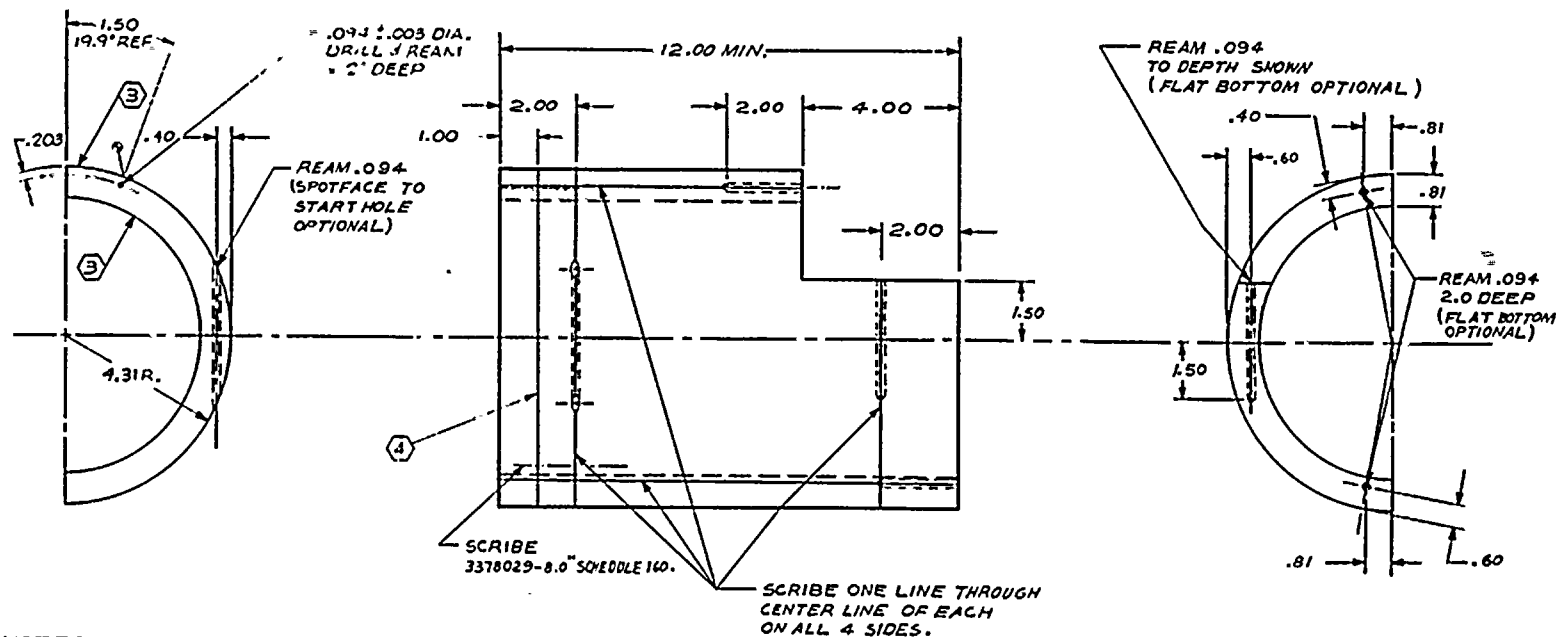
MODIFY ONLY

LOT: ACCEPTED ✓

REJECTED

SIGNED [Signature]

DATE Nov 30, 1988



NOTES:

- ① MAKE FROM 8.00" SCHEDULE 160 DONALD C. COOK, UNIT #1 STAINLESS STEEL PIPE.
2. DIMENSIONS ARE IN INCHES.
- ③ THIS SURFACE FINISH TO BE AS SUPPLIED.
- ④ SCRIBE CENTERLINES .003 TO .005 WIDE AND DEEP WHERE HILD. STEEL STAMP OR MILL. AT AN INDEX MARK AT EACH END OF CENTERLINES AS SHOWN IN 1/32" & 1/32" & 1/32" & 1/32"

A 7423		DATE		BY		APP.		REV. NO.		PART NAME		MATERIAL	
REVISIONS												PARTS LIST	
DESIGNED BY	J. Ramo			REV. NO.	1			TOLERANCES UNLESS SHOWN OTHERWISE		CALIBRATION BLOCK PIPE			
DESIGNED BY	MATERIAL			REV. NO.	1			DIMENSIONS		8.00"			
CHECKED BY	HEAT TREAT			REV. NO.	2			SOUTHWEST RESEARCH INSTITUTE		DATE 3-29-71		SCALE 1/2	
APPROVED BY	PARTS			REV. NO.	3			SAN ANTONIO, TEXAS		DRAWING NUMBER		C-3378029A	

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San Antonio, Texas 78211
(512) 924-4734



HERCO
Aircraft Machine, Inc.

NO.2

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 88-0148

ITEM CALIBRATION Block

P/N C 3378029 A

QTY. 1 ea

NSN R.O. 623751

		ACC	REJ			ACC	REJ			ACC	REJ
1	.203	✓		16				31			
2	1.50	✓		17				32			
3	.041 ± .003 DAX 2 nd DA	✓		18				33			
4	1.00	✓		19				34			
5	SCRIBE LINE	✓		20				35			
6				21				36			
7				22				37			
8				23				38			
9				24				39			
10				25				40			
11				26				41			
12				27				42			
13				28				43			
14				29				44			
15				30				45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS ± _____

.X ± .01

.XX ± .02

.XXX ± .005

ANGLES ± _____

D. D. 623751
LOS 2672

NUMBER OF SAMPLES 1

NUMBER OF ACCEPTED 1

NUMBER OF REJECTED _____

PAGE OF

REMARKS:

MODIFY ONLY

LOT: ACCEPTED ✓

REJECTED _____

SIGNED Engene L. B.

DATE Nov 29, 1988



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK 3378030 IS HEREBY
CLASSIFIED AS P-NUMBER * GROUP IN ACCORDANCE WITH
SECTION II EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
 IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.

DESIGN CRITERIA

The design modification (1/4t end-drilled hole) to the above calibration block, 3378030, complies with the requirements of Sections V and XI, 1983 Edition, Summer 1983 Addenda of the ASME Boiler and Pressure Vessel Code. The design also complies with SwRI's nondestructive testing procedure requirements.

*No material certifications or documentation were provided by American Electric Power to SwRI for this block.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (S_wRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (S_wRI)
DRAWING (S_wRI) C-3378030-A

Robert Edwards **SIGNATURE**

Lead Engineer

TITLE

Nov. 29, 1988

DATE _____

3733 PITLUK
P.O. Box 3452
San Antonio, Texas 78211
(512) 924-4734



HERCO
Aircraft Machine, Inc.

NO. 2

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 88-0145 ITEM CALIBRATION Block
P/N C 3378 030 A QTY. 1ea NEW R.O. 623738

		ACC	REJ			ACC	REJ			ACC	REJ
1	.250	✓		16				31			
2	1.50	✓		17				32			
3	.094 ± .003 x 2 ¹ _D	✓		18				33			
4	1.00	✓		19				34			
5	SCRIBE	✓		20				35			
6				21				36			
7				22				37			
8				23				38			
9				24				39			
10				25				40			
11				26				41			
12				27				42			
13				28				43			
14				29				44			
15				30				45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS ± —

ANGLES ± 0°30'

.X ± .1

.XX ± .02

.XXX ± .005

NUMBER OF SAMPLES 1

NUMBER OF ACCEPTED 1

NUMBER OF REJECTED —

PAGE OF

REMARKS:

MODIFY ONLY

LOT: ACCEPTED ✓

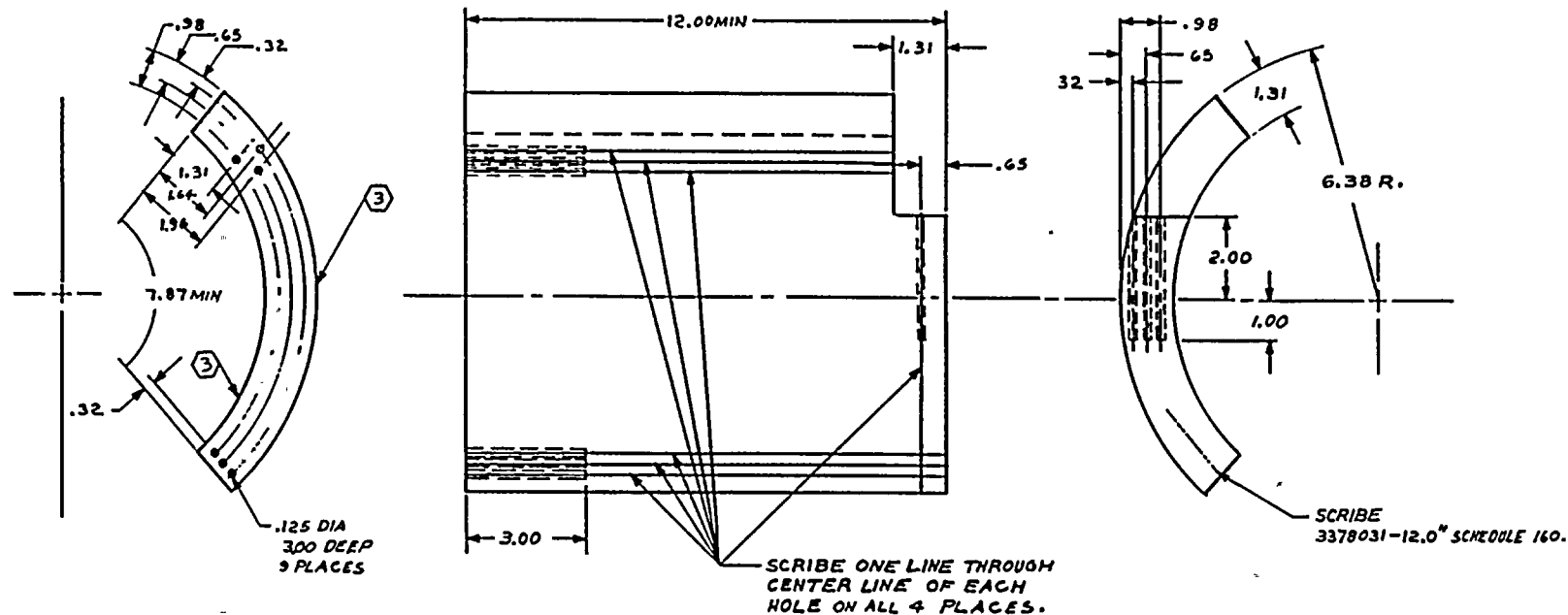
REJECTED

SIGNED [Signature]

DATE Nov 29, 1988

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C-251



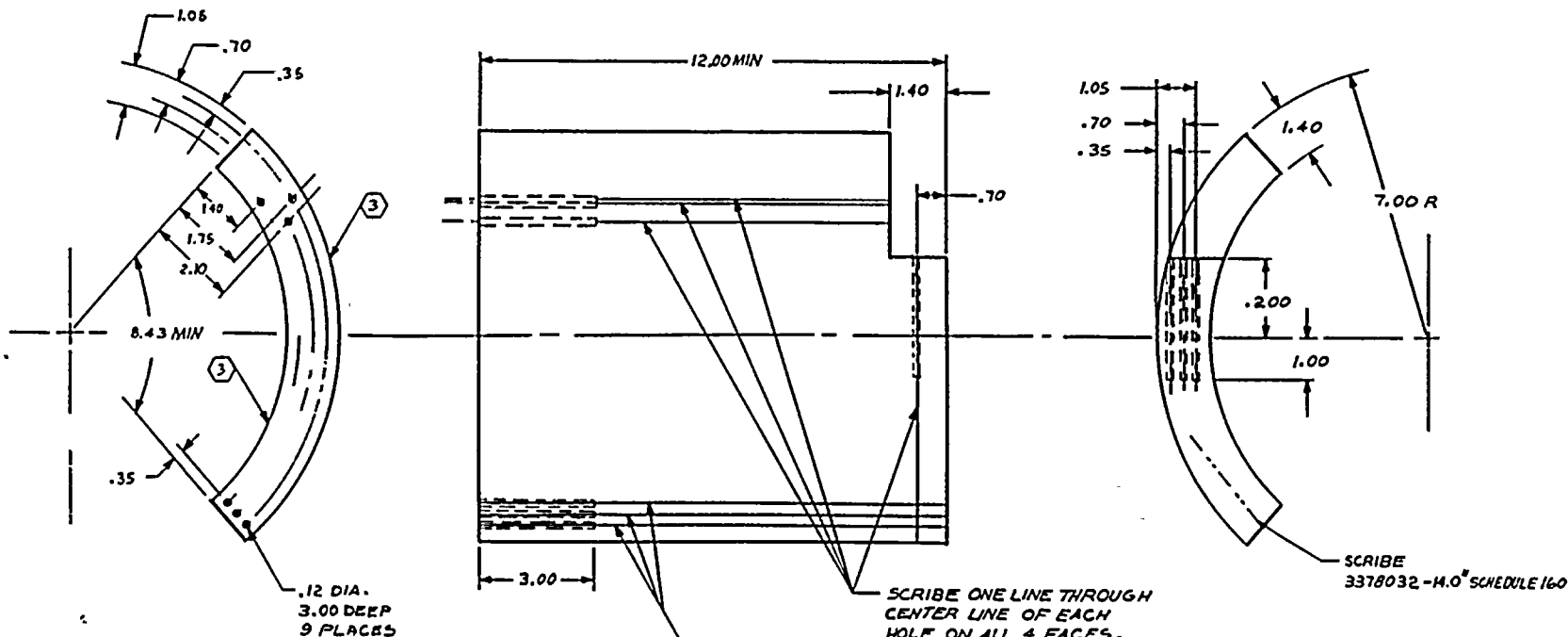
NOTES:

- ① MAKE FROM 12.00" SCHEDULE 160
DONALD C. COOK, UNIT #1
STAINLESS STEEL PIPE.
- ② DIMENSIONS ARE IN INCHES.
- ③ THIS SURFACE FINISH TO BE SUPPLIED.

LT.	CHANGE	DATE	BY	APP.	DATE	NO.	PART NAME	MATERIAL
REVISIONS								
DATE	BY	NO.	DATE	NO.	DATE	NO.	DATE	NO.
1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3
SOUTHWEST RESEARCH INSTITUTE							DATE 3-29-73	SCALE 1/2
SAN ANTONIO, TEXAS							DRAWING NUMBER	C-3378031

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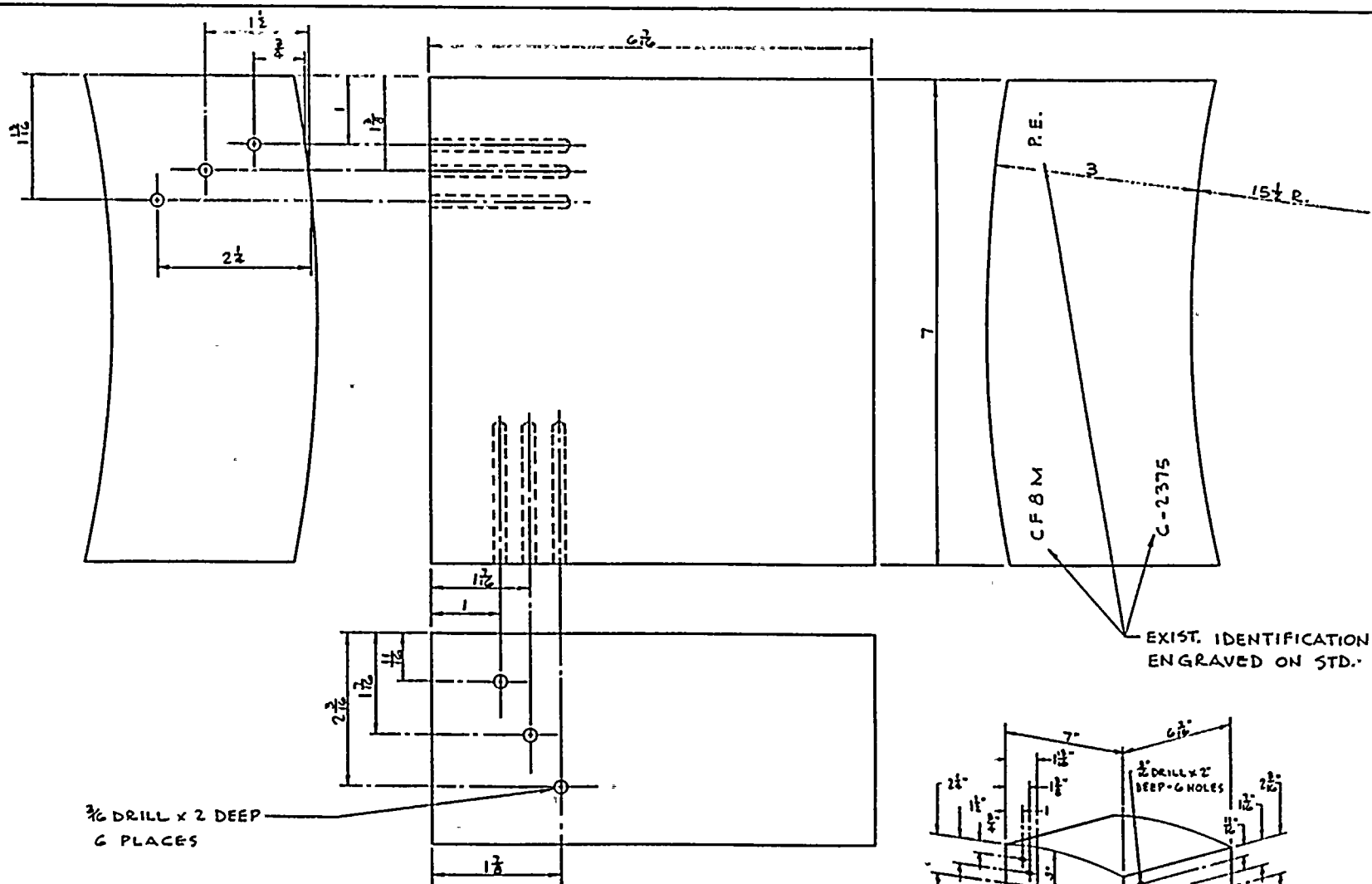
C-253



- ① MAKE FROM 14.00" SCHEDULE 160
DONALD C. COOK, UNIT #1
STAINLESS STEEL PIPE.
2. DIMENSIONS ARE IN INCHES.
③ THIS SURFACE FINISH TO BE
SUPPLIED.

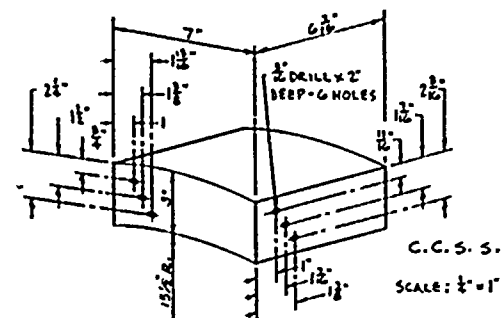
REV.	CHANGE	DATE	BY	APP.	DATE	NO.	PART NAME	MATERIAL
REVISIONS					PARTS LIST			
DRAWN BY	D. R. Myers	NO	1		QUANTITIES	1.00	CALIBRATION BLOCK PIPE 14"	
DESIGNED BY		MATERIAL	①		DECIMALS	.01		
CHECKED BY		WEIGHT	~		PLACEMENT	3.00		
APPROVED BY		FINISH	③		SHADE	0.00		
					SOUTHWEST RESEARCH INSTITUTE		DATE 3-27-73	SCALE 1/2
					SAN ANTONIO, TEXAS		DRAWING NUMBER	C-3378032

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NOTE :

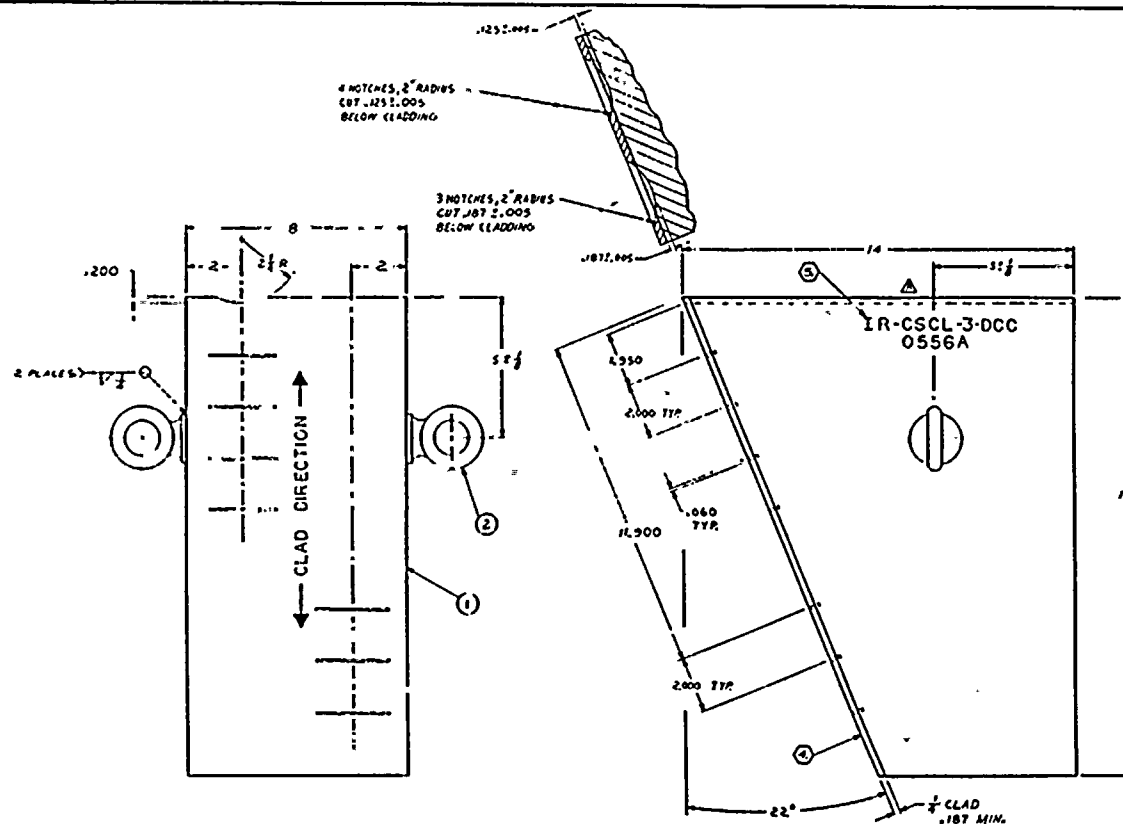
ALL DIM. GIVEN ARE AS BUILT



LET.	CHANGE	DATE	BY	APP.	DRAW NO.	PART NAME	MATERIAL
REVISIONS					PARTS LIST		
ISSUED BY	ISS	C.C.S.S.			PERFORMANCE IMPROVEMENTS CORRECTIONS REWORKS REVISIONS	MAIN REACTOR COOLANT LOOPS STANDARD - DC. COOL	
DESIGNED BY	DESIGNED						
CHECKED BY	REVIEW						
APPROVED BY	POWER						
SOUTHWEST RESEARCH INSTITUTE					DATE 10-30-74 SCALE 1/1		
SAN ANTONIO, TEXAS					DRAWING NUMBER C-3378033		

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C-257

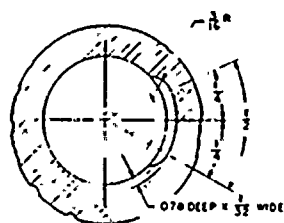


1. MARK FROM SASOB CLX S-WR1 LOO No. 0356A
CHEMICAL ANALYSIS SAMPLE No. 0356A.
2. STEEL STAMP ID. No. AND SAMPLE No. AS SHOWN ON SURFACE INDICATED, IN
CHARACTERS 3/16 MINIMUM HEIGHT.
3. CLAD OVERLAY IN ACCORDANCE WITH S-WR1-RP 900-2-REV. O.
4. ULTRASONIC EXAMINATION TO BE PERFORMED IN ACCORDANCE WITH ASME SECTION X,
1971, ARTICLE 23, 54578 INCLUDING ACCEPTANCE STANDARD LEVEL I AND
SUPPLEMENTARY REQUIREMENTS SI PRIOR TO MACHINING.
5. BREAK ALL SHARP EDGES 1/32 AND REMOVE BURRS.
6. DIMENSIONS ARE IN INCHES.
7. NOTE#1

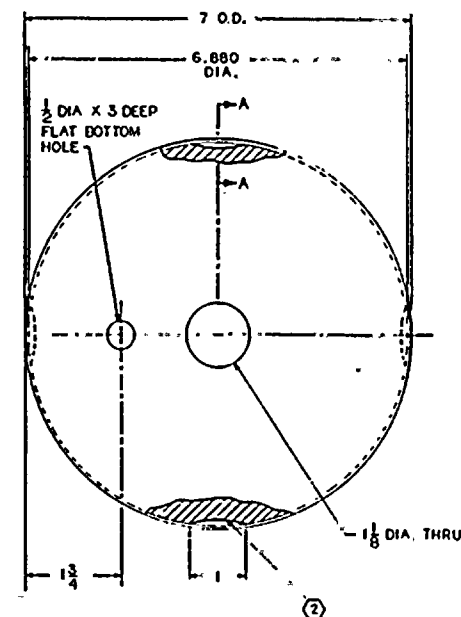
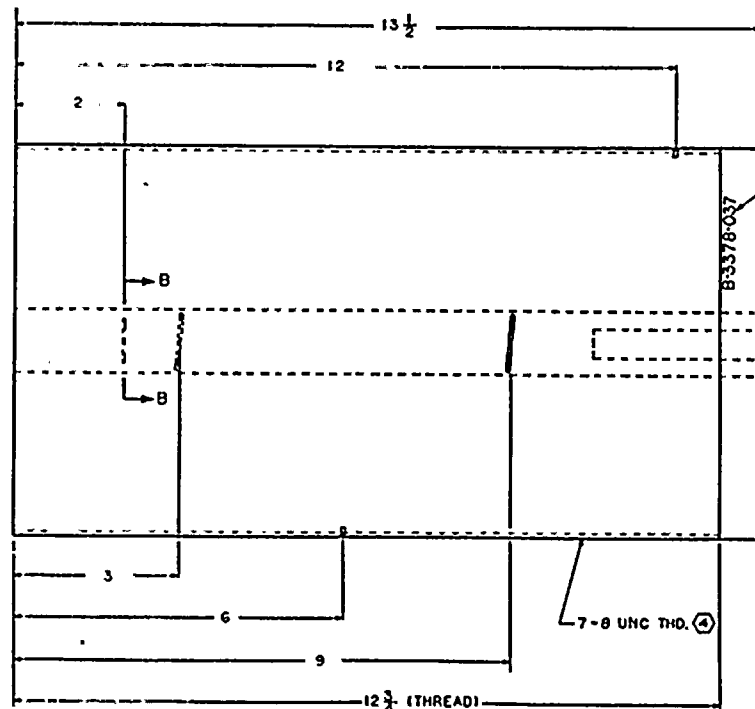
2		LIFTING EYE		No. 3024726 McMASTER-CARR	
1		BLOCK		(6) CARBON STEEL	
DATE	TIME	PART NAME		SURFACES	
APR 23 1964		2027-135			
SOUTHWEST RESEARCH INSTITUTE					
QUALITY ASSURANCE DIVISION AND CHEMICAL DIVISION					
DOW CHEMICAL COMPANY					
QD INNER RADIUS UT CATERPILLAR BLOCK					
D.C. CODE				PAGE 1	
1/2				A-D-3378036	

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C-259

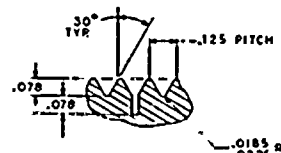


SECTION BB
SCALE: 2/1



NOTES:

1. BREAK SHARP EDGES
2. MACHINED SLOT 4 PLACES
SLOT CONFIGURATION TO BE DETERMINED
BY MACHINING REQUIREMENTS
3. STEEL STAMP DNO NO. B-3378-037
4. RPV STUD SPECIFICATIONS:
7-8-25 THREAD
MINOR DIA. MAX. = 6.8837
MINOR DIA. MIN. = 6.8647
PITCH DIA. MAX. = 6.9326
PITCH DIA. MIN. = 6.9188
MAJOR DIA. MIN. = 7.000
THREAD FINISH TO BE 125 AA, ALL BURRS AND
ROUGH EDGES TO BE REMOVED



SECTION A-A
NO SCALE
THREAD AND SLOT DEPTH
ARE AS BUILT

1. THIS DRAWING IS THE PROPERTY OF THE UNITED STATES GOVERNMENT AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT PERMISSION IN WRITING FROM THE UNITED STATES GOVERNMENT.

REV	DESCRIPTION	DATE	BY	CHKD
1	6028	6-15-61	JH	JH
2	6028	6-15-61	JH	JH
3	6028	6-15-61	JH	JH
4	6028	6-15-61	JH	JH
5	6028	6-15-61	JH	JH
6	6028	6-15-61	JH	JH
7	6028	6-15-61	JH	JH
8	6028	6-15-61	JH	JH
9	6028	6-15-61	JH	JH
10	6028	6-15-61	JH	JH

SOUTHWEST RESEARCH INSTITUTE		LOW CARBON STEEL	
QUALITY ASSURANCE DIVISION		DRAWING NO. 2227-111	
SHEET 1 OF 1		PART NAME	
RPV STUD CALIBRATION BLOCK		Dwg. No. 2227-111	
DC COOP UNIT 1		SHEET 1 OF 1	
C 0- 3378 037		8	



SOUTHWEST RESEARCH INSTITUTE

P-NUMBER CLASSIFICATION FOR CALIBRATION BLOCKS

CALIBRATION BLOCK B-3378-037 IS HEREBY
CLASSIFIED AS P-NUMBER N/A* GROUP _____ IN ACCORDANCE WITH
SECTION IX 1980 EDITION OF THE ASME BOILER AND PRESSURE
VESSEL CODE. THE P-NUMBER CLASSIFICATION FOR THIS CALIBRATION BLOCK
IS SUBSTANTIATED WITH THE ATTACHED CHEMICAL ANALYSIS REPORT FOR
* _____ IN ACCORDANCE WITH THE MATERIALS
SPECIFICATION SECTION II OF THE ASME BOILER AND PRESSURE CODE.


DESIGN CRITERIA

The design for the above calibration block incorporates the requirements of
Section XI, 1980 Edition and Section V, 1980 Edition of the ASME Boiler &
Pressure Vessel Code. The design also meets SwRI nondestructive testing
procedure requirements and tolerances.

*Material certification not provided for calibration block. Bolting material does
not have a P-Number classification in accordance with Section IX of the ASME code.

ATTACHMENTS

MILL TEST REPORT/CHEMICAL ANALYSIS REPORT
PRELIMINARY UT DATA SHEETS (SwRI)
DIMENSIONAL DATA SHEETS (MACHINE SHOP - QC)
FINAL UT ACCEPTANCE DATA SHEETS (SwRI)
DRAWING (SwRI) D-3378-037-B


Robert L. Edwards

SIGNATURE

Lead Engineer

TITLE

July 2, 1987

DATE

CHARLES C. KAWIN COMPANY

METALLURGICAL LABORATORIES

CHEMISTS • MECHANICAL TESTING • METALLOGRAPHERS • CONSULTANTS

MAILING ADDRESS / P.O. BOX 310 / MAYWOOD, ILLINOIS 60153

Southwest Research Institute
P. O. Box 28510
8500 Culabra Road
San Antonio, Texas 78284
Attn: Mr. Robert L. Edwards

DATE: 10-31-74

DESCRIPTION:

PO#2139

Lab. #41

SAMPLE IDENT.	C	Mn	Si	P	S	Ni	Cr	Mo	Cu	Mg	Al	V		
B-3373037 Carbon Steel ST40	.24	.69	.23	.010	.022							.01		

CHARLES C. KAWIN COMPANY

LABORATORIES - WOODVIEW, ILL. AND BUFFALO, N.Y.

CHARLES C. KAWIN COMPANY

METALLURGICAL LABORATORIES

CHEMISTS • MECHANICAL TESTING • METALLOGRAPHERS • CONSULTANTS
MAILING ADDRESS / P.O. BOX 310 / MAYWOOD, ILLINOIS 60153

Southwest Research Institute
P. O. Box 28510
8500 Culebra Road
San Antonio, Texas 78284
Attn: Mr. Robert L. Edwards

DATE: 10-31-74

DESCRIPTION:

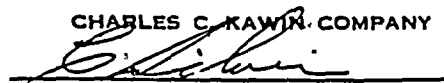
PO#2139

Lab. #41

Add'l. Analysis 12-2-74

SAMPLE IDENT.	C	Mn	Si	P	S	Ni	Cr	Mo	Cu	Mg	Al	V		
B-3378037 Carbon Steel ST40	.24	.69	.23	.010	.022	.13	.08	.05				.01		

CHARLES C. KAWIN COMPANY



LABORATORIES - BROADVIEW, ILL. AND BUFFALO, N.Y.

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San Antonio, Texas 78211
(512) 924-4734



HERCO
Aircraft Machine, Inc.

NO.2

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 87-0136 ITEM CALIBRATION BLOCK, STD
P/N D-3378 037 (B) QTY. 1 ea NON R.O. 75421

		ACC	REJ			ACC	REJ			ACC	REJ
1	$3/16$ R	✓		16				31			
2	$1/4$	✓		17				32			
3	$1/2$	✓		18				33			
4	$1/4$	✓		19				34			
5	.078 Dec x $1/34$	✓		20				35			
6	2"	✓		21				36			
7				22				37			
8				23				38			
9				24				39			
10				25				40			
11				26				41			
12				27				42			
13				28				43			
14				29				44			
15				30				45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS = $1/16$

ANGLES = 1°

.X = 7
.XX = 0.010
.XXX = 7

97RI
R.O. 75421
P. 3.
LOG 2430

NUMBER OF SAMPLES 1
NUMBER OF ACCEPTED 1
NUMBER OF REJECTED 0

REMARKS:

LOT: ACCEPTED ✓
REJECTED _____
SIGNED [Signature]
DATE 6/22/87

SOUTHWEST RESEARCH INSTITUTE

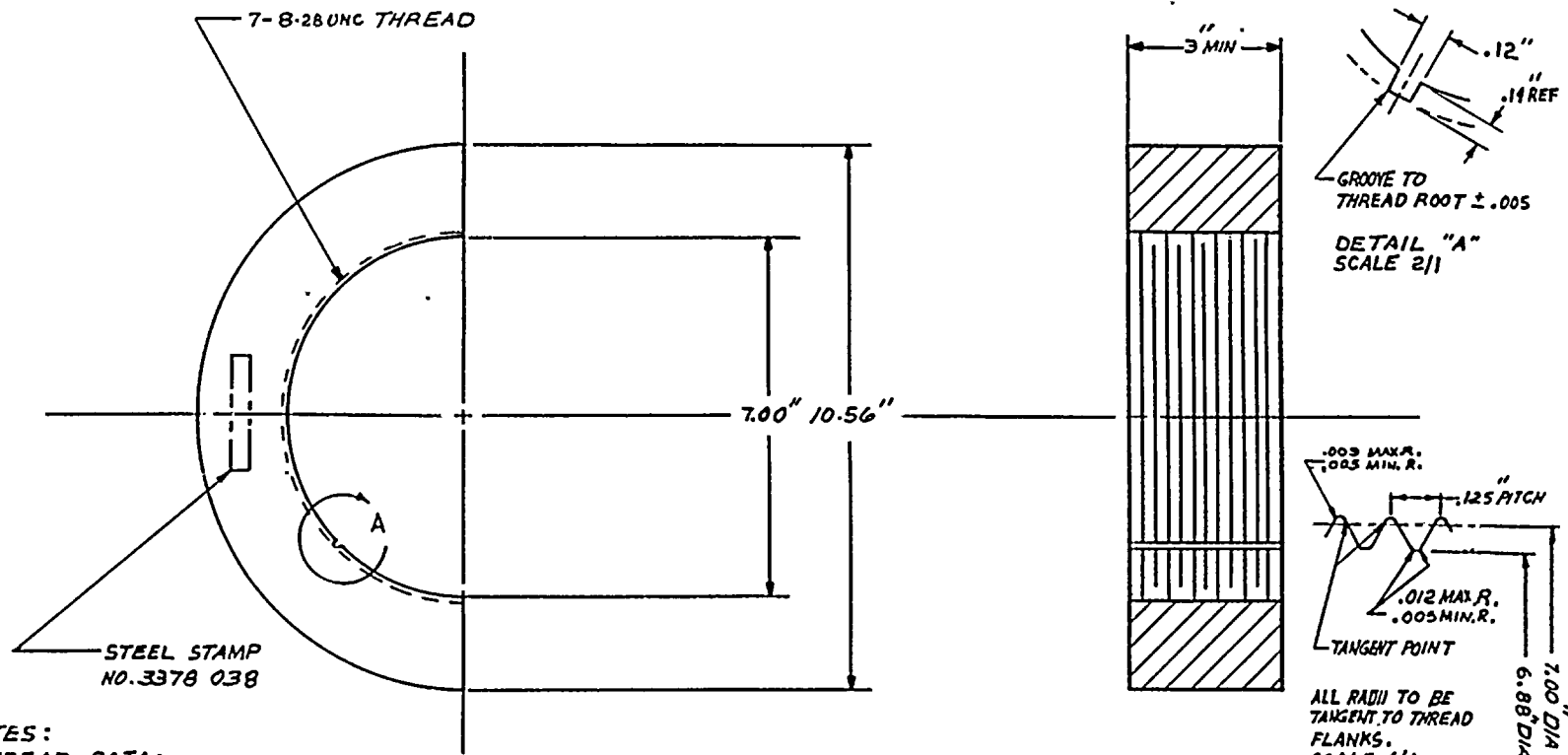
Department of Research and Engineering
Field Engineering Section

P-Number Classification for Calibration Standards

The following Calibration Standard B-3378037 is in
P-Number 1 category, Section IX of the ASME Boiler and Pressure
Vessel Code. The P-Number classification for this calibration standard
is substantiated with the attached chemical analysis report in accordance
with the materials specification Section II of the ASME Boiler and Pressure
Vessel Code.



Robert L. Edwards
Equipment Coordinator
Southwest Research Institute
(Division 17)



NOTES:

1. THREAD DATA:

MAJOR DIA. MIN. - 7.0"

PITCH DIA. MAX. - 6.93"

PITCH DIA. MIN. - 6.92"

MINOR DIA. MAX. - 6.89"

MINOR DIA. MIN. - 6.86"

2. BREAK SHARP EDGES AND
REMOVE BURRS.

COMBUSTION ENGINEERING REF DWG. E234-123


LIT.	CHANGE	DATE	BY	APP.	DRAWN NO.	NO. REQ'D.	PART NAME	MATERIAL
REVISIONS					PARTS LIST			
DRAWN BY <i>A. James</i>	NO. REQ'D. <i>~</i>				TOLERANCES UNLESS NOTED DECIMALS $\pm .01$ FRACTIONS $\pm \frac{1}{32}$ ANGLES $\pm 30'$		REFERENCE STANDARD FOR STUD. NUTS	
DESIGNED BY	MATERIAL LOW CARBON STEEL							
CHECKED BY	HEAT TREAT <i>~</i>				SOUTHWEST RESEARCH INSTITUTE		DATE 6-22-73	SCALE 1/2
APPROVED BY <i>[Signature]</i>	FINISH 125						DRAWING NUMBER B-3378 038	
					SAN ANTONIO, TEXAS			

SOUTHWEST RESEARCH INSTITUTE

Department of Research and Engineering
Field Engineering Section

P-Number Classification for Calibration Standards

The following Calibration Standard B-3378038 is in
P-Number 1 category, Section IX of the ASME Boiler and Pressure
Vessel Code. The P-Number classification for this calibration standard
is substantiated with the attached chemical analysis report in accordance
with the materials specification Section II of the ASME Boiler and Pressure
Vessel Code.


Robert L. Edwards
Equipment Coordinator
Southwest Research Institute
(Division 17)

CHARLES C. KAWIN COMPANY

METALLURGICAL LABORATORIES

CHEMISTS • MECHANICAL TESTING • METALLOGRAPHERS • CONSULTANTS
MAILING ADDRESS / P.O. BOX 310 / MAYWOOD, ILLINOIS 60153

Southwest Research Institute

DATE: 10-31-74

DESCRIPTION:

Attn: Mr. Robert L. Edwards

P02139

Lab. #42

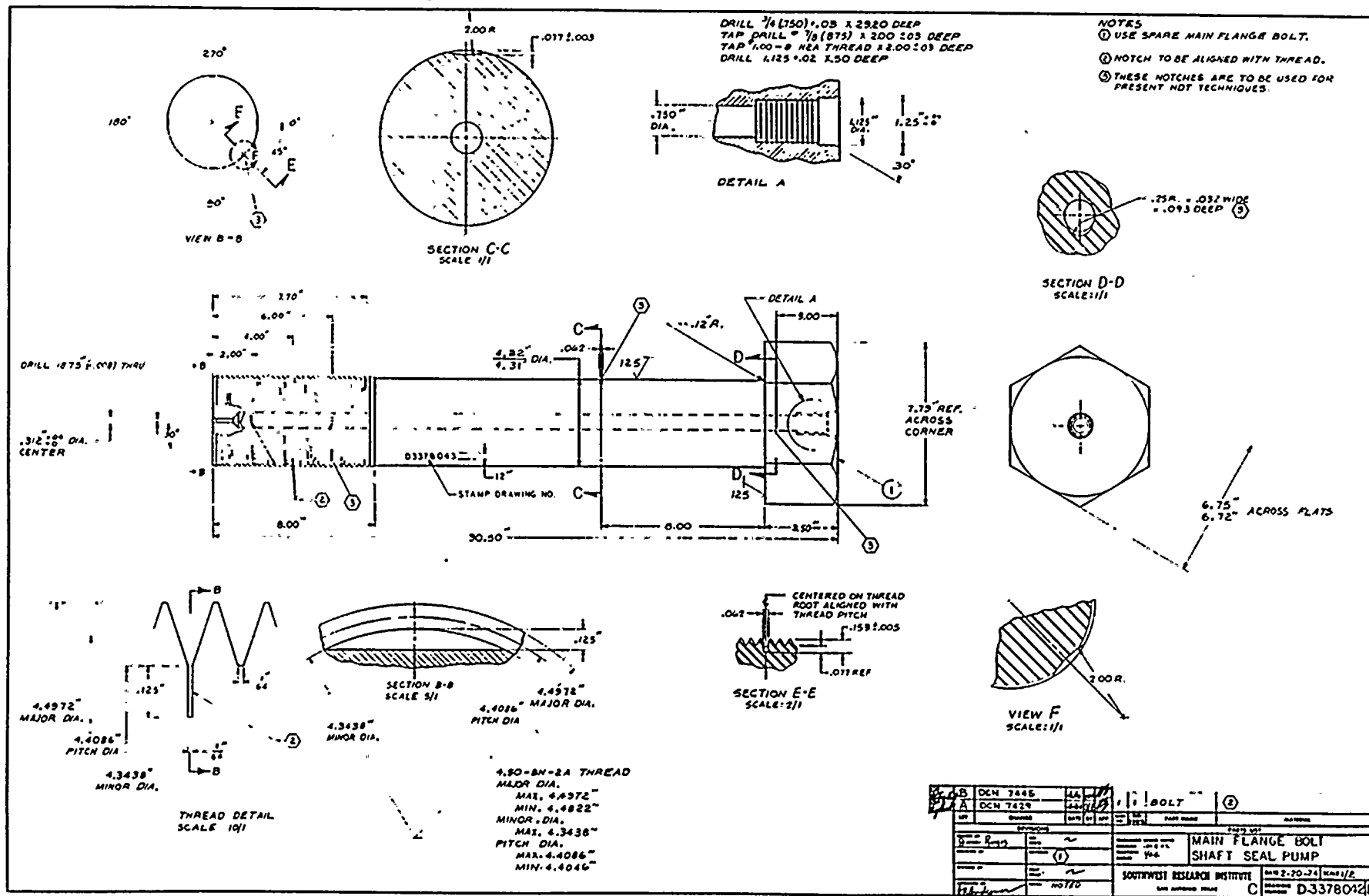
SAMPLE IDENT.	C	Mn	Si	P	S	Ni	Cr	Mo	Cu	Mg	Al	V		
B-3378038 Carbon Steel NUT	.24	.66	.03	.014	.020							.01		

CHARLES C. KAWIN COMPANY

[Signature]

LABORATORIES - WOODDALE, ILL. AND BUFFALO, N.Y.

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3733 PITLUK
P.O. Box 3452
San Antonio, Texas 78211
(512) 924-4734



HERCO
Aircraft Machine, Inc.

NO.2

QUALITY CONTROL INSPECTION REPORT

CONTRACT NR: 88-0148 ITEM MAIN FLG BOLT
P/N D 3378 042 QTY. 1 ea NSN R.D 623751

		ACC	REJ			ACC	REJ			ACC	REJ
1	45°	✓		16				31			
2	6.00	✓		17				32			
3		✓		18				33			
4	2.00 R	✓		19				34			
5	.077 ±.003	✓		20				35			
6	.062	✓		21				36			
7	3.00	✓		22				37			
8	8.00	✓		23				38			
9	.062	✓		24				39			
10	.153 ±.005	✓		25				40			
11	.25 R X.032 W X.053 D	✓		26				41			
12	2.000 R	✓		27				42			
13				28				43			
14				29				44			
15				30				45			

TOLERANCES ON DIMENSIONS
(UNLESS OTHERWISE SPECIFIED)

FRACTIONS ± 1/64 ANGLES ±

.X ±
.XX ± .02
.XXX ±

NUMBER OF SAMPLES 1

NUMBER OF ACCEPTED 1

NUMBER OF REJECTED

PAGE OF

REMARKS:

LOT: ACCEPTED ✓

REJECTED

SIGNED

DATE Nov 30, 1988

APPENDIX D

ALLOCATION TABLES FOR CLASS 1, 2, AND 3 COMPONENTS

APPENDIX D

ALLOCATION TABLES FOR CLASS 1, 2, AND 3 COMPONENTS

Allocation tables have been developed for accountability of the components in a given American Society of Mechanical Engineers (ASME) category, the number of required examinations, and the number of scheduled examinations in the Donald C. Cook Nuclear Plant, Unit 1 (Cook 1), Long-Term Plan. These tables will assist planners with tracking examinations performed and will help to verify that the Inspection Program requirements for Section XI are satisfied. Except for Class 1 piping welds, allocation of Class 1, 2, and 3 components and supports has been prepared in accordance with Subsections IWB, IWC, IWD, and IWF of the 1989 Edition of Section XI. Allocation of Class 1 piping welds has been prepared in accordance with Subsection IWB of the 1974 Edition of Section XI with Addenda through Summer 1975 as allowed by 10CFR50.55a.

Class 1 Components

The selection and allocation criteria for Class 1 piping welds were based on the 1974 Edition of Section XI with Addenda through Summer 1975 as allowed by 10CFR50.55a. Other Class 1 components are scheduled for inspection in accordance with Table IWB-2500-1 of the 1989 Edition of Section XI. An allocation table for Class 1 components, which begins on page D-3, outlines the current inspection schedule set forth in the "Third 10-Year Interval Long-Term Inservice Examination Plan for Class 1, 2, and 3 Components and Systems at Donald C. Cook Nuclear Plant, Unit 1," dated November 1995.

Class 1 components are allocated over a 10-year inspection interval which is divided into three periods. The required inspection completion percentage for each of these periods is called out in Table IWB-2412-1. Class 1 components which fall within the Section XI examination categories listed in Table IWB-2500-1 are allocated according to these categories. Table IWB-2500-1 also gives the percentage of components to be scheduled for examination in each category. In accordance with IWB-2420, the sequence of examinations established in this 10-year plan shall be repeated during each successive interval, to the extent practical.

ASME Code Exemptions Employed

IWB-1220 - The following components (or parts of components) are exempted from the volumetric and surface examination requirements of IWB-2500:

- (a) Components that are connected to the reactor coolant system and part of the reactor coolant pressure boundary and that are of such a size and shape so that upon postulated rupture the resulting flow of coolant from the reactor coolant system under normal plant operating conditions is within the capacity of makeup systems which are operable from onsite emergency power.
- (b) 1. Piping of 1" nominal pipe size and smaller, except for steam generator tubing; and
2. Components and their connections in piping of 1" nominal pipe size and smaller.
- (c) Reactor vessel head connections and associated piping, 2" nominal pipe size and smaller, made inaccessible by control rod drive penetrations.

The allocation table for Class 1 components at Cook 1 contains the following headings: Class 1 Systems and Components, ASME Category, Total, and Third 10-Year Interval Period Scheduled 1, 2, and 3.

The "Class 1 Systems and Components" heading groups components on the basis of function and is subdivided for piping into line diameter and by line identification number. All piping allocation requirements are based on the pipe diameters within a given system. For example, all Category B-J, 10" Safety Injection (SI) piping welds have been grouped together, and their 25-percent allocation is derived for the group rather than for each 10" SI line. The four main reactor coolant lines were not subdivided by size because the various portions of each line are identical for examination purposes.

The "ASME Category" for Class 1 components is defined in Section XI, Table IWB-2500-1.

The "Total" is the number of components or welds on a line or components in an ASME category.

The "Third 10-Year Interval Period Scheduled 1, 2, and 3" are the three time spans which comprise the 10-year inspection interval. The numbers represent welds or components scheduled for inspection in each period of the Third 10-Year Inservice Inspection for Cook 1.

Notes have been included at the end of the vessel and piping sections of the table to clarify the allocation rationale for some systems or components.

**10-YEAR CLASS 1 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1**

<u>Class 1 Systems and Components</u>		<u>ASME Category</u>	<u>Total</u>	<u>3rd 10-Year Interval Period Scheduled</u>		
				<u>1</u>	<u>2</u>	<u>3</u>
1.	Reactor Pressure Vessel					
1.1	Shell Welds					
1.1.1	Circumferential Welds	B-A	3			3
1.1.2	Longitudinal Welds	B-A	9			9
1.2	Head Welds					
1.2.1	Dollar Plate Welds	B-A	2			
1.2.2	Meridional Welds	B-A	12	2	4	6
1.3	Head-to-Flange	B-A	1	1/3	1/3	1/3
1.4	Vessel-to-Flange (a)	B-A	1			1
1.5	Nozzle-to-Vessel Welds (b)	B-D	8			8
1.6	Nozzle Inside Radius Section (b)	B-D	8			8
1.7	Partial Penetration Welds					
1.7.1	Lower Head Penetrations	B-E	58			15
1.7.2	Control Rod Drive Penetrations	B-E	79			20
1.7.3	Vent Line Penetrations	B-E	1			1
1.8	Nozzle-to-Safe Ends (b)	B-F	8			8
1.9	Bolting					
1.9.1	Studs	B-G-1	54	18	18	18
1.9.2	Nuts	B-G-1	54	18	18	18
1.9.3	Washers	B-G-1	54	18	18	18
1.9.4	Flange Threads	B-G-1	54	18	18	18

**10-YEAR CLASS 1 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1**

<u>Class 1 Systems and Components</u>		<u>ASME Category</u>	<u>Total</u>	<u>3rd 10-Year Interval Period Scheduled</u>		
				<u>1</u>	<u>2</u>	<u>3</u>
1.10	Interior Surfaces and Core Support Structure (c)					
1.10.1	RPV Interior	B-N-1	1	1	1	1
1.10.2	Core Support Lugs	B-N-2	6			6
1.10.3	Core Support Structure	B-N-3	1			1
1.11	Control Rod Drive Housing Welds	B-O	79			8
2.	Pressurizer (d)					
2.1	Shell-to-Head Welds					
2.1.1	Circumferential	B-B	2		1	1
2.1.2	Longitudinal	B-B	2	1	1	
2.2	Nozzle-to-Head Welds	B-D	0			
2.3	Nozzle Inside Radius Section	B-D	6	3	3	
2.4	Partial Penetration Welds					
2.4.1	Heater Penetration Welds	B-E	78			78
2.4.2	Instrument and Sample Nozzles	B-E	9			3
2.5	Nozzle-to-Safe End	B-F	6	2	4	
2.6	Support Skirt	B-H	1		1	
2.7	Bolting	B-G-2	16	1		
3.	Steam Generators (d)					
3.1	Lower Head-to-Tube Sheet	B-B	4			1
3.2	Nozzle Inside Radius Section	B-D	8	2	6	
3.3	Nozzle-to-Elbow	B-F	8	2	4	2
3.4	Bolting	B-G	8 sets		4	4

**10-YEAR CLASS 1 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1**

<u>Class 1 Systems and Components</u>			<u>ASME Category</u>	<u>Total</u>	<u>3rd 10-Year Interval Period Scheduled</u>		
					<u>1</u>	<u>2</u>	<u>3</u>
4. Reactor Coolant (RC) System							
4.1 Primary Loops (e)							
4.1.1	1-RC-1	B-J	23	2		1	
4.1.2	1-RC-2	B-J	23	2	2	3	
4.1.3	1-RC-3	B-J	24	2	2	4	
4.1.4	1-RC-4	B-J	24	2	2	2	
4.2 14" RC Lines							
4.2.1	1-RC-5	B-J	5	1	1		
4.3 6" RC Lines							
4.3.1	1-RC-6	B-J	10	1	1		
4.3.2	1-RC-7	B-J	8			2	
4.3.3	1-RC-8	B-J	8	1		2	
4.3.4	1-RC-9	B-J	8	1	1	1	
4.4 4" RC Lines							
4.4.1	1-RC-6	B-J	5		1		
4.4.2	1-RC-10 (i)	B-J	39	4	4	4	
4.4.3	1-RC-11	B-J	21	1	2	2	
4.4.4	1-RC-12	B-J	20	2	2	1	
4.5 3" RC Lines							
4.5.1	1-RC-6	B-J	19	2		3	
4.5.2	1-RC-13	B-J	24	2	4		
4.5.3	1-RC-14	B-J	25	2		3	
4.5.4	1-RC-15	B-J	25	2		5	
4.5.5	1-RC-16	B-J	27	3	5		

**10-YEAR CLASS 1 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1**

<u>Class 1 Systems and Components</u>				3rd 10-Year Interval Period Scheduled		
				<u>1</u>	<u>2</u>	<u>3</u>
4.6	2" RC Lines					
4.6.1	1-RC-501	B-J	12	1	1	1
4.6.2	1-RC-504	B-J	27	3	4	
4.6.3	1-RC-505	B-J	34	3	5	
4.6.4	1-RC-506	B-J	36	3		7
4.6.5	1-RC-507	B-J	27	2		5
4.6.6	1-RC-508	B-J	37	4		5
4.6.7	1-RC-509	B-J	38	3		6
4.6.8	1-RC-510	B-J	27	2	5	
4.6.9	1-RC-511	B-J	36	3	6	
4.7	RC Flange Bolting and Integrally Welded Attachments (IWA)					
4.7.1	Flange Bolting					
	4.7.1.1 Pipe Flange Bolting	B-G-2	11	3	4	4
	4.7.1.2 Valve Flange Bolting	B-G-2	3		1	
4.7.2	Welded Attachments (f)					
	4.7.2.1 4" RC-IWA	B-K-1	1	1		
5.	Safety Injection (SI)					
5.1	10" SI					
5.1.1	1-SI-28	B-J	1		1	
5.1.2	1-SI-29	B-J	20	2	4	3
5.1.3	1-SI-30	B-J	1			
5.1.4	1-SI-31	B-J	23	1	2	3
5.1.5	1-SI-32	B-J	1			

**10-YEAR CLASS 1 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1**

<u>Class 1 Systems and Components</u>			<u>ASME Category</u>	<u>Total</u>	<u>3rd 10-Year Interval Period Scheduled</u>		
					<u>1</u>	<u>2</u>	<u>3</u>
5.1.6	1-SI-33		B-J	21	1	3	3
5.1.7	1-SI-34		B-J	1			
5.1.8	1-SI-35		B-J	23	3	2	2
5.2	8" SI						
5.2.1	1-SI-21		B-J	11		1	1
5.2.2	1-SI-25		B-J	10	1	1	
5.2.3	1-SI-33		B-J	3			
5.3	6" SI						
5.3.1	1-SI-21		B-J	3			
5.3.2	1-SI-22		B-J	17		3	
5.3.3	1-SI-23		B-J	17	1	1	2
5.3.4	1-SI-25		B-J	3			2
5.3.5	1-SI-26		B-J	13	1	1	1
5.3.6	1-SI-27		B-J	16	2	1	1
5.3.7	1-SI-35		B-J	4			1
5.3.8	1-SI-68		B-J	1			
5.3.9	1-SI-69		B-J	1	1		
5.3.10	1-SI-70		B-J	1			
5.4	4" SI						
5.4.1	1-SI-51		B-J	9			2
5.5	3" SI						
5.5.1	1-SI-39		B-J	4	1		

**10-YEAR CLASS 1 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1**

<u>Class 1 Systems and Components</u>				3rd 10-Year Interval Period Scheduled		
				<u>ASME Category</u>	<u>Total</u>	<u>1</u> <u>2</u> <u>3</u>
5.6	2.5" SI					
	5.6.1	1-SI-39	B-J	12		2 1
	5.6.2	1-SI-40	B-J	26	3	2 2
5.7	1-1/2" SI					
	5.7.1	1-SI-545	B-J	52	4	5 4
	5.7.2	1-SI-546	B-J	47	4	4 4
	5.7.3	1-SI-548	B-J	49	4	4 4
	5.7.4	1-SI-549	B-J	54	5	4 3
5.8	SI Flange Bolting and Integrally Welded Attachments (IWA)					
	5.8.1	Flange Bolting				
		5.8.1.1 Valve Flange Bolting	B-G-2	18	4	1 2
	5.8.2	Integrally Welded (f) Attachments (IWA)				
		5.8.2.1 10" SI-IWA				
		5.5.2.1.1 1-SI-29	B-K-1	3	1	1
		5.5.2.1.2 1-SI-31	B-K-1	3		
		5.5.2.1.3 1-SI-33	B-K-1	3		
		5.5.2.1.4 1-SI-35	B-K-1	3		
		5.8.2.2 8" SI-IWA				
		5.5.2.2.1 1-SI-21	B-K-1	2	1	
		5.5.2.2.2 1-SI-25	B-K-1	2		

**10-YEAR CLASS 1 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1**

<u>Class 1 Systems and Components</u>					3rd 10-Year Interval Period Scheduled		
					<u>1</u>	<u>2</u>	<u>3</u>
5.8.2.3 6" SI-IWA							
	5.5.2.3.1	1-SI-22	B-K-1	2	1		
	5.5.2.3.2	1-SI-23	B-K-1	2			
	5.5.2.3.3	1-SI-26	B-K-1	2			
	5.5.2.3.4	1-SI-27	B-K-1	2			
5.8.2.4 1-1/2" SI-IWA							
	5.5.2.4.1	1-SI-545	B-K-1	2			
	5.5.2.4.2	1-SI-546	B-K-1	2		1	
	5.5.2.4.3	1-SI-548	B-K-1	2			
	5.5.2.4.4	1-SI-549	B-K-1	2			
6. Chemical and Volume Control (CS) System							
6.1 3" CS							
	6.1.1	1-CS-92	B-J	10			1
	6.1.2	1-CS-96	B-J	13	1	1	
	6.1.3	1-CS-99	B-J	23	3	2	3
6.2 2" CS							
	6.2.1	1-CS-780	B-J	24	2	2	2
6.3 CS Flange Bolting and Integrally Welded Attachments (IWA)							
	6.3.1	Flange Bolting - None					
	6.3.2	IWA - All Excluded by Size					

**10-YEAR CLASS 1 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1**

<u>Class 1 Systems and Components</u>					3rd 10-Year Interval Period Scheduled		
					<u>1</u>	<u>2</u>	<u>3</u>
7. Residual Heat Removal (RHR)							
7.1 14" RHR							
7.1.1	1-RH-28	B-J	13	2	1	1	
7.1.2	1-RH-29	B-J	4	1			
7.2 8" RHR							
7.2.1	1-RH-27	B-J	4				1
7.2.2	1-RH-30	B-J	1				
7.3 Flange Bolting and Integrally Welded Attachments (IWA)							
7.3.1 Flange Bolting							
	7.3.1.1 Valve Flange Bolting	B-G-2	2				1
7.3.2 Integrally Welded Attachments (IWA) (f)							
7.3.2.1 14" RH-IWA							
	7.3.2.1.1 1-RH-28	B-K-1	3				1
8. Waste Disposal (WD) System							
8.1 2" WD							
8.1.1	1-WD-640	B-J	4				1
8.1.2	1-WD-642	B-J	4		1		
8.1.3	1-WD-644	B-J	9	1	1	2	
8.1.4	1-WD-651	B-J	4				1

**10-YEAR CLASS 1 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1**

<u>Class 1 Systems and Components</u>			3rd 10-Year Interval Period Scheduled		
			<u>1</u>	<u>2</u>	<u>3</u>
No-Integrally Welded Attachments or Flange Bolting					
9. Reactor Coolant Pumps (RCP)					
9.1	RCP-Bolting (4 sets of 24)	B-G-1	4 sets	1	
9.2	RCP Lower Seal Bolting (4 sets of 12)	B-G-2	4 sets	1	
9.3	Support Lugs (4 sets of 3)	B-K-1	4 sets		1
9.4	Circumferential Casing Weld	B-L-1	4		1
9.5	Casing Internal Surface	B-L-2	4		
9.6	Flange Surface	B-G-1	4		1
9.7	Flywheel (g)	RG-1.14	4	4	4
10. Valve Internals (h)					
11.1	Aloyco Swing Check Valves	B-M-2	8	2	
11.2	Darling Swing Check Valves	B-M-2	10	2	
11.3	Crosby Safety Valves	B-M-2	3		1
11.4	Lunkenheimer Gate Valves	B-M-2	2		1
11.5	Copes Vulcan Globe Valves	B-M-2	2		1

COOK 1 CLASS 1 ALLOCATION TABLES

NOTES

- (a) The vessel-to-flange weld partial examinations from the seal surface will be deferred to the third inspection period. The vessel-to-flange examination from the vessel wall will be performed in the third period when the core barrel is removed. See relief request in Appendix E.
- (b) In accordance with the alternative options allowed by Code Case N-521, all nozzle examinations and associated inside radius sections and butt welds will be accomplished during the third period.
- (c) RPV internal components are listed in the long-term plan for accounting purposes but are reported elsewhere.
- (d) Pressurizer and steam generator heads are cast and have no B-B, B2.20 welds.
- (e) Weld count includes circumferential and branch connection welds only. B-J longitudinal welds will be examined if they intersect the scheduled circumferential welds.
- (f) For Category B-K, Integral Attachments to Piping, Pumps, and Valves:

The guidelines of Code Case N-509 will be used in the performance and scheduling of examinations in lieu of the B-K-1 requirements of the 1989 Edition of Section XI which does not require examinations for the third and fourth intervals.

Scope of examination—10% of the Integral Attachments will receive a surface examination on 100% of the required areas of each welded attachment. In the case of multiple components within a system of similar design, function, and service, only one of the integral attachments of only one of the multiple components shall be examined. The integral attachments selected for examination shall correspond to those component supports selected by IWF-2510(b).

- (g) Flywheel examinations are scheduled in accordance with USNRC Regulatory Guide 1.14.
- (h) One valve internal of each type will be examined when opened for maintenance or other reasons.
- (i) Four welds on 1-10-RC (7F, 8S, 9F, and 10S) are scheduled for augmented examination in accordance with NRCB 88-08, Supplement 2. For allocation purposes these welds are counted only once; 7F, first period; 8S, second period; 9F and 10S in the third period.

UNIT 1
SUMMARY OF CLASS 1 ALLOCATIONS

<u>Category</u>	<u>Area</u>	<u>Total No.</u>	<u>No. Sched. Period</u>		
			<u>1</u>	<u>2</u>	<u>3</u>
B-A	RPV	28	2	5	19
B-B	Pressurizer	4	1	2	1
	Steam Generators	4			1
B-D	RPV	16			16
	Pressurizer	6	3	3	
	Steam Generator	8	2	6	
B-E	RPV	137			32
	Pressurizer	97			81
B-F	RPV	8			8
	Pressurizer	6	2	4	
	Steam Generators	8	2	4	2
B-G-1	RPV Studs, Nuts, Washers, and Flange Threads	54 sets	18	18	18
	RCP Bolts, Nuts, Bushings, and Washers	4 sets	1		
	RCP Flange Surface				1
B-G-2	Pressurizer	16	1		
B-H	Pressurizer	1		1	
B-N-1	RPV	1	1	1	1
B-N-2	RPV	6			6
B-N-3	RPV	1			1
B-O	RPV	79			8
PIPING SYSTEMS					
	<u>RC System</u>				
B-J	Primary RC Loops	94	8	6	10
	14" RC Lines	5	1	1	
	6" RC Lines	34	3	2	5

UNIT 1
SUMMARY OF CLASS 1 ALLOCATIONS

<u>Category</u>	<u>Area</u>	<u>Total No.</u>	<u>No. Sched. Period</u>		
			<u>1</u>	<u>2</u>	<u>3</u>
B-J	4" RC Lines	85	7	9	7
(Cont'd)	3" RC Lines	120	11	9	10
	2" RC Lines	274	24	21	24
	<u>Safety Injection</u>				
	10" SI Lines	91	8	12	11
	8" SI Lines	24	1	2	1
	6" SI Lines	76	5	5	8
	4" SI Lines	9			2
	3" SI Lines	4	1		
	2-1/2" SI Lines	38	3	4	3
	1-1/2" SI Lines	201	17	17	17
	<u>Chemical and Volume Control</u>				
	3" CS Lines	46	4	4	4
	2" CS Lines	23	2	2	2
	<u>Residual Heat Removal</u>				
	14" RHR	17	3	1	1
	8" RHR	5			1
	<u>Waste Disposal</u>				
	2" WD	21	1	2	4
B-G-1	RC Pumps Bolting (4 sets of 24)	4 Sets	1		
B-G-2	Pressurizer	16	16		
	Steam Generator	8 Sets		4	4
	<u>RC Systems</u>				
	Pipe Flanges	11	3	4	4
	Valve Flanges	3		1	
	RC Pump Lower Seal Bolting (4 sets of 12)	4 Sets	1		
	<u>SI Systems</u>				
	Valve Flanges	18	5	7	6

UNIT 1
SUMMARY OF CLASS 1 ALLOCATIONS

<u>Category</u>	<u>Area</u>	<u>Total No.</u>	<u>No. Sched. Period</u>		
			<u>1</u>	<u>2</u>	<u>3</u>
B-G-2 (Cont'd)	<u>RH Systems</u> Valve Flanges	2			1
B-K-1	RC Systems	1	1		
	<u>SI Systems</u>				
	10" SI Lines	9	1	1	
	8" SI Lines	4	1		
	6" SI Lines	8	1		
	1-1/2" SI Lines	8		1	
	<u>RHR Systems</u>				
	14" RH Lines	3			1
	RC Pumps (Sets of 3)	4			1
B-L-1	RCP Casing Weld	4			1
B-L-2	RCP Casing Internal Surface	4			1
B-M-2	Valve Internals	25			7

**DONALD C. COOK NUCLEAR PLANT,
UNIT 1, LONG-TERM PLAN CLASS 2
ALLOCATION TABLES**

Class 2 Components

Class 2 components are scheduled and allocated over a 10-year inspection interval in accordance with Inspection Program B, as specified in IWC-2412-1. The required inspection completion percentage for each period is called out in IWC-2412-1. Class 2 components fall within the examination categories listed in Table IWC-2500-1 and are allocated according to these categories. Table IWC-2500-1 also gives the percentage of components to be selected for examination in each category. In accordance with IWC-2420(a), the sequence of examinations established in this 10-year plan shall be repeated during each successive interval and are repeating examinations performed in previous intervals to the extent practical.

Components Exempt from Examination

IWC-1220 - The following components (or parts of components) are exempted from the volumetric and surface examination requirements of IC-2500.

IWC-1221- Components within RHR, ECC, and CHR systems (or portions of systems).

- (a) Vessels, piping, pumps, valves, and other components NPS 4 and smaller in all systems except high pressure safety injection systems of pressurized water reactor plants.
- (b) Vessels, piping, pumps, valves, and other components NPS 1-1/2 and smaller in high pressure safety injection systems of pressurized water reactor plants.
- (c) Component connections MPS 4 and smaller (including nozzles, socket fittings, and other connections) in vessels, piping, pumps, valves, and other components of any size in all systems except high pressure safety injection systems of pressurized water reactor plants.
- (d) Component connections NPS 1-1/2 and smaller (including nozzles, socket fittings, and other connections) in vessels, piping, pumps, valves, and other components of any size in high pressure safety injection systems of pressurized water reactor plants.
- (e) Vessels, piping, pumps, valves, other components, and component connections of any size in statically pressurized, passive (i.e., no pumps) safety injection systems of pressurized water reactor plants.
- (f) Piping and other components of any size beyond the last shutoff valve in open ended portions of systems that do not contain water during normal plant operating conditions.

IWC-1222 - Components within systems (or portions of systems) other than RHR, ECC and CHR systems.

- (a) Vessels, piping, pumps, valves, and other components NPS 4 and smaller.
- (b) Component connections NPS 4 and smaller (including nozzles, socket fittings, and other connections) in vessels, piping, pumps, valves, and other components of any size.

- (c) Vessels, piping, pumps, valves, other components, and component connections of any size in systems or portions of systems that operate (when the system function is required) at a pressure equal to or less than 275 psig and at a temperature equal to or less than 200 degrees F.
- (d) Piping and other components of any size beyond the last shutoff valve in open ended portions of systems that do not contain water during normal plant operating conditions.

IWC-1230 - Concrete Encased Components. Piping support members and piping support components that are encased in concrete shall be exempted from the examination requirements of IWC-2500.

Category C-C, Integral Attachments for Vessels, Piping, Pumps and Valves

The guidelines of Code Case N-509 will be used in the performance and scheduling of examinations in lieu of the C-C requirements of the 1989 Edition of Section XI.

Scope of examination - 10% of the Integral Attachments will receive a surface examination, 100% of required areas of each welded attachment. In the case of multiple components within a system of similar design, function, and service, only one of the integral attachments of only one of the multiple components shall be examined. The integral attachments selected for examination shall correspond to those component supports selected by IWF-2510(b).

Category C-F-1, Pressure-Retaining Welds in Austenitic Stainless Steel or High Alloy Piping

The welds selected for examination shall include 7.5% of all austenitic stainless steel or high alloy welds not exempted by IWC-1220 (some welds not exempted by IWC-1220 are not required to be nondestructively examined per Examination Category C-F-1. These welds, however, are included in the total weld count to which the 7.5% sampling rate is applied.). The examinations shall be distributed as follows:

The examinations are distributed among the Class 2 systems prorated, to the degree practicable, on the number of nonexempt austenitic stainless steel or high alloy welds in each system (i.e., if a system contains 30% of the nonexempt welds, then 30% of the nondestructive examinations required by Examination Category C-F-1 will be performed on that system);

Within a system, the examinations are distributed among terminal ends and structural discontinuities prorated, to the degree practicable, on the number of nonexempt terminal ends and structural discontinuities in that system; and

Within each system, examinations are distributed between line sizes prorated to the degree practicable.

The welds selected for examination shall be reexamined during subsequent inspections over the service lifetime of the piping component to the extent practical. The welds selected for examination are selected from those which have been examined in previous intervals to the maximum extent practical.

Category C-F-2, Pressure-Retaining Welds in Carbon or Low Alloy Steel Piping

The welds selected for examination include 7.5% of all carbon and low alloy steel welds not exempted by IWC-1220. The examinations are distributed as follows:

The examinations are distributed among the Class 2 systems prorated, to the degree practicable, on the number of nonexempt carbon and low alloy steel welds in each system.

Within a system, the examinations are distributed among terminal ends and structural discontinuities prorated, to the degree practicable, on the number of nonexempt terminal ends and structural discontinuities in that system; and

Within each system, examinations are distributed between line sizes prorated to the degree practicable.

Only these welds showing reportable preservice transverse indications need to be examined for transverse reflectors.

The format of the Class 2 allocation tables consists of five columns: Class 2 Systems and Components, ASME Category, Total, NDE Required (the number of welds in the line requiring NDE per C5.10 and C5.50), and Scheduled 10-Year Interval or No. of Piping Welds Scheduled for Each 10-Year Interval. "System/Component" groups vessels and piping systems on the basis of function and is subdivided into line identification number for piping. All piping identification requirements are based on the piping diameters within a given system. The ASME Categories for Class 2 components are contained in Section XI, Table IWC-2500-1.

The "Total" is the number of welds or examination areas on a line or component for a given ASME category.

Notes have been included at the end of the allocation table sections to clarify the allocation rationale as required.

For Class 2 examination areas, the "Period Scheduled 1, 2, and 3" are the three time spans which comprise the second 10-year inspection interval. The number in this column represents the examination areas scheduled for inspection in the third interval.

**10-YEAR CLASS 2 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1
Vessel Examination Areas**

<u>Class 2 Systems and Components</u>				<u>Period Scheduled</u>		
				<u>ASME Category</u>	<u>Total</u>	<u>1</u> <u>2</u> <u>3</u>
1.	Steam Generator.(STM)					
1.1	Circumferential Welds					
	1.1.1	STM No. 11	C-A	7	1	
	1.1.2	STM No. 12	C-A	7		
	1.1.3	STM No. 13	C-A	7	1	
	1.1.4	STM No. 14	C-A	7		2
1.2	Nozzle-to-Shell					
	1.2.1	Feedwater	C-B	4	1	
	1.2.2	Main Steam	C-B	4		1
1.3	Nozzle-Inside Radius Section					
	1.3.1	Feedwater	C-B	4	1	
	1.3.2	Main Steam	C-B	4		1
2.	Other Class 2 Vessels					
2.1	Regenerative Heat Exchanger					
	2.1.1	Circumferential Welds	C-A	12	4	4 4
2.2	Chemical & Volume Control Tank					
	2.2.1	Circumferential Welds	C-A	2		2
	2.2.2	Integrally Welded Vessel Supports	C-C	4	1	2 1
2.3	CTS Heat Exchanger East					
	2.3.1	Circumferential Welds	C-A	2	1	
	2.3.2	Nozzle-to-Shell Welds	C-B	2		1

**10-YEAR CLASS 2 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1
Vessel Examination Areas**

<u>Class 2 Systems and Components</u>		<u>ASME Category</u>	<u>Total</u>	<u>Period Scheduled</u>		
				<u>1</u>	<u>2</u>	<u>3</u>
2.4	CTS Heat Exchanger West					
2.4.1	Circumferential Welds	C-A	2		1	
2.4.2	Nozzle-to-Shell Welds	C-B	2			1
2.5	RHR Heat Exchanger East					
2.5.1	Circumferential Welds	C-A	2	1		
2.5.2	Nozzle-to-Shell Welds	C-B	2	1		
2.5.3	Nozzle Inside Radius Sections	C-B	2			
2.5.4	Integrally Welded Vessel Supports	C-C	2	1		
2.6	RHR Heat Exchanger West					
2.6.1	Circumferential Welds	C-A	2			1
2.6.2	Nozzle-to-Shell Welds	C-B	2		1	
2.6.3	Nozzle Inside Radius Sections	C-B	2			
2.6.4	Integrally Welded Vessel Supports	C-C	2		1	
2.7	Boron Injection Tank					
2.7.1	Circumferential Welds	C-A	2		2	
2.7.2	Nozzle-to-Shell	C-B	2			2
2.7.3	Integrally Welded Vessel Supports	C-C	4	1	1	2

**10-YEAR CLASS 2 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1
Piping Examination Areas**

<u>Class 2 Piping</u>			<u>Wall Thickness</u>	<u>ASME Catg'y</u>	<u>Total Welds (c)</u>	<u>NDE Req'mnt</u>	<u>Period Scheduled</u>		
							<u>1</u>	<u>2</u>	<u>3</u>
3. Emergency Core Cooling									
3.1 18" SI									
	3.1.1	1-SI-2	0.562	C-F-1	6	6		1	
	3.1.2	1-SI-3	0.562	C-F-1	6	6		1	
3.2 14" SI									
	3.2.1	1-SI-2	0.438	C-F-1	19	19		1	2
	3.2.2	1-SI-3	0.438	C-F-1	16	16	2	1	1
	3.2.3	1-SI-4	0.438	C-F-1	21	21	1	1	1
3.3 12" SI									
	3.3.1	1-SI-2	0.402	C-F-1	18	18	1	1	1
	3.3.2	1-SI-3	0.402	C-F-1	18	18	1	1	1
	3.3.3	1-SI-4	0.406	C-F-1	2	2			1
3.4 10" SI									
	3.4.1	1-SI-28	0.365/1.000	C-F-1	10	2			
	3.4.2	1-SI-30	0.365/1.000	C-F-1	10	3	1		
	3.4.3	1-SI-32	0.365/1.000	C-F-1	11	2			
	3.4.4	1-SI-34	0.365/1.000	C-F-1	11	3	1		
3.5 8" SI									
	3.5.1	1-SI-5	0.148	C-F-1	6	6	1		
	3.5.2	1-SI-20	0.812	C-F-1	9	9	1	1	
	3.5.3	1-SI-21	0.812	C-F-1	22	22	1	1	2
	3.5.4	1-SI-24	0.812	C-F-1	10	10	1		1
	3.5.5	1-SI-25	0.812	C-F-1	24	24	2	1	1
	3.5.6	1-SI-70	0.812	C-F-1	6	6			1
	3.5.7	1-SI-71	0.812	C-F-1	9	9		1	

**10-YEAR CLASS 2 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1
Piping Examination Areas**

<u>Class 2 Piping</u>		<u>Wall Thickness</u>	<u>ASME Catg'y</u>	<u>Total Welds (c)</u>	<u>NDE Req'mnt</u>	<u>Period Scheduled</u>		
						<u>1</u>	<u>2</u>	<u>3</u>
3.6	6" SI							
3.6.1	1-SI-5	0.280	C-F-1	28	28	1		1
3.6.2	1-SI-50	0.719	C-F-1	1	1			
3.6.3	1-SI-51	0.719	C-F-1	1	1			
3.6.4	1-SI-68	0.719	C-F-1	22	22	1		2
3.6.5	1-SI-69	0.719	C-F-1	17	17	1	1	1
3.6.6	1-SI-70	0.719	C-F-1	14	14	1	1	1
3.6.7	1-SI-71	0.719	C-F-1	17	17	1	1	
3.7	4" SI							
3.7.1	1-SI-5	0.120	C-F-1	8	8		1	
3.7.2	1-SI-11A	0.337	C-F-1	17	17	1		
3.7.3	1-SI-11	0.337/0.430	C-F-1	85	85	2	2	3
3.7.4	1-SI-12	0.337/0.430	C-F-1	26	26	1	1	
3.7.5	1-SI-19	0.430	C-F-1	7	7	1		
3.7.6	1-SI-50	0.430	C-F-1	29	29		1	1
3.7.7	1-SI-51	0.430	C-F-1	20	20		1	1
3.7.8	1-SI-74	0.430	C-F-1	17	17	1		
3.7.9	1-SI-80	0.430	C-F-1	33	33		1	2
3.8	2.5"SI							
3.8.1	1-SI-11A	0.203	C-F-1	1	1			
3.8.2	1-SI-11	0.203	C-F-1	1	1			
3.9	2" SI							
3.9.1	1-SI-19	0.344	C-F-1	4	4			
3.9.2	1-SI-74	0.344	C-F-1	4	4			

**10-YEAR CLASS 2 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1
Piping Examination Areas**

<u>Class 2 Piping</u>		<u>Wall Thickness</u>	<u>ASME Catg'y</u>	<u>Total Welds (c)</u>	<u>NDE Req'mnt</u>	<u>Period Scheduled</u>		
						<u>1</u>	<u>2</u>	<u>3</u>
3.10 14" RH								
3.10.1	1-RH-1	0.438	C-F-1	2	2			1
3.10.2	1-RH-2	0.438	C-F-1	2	2			
3.10.3	1-RH-28	0.438	C-F-1	5	5	1		
3.11 12" RH								
3.11.1	1-RH-3	0.406	C-F-1	3	3		1	
3.11.2	1-RH-4	0.406	C-F-1	16	16	1	1	1
3.11.3	1-RH-27	0.406/1.302	C-F-1	15	15	1	1	
3.12 8" RH								
3.12.1	1-RH-1	0.322	C-F-1	28	0			
3.12.2	1-RH-2	0.322	C-F-1	25	0			
3.12.3	1-RH-3	0.322	C-F-1	22	0			
3.12.4	1-RH-5	0.322/0.148	C-F-1	34	0			
3.12.5	1-RH-6	0.322/0.148	C-F-1	36	0			
3.12.6	1-RH-7	0.322/0.812	C-F-1	28	15	2	1	
3.12.7	1-RH-8	0.322/0.812	C-F-1	31	22	1	1	1
3.12.8	1-RH-9	0.322/0.148	C-F-1	23	0			
3.12.9	1-RH-10	0.322/0.148	C-F-1	17	0			
3.12.10	1-RH-11	0.322/0.148	C-F-1	12	0			
3.12.11	1-RH-30	0.812	C-F-1	6	6			1
4. Chemical and Volume Control System								
4.1 8" CS								
4.1.1	1-CS-33	0.148	C-F-1	15	0			
4.1.2	1-CS-35	0.148	C-F-1	2	0			

**10-YEAR CLASS 2 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1
Piping Examination Areas**

<u>Class 2 Piping</u>		<u>Wall Thickness</u>	<u>ASME Catg'y</u>	<u>Total Welds (c)</u>	<u>NDE Req'mnt</u>	<u>Period Scheduled</u>		
						<u>1</u>	<u>2</u>	<u>3</u>
4.2	6" CS							
	4.2.1	1-CS-33	0.134	C-F-1	10	0		
	4.2.2	1-CS-35	0.134	C-F-1	13	0		
4.3	4" CS							
	4.3.1	1-CS-32	0.438	C-F-1	43	43	1	1
	4.3.2	1-CS-34	0.438	C-F-1	44	43	1	1
	4.3.3	12-CS-131	0.438	C-F-1	4	4	1	
4.4	3" CS							
	4.4.1	1-CS-34	0.438	C-F-1	15	15		1
	4.4.2	1-CS-36	0.438	C-F-1	20	20	1	1
	4.4.3	1-CS-41	0.438	C-F-1	6	6	1	1
	4.4.4	1-CS-132	0.438	C-F-1	2	2		
4.5	2" CS							
	4.5.1	1-CS-747	0.344	C-F-1	23	23	1	
	4.5.2	1-CS-748	0.344	C-F-1	16	16		1
	4.5.3	1-CS-747A	0.344	C-F-1	6	6		
	4.5.4	1-CS-753	0.344	C-F-1	12	12		1
	4.5.5	1-CS-754	0.344	C-F-1	6	6		
5.	Containment Spray Piping (a)							
5.1	10" CTS							
	5.1.1	1-CTS-1	0.365	C-F-1	34	0		1
	5.1.2	1-CTS-2	0.365	C-F-1	6	0	1	2
	5.1.3	1-CTS-4	0.365	C-F-1	31	0		1
	5.1.4	1-CTS-5	0.365	C-F-1	7	0	1	

**10-YEAR CLASS 2 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1
Piping Examination Areas**

<u>Class 2 Piping</u>		<u>Wall Thickness</u>	<u>ASME Catg'y</u>	<u>Total Welds (c)</u>	<u>NDE Req'mnt</u>	<u>Period Scheduled</u>		
						<u>1</u>	<u>2</u>	<u>3</u>
5.2	8" CTS							
5.2.1	1-CTS-3	0.148/0.322	C-F-1	20	0		1	1
5.2.2	1-CTS-6	0.322/0.148	C-F-1	21	0	1		
5.3	6" CTS							
5.3.1	1-CTS-2	0.280	C-F-1	25	0	3	1	
5.3.2	1-CTS-5	0.134/0.280	C-F-1	21	0			
6.	Feedwater System							
6.1	16" FW							
6.1.1	1-FW-11	0.844	C-F-2	2	2		1	
6.1.2	1-FW-13	0.844	C-F-2	2	2			
6.1.3	1-FW-16	0.844	C-F-2	2	2			
6.1.4	1-FW-18	0.844	C-F-2	2	2			
6.2	14" FW							
6.2.1	1-FW-10	0.750	C-F-2	24	24	1	1	1
6.2.2	1-FW-11	0.750	C-F-2	11	11		1	
6.2.3	1-FW-12	0.750	C-F-2	21	21			1
6.2.4	1-FW-13	0.750	C-F-2	11	11	1	1	
6.2.5	1-FW-15	0.750	C-F-2	17	17	1		
6.2.6	1-FW-16	0.750	C-F-2	11	11			
6.2.7	1-FW-17	0.750	C-F-2	16	16			1
6.2.8	1-FW-18	0.750	C-F-2	11	11			
6.3	6" FW							
6.3.1	1-FW-26	0.432	C-F-2	19	19			1
6.3.2	1-FW-27	0.432	C-F-2	19	19		1	1
6.3.3	1-FW-30	0.432	C-F-2	19	19	1		
6.3.4	1-FW-31	0.432	C-F-2	18	18	1	1	

**10-YEAR CLASS 2 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1
Piping Examination Areas**

<u>Class 2 Piping</u>		<u>Wall Thickness</u>	<u>ASME Catg'y</u>	<u>Total Welds (c)</u>	<u>NDE Req'mnt</u>	<u>Period Scheduled</u>		
						<u>1</u>	<u>2</u>	<u>3</u>
7. Main Steam System Piping								
7.1 32" MS								
7.1.1	1-MS-1	1.000	C-F-2	4	4			
7.1.2	1-MS-6	1.000	C-F-2	5	5		1	
7.1.3	1-MS-10	1.000	C-F-2	4	4			
7.1.4	1-MS-14	1.000	C-F-2	4	4			
7.2 30" MS								
7.2.1	1-MS-1	1.000	C-F-2	7	7	1		
7.2.2	1-MS-2	1.000	C-F-2	26	26	1		
7.2.3	1-MS-6	1.000	C-F-2	6	6			
7.2.4	1-MS-7	1.000	C-F-2	27	27	1	1	
7.2.5	1-MS-10	1.000	C-F-2	6	6		1	
7.2.6	1-MS-11	1.000	C-F-2	27	27		1	2
7.2.7	1-MS-14	1.000	C-F-2	6	6			
7.2.8	1-MS-15	1.000	C-F-2	27	27	1		1
7.3 6" MS								
7.3.1	1-MS-2	0.432	C-F-2	6	6			
7.3.2	1-MS-7	0.432	C-F-2	5	5	1		
7.3.3	1-MS-11	0.432	C-F-2	6	6		1	
7.3.4	1-MS-15	0.432	C-F-2	6	6			
7.3.5	1-MS-189	0.432	C-F-2	11	11			1
7.3.6	1-MS-190	0.432	C-F-2	12	12		1	
7.3.7	1-MS-191	0.432	C-F-2	12	12			
7.3.8	1-MS-192	0.432	C-F-2	12	12			1

**10-YEAR CLASS 2 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1
Piping Examination Areas**

<u>Class 2 Piping</u>	<u>ASME Category</u>	<u>Total</u>	<u>Period Scheduled</u>		
			<u>1</u>	<u>2</u>	<u>3</u>
8. Emergency Core Cooling Integrally Welded Attachments (IWA) 10% Sample					
8.1 18" SI - IWA (None)					
8.2 14" SI - IWA					
8.2.1 1-SI-4	C-C	1	1		
8.3 12" SI - IWA (None)					
8.4 10" SI - IWA (None)					
8.5 8" SI - IWA					
8.5.1 1-SI-20	C-C	1		1	
8.5.2 1-SI-21	C-C	2			
8.5.3 1-SI-25	C-C	1			
8.5.4 1-SI-70	C-C	1			
8.5.5 1-SI-71	C-C	1		1	
8.6 6" SI - IWA (None)					
8.7 14" RH - IWA (None)					
8.8 12" RH - IWA (None)					
8.9 8" RH - IWA					
8.9.1 1-RH-1	C-C	1			
8.9.2 1-RH-2	C-C	1			
9. Chemical and Volume Control System Integrally Welded Attachments (IWA)					
9.1 8" CS - IWA (None)					
9.2 6" CS - IWA (None)					

**10-YEAR CLASS 2 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1
Piping Examination Areas**

<u>Class 2 Piping</u>	<u>ASME Category</u>	<u>Total</u>	<u>Period Scheduled</u>		
			<u>1</u>	<u>2</u>	<u>3</u>
10. Containment Spray Piping Integrally Welded Attachments (IWA)					
10.1 10" CTS - IWA (None)					
10.2 8" CTS - IWA (None)					
10.3 6" CTS - IWA (None)					
11. Feedwater System Integrally Welded Attachments (IWA)					
11.1 16" FW - IWA (None)					
11.2 14" FW - IWA					
11.2.1 1-FW-10	C-C	5	1	1	
11.2.2 1-FW-11	C-C	1			
11.2.3 1-FW-12	C-C	3			
11.2.4 1-FW-13	C-C	1			
11.2.5 1-FW-15	C-C	1			
11.2.6 1-FW-16	C-C	1			
11.2.7 1-FW-17	C-C	2			
11.2.8 1-FW-18	C-C	1			
11.3 6" FW (None)					
12. Main Steam System Piping Integrally Welded Attachments (IWA)					
12.1 32" MS - IWA (None)					
12.2 30" MS - IWA					
12.2.1 1-MS-1	C-C	1		1	
12.2.2 1-MS-2	C-C	1		1	
12.2.3 1-MS-6	C-C	1			

**10-YEAR CLASS 2 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1
Piping Examination Areas**

<u>Class 2 Piping</u>	<u>ASME Category</u>	<u>Total</u>	<u>Period Scheduled</u>		
			<u>1</u>	<u>2</u>	<u>3</u>
12. Main Steam System Piping Integrally Welded Attachments (IWA)					
12.1 32" MS - IWA (None)					
12.2 30" MS - IWA					
12.2.1 1-MS-1	C-C	1		1	
12.2.2 1-MS-2	C-C	1		1	
12.2.3 1-MS-6	C-C	1			
12.2.4 1-MS-7	C-C	1			
12.2.5 1-MS-10	C-C	3			
12.2.6 1-MS-11	C-C	1			
12.2.7 1-MS-14	C-C	1			
12.2.8 1-MS-15	C-C	1			
12.3 6" MS - IWA (None)					
<u>Class 2 Pumps and Valves</u>					
13. Safety Injection Pumps (b)					
13.1 Pump No. 1	C-C	4			
13.2 Pump No. 2	C-C	4			
14 RHR Pumps (b)					
14.1 Pump No. 1	C-C	1			
14.2 Pump No. 2	C-C	1			
15. Main Steam Isolation Valves					
15.1 Cylinder Weld	C-G	4	1		
15.2 Integral Attachments	C-C	8		2	
15.3 Flange Bolting	C-D	4			1

**10-YEAR CLASS 2 ALLOCATIONS FOR
DONALD C. COOK NUCLEAR PLANT, UNIT 1
Piping Examination Areas**

NOTES:

- (a) 7.5% of the Containment Spray System has been included for examination to ensure system integrity.
- (b) Pump supports will be examined when the insulation is removed for maintenance or other reasons.
- (c) Nonexempt lines/welds which do not require examination in accordance with C-F-1 and C-F-2 thickness criteria (less than 0.375 inch thick) have been included for total weld count.

Cook 1
Class 2 Piping Allocation Summary

<u>Category</u>	<u>Area</u>	<u>Total</u>	<u>Total NDE Required</u>	<u>No. Sched. Period</u>		
				<u>1</u>	<u>2</u>	<u>3</u>
C-A	<u>Shell Welds</u>					
	Steam Generators	28	4	1	1	2
	Regen. Heat Exchanger	12	12	4	4	4
	Chem & Vol Control Tank	2	2	1	1	
	CTS Heat Exchanger	4	2	1	1	
	RHR Heat Exchanger	4	2	1		1
	Boron Injection Tank	2	2		2	
C-B	<u>Nozzle-Shell Welds/IRS</u>					
	Steam Generators	16	4	2		2
	CTS Heat Exchanger	4	2		1	1
	RHR Heat Exchangers*	8	4	1	1	
	Boron Injection Tank	4	0			
C-C	<u>Integrally Welded Attachments</u>					
	Chem & Vol Control Tank	4	4	1	2	1
	RHR Heat Exchanger	4	2	1	1	
	Boron Injection Tank	4	4	1	1	2

*Relief being requested for IRS Examinations

Cook 1
Class 2 Piping Allocation Summary

<u>Category</u>	<u>Area</u>	<u>Total</u>	<u>Total NDE Required</u>	<u>No. Sched. Period</u>			<u>Total</u>
				<u>1</u>	<u>2</u>	<u>3</u>	
C-F-1	<u>Stainless Steel Piping Emergency Core Cooling (SI)</u>						
	18" SI	12	12		2		2
	14" SI	56	56	3	3	4	10
	12" SI	38	38	2	2	3	7
	10" SI	42	10	2			2
	8" SI	86	86	6	4	5	15
	6" SI	100	100	5	3	5	13
	4" SI	242	242	6	7	7	20
	2.5" SI	2	2	1			1
	2" SI	4	4				
	Subtotal	582	550	25	21	24	70
	Examine						70
	<u>Residual Heat Removal (RH)</u>						
	14" RH	9	9	1		1	2
	12" RH	34	34	2	3	1	6
	8" RH	262	43	3	2	2	7
	Subtotal	305	86	6	5	4	15
	Examine						15
	<u>Chemical & Volume Control System (CS)</u>						
	8" CS	17	0				
	6" CS	23	0				
	Subtotal	40	0				
	<u>Containment Spray (CTS)*</u>						
	10" CTS	78	0	1	2	3	6
	8" CTS	41	0	1	1	1	3
	6" CTS	46	0	3	1	0	4
	4" CTS	91	0	1			1
	3" CTS	43	0		1		1
	2" CTS	63	0			1	1
	Subtotal	362	0	6	5	5	16
	C-F-1 Subtotal	1289	604	7.5% = 97 welds			

* 7.5% Augmented

Cook 1
Class 2 Piping Allocation Summary

<u>Category</u>	<u>Area</u>	<u>Total</u>	<u>Total NDE Required</u>	<u>No. Sched. Period</u>			<u>Total</u>
				<u>1</u>	<u>2</u>	<u>3</u>	
C-F-2	Carbon Steel Piping <u>Feedwater System (FW)</u>						
	16" FW	8	8		1		1
	14" FW	122	122	3	3	3	9
	6" FW	<u>75</u>	<u>75</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>6</u>
	Subtotal	205	205	5	6	5	16
	<u>Main Steam Systems (MS)</u>						
	32" MS	17	17		1		1
	30" MS	132	132	4	3	3	9
	6" MS	<u>70</u>	<u>70</u>	<u>1</u>	<u>2</u>	<u>2</u>	<u>6</u>
	Subtotal	219	219	5	6	5	16
	C-F-2 Total	424	424	7.5% = 32 welds			

Class 3 Components

Class 3 pressure-retaining components will have pressure tests scheduled by IMP, as maintenance requirements and plant technical specifications dictate. The integral attachments are scheduled for examination in conjunction with the Class 3 support components as specified in Code Case N-491. Allocations for Class 3 pressure-retaining components and integral attachments have, therefore, not been individually identified.

ASME Code Exemptions Employed

Integral attachments of supports and restraints to components that are 4" nominal pipe size and smaller within the system boundaries of Examination Categories D-A, D-B, and D-C of Table IWD-2500-1 shall be exempt from the visual examination VT-3, except for the Auxiliary Feedwater System.

Integral attachments of supports and restraints to components exceeding 4" Nominal Pipe Size may be exempted provided:

- (a) The components are located in systems (or portions of systems) whose function is not required in support of reactor residual heat removal, containment heat removal, and emergency core cooling; and
- (b) The components operate at a pressure of 275 psig or less and at a temperature of 200 degrees F (93 degrees C), or less.

**DONALD C. COOK NUCLEAR PLANT, UNIT 1
LONG-TERM PLAN CLASS 1, 2, AND 3**

PIPING AND VESSEL SUPPORTS (IWF)

Class 1, 2, and 3 Component Supports

Component supports subject to examination are selected in accordance with Code Case N-491.

Components Exempt from Examination

Component supports exempt from the examination requirements of IWF-2000 are those connected to components and items exempted from examination under IWB-1220, IWC-1220, and IWD-1220. In addition, portions of supports that are inaccessible by being encased in concrete, buried underground, or encapsulated by guard pipe are also exempt.

Category F-A, Supports

F1.10 – Class 1 Piping Supports

Scope of Examination—25% of the Class 1 piping supports will receive a Visual (VT-3) examination. The total percentage sample shall be comprised of supports from each system (e.g., Safety Injection, Reactor Coolant, or RHR), where the individual sample sizes are proportional to the total number of nonexempt supports of each type and function within each system.

F1.20 – Class 2 Piping Supports

Scope of Examination—15% of the Class 2 piping supports will receive a Visual (VT-3) examination. The total percentage sample shall be comprised of supports from each system (e.g., Main Steam, Feedwater, or RHR), where the individual sample sizes are proportional to the total number of nonexempt supports of each type and function within each system.

F1.30 – Class 3 Piping Supports

Scope of Examination—10% of the Class 3 piping supports will receive a Visual (VT-3) examination. The total percentage sample shall be comprised of supports from each system (e.g., Main Steam, Feedwater, or RHR), where the individual sample sizes are proportional to the total number of nonexempt supports of each type and function within each system.

F1.40 – Supports Other Than Piping Supports

Scope of Examination—For multiple components within a system of similar design, function, and service, the supports of only one of the multiple components are required to be examined.

Item Numbers

Item numbers will be categorized to identify support types by component support function.

- A - One-direction Restraints
- B - Multi-direction Restraints
- C - Spring Hangers and Supports
- D - Anchors
- H - Heat Exchangers
- P - Pumps
- S - Snubbers
- T - Tanks
- V - Vessels
- W - Welded Attachments

Several supports hold more than one classified line. These supports are counted only once and, if scheduled for examination, will cover all of the applicable lines. The support will be counted once for credit.

DONALD C. COOK NUCLEAR PLANT, UNIT 1, IWF ALLOCATIONS

<u>Class 1 Support Components</u>	<u>ASME Category</u>	<u>Total</u>	<u>Scheduled in Period</u>		
			<u>1</u>	<u>2</u>	<u>3</u>
<u>Vessel Supports</u>					
Pressurizer	F-A, F1.40	1			
Steam Generators	F-A, F1.40	4			
<u>Piping Supports</u>					
<u>Reactor Coolant</u>					
1-RC-5	F-A, F1.10	1			
1-RC-6	F-A, F1.10	6			
1-RC-10	F-A, F1.10	9	1		
1-RC-11	F-A, F1.10	5			1
1-RC-12	F-A, F1.10	4	1	1	
1-RC-13	F-A, F1.10	6	1	1	
1-RC-14	F-A, F1.10	6		1	1
1-RC-15	F-A, F1.10	7	1		2
1-RC-16	F-A, F1.10	6			
1-RC-501	F-A, F1.10	1		1	
1-RC-504	F-A, F1.10	1		1	
1-RC-505	F-A, F1.10	2			1
1-RC-506	F-A, F1.10	2			
1-RC-507	F-A, F1.10	1		1	
1-RC-508	F-A, F1.10	2	1		
1-RC-509	F-A, F1.10	2		1	
1-RC-510	F-A, F1.10	1			
1-RC-511	F-A, F1.10	2			
<u>Safety Injection</u>					
1-SI-21	F-A, F1.10	2		1	
1-SI-25	F-A, F1.10	1			1
1-SI-29	F-A, F1.10	1			
1-SI-31	F-A, F1.10	1			
1-SI-33	F-A, F1.10	1			
1-SI-35	F-A, F1.10	1			
1-SI-545	F-A, F1.10	15	1	2	

DONALD C. COOK NUCLEAR PLANT, UNIT 1, IWF ALLOCATIONS

<u>Class 1 Support Components</u>	<u>ASME Category</u>	<u>Total</u>	<u>Scheduled in Period</u>		
			<u>1</u>	<u>2</u>	<u>3</u>
<u>Safety Injection (Cont'd)</u>					
1-SI-546	F-A, F1.10	10	2	1	
1-SI-548	F-A, F1.10	3	1		1
1-SI-549	F-A, F1.10	15			2
<u>Chemical and Volume Control</u>					
1-CS-92	F-A, F1.10	1	1		
1-CS-96	F-A, F1.10	4			1
1-CS-99	F-A, F1.10	3			
1-CS-780	F-A, F1.10	4		1	1
<u>Residual Heat Removal</u>					
1-RH-28	F-A, F1.10	2	2		
TOTAL CLASS 1 PIPING SUPPORTS		128	11	12	11
TOTAL TO EXAMINE - 25%		34			
Pump Supports	F-A, F1.40	4			1

DONALD C. COOK NUCLEAR PLANT, UNIT 1, IWF ALLOCATIONS

<u>Class 2 Support Components</u>	<u>ASME Category</u>	<u>Total</u>	<u>Scheduled in Period</u>		
			<u>1</u>	<u>2</u>	<u>3</u>
<u>Vessel Supports</u>					
Regen. Heat Exchanger	F-A, F1.40	6	2	2	2
Chemical and Volume Control Tank	F-A, F1.40	4	2	2	
RHR Heat Exchanger East	F-A, F1.40	2		2	
RHR Heat Exchanger West	F-A, F1.40	2			2
Boron Injection Tank	F-A, F1.40	4	2	2	
Vessel Totals		18	6	8	4
<u>Piping Supports</u>					
<u>Safety Injection</u>					
1-SI-2	F-A, F1.20	17	1	1	1
1-SI-3	F-A, F1.20	13	1	1	
1-SI-4	F-A, F1.20	7			1
1-SI-5	F-A, F1.20	4			1
1-SI-11	F-A, F1.20	23		3	1
1-SI-12	F-A, F1.20	10	2		
1-SI-19	F-A, F1.20	1			
1-SI-20	F-A, F1.20	1			
1-SI-21	F-A, F1.20	6			1
1-SI-25	F-A, F1.20	10	1	1	
1-SI-28	F-A, F1.20	1			
1-SI-30	F-A, F1.20	1			
1-SI-32	F-A, F1.20	1			
1-SI-34	F-A, F1.20	1			
1-SI-50	F-A, F1.20	6			
1-SI-51	F-A, F1.20	8			
1-SI-68	F-A, F1.20	2			
1-SI-69	F-A, F1.20	2			
1-SI-70	F-A, F1.20	2			
1-SI-71	F-A, F1.20	4			1
1-SI-74	F-A, F1.20	1			
1-SI-80	F-A, F1.20	5	1		

DONALD C. COOK NUCLEAR PLANT, UNIT 1, IWF ALLOCATIONS

<u>Class 2 Support Components</u>	<u>ASME Category</u>	<u>Total</u>	<u>Scheduled in Period</u>		
			<u>1</u>	<u>2</u>	<u>3</u>
<u>Residual Heat Removal</u>					
1-RH-1	F-A, F1.20	15			1
1-RH-2	F-A, F1.20	10		1	
1-RH-3	F-A, F1.20	7	1		
1-RH-4	F-A, F1.20	7			1
1-RH-5	F-A, F1.20	13	1		1
1-RH-6	F-A, F1.20	7			1
1-RH-7	F-A, F1.20	11	1		
1-RH-8	F-A, F1.20	8			1
1-RH-9	F-A, F1.20	8	1		
1-RH-10	F-A, F1.20	4		1	
1-RH-11	F-A, F1.20	1			
1-RH-27	F-A, F1.20	3			
1-RH-28	F-A, F1.20	1		1	
1-RH-30	F-A, F1.20	4			
<u>Chemical and Volume Control</u>					
1-CS-32	F-A, F1.20	14			2
1-CS-33	F-A, F1.20	4			
1-CS-34	F-A, F1.20	8			2
1-CS-35	F-A, F1.20	4		2	
1-CS-36	F-A, F1.20	9			2
1-CS-747	F-A, F1.20	3			
1-CS-747A	F-A, F1.20	3		1	
1-CS-748	F-A, F1.20	1			
<u>Containment Spray</u>					
1-CTS-1	F-A, F1.20	8			1
1-CTS-2	F-A, F1.20	8	1		
1-CTS-3	F-A, F1.20	6		1	
1-CTS-4	F-A, F1.20	9			1
1-CTS-5	F-A, F1.20	7			1
1-CTS-6	F-A, F1.20	6		1	

DONALD C. COOK NUCLEAR PLANT, UNIT 1, IWF ALLOCATIONS

<u>Class 2 Support Components</u>	<u>ASME Category</u>	<u>Total</u>	<u>Scheduled in Period</u>		
			<u>1</u>	<u>2</u>	<u>3</u>
<u>Feedwater</u>					
1-FW-10	F-A, F1.20	9	2		
1-FW-11	F-A, F1.20	4	1		
1-FW-12	F-A, F1.20	7		1	
1-FW-13	F-A, F1.20	4			1
1-FW-15	F-A, F1.20	6	1		
1-FW-16	F-A, F1.20	4		1	
1-FW-17	F-A, F1.20	6	1		
1-FW-18	F-A, F1.20	4		1	
1-FW-26	F-A, F1.20	5			1
1-FW-27	F-A, F1.20	4		1	
1-FW-30	F-A, F1.20	3			1
1-FW-31	F-A, F1.20	3			
<u>Main Steam</u>					
1-MS-1	F-A, F1.20	3	1		
1-MS-2	F-A, F1.20	2			
1-MS-6	F-A, F1.20	3			1
1-MS-7	F-A, F1.20	2			
1-MS-10	F-A, F1.20	3			
1-MS-11	F-A, F1.20	2			
1-MS-14	F-A, F1.20	3			
1-MS-15	F-A, F1.20	2			
1-MS-189	F-A, F1.20	1			
1-MS-190	F-A, F1.20	3			
1-MS-191	F-A, F1.20	3		1	
1-MS-192	F-A, F1.20	1			
CLASS 2 PIPING SUPPORTS		362	17	21	23
EXAMINE 15% OF TOTAL		54.30			
EXAMINED EXTRA TO INCLUDE SUPPORTS WITH PREVIOUS DISCREPANCIES					

DONALD C. COOK NUCLEAR PLANT, UNIT 1, IWF ALLOCATIONS

<u>Class 3 Support Components</u>	<u>ASME Category</u>	<u>Total</u>	<u>Scheduled in Period</u>		
			<u>1</u>	<u>2</u>	<u>3</u>
<u>Vessel Supports</u>					
CTS Heat Exchangers	F-A, F1.40	18	3	4	2
RHR Heat Exchangers	F-A, F1.40	2			1
Vessel Totals		20	3	4	3

Piping Supports

Auxiliary Feedwater System

1-C-32	F-A, F1.30	15	1		1
1-C-59	F-A, F1.30	13		2	
1-C-63	F-A, F1.30	2			
1-C-65	F-A, F1.30	5			
1-C-67	F-A, F1.30	8	1		1
1-AC-159	F-A, F1.30	7	1		

Component Cooling Water

1-CCW-1	F-A, F1.30	17	1		1
1-CCW-2	F-A, F1.30	7	1		
1-CCW-6	F-A, F1.30	2			
1-CCW-7	F-A, F1.30	12	1	1	
1-CCW-8	F-A, F1.30	24	1	1	1
1-CCW-35	F-A, F1.30	15		1	1
1-CCW-36	F-A, F1.30	2			
1-CCW-37	F-A, F1.30	14	1	1	
1-CCW-40	F-A, F1.30	14	1		1
1-CCW-48	F-A, F1.30	3			
1-CCW-49	F-A, F1.30	13	1		
1-CCW-52	F-A, F1.30	4			
1-CCW-53	F-A, F1.30	3			
1-CCW-60	F-A, F1.30	8		1	
1-CCW-63	F-A, F1.30	7			1
1-CCW-65	F-A, F1.30	4			
1-CCW-66	F-A, F1.30	3			
1-CCW-94	F-A, F1.30	15	1	1	
1-CCW-98	F-A, F1.30	16		1	1
1-CCW-50	F-A, F1.30	4			
1-CCW-58	F-A, F1.30	8	1		

DONALD C. COOK NUCLEAR PLANT, UNIT 1, IWF ALLOCATIONS

<u>Class 3 Support Components</u>	<u>ASME Category</u>	<u>Total</u>	<u>Scheduled in Period</u>		
			<u>1</u>	<u>2</u>	<u>3</u>
<u>Essential Service Water System</u>					
1-ESW-1	F-A, F1.30	2			
1-ESW-2	F-A, F1.30	3			1
1-ESW-28	F-A, F1.30	1			
1-ESW-43	F-A, F1.30	6	1		
1-ESW-44	F-A, F1.30	11		1	
1-ESW-45	F-A, F1.30	5			
1-ESW-46	F-A, F1.30	10			1
1-ESW-47	F-A, F1.30	4			
1-ESW-51	F-A, F1.30	6			1
1-ESW-52	F-A, F1.30	4			
1-ESW-56	F-A, F1.30	5	1		
1-ESW-57	F-A, F1.30	5			1
1-ESW-61	F-A, F1.30	4		1	
1-ESW-64	F-A, F1.30	10			1
1-ESW-65	F-A, F1.30	11		1	
<u>Feedwater System</u>					
1-FW-19	F-A, F1.30	18	1	1	
1-FW-28	F-A, F1.30	7	1	1	
1-FW-29	F-A, F1.30	8	1	1	
1-FW-34	F-A, F1.30	16		1	1
1-FW-35	F-A, F1.30	23	1		1
1-FW-36	F-A, F1.30	5			1
1-FW-40	F-A, F1.30	17	1	1	
1-FW-46	F-A, F1.30	6			1
1-FW-47	F-A, F1.30	4			
1-FW-52	F-A, F1.30	23	1	1	
1-FW-86	F-A, F1.30	8	1		1
1-FW-24	F-A, F1.30	5		1	
1-FW-25	F-A, F1.30	3			
1-FW-22	F-A, F1.30	23	1		1
1-FW-39	F-A, F1.30	18		1	1
1-FW-43	F-A, F1.30	5			1
1-FW-49	F-A, F1.30	5		1	
1-FW-87	F-A, F1.30	3			

DONALD C. COOK NUCLEAR PLANT, UNIT 1, IWF ALLOCATIONS

<u>Class 3 Support Components</u>	<u>ASME Category</u>	<u>Total</u>	<u>Scheduled in Period</u>		
			<u>1</u>	<u>2</u>	<u>3</u>
<u>Spent Fuel Cooling</u>					
12-SF-1	F-A, F1.30	6			1
12-SF-2	F-A, F1.30	2			
12-SF-3	F-A, F1.30	5		1	
12-SF-4	F-A, F1.30	5	1		
12-SF-5	F-A, F1.30	<u>2</u>			
TOTAL NONEXEMPT PIPING		549	23	22	23
SUPPORT COMPONENTS					
TOTAL REQUIRING EXAMINATION (10%)		54.9			

APPENDIX F

**DONALD C. COOK NUCLEAR PLANT,
UNIT 1, LINE LISTING**

APPENDIX F

DONALD C. COOK NUCLEAR PLANT, UNIT 1, LINE LISTING

A listing of the lines and systems in the Donald C. Cook Nuclear Plant, Unit 1, that are included in the inservice inspection program are contained in this appendix. The tables are organized to provide the following information:

<u>COMPONENT/LINE NO:</u>	AEP line number taken from plant isometric drawings. This same designator is used in the ISIC tables and ISI isometric drawings in this plan.
<u>CLASS:</u>	Classification in accordance with ASME, Section XI, 1989 Edition. Class 1 is treated in accordance with the rules put forth in Article IWB, Class 2, Article IWC, and Class 3, IWD.
<u>SIZE:</u>	Nominal pipe size in inches. If more than one size is found in the line, both sizes are given, i.e., 10/8.
<u>PIPE SCHEDULE:</u>	Schedule of pipe designated for the line as determined from the AEP "Pipe Material Specification," dated 2/1/93.
<u>PRESSURE:</u>	Design pressure as stated in AEP "Pipe Material Specification," dated 2/1/93.
<u>TEMPERATURE:</u>	Design temperature as stated in AEP "Pipe Material Specification," dated 2/1/93.
<u>EXAM TYPE:</u>	Type of examination prescribed by the applicable category and item in the ASME code. VT- visual examination, UT-ultrasonic examination, MT-magnetic particle examination, and PT-liquid penetrant examination. If more than one type of examination is required, both have been specified.
<u>FLOW DIAGRAM:</u>	Flow diagram on which the line appears. The flow diagram designator is preceded by 1 or 2 as applicable to Unit 1 or Unit 2.

DONALD C. COOK NUCLEAR PLANT, UNIT 1
CLASS 1 LINE LISTING

COMPONENT/ LINE NO.	CLASS	SIZE	PIPE SCHD	PRESSURE	TEMP	EXAM TYPE	FLOW DIAGRAM
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REACTOR COOLANT

1-RC-1/1	1	29	2.7	2485	650	PT/UT	5128
1-RC-1/2	1	31	2.88	2485	650	PT/UT	5128
1-RC-1/3	1	27.5	2.56	2485	650	PT/UT	5128
1-RC-2/1	1	29	2.7	2485	650	PT/UT	5128
1-RC-2/2	1	31	2.88	2485	650	PT/UT	5128
1-RC-2/3	1	27.5	2.56	2485	650	PT/UT	5128
1-RC-3/1	1	29	2.7	2485	650	PT/UT	5128
1-RC-3/2	1	31	2.88	2485	650	PT/UT	5128
1-RC-3/3	1	27.5	2.56	2485	650	PT/UT	5128
1-RC-4/1	1	29	2.7	2485	650	PT/UT	5128
1-RC-4/2	1	31	2.88	2485	650	PT/UT	5128
1-RC-4/3	1	27.5	2.56	2485	650	PT/UT	5128
1-RC-5	1	14	160	2485	650	PT/UT	5128A
1-RC-6/1	1	6	160	2485	650	PT/UT	5128A
1-RC-6/2	1	4	120	2485	650	PT/UT	5128A
1-RC-6/3	1	4	120	2485	650	PT/UT	5128A
1-RC-7	1	6	160	2485	650	PT/UT	5128A
1-RC-8	1	6	160	2485	650	PT/UT	5128
1-RC-9	1	6	160	2485	650	PT/UT	5128
1-RC-10	1	4	120	2485	650	PT/UT	5128
1-RC-11	1	4	120	2485	650	PT/UT	5128
1-RC-12	1	4	120	2485	650	PT/UT	5128
1-RC-13	1	3	160	2485	650	PT	5128
1-RC-14	1	3	160	2485	650	PT	5128
1-RC-15	1	3	160	2485	650	PT	5128
1-RC-16	1	3	160	2485	650	PT	5128
1-RC-501	1	2	160	2485	650	PT	5128A
1-RC-504	1	2	160	2485	650	PT	5128A
1-RC-505	1	2	160	2485	650	PT	5128A
1-RC-506	1	2	160	2485	650	PT	5128A
1-RC-507	1	2	160	2485	650	PT	5128A
1-RC-508	1	2	160	2485	650	PT	5128A
1-RC-509	1	2	160	2485	650	PT	5128A
1-RC-510	1	2	160	2485	650	PT	5128A
1-RC-511	1	2	160	2485	650	PT	5128A

DONALD C. COOK NUCLEAR PLANT, UNIT 1
CLASS 1 LINE LISTING (CONT'D)

COMPONENT/ LINE NO.	CLASS	SIZE	PIPE SCHED	PRESSURE	TEMP	EXAM TYPE	FLOW DIAGRAM
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SAFETY INJECTION

1-SI-21	1	8	140	2485	650	PT/UT	5143
1-SI-22	1	6	160	2485	650	PT/UT	5143
1-SI-23	1	6	160	2485	650	PT/UT	5143
1-SI-25	1	8	140	2485	650	PT/UT	5143
1-SI-26	1	6	160	2485	650	PT/UT	5143
1-SI-27	1	6	160	2485	650	PT/UT	5143
1-SI-29	1	10	140	2485	650	PT/UT	5143
1-SI-28	1	10	140	2485	650	PT/UT	5143
1-SI-68	1	6	160	2485	650	PT/UT	5143
1-SI-31	1	10	140	2485	650	PT/UT	5143
1-SI-30	1	10	140	2485	650	PT/UT	5143
1-SI-69	1	6	160	2485	650	PT/UT	5143
1-SI-33	1	10	160	2485	650	PT/UT	5143
1-SI-32	1	10	140	2485	650	PT/UT	5121
1-SI-70	1	6	160	2485	650	PT/UT	5143
1-SI-35	1	10	140	2485	650	PT/UT	5143
1-SI-34	1	10	140	2485	650	PT/UT	5143
1-SI-39	1	2.5	160	2375	200	PT	5142
1-SI-40	1	2.5	160	2375	200	PT	5142
1-SI-51	1	4	120	2375	200	PT	5142
1-SI-545	1	1.5	160	2485	650	PT	5142
1-SI-546	1	1.5	160	2485	650	PT	5142
1-SI-548	1	1.5	160	2485	650	PT	5142
1-SI-549	1	1.5	160	2485	650	PT	5142

RESIDUAL HEAT REMOVAL

1-RH-27	1	12	160	1750	200	PT/UT	5143
1-RH-28	1	14	160	2485	350	PT/UT	5143
1-RH-29	1	14	160	2485	350	PT/UT	5143

CHEMICAL VOLUME CONTROL

1-CS-92	1	3	160	2485	650	PT/UT	5129
1-CS-96	1	3	160	2485	650	PT/UT	5129
1-CS-99	1	3	160	2485	650	PT/UT	5129
1-CS-780	1	3	160	2485	650	PT/UT	5129

DONALD C. COOK NUCLEAR PLANT, UNIT 1
CLASS 1 LINE LISTING (CONT'D)

COMPONENT/ LINE NO.	CLASS	SIZE	PIPE SCHED	PRESSURE	TEMP	EXAM TYPE	FLOW DIAGRAM
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WASTE DISPOSAL

1-WD-640	1	2	160	2485	650	PT/UT	5128
1-WD-642	1	2	160	2485	650	PT/UT	5128
1-WD-644	1	2	160	2485	650	PT/UT	5128
1-WD-651	1	2	160	2485	650	PT/UT	5128

DONALD C. COOK NUCLEAR PLANT, UNIT 1
CLASS 2, LINE LISTING

COMPONENT/ LINE NO.	CLASS	SIZE	PIPE SCHD	PRESSURE	TEMP	EXAM TYPE	FLOW DIAGRAM
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SAFETY INJECTION

1-SI-2	2	18/12	40	30	190	PT/UT	5143
1-SI-3	2	18/12	40	30	190	PT/UT	5143
1-SI-4	2	14	40	450	350	PT/UT	5143
1-SI-20	2	8	140	2485	650	PT/UT	5143
1-SI-21	2	8	140	1750	200	PT/UT	5143
1-SI-24	2	8	140	1750	200	PT/UT	5143
1-SI-25	2	8	140	1750	200	PT/UT	5143
1-SI-28	2	10	40S	700	120	PT/UT	5143
1-SI-30	2	10	40S	700	120	PT/UT	5143
1-SI-32	2	10	40S	700	120	PT/UT	5143
1-SI-34	2	10	40S	700	120	PT/UT	5143
1-SI-68	2	6	160	1750	200	PT/UT	5143
1-SI-69	2	6	160	1750	200	PT/UT	5143
1-SI-70	2	6	160	1750	200	PT/UT	5143
1-SI-71	2	6	160	1750	200	PT/UT	5143
1-SI-5	2	4	80	1750	200	PT	5142
1-SI-11	2	4	80	1750	200	PT/UT	5142
1-SI-12	2	4	80	1750	200	PT/UT	5142
1-SI-19	2	4	120	1750	200	PT/UT	5142
1-SI-50	2	4	120	2375	200	PT/UT	5142
1-SI-74	2	4	120	2375	200	PT/UT	5143
1-SI-80	2	4	120	2375	200	PT/UT	5129

MAIN STEAM

1-MS-1	2	32/30	1.125/1.0	1085	600	MT/UT	5105
1-MS-2	2	30/6	1.0/80	1085	600	MT/UT	5105
1-MS-6	2	32/30	1.125/1.0	1085	600	MT/UT	5105
1-MS-7	2	32/30	1.125/1.0	1085	600	MT/UT	5105
1-MS-10	2	30/6	1.0/80	1085	600	MT/UT	5105
1-MS-11	2	30/6	1.0/80	1085	600	MT/UT	5105
1-MS-14	2	32/30	1.125/1.0	1085	600	MT/UT	5105
1-MS-15	2	30/6	1.0/80	1085	600	MT/UT	5105
1-MS-189	2	6	80	1085	600	MT/UT	5105
1-MS-190	2	6	80	1085	600	MT/UT	5105
1-MS-191	2	6	80	1085	600	MT/UT	5105
1-MS-192	2	6	80	1085	600	MT/UT	5105

DONALD C. COOK NUCLEAR PLANT, UNIT 1
CLASS 2 LINE LISTING (CONT'D)

COMPONENT/ LINE NO.	CLASS	SIZE	PIPE SCHED	PRESSURE	TEMP	EXAM TYPE	FLOW DIAGRAM
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FEEDWATER

1-FW-10	2	14	80	1085	600	MT/UT	5106
1-FW-11	2	14/16	80	1085	600	MT/UT	5106
1-FW-12	2	14	80	1085	600	MT/UT	5106
1-FW-13	2	14/16	80	1085	600	MT/UT	5106
1-FW-15	2	14	80	1085	600	MT/UT	5106
1-FW-16	2	14/16	80	1085	600	MT/UT	5106
1-FW-17	2	14	80	1085	600	MT/UT	5106
1-FW-18	2	14/16	80	1085	600	MT/UT	5106
1-FW-26	2	6	80	1550	120	MT/UT	5106
1-FW-27	2	6	80	1550	120	MT/UT	5106
1-FW-30	2	6	80	1550	120	MT/UT	5106
1-FW-31	2	6	80	1550	120	MT/UT	5106

CONTAINMENT SPRAY

1-CTS-1	2	10	40S	280	190	PT/UT	5144
1-CTS-2	2	6	40S	280	190	PT/UT	5144
1-CTS-3	2	8	40	280	190	PT/UT	5144
1-CTS-4	2	10	40	400	350	PT/UT	5144
1-CTS-5	2	6	40/10	280	190	PT/UT	5144
1-CTS-6	2	8	40/10	280	190	PT/UT	5144

RESIDUAL HEAT REMOVAL

1-RH-1	2	8	40S	150	250	PT/UT	5143
1-RH-2	2	8	40S	600	350	PT/UT	5143
1-RH-3	2	8	40S	600	350	PT/UT	5143
1-RH-4	2	12	40	600	350	PT/UT	5143
1-RH-5	2	8	40S	600	350	PT/UT	5143
1-RH-6	2	8	40S	600	350	PT/UT	5143
1-RH-7	2	8	140/40	600	350	PT/UT	5143
1-RH-8	2	8	140	600	350	PT/UT	5143
1-RH-9	2	8	40S	600	350	PT/UT	5143
1-RH-10	2	8	40S	600	350	PT/UT	5143
1-RH-11	2	8	10/40	600	350	PT/UT	5143
1-RH-27	2	12	40S	600	350	PT/UT	5143
1-RH-28	2	14	40	450	350	PT/UT	5143
1-RH-30	2	8	40S	600	350	PT/UT	5143

DONALD C. COOK NUCLEAR PLANT, UNIT 1
CLASS 2, LINE LISTING (CONT'D)

COMPONENT/ LINE NO.	CLASS	SIZE	PIPE SCHED	PRESSURE	TEMP	EXAM TYPE	FLOW DIAGRAM
CHEMICAL VOLUME CONTROL							
1-CS-33	2	4	10	220	200	PT/UT	5129
1-CS-35	2	4	10	220	200	PT/UT	5129
1-CS-34	2	4	120	220	200	PT/UT	5129
12-CS-131	2	4	120	220	200	PT/UT	5129
1-CS-32	2	3	160	220	200	PT/UT	5129
1-CS-34	2	3	160	220	200	PT/UT	5129
1-CS-36	2	3	160	220	200	PT/UT	5129
1-CS-41	2	3	160	220	200	PT/UT	5129
12-CS-132	2	3	160	220	200	PT/UT	5129
1-CS-747	2	2	160	220	200	PT	5129
1-CS-748	2	2	160	220	200	PT	5129
1-CS-7474	2	2	160	220	200	PT	5129
1-CS-753	2	2	160	220	200	PT	5129
1-CS-754	2	2	160	220	200	PT	5129

DONALD C. COOK NUCLEAR PLANT, UNIT 1
CLASS 3 LINE LISTING

COMPONENT/ LINE NO.	CLASS	SIZE	PIPE SCHD	PRESSURE	TEMP	EXAM TYPE	FLOW DIAGRAM
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AUXILIARY FEEDWATER

1-C-32	3	12	ST	25	120	VT	5106A
1-C-59	3	12	ST	25	120	VT	5106A
1-C-65	3	10	40	105	120	VT	5106A
1-C-67	3	8	40	105	120	VT	5106A
1-C-68	3	8	ST	105	120	VT	5106A
1-C-63	3	12	ST	25	120	VT	5106A

COMPONENT COOLING

12-CCW-50	3	18	ST	150	115	VT	5135A
12-CCW-58	3	16	ST	150	115	VT	5135A
1-CCW-1	3	12	ST	150	115	VT	5135
1-CCW-2	3	12	ST	150	115	VT	5135
1-CCW-7	3	12	ST	150	115	VT	5135
1-CCW-8	3	16	ST	150	115	VT	5135
1-CCW-35	3	14	ST	150	115	VT	5135A
1-CCW-36	3	10	ST	150	115	VT	5135A
1-CCW-37	3	14	ST	150	115	VT	5135A
1-CCW-40	3	16	ST	150	115	VT	5135A
1-CCW-48	3	18	ST	150	115	VT	5135A
1-CCW-49	3	14	ST	150	115	VT	5135A
1-CCW-52	3	8	ST	150	115	VT	5135
1-CCW-53	3	16/12	ST	150	115	VT	5135
1-CCW-60	3	8	ST	150	115	VT	5135
1-CCW-61	3	10	ST	150	115	VT	5135A
1-CCW-63	3	8	ST	150	115	VT	5135
1-CCW-65	3	8	ST	150	115	VT	5135
1-CCW-66	3	6	ST	150	115	VT	5135
1-CCW-94	3	6	ST	150	115	VT	5135
1-CCW-98	3	6	ST	150	115	VT	5135

ESSENTIAL SERVICE WATER

1-ESW-1	3	20	ST	105	81	VT	5113
1-ESW-2	3	20	ST	105	81	VT	5113
1-ESW-5	3	6	40	105	81	VT	5113
1-ESW-8	3	6	40	105	81	VT	5113
1-ESW-27	3	6	40	105	81	VT	5113
1-ESW-28	3	6	40	105	81	VT	5113

DONALD C. COOK NUCLEAR PLANT, UNIT 1
CLASS 3 LINE LISTING (CONT'D)

COMPONENT/ LINE NO.	CLASS	SIZE	PIPE SCHED	PRESSURE	TEMP	EXAM TYPE	FLOW DIAGRAM
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ESSENTIAL SERVICE WATER (CONT'D)

1-ESW-29	3	6	40	105	81	VT	5113
1-ESW-33	3	6	40	105	81	VT	5113
1-ESW-35	3	6	40	105	81	VT	5113
1-ESW-37	3	6	40	105	81	VT	5113
1-ESW-39	3	6	40	105	81	VT	5113
1-ESW-41	3	4	40	105	81	VT	5113
1-ESW-43	3	12	ST	105	81	VT	5113
1-ESW-44	3	20	ST	105	81	VT	5113
1-ESW-45	3	12	ST	105	81	VT	5113
1-ESW-46	3	12	ST	105	81	VT	5113
1-ESW-47	3	16	ST	105	81	VT	5113
1-ESW-51	3	20	ST	105	81	VT	5113
1-ESW-52	3	20	ST	105	81	VT	5113
1-ESW-56	3	20	ST	105	81	VT	5113
1-ESW-57	3	16	ST	105	81	VT	5113
1-ESW-61	3	6	ST	105	81	VT	5106A
1-ESW-64	3	12	ST	105	81	VT	5113
1-ESW-65	3	12	ST	105	81	VT	5113
12-ESW-X-1	3	20	ST	105	81	VT	5113
12-ESW-X-2	3	20	ST	105	81	VT	5113

FEEDWATER

1-FW-19	3	8	80	1550	120	VT	5106A
1-FW-34	3	6	80	1550	120	VT	5106A
1-FW-35	3	6	80	1550	120	VT	5106A
1-FW-36	3	8	80	1550	120	VT	5106A
1-FW-40	3	6	80	1550	120	VT	5106A
1-FW-46	3	6	80	1430	120	VT	5106A
1-FW-47	3	6	80	1550	120	VT	5106A
1-FW-52	3	6	80	1550	120	VT	5106A

AUXILIARY FEEDWATER

1-AFW-86	3						
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DONALD C. COOK NUCLEAR PLANT, UNIT 1
CLASS 3 LINE LISTING (CONT'D)

COMPONENT/ LINE NO.	CLASS	SIZE	PIPE SCHED	PRESSURE	TEMP	EXAM TYPE	FLOW DIAGRAM
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SPENT FUEL COOLING

12-SF-1	3	10	10S	150	140	VT	5136
12-SF-2	3	8	10S	150	140	VT	5136
12-SF-3	3	10	10S	150	140	VT	5136
12-SF-4	3	8	10S	150	140	VT	5136
12-SF-5	3	10	10S	150	140	VT	5136

18

19

20