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200 SERIES
LOW VOLTAGE ELECTRIC PENETRATION
QUALIFICATION TEST REPORT

B Y

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Page	Change	Comment
2	New Tab	
9	Changed Figure # from 1 to 2	Correct report continuity
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	Added Test 1 and 2 Test Hardware	Incorporate missing data
30	Identified Test #3 Hardware	Clarify data
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32	Added 210* Column to Test # 2 and Added Footnote	Completion of test data added
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33	Added Paragraph Headings.	Clarify discussion
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34	Added S/N E339F012	Clarify discussion
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35 - 39	New	Completion of test data added
40	Added third Reference	
Appendix A	New	Complete test data
Appendix B	New	

ABSTRACT

This is the final report for qualification testing of the 200 Series Low Voltage Electric Penetrations, applying to standard plant, Shoreham, and Cofrentes. This testing complies with and exceeds the requirements of IEEE-STD-317 (1972 edition).

CONTENTS

INTRODUCTION

This test report documents objective evidence for design verification of the 200 Series Electric Penetration, Low Voltage design, for both integral and free-standing containment applications. As the 200 Series design is similar to the 100 Series in most respects, the objective evidence herein is supplemented by the qualification test report for the 100 Series design. The results of all testing were reviewed by the General Electric Company, NEC&ID Design Review Board in the 4th Qtr., 1976.

SUMMARY

Introduction

This section summarizes the testing that has been completed on the 200 Series Electrical Penetration. [redacted]

Sequence of Testing

The sequence of testing is divided into six (6) phases. Each phase is performed independently because of the facilities and equipment required for each test. Each test is performed in series so that the end result will provide an accumulative effect. The breakdown of the sequence is as follows:

Thermal Cycle
Gamma Exposure
Overcurrent
LOCA
Seismic
Long Term Post LOCA

Test Hardware Configuration

The test penetration was a standard 200 Series design with an additional Shield Building Module Seal installed on the end of the penetration outside the reactor. This additional seal had no effect on the primary 200 Series seal. The Shield Building Module was positioned approximately 8 feet from the primary seal and consisted of epoxy sealant being poured around the cables which were supported in a 2.50 inch sleeve.

All modules were installed in a header assembly during each phase of testing except for Gamma Exposure. The Gamma Test Facility required the modules be removed from the header and each module was exposed independently. The modules were reinstalled in the header assembly following the gamma exposure.

Qualification Summary

The 200 Series Electrical Penetration has successfully demonstrated that this design will maintain the electrical and structural integrity in a Nuclear Containment Structure, for the service environment and electrical parameters summarized in each of the sections of this report.

THERMAL CYCLE

Introduction

Thermal cycle testing simulates temperature excursions within the reactor building, over the life of the plant. Since the penetration design deals with organic materials and relies on their bonding strength to steel, both temperature cycling and moisture are conditions which affect the integrity of the product.

The penetration modules are all designed with redundant seal barriers, only one of which will actually experience the temperature change rates associated with the reactor building.

Requirements

The primary seal shall be subjected to 120 cycles of temperature change from 50°F to 150°F to 50°F in a period not to exceed 24 hours per cycle. The relative humidity, superimposed on this temperature environment, shall be maintained at a maximum during each cycle.

Test Equipment and Setup

Tenney Environmental Test Chamber, S/N 8723-3

Thermal Cycle Test Setup - Figure 1

Test Hardware

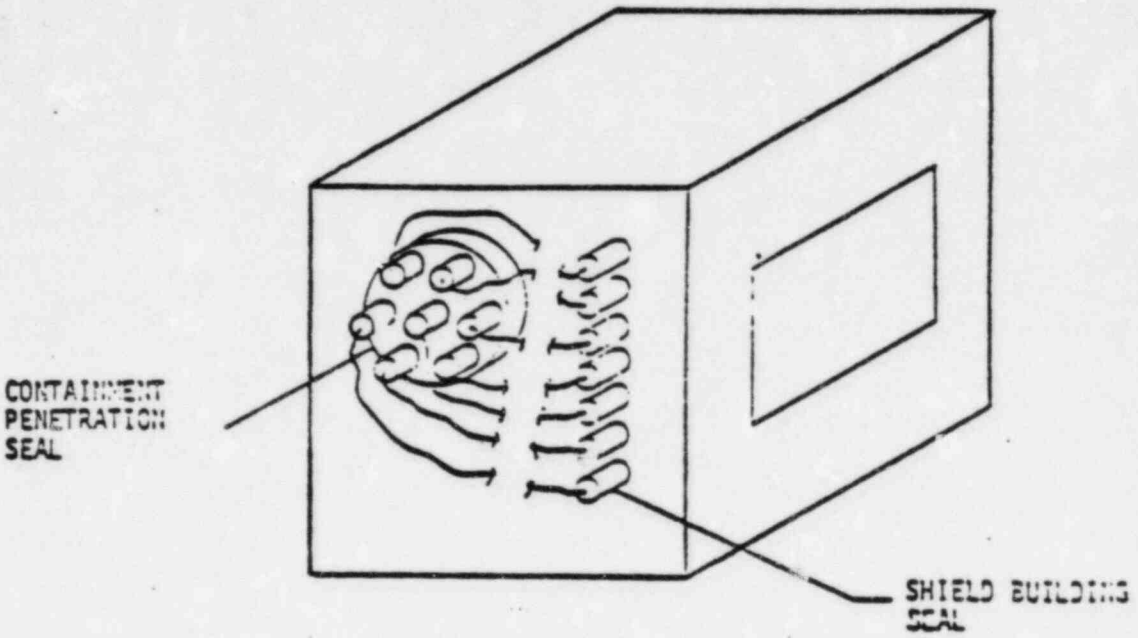
Electric Penetration Assembly 1958B850. See Appendix B.

Test Description

Table 1 summarizes the test conditions.

THERMAL CYCLE TEST SET-UP

FIGURE 1



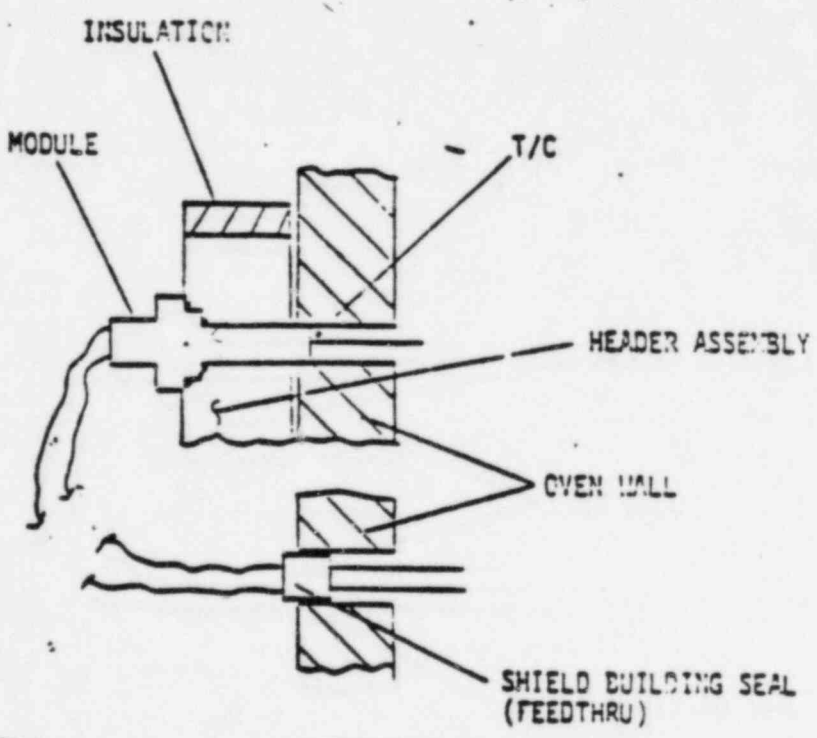


TABLE I

SUMMARY OF THERMAL CYCLING

Temperature cycle	50°F-150°F-50°F
Cyclic rate	1 cycle per 6 hours
Relative humidity	70%-100%-70%
Number of cycles	120

This test was performed over a 30 day period with no interruptions. The wires, cables and SRM/IRM connectors were left open inside the test chamber. This allowed moisture to collect on the face of the SRM/IRM connectors and to penetrate up the inside of the wires and cables. Outside the test chamber the ambient temperature was maintained between 70°F and 75°F.

Test Results

Leak Test - Less than 1×10^{-6} cc/sec

Electrical Tests

Module	Insulation Resistance	Applied Voltage	Remarks
#10 AWG	10^6 Ω	500V	
#2 AWG	10^6 Ω	500V	
#8 AWG	10^6 Ω	500V	
#12 AWG	10^6 Ω	500V	
T/C	10^6 Ω	500V	
SRM/IRM			
Cable 1	10^{11}	3 KV	Excessive moisture caused low I.R.
Cable 2	2.5×10^{10}	3 KV	
Cable 3	10^{12}	3 KV	

GAMMA EXPOSURE

Introduction

The effects of radiation exposure on the electrical penetrations are directed specifically at the sealant compound and its interface with mating parts; i.e., the ability to maintain an adequate bond adhesion. In qualifying the penetration for service environments described herein, the following constraints are established:

1. The maximum containment integrated dose, both for normal and loss-of-coolant accident, is considered to be isotropic over a 2 π solid angle.

2. The objectives of the penetration performance are to maintain containment and electrical integrity.

3. The maximum integrated dose (gamma) occurs during post-accident conditions.

This report defines the maximum allowable containment integrated gamma dose (1×10^8R), then analytically apportions this containment dose to the epoxy by considering the protection afforded by the geometry of the penetration.

This analysis was used to determine the actual hardware radiation exposure in order to qualify the electrical penetrations.

RADIATION APPORTIONMENT

Introduction

This analysis determines the gamma radiation level which would be "seen" by a "detector" located at the epoxy seal of the module assembly

In summary, the epoxy seal is housed in a steel cylinder, approximately 2.12 inches in diameter. This seal, when installed in the 2.00 inch thick steel header plate, becomes located behind the surface of the header plate. The seal can thus be treated as a detector located in a tunnel, thereby receiving the appropriate radiation shielding, which is detailed in the analysis below.

Two installations are available: (1) the penetration located inside the containment and (2) the penetration located outside the containment at the end of a three foot nozzle. In both cases, barrier protection afforded by cables, junction boxes and other extraneous hardware is ignored.

Analysis - Penetration Installed Inside Containment

Figure 2 defines the plan view arrangement of the penetration and detector location relative to the containment environment.

Given: Containment γ dose = $1.0 \times 10^8 R$

$$\frac{1.0 \times 10^8 R}{2\pi \text{ steradians}} = 1.59 \times 10^7 R/\text{Ster}$$

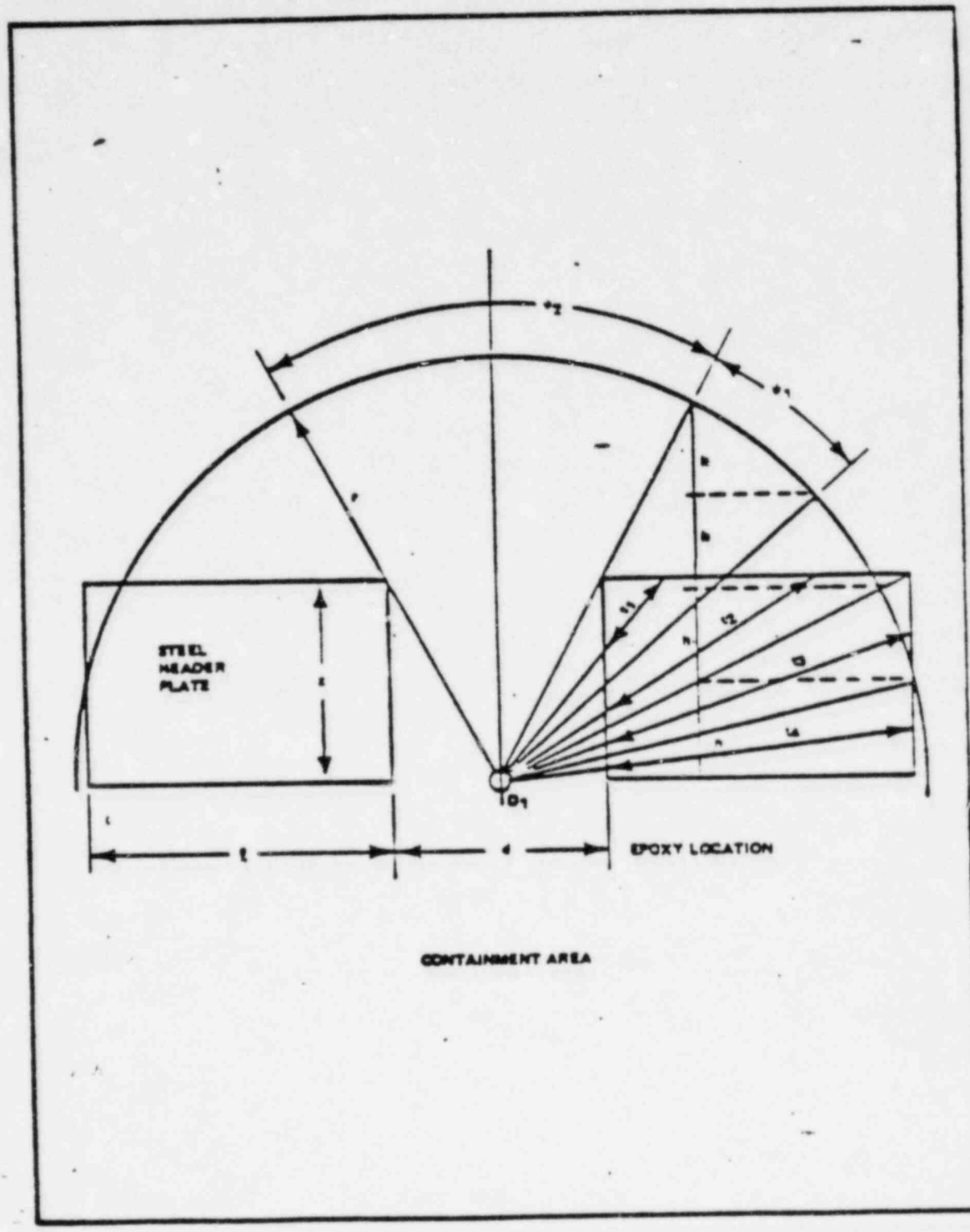


Figure 2 ELECTRICAL PENETRATION GAMMA RADIATION EXPOSURE

From Figure 2:

Solid angle of each of 4 shielded zones:

$$\psi_1 = \frac{2\pi rh}{r^2} = \frac{2\pi h}{r} \text{ where values are scaled from Figure 2}$$

and $$\psi_1 = \frac{2\pi(0.92)}{4.250} = 1.35$$

$$\psi_1 = A/z^2 = \frac{\pi d^2/4}{z^2} = \frac{\pi(2.12)^2}{2^2} = 0.88$$

Check ψ_2:

$$\psi_2 = 2\pi - 4(\psi_1) = 6.28 - 4(1.35) = 0.88$$

Given: Containment ψ dose $(R_o) = 1.0 \times 10^8 R$

ψ dose (R_1) at module epoxy (detector D_1)

$$R_1 = \left(\frac{R}{Ster}\right)(\psi_2 + \psi_1 B_n)$$

where B_n = transmission or protection factor of the steel defined by thickness t_n shown on Figure 2.

From Figure 2	B (Factor)
$t_1 = 0.934$	0.7
$t_2 = 2.50$	0.2
$t_3 = 3.25$	0.12
$t_4 = 3.00$	0.15

$$R_1 = (1.59 \times 10^7)\,[0.88 + 1.35\,(0.7 + 0.2 + 0.12 + 0.15)]$$

$$= (1.59 \times 10^7)\,(0.88 + 1.58)$$

$$= 3.90 \times 10^7 R$$

Requirements

To minimize the number of irradiation exposure tests, a conservative minimum value of 5×10^7R was selected as the integrated dose level applied to the qualification hardware.

Test Equipment and Setup

Gamma radiation exposure was performed at Vallecitos Nuclear Center. Each penetration module and it's shield building seal were exposed to the required total gamma dose in the gamma field at the Cobalt-60 facility. Each electrical penetration module was exposed individually.

Test Hardware

Modules	Serial No.	Part No.
4/0 AWG	TG-8	163C1914G008
2 AWG	TG-7	163C1914G007
8 AWG	TG-6	163C1914G006
12 AWG	TG-5	163C1914G005
T/C	TG-3	163C1914G003
SRM/IRM	TG-1	195B9904G001

Test Description

Each module was subjected to the exposure shown in Table 2.

Table 2

Modules	Serial No.	Primary Seal	Shield Bldg. Seal
4/0 AWG	TG-8	5.3×10^7 Rads	1.3×10^5 Rads
2 AWG	TG-7	9.8×10^7 Rads	1.3×10^5 Rads
8 AWG	TG-6	6.7×10^7 Rads	1.3×10^5 Rads
12 AWG	TG-5	6.0×10^7 Rads	1.3×10^5 Rads
T/C	TG-3	5.0×10^7 Rads	1.3×10^5 Rads
SRM/IRM	TG-1	6.1×10^7 Rads	1.3×10^5 Rads

This test was performed on each module separately. The penetration was disassembled and each module, with its own set of "O" rings, was subjected to gamma radiation. The 4/0 AWG required two adjacent cables be cut before it would fit into tube going into the gamma pit. The 2 AWG module required cutting three cables for the same reason. These cables were cut between the two seals and spliced back together after testing.

Test Results

Leak Test - All modules had a leak rate less than 1×10^{-6} CC/sec

Electrical Testing

Module	Insulation Resistance	Withstand Voltage
#4/0 AWG	10^6	500V
#2 AWG	10^6	500V
#8 AWG	10^6	500V
#12 AWG	10^6	500V
T/C	10^6	500V
SRM/IRM	10^{12}	500V

OVERCURRENT TESTING

Introduction

This test covers short circuit, overload and rated current loading on the 4/0 AWG, 2 AWG, 8 AWG, and 12 AWG modules. These tests demonstrate the ability of the penetration to withstand these current loading conditions.

Requirements

The test requirements are shown in the table below:

Module	SHORT CIRCUIT			OVERLOAD		RATED CURRENT
	I ASYM AMPS-RMS	I SYM AMPS-RMS	TIME CYCLES	I AMPS	TIME SEC.	I AMPS
4/0	42000	32000	8 Hz	1050	30	150
2	13000	10000	8 Hz	470	30	67
8	3300	2600	8 Hz	170	30	24
12	1800	1350	8 Hz	84	30	12

Notes: 1) Rated and over-load currents are derated for density of wires and 122°F per NEC.

2) Short circuit currents are maximum of any one of the three phases.

Test Equipment and Setup

The overcurrent testing was performed at the General Electric High Test Lab. in Bloomington Illinois. See test results summary for test setup.

Test Hardware

Electric Penetration Assembly 133D9258

Junction boxes were not used with this assembly.

Test Description and Results

See report, "Electrical Penetration Test Results Summary 4/0, #2, #8, #12 Modules", prepared by Leland Wright, Manager of Evaluation Laboratory.

Discussion of Results

The 4/0 AWG module insulation separation was on one end of the Shield Building Seal Module. This can only be attributed to a defect that occurred during manufacturing or assembly since this was the only cable out of the six that showed any separation. It should be noted that the actual test current was approximately 15% higher than the required value. Also, in the three phase test circuit two adjacent cables were used instead of alternating cables (See Figure 3). This was necessary because of the cables that were cut during the Radiation Test.

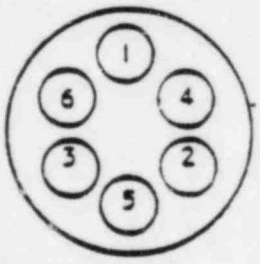


Figure 3

Test Circuit Used Cables 1, 4 and 3

The cuts in the insulation at the cable supports resulted from sharp edges where the holes were cut in the support. These supports did not have the 45° bevel required on all holes cut in the support boards. The beveled support board was used on the short circuit testing covered in Low Voltage Qualification Test Report #74-502-3 with no insulation damage.

Test Results

Leak Test - Less than 1×10^{-6} cc/sec

Electrical Tests

Modules	Insulation Resistance	Applied Voltage
4/0 AWG	10^6 Ω	500V
# 2 AWG	10^6 Ω	500V
# 8 AWG	10^6 Ω	500V
#12 AWG	10^6 Ω	500V
T/C	N/A	N/A
SRM/IRM	N/A	N/A

ELECTRICAL PENETRATION

TEST RESULTS SUMMARY

4/0, #2, #8, #12 MODULES

Short circuit, overload, and rated current tests were conducted on the 4/0, 2, 8, and 12 modules from Aug.18 through Aug.27 at General Electric's High Current Test Lab. in Bloomington, Illinois.

All short circuit tests were run with maximum offset current in C phase with controlled power factor to meet or exceed the required asymmetrical to symmetrical ratio. The test parameters are listed in Table 3.

Some results from the short circuit tests are worth noting. The 4/0 module, C phase wire had insulation slippage that left the copper wire bare near the module. Also, all phases showed cut insulation in the cable supports external to the module. Figures 6 through 8 illustrate the observed 4/0 cable condition after the test.

TABLE 3

Module	Voltage Open Circuit	Asym I Avg.	Sym I Avg.	I Duration Cycle @ 60 Hz	A Phase Asym I / Sym I	B Phase Asym I / Sym I	C Phase Asym I / Sym I
4/0	670	41378	35406	8 1/2	34751 / 33492	41267 / 35882	48116 / 36842
#2	605	12816	10201	8 1/2	10864 / 10137	12743 / 9868	14842 / 10599
#8	632	3128	2704	9	2631 / 2590	3280 / 2697	3474 / 2826
#12	492	1634	1425	4*	1397 / 1384	1743 / 1432	1761 / 1458

* Power applied for 8 cycles, shorting connector interrupted current.

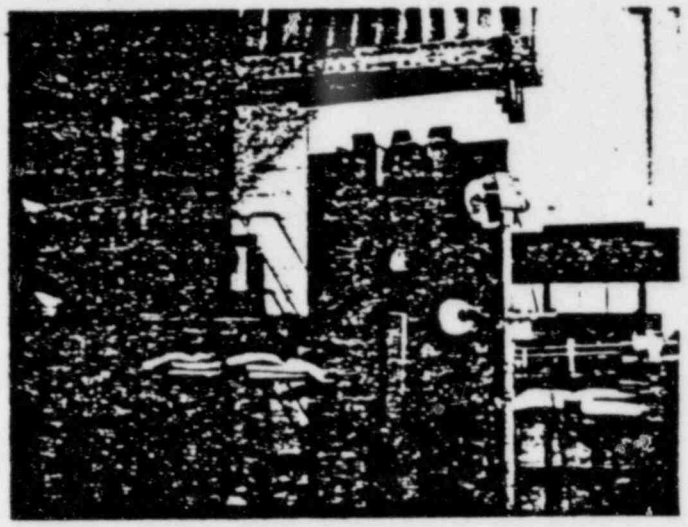


FIGURE 4 Device before the short circuit tests. All cables are supported midway between the modules in a single clamp.

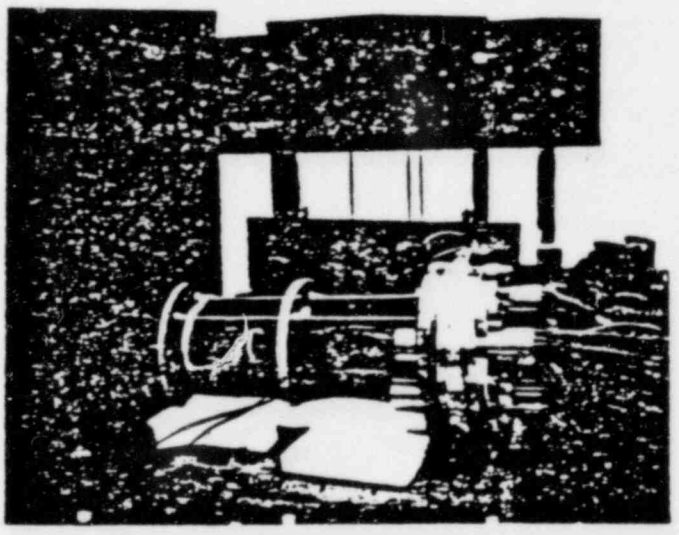


FIGURE 5 Before the 4, 8, 12 tests. The flange is grounded through 2 #10 wires.

FIGURE 6 After the 4/0 test. The C phase insulation is separated.

FIGURE 7 After the 4/0 short circuit test. Insulation is cut through at the cable support.

FIGURE 8 After the 4/0 short circuit test. The cables have assumed a maximum inductance configuration but the shorting connectors are not broken and the module in the photo shows no visually detectable damage.

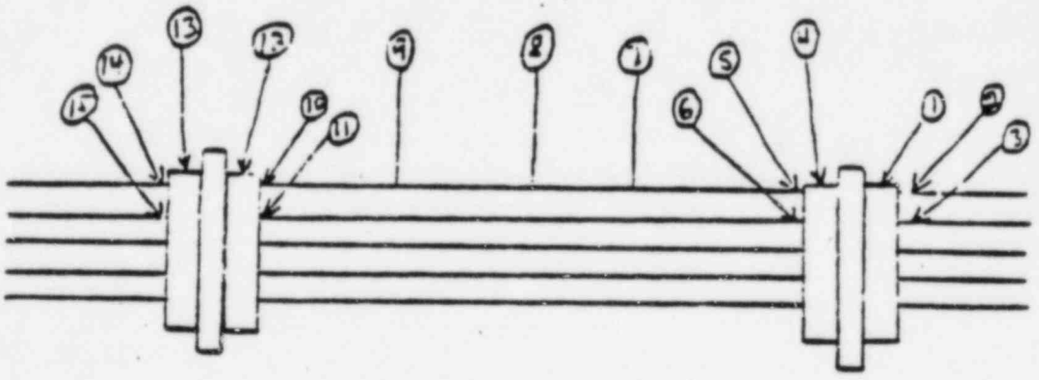
OVERLOAD AND HEAT RISE TESTS

Test parameters and results are listed in Tables II through V. Temperatures were measured in degrees centigrade after the heat rise test and again after the overload test. The heat rise tests were conducted on the open configuration of the assembly and no enclosing material was used around the assembly.

Figure 9 illustrates the location of the 15 thermocouples used on all the overload and heat rise tests.

Heat runs were allowed to stabilize overnight. The 30 second overload test was applied after temperatures had stabilized and at the same time the heat run current was applied. Temperatures were measured with iron/constantine thermocouple wire and monitored by a Doric thermocouple meter calibrated within 1% accuracy. Each wire module was tested separately. The 3 short circuit wires of each module were used for the 30 second overload tests. The overload test was conducted 3 phase, upstream loads with Wye connection. The following sketch is position of thermocouples and same applies to all modules: (Represents one module of wires).

Thermocouples or outside insulation of wires. All temperatures are in degrees C.



Input End Short Circuit End

FIGURE 9 Thermocouple locations.

Table II

Module 4/0

Overload Test

Voc_{LL} 628

Vcc_{LL} 602

I 1052

Heat Run

Voc_{LL} 626.9

Vcc_{LL} 600.1

I 151.14

Total number of wires in module 6

No. used for overload 3

No. used for heat run 3

	START	FINISH	RISE	WITH OVER-LOAD AMPS	TOTAL RISE
AMBIENT	24.9	29.3	4.4	29.2	4.3
1	25.0	37.3	7.9	37.5	8.2
2	26.8	38.0	6.8	38.2	7.1
3	25.2	37.5	7.9	37.6	8.1
4	24.9	38.9	9.6	42.0	12.8
5	25.2	41.7	12.1	42.8	13.3
6	25.1	39.6	10.1	40.3	10.9
7	25.3	36.9	7.2	37.2	7.6
8	25.4	36.2	6.4	36.3	6.6
9	25.3	37.4	7.7	37.9	8.3
10	25.0	36.2	6.8	37.4	8.1
11	25.1	36.9	7.4	37.1	7.7
12	25.1	31.9	2.8	32.5	3.5
13	25.0	31.6	2.6	31.7	2.8
14	25.2	35.7	6.1	36.0	6.5
15	25.1	34.8	5.3	36.4	7.0

Table III

Module #2

Overload Test

Voc_{LL} 615

Vcc_{LL} 602

I 471

Heat Run

Voc_{LL} 612.5

Vcc_{LL} 600.4

I 68.91

Total number of wires in Module 15

No. used for overload 4

No. used for heat run 6

	START	FINISH	RISE	WITH OVER-LOAD AMPS	TOTAL RISE
AMBIENT	28.8	28.7	-0.1	28.7	-0.1
1	29.1	38.8	9.8	41.8	12.8
2	29.2	41.6	12.5	45.8	16.7
3	29.1	43.0	14.0	44.5	15.5
4	28.9	40.0	11.2	44.6	15.8
5	29.0	43.9	15.0	45.8	16.9
6	28.8	40.5	11.8	44.3	15.6
7	29.4	38.7	9.4	38.9	9.6
8	29.1	33.1	4.1	33.5	4.5
9	29.3	39.6	10.4	40.6	11.4
10	29.2	34.8	5.7	36.2	7.1
11	29.4	36.3	6.9	38.1	8.8
12	29.2	31.4	2.3	32.6	3.5
13	28.9	32.0	3.2	32.3	3.5
14	29.5	37.0	7.6	38.3	8.9
15	29.5	34.3	4.9	35.5	6.1

Table IV

Module #8

Overload Test

Voc_{LL} 605

Vcc_{LL} 601

I 170.5

Heat Run

Voc_{LL} 536.1

Vcc_{LL} 532.6

I 24.02

Total number of wires in Module 45

No. used for overload 4

No. used for heat run 18

	START	FINISH	RISE	WITH OVER-LOAD AMPS	TOTAL RISE
AMBIENT	24.7	28.8	4.1	27.7	3.0
1	24.8	40.4	11.5	39.6	11.8
2	24.9	43.2	14.2	42.3	14.4
3	24.7	44.1	15.3	46.7	19.0
4	24.8	44.5	15.6	46.8	19.0
5	24.9	48.3	19.3	48.1	20.2
6	24.7	45.0	16.2	45.1	17.4
7	25.2	49.1	19.8	48.9	20.7
8	24.9	37.3	8.3	36.9	9.0
9	25.1	38.1	8.9	38.0	9.9
10	25.2	37.4	8.1	36.8	8.6
11	25.1	38.4	9.2	38.1	10.0
12	24.9	34.3	5.3	33.7	5.8
13	24.7	33.1	4.3	32.3	4.6
14	24.9	39.4	10.4	38.6	10.7
15	25.0	37.4	8.3	36.7	8.7

Table V

Module #12

Overload Test

Voc_{LL} 608

Vcc_{LL} 605

I 84.0

Heat Run

Voc_{LL} 536.1

Vcc_{LL} 534.2

I 12.07

Total number of wires in module 121

No. used for overload 4

No. used for heat run 42

	START	FINISH	RISE	WITH OVER-LOAD AMPS	TOTAL RISE
AMBIENT	25.7	28.1	2.4	28.1	2.4
1	26.0	69.3	40.9	71.9	43.5
2	25.8	62.9	34.7	64.3	36.1
3	25.8	84.7	56.5	93.6	65.4
4	26.1	64.4	35.9	65.3	36.8
5	26.0	59.3	30.9	59.4	31.0
6	26.0	66.8	38.4	67.3	38.9
7	25.9	62.6	34.3	62.8	34.5
8	25.7	46.7	18.6	48.9	20.8
9	25.9	35.5	7.2	35.9	7.6
10	26.2	39.7	11.1	39.8	11.2
11	26.2	41.7	13.1	41.8	13.2
12	26.1	36.4	7.9	36.6	8.1
13	26.3	37.7	9.0	38.1	9.4
14	26.4	39.5	10.7	40.1	11.3
15	26.4	40.3	11.5	40.7	11.9

NOTE: #16 wire spliced with #12 wire on short circuit end.

Leland Wright

Leland Wright
Manager-Evaluation Laboratory

LOSS-OF-COOLANT ACCIDENT

Introduction

This qualification test is designed to demonstrate that the 200 Series electrical penetration can maintain necessary requirements for containment integrity and electrical circuit integrity during a postulated nuclear containment loss-of-coolant accident (LOCA). This is a simultaneous testing of service environment (LOCA) and electrical loading. All qualification hardware has been previously exposed to thermal cycle (simulation startup and shutdown during the life of the plant), exposure to gamma radiation, and overload current testing, except as noted.

Requirements

The environmental test requirements are listed in the table below:

Environmental Conditions

Temperature, ^{o}F	340	320	250	200*
Pressure, psig	103	81	25	20
Humidity, %	100	100	-	-
Duration, hours	3	3	18	100 days

* This phase of testing to be completed after seismic testing

Voltage

Operating voltages of 500V on all power modules and 220V on the control modules are required on 30% of the conductors in each module during the first 24 hours of testing.

Current loading is required on 30% of the conductors in each module, except the thermocouple and SRM/IRM, during the first 24 hours of testing. See table for required current test values.

Current Loading

Module	4/0 AWG	2 AWG	8 AWG	12 AWG
Current, amp.	150	67	24	2.5

Test Equipment and Setup

Autoclave - The autoclave is an ASME "U" stamped vessel designed for 150 psig and 350°F. The autoclave is equipped with GE Calrod heater elements and variac potentiometers. The minimum required line voltage and current are 110 v and 30 amperes to achieve necessary heating.

The autoclave is filled with 5-1/2 gallons of water for obtaining the required relative humidity during test. Calibrated pressure gauges and relief valves are attached to the autoclave. All interface piping connections for helium supply are 1/4 NPT.

Power Supply - Model M8C15-250, Systron Donner Corp., Serial No. 153701

LOCA Test Setup - See Figure 10.

Test Hardware

Electric Penetration Assembly 195B9850 - Six modules are installed in this assembly. The seventh hole in the header was plugged with an old design stock module. This old module was later replaced with a steel plug. The modules are identified as follows for Tests 1 and 2.

Modules	Serial No.	Part Number
4/0 AWG	TG-8	163C1914G008
2 AWG	TG-7	163C1914G007
8 AWG	TG-6	163C1914G006
12 AWG	TG-5	163C1914G005
T/C	TG-3	163C1914G003
SRM/IRM	TG-1	195B9904G001

The modules used in Test 3 are identified as follows:

Modules	Serial No.	Part Number
4/0 AWG	E339F009	163C1914G008
2 AWG	E339F014	163C1914G007
8 AWG	E339F012	163C1914G006

TEST SETUP - LOCA TEST

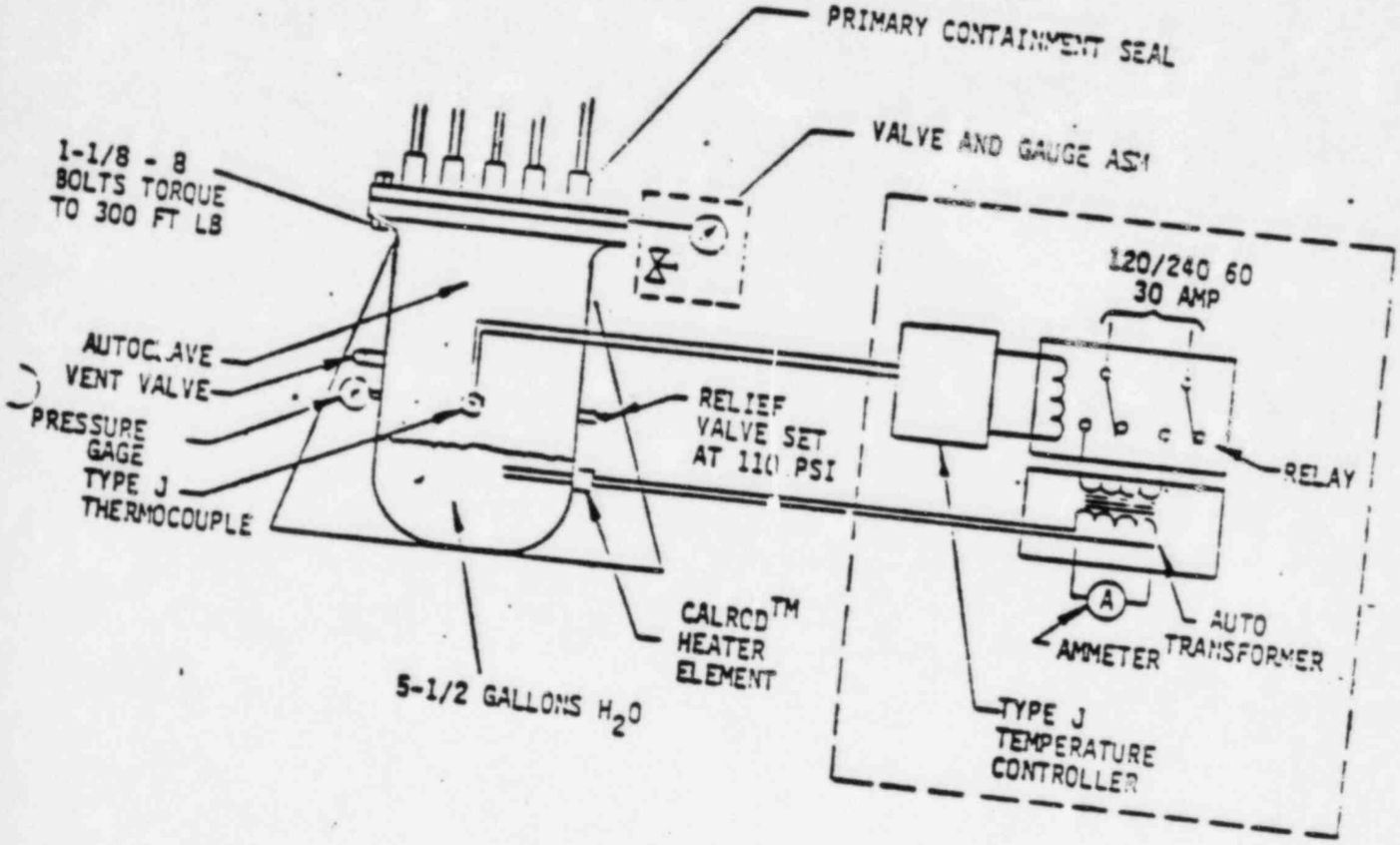


FIGURE 10

Test Description

The actual test values are summarized below:

ENVIRONMENTAL CONDITIONS

Test #1

Temperature, °F	260	340	340	Plug
Pressure, psig	20	103	103	Blowout
Humidity, %	100	100	100	Test
Duration, hours (running time)	0	.75	1.25	Stopped

Test #2

Temperature, °F	235	340	340	328	328	275	275	210*
Pressure, psig	22	103	103	80	80	26	26	20
Humidity, %	100	100	100	100	100	100	100	100
Duration, hours (running time)	0	1.5	4.5	4.75	8.0	8.5	25.5	13 days

Test #3

Temperature, °F	250	340	340	325	250
Pressure, psig	25	103	103	81	25
Humidity, %	100	100	100	100	100
Duration, hours (running time)	0	1.0	4.0	7.0	25.0

Current

Modules	4/0 AWG	2 AWG	8 AWG	12 AWG	T/C
No. of Conductors	3	6	15	28	28
Current (amp.)	150	75	25	2.5	2.5

Voltage

Modules	4/0 AWG	2 AWG	8 AWG	12 AWG	T/C
No. of Conductors	4	6	15	28	28
Voltage	500	500	500	250	250

* Test conducted after seismic test (p. 35) with no electrical loading.

Tests 1 & 2

The testing sequence was performed in three phases because of a Dummy Module blowout during Test #1. This Dummy Module was used to seal the additional (seventh) header hole and consisted of an old design stock module. The blowout of the Dummy Module caused an instantaneous blowdown of the autoclave resulting in a jet force type of situation inside the autoclave. The Dummy Module was replaced with a steel plug and the test was restarted. After restarting the test, it was found that the blowout resulted in the inability to apply operating voltages on the three power modules. The test was continued for the 24 hour duration with the rated current loading being continuously applied. After completion of the test, it was found that the affect of the blowout was to destroy the voltage circuitry configuration inside the autoclave. The series circuit for current loading remained operational and current was applied continuously during the test. The circuitry for the 12 AWG and thermocouple modules also remained totally operable for voltage and current.

Test 3

Verification that voltage could be maintained during LOCA was performed on backup modules of the same type. These three modules were not subjected to thermal cycle or radiation aging since both analysis and testing have demonstrated that this type of aging will slightly improve the electrical characteristics of the epoxy. All three modules were subjected to the required environment. Operating voltage was applied continuously on the 4/0 AWG and the 2 AWG module. Operating voltage was also applied to the 8 AWG module but the parallel circuit shorted during the 340°F phase. The test was continued and it was found that two (2) out of the fifteen (15) cables were shorting to ground. These two (2) cables were removed from the circuit and voltage was reapplied before the beginning of the 320°F phase of the test. After testing, it was found that the two (2) failing cables were in direct contact with the inside of the autoclave, thereby causing the short. All conductors were tested individually after the test at 500 volts and showed an insulation resistance of greater than 10^8 ohms.

Test Results

Leak Test - Each module had a leak rate less than 1×10^{-6} cc/sec.

Electrical Testing

Electrical integrity was demonstrated during testing. In addition, the 8 AWG module (S/N E339F012) successfully passed a 500 V withstand voltage test and had an insulation resistance of greater than 10^8 ohms on all cables after testing. The SRM/IRM module had an insulation resistance greater than 10^{10} and successfully passed a withstand voltage of 2.2 KV after testing.

SEISMIC VIBRATION TEST

Introduction

The testing performed on the 100 Series design also applies to this 200 Series design. For the integral containment application, there is no difference, from a vibration model point of view, between the two series. In the free-standing containment, the natural frequency (200 Series) must necessarily be greater since both ends of the cable feed-thru are fixed, whereas in the 100 Series, only the "header-end" is fixed.

The 200 Series qualification unit was subjected to a seismic test for the purpose of imposing loads on the unit, as part of the overall sequential testing program. Following the short-term LOCA event (first 24 hours), the unit was transferred from the autoclave test chamber and placed on the GE-San Jose vibration facility platform.

Requirements

As the natural frequency of the penetration is greater than 33 Hz, the horizontal and vertical g loading is conservatively established at 1.5 g, respectively.

Test Equipment

GE San Jose Vibration Test Facility under management and direction of Development Engineering, BWRSD.

Test Hardware

Modules	Serial No.	Part Number
4/0 AWG	TG-8	163C1914G008
2 AWG	TG-7	163C1914G007
8 AWG	TG-6	163C1914G006
12 AWG	TG-5	163C1914G005
T/C	TG-3	163C1914G003
SRM/IRM	TG-1	195B9904G001

Test Description

The following input loads were applied to the unit:

Type	Frequency Range	Horizontal	Vertical
Random	0 - 50 Hz	1.5g	1.5g

The unit was not rigidly fixed to the table whereas in the plant installed condition, the header is welded to the nozzle. The test condition produced amplication on the unit which exceeded the 1.5g load.

Being an unrealistic condition, the unit was subjected to loads in excess of actual limits, thus providing a test margin.

Appendix A of this report extracts the test of the 100 Series from the Low Voltage Qualification Test Report (100 Series) (reference).

In addition, each module was wired in series and connected to a 110 VAC light bulb circuit which remained "on" throughout the test. There were no observed intermittent lighting conditions.

Acceptance Testing

The assembly was reinstalled in the autoclave (see page 29). For a period of 10 days, the autoclave maintained 20 psig of nitrogen, verifying that the penetration was leak tight to less than 1×10^{-2} cc/sec.

LOCA Confidence Test

To increase the confidence level and sample size in the qualification test, the LOCA phase of the program was repeated using modules totally fabricated by Shop Operations personnel.

Test Equipment and Set-Up

Autoclave - The autoclave is an ASME "U" stamped vessel designed for 150 psig and 350°F. The autoclave is equipped with GE calrod heater elements and variac potentiometers. The minimum required line voltage and current are 110 v and 30 amperes to achieve necessary heating.

The autoclave is filled with 5-1/2 gallons of water for obtaining the required relative humidity during test. Calibrated pressure gauges and relief valves are attached to the autoclave. All interface piping connections for helium supply are 1/4 NPT.

Power Supply - Model M8C15-250, Systron Donner Corp., Serial No. 153701

LOCA Test Setup - See Figure 10.

Test Hardware

Electric Penetration Assembly 195B9850 - Three modules were installed in the header plate assembly. The module identifications are as follows:

Module	S/N	Part Number
16 AWG	E339F105	163C1914G005
4/0	E339F009	163C1914G008
2 AWG	E339F014	163C1914G007

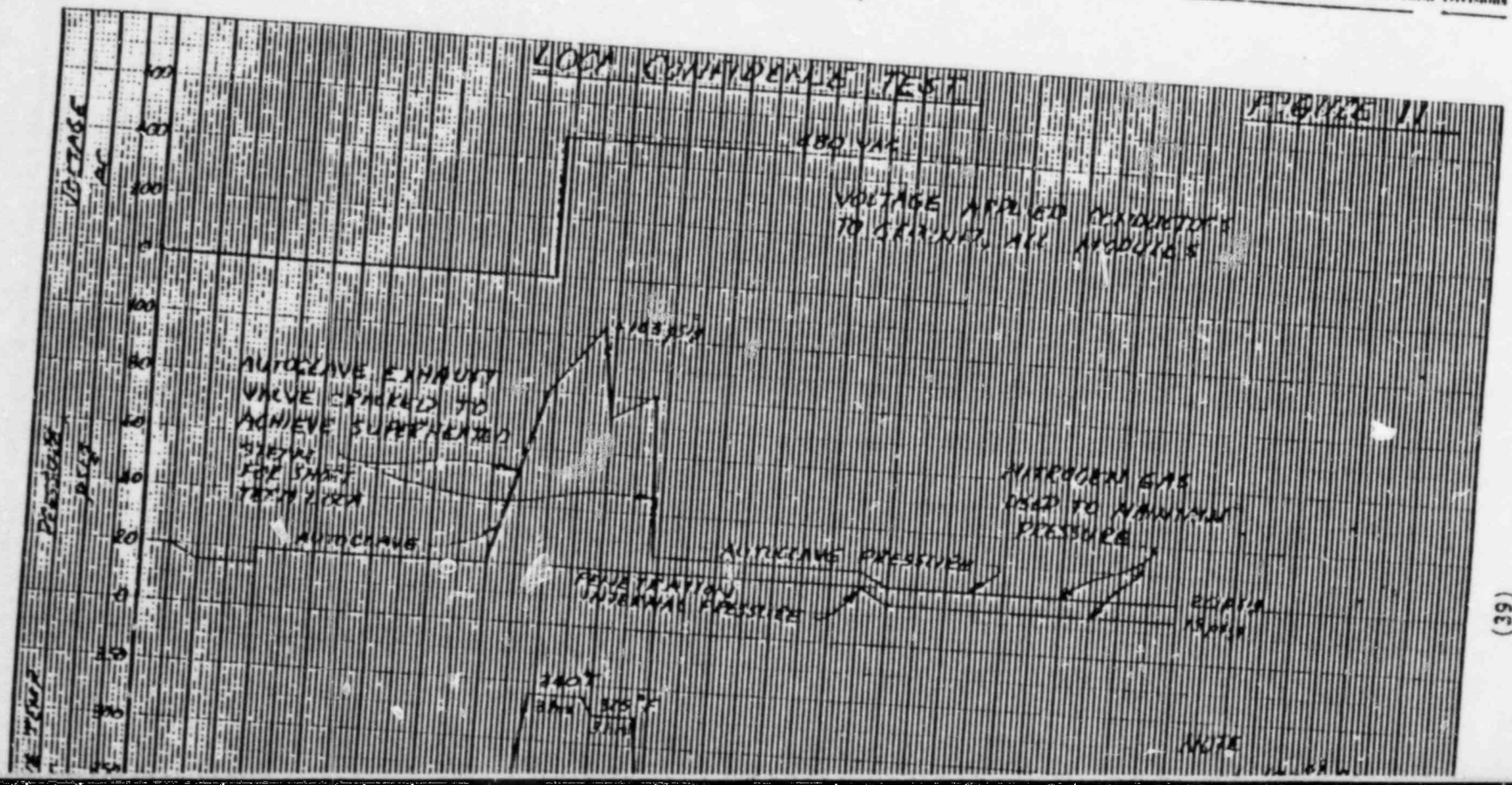
Test Description

The actual test values are summarized on Figure 11. Throughout the test, 100% RH was present in the autoclave.

Discussion

All circuits in all modules withstood a continuous voltage stress without breakdown. At no time during the test did the penetration assembly lose pressure, demonstrating a leak rate of less than $1x10^{-2}$ cc N_2/sec. at environmental pressures and temperatures. Furthermore, the modules were subjected to 12 days (from 12/22/76 - 1/3/77) of preheat stress prior to start of the LOCA environmental event.

In every respect, the 200 Series Pen Seal design passed qualification test loads and has demonstrated the design capability of being installed in nuclear containment structures.


LOCA CONTAINMENT TEST
480 VAC
VOLTAGE APPLIED TO MOTOR TO OBTAIN ALL ADJUSTS
AUTOCLAVE EXHAUST VALVE CRACKED TO ACHIEVE SUPERHEATED STEAM FOR SMOKE TEST PURPOSES
AUTOCLAVE
AUTOCLAVE PRESSURE
NITROGEN GAS USED TO MAINTAIN PRESSURE
20 PSIA MINIMUM
NOTE

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References:

Qualification Test Plan	:	262A7178
Qualification Test Summary Report (100 Series)	:	SPE Memo 994-75-011
Low Voltage Qualification Test Report (100 Series):		74-502-3

APPENDIX A

SEISMIC

BASIC EQUIPMENT REQUIREMENT

To assure that the equipment will remain operational so that a safe and orderly shutdown of the plant can be achieved and maintained after experiencing an earthquake.

To assure that the equipment will remain operational to perform their functions as required for the continued operation of the plant after experiencing an earthquake with subsequent preventative maintenance performed on the equipment.

INTRODUCTION

This seismic test is applicable to penetrations installed in nozzles which are held rigid in the containment wall by a liner plate and surrounding concrete. The length of the nozzle is not a variable in the test, but instead, the penetration overhang of 6 to 10 inches from the containment wall is the main modeling characteristic.

The nozzle length affects only the internal cable vibration characteristics of the low voltage and signal penetrations, and since cables are supported approximately every 24 inches, a 4-1/2 foot length nozzle has been selected.

The design acceleration spectra selected is a worst case composite of known specifications reviewed to date.

REFERENCES

IEEE Standard 317-1972
GE Document No. 383HA745
Design and Performance Specification 234A9894
AEC Regulatory Guides 1.61 and 1.60

CONFIGURATIONS

The low voltage and signal penetrations are of an independent modular design. As a result of this design, a potpourri of various wire and cable feedthrus are incorporated into a single header. These modules are selected to cover the range of available cable sizes and all generic module designs and include the following:

Coax RG-59 (PWR)
No. 4/0
No. 8 AWG
No. 6 AWG
SRM/IRM Coax (BWR)
RG-11 Triax (PWR)
No. 12 AWG

In addition, the seismic test will examine terminations in the junction boxes which will include:

Terminal boards
Bulkhead associated connectors
Pigtail leads

SUCCESS CRITERIA

STRUCTURAL INTEGRITY

Each penetration is fabricated in accordance with the ASME Boiler and Pressure Vessel Code, Section III, Class MC and thereby receives all NDT weld examinations. After completion of the test, the welds will once again be examined in the manner prescribed by Section III of the Code.

Visual examination (QC inspections) will be made of all non-Code hardware, including:

All screw attachments
Junction box brackets
Terminal blocks
Wire and cable

Criteria for success will be that:

1. No structural change shall occur as a result of the vibration test, to the ASME Code welds, and any other structural attachment weld, such as junction box brackets.
2. Terminal block connections and bulkhead connectors shall not loosen so as to cause electrical discontinuity.
3. Electrical wire shall not sever nor shall wire insulation be damaged.
4. Electrical connector lugs (for low voltage power cables (4/0)) shall not become loose.
5. Attachment hardware shall not loosen so as to cause secondary structural anomalies.

LEAK RATE INTEGRITY

Prior to and after completion of the test, the electrical penetrations will be tested to determine the helium leak rate at 92 psig of pressure. The acceptance criteria shall be a leak rate not to exceed 1×10^{-6} cc He/sec as determined by a helium mass spectrometer.

ELECTRICAL INTEGRITY

It is anticipated that vibration loads will affect electrical integrity in the areas of continuity. Final electrical production tests shall be conducted by General Electric at San Jose, California and shall include:

100% continuity of wires/cables
30% sample for withstand voltage
30% sample of insulation resistance

DOCUMENTATION

The documentation supporting the final test report shall include:

Seismic test results
QC pre-test production records
QC post-test records

VIBRATION TESTING OF ELECTRICAL PENETRATIONS

INTRODUCTION

The natural frequencies of the penetration have been studied by analysis. It indicates that all penetrations have very high natural frequency (rigid equipment). The model mass and damping value are also to be evaluated from the test data. The acceleration input at the shake table level is identified. The test results requirements are also discussed in the report.

The electrical penetration, which consists of two junction boxes and their attachments connected together by a 60 inch long (18 inch D or 12 inch D) nozzle, maintain the continuity of electrical cables between the inside and the outside of the reactor containment. The center portion of the nozzle is permanently cast inside the containment concrete wall.

The electrical penetration is considered as seismic category I equipment and the design will be qualified by test. The purpose of this report is to study the dynamic properties of this equipment and to identify the test requirements.

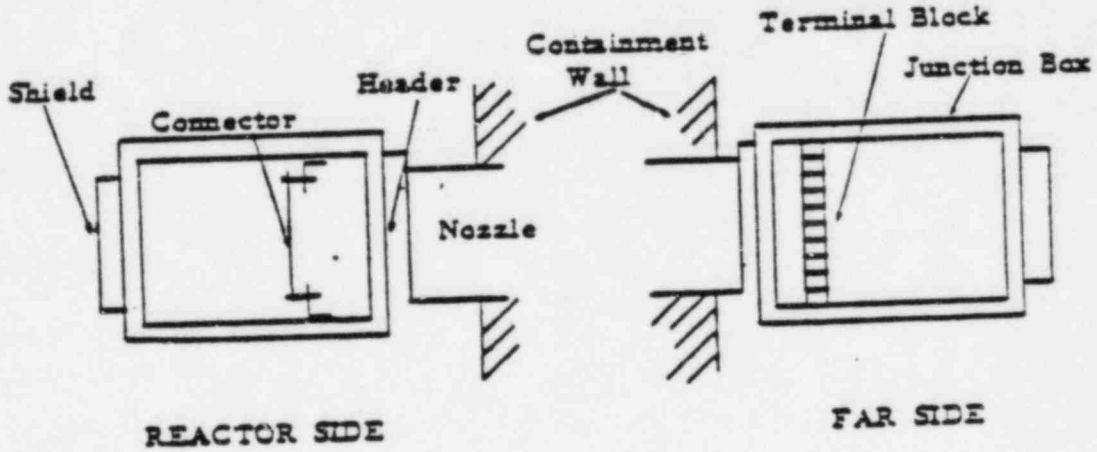
It has been found that the natural frequency of the terminal block in the junction box is low. High seismic stresses may occur as a result of this low frequency value.

NATURAL FREQUENCIES OF THE ELECTRICAL PENETRATION

Dynamic system properties are characterized by natural frequencies, dampings, and modal masses. This section is devoted to the study of natural frequencies of the electrical penetration.

The electrical penetration behaves essentially as two independent cantilever beams in vibration. The center portion of the nozzle is rigidly connected to the concrete containment and the junction boxes attached at the two ends of the nozzle are hung freely. Each beam consists of a shield, a junction box, a header, and part of the nozzle. The vibratory behavior of the cantilever beam in both the horizontal and the lateral direction are of interest here. The following briefly summarized the method of calculating the natural frequency of the system.

The two overhung parts of the electrical penetration a.. shown in Figure 11-1.



ELECTRICAL PENETRATION

Figure 11-1

In studying the lateral vibration, the electrical penetration is modeled as a two-degree lumped mass system. Flexibility method is used in calculating the fundamental frequency of the system.

The following formula is used:

$$\left(\frac{1}{\omega^2}\right)^4 - (f_{11}\, m_1 + f_{22}\, m_2)\frac{1}{\omega^2} + (f_{11}\, f_{22} - f_{12}^2)\, m_1\, m_2 = 0 \qquad (1)$$

where f_{ij} are the flexibility coefficients and they are given by:

$$f_{11} = l_1^3/(3EI_1) + l_1/(GA_{v1})$$

$$f_{12} = (3l_2\, l_1^2 + 2l_1^3)/6EI_1 + (l_1 + l_2)/(GA_{v1})$$

$$f_{22} = l_2^3/(3EI_2) + (3l_1 l_2^2 + 3l_1^2 l_2 + l_1^3)/(3EI_1) + (l_1 + l_2)/(GA_{v1}) + l_2/(GA_{v2})$$

The stiffness method is used in calculating the natural frequency in the longitudinal direction (X-direction). The electrical penetration is also modeled as a two-degree lumped mass system. The equation which will yield the fundamental frequency of the system is given by:

$$\omega^4 - [k_2/m_2 + (k_1 + k_2)/m_1]\,\omega^2 + k_1\, k_2/(m_1\, m_2) = 0 \qquad (2)$$

where k_{ij} are the stiffness coefficients and they are given by:

$$k_1 = A_1\, E/l_1$$

$$k_2 = A_2\, E/l_2$$

The information used in the calculation and results obtained are summarized in Table 11-1.

TESTING EQUIPMENT

Dynamic properties of the electrical penetration can be established from test. This information includes natural frequencies, modal dampings and the maximum response of the electrical penetration under the prescribed input acceleration.

TABLE 11-1
NATURAL FREQUENCIES OF ELECTRICAL PENETRATION

		Far Side	Reactor Side
Section Properties	m_1 (lb-sec^2/in.)	0.955	1.008
	m_2 (lb-sec^2/in.)	0.655	0.655
	ℓ_1 (in.)	4.5	10
	ℓ_2 (in.)	30	30
	I_1 (in.^{4})	475	475
	A_1 (in.^{4})	26	26
	I_2 (in.^{4})	954 (or 472)	954 (or 472)
	A_2 (in.^{4})	8.7	8.7
Fundamental Frequency (CPS)	X - Direction motion	560	530
	Y - Direction motion	150	129
	Z - Direction motion	140	125
	Cable housing	N/A	
	Terminal block	24	
	Connector plate	16	
	Top PL of junction box	30	

Testing Method

The electrical penetration shall be mounted properly on the shake table to simulate its actual supporting condition in the reactor building. In order to achieve the appropriate boundary conditions, it is suggested that the center span of the nozzle be cast in concrete if feasible. The entire assembly is tested each time but only the concrete block is bolted to the shake table. The acceleration at the point of attachment to the shake table will be recorded during the test and it is to be used as the reference input to avoid instrument error.

The test is to be divided into three parts: the low amplitude resonant search, the steady state vibration test, and the fragility test.

- Low amplitude resonant search: This part of the test is to establish the dynamic properties of the system. Natural frequencies of the assembly and its component, and the associated modal dampings and modal masses are to be found first. The input acceleration shall be with low amplitude but with varied frequency. It starts at low frequency and increases gradually. The rate of this frequency increase shall not be greater than 4 octaves/minute to avoid the missing of any resonant frequency.

- Steady state vibration test: The purpose of this part is to establish the functional capability of the equipment. The acceleration input will be discussed below and it shall last no less than 30 seconds at any testing frequency.

Dynamic Properties of the Electrical Penetration

Natural frequencies of the electrical penetration assembly and its components, the associated modal dampings and modal mass will be established from the test. Natural frequencies are calculated and given in this report. They are intended for reference only. Due to inherent errors in the approximation of the lumped mass system and the idealization of boundary conditions, the actual frequencies will be different from the calculated values.

Because the equipment has high natural frequency (rigid equipment), only the fundamental mode is of interest. Results obtained shall be included in the final report.

Testing Acceleration Input

The acceleration input shall be chosen properly so that it is compatible with the seismic requirements for Category I equipment as specified in CE document number 383HA745. These requirements, which are represented in the form of floor spectra, are given in Figures 11-3 and 11-4. The critical damping of 0.5% is to be used unless test results show otherwise.

In the steady state vibration test, the acceleration input at the shake table can be shown in one of the following two ways:

1. The acceleration input can be in the form of random, complex wave, decaying sine, or sine beat function. The amplitude of this input and its frequency content shall be chosen in such a way that the response spectrum developed from this input function will envelop the spectrum given in Figure 11-3 or 11-4.

2. Since the equipment is rigid and has natural frequencies greater than 33 cps, the applicable portion of the floor spectrum (Figures 11-3 and 11-4) has constant value. Thus, the input can be chosen in sinusoidal with a single frequency and with an amplitude of 1.25g for horizontal input and 1.0g for vertical input.

It is to be noted that Figures 11-3 and 11-4 are applicable to equipment located at ground level only. For requirements at higher elevation in the reactor building, the author of this report should be consulted.

Output Requirements

The main purpose of this test is to prove that the functional capability of the electrical penetration will be maintained during and after the design seismic loading is applied. Therefore, the functional capability shall be tested during and after the test.

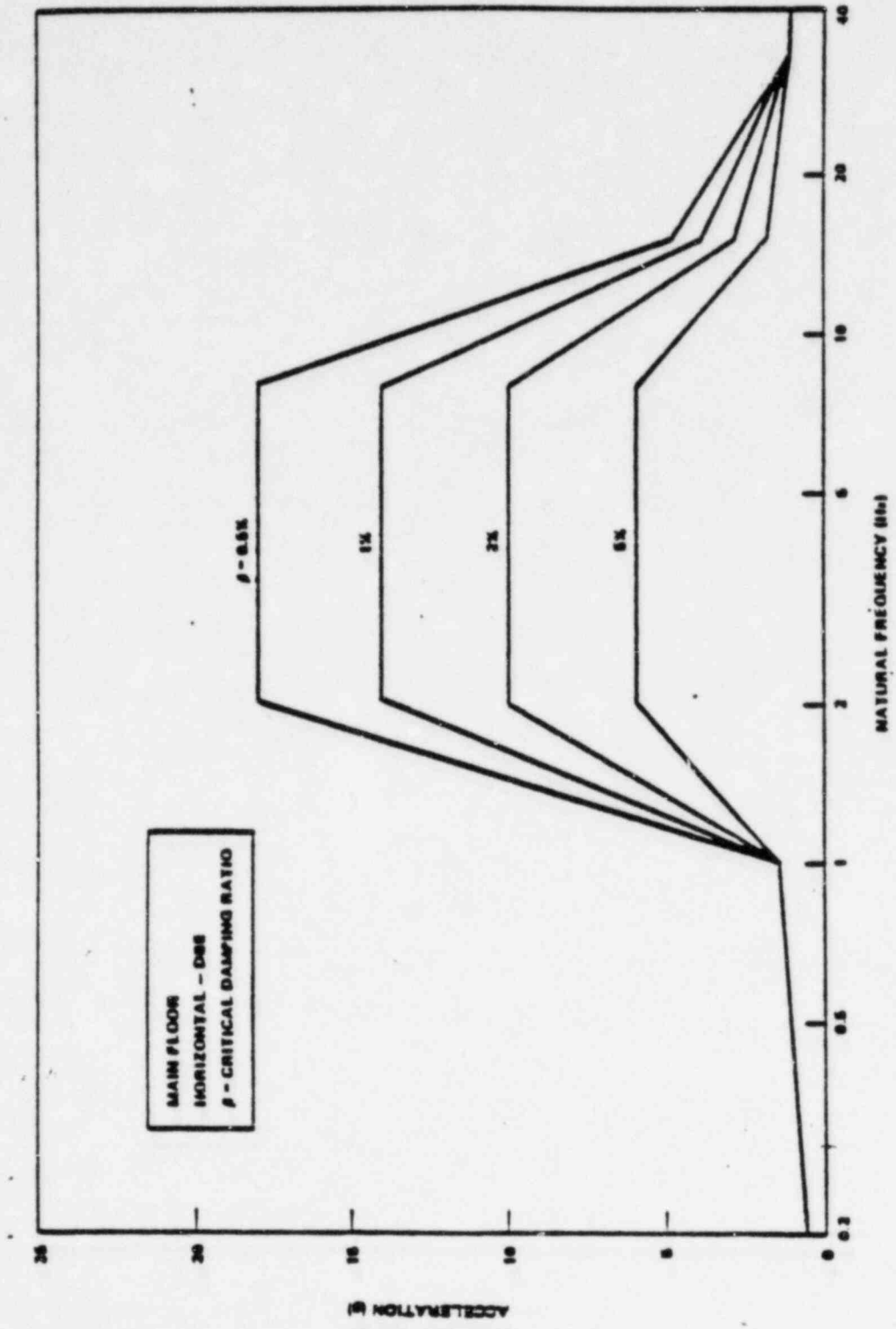


FIGURE 11-1 DESIGN ACCELERATION SPECTRA

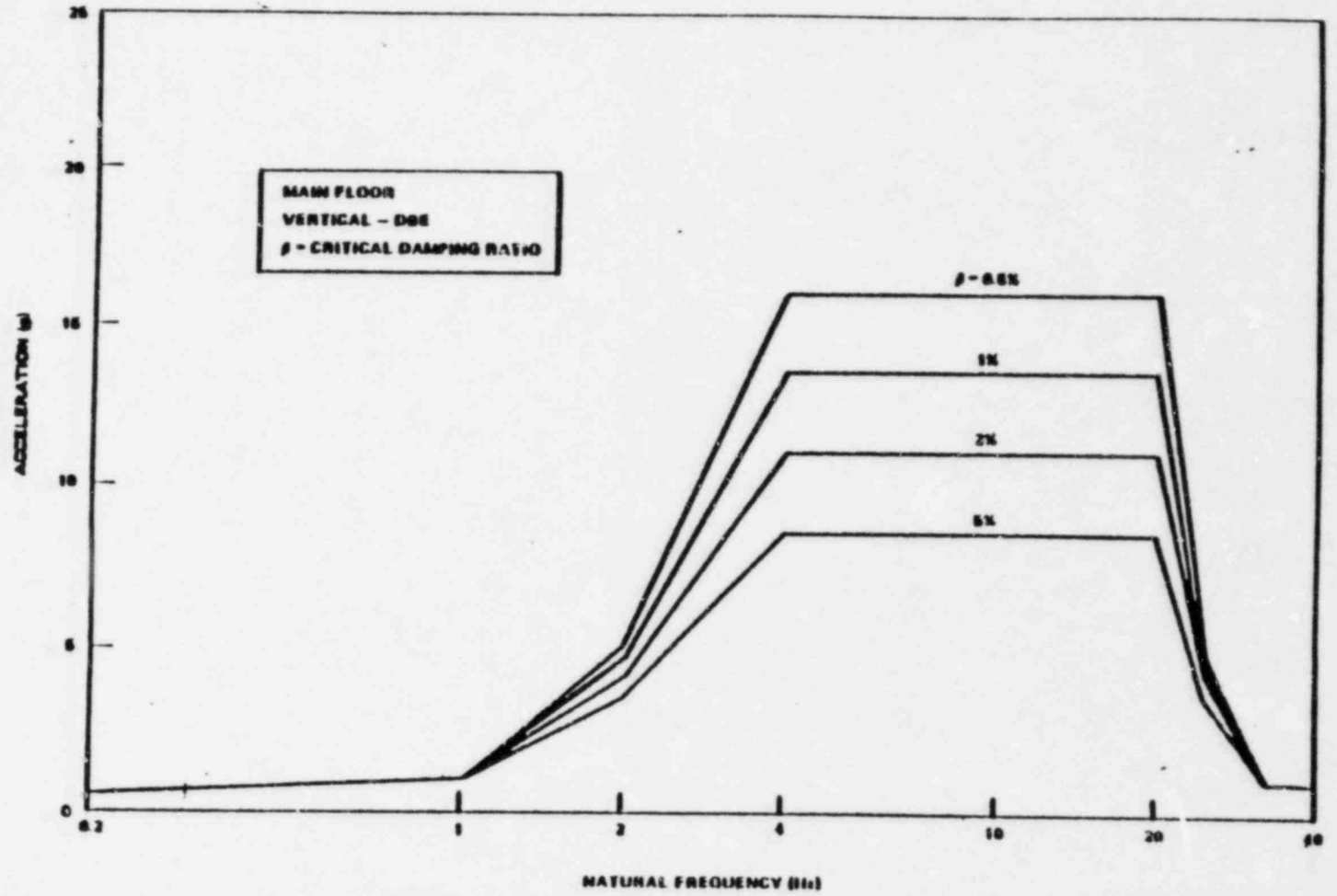


FIGURE 11-4. DESIGN ACCELERATION SPECTRA

Mechanical failure is intimately related to functional failure for this equipment, hence, the maximum response at critical locations shall be obtained. The following are the suggested locations from where output are required from the test.

Acceleration Output:

At the terminals of the cable in the junction box.

At the center span of the electrical penetration.

Displacement Output:

At the outside face of the junction box.

At the center span of the cable bundles for all electrical penetrations.

Stress Output:

On the outside surface of the nozzle near the supporting point.

After the test, the entire assembly shall be thoroughly examined for any possible damages. The lock screws which hold the junction box assembly on the far side to the nozzle shall be inspected for any possible mechanical failure.

WEIGHT STATEMENT

See Table 11-2.

TEST RESULTS

The following pages are certified results of the seismic vibration tests.

TABLE 11-2

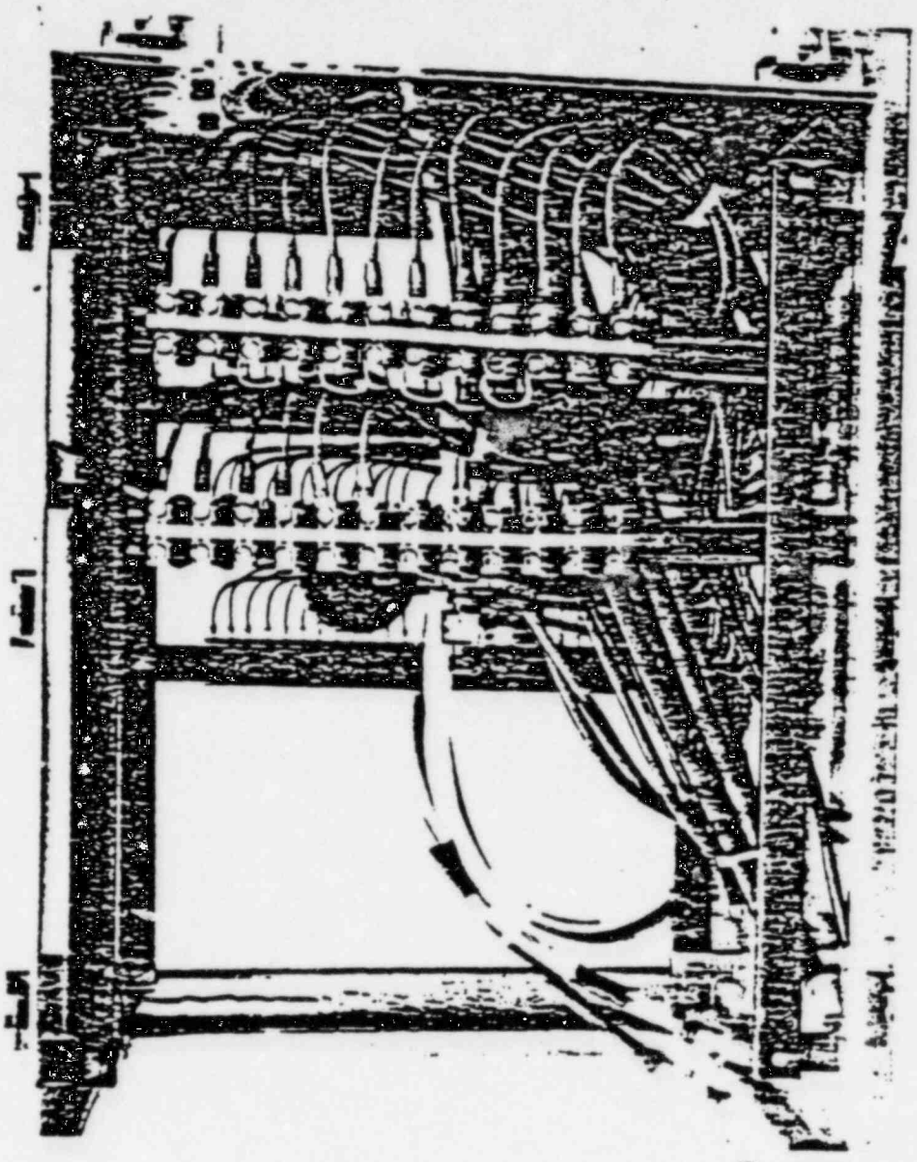
WEIGHT STATEMENT LOW VOLTAGE AND SIGNAL PENETRATION

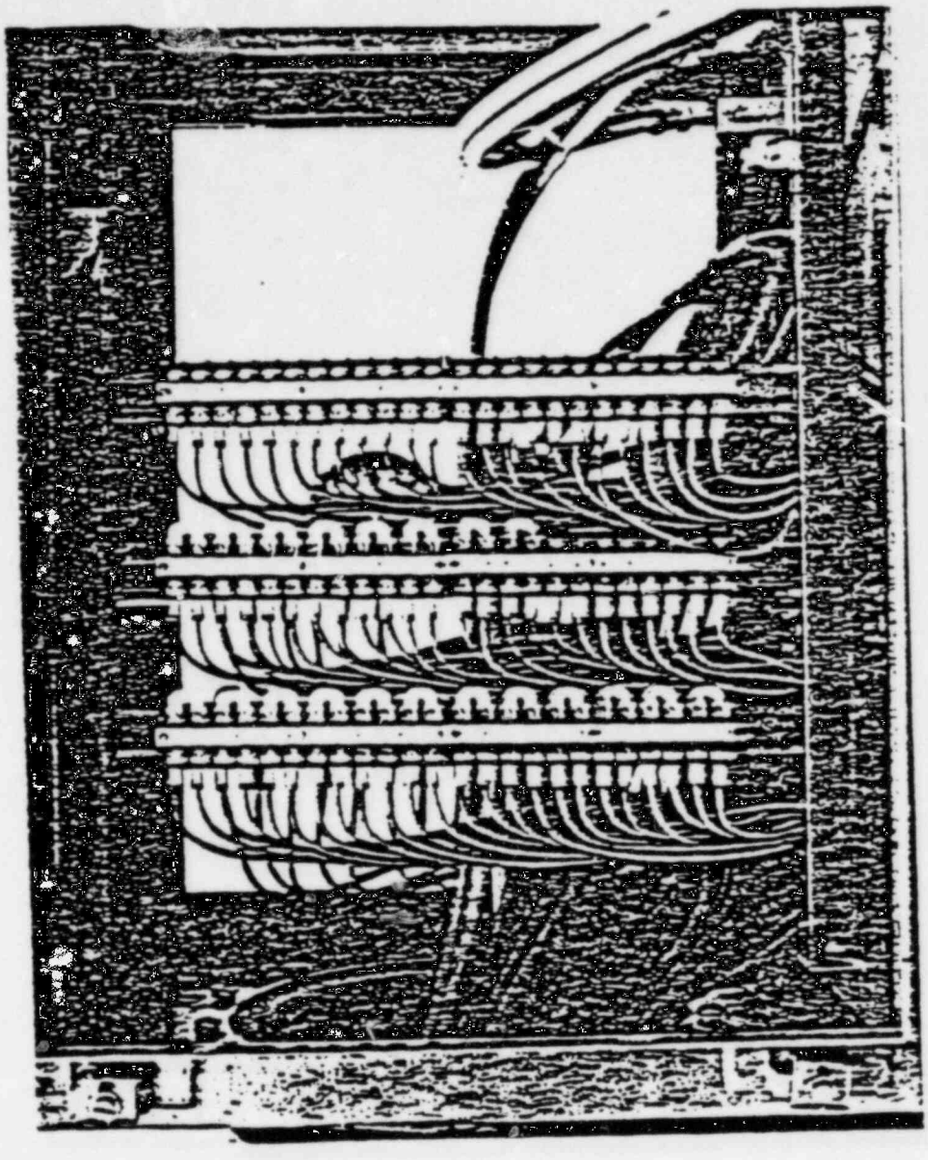
FOR 60 INCH LONG 12 INCH SCHEDULE 20 NOZZLE

Location	Grouping	Name	Dwg No.	Quantity	Unit Wgt lb	Total Wgt lb	Adjusted Weight lb*	Point Mass Wgt. lb
Constant End wgt Pen seal End	Penetration	Header	157C4828	1	66.0	66.0	70	
		Module asm.	174B9102	7	20.0	140.0	140	
		Adapter	234A9079	1	4.2	4.2	4	260
		Clamp	234A9056	12	3.0	36.0	40	
	--	Bolt	235A1031	12	0.5	6.0	6	
	Junction box	Junction box	115D3361	1	118	118	120	
		Cable	Miscellaneous	1	64	64	65	185
	Shields	Shields	175A9753P002	3	60	180	180	180
Constant End wgt Support End	Shell ring	Shell	157C4638P002	1	53	53	54	
		Ring	157C4839	1	21	21	22	76
	Junction box	Junction box	115D3361	1	118	118	120	
		Cable	Miscellaneous	1	64	64	65	185
	Shield	Shield	175A9753P002	3	60	180	180	180
Center Equally Distr. wgt for 60 in. nozzle	Support	Covers						
		Supports	Miscellaneous	1	50	50	50	
		Elec. cable	Miscellaneous	1	125	125	125	175
	Total with shields						1061**	
	Total without shields						881	
	Total without junction boxes (both ends)						511	

*Engineer's estimated adjustment.

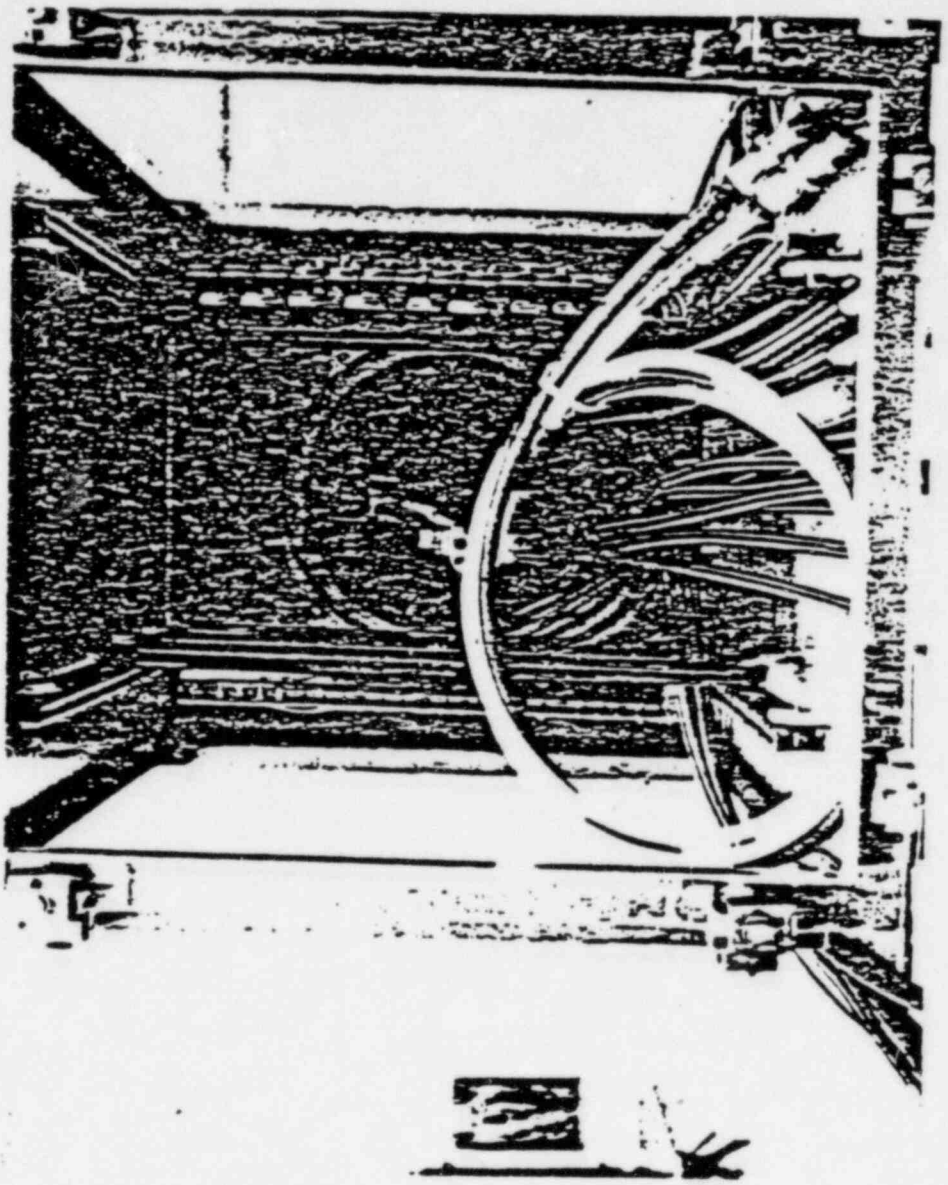
**Shields one end only.





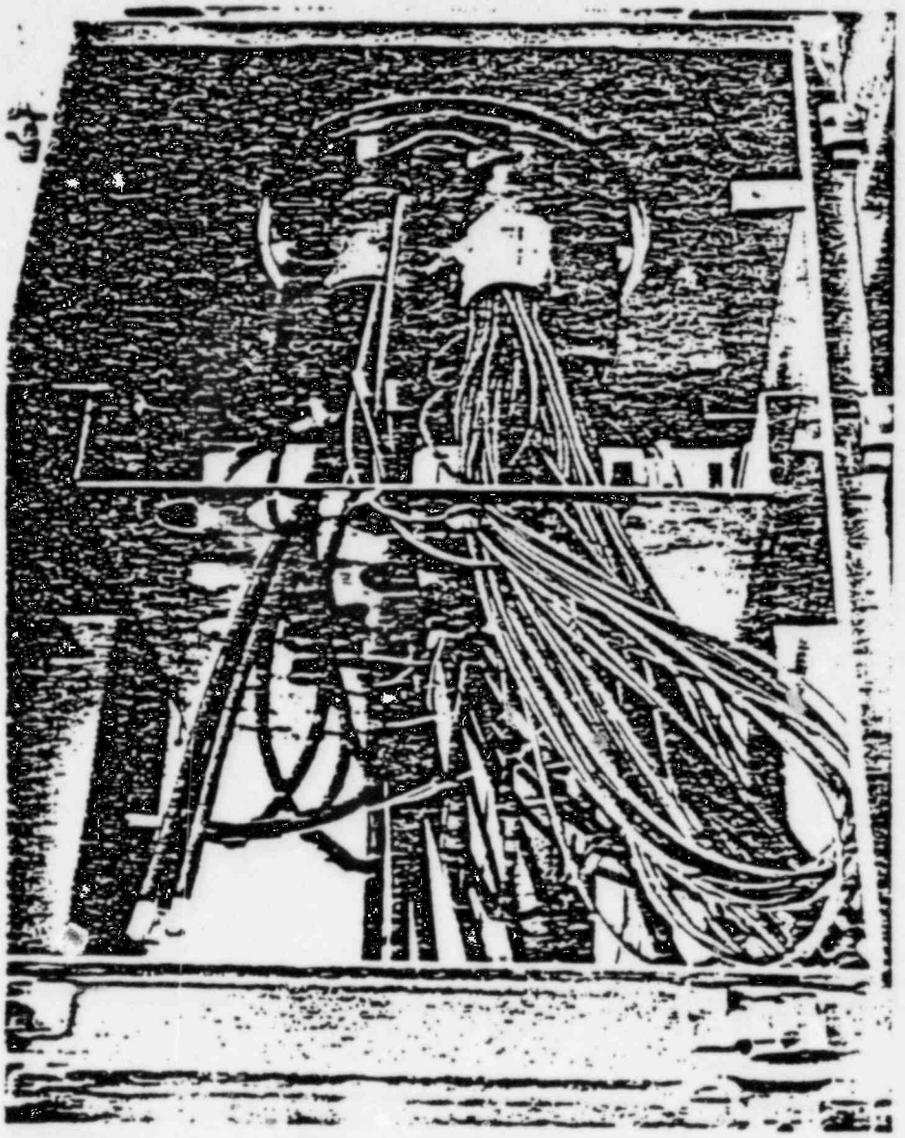
JUNCTION BOX TERMINATIONS BEFORE TEST

JUNCTION BOX CONNECTOR PLATE BEFORE TEST



END VIEW TERMINATIONS BEFORE TEST

END VIEW PIGTAIL TERMINATIONS BEFORE TEST



CONNECTOR TERMINATION AND PIGTAILS BEFORE TEST

OGDEN TECHNOLOGY LABORATORIES, INC.
Subsidiary of Ogden Corporation
1336 E. VALENCIA DRIVE, FULLERTON, CALIFORNIA 92631
TELEPHONES: 714/879-6110
213/269-4433

4 October 1973

FULLERTON DIVISION REPORT NUMBER F-73414
General Electric Co. P. O. Number 282-P4615, Revision 01

A. TEST: Seismic Vibration (Partial)

B. TEST ITEM: Electrical Penetration, P/N 159C4519

C. SPECIFICATIONS: 1. General Electric 941-V7110-2 and 941-SY008-12

2. Direction of General Electric Engineering representatives at the test site.

D. RESULTS: This is to certify that the test item was subjected to the Seismic Vibration (Partial) Test according to the above specifications.

The test item sustained physical damage after 13 minutes of vibration, and the testing was terminated by General Electric.

The test item was returned to General Electric for evaluation.

OGDEN TECHNOLOGY LABORATORIES, INC.

R. D. Short, Division Manager

T. P. Smith, Test Engineer

Subscribed and sworn to before me this 9th day of October 1973.

OFFICIAL SEAL
AMADOR HERNANDEZ
NOTARY PUBLIC - CALIFORNIA
ORANGE COUNTY
My Commission Expires APR 8 1977

Amador Hernandez, Notary Public in and for the County of Orange, State of California. My commission expires April 8, 1977.

R. J. McKelligott,
Quality Assurance Manager

Encl: Photographs & Oscillograph Recordings

mne

DATE STARTED	TEST DATA - SINUSOIDAL VIBRATION	SPECIMEN DESCRIPTION P/N	TECHNICIAN
9-17-73		Penetration LV 1590-4519	Steve Harris
DATE COMPLETED	CUSTOMER	TEST SPECIFICATION	JOB NUMBER
9-18-73	General Electric	GE 941-Y7119-2	F-73414

PHOTO TAKEN ☐ YES ☒ NO

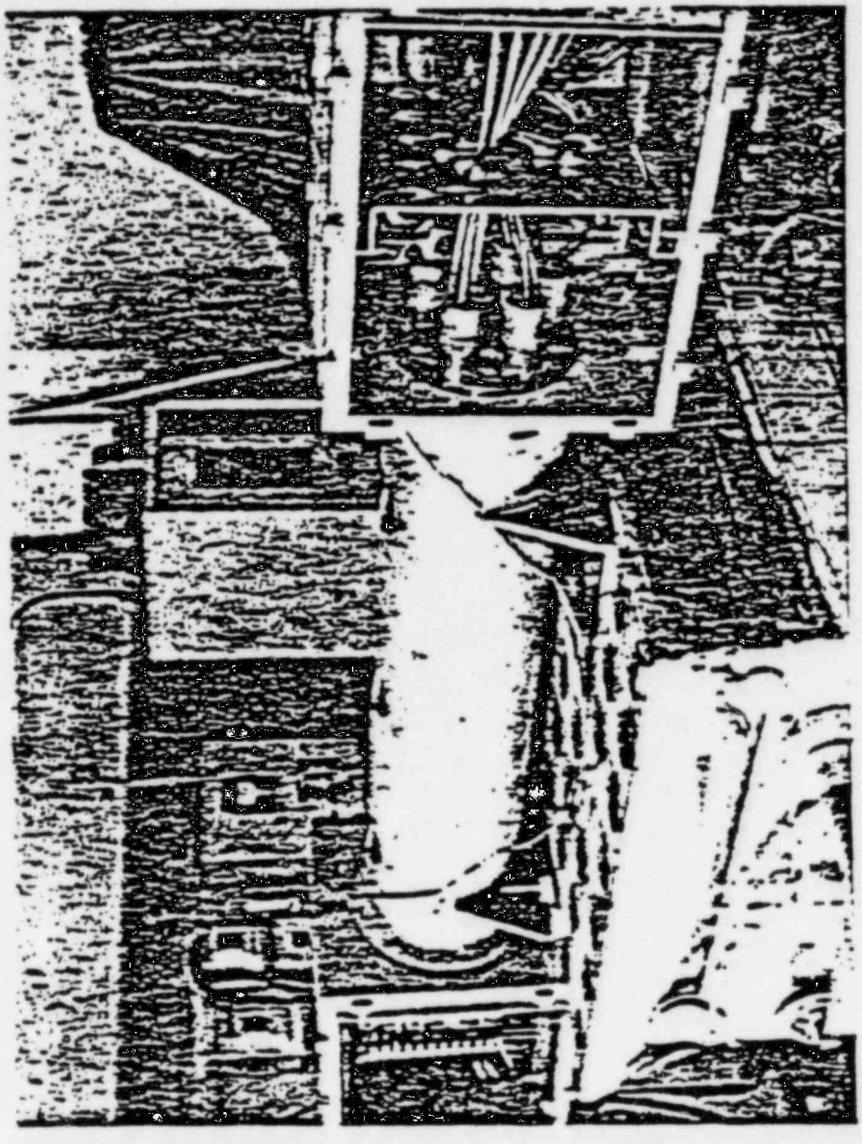
DRAWING ATTACHED ☐ YES ☒ NO

DAMAGE INCURRED ☐ YES ☐ NO

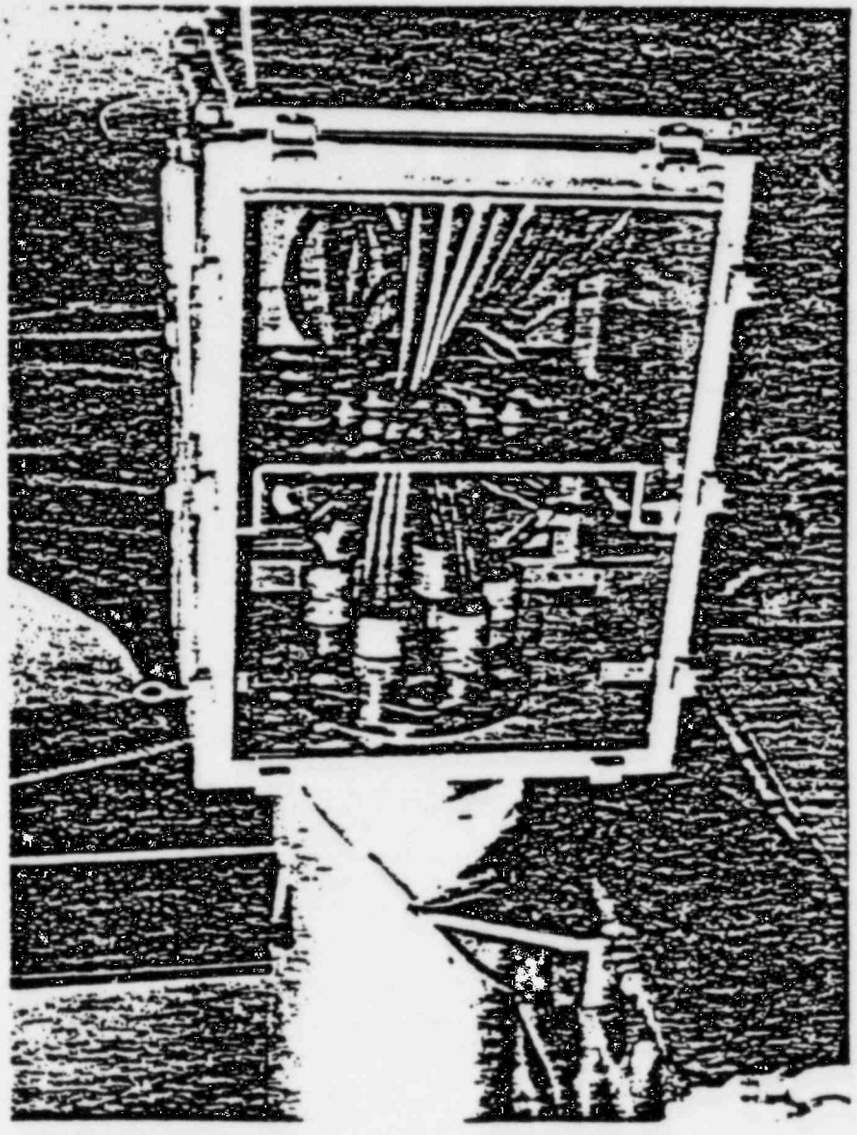
1973 DATE	HOUR TIME	°F TEMPERATURE	Hz FREQUENCY	INCH D.A. DISPLACEMENT	G/Hz ACCELERATION	X-Y-Z AXIS	OCT/MIN SWEEP RATE	MIN DURATION	NOISE	TEST SEQUENCE	RESPONSE MONITOR AXIS	RESPONSE AMPLITUDE G/Hz	RESPONSE FREQUENCY Hz	SPECIMEN OPERATION / COMMENTS
9-17	1540	N/A	5-60	-	.2	Long.	1	3	1	long	1	23		Accel at 2. Response Input .7g at peak
	1620		23	-	.9	-	-	5	3		4	23		Dwell
	1630		33	-	1.2	-	-	.5	3		.8	32		Dwell
	1640		5-35	-	.2	Vert	1	2	4	Vert				Sweep
	1650		28	-	2.5	Vert	-	.5	5	Vert	1.5	28		Dwell
	1710		33	-	1	Vert	-	.5	6	Vert	.7	33		Dwell
9-18	1415		24	-	1.6	Vert	-	.5	7	Vert	.5	24		Dwell
	1450		24	-	1.3	Horz	-	.5	8	Horz	.6	24		Dwell
	1505		24	-	2.8	Horz	-	.5	9	Horz	.10	24		Dwell
	1520		24	-	5.0	Vert	-	-	10	Vert	-	-		Table amplitude get to 4g before continuous cover lnks - else note crack in top of the inside hex - never get to full level to start the dwell. End of test as per cust. Sample was monitored for continuity during test. No discontinuity was noted.

EQUIPMENT LIST

Description	Apparatus — Job No. F-73414	Calibration
SINE VIBRATION	Feldmar Stop Watch, Model 601, OTL Control No. 3061	12 months Due 5-31-74
	MB Vibration Meter, Model M3, OTL Control No. 302	6 months Due 1-9-74
	MB Vibration Pick-up, Model 124, OTL Control No. 5628	6 months Due 1-8-74
	MB Vibration Pick-up, Model 124, OTL Control No. 5534	6 months Due 1-8-74
	Hewlett Packard Frequency Meter, Model 500B, OTL Control No. 1516	6 months Due 1-13-74
	CEC Oscillograph, Model 5-124, OTL Control No. 2524	6 months Due 1-9-74
	Henry & Wright Vibration System per Dwg. No. C-203367, 5000 force/ pounds, 1-55 Hz 0.26 inch da	Prior to Test
	Endevco Accelerometers	6 months
	Model — Control No.	Due
	2242 — 2658	9-21-73
	2214 — 3111	9-21-73
	2211M5 — 2627	10-16-73
	2215 — 2242	10-16-73
	2242 — 2660	10-16-73
	2213 — 3019	9-21-73
	Unholtz-Dickie Amplifiers	6 months
	Model — Control No.	Due
	8PMCV — 2456	10-26-73
	8PMC7 — 338-3	10-17-73
	8PMCV — 2742	10-26-73
	8PMC — 155-6	9-21-73



TEST SETUP OGDEN LABS



AFTER TEST

FR - 25

DISCUSSION OF RESULTS

SUMMARY OF RESULTS

Natural Frequencies

The following natural frequencies (f_R) were recorded during the test.

Basic penetration (without junction box)

f_R vertical	>33 cps
f_R horizontal	>33 cps

Junction box

f_R vertical	28 cps minimum
f_R horizontal	24 cps minimum

Input Accelerations

Horizontal	2.8g at 24 cps
Vertical	2.5g at 28 cps
Vertical	4.0g (attempt to reach 5g for destructive test)

Electrical Integrity

During the test of "Input Accelerations" above, electrical power was applied to the series circuit of penetration wires and monitored via a 60 watt light bulb. At no time during the test did the bulb extinguish, or dim.

Post Acceptance

The following tests were conducted by GE Quality Control:

Leak rate test	See test data sheet
Insulation resistance test	See test data sheet
Withstand voltage test	See test data sheet
Continuity test	See test data sheet

There was no electrical change in the penetration as a result of the test.

Mechanical Integrity

There was no change in structural integrity of the welds as a result of test, using the dye penetrant inspection method.

At 4.0g horizontal input, one junction box corner joint cracked. Corrective action has been taken by requiring a complete bead weld on all non-formed corners.

Terminal blocks, lug connections and cable insulation showed no visible change as a result of the test. In addition, all junction box cover screws remained tight during the test.

DISCUSSION

The input levels are in excess of the floor or ground motion. The response spectra show that for the natural frequencies of the equipment, the following accelerations should be expected:

f_R	AEC Regulatory Guide 1.60 and 1.61	Figures 11-1 and 11-2
Vertical, 28 Hz	~2.0g	3g
Horizontal, 24 Hz	~1.5g	3g

The test data yielded the following response, without failure to the equipment.

Vertical at 28 Hz	1.5g with a 2.5g input
Horizontal at 24 Hz	4.0g with a 2.8g input

The results indicate a damping factor greater than 0.5% in the vertical direction.

Based on this test, the electrical penetration is considered qualified for the earthquake loadings produced by this test, i.e.,

2.5g ground acceleration, vertical for 30 second duration -

2.8g ground acceleration, horizontal for 30 second duration

GENERAL ELECTRIC

SAN JOSE, CALIFORNIA

ISSUED BY	SUBJECT	CLASSIFICATION
QUALITY ENGINEERING	Penetration Leak Tests 100 Series Penetrations	Test Data Sheet

Customer Engrg Qualification S/N 6,574,047

Drawing No. 159C4519 EP No. _____

Calibration Data

Std Leak 5.2×10^{-7}

\+ Meter Reading 20 x 100

= Sensitivity 2.6×10^{-10}

Mass Spec. Serial No.

0975

Calibrated by:

E. Warner

TEST DATA

Mass Spec. Reading	Test Gas Pressure (S/B 48 ± 2)	Recorded By
30 x 10	0	E. Warner

Sensitivity	X	Reading	=	Leak Rate	
2.6×10^{-10}	X	30 x 10	=	7.8×10^{-8}	cc/sec.

Reason for Test

☐ In-Process Test ☐ Retest per IR ☐ QC Audit

Date of Test 10/29/73

Data Reviewed By J.P. Diodati

PREPARED BY J. G. Fairmess REVIEWED BY D.W. Delk REVISED BY	DATE ISSUED 7/24/72 SUPERSEDES ISSUE DATED New	NO. TI 1479 REV. 0 PAGE 1 OF 1

Data Sheet ____ of _____

DATA SHEET 8

Orbiter Penetration Test
Final Electrical Test
for
Low Voltage Control and Power
Vibration

Drawing No. _____ _____ Rev. _____

Unit Type Engr. _____ Module Serial No. _____

Customer Mark No. _____ Penetration Serial No. 6,574,047

Temperature 70°F

Test performed on: Customer Module ☐ Penetration Assembly ☑

Module No.	Continuity	Withstand Voltage Cond to Cond/Ground	Insulation Resistance Cond to Cond/Ground	Stamp	Date
Coax A	Used T1 1487	--	--	--	--
4/0 B	0.1 Ω	3.0 kv	>1 x 10^9 Ω	APVD N68	1/2/74
2 AWG C	0.1 Ω	2.9 kv	>1 x 10^9 Ω		
8 AWG D	0.1 Ω	3.0 kv	>1 x 10^9 Ω	APVD N68	1/2/74
12 AWG E	0.1 Ω	3.0 kv	>1 x 10^9 Ω	[illegible]	1/2/74
Coax F	Used T1 1487	--	--	--	--
Plug G	--	--	--	--	--

Unit disposition: Accept ☐ Reject: ☐ IR No. _____

Comments: _____

_____

_____

DATA SHEET A

LV Vibration
Penetration Seal

Final Electrical Test
Coax Unit

Drawing No. Engr. Rev. _____

Test performed on: Customer Module ☐ Penetration Assembly ☑

Module Serial No. _____

Penetration Serial No. 6,574,047 Customer Mark No. _____

Temperature 70°F

Cable	Continuity	Insulation Resistance Reading		Date	Stamp
		Cond/Cond/Shield/Grnd	Shield/Shield/Grnd		
IRM1.B	0.6 Ω	1×10^{11} Ω	5×10^{9} Ω	1/2/74	
IRM2.B	0.2 Ω	5×10^{10} Ω	5×10^{9} Ω	1/2/74	
SRM1.B	0.2 Ω	1.5×10^{11} Ω	$.2 \times 10^{10}$ Ω	1/2/74	
4.					
5.					
6.					
7.					

Unit Disposition: Accept ☐ Reject ☐ IR No. _____

Comments: Module "A"

NO. TT 1487
REV. 0
PAGE 4 OF 5

DATA SHEET A

LV Vibration
Penetration Seal

Final Electrical Test
Coax Unit

Drawing No. Engr Rev. _____

Test performed on: Customer Module ☐ Penetration Assembly ☑

Module Serial No. _____

Penetration Serial No. 6,574,047 Customer Mark No. _____

Temperature 70°F

Cable	Continuity	Insulation Resistance Reading		Date	Stamp
		Cond/Cond/Shield/Grnd	Shield/Shield/Grnd		
1. B	0.2 Ω	3×10^{10} Ω	3×10^{9} Ω		1/2/74
2. B	0.2 Ω	1.1×10^{11} Ω	5×10^{9} Ω		1/2/74
3. B	0.2 Ω	1.0×10^{13} Ω	5×10^{9} Ω		1/2/74
4.					
5.					
6.					
7.					

Unit Disposition: Accept ☐ Reject ☐ IR No. _____

Comments: Module "F"

APPENDIX B
MANUFACTURING PLANNING CARDS
VERIFICATION OF CONSTRUCTION
OF MODULE ASSEMBLIES

GENERAL ELECTRIC

ESSENTIAL COMPONENT

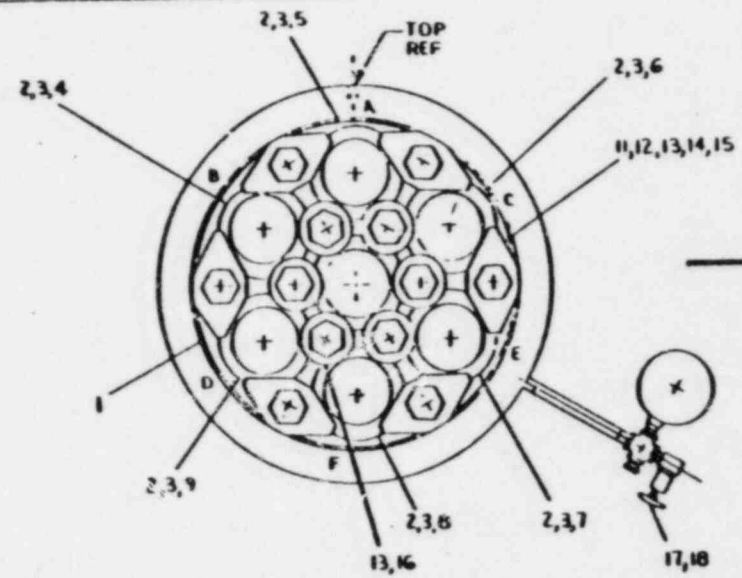
THIS ITEM IS OR CONTAINS A SAFETY RELATED COMPONENT

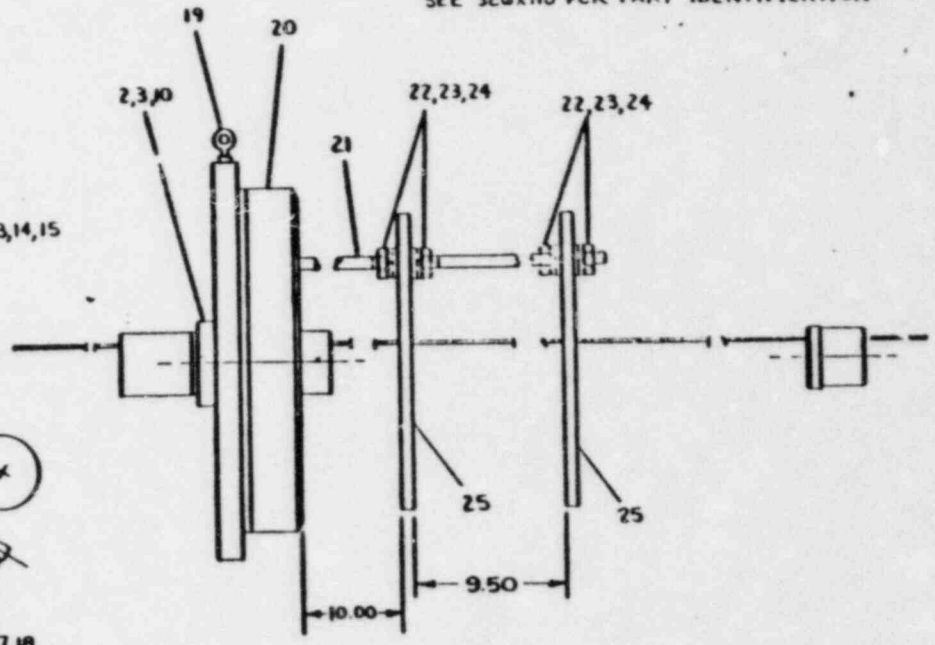
ASME CODE
SECTION III CLASS MC

195B9850

ELECTRIC PENETRATION

SEE SEGMENT FOR PART IDENTIFICATION





NOTES:
1. LUBRICATE TAP HOLES & BOLTS WITH MOLYDISULFIDE DRY FILM LUBRICANT (ITEM 14) TORQUE ALL BOLTS TO 110 FT LBS @ 20 FT LB INCREMENTS.
2. USE ITEM 15 TO SAFETY-LOCK OUTER BOLT TO ADJACENT INNER BOLT (6 PLACES).
3. TORQUE EACH ROD (ITEM 21) TO 360 INCH LBS.
4. ASSEMBLY TO BE PNEUMATICALLY TESTED IN ACCORDANCE WITH THE CERTIFIED STRESS REPORT.

REVISIONS				C	PRINTS TO
2	ECN 11-3-75	JRG	1	3-2-75	41
NE 78671	CHKD JRG		NE 53225	CHKD RDM ESM	279
					428

MED SAN JOSE

195B9850

SCALE M C1 EB

REVISION STATUS SHEET

GENERAL ELECTRIC

NUCLEAR ENERGY DIVISION

DOCUMENT NO. 386X110 REV. 1

APPLICATION MARK III

FCF 386X210

☐ SPECIFICATION ☒ DRAWING ☐ OTHER _____ TYPE _____

DOCUMENT TITLE ELECTRIC PENETRATION, LOW VOLTAGE

LEGEND:

REVISIONS		
0	ISSUED Sept 13, 74	
1	E. MARGHERONE Oct. 23, 74 EM NE 51875	

DESCRIPTION OF GROUPS	PRINTS TO
	A13
	41
	69
	279
	428

ISSUED E. MARGHERONE SEPT 11, 74	APPROVED R. SCHUSTER,	BWRS DEPT.	386X110
ISSUED E. Margheron Sept 13 74	R. M.	SAN JOSE LOCATION	CONT. ON SHEET 2 SH. NO. 1

M 3.2. CI EIS

GENERAL ELECTRIC

TITLE: ELEC PENETRATION, EP — SHELTON WATER REACTOR SYSTEMS DEPARTMENT, SAN JOSE, CA — PL 386X110 — SECT A — REV. 1

ITEM NO.	DOCUMENT TYPE	DESCRIPTION NAME	DESCRIPTION IDENTIFICATION	LIFE STA	GROUP NUMBER AND QUANTITY 0001	UNITS	SRC	SECT A	REV. 1
001		RING	7A5A1900P001		1			NO	
002		O RING	209A4117P029		7				
003		O RING	209A4117P030		7				
004		WIRE MODULE	163C1914G004		1				
005		WIRE MODULE	163C1914G003		1				
006		WIRE MODULE	163C1914G005		1				
007		WIRE MODULE	163C1914G007		1				
008		WIRE MODULE, SIGNAL	195B9904G001		1				ENG
009		WIRE MODULE	163C1914G006		1				
010		WIRE MODULE	163C1914G008		1				
011		CLAMP	262A7086P001		6				
012		WASHER, PLAIN	175A0611P019		12			NO	
013		BOLT, HEX HEAD	192AP37340		12				
014		LUBRICANT	235A1848P001		AR			NO	
015		WIRE, STAINLESS STEEL	175A8866P008		AR			NO	
016		WASHER	262A7087P001		6				
017		THREAD SEALANT	299A1067P001		AR				
018		PRESSURE GAUGE & VALVE	174B947S6001		1			NO	
019		BOLT, EYE (SHOULDER)	175A1028P001		1			NO	
020		HEADER RING-MACHINED	163C1885P001		1				
021		STUD, THREADED R.U	176A1578P025		6				
022		WASHER, PLAIN(PLATED STEEL	175A0316P045		24				
023		WASHER, SPRING LOCK	175A0815P015		24				
024		HEX NUT	175A0031P029		24				
025		SUPPORT-WIRE	163C1936P001		2				

MADE BY: EIP — DATE: NO 10, DAY 24, YEAR 74 — LAST ITEM NO. USED - 025 — FINAL SECTION — CONT ON SHEET: FINAL — SH NO — PL 386X110 — SECT A — REV. 1

MED 3441A 7M

PLANNING CARD

313-314 SPECIALTY SHOP	315 PENETRATION SHOP	324 SENSOR SHOP	327 FAB MACH SHOP	323 PANEL SHOP	QA SP-143 SE-155 PE-152 FM-161

MAIN DWG. NO. | MAIN DWG. NAME

PLANNING RECORD INFORMATION

9589904 G001

SRM/IRM

S/N TG-1

S/C

1. SET-UP
2. APPLIED
3. UNAPPLIED
4. ALLOCA

MATERIAL SPECIFICATIONS

MATERIAL SIZE - PER PIECE

TYPE OF PLANNING: SPECIAL ☐ REGULAR ☐ | PLANNING REV. NO. | ENGR. DWG. REV. NO. | LABOR CODE ☐1 ☐2 ☐3 ☐4 | PLANNER & CRITERIA PLANNER A. D. Pinnelly 6/2/76 | Richmond 6/3/76

COMP.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G. E.	AUTO WIRE	QUALITY ASSURANCE	SET-UP	PLANNING
		[illegible]		11015				
		[illegible]		5/27/76				
		[illegible] - CHECK SOLDER FOR GOOD SOLDER JOINTS		N/A 11015		5/27/76		
		[illegible]		15				
		[illegible]		5/27/76				
		[illegible] - ELECTRICAL TEST PER [illegible]		N/A 11015		5/27/76		
		[illegible]		11015				
		[illegible]		5-27-76				
		[illegible] - Verify Sleeve is uniformly sandblasted.		11				
				6/3/76				

SERIAL NO. | QTY. QA COMP. | STAMP & DATE | QTY. REJ. | DATE & INIT. | ECON. LOT QTY. | UNIT HRS.

COMPLETION DATE | B-4 | PLNG HRS

P.N. ST2799451-2 NAME Signal Umbilical PLANNING CARD

COMP. NO.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G.E.	SIGNOFF AUTH. INSP.	PLANNING SCAN STA.	PLANNING SET-UP
937	070	SET UP & MAKE INITIAL PASS PER MPI 27.019, REV ___ PASS EPOXY "A" AND ET UMBILICAL		11/6/70			
5-2	071	Q.A. - WITNESS EPOXY MIXING AND ENCAPSULATION PER MPI 27.019, REV C AND TI 2004, REV C		11/6/70			
937	072	SET UP & RUN FEEDTHROUGH" OF MODULE PER MPI 27.003, REV ___		11/6/70			
5-2	051	Q.A. - CHECK THIX OPERATION VERIFY THIX MAKES A GOOD SEAL BETWEEN WIRES & FEED THRU.				NOT USED by Q.A.	
937	060	SET UP & MIX EPOXY PER MPI 27.019 REV ___ PASS EPOXY IN "FEEDTHROUGH" OF MODULE.				Potted in Epoxy Fixture while curing.	
5-2	061	Q.A. - WITNESS EPOXY MIXING AND ENCAPSULATION PER MPI 27.019, REV ___ AND TI 2004, REV ___					
937	070	CURE EPOXY SEAL FROM SLEEVES PER FEEDTHROUGH					
5-2	071	Q.A. - ELECTRICAL PER TI 1648, REV ___					
5-2	073	QA - TEST EPOXY SPECIMENS PER TI 2004, REV ___				N	

PLANNING REV. NO. 1 2 3 B5 4 5 P.O. ___

PLANNING CARD

DRAWING NO. 1253920360001
DRAWING NAME SRM/RU Stock Assy

313-314 SPECIALTY SHOP	920 PENETRATION SHOP	924 SENSOR SHOP	927 FAB MACH SHOP	923 PANEL SHOP	QA SP-143 SE-955 PE-952 FM-956	92 ELE TRO

MAIN DWG. NO. | MAIN DWG. NAME

PLANNING RECORD INFORMATION

1. SET-UP	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.
2. APPLIED	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.
3. UNAPPLIED	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.
4. REWORK					

MATERIAL SPECIFICATIONS:

MATERIAL SIZE PER PIECE

TYPE OF PLANNING: SPECIAL ☐ REGULAR ☐ | PLANNING REV. NO. | ENGR. DWG. REV. NO. | LABOR CODE | PLANNER & DATE | QA PLANNER & DA

COMP. NO.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G. E.	SIGNOFF AUTH INSP.	PLANNING TIME WORK STA	PLANNING TIME SET-UP	PLANNING TIME TA
	927 010	Build cables per 2624222601 dwg & P.L.		11615				
	952 011	Test cables per TI 1506						
		Install [illegible]						
		[illegible]						
		ASSEMBLY STOCK Module per dwg		11615				
	952-021	Q.A - Unity assembly is per 1952-402 CAN dwg & P.L.						
	927 030	E-Encapsulate and cure one end per [illegible] NOTE: Q.A. to witness encapsulation.		11615				

SERIAL NO.
COMPLETION DATE
PAGE 1 OF 2

QTY. QA COMP.	STAMP & DA..	QTY. REC. STKRM	DATE & INIT.

ECON. LOT QTY. | UNIT HRS. | PLND HRS.

DWG NO. _____ NAME _____ PLANNING CARD

COMP. NO.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF: G. E.	SIGNOFF: ALTN INSP.	PLANNING TIM: WORK STA.	PLANNING TIM: SET-UP	PLANNING TIM: TASK
452	031	Q.A. - Witness encapsulation per MPI 27.018 T.C. 5/12/76 and TE 2003 Rev. 5/26/76 DWG 5/20/76						
437	042	Encapsulate & Cure Ether end per MPI 27.018 TX 5/12 Cost Tensile specimen						
452	041	Q.A. - WITNESS encapsulation per MPI 27.018 T.C. 5/12/76 Rev. — and TE 2003 Rev. 5/26/76 DWG 5/20/76						
452	043	Q.A. - Test Tensile specimen per TI 1460, Rev. 4 5/12/76 DWG 5/20/76				5/26/76		
437	050	Clean modules from excess Epoxy						
452	051	Q.A. - Test Test Modules per TI 1460, Rev. 4				5/26/76		
452	053	Q.A. - ELECTRICAL TEST per TE - Rev. — DWG 5/20/76						
		TI 1457 REV 3 ELECTRICAL TEST				5/26/76		

PLANNING REV. NO., DATE, & REASON

SERIAL NO. _____

PAGE 2 OF 2

PLANNING SHEET

223-224 SPECIALTY SHOP	225 PENETRATION SHOP	226 SENSOR SHOP	227 FAB MACH. SHOP	228 PAINT SHOP	229 QA

MAIN DWG. NO. | MAIN DWG. NAME

PLANNING RECORD INFORMATION

163C1919G005 S/N TG-5

#12 awg.

NOTE: Has large void in coat of encapsulation on long end (A) of module. Apply additional encapsulant locally

1. CUT-UP
2. APPLIED
3. UNAPPLIED

REASON

TEMPLATE/SHEET PART ONLY

TOP ASSEMBLY - WORK ORDER

TYPE OF PLANNING | PLANNING REV. NO. 5/21/76 0 | ENGR. CHG. REV. NO. | LABOR CODE | PLANNER & DATE

SIGNOFF | PLANNING

OPER. NO.	DEPT. NO.	OPERATION DESCRIPTION	SEQ.	Q. E.	AUTH. NO.	WORK CTR.	SET-UP
		Stain & Clean Cabling	11015				
		Cut, Strip, Tin Leads	5/21/76				
		Install Wire Clamps					
		Clamping					
		Solder - Verify Entire Cap	11015				
		Cut Wires To Data Order at Cap End Only. Install Strain Relief Tubing To Connectors					
		Solder Tubing Ends Connectors	11015				
		Final Visual Inspection	5/21/76				

OPER. NO.	DEPT. NO.	QTY. QA COMP.	STAMP & DATE	QTY. REC. STORE	DATE & INIT.	SCRP. QTY.	UNIT HRS.
COMPLETION DATE							PLND HRS.

DWG NO. 1[illegible]C-C NAME U.C. L P Asst. Module PLANNING CARD

COMP. NO.	OPER NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF C.E.	SIGNOFF ACCEPTANCE	PLANNING TIME ACTUAL
		52 031 Q.A - Verify slave is uniformly sandblasted		[illegible] 6/1/71		
		927 040 Set up & mix epoxy for MPI 27.019 Rev [illegible] Pour mixed epoxy in "B" end of module		11015 6/2/71		
		952 041 Q.A - Witness epoxy mixing and encapsulation for MPI 27.019 Rev [illegible] and TI 2004 Rev C TAKE TENSILE SPECIMENS		[illegible] 6/2/71		
		927 050 Set up & mix [illegible] amount of module per MPI 27.005 Rev —		11015 6/10/71		
		952 051 Q.A - CHECK THIX OPERATION VERIFY THIX MAKES A GOOD SEAL BETWEEN WIRES AND FEED THRU.				
		927 060 Set up & mix epoxy per MPI 27.019 Rev — Item epoxy in "A" end of module.		11015 6/2/71		
		952 061 Q.A - Verify epoxy mix & encapsulation per MPI 27.019 Rev [illegible] & TI 2004 Rev C TAKE TENSILE SPECIMENS		[illegible] 6/2/71		
		927 070 Set up & mix Epoxy per MPI 27.019 Pour epoxy in front [illegible] of module			Visual test unit by Q.A. for Ease of Test & Test'd by Engr. for Complete	

SERIAL NO. —
PAGE 2 OF 2

PLANNING REV. NO., DATE, &

D-9

PART NO. [illegible] NAME LEC, LIP CNCT Ass'd PLANNING CARD

OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF Q.E.	SIGNOFF AUTO-INSP.	PLANNING ACCPT STD	PLANNING SET-UP
052	01 QA — Witness epoxy potting and encapsulation per TIPI 27619 Rev ___ and TI [illegible]					
037	070 Clean [illegible] epoxy from [illegible] & "Frostingwork"					
037	081 QA — ELECTRICAL TEST PER TI 1698 Rev ___					
052	083 QA — TEST EPOXY SPECIMENS PER TI 2004 Rev ___					

PLANNING REV. NO., DATE, & REASON

SERIAL NO. ___

PAGE 2 OF 2

PLANNING CARD

313-314 SPECIALTY SHOP	920 PENETRATION SHOP	924 SENSOR SHOP	927 FAB MACH SHOP	923 PANEL SHOP	QA SP-343 SE-955 PE-952 [illegible]-954	922 ELEC TRON

DRAWING NO. [illegible]

DRAWING NAME [illegible]

MAIN DWG. NO.

MAIN DWG. NAME

PLANNING RECORD INFORMATION

'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____
'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____
'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____

1. SET-UP
2. APPLIED
3. UNAPPLIED
4. PERCENT

MATERIAL SPECIFICATIONS:

MATERIAL SIZE – PER PIECE

TYPE OF PLANNING		PLANNING REV. NO.	ENGR. DWG. REV. NO.	[illegible]	PLANNER & DATE	QA PLANNER & DATE
SPECIAL ☒ REGULAR ☐	⓪ ① ②				[illegible]	T. Kappel 1-5-76

COMP. NO.	OPER. NO.	OPERATION DESCRIPTION	[illegible]	AUTH. NO.	WORK STA.	SET-UP	TASK
[illegible]	[illegible]	[illegible] module [illegible] [illegible]	[illegible]				
[illegible]	[illegible]	[illegible] inspect [illegible] [illegible] [illegible] finish	109 [illegible]-76				
[illegible]	[illegible]	Assemble [illegible] module per dwg [illegible]	1105 5/5/76				
[illegible]	[illegible]	[illegible] inspect [illegible] [illegible] Inspect [illegible] [illegible]	[illegible] [illegible]				
[illegible]	[illegible]	[illegible] and [illegible] [illegible] [illegible]	1101 5/21/76				

SERIAL NO. ____	QTY. QA COMP.	STAMP & DATE	QTY. REC. STKRM	DATE & INIT.	ECON. LOT QTY.	UNIT HRS.
COMPLETION DATE ____						PLND HRS.
PAGE ____ OF ____						

B. 11

NO. [illegible] NAME #12 AWG STOCK PLANNING CARD

COMP. NO.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G. E.	SIGNOFF AUTH INSP.	PLANNING TIME WORK STA.	PLANNING TIME SET-UP	PLANNING TIME TA
		[illegible]		108				
		[illegible]		5-21-76				
		[illegible]		5/22/76				
		[illegible]		1103				
		[illegible]		5/23/76				
		[illegible]		111				
		[illegible]		5/24/76				
		[illegible]		111				
		[illegible]		111				

PLANNING REV. NO., DATE, & REASON

SERIAL NO. _____

PAGE 2 OF 2

163C1588G005 (#1)
Qualification Module
#12 Only size Single
Part G.A. inspection per
dwgs.

163C1940P011 (2)	ICS	2-27-76
163C1790P010 (4)	ICS	2-27-76
262A6653P001 (1:9)	ICS	2-27-76
175A6005P005 (1)	ICS	2-27-76
117C1002P5022 (1)	ICS	2-27-76
195B9702P001 (1)	ICS	2-27-76

923 PANEL SHOP | QA SP-143 SE-953 PE-952 PE-941 | 922 ELECTRONICS

"T" QTY. PROJ.

"T" QTY. PROJ.

"T" QTY. PROJ.

ER & DATE | QA PLANNER & DAT. 1-5-76.

TP | PLANNING TIME

AUTO INSP | QTY. | SET-UP | TASK

5/21/76

SERIAL NO.
COMPLETION DATE
PAGE ____ OF ____

QTY. QA CC'D	INITIALS & DATE	QTY. REC. STKPM	DATE & INIT.

ECON. LOT QTY. | UNIT HRS. | PLND HRS.

PLANNING CARD

333-334 SPECIALTY SHOP	920 PENETRATION SHOP	924 SENSOR SHOP	927 FAB MACH SHOP	923 PANEL SHOP	QA SP-343 SE-333 RE-XXX FLIGHT PA...	PLAN...

MAIN DRG. NO. | MAIN DRG. NAME

PLANNING RECORD INFORMATION

163C1914600G

#8 awg

ok

S/O TB-6

1. LIFT-UP
2. APPLIED
3. UNAPPLIED
4. REWORK

MATERIAL SPECIFICATIONS:

MATERIAL SIZE - PER PIECE

TYPE OF PLANNING: SPECIAL ☐ REGULAR ☐ | PLANNING REV. NO. 5/26/76 0 | ENGR. DWG. REV. NO. | LABOR CODE | PLANNER & DATE | QA PLANNING

COMP. NO.	OPER. NO.	OPERATION DESCRIPTION	SEC.	U.E.	AUTH. NO.	WORK CTR.	SET-UP
010	010	CUT STRIP & CRIMP CABLING PER DWG 1631914 & NOTE: USE LARGER CRIMPER.		11015	5/27/76		
020	020	ALL END — WHITE END CAP		N/A 11015	5/27/76		
030	030	CUT WIRES TO DETH ORDER OF WIRING PER DWG 1631914 (FROM "END" LOOKING TO CONNECTOR)		B' end only	11015 Stock 11015 Stock		
040	040	ALL [illegible] WITH YELLOW STRIP TUBING OVER CRIMP CONNECTIONS		N/A 11015	5/27/76		
050	050	[illegible] PER DWG 1631914		11015	5/27/76		

SERIAL NO.	QTY. QA COMP	STAMP & DATE	QTY. REC. ITEM	DATE & INIT.	ECON. LOT QTY.	UNIT HRS
COMPLETION DATE						PLND HRS

DWG NO. [illegible] NAME [illegible] PLANNING CARD

COMP. NO.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G. E.	SIGNOFF AUDIT NO.	PLANNING WORK STA.	PLANNING SET-UP
		[illegible] Q.E. - Verify sleeve is uniformly serrated		[illegible] 6/3/76			
		[illegible] MP-27.019 Rev. [illegible] Pull mixed epoxy in "B" end of nozzle		11015 6/3/76			
952	051	Q.A. - Witness epoxy mixing & encapsulation per MPI 27.017 Rev. O and TI 2004 Rev. O - TENSILE SPECIMENS		[illegible] 6/3/76			
927	010	Set up & mix hand thrusted" of nozzle per MPI 27.003, Rev. —		11015 6/10/76			
952	051	Q.A. - CHECK THIX OPERATION VERIFY THIX MIXES A GOOD SEAL BETWEEN WIRES AND FEED THRU.					
927	010	Set up & mix epoxy per MPI 27.019 Rev. — Item epoxy in "A" end of nozzle.		11015 6/8/76			
952	051	Q.A. - Verify epoxy mixed & encapsulation per MPI 27.019 Rev. [illegible] ETI 2004 Rev. [illegible] TAKE TENSILE SPECIMENS		[illegible] 6/8/76			
937	070	Set up & mix epoxy per MPI 27.019 Rev. — epoxy in [illegible] end of nozzle		Not witnessed by Q.E. patted in Eng. Lab - Tested by Eng. Tony [illegible]			

PLANNING REV. NO., DATE, &

B 15

SERIAL NO. ____

PAGE 2 OF 3

DRG NO. 1[illegible]-2 NAME LOC, LIP CAST Mod PLANNING CARD

OP.	CRFT NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF Q.C.	SIGNOFF AUTO MFR.	PLANNING TIME: MCPA STA.	PLANNING TIME: SET-UP
952	071	QA — Witness Epoxy mixing and encapsulation per WPI 27.019 Rev ____ and TI 2004 Rev ____					
937	070	Clean [illegible] with Lint free cloth & "Freon TF"					
937	081	QA — ELECTRICAL TEST PER TI 1648 Rev ____					
952	083	QA — TEST EPOXY SPECIMENS PER TI 2004, Rev ____					

PLANNING REV. NO., DATE, & REASON | 1 | 2 | 3 | 4 | 5 |

SERIAL NO. ____

PAGE 2 OF 2

DRAWING NO. [illegible]

DRAWING NAME [illegible]

PLANNING CARD

913-914 SPECIALTY SHOP	920 PENETRATION SHOP	924 SENSOR SHOP	927 FAB MACH SHOP	923 PANEL SHOP	QA SP-743 SE-951 PE 952 [illegible]	922 [illegible]

MAIN DWG. NO.

MAIN DWG. NAME

PLANNING RECORD INFORMATION

	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____
1. SET-UP	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____
2. APPLIED 3. UNAPPLIED 4. REWORK	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____	'T' ____ Qty. ____ Proj. ____

MATERIAL SPECIFICATIONS:

MATERIAL SIZE - PER PIECE

TYPE OF PLANNING		PLANNING REV. NO.	ENGR. DWG. REV. NO.	LABOR CODE	PLANNER & DATE	QA PLANNER & DATE
SPECIAL ☒ REGULAR ☐	① ② ③			① ② ③ ④	[illegible]	[illegible] 15-76

COMP NO.	OPR NO.	OPERATION DESCRIPTION	REQ	SIGNOFF G.E.	SIGNOFF AUTH INSP	PLANNING TIME WORK STA	PLANNING TIME SET-UP	PLANNING TIME TASK
[illegible]	[illegible]	[illegible]		11015 5/7/76				
[illegible]	[illegible]	[illegible] all [illegible] finish.		[illegible] 5-4-76				
[illegible]	7.0.2	[illegible] SCOTCH KOTE [illegible] 11 [illegible] 8 [illegible] 4/4/76		11015 4/6/76				
[illegible]	23	Apply SCOTCHKOTE #2005 [illegible] 8 Rev [illegible]		11015 4/26/76				
[illegible]	03	[illegible] 1697 [illegible] 5/6/76 [illegible] [illegible] -7-76		[illegible]				

SERIAL NO. ____	QTY. QA COMP.	STAMP & DATE	QTY. REC. STKRM	DATE & INIT.	ECON. LOT QTY.	UNIT HRS.
COMPLETION DATE ____						
PAGE 1 OF 3						PLND HRS.

3-17

PC NO. 1630 [illegible] NAME # 8 STOCK PLANNING CARD

COMP NO.	OPER NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF: Q.E.	SIGNOFF: AUTH INSP.	PLANNING TIME: SCRN STA.	PLANNING TIME: SET-UP	PLANNING TIME: T. EA
050	010	[illegible] STOCK [illegible]		[illegible]				
		[illegible] 1630 [illegible]		5/26/76				
052	040	C A - [illegible]		[illegible]				
		[illegible]		[illegible]				
		[illegible]						
		[illegible]						
054	050	[illegible]		[illegible]				
		[illegible]		5/26/76				
		[illegible] 5/24/76						
		[illegible]						
056	060	C A - [illegible]		[illegible]				
		[illegible]		[illegible]				
		[illegible] TVC 5/26/76						
		[illegible] 5/26/76						
058	070	[illegible]		[illegible]				
		[illegible]		5/26/76				
		[illegible] 5/26/76						
060	080	C A [illegible]		[illegible]				5/26/76
		[illegible]		[illegible]				
		[illegible]		[illegible]				
062	090	C A - TEST [illegible]		[illegible]				
		[illegible] DRAFT 5/12/76				5/26/76		
		[illegible]						
		[illegible] 5/26/76						

PLANNING REV. NO., DATE, & REASON

SERIAL NO. [illegible]
PAGE 2 OF 2

ING NO. 1650122G006 NAME # 8 STOCK PLANNING CARD

COMP. NO.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF		PLANNING TIME		
				Q. E.	AUTH INSP.	WORK STA.	SET-UP	TASK
937	07	Check module assy of Accum assy & Larger materials.		11015 5/21/76				
952	071	C A - Lock Test modules per TI 1640 Rev 4		5/26/76				
952	075	C A - Electrical Test modules per TI 1641 Rev 3		5 28 76				

PLANNING REV. NO., DATE, & REASON: 1 | 2 | 3 | 4 | 5

SERIAL NO. ____

PAGE 3 OF 3

PLANNING C-[illegible]

312-324 SPECIALTY SHOP	320 PENETRATION SHOP	28 SENSOR SHOP	927 FAB MACH SHOP	940 PANEL C-UP	28 CP-[illegible] PE-[illegible]

MA N DWG. NO. | MAIN DWG. NAME

PLANNING RECORD INFORMATION

DRAWING NO. 163C1214G003-8 DRAWING NAME LLC LIP [illegible]

163C1914G003

T/C RC

SIN TG-3

SET-UP

2. APPLIED

1. UNAPPLIED

4. REWORK

MATERIAL SPECIFICATIONS:

MATERIAL SIZE - PER PIECE

TYPE OF PLANNING: ECIA ☐ REGULAR ☐ | PLANNING REV. NO. 5/16/76 0 | ENGR. DWG. REV. NO. | LABOR CODE | PLANNER & DATE T-[illegible] RC 5/[illegible]

COMP. NO.	OPER. NO.	MPS OPERATION DESCRIPTION	SEQ	SIGNOFF G. E.	PLAN NO.
237	C10	CUT STOCK & COUNTERSINK [illegible] CO. DWG. 163C1914 NOTE: USE CORRECT CRIMPER.		11015 5/27/76	
237	C11	INSPECT STRIP CAP		N/A 11015	
237	C10	CONTACT WITH TO SEAL ends of [illegible] CO. DWG. 163C1914 (Front Spar Inc.) TO [illegible]		8' end only 11015 5/27/76	
		[illegible]		N/A 11015 5/27/76	
		[illegible]		11015 5/27/76	

SERIAL NO. _____

COMPLETION DATE _____

QTY. QA COMP	STAMP & DATE	QTY. REJ.	MAT. & INIT.

ECON. LOT QTY.

UNIT NOS.

PLNG NOS.

DWG NO. 1[illegible]-0 NAME UC LIP CONT. MODULE PLANNING CARD

COMM. NO.	OPER NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G.E.	SIGNOFF Q.A. INSP.	PLANNING TIME WORK CTR.	PLANNING TIME SET-UP
952	031	Q.A - Verify sleeve is uniformly sandblasted.		[illegible] 6/3/76			
952	040	SET UP & MIX EPOXY FOR MPI 27.019 Pur. Part mixed epoxy in "B" end of module		1101 6/2/76			
952	041	Q.A - Witness epoxy mixing and encapsulation per MPI 27.019 Rev C and TI 2004 Rev C TAKE TENSILE SPECIMENS		[illegible] 6/2/76			
937	050	SET UP & MIX Encapsulant" of module per MPI 27.005, Rev. —		1105 6/10/76			
952	051	Q.A - CHECK THIX OPERATION. VERIFY THIX HAVES A GOOD SEAL BETWEEN WIRES AND FEED THRU.					
937	060	SET UP & MIX EPOXY PER MPI 27.019 Rev. — Item epoxy in "A" end of module.		1105 6/4/76			
952	061	Q.A - Verify epoxy mix & encapsulation per MPI 27.019 Rev — & TI 2004 Rev — TAKE TENSILE SPECIMENS		[illegible] 6/9/76			
937	070	SET UP & MIX EPOXY PER MPI 27.019 Item epoxy in FOOT end of module		Not notified by Q.A - to be mixed by Engr.			

PLANNING REV. NO., DATE, & [illegible]

SERIAL NO. —

PAGE 2 OF 2

PART NO. [illegible] NAME LOC, LIP CUT OUT PLANNING CARD

OPN NO.	CODE NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF Q.C.	SIGNOFF INSP.	PLANN NO. ACCEPT SET-UP
952	071	Q.A. — Witness Epoxy mixing and encapsulation per GPI 27-019 Rev ___ and TI 2004, Rev ___				
737	070	"Load Limit Switch Final Check & "Load Test"				
737	001	Q.A. — ELECTRICAL TEST PER TI 1648 Rev ___				
952	073	Q.A. — TEST EPOXY SPECIMENS PER TI 2004, Rev ___				

PLANNING REV. NO. DATE & STATION 1 2 3 4 5

B-22

SERIAL NO. ___

PAGE 3 OF 3

PLANNING CARD

313-314 SPECIALTY SHOP	920 PENETRATION SHOP	924 SENSOR SHOP	927 FAB MACH SHOP	923 PANEL SHOP	QA SP-143 SE-751 PE-952	ELEC.

DRAWING NO.

DRAWING NAME

MAIN DWG. NO. | MAIN DWG. NAME

PLANNING RECORD INFORMATION

1. SET-UP	"F" Qty. Proj.	"F" Qty. Proj.	"F" Qty. Proj.	"F" Qty. Proj.	"F" Qty. Proj.
2. APPLIED	"F" Qty. Proj.	"F" Qty. Proj.	"F" Qty. Proj.	"F" Qty. Proj.	"F" Qty. Proj.
3. UNAPPLIED	"F" Qty. Proj.	"F" Qty. Proj.	"F" Qty. Proj.	"F" Qty. Proj.	"F" Qty. Proj.
4. REWORK	"F" Qty. Proj.	"F" Qty. Proj.	"F" Qty. Proj.	"F" Qty. Proj.	"F" Qty. Proj.

MATERIAL CATEGORY

MATERIAL PER PIECE

TYPE OF PLANNING: SPECIAL ☒ REGULAR ☐ | PLANNING REV. NO. | ENGR. DWG. REV. NO. | LABOR CODE ☐☐☐☐ | PLANNER & DATE | QA PLANNER & DATE 1-5-76

COMP NO.	OPER NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G. E.	SIGNOFF AUTH REP	PLANNING TIME WORK STA	PLANNING TIME SET-UP
		[illegible]		11015			
		[illegible]		5/8/76			
		[illegible]		[illegible]			
		[illegible]		5376			
		[illegible]					
		[illegible] SCOTCHKOTE		11015			
		[illegible]		4/28/76			
		[illegible] 5/7/76					
		[illegible]					
	13	[illegible] SCOTCHKOTE		11015			
		[illegible]		4/20/76			
		[illegible]					
	31	[illegible]					
		[illegible]		5 20 76			
		[illegible] 5/18/76 [illegible]					
		[illegible]					
		[illegible]		5 7 76			

JOB NO.	QTY QA DOWN	STAMP & DATE	QTY REC.	DATE & INIT.	ECON. LOT QTY.	UNIT HRS.
COMPLETION DATE						PLNG HRS.

PAGE 1 OF 3

DWG NO. 1105L1878G003 NAME TC STOCK PLANNING CARD -

COMP NO.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF		PLANNING TIME		
				Q.E.	AUTH INSP.	WORK STA.	SET-UP	TASK
	C40	Assemble stock as shown per dwg 1105L1878		11C15 5/6/76				
	C42	QA - Visually examine dimensions per dwg 1105L1878, document per applicable note.		5/20/76				
	C50	Fabricate and mark per 11C15T sht 1/76 dwg 1105L1878 Rev T dated 5/4/76 note: C & E to witness.		11C15T sht 1/76				
	C51	QA - witness operations for per dwg 1105L1878 Rev T dated 5/4/76 only 5/20/76						
	C60	Fabricate and mark stock per dwg 1105L1878 Rev T dated 5/4/76 sht 2 only		11C15 5/21/76				
	C61	QA witness operations of 2nd set per dwg 1105L1878 Rev T dated 5/4/76 only 5/20/76		11C3 5/20/76				
	C62	QA - Test Tooling per dwg 1105L1878 Rev T DRAFT 5/12/76 5/26/76 2003 only sht 2						
		R46-1C11 5/26/76						

PLANNING REV. NO., DATE, & REASON: 1 2 3 4 5

SERIAL NO. _____

PAGE 2 OF 3

PG NO. _____ NAME _____ PLANNING CARD

COMP. NO.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G. E.	SIGNOFF AUTH INSP.	PLANNING TIME #CRH STA.	PLANNING TIME SET-UP	PLANNING TIME TASK
95	070	Clean module body of excess epoxy & foreign materials.		1/16/J				
152	071	C.A. - LOCK TEST modules per TI 1040, Rev 4		5/26/76				
		ELECT. ONLY [10] 5.25.76						
952	073	C.A. - ELECTRICAL TEST modules per TI 1040 Rev ___ Check functions & input levels per TI 1040, Rev ___ and test limits.						
		Input & IR only [111]						

PLANNING REV. NO., DATE, & REASON | 1 | 2 | 3 | 4 | 5 |

SERIAL NO. _____

PAGE 2 OF 2

PLANNING C-

313-314 SPECIALTY SHOP	920 PENETRATION SHOP	924 SENSOR SHOP	927 FAB MACH SHOP	923 PANEL SHOP	24 SP-342 SE-355 PE-352	942 ENGR.

MAIN DWG. NO. | MAIN DWG. NAME

PLANNING RECORD INFORMATION

163C1914G007 S/N TG-7

#2 awg

1. SET-UP
2. APPLIED
3. UNAPPLIED
4. REWORK

NOTE: LONG end ('A' end) has Large Void in Center of encapsulation. Also, Extruded portion broken when trying to Remove it to verify it is Properly Centered prior to cure.

MATERIAL SPECIFICATION

MATERIAL SIZE - PART NO.

TYPE OF PLANNING: SPECIAL ☐ REGULAR ☐		PLANNING REV. NO.	ENGR. DWG. REV. NO.	LABOR CODE	PLANNER & DATE	QA PLANNER & DATE
		5/26/76 O				R Chan 6/3/76

CODE	OPER NO.	OPERATION DESCRIPTION	SEC	SIGNOFF G.E.	AUTH WCR	QCR QA	SET-UP QA	PLANNING TIME
		237 Cut Coax & Crimp Cabling		11015				
		Test Assembly		5/27/76				
		Clean						
		Install Field Cap		N/A 11015	5/27/76			
		237 Cut Coax wires to drill order of Assembly as shown in Figure 1 (Note: Coax wires to connectors)		2' end only 11015 SH 'A' end 11015 6/5/76				
		Wire Assembly Shrink Lag Cross Connectors		N/A 11015	5/27/76			
		37 Test Assembly Visual and Mech Insp per Insp Dwg 163C1914		11015 5/27/76				

SERIAL NO. COMPLETION	QTY. QA CONF	STAMP & DATE	QTY. REC. ITEM	DATE & INIT.	QTY	UNIT HRS
			12			

PG NO. 1128105-2-B NAME LIC, LIP Cont. Module PLANNING CARD

COMP. NO.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF — Q.E.	SIGNOFF — AUTH. INSP.	PLANNING TIME — WORK STA.	PLANNING TIME — SET-UP
	52 051	Q.A - Verify sleeve is uniformly sandblasted		[signature] 6/3/76			
	937 040	SET UP & MIX EPOXY FOR MPI 27.019 Rev. — Pour mixed epoxy in "B" end of Module		11015 6/4/76			
	952 041	Q.A - Witness epoxy mixing and encapsulation per MPI 27.019 Rev C and TI 2604 Rev D TAKE TENSILE SPECIMENS		[signature] 6/3/76 11015			
	937 050	SET UP & MIX [illegible] OF Module per MPI 27.005 Rev —		6/10/76			
	52 051	Q.A - CHECK THIX OPERATION VERIFY THIX MAKES A GOOD SEAL BETWEEN WIRES AND FEED THRU.					
	937 060	SET UP & MIX EPOXY PER MPI 27.019 Rev — Item Epoxy in "A" end of module.		11015 6/8/76			
	52 061	Q.A - Verify epoxy mix & encapsulation per MPI 27.019 Rev — & TI 2604 Rev — TAKE TENSILE SPECIMENS		[signature] 6/9/76			
	937 070	SET UP & MIX EPOXY PER MPI 27.019 Rev — Pour epoxy in front "wing" of Module		MUST INITIALS by Q.A — Verified in Eng — by Eng			

PLANNING REV. NO., DATE, & 3.20

SERIAL NO. —
PAGE 2 OF —

PLANNING CARD

OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF: QA	SIGNOFF: AUTO INSP.	PLANNING TIME: WORK STA.	PLANNING TIME: SET-UP
952	071 QA — Witness Epoxy mixing and encapsulation per GIPT 27.019 Rev ____ and TI-2004, Rev ____					
937	071 Clean epoxy with Freon solvent & "Freon Tough"					
937	081 QA — ELECTRICAL TEST PER TI 1648 Rev ____					
952	083 QA — TEST EPOXY SPECIMENS PER TI 2004, Rev ____					

PLANNING REV. NO., DATE, & REASON

B 28

SERIAL NO. ____

PAGE 3 OF 3

PLANNING CARD

DRAWING NO. 1637255-002 DRAWING NAME Valley Stack Module

313-314 SPECIALTY SHOP	920 PENETRATION SHOP	224 SENSOR SHOP	927 FAB MACH SHOP	923 PANEL SHOP	QA SP-143 SE-955 PE-952 PM-956	922 ELEC-TRONICS

MAIN DWG. NO. | MAIN DWG. NAME

PLANNING RECORD INFORMATION

1. SET-UP	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.
2. APPLIED	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.
3. UNAPPLIED	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.	'T' Qty. Proj.
4. REWORK					

MATERIAL SPECIFICATIONS:

MATERIAL [illegible] PIECE

TYPE OF PLANNING SPECIAL ☐ STD. ☐		PLANNING REV. NO.	ENGR. DWG. REV. NO.	LABOR CODE	PLANNER & DATE	QA PLANNER & DATE
	0 0 0			0 2 3 4		5/6 5-7.

COMP. NO.	OPN NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G. E.	SIGNOFF QA	PLANNING TIME WORK STA.	PLANNING TIME SET-UP	PLANNING TIME Tm.
137	010	Clean Module Assy of [illegible] IAW 20013 Engrave Dwg & Serial No's on Body.		11615 5-1-74				
952	011	Q.A. - Visual Inspect module body for processing per IAW 20023		53 5-6				
937	020	Panel & Scotchkote parts using instructions of IAW 20023 & Scotchkote (Unit 16 COS Rev 2)		11615 5-3-74				
952	021	Q.A. - Test Film Inspect Scotchkote for [illegible] IAW 20023						

5-7-74

SERIAL NO.	QTY. QA COMP.	STAMP & DATE	QTY. REC. STORES	DATE & INIT.	ECOR LOT QTY.	UNIT MAT	
COMPLETION DATE						PLNG MRS.	
PAGE ____ OF ____							

Page 4 of 4

S NO. _____ NAME _____ PLANNING CARD -

COMP. NO.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF		PLANNING TIME		
				G. E.	ALTN INSP.	WORK STA.	SET-UP	TASK
937	030	Assemble strut modules		5/11/76				
		per dwg.						
-2	051	QA - Verify assembly per 1620/222 dwg. & TP's		5-20-76				
937	040	ENCAPSULATE AND CURE PIE per GE spec 22018 TOC 5/4/76 NOTE: QA TO WITNESS ENCAP		11C15	5/24/76 Rec'd			
952	041	QA - WITNESS ENCAPSULATION per spec 22018 5/4/76 and TE 2003 Rev — ONLY 5/24/76 TOC		5-24-76				
937	070	ENCAPSULATE & CURE OTHER END PER SPEC 22018 TOC 5/4/76 (CAST TENSILE SPECIMENS) and TE 2003 Rev — ONLY 5/24/76			11C15 5/24/76			
952	051	QA - WITNESS ENCAPSULATION OF OTHER END PER SPEC 22018 TOC and TE 2003 Rev — ONLY 5/24/76		108 5-31-76	5/24/76			
952	052	QA TEST TENSILE SPECIMENS PER TI 1620 Rev. DRAFT 5/12/76 and TE 2003 Rev — ONLY 5/24/76		—	5/24/76			
937	060	QA [illegible] of excess epoxy & foreign materials						
952	061	QA - LEAK TEST MODULES PER TI 1620, REV. 4		6/4/76				
952	063	QA - ELECTRICAL TEST PER TI [illegible] REV. 3						

PLANNING CARD

333-334 SPECIALTY SHOP	335 PENETRATION SHOP	336 SENSOR SHOP	337 FAB MACH SHOP	340 PANEL SHOP	341 SP-343 PE-342 SE-1101 PW-1102

MAIN DRG. NO. | MAIN DRG. NAME

PLANNING RECORD INFORMATION

163C1914G008

40

S/N T6-8

E/C

1. SET-UP
2. APPLIED
3. UNAPPLIED
4. PCS PER

MATERIAL SPECIFICATIONS:

MATERIAL SIZE - PER PIECE

TYPE OF PLANNING: SPECIAL ☐ REGULAR ☐	PLANNING REV. NO.	ENGR. DRG. REV. NO.	LABOR CODE	PLANNER & DATE	CA PLN
	5/16/76 O		T-[illegible]		RC 6/3/76

SEQ. NO.	OPER. NO.	MFG. OPERATION DESCRIPTION	SEQ.	SIGNOFF G. E.	PLANNING
		[illegible]		1101J 5/27/76	
		[illegible]		N/A 1101J 5/27/76	
		[illegible]		Preformly 1101J 5/27/76	
		[illegible]		N/A 1101J 5/27/76	
		[illegible]		N/A 1101J 5/27/76	
		[illegible]		1101J 5/27/76	

SERIAL NO.	QTY. CA ISSUE	STAMP & DATE	QTY. REC. MFG.	DATE & INIT.	ECON. LOT QTY.	UNIT HRS.
COMPLETION DATE			15-31			PLND HRS.

PAGE 1 OF 2

PG NO. [illegible] NAME U.S. L.P. Cont. Mod. PLANNING CARD

OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF Q.E.	SIGNOFF [illegible]	PLANNING TIME [illegible]
	52 C31 Q.A - Verify sleeve is uniformly sandblasted		1/31/11		
227 C40	Set up & mix epoxy for MPI 27.019 Rev [illegible] Pour mixed epoxy in "B" end of module		11015 6/3/76		
452 C41	Q.A - Witness epoxy mixing and encapsulation per MPI 27.019 Rev dot and TI 2604 Rev 0 TAKE TENSILE SPECIMENS		6/3/76		
937 C50	Set up & mix [illegible] of module per MPI 27.003, Rev: ———		11015 6/10/76		
451-C51	Q.A - CHECK THIX OPERATION. VERIFY THIX HAVES A GOOD SEAL BETWEEN WIRES AND FEED THRU.				
937 C10	Set up & mix epoxy Per MPT 27.019 Rev. — Item epoxy in "A" end of module.		11015 6/3/76		
2 C61	Q.A - Verify epoxy mix & encapsulation per MPI 27.019 Rev & TI 2604 Rev TAKE TENSILE SPECIMENS		6/9/76		
937 C70	Set up & mix Epoxy Per MPI 27.019 Rev. — Pour epoxy in [illegible]		Part Witness by Q.A [illegible] Was Encapsulated Tested by Eng.		

PLANNING REV. NO. DATE, &

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SERIAL NO. ———
PAGE 2 OF 2

PART NO. [illegible] NAME LOC. LIP PLT W/L PLANNING CARD

NO.	CODE NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF		PLANNING TIME
				G.E.	AUTO INSP.	AUTH SPEC. SET-UP T.
452	011	QA - Witness Epoxy mixing and encapsulation of WPI 37.619 Rev ___ and TI 2004, Rev ___				
437	020	Clean crack with fluid cloth & "Pre-Touch"				
437	021	QA - ELECTRICAL TEST PER TI 1643 Rev ___				
452	033	QA - TEST EPOXY SPECIMENS PER TI 2004, Rev ___				

PLANNING REV. NO., DATE, & REASON

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SERIAL NO. ___

PAGE 3 OF 3

PLANNING CARD

313-314 SPECIALTY SHOP	920 PENETRATION SHOP	924 SENSOR SHOP	927 FAB MACH SHOP	923 PANEL SHOP	QA SP-343 SE-953 PE-952	912 ELEC- TRICAL

DRAWING NO.

MAIN DWG. NO. | MAIN DWG. NAME

PLANNING RECORD INFORMATION

1. SET-UP	"P" Qty. Proj.	"P" Qty. Proj.	"P" Qty. Proj.	"P" Qty. Proj.	"P" Qty. Proj.
2. APPLIED	"P" Qty. Proj.	"P" Qty. Proj.	"P" Qty. Proj.	"P" Qty. Proj.	"P" Qty. Proj.
3. UNAPPLIED	"P" Qty. Proj.	"P" Qty. Proj.	"P" Qty. Proj.	"P" Qty. Proj.	"P" Qty. Proj.
4. REWORK	"P" Qty. Proj.	"P" Qty. Proj.	"P" Qty. Proj.	"P" Qty. Proj.	"P" Qty. Proj.

MATERIAL SPECIFICATIONS:

MATERIAL SIZE - PER PIECE

TYPE OF PLANNING		PLANNING REV. NO.	ENGR. DWG. REV. NO.	LABOR CODE	PLANNER & DATE	QA PLANNER & DATE
SPECIAL ☒ REGULAR ☐	0 1 2			1 2 3 4	[illegible]	[illegible] 1-5-76

COMP NO.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF Q. C.	SIGNOFF AUTH	PLANNING TIME WORK	PLANNING TIME SET-UP	PLANNING TIME TAKT
		[illegible]		11015				
		[illegible]		4/27/76				
		[illegible]		[illegible]				
		[illegible]		5-3-76				
		[illegible]						
		[illegible] SCOTCHKOTE		11015				
		[illegible]		4/28/76				
		[illegible] 5/3/76						
		[illegible] SCOTCHKOTE [illegible]		11015				
		[illegible]		4/29/76				
		[illegible]						
		[illegible]						
		[illegible] 5/4/76 [illegible]						
		[illegible]						
		[illegible] 5/7/76						

SERIAL NO.	QTY. QA COMP.	STAMP & DATE	QTY. RE-WORK	DATE - INIT.	ECCN. -OT QTY.	UNIT HRS.
COMPLETION DATE						PLNG HRS.

PAGE 1 OF 3

[illegible] NO. 112X1884G006 NAME 4/0 STACK PLANNING CARD

COMP. NO.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G.E.	SIGNOFF AUTH INSP.	PLANNING TIME WORK STA.	PLANNING TIME SET-UP	PLANNING TIME TIME
[illegible]	050	disassemble stack module per dwg 112C1884		5/17/76				
252	051	Q A - Verify assembly to dwg 112C1884, and inspect per applicable notes.		5/20/76				
252	052	Encapsulate and cure one [illegible] per UPI 27.018 TDG Notify Q A to witness encapsulation.		11015 5/?/76	5/?/76			
[illegible]	055	Q A - Witness encapsulation per UPI 27018 Rev — 2003 TDG [illegible] and TE ~~[illegible]~~ Rev — [illegible] 5/?/76		[illegible]				
252	060	Encapsulate and cure stack [illegible] per UPI 27 018 TDG 5/?/76 Cast tensile specimen.		5/?/76	11015 5/?/76			
[illegible]	061	Q A witness encapsulation of 2nd unit per UPI 27.018 TDG [illegible] Rev — and TE 2003 Rev [illegible] draft [illegible] 5/?/76		[illegible] 5/?/76				
252	063	Q A - Test tensile specimen per TE ~~[illegible]~~ Rev DRAFT 5/13/76 2003 [illegible] 5/26/76		[illegible]	5/26/76			
		R461X [illegible] 5/26/76						

PLANNING REV. NO., DATE, & REASON 1 2 3 4 5

SERIAL NO. ______

PAGE 2 OF ______

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...S NO. 1630188X6CTF NAME 4/0 STOCK PLANNING CARD

COMP. NO.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF		PLANNING TIME		
				G. E.	AUTH INSP.	WORK STA.	SET-UP	TASK
9371	70	Clean module body of excess epoxy & foreign materials.						
5201	71	G. A. - lock test modules for TI 1630 Rev 4		III 5/26/76				
5202	71	T. A - Electrical Test modules for TI 1630 Rev 3		III				

PLANNING REV. NO., DATE, & REASON | 1 | 2 | 3 | 4 | 5 |

SERIAL NO. _____

PAGE 3 OF 3

WORK ORDER S/N E339F014

#2 assy TOP

Project Code KSI Liquid Plant

Part Number 1640544GAC Code

Originator Chuck Nicholls

Acct. Number TT 148

T' Number TVC 93

Quantity 6

Plan Yield 1.245

Required Date 1405

ASME CODE WORK

Wed 7-13-76

4. REWORK

MATERIAL SPECIFICATIONS: Use END 301 Series Only

MATERIAL SIZE - PER PIECE: W.O.R.C. - "Unit Length"

TYPE OF PLANNING: SPECIAL ☐ REGULAR ☒ 301

PLANNING REV. NO. 2 | ENGR. CHG. REV. NO. PL 2 | LABOR CODE | PLANNER & DATE | QA PLANNER & DA

COMP. NO.	OPER NO.	OPERATION DESCRIPTION	SIGNOFF G.E.	SIGNOFF AUTH	PLANNING TIME SET-UP
		Extra Work			
		NOTE: All operations are to be performed in sequence unless designated by an asterisk (*) in the sequence column.			
			9/1/2016		
020	010	Accumulate parts		100	.25
030	020	Cut wire per M.O.S. Rev.	SG 9-27-76		
	030	Weld per M.O.S.			

SERIAL NO. E339F014

COMPLETION DATE

PAGE 1 OF 7

QTY. QA COMP	STAMP & DATE	QTY. REC. STKPM	DATE & INIT.
		2-27	

ECON. LOT QTY.

UNIT HRS.

PLNG HRS.

164C5446 AC C1-7 NAME CUSTOMER MODULE PLANNING CARD

COMP.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF		PLANNING TIME	
				G.E.	AUTH. INSP.	WORK STA.	SET-UP
920	040	Assemble contacts to wires per M.P.S.		SC 9-21-76		1400	.10
	041	Q.A. - Inspect crimped connectors for uniform indents. Verify strip dim does not exceed insulation O.D. +1/32". Check for nicked or cut strands; not to exceed 10%. Long lead crimping checked by Tom Smith 10/Jul/76		9/21/76		5002	
		Check wire length per dwg. for the appropriate groups. NOTE: Wires exceeding dwg. spec. in length are acceptable at this stage of manufacture.					
920	050	Cut shrink tubing per M.P.S. Clean shrink tubing per M.P.S. 20.024 Rev. G		9-21-76		1827	.08
920	060	Assemble shrink tubing to connectors per M.P.S.		9-21-76		1450	.10
952	065	Q.A. - Inspect shrink tubing per 1175-002 Rev. 3.6.7. and 3.6.8. Rev. 1 and dwg. note 1.		9-22-76		5009	

PLANNING REV. NO. 1/ 2/ 3/ B-38 4/ 5/

SERIAL NO. E339F01C

PAGE 2 OF

-C5446 AC G 1 -7 NAME CUSTOMER MODULE PLANNING CARD

	OPER. NO.	OPERATION DESCRIPTION	SEC	SIGNOFF G. E.	SIGNOFF AUTO. OPER.	PLANNING TIME AUTO. SET-UP TIME
920	070	Engrave customer drawing & group number on module body. Record S/N on each page of WORC.		11/15 10/1/76	T G	1521
920	080	Clean wires per WPI 20.024. For Groups -. 1 - 3 ultra-sonically clean textolite boards with freon for 3 - 5 minutes.		11/15 10/1/76	T.G	1521
920	090	For Groups -. 3 & 4 - Connect wires and SST sleeve to both ends of stock module per WPS. Rev. 1 For Groups 1. 2. 3 & 5 - Connect wires and SST sleeves to one end only per WPS. Rev. 1		11/15 10/1/76	T.G.	1521 .10
920	100	Set-up stock module in stringing and potting fixture. Secure cables to fixture with cyraps so that cables will not loosen or pull off rods. NOTE: Bundle of wires must be centered in sleeve. Do not pull bundle off-center when securing to fixture. Do not place cyraps closer than 12 inches from module body sleeve.		11/15 10/1/76		1521 .06
		COMPLETE ELECT. TEST PER TE1647 REV. 4 WAIVER 114		10/1/76		

PLANNING REV. NO., DATE, &

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SERIAL NO. E339FC

PAGE 3 OF

ASSY NO. [illegible] - 7 NAME CUSTOMER MODULE PLANNING CARD

OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF Q.E.	SIGNOFF ACCEP'D	PLANNING TIME SCHED STA	PLANNING TIME SET-UP	PLANNING TIME RATE
101	Q.A. - Verify correct module S/N is recorded on each face of MDRC. Verify cables are tightly secured to fixture and are centered in sleeve. Group 2 & 3 - Check continuity resistance per TI 1648, Rev. N/A. Verify wire type is correct for each rod. Group 4, 5 & 6 - Verify cables are screwed tightly on each rod. Check continuity, resistance, per TI 1648, Rev. N/A. T Rupert 11-22-76 NOTE: Data sheet not required. C E Zilmer Ling 10/1/76		11015 10/5/76	T.G.	1109	.10	.2.
120	102 Groups 3 & 7A - Check continuity.		H Kemplich. E Zilmerling	10/1/76	1521		.3.
120	110 Encapsulate one end per MPS, Rev. 1 and MPI 27.019, Rev. 1 NOTE: Q.A. to witness epoxy mixing.		11015 10/2/76		1330	.20	..
952	111 Q.A. - (1) Witness epoxy mixing per MPI 27.019, and obtain epoxy eaten sample per TI 2004, Rev. TI2004 Record on TI 2004 data sheet. (2) For Groups 2, 3 & 4 inspect epoxy level after 20-30 minutes but prior to potting board placement and removal of heater tapes. Witness mixing and epoxy addition, if required. Return to:		N/A 11015 10/2/76		30231		..

PLANNING REV. NO., DATE, & [illegible]

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SERIAL NO. 673-F014

PAGE 4 OF 7

.04C5446AC G 1 - 7 NAME CUSTOMER MONITOR PLANNING CARD

	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G. E.	SIGNOFF [illegible] INSP.	PLANNING TIME MCHN STA	PLANNING TIME SET-UP/ TA
920	112	Groups a, b & h - Mix and add epoxy if required.		~~[illegible]~~ 7	[illegible]	1550	.10 .2
		Q.A. to witness. Add potting board. Remove		11/15	TG		
		heater tapes.		10/7/76			
952	113	QA - Verify epoxy cure time and hardness per		11/15	TG	5023	
		WPI 27.019, Rev. 1.		1/7/77			
920	120	Relase fixture 150[2] for second encapsulation.		14310		1550	.10 1.
		Setting second end of Groups 1, 2, 3, 5 and		10/24/76			
		assemble sleeve per WPS. Check continuity of					
		Groups 1 and 2.					
952	125	Q.A. - Groups ~~1 and 2~~ - Check continuity, resistance		11		5023	
		per WI 200[2], Rev. 4		9/24/76			
920	130	Encapsulate second end per WPS, Rev. ____ and				1550	.10
		WPI 27.019, Rev.					
		NOTE: Q.A. to witness epoxy mixing.					
952	131	Q.A. witness epoxy mixing & obtain epoxy batch				5023	
		sample per WI 200[2], Rev. ____ Record on WI 200[2]					
		data sheet. For Groups a, b & h inspect epoxy					
		level 20-30 minutes prior to potting board placement.					
		Record Lot # per WI 200[2].					

PLANNING REV. NO., DATE, & 1 2 3 B-47 4 5

SERIAL NO. E3[illegible]F014

PAGE 5 OF 7

5446 AC C 1 - 7 NAME CUSTOMER MODULE PLANNING CARD

OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF Q.E.	SIGNOFF AUTH INSP	PLANNING TIME WORK STA.	PLANNING TIME SET-UP	PLANNING TIME RA
132	Seat potting board for Groups 4, 5 and 6.				1550		
952 133	Q.A. - Verify epoxy cure time and hardness per MPI 27.019, Rev.				5070		
	Record hardness: Long end						
	Short end						
	ELECTRICALLY TEST PER TI 1077 REV						
920 140	Remove customer module from rack & clean excess epoxy only after Operation 133 is completed.				1560	.04	
952 141	Q.A. - (1) Inspect assembly dimensions per dwg.				5070		
	Record wire length below.						
	(2) Inspect per note 1 of drawing.						
	(3) Verify proper marking per oper. 070.						
	(4) Inspect for cleanliness & workmanship.						
	Short end						
	Long end						
952 143	Q.A. Complete inspection per TI 2004, Rev. and MPI 27.019, Rev.				5060	.30	
	Hardness: Long end						
	Short end						
952 145	Q.A. - Records				5001		
	(1) Verify all data has been filled in (WORC)						
	(2) Verify document revisions have been recorded in the "Revision Blanks"						
	(3) Verify all blocked operations are signed off and dated.						
	(Continued on page 7)						

PLANNING REV. NO., DATE, & REVISION 1 2 3 4 5

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SERIAL NO E339F014

164C5446AC G 1 - 7 NAME CUSTOMER MODULE PLANNING CARD

OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G. E.	SIGNOFF [illegible] INSP.	PLANNING TIME [illegible] STD	PLANNING TIME SET-UP
145	Continued					
	(4) Verify NORC acceptability per QAP 17.1. Rev.					
	(5) Retain NORC until assigned to a penetration assembly. Then place in the Records Package.					

PLANNING REV. NO. - OF 5

1 2 3 4 5

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SERIAL NO. E039FC1C

PAGE 7 OF

WORK ORDER

S/N E339F009

ISSUED

ORIGINAL

4. REWORK

MATERIAL SPECIFICATIONS:

MATERIAL SIZE - PER PIECE

Use EMD 301 Epoxy Only

W.O.R.C. - "Unit Center"

TYPE OF PLANNING: SPECIAL ☐ REGULAR ☒

PLANNING REV. NO. 0 1 2

ENGR. DWG. REV. NO.

LABOR CODE 1 2 3 4

PLANNER & DATE

QA PLANNER & DA

COMP. NO.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G. E.	SIGNOFF AUTH INSP.	PLANNING TIME WORK STA	PLANNING TIME SET-UP	PLANNING TIME TAC
		Extra Work						
		NOTE: All operations are to be performed in sequence unless designated by an asterisk (*) in the sequence column.						
920	010	Accumulate parts		7/6/76 S.N. 122214		1100	.25	
920	020	Cut wire per M.P.S. Rev. D		66. 1253 1 7/6/76		1211	.0	.5
	030	Mark wires per M.P.S		1276		1211	.15	.20

SERIAL NO. E339F009 COMPLETION	QTY. QA COMP.	STAMP & DATE	QTY. REC. STKRM	DATE & INIT.	ECON. LOT QTY.	UNIT HRS.
			B-44			

-05446 AC G1-7 NAME CUSTOMER MODULE PLANNING CARD

OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G. E.	SIGNOFF AUTH INSP.	PLANNING TIME WORK STA.	PLANNING TIME SET-UP	PLANNING TIME TA
040	Assemble contacts to wires per M.P.S.		7 2 76		1430	.10	.
			2C606				
041	O.A. - Inspect crimped connectors for uniform indents. Verify strip cap does not exceed insulation O.D. +1/32". Check for nicked or cut strands; not to exceed 10%.				5002		
	Check wire length per dwg. for the appropriate groups. NOTE: Wires exceeding dwg. spec. in length are acceptable at this stage of manufacture.						
050	Cut shrink tubing per M.P.S. Clean shrink tubing per M.P.I. 20.024 Rev. 1 one end only		2C756		1827	.03	
060	Assemble shrink tubing to connectors per M.P.S. one end only		2C756		1450	.10	
065	O.A. - Inspect shrink tubing per TIPE-028 Para. 3.6.7. and 3.6.8. Rev. 1 and dwg. note 1.		100 T		5009		

PLANNING REV. NO., DATE, & REASON | 1 | 2 | 3 | 4 | 5

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SERIAL NO. E339Fon9

PAGE 2 OF ___

...o AC G 1 -7 NAME CUSTOMER MODULE PLANNING CARD

SEQ.	OPER. NO.	OPERATION DESCRIPTION	SEC	SIGNOFF G. E.	SIGNOFF AUTH REP	PLANNING TIME MCHN STA.	PLANNING TIME SET-UP	PLANNING TIME TASK
-20	070	Engrave customer drawing & group number on module body. Record S/N on each page of WORC.		20715 10/12/71		1521		.1m
920	080	Clean wires per MPI 20.024. For Groups 4, 5 & 6 ultrasonically clean textolite boards with freon for 3 - 5 minutes.		20745 10/12/71		1221		.1m
		One End Only						
920	090	For Groups 4, 5 & 6 - Connect wires and SST sleeve to both ends of stock module per MPS. Rev. 1. For Groups 1, 2, 3 & 7 - Connect wires and SST sleeves to one end only per MPS. Rev. 1.		20745 10/12/71		1521	.10	2.7m
920	100	Set-up stock module in stringing and potting fixture. Secure cables to fixture with tywraps so that cables will not loosen or pull off rods. NOTE: Bundle of wires must be centered in sleeve. Do not pull bundle off-center when securing to fixture. Do not place tyraps closer than 12 inches from module body sleeve.		20745 10/12/71		1521	.04	.1m

PLANNING REV. NO., DATE, & REASON | 1 | 2 | 3 | 4 | 5 |

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SERIAL NO. E339F0C7

PAGE 3 OF 7

-2 W C 1 - 7 NAME CUSTOMER MODULE PLANNING CARD

	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G. E.	SIGNOFF AUTH INSP.	PLANNING TIME WORK STA.	PLANNING TIME SET-UP	PLANNING TIME TASK
352	101	O.A. - Verify correct module S/N is recorded on		[illegible]		3009	.10	.50
		each page of WORC.		10/12/96				
		Verify cables are tightly secured to fixture and						
		are centered in sleeve.						
		Group 1 & 2 - Check continuity resistance per						
		TI 1648, Rev. N/A. Verify wire type is correct						
		for each rod.						
		Group 4, 5 & 6 - Verify cables are screwed tightly						
		on each rod. Check continuity resistance per						
		TI 1648, Rev. 4.						
		NOTE: Data Sheet not required.						
		FULL ELECTRICAL TIEST PER TI 1648 REV 4 COMPLETE						
420	102	Groups 3 & 7 - Check continuity. [illegible] 10/12/96		1114	[illegible]	1321		.50
420	110	Encapsulate one end per MPS. Rev. 1 and		1105		3301	.10	.50
		MPI 27.019, Rev. 1		10/12/96				
		NOTE: O.A. to witness epoxy mixing.						
352	111	O.A. - (1) Witness epoxy mixing per MPI 27.019 and		[illegible]	[illegible]	5023		.50
		obtain epoxy batch sample per TI 2004, Rev.		10/12/96				
		Record on TI 2004 data sheet.						
		(2) For Groups 4, 5 & 6 inspect epoxy level after						
		20-30 minutes but prior to potting board						
		placement and removal of heater tapes. Witness						
		mixing and epoxy addition, if required.						
		Record Lot #5 12-21-1 20# IT#						

PLANNING REV. NO., DATE, & REASON | 1/ | 2/ | 3/ | 4/ | 5/

SERIAL NO. E35FCC9

PAGE 4 OF 7

DELMAC C 1 - 7 NAME CUSTOMER MODULE PLANNING CARD

NO.	OPER. NO.	OPERATION DESCRIPTION	SEC	SIGNOFF G. E.	SIGNOFF AUTH. INSP.	PLANNING TIME OPER. STA	SET-UP	TASK
920	112	Group -, 5 & 6 - Mix and add epoxy if required. O.A. to witness. Add potting board. Remove heater tapes.		[illegible] 11/15	11/15 11/14/76	1550	.10	.25
952	113	O.A. - Verify epoxy cure time and hardness per MPI 27.019, Rev. 1		11/15 11/27/76		5023		
920	120	Rotate fixture 180° for second encapsulation. String second end of Groups 1, 2, 3 & 7 and assemble sleeve per MPS. Check continuity of Groups 3 and 7.		20633 11/30/76		1550	.10	.25
952	125	O.A. - Groups ~~1 and 2~~ - Check continuity resistance [illegible] per TI [illegible], Rev. 4		[illegible] 12/1/76		5023		.50
920	130	Encapsulate second end per MPS, Rev. 1 and MPI 27.019, Rev. 1 NOTE: O.A. to witness epoxy mixing.		14320 12/2/76		1550	.10	.25
952	131	O.A. - Witness epoxy mixing & obtain epoxy batch sample per TI 2004, Rev. C. Record on TI 2004 data sheet. For Groups 4, 5 & 6 inspect epoxy level 20-30 minutes prior to potting board placement. Record Lot # 9/1W/L P09211-65F76 IT# 1		1103 12/3/76		5023		.25

SERIAL NO. [illegible]

PAGE 5 OF [illegible]

PLANNING REV. NO., DATE, & REASON

...o AC G 1 - 7 NAME CUSTOMER MODULE PLANNING CARD

	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G. E.	SIGNOFF AUTH INSP.	PLANNING TIME WORK STA.	PLANNING TIME SET-UP	TASK
420	132	Seat potting board for Groups 4, 5 and 6.				1330		
952	133	O.A. - Verify epoxy cure time and hardness per MPI 27.019, Rev. C Record hardness: Long end 60 Short end INSPECT WIRE ENDS FOR CONTINUITY PER ITEM 5 SEV TEST ONLY				5027		
920	140	Remove customer module from rack & clean excess epoxy only after Operation 133 is completed.				1360	.04	
952	141	O.A. - (1) Inspect assembly dimensions per dwg. Record wire length below. (2) Inspect per note 2 of drawing. (3) Verify proper marking per Oper. 070. (4) Inspect for cleanliness & workmanship. Short end Long end				5070		
952	143	O.A. Complete inspection per TI 2004, Rev. and MPI 27.019, Rev. Hardness: Long end Short end				5061	.30	
952	145	O.A. - RECORDS (1) Verify all data has been filled in (WORC) (2) Verify document revisions have been recorded in the "Revision Blanks" (3) Verify all blocked operations are signed off and dated.				5001		

(Continued on page 7)

PLANNING REV. NO., DATE, & REASON | 1 | 2 | 3 | 4 | 5

SERIAL NO. 6339-009

3446AC G 1 - 7 NAME CUSTOMER MODULE PLANNING CARD

NO.	OPER. NO.	OPERATION DESCRIPTION	SEQ	SIGNOFF G. E.	SIGNOFF AUTH. INSP.	PLANNING TIME WORK STA.	PLANNING TIME SET-UP TIME
	1-5	Continued ----					
		(4) Verify WORC acceptability per QAP 17.1, Rev. .					
		(5) Retain WORC until assigned to a penetration assembly. Then place in the Records Package.					

PLANNING REV. NO., DATE, & SIGN

1 2 3 4 5

B-52

SERIAL NO. 33F

PAGE 7 OF

APPENDIX B

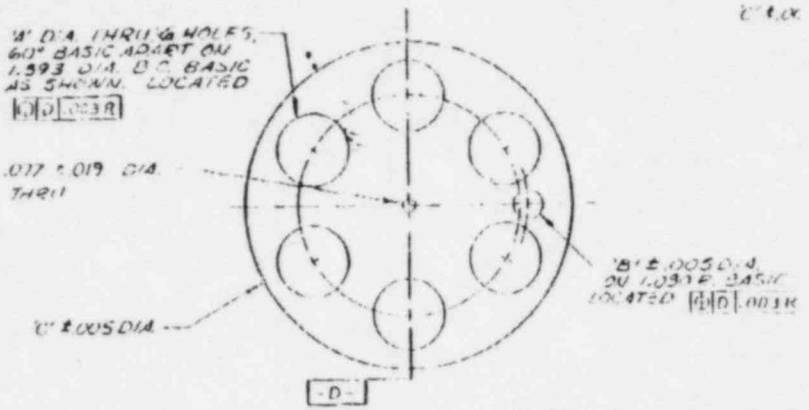
APPENDIX B

INDEX

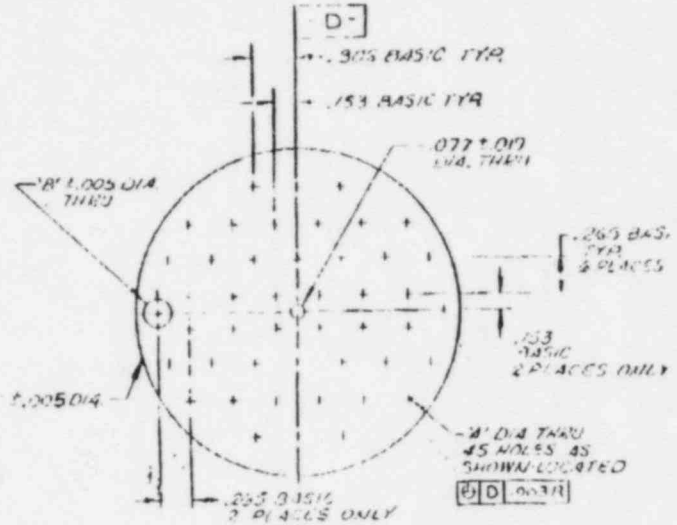
DRAWING NUMBER	SUBJECT
163C1790	Potting Board
167A2534	Textolite (Glass cloth base epoxy sheet)
175A8230	Tubing Shrinkable
195B9702	Housing, Electrical Connector
225A5146	Contact, Female
234A9806	Coating Compound
262A6669	Rod (thermocouple)
262A6849	Rod (size #12 & 8 AWG)
262A6853	Rod (size #2 & 4/0 AWG)
262A6854	Sealant, Electrical Casting Resin (EMR-300)
262A7075 (proprietary, not included in this appendix)	
262A7076	Sealant (Encapsulation Compound XR5237)
262A7898	Stranded wire
272A8189 (proprietary, not included in this appendix)	EMR-301 Casting Resin

Shoreham (LILCO) Penetration Seal Installation Instruction Manual 283X412BD (Excerpts)

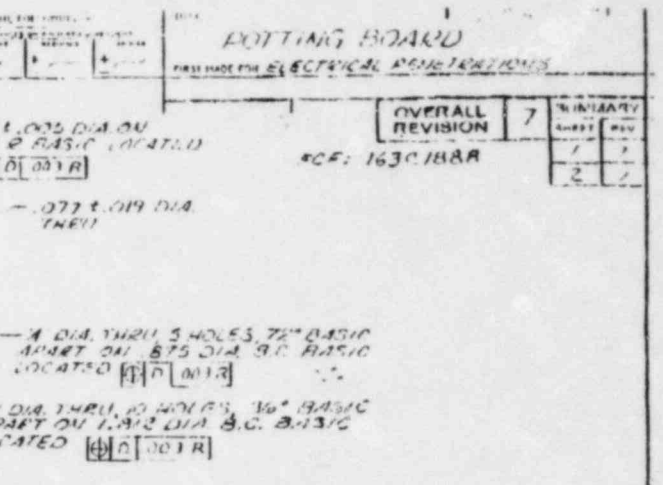
General Electric EIS File printout for containment penetrations



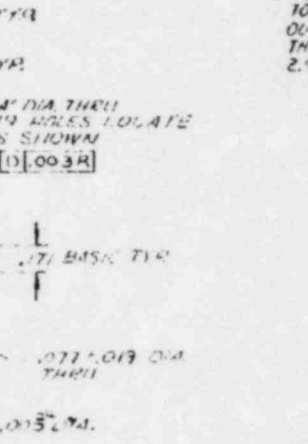
PT. NO.	'A'	'B'	'C'	WIRE SIZE	MATERIAL
1	.331 ± .003	.218	2.415	4/0	167A2534P7
2	.093 ± .005	OMIT	2.410	4/0	272AB133P1
3	.718 ± .005	.218	2.415	4/0	167A2534P7



PT. NO.	'A'	'B'	'C'	WIRE SIZE	MATERIAL
7	.182 ± .003	.187	2.415	#8	167A2534P7
8	.147 ± .013	OMIT	2.410	#8	272AB133P1
9	.272 ± .005	.187	2.415	#8	167A2534P7



'A'	'B'	'C'	WIRE SIZE	MATERIAL
.731 ± .003	.218	2.415	#2	162A2534P7
.306 ± .009	OMIT	2.410	#2	272AB133P1
.418 ± .005	.218	2.415	#2	167A2534P7



'A'	'B'	'C'	WIRE SIZE	MATERIAL
.170 ± .003	.187	2.415	#12	167A2534P1
.092 ± .009	OMIT	2.410	#12	272AB133P1
.253 ± .003	.187	2.415	#12	167A2534P1
.389 ± .013	.187	2.415	#16	167A2534P1
.092 ± .009	OMIT	2.410	#16	272AB133P1
.196 ± .009	.187	2.415	#16	167A2534P1

NOTES:
1. TOLERANCE ON OUTSIDE DIAMETER TO BE ± .005. NO DIAMETER ON THE OUTSIDE SURFACE SHALL BE LESS THAN 2.355 OR GREATER THAN 2.965

PUTTING BOARD
FIRST MADE FOR ELECTRICAL PENETRATIONS

OVERALL REVISION 7

SCF: 163C1188

MAY 31, 74

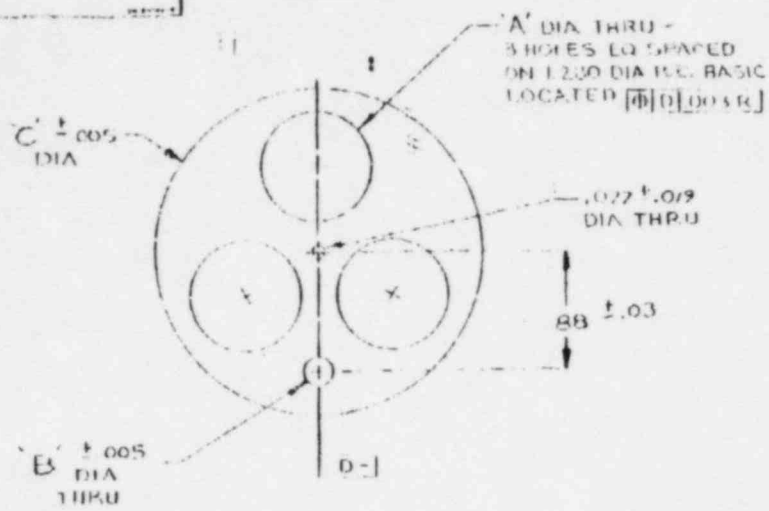
SAN JOSE

163C1190

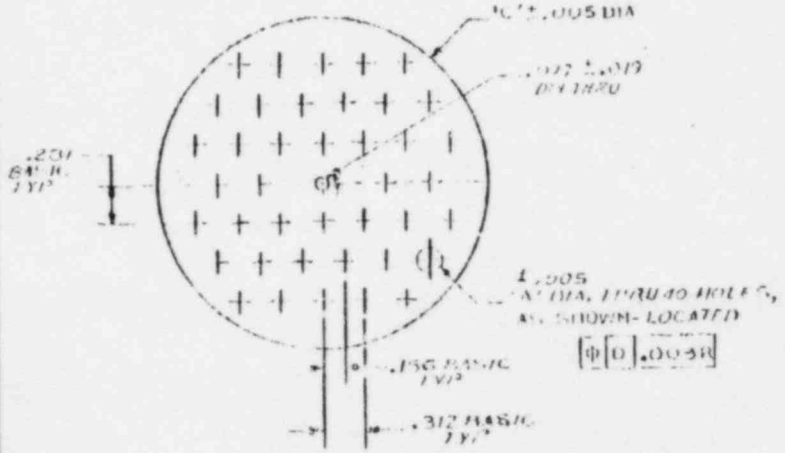
GENERAL ELECTRIC 16C1790

16A2400 250V

POTTING BOARD
FOR ELECTRICAL PENETRATIONS



PART NO	'A'	'B'	'C'	WIRE SIZE	MATERIAL
16	.826 ±.003	.218	2.415	SRM/TRM	16A2534P1
17	.193 ±.006	OMIT	2.410	SRM/TRM	22A8133P1
18	.500 ±.010	.218	2.415	SRM/TRM TRIAX	16A2534P1
19	.353 ±.003	.218	2.415	TRIAX	16A2534P1
20	.918 ±.007	OMIT	2.410	TRIAX	22A8133P1



PART NO.	'A'	'B'	'C'	WIRE SIZE	MATERIAL

GENERAL ELECTRIC

167A2534
CONT ON SHEET FINAL SHEET 1A

A16X89

167A2534
CONT ON SHEET FINAL SHEET 1A

TITLE
TEXTOLITE (GLASS CLOTH BASE EPOXY SHEET)

FIRST MADE FOR STANDARDS

REVISIONS

GENERAL

GENERAL PURPOSE GLASS CLOTH BASE LAMINATED EPOXY SHEET. AVERAGE PROPERTIES INCLUDE HIGH INSULATION RESISTANCE, VERY LOW WATER ABSORPTION, HIGHEST BONDING STRENGTH OF GLASS LAMINATES, AND HIGH STABILITY IN HUMIDITY. SEE NEMA OR MILITARY SPECIFICATIONS FOR GUARANTEED VALUES. STANDARD SIZED SHEETS OF 36" x 36", 36" x 48", 36 36" x 72" RANGE IN THICKNESS FROM .020" to .50". CONTINUOUS OPERATING TEMPERATURE LIMIT OF 130°C.

PART NO.	THICKNESS	THICKNESS* TOLERANCE
6	.031	± .005
7**	.062	± .0075
8**	.093	± .009
9**	.125	± .012
11**	.187	± .019
13**	.250	± .022
17	.500	± .036
21	.750	± .043

** PREFERRED PART

*AT LEAST 90% OF AREA OF THE SHEET SHALL BE WITHIN THE SPECIFIED TOLERANCES, AND AT NO POINT SHALL THE THICKNESS VARY FROM THE NOMINAL BY A VALUE GREATER THAN 125% OF THE SPECIFIED TOLERANCES.

MATERIAL: TEXTOLITE GRADE 11637 WITH RESIDUE-FREE SURFACE, (NATURAL GREENISH COLOR) NEMA GRADE FR-4 IN COMPLIANCE WITH MIL-P-18177 TYPE GEE. [2]

[2]

MANUFACTURED BY: THIS IS A MILITARY GRADE MATERIAL. SELECT MANUFACTURER PER GPL 18177 (REVISION IN EFFECT AT TIME OF P.O. ISSUE)

FOR REVISIONS SEE SHEET 1

LAST

167A2534
CONT ON SHEET FINAL SHEET 1A

#2-56 UNC-2B SST

005	SEALANT	Z6ZA7075P001	AR	Z1								
006	ROD	Z6ZA6849P005	41	Z1								
008	ROD	Z6ZA6849P004	33	Z1								
011	POTTING BOARD	163C1720P014	2	Z1								
012	POTTING BOARD	163C1720P013	6	Z1								
013	GLASS FIBER, CHOPPED	175A8122P001	AR	1F						N		

PARTS LIST NO ? 163C1886
SUFFIX NUMBER ? C003

TITLE:MODULE

PL REV: 6 DOC REV: 5 CMEL-FIC CMEL-DIC

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C	S C	A F	R C	C D
001	HOUSING, ELECTRICAL	195B9702P001		1	Z1						
002	SCREW,MACH,FNH	NI53F502Z		1	Z3						
004	NUT,MSCR,HEX	NZZ6F5		1	Z3						
	#2-56 UNC-2B SST										
005	SEALANT	Z6ZA7075P001		AR	Z1						
006	ROD	Z6ZA6849P005		41	Z1						
007	ROD	Z6ZA6849P001		33	Z1						
010	ROD	Z6ZA6849P002		33	Z1						
011	POTTING BOARD	163C1720P014		2	Z1						
012	POTTING BOARD	163C1720P013		6	Z1						
013	GLASS FIBER, CHOPPED	175A8122P001		AR	1F					N	

PARTS LIST NO ? 163C1886
SUFFIX NUMBER ? C004

TITLE:MODULE

PL REV: 6 DOC REV: 5 CMEL-FIC CMEL-DIC

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C	S C	A F	R C	C D
001	HOUSING, ELECTRICAL	195B9702P001		1	Z1						
002	SCREW,MACH,FNH	NI53F502Z		1	Z3						
004	NUT,MSCR,HEX	NZZ6F5		1	Z3						
	#2-56 UNC-2B SST										
005	SEALANT	Z6ZA7075P001		AR	Z1						
006	ROD	Z6ZA6849P005		41	Z1						
008	ROD	Z6ZA6849P004		33	Z1						
010	ROD	Z6ZA6849P002		33	Z1						
011	POTTING BOARD	163C1720P014		2	Z1						
012	POTTING BOARD	163C1720P013		6	Z1						
013	GLASS FIBER, CHOPPED	175A8122P001		AR	1F					N	

PARTS LIST NO ? 163C1886
SUFFIX NUMBER ? C005

TITLE:MODULE

PL REV: 6 DOC REV: 5 CMEL-FIC CMEL-DIC

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C	S C	A F	R C	C D
001	HOUSING, ELECTRICAL	195B9702P001		1	Z1						
002	SCREW,MACH,FNH	NI53F502Z		1	Z3						
004	NUT,MSCR,HEX	NZZ6F5		1	Z3						
	#2-56 UNC-2B SST										
005	SEALANT	Z6ZA7075P001		AR	Z1						
006	ROD	Z6ZA6849P005		41	Z1						
008	ROD	Z6ZA6849P004		33	Z1						
010	ROD	Z6ZA6849P002		33	Z1						
011	POTTING BOARD	163C1720P014		2	Z1						
012	POTTING BOARD	163C1720P013		6	Z1						
013	GLASS FIBER, CHOPPED	175A8122P001		AR	1F					N	

PARTS LIST NO ? 163C1886
SUFFIX NUMBER ? C006

TITLE:MODULE

PL REV: 6 DOC REV: 5 CMEL-FIC CMEL-DIC

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C	S C	A F	R C	C D
001	HOUSING, ELECTRICAL	195B9702P001		1	Z1						
002	SCREW,MACH,FNH	NI53F502Z		1	Z3						
004	NUT,MSCR,HEX	NZZ6F5		1	Z3						
	#2-56 UNC-2B SST										
005	SEALANT	Z6ZA7075P001		AR	Z1						
006	ROD	Z6ZA6849P005		41	Z1						
008	ROD	Z6ZA6849P004		33	Z1						
010	ROD	Z6ZA6849P002		33	Z1						
011	POTTING BOARD	163C1720P014		2	Z1						
012	POTTING BOARD	163C1720P013		6	Z1						
013	GLASS FIBER, CHOPPED	175A8122P001		AR	1F					N	

GENERAL ELECTRIC

175A8230

REV 10

175A8230

CONT ON SHEET 2 SH NO 1

TITLE PURCHASED PART

TUBING SHRINKABLE (POLYOLFIN, FLEXIBLE RATED: 55°C-135°C)

FIRST MADE FOR STA. 6 ABDS

CONT ON SHEET 2 SH NO 1

OVERALL REVISION	10

SUMMARY

SHEET	REV
1	10
2	10
3	10

UNLESS OTHERWISE SPECIFIED USE	APPLIED PRACTICES	SURFACES	TOLERANCES ON MATERIAL DIMENSIONS FRACTIONS ±	DECIMALS ±	ANGLES ±
		✓			

REVISIONS

10	E Galan 9-11-78 E GALAN		
	NJ04618 REDRAWN REV STATUS SHT & RENUMBER SHT FROM 01 TO 1, 02 & 2 TO 3 CHK'D BY: E L INMAN		

C

PRINTS TO

23
DRB
68
69
78

MADE BY D. CLUFF FEB 25, 71

ISSUED RFS0665 MAR 2, 71

2-14-73

E.C.N. RE

NED

SAN JOSE

DIV OR DEPT

LOCATION

175A8230

CONT ON SHEET 2 SH NO 1

CI

PRINTED IN U.S.A.

(10)

GENERAL ELECTRIC

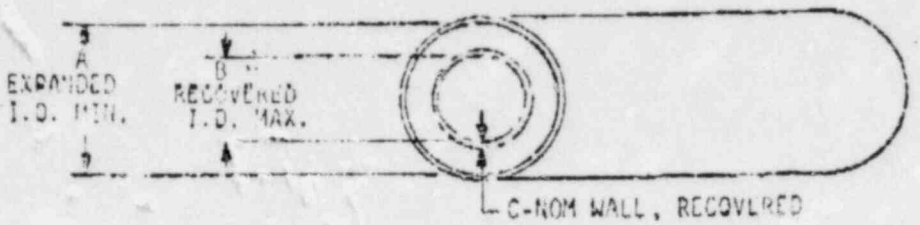
175A8230

TITLE PURCHASED PART
TUBING, SHRINKABLE (POLYOLEFIN, FLEXIBLE
RATED: 55°C-135°C)

FIRST MADE FOR STANDARDS

CLASS II FSC 5970-11/11

REVISIONS



MATERIAL: FLEXIBLE GENERAL PURPOSE IRRADIATED POLYOLEFIN "HEAT SHRINKABLE" TUBING.

COLOR: SEE TABLE, CATALOG NUMBER SUFFIX. (YEL=YELLOW, BLK=BLACK, BLU=BLUE)

LENGTH: STOCKED IN 4 FOOT LENGTHS BUT AVAILABLE LONGER ON SPECIAL ORDER.

TEMP RATED: -55°C TO 135°C CONTINUOUS.

FLAMMABILITY: WHEN TESTED PER ASTM D876 (SECTIONS 11-16) TUBING MUST EXTINGUISH WITHIN 15 SECONDS AND NOT DRIP OR FLOW.

CORROSION: WHEN TESTED PER ASTM D2671-APPENDIX COPPER MIRROR (A1.5.1) WITH SPECIMEN KEPT AT A TEMPERATURE OF 175°C + 5° FOR 16 HOURS. COPPER CONTACT (A1.5.2) RESULTING CORROSION MUST BE WITHIN DESCRIBED LIMITS:

1. SPECIMENS SHALL BE PREPARED BY BEING SHRUNK BY HEATING FOR 2 MINUTES IN A MECHANICAL OVEN WHICH IS AT 150°C + 5° WITH AN AIR VELOCITY OF 100-200 FT PER MIN PAST SPECIMENS, REMOVED FROM OVEN AND COOLED AT ROOM TEMPERATURE.
2. COPPER MIRROR: COPPER TRANSPARENCY DUE TO CORROSION SHALL NOT EXCEED 5% OF TOTAL MIRROR AREA.
3. COPPER CONTACT: COPPER WIRE SHALL NOT BE PITTED OR BLACK, AND TUBING NOT EMBRITTLED, CRACKED, OR DISCOLORED.

10 REVISED PER ECN 9-11-75 (KT THOMAS)
MJ04615 CHG'D BY: (KT THOMAS)

PRINTS TO

DRAWN P. RODRIGUEZ 18 JULY 66	APPROVED A. McQUEEN JULY 19, 66	NED SAN JOSE	17548230
			SHEET 3 OF 3 SHEET NO. 2

C1

(17)

(11)

GENERAL ELECTRIC

175A8230

CONT ON SHEET F SH NO. 3

TITLE PURCHASED PART

TUBING, SHRINKABLE (POLYOLEFIN, FLEXIBLE RATED: 55°C-135°C)

175A8230

CONT ON SHEET F SH NO. 3

FIRST MADE FOR STANDARDS CLASS II SPEC 6970-11/N

VENDOR CAT. NO.

PART	SIZE (INCH)	A	B	C	ALPHA WIRE	FT	RAYCLAD TUBES	FT	ECC
1								200	VEP-876-3/32-BLK
2	3/32	.093	.06	.020	FIT-876-3/32-BLK	100	RT-876-3/32-BLK		
3	1/8	.125	.062	.020	FIT-876-1/8-BLK	100	RT-876-1/8-BLK	200	VEP-876-1/8-BLK
4	3/16	.187	.093	.020	FIT-876-3/16-BLK	100	RT-876-3/16-BLK	200	VEP-876-3/16-BLK
5	1/4	.250	.125	.025	FIT-876-1/4-BLK	100	RT-876-1/4-BLK	100	VEP-876-1/4-BLK
6	3/8	.375	.18	.025	FIT-876-3/8-BLK	100	RT-876-3/8-BLK	100	VEP-876-3/8-BLK
7	1/2	.500	.25	.025	FIT-876-1/2-BLK	20	RT-876-1/2-BLK	100	VEP-876-1/2-BLK
8	3/4	.750	.375	.030	FIT-876-3/4-BLK	20	RT-876-3/4-BLK	100	VEP-876-3/4-BLK
9	1	1.00	.500	.035	FIT-876-1 -BLK	43	RT-876-1 -BLK	48	VEP-876-1-BLK
10	1 1/2	1.50	.750	.040	FIT-876-1 1/2-BLK	20	RT-876-1 1/2-BLK	43	VEP-876-1 1/2-BLK
11	2	2.00	1.00	.045	FIT-876-2-BLK	20	RT-876-2-BLK	24	VEP-876-2-BLK
12	3	3.00	1.50	.050	FIT-876-3-BLK	8	RT-876-3-BLK	24	VEP-876-3-BLK
13									
14									
28	4	4.00	2.00	.065	FIT-876-4-YEL	3	RT-876-4-YEL	24	VEP-876-4-YEL
29	1/2	.500	.250	.020	FIT-876-1/2-YEL	20	RT-876-1/2-YEL	100	VEP-876-1/2-YEL
30	1/2	.500	.250	.025	FIT-876-1/2-BLU	20	RT-876-1/2-BLU	100	VEP-876-1/2-BLU
60	1/2	.500	.250	.025	FIT-876-1/2-GRN	20	RT-876-1/2-GRN	100	VEP-876-1/2-GRN

AS MANUFACTURED BY: ALPHA WIRE, RAYCLAD TUBES, L.P. PANEL & SUBS, INC., ELECTRONIZED CONTROL CORP. OR ENGINEERING APPROVED EQUIVALENT

REVISIONS

ID Raychem 9-11-78 LETR
Ltr 0015 (Q)

PRINTS

DRAWN BY D. CLIFF FEB. 25, 1971

APPROVALS W. F. STLICKAL MAR. 2, 71

NED DIV OR DEPT

SAN JOSE LOCATION

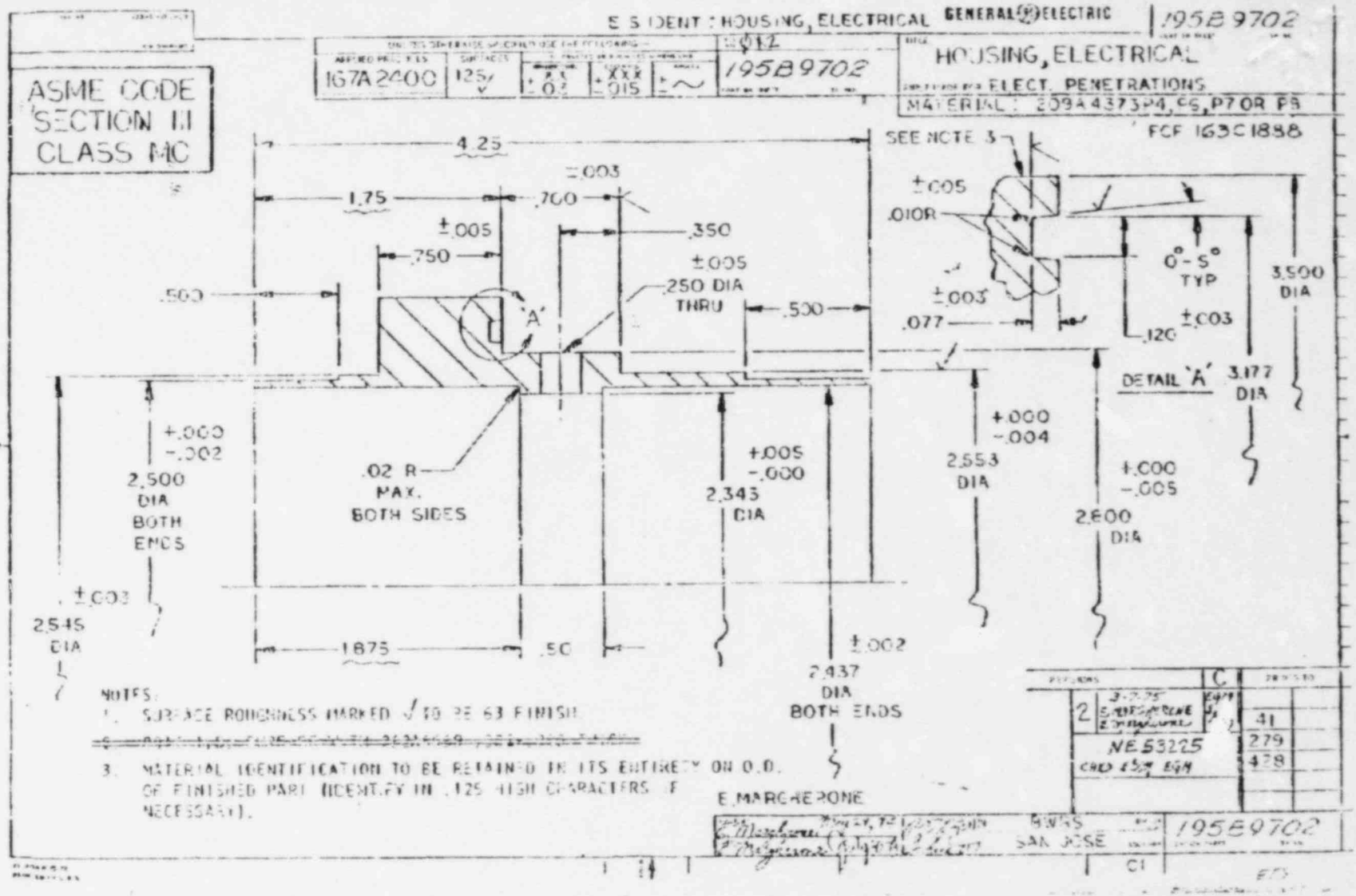
175A8230 CONT ON SHEET F SH NO. 3

CODE IDENT

RF-

CI

11 803 WF (2-74)
PRINTED IN U.S.A.


ASME CODE
SECTION III
CLASS MC
HOUSING, ELECTRICAL
ELECT. PENETRATIONS
MATERIAL: SA 479 316, SS, P70R FS
FCF 163C1888
SEE NOTE 3
4.25
1.75
.700
.350
.750
.500
.250 DIA THRU
.010R
.077
.120
0°-5° TYP
3.500 DIA
DETAIL 'A'
3.177 DIA
2.500 DIA BOTH ENDS
.02 R MAX. BOTH SIDES
2.345 DIA
2.553 DIA
2.600 DIA
2.545 DIA
1.875
.50
2.437 DIA BOTH ENDS
NOTES:
1. SURFACE ROUGHNESS MARKED √ TO BE 63 FINISH.
3. MATERIAL IDENTIFICATION TO BE RETAINED IN ITS ENTIRETY ON O.D. OF FINISHED PART (IDENTIFY IN .125 HIGH CHARACTERS IF NECESSARY).
E. MARCHERONE
SAN JOSE
1958702

EIS IDENT: CONNECTOR

GENERAL ELECTRIC

225A5146

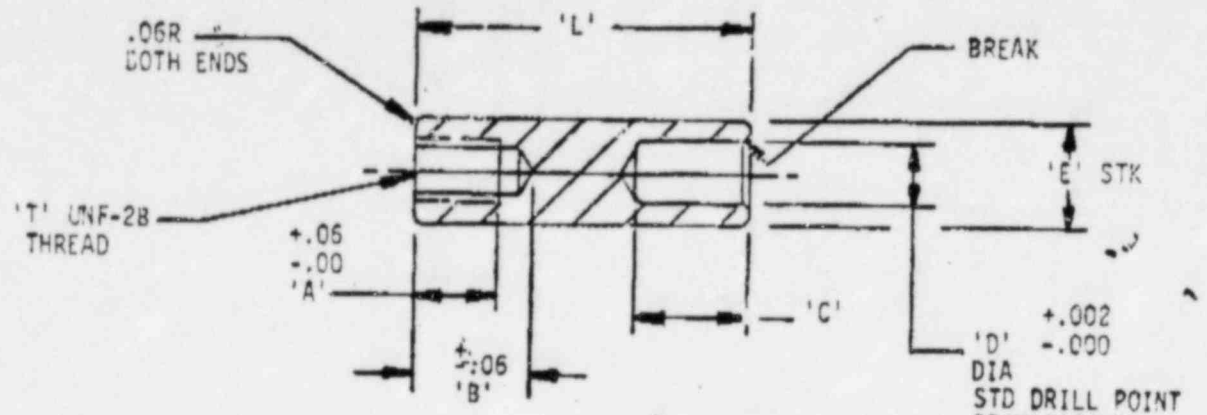
CONT ON SHEET | SH NO.

TITLE: CONNECTOR

FIRST MADE FOR MODULE ASM

MATERIAL: SAE-CA145 COPPER ROD (SEE TABLE)

FCF 157C4837



PT NO	AWG WIRE SIZE	'A'	'B'	'C'	'D'	'E' DIA STK	'T'	'L'
1	#8	.15	.35	.50	.149	.250±.0015	#6-40	1.15
2	#6	.23	.46	.50	.187	.312±.0015	#10-32	1.28
3	#4	.28	.56	.56	.238	.375±.0015	1/4-28	1.38
4	#2	.40	.63	.75	.302	.437±.0015	5/16-24	1.63
5	1/0	.42	.72	.75	.375	.562±.002	3/8-24	1.72
6	1/0	.54	.78	.75	.375	.625±.002	7/16-20	1.84
7	2/0	.54	.78	.75	.421	.625±.002	7/16-20	1.84
8	4/0	.60	.83	.84	.531	.750±.002	1/2-20	1.95

UNLESS OTHERWISE SPECIFIED USE	APPLIED PRACTICES	SURFACES	TOLERANCES ON MACHINED DIMENSIONS: FRACTIONS	DECIMALS	ANGLES
	167A2400	125 ✓	± ~	± XX .03	± ~

NOTES:

~~1. TIN PLATE .0003 - .0006 PER 175A8146P1. DO NOT PLATE THREADS.~~

2. STRESS RELIEVE @ 350°F FOR 1 HOUR, AIR ATMOSPHERE.

REVISIONS | C

7	SV. Frank 6-24-75 W. FRANK	EGM EBM	

NE61377
CHKD EBM EGM.

PRINTS TO: 41, 279, 429

MADE BY	DATE	APPROVALS		
E. Margherone	Nov 5, 71		BWRS (DIV OR DEPT)	225A5146
E. Margherone	12-8-71	12/1/71	SAN JOSE, CALIF. (LOCATION)	CONT ON SHEET / SH NO

FP-803 R 8/71
PRINTED IN U.S.A.

CI

EIS

PL. IDENT : CONTACT

GENERAL ELECTRIC

234A9806

REV NO. Ø1

234A9806

COPY ON SHEET BH NO.

TITLE

CONTACT, FEMALE

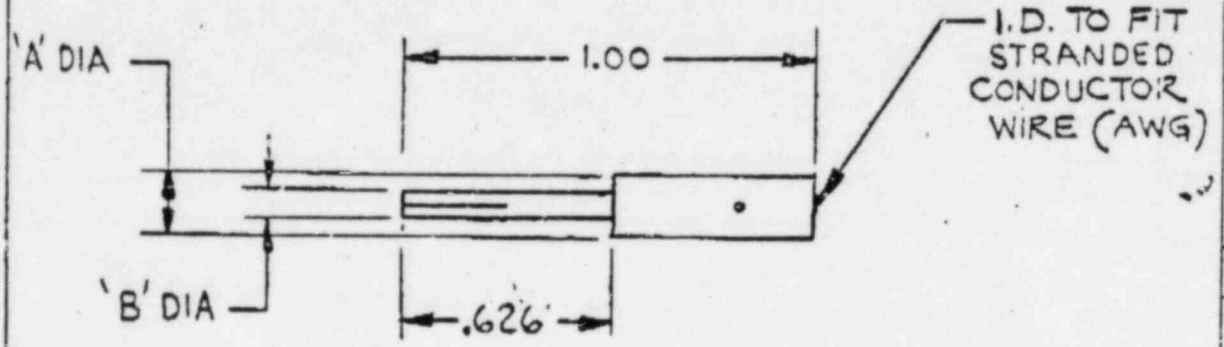
FIRST MADE FOR ELECT. PENETRATIONS

PURCHASED PART FSC 5935-87/N

CONT ON SHEET BH NO

REVISIONS

1	E. Mangiarone 12-21-72	ADDED PT 8. NH



NOTE:

FOR MATING CONTACT SEE DWG 234A9805

** FINISH : GOLD PLATED

* AMPERAGE RATING CONTINUOUS

PT NO.	WIRE AWG	NO. OF STRANDS	'A'	'B'	*AMPS	MATERIAL	CATALOG NO.
1	16	26	.110	.080	20	BERYLLIUM COPPER **	(LATER)
2	10	19	.150	.120	45		
3	16	26	.110	.080	20	IRON	
4						COPPER	
5						CHROMEL	
6						ALUMEL	
7						CONSTANTAN	
8	16	26	.150	.120	45	SAME AS PT 1	

AS MANUFACTURED BY: BOSTON CABLE OR ENGINEERING APPROVED EQUIV.

A19

24

PRINTS TO

MADE BY	APPROVED	DIV OR DEPT	234A9806
RP Kidwell 5 MAY 71	N. Lyons 12/1/71	APED	
ISSUED E. Mangiarone 12-8-71		SAN JOSE, CALIF LOCATION	CONT ON SHEET BH NO

PP-803-WP (5-68) PRINTED IN U.S.A.

(10)

CODE IDENT NO.

GENERAL ELECTRIC

262A6669 — CONT ON SHEET — SH NO.

REV NO. 0

262A6669 — CONT ON SHEET — SH NO.

TITLE: COATING COMPOUND

FIRST MADE FOR CHINSHAN 1 & 2

REVISIONS

PURCHASED PART — FSC 8030-50/N

(1) SCOTCHKOTE CAT. NO. PROTECTIVE RESIN NO. 2006
EPOXY POWDER, 1 PART

DESCRIPTION: A ONE PART, HEAT CURABLE, FLEXIBLE, THERMOSETTING EPOXY POWER COATING DESIGNED FOR APPLICATION ON PREHEATED OR COLD SURFACES BY ELECTROSTATIC DEPOSITIONS.

TYPICAL PROPERTIES

PROPERTY	VALUE
COLOR	BEIGE
HARDNESS - PENCIL	5H
ADHESION OVERLAP SHEAR ASTM D 1002-64 1/8" STEEL PANEL, 0.010 GLUE LINE	5860 psi
IMPACT ASTM G-14-69T 1/8"x3"x3" STEEL PANELS	160 IN.-LBS.
SALT SPRAY ASTM B-1174 96 HRS.	NO UNDER CUTTING
WEATHEROMETER 5000 HRS.	SURFACE CHALKING
GLOSS, ASTM D-1471-57T GARDNER 60° SPECULAR	60

PROPERTY	VALUE
FLAMABILITY Mil-I-6923 E	SELF-EXTINGUISHING
SPECIFIC GRAVITY, CURED RESIN	1.62
COVERAGE (SQ.FT./LBS./MIL)	128
SHELF LIFE MONTHS @ 70-80°F	12+
EXPLOSIBILITY MINIMUM EXPLOSIVE CONCENTRATION IN OZ./CU.FT.	.03
HIDING POWER	1-1½ MILS
BEND, 1/8" MANDREL	PASSES

CURING GUIDE			GEL TIMES(±10%)		
3 MIN.	@450°F	(232°C)	30 SECS.	@450°F	(232°C)
5 MIN.	@400°F	(204°C)	50 SECS.	@400°F	(204°C)
10 MIN.	@350°F	(117°C)	80 SECS.	@350°F	(117°C)

AS MANUFACTURED BY: SCOTCHKOTE
OR ENGINEERING APPROVED EQUIVALENT

A19

PRINTS TO

MADE BY B. WALDROP APR. 1, 1974 — APPROVED P.M. SCHUSTER — DEPT B&RS — DIV OR DEPT 262A6669

CHKD E. Mayfield April 23 74 — LOCATION SAN JOSE — CONT OR SHEET — SH NO.

CODE IDENT NO. CI

PRINTED IN U.S.A. — ETS

GENERAL ELECTRIC

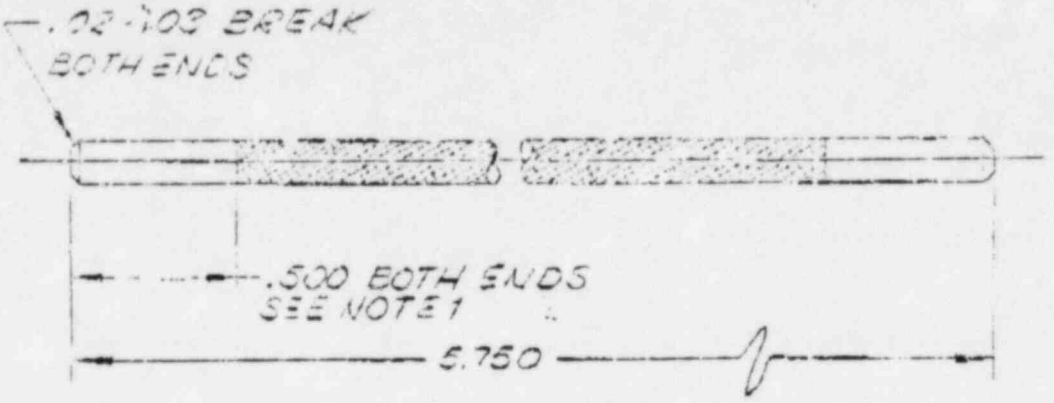
262A6849

TITLE: ROD

FIRST MADE FOR ELECTRICAL PENETRATIONS

262A6849

F.C.F: 163C1888



PART NO.	MAKE FROM	MATERIAL (REF)
1	249A1087P005	ALUMEL
2	249A1087P006	CHROMEL
3	249A1087P007	IRON
4	249A1087P0[illegible]	CONSTANTAN
5	249A1087P0[illegible]	COPPER

NOTES:

1. COAT SHADED AREA ONLY WITH 262A6669P001, .001-.003 THICK ON PART 1 THRU 4.
   COAT .002-.004 THICK ON PART 5.
2. TIN PLATE EXPOSED COPPER ENDS PER 175A6146 (PARTS ONLY)

UNLESS OTHERWISE SPECIFIED USE	APPLIED PRACTICES	SURFACE	TOLERANCES FOR DECIMALS (DECIMALS)	(FRACTIONS)	(ANGLES)
	167A2400	125		± /	± .020	± /

REVISIONS					C	PRINTED
3	B=4.30 C TIN PLATE 4-76	JRG	1	7.0 LINE 11 AGUIRRE	JRG	
NE77337 CHKD JRG			NE66210 CHKD JRG			41 279
			2	B Hudson 2-1-76 B. HUDSON	JRG	428
			NE68792 CHKD JRG			

R. K. KEENE MAY 30, '74	APPROVED QUALITY	NED	262A6849
E. Mayberry July 3 '74	SCHEDULER	SAN JOSE	C1

DRAWN BY

LOCATION

DIV OR DEPT

SHT NO

CONT ON SHEET

ES

GENERAL ELECTRIC

262A6853

SHT 01 OF 23

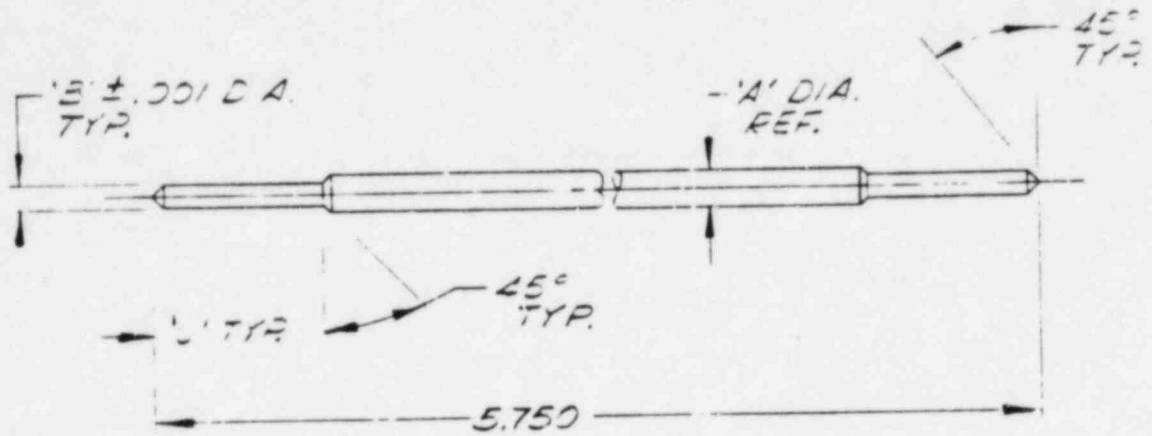
262A6853

TITLE

ROD

FIRST MADE FOR ELECTRICAL PENETRATIONS

FCF: 163C1888



PT. NO.	'A'	'B'	'C'	MATERIAL	SIZE (AWG)
1	.105	.094	.500	22CA5243-002	12
2	.156	.142	.625	SAE-CA145	8

NOTES:

1. PLATE TO BE COATED WITH 262A6604P001 .002-.005 THICK ON .156 DIA. ONLY.
2. TIN PLATE EXPOSED COPPER ENDS PER 175A8196

UNLESS OTHERWISE SPECIFIED USE	APPLIED FRACTIONS	SURFACES	FRACTIONS	DECIMALS	ANGLES
	167A2400	125	± /	±.020	± 2°

REVISIONS

						C	PRINTS TO
3	B 9.30 BTA 11 76	JRG	1	J.L. AGUIRRE 1-6-76	JRG		
NE 77337 CHKD JRG			NE 66210 CHKD JRG			A1	
			2	B HUDSON 7-21-76	JRG		27
			NE 68792 CHKD JRG				428

K KEGLE MAY 30, '74		NED	262A6853
E. MIGLIORELLI	SCHEDULER	SAN JOSE LOCATION	C1

GENERAL ELECTRIC

262A6854

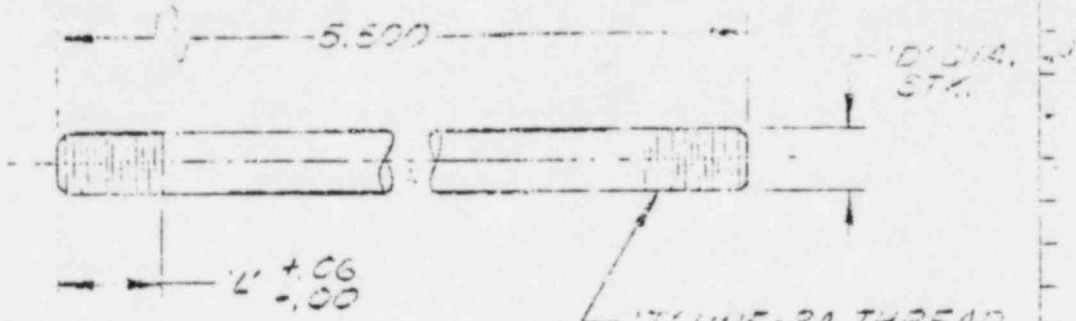
TITLE

ROD

262A6854

FIRST MADE FOR ELECTRICAL PENETRATIONS

FCF: 163C1888



MATERIAL: SAE-CA145 COPPER ROD

PART NO.	AWG WIRE SIZE	'T'	'L'	'D' DIA. STK
1	#2	5/16-24	.56	.312 ±.0015
2	#10	1/2-20	.56	.500 ±.0015

NOTES:
1. COAT WITH 262A6664P001, .003-.005 THICK. MASK .56 OF THREADS FROM EACH END OF ROD BEFORE COATING.

UNLESS OTHERWISE SPECIFIED | APPLIED FINALTIES 16TAPAOD | SURFACES 125√ | FRACTIONS ± | DECIMALS ±.030 | ANGLES ±

REVISIONS | C

1	T.C. 1-16-76 L. AGUIRRE	JRG	41
N	66210 CHKD JRG		279
2	B Madison 7-21-76 B. MADISON	JRG	428
NC 68792 CHKD JRG			

DRAWN K REECE MAY 30,'14 | APPROVED | NED | 262A6654

SAN JOSE | SCHUSTER | C1

EIS IDENT: SEALANT

GENERAL ELECTRIC

26DA7076 SHEET 2 REV 1

C 81224

26DA7076 SHEET 2 REV 1

TITLE SPECIFICATION
SEALANT (ENCAPSULATION COMPOUND)

FIRST MADE FOR ELECTRICAL PENETRATION MODULES

OVERALL REVISION 4

SUMMARY SHEET	REV
1	4
2	3
3	2
4	3
5	2
6	2
7	2
8	4

REVISIONS

3M

1.0 SCOPE

This specification covers a two-part, non-flame propagating epoxy resin system which will cure at room temperature. It is suitable for potting and encapsulation of electrical low and high voltage cables and cable splices.

2.0 APPLICABLE DOCUMENTS

Specification Mil-I-16923E: Insulating Compound, Electrical, Embedding.
Fed-Std-406: Plastics, Methods of Testing: Method 4041-Electr. Resistance
Fed-Std-406: Plastics, Methods of Testing: Method 1011-Tensile Strength.

ASTM Spec. D 1706: Indentation Hardness of Plastics by Means of a Durometer.

ASTM Spec. D 149: Dielectric Breakdown Voltage and Dielectric Strength of Electrical Insulating Materials.

ASTM Spec D 618: Conditioning Plastics and Electrical Insulating Materials for Testing.

ASTM Spec. D 1672: Exposure of Polymeric Materials to High Energy Radiation.

3.0 REQUIREMENTS

The resin shall be supplied in the form of two liquids, designated Part A (resin) and Part B (catalyst or hardener). Each component or the resin only shall contain a certain amount of chemically inert filler material. Resin and hardener shall not include any chemical constituents that vaporize easily under vacuum conditions or at elevated temperatures as recommended by the manufacturer of subject resin to prevent casting imperfections, blowholes, and other voids. Each component shall be free from impurities within the limits of best commercial practice. The density of the components as determined after degassing shall be 9.7 ± 0.1 Lbs/Gal for component A and 10.8 ± 0.1 Lbs/Gal for component B.

When mixed in the specified proportions, vacuum degassed, and cured at room temperatures not below 73°F, the resin shall harden with a minimal volatile loss or significant shrinkage to a uniform, solid mass of specified hardness. After completion of the curing period which shall not exceed five days at 73°F temperature the cast resin shall show uniform hardness and no further shrinkage. The specific gravity of the properly prepared and cured resin shall be 1.35 ± 0.05.

NEPD SAN JOSE

26DA7076 SHEET 2 REV 1

E. Mayhew 11-1-74 23 Sep 1974

CC:

EIS

SPEC NO. 123 | 262A7076 SHEET 3 REV. 2

TITLE: SEALANT (ENCAPSULATION COMPOUND)

FIRST MADE FOR: ELECTRICAL PENETRATION MODULES

REVISIONS

3	NE78350	11-10-78	IRG
2	N60914	6-9-78	EM
1	N60722	5-9-78	EM

3.1 Physical Requirements

3.1.1 Handling and Casting

The resin, after mixing in the proper proportions as called for by the manufacturer, shall have a working life of 20 min. minimum as determined per paragraph 4.4.2 of this specification.

The heat as generated during the initial curing cycle shall not exceed 350°F for a one lb. sample as cast into a thin-walled metal container. This container shall not be attached to parts or devices working as a heat sink for the latter during the curing of the resin as contained therein.

3.1.2 Properties

The individual components and the properly mixed, degassed, cast and cured resin shall conform to the requirements as listed in Table I. The supplier shall be responsible only for conformance to those properties denoted with a "Q".

TABLE I
REQUIREMENTS

PROPERTY	UNITS	REQUIRED FOR *	AVERAGE VALUE	DEVIATION ALLOWED	REFERENCE
Shelf Life	Months	Q	6	Minimum	See para. 4.4.1
Working Life	Minutes	Q	20	Minimum	See para. 4.4.2
Shore D Hardness	Shore D Units	Q	60	MINIMUM	ASTM-D1706
Coefficient of Linear Thermal Expansion	Inch/Inch/°C from 23°C to 113°C	Q	16.8×10^{-5}	$\pm 1.0 \times 10^{-5}$	MIL-I-16923E
Ultimate Tensile Strength	PSI	Q	2,400	Min.	Crosshead speed to be 0.2"/min. Fed-Std-406 Method 1011
Elongation at Break	% of initial	Q	10%	Min.	

PRINTS TO

NAVY MERIT 8-23-78 | NEPD SAN JOSE | 262A7076 SHEET 3

23 Sept 78 | CI

TABLE I: REQUIREMENTS (Cont'd)

PROPERTY	UNITS	REQUIRED FOR	AVERAGE VALUE	DEVIATION ALLOWED	REFERENCE
Dielectric Strength	Volts/ Mil	Q	350	Min	ASTM-0149
Volume Resistivity	Ohm-Cm	Q	1×10^{12} @ 500 V	Min	Method 4041 of Std. #406
Electrical Insulation Resistance	Ohms	I	1.0×10^{11} @ 500 V	Min	G.E. Dwg. # 117C1534 175A1083
Radiation Resistance	Rads	I	1.0×10^{8}	Min	ASTM-D1672
Moisture Absorption	%	Q	0.85	Max	See para. 4.4.8

* Q for Vendor Qualification; I for Internal Inspection purposes

3.2 Packaging

The materials for subject compound shall be delivered in suitable containers to allow safe transportation and storage by common and other carriers at the lowest rate to the point of delivery. Each package shall be clearly marked with the net weight, the manufacturer's name, the type, component or chemical designation, the manufacturer's lot number and the actual date of manufacture.

4.0 QUALITY ASSURANCE PROVISIONS

4.1 The supplier shall certify that each individual lot of material conforms to all applicable requirements of this spec. The purchaser will conduct certain tests as stated in para. 4.3 and 4.4 of this spec. so as to verify the acceptability of any particular lot.

4.2 Preproduction Samples

When requested, a preproduction sample shall consist of a one pound minimum sample representative of the identical material and manufacturing process as used for actual production. The preproduction sample shall be subjected to all examinations and tests as specified herein. When stipulated as a pre-negotiated term of the purchase order, prior to shipment the supplier shall submit a certified test report to verify his compliance as per paragraph 4.1.

REVISIONS

2	12 Nov 74	NE 60914	CWD EOM ESM
1	19 Sept 74	NE 60762	CWD EOM ESM

PRINTS TO

NO. 623 | 262A7076 SHEET 5 OF 4

TITLE: SEALANT (ENCAPSULATION COMPOUND)

FIRST MADE FOR: ELECTRICAL PENETRATION MODULES

REVISIONS

4.3 Classification of Tests

As indicated on Table I, all tests shall be conducted for the following purposes:

4.3.1 Qualification Tests: Are those tests initially performed on the resin to approve it as an acceptable product. These tests shall consist of all the ones so identified in Table I and shall be performed in accordance with the appropriate paragraphs of this specification. Failure in any test shall disqualify the resin represented.

4.3.2 Inspection Tests: Are those tests performed on incoming individual lots shipped in fulfillment of a purchase order to audit and verify their compliance with paragraph 4.1 and 4.3.1.

4.3.2.1 Inspection Lot: For the purpose of inspection and testing a lot shall be defined as both components of all the resin of the same type, and submitted for inspection at the same time.

4.3.2.2 Sampling Procedure: One container of each component of each inspection lot shall be selected for sampling. The material in each container shall be thoroughly stirred to insure complete homogeneity with all settled material brought into suspension.

4.3.2.3 Rejection and Retest: Failure of any lot to meet all the applicable requirements of this specification shall be cause for retest. The property in question shall be retested on new specimens prepared from fresh resin. If the average retest value fails to meet the specification requirement, the entire lot shall be rejected.

4.4 Test Procedures

Unless otherwise specified, all tests shall be conducted at standard conditions, i.e., 50°±5% relative humidity and a temperature of 73°±2°F. The samples shall be preconditioned according to ASTM Spec. D618-61.

PRINTS TO

4.4.1 Shelf Life

Both components of the epoxy resin when properly stored at 73° ± 2°F in their unbroken shipping containers shall have a minimum of six months storage life during which no chemical breakdown or deterioration of the resulting properties as listed in paragraph 3.1.2 shall occur.

4.4.2 Pot Life or Working Life

This shall be the time from completion of the mixing of the components to the onset of rapid increase of the viscosity preventing further casting operations. The mixed resin shall be kept either at room temperature of 73°F ± 2° or a defined elevated temperature as recommended by the manufacturer to better facilitate casting. The time during which the viscosity stays below 100,000 Centipoises shall be determined by periodic measurement preferably using a Brookfield Viscosimeter with a number 4 spindle rotating between 5 and 30 RPM.

4.4.3 Initial Viscosity

The initial viscosity of the properly mixed resin shall be determined using a Brookfield Viscosimeter with a number 4 spindle rotating between 5 and 30 RPM. A 200 ml capacity tall form beaker shall be used for the determination. The resin temperature shall be 73°F ± 2°F or such temperature as recommended by the manufacturer for the proper handling of the resin.

4.4.4 Shore D Hardness

A slab of resin shall be cast and cured according to the resin manufacturer's instructions. The slab shall have a minimum thickness of 3/8" and a size of at least 3 square inches. The tests shall be conducted according to ASTM Spec. D1706-61. An instantaneous reading shall be taken with a Shore D Durometer.

4.4.5 Dielectric Strength

Dielectric strength testing equipment capable of producing at least 75KV conforming to ASTM Spec. D-149-64 shall be used. The cut slab specimens shall be immersed at least 1" below the surface of a bath of high grade transformer oil. The rate of voltage rise shall be 500 volts/sec. The breakdown voltage shall be determined and the dielectric strength in volts/mil shall be calculated for each specimen. The average of four values shall be used to determine the conformance to this specification.

REVISIONS

2 E. Macpherson 8-8-74 NEG 0994 CHKD EGM EGM

1 E. Macpherson 8-22-74 NEG 0752 CHKD EGM EGM

4.4.5.1 Test Electrodes: The electrodes shall consist of two opposed brass rods 1/4" diameter with edges rounded to a radius of 1/32". The electrodes shall be mounted vertically and coaxially within 1/16". The movable top electrode shall press on the specimen with a weight of 0.10 lbs.

4.4.5.2 Test Specimen: Specimens shall be cast in a mold as specified in paragraph 4.5.1 of MIL-I-16923E according to the resin manufacturer's instructions. The size of the test specimen shall be 3"x3"x0.125" ±0.010 inch thickness. The large surfaces of the specimen shall be cast surfaces with a smooth surface condition as attained by the use of polished steel plates and Teflon type mold release agent for the casting process.

4.4.6 Electrical Insulation Resistance

4.4.6.1 Volume Resistivity Tests:

According to the manufacturer's instructions a minimum of three samples shall be cast and conditioned per ASTM-D618 and subsequently be tested per Federal Test Method Std. #406, Method 4041

4.4.6.2 For "In-House" testing:

According to the manufacturer's instructions, three plugs from identical resin lots shall be cast, degassed, and cured in a mold as shown on drawing #117C1534: Part I. Each test plug shall carry a pair of electrodes properly shaped and spaced as shown on drawing #175A1083. An electrode spacing fixture as shon on drawing #117C1534 parts 2 to 10 shall be used to insert and space the electrode wire pairs in the still liquid cast resin. After completion of the curing cycle of the resin, the specimen shall be stabilized at room temperature according to paragraph 4.4. Then the electrodes shall be connected to a picoammeter and a suitable stable power supply to provide 500 volts DC current. The resistance measured over the electrodes at above voltage shall not drop below 1×10^{11} ohms under an average of 2 min. of applied voltage.

4.4.7 Coefficient of Linear Thermal Expansion

The linear thermal expansion shall be determined on at least three specimens prepared according to paragraph 4.4.5.2. The

REVISIONS

2 NE60994 CNSD 20MAY EGM

1 NE60762 CNSD 8MAY EGM

PRINTS TO

size of the specimens shall be 2" length by 1/2" square and the test method shall be in accordance with paragraph 4.6.8 of MIL-I-16923E.

4.4.8 Moisture Absorption

The moisture absorption shall be determined on three specimens of 1"x3"x1/8" height cut from cast slabs in accordance with paragraph 4.4.5.2. The specimens shall be placed in a desiccator over dry $CaCl_2$ for 96 hours. After conditioning, the specimens shall be weighed, exposed to 96-1% relative humidity for 240 hours, then weighed again. The average percentage of weight gain due to absorption of humidity shall be reported as follows:

$$\frac{\text{Wet Weight} - \text{Dry Weight}}{\text{Dry Weight}} \times 100$$

4.4.9 Ultimate Tensile Strength and Elongation

The ultimate tensile strength and the percentage of elongation at break shall be determined on a minimum of four samples according to Fed. Test Std. 406, Method 1011 with a testing machine crosshead speed of 0.2"/Min.

APPENDIX

QUALIFIED PRODUCT:

- Scotchcast Resin XR-5237 in 1 Gal. container

by: Minnesota Mining and Manufacturing Co.
Electrical Products Division
2501 Hudson Rd.
St. Paul, Minnesota 55119

- Each container to be marked to indicate:

1. Manufacturer
2. Manufacturer's Product Identification
3. Manufacturers Lot #
4. The Actual Date of Manufacture

4 QUANG 119 NJOBB52 CHK'D BY R.J. MENEZES

EIS IDENT: WIRE

GENERAL ELECTRIC

NUCLEAR ENERGY DIVISION

REVISION STATUS SHEET

262A7898
CONT ON SHEET 1A SH NO. 1

DOCUMENT TITLE [illegible]

☐ SPECIFICATION ☒ DRAWING ☐ OTHER _____ TYPE [illegible]

FMF 11A

LEGEND OR DESCRIPTION OF GROUPS

MPL No. N/A

[illegible] FOR [illegible] DESIGN AND [illegible]

[4] USE DWG NO [illegible] (REFER TO [illegible]

SHEET 7 FOR DETAILS.)

REVISIONS		C
3	S RICKERD JR JAN 7 - 1978 APPROVED BRS NE 94793 CHK'D BY P. RODRIGUEZ ADDED NOTE TO REV BLOCK ALL SHEETS AND UPDATED ALL SHEETS TO SHOW ONE REVISION FOR TOTAL DWG. CHG'D SH 1 TO 1A ADDED NEW SH 1 (COVER SHEET)	
4	TRUONG NU AUG 04 1981 PH ADDED NEW SHT. 7 NJ 73207 ; ENG: U.C. Varcales CHK'D BY: E. KERK	

	043A			
	429C			
	126C			
	001A			
	428A			

PRINTS TO

MADE BY S. RICKERD JR 19 OCT '77	APPROVALS A. BURTON C. Burton 10-28-77	DEPT NPD	LOCATION SAN JOSE
CHKD BY P. RODRIGUEZ P. Rodriguez 26 OCT '77	ISSUED [illegible]	262A7898 CONT ON SHEET 1A SH NO. 1	

NED-805 (9/74)

C1

GENERAL ELECTRIC

262A7898		CONT ON SHEET 2 SH NO 1A
KEY NO 81734	TITLE PURCHASED PART	
262A7898	WIRE, ELECTRICAL (INSULATED)	
CONT ON SHEET 2 SH NO 1A	FIRST MADE FOR STANDARD	

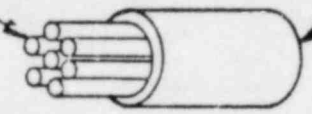
CLASS II FSC 6145-71/N

REVISIONS

THE FOLLOWING SPECIFICATIONS ARE FOR CROSSLINKED (CHEMICAL OR RADIATION) POLYOLEFIN INSULATED STRANDED WIRE THAT IS FLAME RETARDANT, RADIATION RESISTANT AND CAPABLE OF EXCELLENT ADHERENCE * PROPERTIES TO EPOXY POTTING MATERIALS.

FOR NEW DESIGNS AND RENEWAL PARTS USE 272A7917 FOR DETAILS REFER TO SH. 1 OF THIS DRAWING. 4

FOR REVISION SEE SHEET 1



262A7898 P ___ K ___

CONDUCTOR SIZE & STRAND CODE SEE TABLE I	INSULATION COLOR CODE SEE TABLE II

EXAMPLE: 262A7898 P005K008 (14 AWG, 7 STRANDS, GREY)

SPECIFICATIONS:

TEMPERATURE RATING: THE WIRE INSULATION WILL BE CAPABLE OF RECOVERING ITS NORMAL TEMPERATURE CHARACTERISTICS AFTER THE FOLLOWING EXPOSURES: 90°C CONTINUOUS
150°C 24 HOURS

CONDUCTOR PLATING: (TIN OR SILVER) TEST PER ASTM B33 SECTION 6.4 THRU 6.6

VOLTAGE RATING: 600V

PHYSICAL PROPERTIES: TENSILE STRENGTH (INSULATION): 1800 PSI (MIN)
ELONGATION (INSULATION): 200% (MIN)

INSULATION RESISTANCE: PER ASTM D470 SECTION 18-22 FOLLOWING A 6 HOUR WATER SOAK, 5000 MEGOHMS/100 FT (MIN)

DIELECTRIC TEST REQUIREMENT: PER ASTM D470 SECTION 13-17 FOLLOWING A 6 HOUR WATER SOAK, 1500 VOLTS/5 MIN, 60 HZ (RMS)

FLAMMABILITY. A 22 INCH SPECIMEN OF THE WIRE SHALL MEET THE VERTICAL FLAME TEST REQUIREMENT DESCRIBED IN 6.19.6 OF IPCEA S-19-81

RADIATION RESISTANCE: 2×10^7R (MIN GAMMA DOSAGE CAPABILITY)

COLORS: PER MIL-STD 122 (SEE TABLE II)

*ADHERENCE: MUST DEMONSTRATE SUPERIOR ADHESION WHEN CAST IN EPOXY RESINS. INSULATION MATERIAL SHALL BE COMPOUNDED IN SUCH A WAY THAT NO PLASTICIZERS WILL MIGRATE TO THE SURFACE AND IMPAIR BONDING BETWEEN THE WIRE INSULATION AND THE EPOXY RESINS. (NOT APPLICABLE TO PARTS 1,3,5,7 & 9)

MARKING: REEL TO BE IDENTIFIED WITH VENDOR CATALOG NUMBER, GE DRAWING NUMBER, AND LOT NUMBER. (FOR THIS WIRE, LOT NUMBER IS OPTIONAL.)

CORROSION: WHEN TESTED PER TEST METHOD MAT-32-A (G.E. COMPANY) REFERENCE ASTM D2671 MAXIMUM MIRROR COPPER REMOVAL SHALL NOT EXCEED 50% OF TOTAL MIRROR AREA.

RESISTANCE TO CHEMICALS: INSULATION SHALL BE REASONABLY RESISTANT TO CHEMICALS PER ASTM D-543, PARAGRAPHS 4.4.34, 4.4.48, 4.4.49. (NOT APPLICABLE TO PARTS 1,3,5,7, & 9)

AS MANUFACTURED BY: G.E. WIRE & CABLE DEPT., (SIMILAR TO SI-57275 GREY), RAYCHEM (FLAMTROL), OR ENGINEERING APPROVED EQUIVALENT.

PRINTS TO

MADE BY B.Waldrop B.WALDROP MAY 5, 1975	APPROVALS C.A.VONDRASEK 5-15-75	NPD SAN JOSE	262A7898
ISSUED R. Inman R. INMAN 6-9-75		DIV OR DEPT / LOCATION	CONT ON SHEET 2 SH NO 1A

CHECKED BY: R. Mathis R. MATHIS 4 JUN 75

FF 803 WF 12 74 PRINTED IN U.S.A.

CODE IDENT NO. CI

GENERAL ELECTRIC | 262A7898

REV LTR B | 1 | 3 | 4 | CONT ON SHEET 3 | SH NO 2

262A7898 | TITLE PURCHASED PART

CONT ON SHEET 3 | SH NO 2 | WIRE, ELECTRICAL (INSULATED)

FIRST MADE FOR STANDARDS

REVISIONS

FOR REVISION SEE SHEET 1

CERTIFICATION: WHEN REQUIRED AS PART OF AN ORDER TO THIS SPECIFICATION A CERTIFICATE OF COMPLIANCE TO SPECIFICATION WILL BE SUPPLIED WITH ORDER.

TABLE I

4

PART NO.	SIZE AWG	NO. OF STRANDS	O.D. MAX.	PAYCHEM PART NO.	SUPERSEDED BY
001	18	7	.119	W1TC18B6	REFER TO SH.7
002	18	16	.119	W1TC18K6	
003	16	7	.132	W1TC16B6	
004	16	26	.132	W1TC16K6	REFER TO SH.7
005	14	7	.148	W1TC14B6	
006	14	41	.151	W1TC14K6	REFER TO SH.7
007	12	7	.168	W1TC12B6	
008	12	65	.170	W1TC12K6	REFER TO SH.7
009	10	7	.193	W1TC10B6	
010	10	105	.198	- - - -	REFER TO SH.7
011	8	133	.294	- - - -	
012	6	133	.362	- - - -	
013	4	133	.432	- - - -	
014	2	133	.489	- - - -	
015	0	259	.610	- - - -	
016	00	259	.668	- - - -	
017	000	259	.729	- - - -	
018	0000	259	.798	- - - -	
019	8	7	.254	W1TC8B6	
020	8	19	.257	W1TC8C6	
021	6	7	.327	W1TC6B6	
022	6	19	.330	W1TC6C6	
023	4	7	.376	W1TC4B6	
024	4	19	.379	W1TC4C6	
025	2	7	.445	W1TC2B6	
026	2	19	.450	W1TC2C6	
027	0	19	.565	W1TC1/0B6	
028	00	19	.615	W1TC2/0B6	
029	000	19	.665	W1TC3/0B6	
030	0000	19	.730	W1TC4/0B6	

NOTES:

1. INSPECT PER 225A6307P1.
2. IF COLOR REQUIREMENTS ARE OTHER THAN THE STANDARD, IT MUST BE SPECIFIED AT TIME OF PURCHASE.

PRINTS TO

MADE BY B. WALDROP MAY 5, 1975

ISSUED R. INMAN 6-9-75

APPROVALS 5-15-75 C G VONDAMM C. VONDAMM

NPD | DIV OR DEPT

SAN JOSE | LOCATION

262A7898 | CONT ON SHEET 3 | SH NO 2

CODE IDENT NO

FF 803 WF (2-74) PRINTED IN U.S.A.

C1

GENERAL ELECTRIC

262A7898

CONT ON SHEET 4 SH NO 3

REV NO 024

TITLE PURCHASED PART

WIRE, ELECTRICAL (INSULATED)

262A7898

CONT ON SHEET 4 SH NO 3

FIRST MADE FOR STANDARDS

REVISIONS

ECR REVISION SEE SHEET 1

TABLE II

INSULATION COLOR CODE NO	BASE COLOR	FIRST TRACER	SECOND TRACER	THIRD TRACER
000	BLACK			
001	BROWN			
002	RED			
003	ORANGE			
004	YELLOW			
005	GREEN			
006	BLUE			
007	VIOLET			
008	GREY			
009	WHITE			
010	WHITE	BLACK		
011	↑	BROWN		
012	↑	RED		
013	↑	ORANGE		
014	↑	YELLOW		
015	↑	GREEN		
016	↑	BLUE		
017	↑	VIOLET		
018	↑	GREY		
019	↑	BLACK	BROWN	
020	↑	↑	RED	
021	↑	↑	ORANGE	
022	↑	↑	YELLOW	
023	↑	↑	GREEN	
024	↑	↑	BLUE	
025	↑	↑	VIOLET	
026	↑	BLACK	GREY	
027	↑	BROWN	RED	
028	↑	↑	ORANGE	
029	↑	↑	YELLOW	
030	↑	↑	GREEN	
031	↑	↑	BLUE	
032	↑	↑	VIOLET	
033	↑	BROWN	GREY	
034	↑	RED	ORANGE	
035	↑	↑	YELLOW	
036	↑	↑	GREEN	
037	↑	↑	BLUE	
038	↑	↑	VIOLET	
039	↑	RED	GREY	
040	↑	ORANGE	YELLOW	
041	↑	↑	GREEN	
042	↑	↑	BLUE	
043	↑	↑	VIOLET	
044	WHITE	ORANGE	GREY	

(CONTINUED ON SHEET 4)

PRINTS TO

MADE BY B. WALDROP MAY 5, 1975

ISSUED R. INMAN 6-9-75

APPROVALS CAVONDAMM 5-15-75 C.G. VANDAMM

NPD DIV OR DEPT

SAN JOSE LOCATION

262A7898

CONT ON SHEET 4 SH NO 3

COLLATERAL NO

RT 803 WF 12 74
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GENERAL ELECTRIC

REV NO 034	TITLE PURCHASED PART	CONT ON SHEET 5 SH NO 4
262A7898	WIRE, ELECTRICAL (INSULATED)	
CONT ON SHEET 5 SH NO 4	FIRST MADE FOR STANDARDS	

TABLE II (CONTINUED)

INSULATION COLOR CODE NO.	BASE COLOR	FIRST TRACER	SECOND TRACER	THIRD TRACER
045	WHITE	YELLOW	GREEN	
046		YELLOW	BLUE	
047		YELLOW	VIOLET	
048		YELLOW	GREY	
049		GREEN	BLUE	
050		GREEN	VIOLET	
051		GREEN	GREY	
052		BLUE	VIOLET	
053		BLUE	GREY	
054		VIOLET	GREY	
055		BLACK	BROWN	RED
056				ORANGE
057				YELLOW
058				GREEN
059				BLUE
060				VIOLET
061			BROWN	GREY
062			RED	ORANGE
063				YELLOW
064				GREEN
065				BLUE
066				VIOLET
067			RED	GREY
068			ORANGE	YELLOW
069				GREEN
070				BLUE
071				VIOLET
072			ORANGE	GREY
073			YELLOW	GREEN
074			YELLOW	BLUE
075			YELLOW	VIOLET
076			YELLOW	GREY
077			GREEN	BLUE
078			GREEN	VIOLET
079			GREEN	GREY
080			BLUE	VIOLET
081			BLUE	GREY
082	WHITE	BLACK	VIOLET	GREY

(CONTINUED ON SHEET 5)

REVISIONS

FOR REVISION SEE SHEET 1

PRINTS TO

MADE BY B. WALDROP MAY 5, 1975	APPROVALS CAVONDALES 5-13-75	NPD DIV OR DEPT	262A7898	
ISSUED R. INMAN 6-9-75		SAN JOSE LOCATION	CONT ON SHEET 5	SH NO 4

FF-803 WF (2 74)
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CODE IDENT NO.

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REVISIONS

FOR REVISION SEE SHEET 1

TABLE II (CONTINUED)

INSULATION COLOR CODE NO	BASE COLOR	FIRST TRACER	SECOND TRACER	THIRD TRACER
083	WHITE	BROWN	RED	ORANGE
084	↕	↕	↕	YELLOW
085	↕	↕	↕	GREEN
086	↕	↕	↕	BLUE
087	↕	↕	↕	VIOLET
088	↕	↕	RED	GREY
089	↕	↕	ORANGE	YELLOW
090	↕	↕	↕	GREEN
091	↕	↕	↕	BLUE
092	↕	↕	↕	VIOLET
093	↕	↕	ORANGE	GREY
094	↕	↕	YELLOW	GREEN
095	↕	↕	YELLOW	BLUE
096	↕	↕	YELLOW	VIOLET
097	↕	↕	YELLOW	GREY
098	↕	↕	GREEN	BLUE
099	↕	↕	GREEN	VIOLET
100	↕	↕	GREEN	GREY
101	↕	↕	BLUE	VIOLET
102	↕	↕	BLUE	GREY
103	↕	BROWN	VIOLET	GREY
104	↕	RED	ORANGE	YELLOW
105	↕	↕	↕	GREEN
106	↕	↕	↕	BLUE
107	↕	↕	↕	VIOLET
108	↕	↕	ORANGE	GREY
109	↕	↕	YELLOW	GREEN
110	↕	↕	YELLOW	BLUE
111	↕	↕	YELLOW	VIOLET
112	↕	↕	YELLOW	GREY
113	↕	↕	GREEN	BLUE
114	↕	↕	GREEN	VIOLET
115	↕	↕	GREEN	GREY
116	↕	↕	BLUE	VIOLET
117	↕	↕	BLUE	GREY
118	WHITE	RED	VIOLET	GREY

(CONTINUED ON SHEET 6)

PRINTS TO

GENERAL ELECTRIC

REV NO 034	TITLE PURCHASED PART	262A7898 CONT ON SHEET 7 SH NO 6
262A7898	WIRE, ELECTRICAL (INSULATED)	
CONT ON SHEET 7 SH NO 6	FIRST MADE FOR STANDARDS	

REVISIONS

FOR REVISION SEE SHEET 1

TABLE II (CONTINUED)

INSULATION COLOR CODE NO.	BASE COLOR	FIRST TRACER	SECOND TRACER	THIRD TRACER
119	WHITE	ORANGE	YELLOW	GREEN
120			YELLOW	BLUE
121			YELLOW	VIOLET
122			YELLOW	GREY
123			GREEN	BLUE
124			GREEN	VIOLET
125			GREEN	GREY
126			BLUE	VIOLET
127			BLUE	GREY
128		ORANGE	VIOLET	GREY
129		YELLOW	GREEN	BLUE
130			GREEN	VIOLET
131			GREEN	GREY
132			BLUE	VIOLET
133			BLUE	GREY
134		YELLOW	VIOLET	GREY
135		GREEN	BLUE	VIOLET
136		GREEN	BLUE	GREY
137	WHITE	GREEN	VIOLET	GREY

PRINTS TO

MADE BY B. Waldrop B. WALDROP MAY 5, 1975	APPROVALS CAYONDARRA C.A. Impson 6 13 75	NPD DIV OR DEPT	262A7898
ISSUED R. INMAN 6-9-75		SAN JOSE LOCATION	CONT ON SHEET 7 SH NO 6 CODE IDENT NO

FF 803 WF 12 74
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GENERAL ELECTRIC

262A7898

REV NO 4

262A7898

CONT ON SHEET F SH NO 7

TITLE PURCHASED PART
WIRE, ELECTRICAL (INSULATED)

FIRST MADE FOR STANDARDS

175A7293P002K008	SUPERSEDED BY	272A7917P018K008	ETCHED
175A7293P005K008		272A7917P014K005	
262A7898P002K002		272A7917P018K002	
262A7898P004K000		272A7917P016K000	
262A7898P004K012		272A7917P016K092	
262A7898P008K000		272A7917P012K000	
262A7898P001K002		272A7917P018K002	
262A7898P002K000		272A7917P018K000	
262A7898P008K012		272A7917P012K092	
262A7898P010K000		272A7917P010K000	
262A7898P006K000		272A7917P014K000	
262A7898P003K003		272A7917P016K003	
262A7898P004K004		272A7917P016K004	
262A7898P005K005		272A7917P014K005	
262A7898P010K010		272A7917P010K090	
262A7898P008K002		272A7917P012K002	

ETCHED CABLE MUST BE REQUESTED ON NEW ORDERS, TO MEET ADHERENCE REQUIREMENT.

REVISIONS

END OF DESIGN GUIDE SHEET 1

PRINTS TO

MADE BY TRUONG NY 6-12-81

ISSUED P. HADDIX

APPROVALS 7/9/81 W.V. Jacobs U.C. YEAMANS

NPD DIV OR DEPT

SAN JOSE LOCATION

262A7898 CONT ON SHEET F SH NO 7

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GEK-62970

operation and maintenance instructions

SHOREHAM (LILCO)

PENETRATION SEAL INSTALLATION

INSTRUCTION MANUAL

283X412BD

BOILING WATER REACTOR SYSTEMS DEPARTMENT
San Jose, California 95125

GENERAL ELECTRIC

JS: 10/76

Table 1-1. Electrical Penetration Drawing Reference

SERVICE	MASTER PL	ASSEMBLY PL	DWG ASSEMBLY	INSTALLATION	WIRE LIST	WIRE TERMINATION	E/P NUMBER
Low Voltage	386X210ACG1	386X110ACG1	204B6172	133D9627AC	163C1902AC		1T23-Z-E-A1
	386X210ACG2	386X110ACG2	204B6172	133D9627AC	163C1902AC		1T23-Z-W-B4
	386X210ACG3	386X110ACG3	204B6172	133D9627AC	163C1902AC		1T23-Z-W-B2
	386X210ACG4	386X110ACG4	204B6172	133D9627AC	163C1902AC		1T23-Z-E-A3
	386X210ACG5	386X110ACG5	204B6172	133D9627AC	163C1902AC		1T23-Z-E-B3
	386X210ACG6	386X110ACG6	204B6173	133D9627AC	163C1902AC		1T23-Z-W-B1
	386X210ACG7	386X110ACG7	204B6172	133D9627AC	163C1902AC		1T23-Z-E-B5
	386X210ACG8	386X110ACG8	204B6172	133D9627AC	163C1902AC		1T23-Z-W-B5
	386X210ACG11	386X110ACG11	204B6173	133D9627AC	163C1902AC		1T23-Z-W-C4
	386X210ACG12	386X110ACG12	204B6172	133D9627AC	163C1902AC		1T23-Z-E-B2
	386X210ACG13	386X110ACG13	204B6173	133D9627AC	163C1902AC	164C5528	1T23-Z-W-B6
	386X210ACG14	386X110ACG14	204B6173	133D9627AC	163C1902AC	164C5528	1T23-Z-W-C6
	386X210ACG15	386X110ACG15	204B6172	133D9627AC	163C1902AC	164C5528	1T23-Z-E-B6
	386X210ACG16	386X110ACG16	204B6172	133D9627AC	163C1902AC	164C5528	1T23-Z-E-C6
	386X210ACG17	386X110ACG17	204B6172	133D9627AC	163C1902AC		1T23-Z-W-C5
	386X210ACG18	386X110ACG18	204B6172	133D9627AC	163C1902AC		1T23-Z-E-C5
Low Voltage (Signal)	386X210ACG9	386X110ACG9	204B6172	133D9627AC	163C1902AC		1T23-Z-E-D5
	386X210ACG9	386X110ACG9	204B6172	133D9627AC	163C1902AC		1T23-Z-E-D6
	386X210ACG9	386X110ACG9	204B6172	133D9627AC	163C1902AC		1T23-Z-W-D2
	386X210ACG10	386X110ACG10	204B6173	133D9627AC	163C1902AC		1T23-Z-W-D1
Medium Voltage	328X393ACG1	328X193ACG1	136B9636	133D9638	163C1902AC		1T23-Z-W-A2
	328X393ACG1	328X193ACG1	136B9636	133D9638	163C1902AC		1T23-Z-W-A3
	328X393ACG1	328X193ACG1	136B9636	133D9638	163C1902AC		1T23-Z-E-A2

PROGRAM NAME

163C1888

*** invalid program - try again ***

PROGRAM NAME? PL

EIS FILE DATED - 11/09/82

EXPLANATION OF REPORT HEADINGS ?

PARTS LIST NO ? 163C1888
SUFFIX NUMBER ? CAMS

TITLE:MODULE PL REV: 6 ADC REV: 5 CMPL-P:C CMPL-D:C

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C	S C	A P	R C	C D
##1	HOUSING, ELECTRICAL	195R97#2P#01		1	21						
##2	SCREW,MACH,PNH	NI53F5#22		1	23						
##4	NUT,MSCR,HLX #4-56 UNC-2B SST	N2L4F5		1	23						
##5	SEALANT	262A7#75P#01		AR	21						
##A	ROD	262A685?P#01		119	21						
#11	PRINTING BOARD	163C179#P#11		2	21						
#12	PRINTING BOARD	163C179#P#1#		6	21						
#13	GLASS FIBER, CHOPPED	175A812?P#01		AR	1F					N	

1/26

TITLE:REAC CNTMT ELEC PEN, LV PL REV: 5 DOC REV: CMPL-P:C CMPL-D:

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A C D	R C D
004	JUNCTION BOX	248A9277C010		2	16			N		
005	GASKET	262A7141P001		2	21					
006	ELEC PENETRATION-LOW VOLT	386X110ACG001		1	02					
007	RING, BACKING-WELDING	289A6119P010		1	23			N		
008	SCREW,MACH,PNH	N153P250016		16	23					
009	WASHER,PLAIN .38	N402P43C		16	23					
010	WASHER,STL SPR LK FOR .375 BOLT C STL	N405P13C		16	23					
015	SPLICE, CONDUCTOR	289A501BP026		130	23			N		
016	SPLICE, CONDUCTOR	289A501BP009		70	23			N		
032	ELECT PEN LOW V.	133D9627AC		X	1H					
033	PENETRATION, ELECTRIC	163C1902AC		X	CC					

PARTS LIST NO ? 386X110AC
SUFFIX NUMBER ? GAP1

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3 DOC REV: CMPL-P:C CMPL-D:

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A C D	R C D
001	BOLT,ETE (SHOULDER)	175A9623P003		2	23			N		
002	NUT,HEX	N203P25C		2	23					
003	SHELL	163C1541P001		1	21					
004	WASHER,PLAIN #10	N402P9C		32	23					
005	SCREW,MACH,PNH #10-24X.38 LG	N00P17006C		32	23					
006	SUPPORT-WIRE	157C4702C002		3	16			N		
007	COVER - 12"	195B9746P006475		2	21					
008	STUD, THREADED ROD	176A1570P038		6	23			N		
009	WASHER,PLAIN	N402P45C		12	23					
010	WASHER,STL SPR LK FOR .50;BOLT C STL	N405P15C		12	23					
011	NUT,HEX .50-13	N203P29C		12	23					
012	HEADER RING-MACHINED	163C1889P001		1	21					
013	O RING	289A4117P029		7	23			B		
014	O RING	289A4117P030		7	23					
015	WIRE MODULE	164C5446ACG005		1	16					
016	WIRE MODULE	164C5446ACG005		1	16					
017	WIRE MODULE	164C5446ACG005		1	16					
018	WIRE MODULE	164C5446ACG005		1	16					
019	PLUG, MODULE	198B6899P001		1	21					
020	WIRE MODULE	164C5446ACG005		1	16					
021	WIRE MODULE	164C5446ACG005		1	16					
022	RING	235A1900P001		1	21			N		
023	CLAMP	234A9855P001		A	23			N		
024	WASHER,PLAIN .938ID X1.50ODX.187THK SST	N400P19		12	23					
025	BOLT, HEX HEAD	235A1831P37040		12	23			N		
026	LUBRICANT	2A2A7893P001		AR	23			N		

	.375 SET				
#33	SCREW,MACH,PNH	N153P25#12	8 23		
#34	SET SCREW,SELF LOCK	2#9A5#43P#18	8 23	N	
#36	PENETRATION, ELECTRIC	163C19#2AC	X CC		
#37	PENETRATION, ELECTRIC	2#4B6172	X 16		
#40	GREASE, SILICONE	175A8251P#03	AR 23	N	

A PARTS LIST VIA THE TERMINAL IS ROUGHLY 6 TIMES AS EXPENSIVE AS
REQUESTING IT THROUGH PD&AS. IF AN IMMEDIATE RESPONSE IS NOT REQUIRED,
PLEASE REQUEST VIA PD&AS. SEE EIS USERS GUIDE FOR FURTHER INFORMATION.

PARTS LIST NO ? 164C5446AC
SUFFIX NUMBER ? C##5

TITLE:WIRE MODULE PL REV: 6 DOC REV: 4 CMPL-P:C CMPL-D:C

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
			ASM	X						
#01	ASSEMBLY	163C1888C#07		1	16					
#02	MODULE	262A6851P#01		3#	21					
#03	CONNECTOR	175A823#P##9		AR	23				B	
#10	TUBING SHRINKABLE	272A1853C#01		AR	16					
#12	CASTING RESIN	163C179#P##6		2	21					
#13	POTTING BOARD	262A7898P##6K###		23#	23	PT				
#14	WIRE	262A6843P##2		2	21					
#2#	SLEEVE	262A7#76P##1		AR	1F					
#23	SEALANT									

G2 = 95
Blue Shrink Tube Cost
(15) #2

PARTS LIST NO ? 396X11##AC
SUFFIX NUMBER ? C##1

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3 DOC REV: CMPL-P:C CMPL-D:

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
#01	BOLT,EYE (SHOULDER)	175A9523P##3		2	23			N		
#02	NUT,HEX	N2#3P25C		2	23					
#03	SHELL	163C15A1P##1		1	21					
#04	WASHER,PLAIN #10	N4#2P9C		32	23					
#05	SCREW,MACH,PNH #10-24X.38 LG	N8#P17##6C		32	23					
#06	SUPPORT-WIRE	157C47#2G##2		3	16			N		
#07	COVER - 12"	195B974A P#6475		2	21					
#08	STUD, THREADED ROD	176A157#P#38		6	23			N		
#09	WASHER,PLAIN	N4#2P45C		32	23					
#10	WASHER,STL SPR LK FOR .5# SHT C STL	N4#5P15C		12	23					
#11	NUT,HEX .5#-13	N2#3P29C		12	23					
#12	HEADER RING-MACHINED	163C1889P##1		1	21					
#13	O RING	2##A4117P#29		7	23			P		
#14	O RING	2##A4117P#3#		7	23					
#15	WIRE MODULE	1A4C544AACG##5		1	16					
#16	WIRE MODULE	164C544AACG##5		1	16					
#17	WIRE MODULE	164C544AACG##5		1	16					
#18	WIRE MODULE	164C544AACG##5		1	16					
#19	PLUG, MODULE	199B6#99P##1		1	21					
#2#	WIRE MODULE	164C544#ACG##5		1	16					

3/24

							E	C	S	A	R	C
ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	C	C	P	C	C	D
#24	WASHER,PLAIN	N408P19		12	23							
	.938IDX1.500DX.10THK SST											
#25	BOLT, HEX HEAD	235A1031P3704P		12	23				N			
#26	LUBRICANT	267A7893P001		AR	23							
#27	WIRE,STAINLESS STEEL	175A8866P008		AR	21				N			
#28	WASHER	267A7005P001		6	21							
#29	PRESSURE GAUGE & VALVE	174B9475C001		1	16				N			
#30	THREAD SEALANT	249A1067P001		AR	23							
#31	RING, BOX	157C4839P005		1	21				N			
#32	WASHER,SST SPR LK	N406P13		8	23							
	.375 SST											
#33	SCREW,MACH,PNH	N153P25012		8	23							
#34	SET SCREW,SELF LOCK	209A5043P010		8	23				N			
#36	PENETRATION, ELECTRIC	163C1902AC		1	00							
#37	PENETRATION, ELECTRIC	204B6172		1	16							
#40	GREASE, SILICONE	175A8251P003		AR	23				N			

A PARTS LIST VIA THE TERMINAL IS ROUGHLY 6 TIMES AS EXPENSIVE AS
REQUESTING IT THROUGH PDEAS

PARTS LIST NO ? 306X1100AC
SUFFIX NUMBER ? G003

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3 DOC REV: CMPL-P:C CMPL-D:

							E	C	S	A	R	C
ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	C	C	P	C	C	D
#01	BOLT,EYE (SHOULDER)	175A9623P003		2	23				N			
#02	NUT,HEX	N203P25C		2	23							
#03	SHELL	163C1541P001		1	21							
#04	WASHER,PLAIN	N402P9C		32	23							
	#10											
#05	SCREW,MACH,PNH	N80P17006C		32	23							
	#10-24X.38 LG											
#06	SUPPORT-WIRE	157C4762G002		3	16				N			
#07	COVER - 12"	195B9746P006475		2	21							
#08	STUD, THREADED ROD	176A1570P038		6	23				N			
#09	WASHER,PLAIN	N402P45C		12	23							
#10	WASHER,STL SPR LK	N405P15C		12	23							
	FOR .50 BOLT C STL											
#11	NUT,HEX	N203P29C		12	23							
	.50-13											
#12	HEADER RING-MACHINED	163C1889P001		1	21							
#13	O RING	209A4117P029		7	23							
#14	O RING	209A4117P038		7	23				B			
#15	WIRE MODULE	164C5446ACG003		1	16							
#16	PLUG, MODULE	198B6099P001		1	21							
#17	WIRE MODULE	164C5446ACG004		1	16							
#18	WIRE MODULE	164C5446ACG003		1	16							
#19	WIRE MODULE	164C5446ACG003		1	16							
#20	WIRE MODULE	164C5446ACG003		1	16							
#21	PLUG, MODULE	198B6099P001		1	21							
#22	RING	235A1908P001		1	21				N			
#23	CLAMP	234A9056P001		6	23				N			
#24	WASHER,PLAIN	N408P19		12	23							
	.938IDX1.500DX.10THK SST											
#25	BOLT, HEX HEAD	235A1031P3704P		12	23				N			
#26	LUBRICANT	267A7893P001		AR	23							
#27	WIRE,STAINLESS STEEL	175A8866P008		AR	21				N			
#28	WASHER	267A7005P001		6	21							
	[illegible]	[illegible]		1	16				N			

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```
      .375 SST
#33   SCREW,MACH,PNH          N153P250I2          8 23              N
#34   SET SCREW,SELF LOCK     2#9A5043P#1#        8 23
#36   PENETRATION, ELECTRIC   163C1?#2AC          X 0?
#37   PENETRATION, ELECTRIC   2#4B6172            X 16              N
#48   GREASE, SILICONE        175A8251P#03        AR 23

A PARTS LIST VIA THE TERMINAL IS ROUGHLY 6 TIMES AS EXPENSIVE AS
  REQUESTING IT THROUGH PREAS. IF AN IMMEDIATE R

PARTS LIST NO ? 164C5446
ID NO. NOT IN FILE

PARTS LIST NO ? 164C6#5446AC
SUFFIX NUMBER ? C##3

TITLE:WIRE MODULE                PL REV: 6  DOC REV: 4  CMPL-P:C  CMPL-D:C

                                                                  E C S A R C
ITEM  NAME                       IDENTIFICATION  STAT  QTY    UM SRC C C P C C D

                                                 ASM    X
#01   ASSEMBLY                   1?C1888C##5             1 16
#02   MODULE                    2?2?7##3P##1          238 23              N
#03   CONTACT                   ?5?4823#P##5           AR 23
#07   TUBING SHRINKABLE         272A8185C##1           AR 16
#12   CASTING RESIN             262A7898P##6K###     1###  23 FT
#14   WIRE                      262A6848P##2             2 21
#20   SLEEVE                    262A7#76P##1           AR 1F
#23   SEALANT

PARTS LIST NO ? 164C5446AC
SUFFIX NUMBER ? C###4

TITLE:WIRE MODULE                PL REV: 6  DOC REV: 4  CMPL-P:C  CMPL-D:C

                                                                  E C S A R C
ITEM  NAME                       IDENTIFICATION  STAT  QTY    UM SRC C C P C C D

                                                 ASM    X
#01   ASSEMBLY                   163C1888C##6            1 16
#02   MODULE                    262A7###P##1           98 21
#03   CONTACT ## AWG            175A823#F##7           AR 23              B
#09   TUBING SHRINKABLE         272A8185C##1           AR 16
#12   CASTING RESIN             163C179##P##9            2 21
#13   POTTING BOARD             262A7898P##6K###     7##  23 FT
#14   WIRE                      262A6848P##2             2 21
#20   SLEEVE                    262A7#76P##1           AR 1F
#23   SEALANT

PARTS LIST NO ? 396X11##C
SUFFIX NUMBER ? C###4

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3  DOC REV:    CMPL-P:C  CMPL-D:

                                                                  E C S A R C
ITEM  NAME                       IDENTIFICATION  STAT  QTY    UM SRC C C P C C D

#01   BOLT,EYE (SHOULDER)       175#9623F##3            2 23              N
#02   NUT,HEX                   N2##P2?C                2 23
#03   SHELL                     163C1541P##1            1 21
      WASHER,PLAIN              N##?P?C                32 23
```

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	#10-24X.38 LG	157C4702G002	3 16							N	
006	SUPPORT-WIRE	195B9746P06475	2 21								
007	COVER - 12"	176A1570P038	6 23							N	
008	STUD, THREADED ROD	N402P45C	12 23								
009	WASHER,PLAIN	N405P15C	12 23								
010	WASHER,STL SPR LK FOR .50 BOLT C STL										
011	NUT,HEX .50-13	M203P29C	12 23								
012	HEADER RING-MACHINED	163C1889P001	1 21								
013	O RING	209A4117P029	7 23								
014	O RING	209A4117P038	7 23								
015	PLUG, MODULE	198B6099P001	1 21								
016	WIRE MODULE	164C5446ACG003	1 16								
017	WIRE MODULE	164C5446ACG004	1 16								
018	PLUG, MODULE	198B6099P001	1 21								
019	PLUG, MODULE	198B6099P001	1 21								
020	PLUG, MODULE	198B6099P001	1 21								
021	WIRE MODULE	164C5446ACG003	1 16								
022	RING	235A1900P001	1 21							N	
023	CLAMP	234A9056P001	6 23							N	
024	WASHER,PLAIN .938IDX1.500DX.10THK SST	N408P19	12 23								
025	BOLT, HEX HEAD	235A1031P37040	12 23							N	
026	LUBRICANT	262A7893P001	AR 23								
027	WIRE,STAINLESS STEEL	175A8866P008	AR 21							N	
028	WASHER	262A7005P001	6 21								
029	PRESSURE GAUGE & VALVE	174B9475G001	1 16							N	
030	THREAD SEALANT	249A1867P001	AR 23								
031	RING, BOX	157C4839P005	1 21							N	
032	WASHER,SST SPR LK .375 SST	N406P13	8 23								
033	SCREW,MACH,PHH	N153P2501Z	8 23								
034	SET SCREW,SELF LOCK	209A5043P018	8 23							N	
036	PENETRATION, ELECTRIC	163C1982AC	X CC								
037	PENETRATION, ELECTRIC	204B6172	X 16								
048	GREASE, SILICONE	175A8251P003	AR 23							N	

A PARTS LIST VIA THE TERMINAL IS ROUGHLY 6 TIMES AS EXPENSIVE AS
REQUESTING IT THROUGH PDEAS. IF AN IMMEDIATE RESPONSE IS NOT REQUIRED,
PLEASE REQUEST VIA PDEAS. SEE EIS USERS GUIDE FOR FURTHER INFORMATION.

PARTS LIST NO ?

PARTS LIST NO ? 386X11A0C
SUFFIX NUMBER ? C005

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3 DOC REV: CMPL-P:C CMPL-D:

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S A P	R C C	C D
001	BOLT,ETE (SHOULDER)	175A9A23P003		2 23					N	
002	NUT,HEX	N208P45C		2 23						
003	SHELL	162C1541P001		1 21						
004	WASHER,PLAIN #10	N402P9C		32 23						
005	SCREW,MACH,PHH #10-24X.38 LG	N00P17006C		32 23						
006	SUPPORT-WIRE	157C4702G002		3 16					N	
007	COVER - 12"	195B9746P06475		2 21						
008	STUD, THREADED ROD	176A1570P038		6 23					N	

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#11	NUT,HEX .50-13	NZ03P29C	12 23		
#12	HEADER RING-MACHINED	163C1889P001	1 21		
#13	O RING	209A4117P029	7 23		
#14	O RING	209A4117P030	7 23		B
#15	WIRE MODULE	164C5446ACG005	1 16		
#16	WIRE MODULE	164C5446ACG006	1 16		
#17	WIRE MODULE	164C5446ACG006	1 16		
#18	WIRE MODULE	164C5446ACG005	1 16		
#19	WIRE MODULE	164C5446ACG005	1 16		
#20	WIRE MODULE	164C5446ACG005	1 16		
#21	PLUG, MODULE	198B6899P001	1 21		
#22	RING	235A1988P001	1 21		N
#23	CLAMP	234A9856P001	6 23		N
#24	WASHER,PLAIN .938IDX1.500DX.10THK SST	N400P19	12 23		
#25	BOLT, HEX HEAD	235A1031P37040	12 23		N
#26	LUBRICANT	262A7893P001	AR 23		
#27	WIRE,STAINLESS STEEL	175A8866P008	AR 21		N
#28	WASHER	262A7005P001	6 21		
#29	PRESSURE GAUGE & VALVE	174B9475G001	1 16		N
#30	THREAD SEALANT	249A1067P001	AR 23		
#31	RING, BOX	157C4839P005	1 21		N
#32	WASHER,SST SPR LK .375 SST	N406P13	8 23		
#33	SCREW,MACH,PNH	N153P25012			

PARTS LIST NO ? 164C5446AC
SUFFIX NUMBER ? G005

TITLE:WIRE MODULE

PL REV: 6 DOC REV: 4 CMPL-P:C CMPL-D:C

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
			ASM	X						
#01	ASSEMBLY	163C1888G007		1 16						
#02	MODULE	262A6851P001		30 21						
#03	CONNECTOR	175A8230P039		AR 23						B
#10	TUBING SHRINKABLE	272A8185G001		AR 16						
#12	CASTING RESIN	163C1790P006		2 21						
#13	POTTING BOARD	262A7898P006K008		230 23	FT					
#14	WIRE	262A6848P002		2 21						
#20	SLEEVE	262A7076P001		AR 1F						
#23	SEALANT									

PARTS LIST NO ? 164C5446AC
SUFFIX NUMBER ? G006

TITLE:WIRE MODULE

PL REV: 6 DOC REV: 4 CMPL-P:C CMPL-D:C

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
			ASM	X						
#01	ASSEMBLY	163C1888G008		1 16						
#02	MODULE	262A6851P002		12 21						
#03	CONNECTOR	175A8230P010		AR 23						N
#11	TUBING SHRINKABLE	272A8185G001		AR 16						
#12	CASTING RESIN	163C1790P003		2 21						
#13	POTTING BOARD	262A7898P006K008		95 23	FT					
#14	WIRE	262A6848P002		2 21						
#20	SLEEVE	262A7076P001		AR 1F						
#23	SEALANT									

SUFFIX NUMBER ? G006

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3 DOC REV: CMPL-P:C CMPL-D:

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
001	BOLT,EYE (SHOULDER)	175A9623P003		2	23				N	
002	NUT,HEX	N203P25C		2	23					
003	SHELL	163C1541P001		1	21					
004	WASHER,PLAIN #10	N402P9C		32	23					
005	SCREW,MACH,PNH #10-24X.38 LG	N00P17006C		32	23					
006	SUPPORT-WIRE	157C4702G002		3	16				N	
007	COVER - 12"	195B9746P06475		2	21					
008	STUD, THREADED ROD	176A157DP038		6	23				N	
009	WASHER,PLAIN	N402P45C		12	23					
010	WASHER,STL SPR LK FOR .50 BOLT C STL	N405P15C		12	23					
011	NUT,HEX .50-13	N203P29C		12	23					
012	HEADER RING-MACHINED	163C1889P002		1	21					
013	O RING	209A4117P029		7	23				B	
014	O RING	209A4117P030		7	23					
015	WIRE MODULE	164C5446ACG005		1	16					
016	WIRE MODULE	164C5446ACG006		1	16					
017	WIRE MODULE	164C5446ACG006		1	16					
018	WIRE MODULE	164C5446ACG005		1	16					
019	WIRE MODULE	164C5446ACG005		1	16					
020	WIRE MODULE	164C5446ACG005		1	16					
021	PLUG, MODULE	198B6099P001		1	21					
022	RING	235A1988P001		1	21				N	
023	CLAMP	236A9056P001		6	23				N	
024	WASHER,PLAIN .928IDX1.500DX.10THK SST	N400P19		12	23					
025	BOLT, HEX HEAD	235A1031P37040		12	23				N	
026	LUBRICANT	262A7093P001		AR	23					
027	WIRE,STAINLESS STEEL	175A8866P008		AR	21				N	
028	WASHER	262A7005P001		6	21					
029	PRESSURE GAUGE & VALVE	235A1953G001		1	16				N	
030	THREAD SEALANT	249A1067P001		AR	23					
031	RING, BOX	157C4039P005		1	21				N	
032	WASHER,SST SPR LK .375 SST	N406P13		8	23					
033	SCREW,MACH,PNH	N135P25012		8						

PARTS LIST NO ? 306X110AC
SUFFIX NUMBER ? G007

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3 DOC REV: CMPL-P:C CMPL-D:

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
001	BOLT,EYE (SHOULDER)	175A9623P003		2	23				N	
002	NUT,HEX	N203P25C		2	23					
003	SHELL	163C1541P001		1	21					
004	WASHER,PLAIN #10	N402P9C		32	23					
005	SCREW,MACH,PNH #10-24X.38 LG	N00P17006C		32	23					
006	SUPPORT-WIRE	157C4702G002		3	16				N	

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#10	WASHER,STL SPR LK FOR .50 BOLT C STL	MA05P15C	12	23	
#11	NUT,HEX .50-13	NZ03P29C	12	23	
#12	HEADER RING-MACHINED	163C1889P001	1	21	
#13	O RING	Z09A4117P029	7	23	B
#14	O RING	Z09A4117P030	7	23	
#15	WIRE MODULE	164C5446ACG007	1	16	
#16	WIRE MODULE	164C5446ACG007	1	16	
#17	WIRE MODULE	164C5446ACG007	1	16	
#18	WIRE MODULE	164C5446ACG007	1	16	
#19	WIRE MODULE	164C5446ACG007	1	16	
#20	WIRE MODULE	164C5446ACG007	1	16	
#21	WIRE MODULE	164C5446ACG009	1	16	
#22	RING	235A1900P001	1	21	N
#23	CLAMP	234A9056P001	6	23	N
#24	WASHER,PLAIN .938IDX1.50ODX.10THK SST	MA00P19	12	23	
#25	BOLT, HEX HEAD	235A1031P37040	12	23	N
#26	LUBRICANT	Z62A7893P001	AR	23	
#27	WIRE,STAINLESS STEEL	175A8866P008	AR	21	N
#28	WASHER	Z62A7005P001	6	21	
#29	PRESSURE GAUGE & VALVE	174B9475G001	1	16	N
#30	THREAD SEALANT	Z49A1067P001	AR	23	
#31	RING, BOX	157C4839P005	1	27	N
#32	WASHER,SST SPR LK .375 SST	MA06P13	8	22	
#33	SCREW,MACH,PNH	MA53P25012	8	23	
#34	SET SCREW,SELF LOCK	Z09A5043P010	8	23	N
#36	PENETRATION, ELECTRIC	163C1902AC	X	CC	
#37	PENETRATION, ELECTRIC	Z04B617Z	X	16	
#40	GREASE, SILICONE	175A8251P003	AR	23	N

A PARTS LIST VIA THE TERMINAL IS ROUGHLY 6 TIMES AS EXPENSIVE AS
REQUESTING IT THROUGH PD&AS. IF A

PARTS LIST NO ? 164X8C5446AC
SUFFIX NUMBER ? C007

TITLE:WIRE MODULE

PL REV: 6 DOC REV: 4 CMPL-P:C CMPL-D:C

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C P	S A C C	R C D
#01	ASSEMBLY		ASM	X					
#02	MODULE	163C1888C003		1	16				
#03	CONTACT	Z62A7003P001		238	23				N
#07	TUBING SHRINKABLE	175A8233P005		AR	23				
#12	CASTING RESIN	Z72A8185G001		AR	16				
#14	WIRE	Z62A7898F00AK008		1800	23	FT			
#20	SLEEVE	Z62A6848P002		2	21				
#23	SEALANT	Z62A7075P001		AR	1F				

PARTS LIST NO ? 164C5446AC
SUFFIX NUMBER ? C000

TITLE:WIRE MODULE

PL REV: 6 DOC REV: 4 CMPL-P:C CMPL-D:C

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C P	S A C C	R C D

#07	TUBING SHRINKABLE	175A8230P005	AR 23		N
#09	TUBING SHRINKABLE	175A8230P007	AR 23		P
#12	CASTING RESIN	272A8185G001	AR 16		
#14	WIRE	262A7898P006X000	600 23 FT		
#20	SLEEVE	262A6848P002	2 21		
#21	TUBING SHRINKABLE	176A1506P007	AR 23		N
#22	TUBING SHRINKABLE	175A8230P004	AR 23		P
#23	SEALANT	262A7876P001	AR 1F		

PARTS LIST NO ? 306X110AC
SUFFIX NUMBER ? C000

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3 DOC REV: CMPL-P:C CMPL-D:

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
#01	BOLT,EYE (SHOULDER)	175A9623P003		2	23			N		
#02	NUT,HEX	N203P25C		2	23					
#03	SHELL	163C1541P001		1	21					
#04	WASHER,PLAIN	N402P9C		32	23					
#05	#10 SCREW,MACH,PAN	N80P17006C		32	23					
#06	#10-24X.38 LG SUPPORT-WIRE	157C4702G002		3	16			N		
#07	COVER - 12"	195B9746P06475		2	21					
#08	STUD, THREADED ROD	176A157#P038		6	23			N		
#09	WASHER,PLAIN	N402P45C		12	23					
#10	WASHER,STL SPR LK FOR .38 BOLT C STL	N405P15C		12	23					
#11	NUT,HEX .50-13	N203P29C		12	23					
#12	HEADER RING-MACHINED	163C1889P001		1	21					
#13	O RING	209A4117P029		7	23					
#14	O RING	209A4117P030		7	23			B		
#15	PLUG, MODULE	198B6099P001		1	21					
#16	PLUG, MODULE	198B6099P001		1	21					
#17	PLUG, MODULE	198B6099P001		1	21					
#18	WIRE MODULE	164C5446ACG009		1	16					
#19	WIRE MODULE	164C5446ACG007		1	16					
#20	WIRE, MODULE	164C5446ACG007		1	16					
#21	PLUG, MODULE	198B6099P001		1	21					
#22	RING	235A1900P001		1	21			N		
#23	CLAMP	234A9056P001		6	23			N		
#24	WASHER,PLAIN .938IDX1.50ODX.10THK SST	N400P19		12	23					
#25	BOLT, HEX HEAD	235A1031P37040		12	23			N		
#26	LUBRICANT	262A7893P001		AR	23					
#27	WIRE,STAINLESS STEEL	175A8866P008		AR	21			N		
#28	WASHER	262A7005P001		6	21					
#29	PRESSURE GAUGE & VALVE	174B9475G001		1	16			N		
#30	THREAD SEALANT	249A1067P001		AR	23					
#31	RING, BOX	157C4839P005		1	21			N		
#32	WASHER,SST SPR LK .375 SST	N406M13		8	23					
#33	SCREW,MACH,PNH	N153P25012		8	23			N		
#34	SET SCREW,SELF LOCK	209A5443P010		8	23					
#36	PENETRATION, ELECTRIC	163C1992AC		1	CC					
#37	PENETRATION, ELECTRIC	204B6172		1	16					
#48	GREASE, SILICONE	175A8251P003		AR	23			N		

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PARTS LIST NO ? 386X110AC
SUFFIX NUMBER ? CA09

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3  DOC REV:    CMPL-P:C  CMPL-D:
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ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S A P	R C C	C D
001	BOLT,EYE (SHOULDER)	175A9623P003		2	23					N
002	NUT,HEX	N203P25C		2	23					
003	SHELL	163C1541P001		1	21					
004	WASHER,PLAIN #10	N402P9C		32	23					
005	SCREW,MACH,PHH #10-24X.38 LG	N00P17006C		32	23					
006	SUPPORT-WIRE	157C4702C002		3	16					N
007	COVER - 12"	195B9746P06475		2	21					
008	STUD, THREADED ROD	176A1570P038		6	23					N
009	WASHER,PLAIN	N402P45C		12	23					
010	WASHER,STL SPR LK FOR .50 BOLT C STL	N405P15C		12	23					
011	NUT,HEX .50-13	N203P29C		12	23					
012	HEADER RING-MACHINED	163C1089P001		1	21					
013	O RING	209A4117P029		7	23					
014	O RING	209A4117P030		7	23					B
015	WIRE MODULE SIGNAL	204B6177ACG001		1	16					
016	PLUG, MODULE	198B6099P001		1	21					
017	WIRE MODULE SIGNAL	204B6177ACG001		1	16					
018	PLUG, MODULE	198B6099P001		1	21					
019	WIRE MODULE	164C5446ACG010		1	16					
020	WIRE MODULE	164C5446ACG007		1	16					
021	WIRE MODULE	164C5446ACG012		1	16					
022	RING	235A1900P001		1	21					N
023	CLAMP	234A9056P001		6	23					N
024	WASHER,PLAIN .928IDX1.50ODX.10THK SST	N400P19		12	23					
025	BOLT, HEX HEAD	235A1031P37040		12	23					N
026	LUBRICANT	202A7893P001		AR	23					
027	WIRE,STAINLESS STEEL	175A8866P008		AR	21					N
028	WASHER	202A7005P001		6	21					
029	PRESSURE GAUGE & VALVE	174B9475G001		1	16					N
030	THREAD SEALANT	249A1067P001		AR	23					
031	RING, BOX	157C4839P005		1	21					N
032	WASHER,SST SPR LK .375 SST	N406P13		8	23					
033	SCREW,MACH,PHH	N153P25012		8	23					
034	SET SCREW,SELF LOCK	209A5043P010		8	23					N
036	PENETRATION, ELECTRIC	163C1902AC		X	CC					
037	PENETRATION, ELECTRIC	204B6172		X	16					
048	GREASE, SILICONE	175A8251P003		AR	23					N

```
A PARTS LIST VIA THE TERMINAL IS ROUGHLY 6 TIMES AS EXPENSIVE AS
  REQUESTING IT THROUGH

PARTS LIST NO ? 164C5446AC
SUFFIX NUMBER ? CA10

TITLE:WIRE MODULE                PL REV: 6  DOC REV: 4  CMPL-P:C  CMPL-D:C
```

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S A P	R C C	C D

11/26

003	CONTACT	Z62A7003P001	230	23					N			
007	TUBING SHRINKABLE	175A8230P005	AR	23					B			
009	TUBING SHRINKABLE	175A8230P007	AR	23								
012	CASTING RESIN	272A8185G001	AR	16								
014	WIRE	262A7898P006K008	320	23	FT							
020	SLEEVE	262A6848P002	2	21								
021	TUBING SHRINKABLE	176A1506P007	AR	23					N			
022	TUBING SHRINKABLE	175AR230P004	AR	23					B			
023	SEALANT	262A7676P001	AR	1F								

PARTS LIST NO ? 164C5446AC
SUFFIX NUMBER ? C012

TITLE:WIRE MODULE

PL REV: 6 DOC REV: 4 CMPL-P:C CMPL-D:C

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
001	ASSEMBLY		ASM	X						
002	MODULE	163C1808G009		1	16					
003	CONTACT (PIN & SOCKET)	159C4343P004		72	23					
007	TUBING SHRINKABLE	175A8230P005		AR	23				N	
012	CASTING RESIN	272A8185G001		AR	16					
014	WIRE	262A7898P006K008		500	23	FT				
018	CONDUIT	175A9665P005		15	23	FT			N	
019	CONNECTOR, STRAIGHT	209A4111P005		2	23				N	
020	SLEEVE	262A6848P002		2	21					
023	SEALANT	262A7676P001		AR	1F					

PARTS LIST NO ? 204B6177AC
SUFFIX NUMBER ? C001

TITLE:WIRE MODULE SIGNAL

PL REV: 1 DOC REV: 0 CMPL-P:C CMPL-D:C

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
001	ASSEMBLY		ASM	X						
002	MODULE, SIGNAL	195B9903G001		1	16					
003	PLUG	145A3201P005		3	23				B	
004	TUBING SHRINKABLE	175A8230P010		AR	23				N	
005	EPOXY	209A4967P001		AR	23					
006	POTTING BOARD	163C1790P010		1	21					
007	TUBING SHRINKABLE	175A8230P008		AR	23				N	
008	SEALANT	272A7258P001		AR	1F					
009	CAP, PROTECTIVE	175A1003P003		6	23				N	
010	CONNECTOR	175A9133P001		3	23				B	
011	CABLE,RADIO FREQUENCY,CNT	225A4706P001		12	23	FT			N	
012	CABLE,RADIO FREQUENCY,CNT	225A4706P002		24	23	FT			N	
013	SLEEVE	262A6848P002		1	21					

PARTS LIST NO ? 386X1190AC
SUFFIX NUMBER ? C010

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3 DOC REV: CMPL-P:C CMPL-D:

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
									N	

12/90

	#10							
005	SCREW,MACH,PNH	N90P17006C	32	23				
	#10-24X.38 LG							
006	SUPPORT-WIRE	157C4702G002	3	16				N
007	COVER - 14"	195B974AP006475	2	21				
008	STUD, THREADED ROD	176A157P0038	6	23				N
009	WASHER,PLAIN	N40P45C	12	23				
010	WASHER,STL SPR LK	N405P15C	12	23				
	FOR .50 BOLT C STL							
011	NUT,HEX	N203P29C	12	23				
	.50-13							
012	HEADER RING-MACHINED	163C1889P002	1	21				
013	O RING	209A4117P029	7	23				
014	O RING	209A4117P030	7	23				B
015	WIRE MODULE SIGNAL	204B6177ACG001	1	16				
016	PLUG, MODULE	198B6099P001	1	21				
017	WIRE MODULE SIGNAL	204B6177ACG001	1	16				
018	PLUG, MODULE	198B6099P001	1	21				
019	WIRE MODULE	164C5446ACG010	1	16				
020	WIRE MODULE	164C5446ACG007	1	16				
021	WIRE MODULE	164C5446ACG012	1	16				
022	RING	235A1900P001	1	21				N
023	CLAMP	234A9056P001	6	23				N
024	WASHER,PLAIN	N400P19	12	23				
	.938IDX1.500DX.10THK SST							
025	BOLT, HEX HEAD	235A1031P37040	12	23				N
026	LUBRILANT	262A7093P001	AR	23				
027	WIRE,STAINLESS STEEL	175A8866P008	AR	21				N
028	WASHER	262A7005P001	6	21				
029	PRESSURE GAUGE & VALVE	235A1953C001	1	16				N
030	THREAD SEALANT	249A1067P001	AR	23				
031	RING, BOX	157C4829P005	1	21				N
032	WASHER,SST SPR LK	NA06P13	8	23				
	.375 SST							
033	SCREW,MACH,PNH	N153P25012	8	23				
034	SET SCREW,SELF LOCK	209A5043P010	8	23				N
035	PIPE, THREADED, SCH 40	235A1954P004	1	23				N
036	PENETRATION, ELECTRIC	163C1982AC	X	CC				
038	PENETRATION, ELECTRIC	204B6173	X	16				
040	GREASE, SILICONE	175A8251P003	AR	23				N

A PARTS LIST VIA THE TERMINAL IS ROUGHLY 6 TIMES AS EXPENSIVE AS
REQUESTING IT THROUGH PDRAS. IF AN IMMEDIATE RESPONSE IS NOT REQUIRED,
PLEASE REQUEST VIA

PARTS LIST NO ? 386X1100C
RETRANSMIT LAST LINE
386X1100C
SUFFIX NUMBER ? G012

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3 DOC REV: CMPL-P:C CMPL-D:

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C	S C	A P	R C	C D
001	BOLT,EYE (SHOULDER)	175A9623P003		2	23					N	
002	NUT,HEX	N403P25C		2	23						
003	SHELL	157C1541P001		1	21						
004	WASHER,PLAIN	N40CP2C		32	23						
	#10										
005	SCREW,MACH,PNH	N90P17006C		32	23						
	#10-24X.38 LG										

#09	WASHER,PLAIN	N40ZP45C	12	23						
#10	WASHER,STL SPR LK FOR .50 BOLT C STL	N40SP15C	12	23						
#11	NUT,HEX .50-13	N20BP29C	12	23						
#12	HEADER RING-MACHINED	163C188P001	1	21						
#13	O RING	209A4117P029	7	23						B
#14	O RING	209A4117P038	7	23						
#15	WIRE MODULE	164C5446ACG003	1	16						
#16	WIRE MODULE	164C5446ACG003	1	16						
#17	WIRE MODULE	164C5446ACG004	1	16						
#18	PLUG, MODULE	198B6099P001	1	21						
#19	WIRE MODULE	164C5446ACG008	1	16						
#20	WIRE MODULE	164C5446ACG003	1	16						
#21	WIRE MODULE	164C5446ACG008	1	16						
#22	RING	235A1900P001	1	21						N
#23	CLAMP	274A9056P001	6	23						N
#24	WASHER,PLAIN .938IDX1.500DX.10THK SST	N40QP19	12	23						
#25	BOLT, HEX HEAD	235A1031P37043	12	23						N
#26	LUBRICANT	262A7893P001	AR	23						
#27	WIRE,STAINLESS STEEL	175A8866P008	AR	21						N
#28	WASHER	262A7005P001	6	21						
#29	PRESSURE GAUGE & VALVE	174B9475G001	1	16						N
#30	THREAD SEALANT	249A1067P001	AR	23						
#31	RING, BOX	157C4839P005	1	21						N
#32	WASHER,SST SPR LK .378 SST	N40AP13	8	23						
#33	SCREW,MACH,PNH	N153P25012	8	23						
#34	SET SCREW,SELF LOCK	209A5043P010	8	23						N
#36	PENETRATION, ELECTRIC	163C1902AC	X	CC						
#37	PENETRATION, ELECTRIC	204B6172	X	16						
#48	GREASE, SILICONE	175A8251P003	AR	23						N

A PARTS LIST VIA THE TERMINAL IS ROUGHLY 6 TIMES AS EXPENSIVE AS
REQUESTING IT THROUGH PUBAS. IF AN IMMEDIATE RESPONSE IS NOT REQUIRED,
PLEASE REQUEST VIA PUBAS. SEE EIS USERS GUIDE FOR FURTHER INFORMATION.

PARTS LIST NO ? 284Y1100C
SUFFIX NUMBER ? G011

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3 DOC REV: CMPL-P:C CMPL-D:

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
#01	BOLT,EYE (SHOULDER)	175A9623P003		2	23				N	
#02	NUT,HEX	N20BP25C		2	23					
#03	SHELL	163C1541P001		1	21					
#04	WASHER,PLAIN #10	N40ZP9C		32	23					
#05	SCREW,MACH,PNH #10-24X.25 LG	NP0BF1700AC		32	23					
#06	SUPPORT-WIRE	157C4702C002		3	16				N	
#07	COVER - 1"	195P9748EW475		2	21					
#08	STUD, THREADED ROD	174A1570P039		4	23				N	
#09	WASHER,PLAIN	N40LP45C		12	23					
#10	WASHER,STL SPR LK FOR .50 BOLT C STL	N40SP15C		12	23					
#11	NUT,HEX .50-13	N20BP29C		12	23					

#16	WIRE MODULE	164C5446AC0#3	1	16								
#17	WIRE MODULE	164C5446AC0#4	1	16								
#18	WIRE MODULE	164C5446AC0#5	1	16								
#19	WIRE MODULE	164C5446AC0#6	1	16								
#20	PLUG, MODULE	198B6#93P#01	1	21								
#21	WIRE MODULE	1A4C5446AC0#8	1	16								
#22	RING	235A19#0P#01	1	21							N	
#23	CLAMP	234A9#54P#01	6	23							N	
#24	WASHER,PLAIN .938IDX1.50ODX.10THK SST	N40#P19	12	23								
#25	BOLT, HEX HEAD	235A1#31P37#40	12	23							N	
#26	LUBRICANT	262A789JP#01	AR	23								
#27	WIRE,STAINLESS STELL	175A8864P#08	AR	21							N	
#28	WASHER	262A7#05P#01	6	21								
#29	PRESSURE GAUGE & VALVE	235A1953C#01	1	16							N	
#30	THREAD SEALANT	249A1#67P#01	AR	23								
#31	RING, BOX	157C4839P#05	1	21							N	
#32	WASHER,SST SPR LK .375 SST	H4#6P13	8	23								
#33	SCREW,MACH,PNH	N153P25#12	8	23								
#34	SET SCREW,SELF LOCK	269A5#43P#10	8	23							N	
#35	PIPE, THREADED, SCH 40	235A1954P#04	1	23							N	
#36	PENETRATION, ELECTRIC	163C19#2AC	X	CC								
#38	PENETRATION, ELECTRIC	2#4B6173	X	16								
#40	GREASE, SILICONE	175A8251P#03	AR	23							N	

A PARTS LIST VIA THE TERMINAL IS ROUGHLY 6 TIMES AS EXPENSIVE AS
REQUESTING IT THROUGH PDBAS. IF AN IMMEDIATE RESPONSE IS NOT REQUIRED,
PLEASE REQUEST VIA

PARTS LIST NO ? 164C5446AC
SUFFIX NUMBER ? C#0?

TITLE:WIRE MODULE PL REV: 6 DOC REV: 4 CMPL-P:C CMPL-D:C

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
			ASM	X						
#01	ASSEMBLY	163C1888C#05		1	16					
#02	MODULE	262A7#03P#01		239	23					
#03	CONTACT,	175A823#P#05		AR	23				N	
#07	TUBING SHRINKABLE	272A8195C#01		AR	16					
#12	CASTING RESIN	262A789BP#06K#08		1#0#	23	FT				
#14	WIRE	262A8949P#0[		[	21					
#20	SLEEVE	262A7#76P#01		AR	1F					
#23	SEALANT									

PARTS LIST NO ? 164C5446AC
SUFFIX NUMBER ? C#04

TITLE:WIRE MODULE PL REV: 6 DOC REV: 4 CMPL-P:C CMPL-D:C

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
			ASM	X						
#01	ASSEMBLY	1A3C1888C#0A		1	16					
#02	MODULE	2A.A7#04P#01		#0	21					
#03	CONTACT #[AWG	175A8[3#P#07		AR	23				P	
#07	TUBING SHRINKABLE	27[A81[5C#01		AR	16					
#12	CASTING RESIN	1A.C1[3#P#02		2	21					
#14	CASTING RESIN									

15.

PARTS LIST NO ? 164C5446AC
SUFFIX NUMBER ? G@@@

TITLE:WIRE MODULE PL REV: 6 DOC REV: 4 CMPL-P:C CMPL-D:C

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C	C C	S P	A C	R C	C D
			ASM	X								
@@1	ASSEMBLY	163C188@G@@5		1	16							
@@2	MODULE	262A7@@3P@@1		4@	23							
@@3	CONTACT	175A823@P@@5		AR	23				N			
@@7	TUBING SHRINKABLE	272A8185G@@1		AR	16							
@12	CASTING RESIN	262A7898P@@6K@@8		64@	23	FT						
@14	WIRE	175A9665P@@5		15	23	FT			N			
@18	CONDUIT	2@VA411IP@@5		2	23				N			
@19	CONNECTOR, STRAIGHT	262A684PP@@2		2	21							
@2@	SLEEVE	262A7@7AP@@1		AR	1F							
@23	SEALANT											

PARTS LIST NO ? 386C11@AC
ID NO. NOT IN FILE

PARTS LIST NO ? 386X11@AC
ID NO. NOT IN FILE

PARTS LIST NO ? 386X11@AC
SUFFIX NUMBER ? G@13

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3 DOC REV: CMPL-P:C CMPL-D:

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C	C C	S P	A C	R C	C D
@@1	BOLT,EYE (SHOULDER)	175A9673P@@3		2	23				N			
@@2	NUT,HEX	N2@3P25C		2	23							
@@3	SHELL	163C1541P@@1		1	21							
@@4	WASHER,PLAIN #10	N4@2P9C		32	23							
@@5	SCREW,MACH,PNH #10-24X.38 LG	N8@P17@@6C		32	23							
@@6	SUPPORT-WIRE	157C47@2C@@2		3	16				N			
@@7	COVER - 12"	195B974AP@6475		2	21							
@@8	STUD, THREADED ROD	176A157@P@3@		6	23				N			
@@9	WASHER,PLAIN	N4@2P45C		12	23							
@1@	WASHER,STL SPR LK FOR .5@ BOLT C STL	N4@5P15C		12	23							
@11	NUT,HEX .5@-1	N2@3P29C		12	23							
@12	HEADER RING-MACHINED	163C1@89P@@2		1	21							
@13	O RING	2@9A117P@29		7	23				P			
@14	O RING	2@9A117P@3@		7	23							
@15	WIRE MODULE	164C5446AC@@7		1	16							
@16	WIRE MODULE	164C5446AC@@7		1	16							
@17	WIRE MODULE	164C5446AC@@7		1	16							
@18	WIRE MODULE	164C5446AC@@1		1	16							
@19	WIRE MODULE	164C5446AC@@1		1	16							
@2@	PLUG, MODULE	195EA@92P@@1		1	21							
		164C5446AC@@7		1	16							

	.938IDX1.500DX.10THK SST											
#25	BOLT, HEX HEAD	235A1031P37#40	12	23								N
#26	LUBRICANT	2A7A7893P001	AR	23								
#27	WIRE,STAINLESS STEEL	175A8866P008	AR	21								N
#28	WASHER	2A7A7005P001	6	21								
#29	PRESSURE GAUGE & VALVE	235A1953G001	1	16								N
#30	THREAD SEALANT	249A1067P001	AR	23								
#31	RING, BOX	157C4839P005	1	21								N
#32	WASHER,SST SPR LK .375 SST	N400P13	8	23								
#33	SCREW,MACH,PNH	N153P25012	8	23								
#34	SET SCREW,SEMS LOCK	2#9A5#43P#10	8	23								N
#35	PIPE, THREADED, SCH 40	235A1954P004	1	23								N
#36	PENETRATION, ELECTRIC	163C19#2AC	X	CC								
#38	PENETRATION, ELECTRIC	2##B6173	X	16								
#39	BUSHING, RUBBER	175A1#46P##6	34	23								N
#40	CONNECTOR, RECP (ELECT)	159C4375P2#29S	34	23								B
#41	CAP, PROTECTIVE	175A1##3P##8	34	23								N
#42	TUBING SHRINKABLE	175A823#P##9	2#	23	FT							B
#43	BUSHING, RUBBER	175A1#46P#1#	12	23								N
#44	CONNECTOR, RECP (ELECT)	159C4375P261#P	12	23								B
#45	CAP, PROTECTIVE	175A1##3P#14	12	23								N
#46	TUBING SHRINKABLE	175A823#P#11	6	23	FT							N
#47	WIRE TERMINATION, RCPT	164C552#	X	PP								
#48	GREASE, SILICONE	175A8251P##3	AR	23								N

A PARTS LIST VIA THE TERMINAL IS ROUGHLY 6 TIMES AS EXPENSIVE AS
REQUESTING IT THROUGH PDEAS.

PARTS LIST NO ? 164C5446AC
SUFFIX NUMBER ? G##1

TITLE:WIRE MODULE

PL REV: 6 DOC REV: 4 CMPL-P:C CMPL-D:C

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C	S P	A C	R C	C D
			ASM	X							
##1	ASSEMBLY	163C18##G##3		1	16						
##2	MODULE	159C4343P##4		238	23						
##3	CONTACT (PIN & SOCKET)	175A823#P##5		AR	23				N		
##7	TUBING SHRINKABLE	27A8185G##1		AR	16						
#12	CASTING RESIN	262A7898P##6K##8		6##	23	FT					
#14	WIRE	2#9A41##P##2		6##	23	FT			N		
#16	WIRE	2#9A41##P##1		6##	23	FT			N		
#17	WIRE	2A7A6A4#P##2		2	21						
#20	SLEEVE	262A7#76P##1		AR	1F						
#23	SEALANT										

PARTS LIST NO ? 1A5#/C5446AC
SUFFIX NUMBER ? G##1

TITLE:WIRE MODULE

PL REV: 6 DOC REV: 4 CMPL-P:C CMPL-D:C

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C	S P	A C	R C	C D
			ASM	X							
##1	ASSEMBLY	163C1##8G##5		1	16						
##2	MODULE	262A7##2P##1		22#	23						
##3	CONTACT	175A823#P##5		AR	23				N		
##7	TUBING SHRINKABLE										

PARTS LIST NO ? 386X110@C
SUFFIX NUMBER ? C@14

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3 DOC REV: CMPL-P:C CMPL-D:

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
@@1	BOLT,EYE (SHOULDER)	175@9623P@@3		2	23			N		
@@2	NUT,HEX	N2@4@25C		2	23					
@@3	SHELL	163C1541P@@1		1	21					
@@4	WASHER,PLAIN #1@	N4@2P9C		32	23					
@@5	SCREW,MACH,PNH #1@-24X.38 LG	N8@P17@@6C		32	23					
@@6	SUPPORT-WIRE	157C47@2C@@2		3	16			N		
@@7	COVER - 12"	195B9746P@6475		2	21					
@@8	STUD, THREADED ROD	176A157@P@38		6	23			N		
@@9	WASHER,PLAIN	N4@2P45C		12	23					
@1@	WASHER,STL SPR LK FOR .5@ BOLT C STL	N4@5P15C		12	23					
@11	NUT,HEX .5@-13	N2@3P29C		12	23					
@12	HEADER RING-MACHINED	163C1889P@@2		1	21					
@13	O RING	2@9A4117P@29		7	23					
@14	O RING	2@9A4117P@3@		7	23			B		
@15	WIRE MODULE	164C5446ACG@@7		1	16					
@16	WIRE MODULE	164C5446ACG@@7		1	16					
@17	WIRE MODULE	164C5446ACG@@7		1	16					
@18	WIRE MODULE	164C5446ACG@@1		1	16					
@19	WIRE MODULE	164C5446ACG@@1		1	16					
@2@	PLUG, MODULE	199B6@99P@@1		1	21					
@21	WIRE MODULE	164C5446ACG@@7		1	16					
@22	RING	235A19@@P@@1		1	21			N		
@23	CLAMP	234A9@56P@@1		6	23			N		
@24	WASHER,PLAIN .938IDX1.5@@DX.1@THK SST	N4@@P19		12	23					
@25	BOLT, HEX HEAD	235A1@31P37@4@		12	23			N		
@26	LUBRICANT	2A2A7593P@@1		AR	22					
@27	WIRE,STAINLESS STEEL	175A8866P@@@		AR	21			N		
@28	WASHER	2A2A7@@5P@@1		6	21					
@29	PRESSURE GAUGE & VALVE	235A1353C@@1		1	16			N		
@3@	THREAD SEALANT	249A1@67P@@1		AR	23					
@31	RING, BOX	157C4939P@@5		1	21			N		
@32	WASHER,SST SPR LK .375 SST	N4@6P13		8	23					
@33	SCREW,MACH,PNH	N153P25@1Z		8	23					
@34	SET SCREW,SELF LOCK	2@9A5043P@1@		9	23			N		
@35	PIPE, THREADED, SCH 4@	235A1254P@@4		1	22			N		
@36	PENETRATION, ELECTRIC	163C179@AC		X	CC					
@37	PENETRATION, ELECTRIC	2@4B6173		X	16					
@39	BUSHING, RUBBER	175A1@4AP@@6		37	23			N		
@4@	CONNECTOR, RECP (ELECT)	159C4375P2@L99		37	23			B		
@41	CAP, PROTECTIVE	175A1@@BP@@9		37	23			N		
@42	TUBING SHRINKABLE	175A952@P@@7		2@	22	FT		B		
@43	BUSHING, RUBBER	175A1@47P1@		14	23			N		
@44	CONNECTOR, RECP (ELECT)	159C4375P4107		14	23			L		
@45	CAP, PROTECTIVE	175A1@@3P@14		14	23			N		
@46	TUBING SHRINKABLE	175A952@P@11		6	23	FT		N		
@47	WIRE TERMINATION, BUTT	164C552@		X	BE					
		175A9551P@@3		AR	23			N		

REQUESTING IT TH

PARTS LIST NO ? 28AX1100C
SUFFIX NUMBER ? 0015

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3 DOC REV: CMPL-P:C CMPL-D:

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
001	BOLT,EYE (SHOULDER)	175A9A23P003		2 23				N		
002	NUT,HEX	N203P25C		2 23						
003	SHELL	163C1541P001		1 21						
004	WASHER,PLAIN #10	N402P9C		32 23						
005	SCREW,MACH,PNH #10-24X.38 LG	N802P17006C		32 23						
006	SUPPORT-WIRE	157C4702G002		3 16				N		
007	COVER - 12"	195B9746P06475		2 21						
008	STUD, THREADED ROD	176A1570P038		6 23				N		
009	WASHER,PLAIN	N402P45C		12 23						
010	WASHER,STL SPR LK FOR .50 BOLT C STL	N405P15C		12 23						
011	NUT,HEX .50-13	N203P29C		12 23						
012	HEADER RING-MACHINED	163C1889P001		1 21						
013	O RING	209A4117P029		7 23						
014	O RING	209A4117P038		7 23				B		
015	WIRE MODULE	164C5446ACG007		1 16						
016	WIRE MODULE	164C5446ACG007		1 16						
017	WIRE MODULE	164C5446ACG007		1 16						
018	PLUG, MODULE	198B6099P001		1 21						
019	WIRE MODULE	164C5446ACG001		1 16						
020	WIRE MODULE	164C5446ACG001		1 16						
021	WIRE MODULE	164C5446ACG007		1 16						
022	RING	235A1900P001		1 21				N		
023	CLAMP	234A9056P001		6 23				N		
024	WASHER,PLAIN .938IDX1.500DX.10THK SST	N400P19		12 23						
025	BOLT, HEX HEAD	235A1031P37040		12 23				N		
026	LUBRICANT	262A7893P001		AR 21						
027	WIRE,STAINLESS STEEL	175A9866P008		AR 21				N		
028	WASHER	262A7005P001		6 21						
029	PRESSURE GAUGE & VALVE	174B9475G001		1 16				N		
030	THREAD SEALANT	249A1067P001		AR 23						
031	RING, BOX	157C4839P005		1 21				N		
032	WASHER,SST SPR LK .375 SST	N406P13		8 23						
033	SCREW,MACH,PNH	N153P25012		8 23				N		
034	SET SCREW,SELF LOCK	209A5043P010		8 23						
036	PENETRATION, ELECTRIC	163C1902AC		X CC						
037	PENETRATION, ELECTRIC	204BA172		X 16						
039	BUSHING, RUBBER	175A1046P006		32 23				N		
040	CONNECTOR, RECP (ELECT)	159L4275P2C29S		32 23				E		
041	CAP, PROTECTIVE	175A1043P005		32 23				N		
042	TUBING,SHRINKABLE	175A6230P002		20 23	FT			P		
043	BUSHING, RUBBER	175A1044P010		11 23				N		
044	CONNECTOR, RECP (ELECT)	159L4275P2610P		11 23				E		
045	CAP, PROTECTIVE	175A1042P014		11 23				N		
046	TUBING, SHRINKABLE	175A6230P011		6 23	FT			N		
047	WIRE TERMINATION, RCPT	1A4L5529		X PP						
048	GREASE, SILICONE	175A6251P003		AR 23				N		

PARTS LIST NO ? 3B6X11@@C
SUFFIX NUMBER ? G@16

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3 DOC REV: CMPL-P:C CMPL-D:

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
@@1	BOLT,EYE (SHOULDER)	175A9623P@@3		2	23				N	
@@2	NUT,HEX	N2@3P25C		2	23					
@@3	SHELL	163C1541P@@1		1	21					
@@4	WASHER,PLAIN #1@	N4@2P9C		32	23					
@@5	SCREW,MACH,PNH #1@-24X.3@ LG	NB@P17@@6C		32	23					
@@6	SUPPORT-WIRE	157C47@2G@@2		3	16				N	
@@7	COVER - 12"	195B974AP@@6475		2	21					
@@8	STUD, THREADED ROD	176A157@F@38		6	23				N	
@@9	WASHER,PLAIN	N4@2P45C		12	23					
@1@	WASHER,STL SPR LK FOR .5@ BOLT C STL	N4@5P15C		12	23					
@11	NUT,HEX .5@-13	N2@3P29C		12	23					
@12	HEADER RING-MACHINED	163C1889P@@1		1	21					
@13	O RING	2@9A4117P@29		7	23					
@14	O RING	2@9A4117P@3@		7	22				B	
@15	WIRE MODULE	164C5446ACG@@7		1	16					
@16	WIRE MODULE	164C5446ACG@@7		1	16					
@17	WIRE MODULE	164C5446ACG@@7		1	16					
@18	PLUG, MODULE	198B6B99F@@1		1	21					
@19	WIRE MODULE	164C5446ACG@@1		1	16					
@2@	WIRE MODULE	164C5446ACG@@1		1	16					
@21	WIRE MODULE	164C5446ACG@@7		1	16					
@22	RING	235A19@@P@@1		1	21				N	
@23	CLAMP	234A9@56P@@1		6	23				N	
@24	WASHER,PLAIN .938IDX1.5@@DX.1@THK SST	N4@@P19		12	23					
@25	BOLT, HEX HEAD	235A1@31P37@4@		12	23				N	
@26	LUBRICANT	262A7B93P@@1		AR	22					
@27	WIRE,STAINLESS STEEL	175A89A6P@@9		AR	21				N	
@28	WASHER	262A7@@5P@@1		6	21					
@29	PRESSURE GAUGE & VALVE	174E9475G@@1		1	16				N	
@3@	THREAD SEALANT	249A1@67P@@1		AR	23					
@31	RING, BOX	157C4B39P@@5		1	21				N	
@32	WASHER,SST SPR LK .375 SST	N4@6P13		8	23					
@33	SCREW,MACH,PNH	N153P25@12		8	22					
@34	SET SCREW,SELF LOCK	2@9A5@43P@1@		8	23				N	
@36	PENETRATION, ELECTRIC	163L19@2AC		X	XX					
@37	PENETRATION, ELECTRIC	2@4EA172		X	1A					
@39	BUSHING, RUBBER	175A1@4AP@@6		24	22				N	
@4@	CONNECTOR, RCPT (ELECT)	159C4375P2A1@P		24	22				P	
@41	CAP, PROTECTIVE	175A1@@3P@@8		24	22				N	
@42	TUBING, SHRINKABLE	175AB23@P@@9		2@	23	FT			D	
@43	BUSHING, RUBBER	175A1@4AP1@		12	22				N	
@44	CONNECTOR, RCPT (ELECT)	159C4375P2A1@P		12	22				P	
@45	CAP, PROTECTIVE	175A1@@3P@14		12	22				N	
@46	TUBING, SHRINKABLE	175A5[illegible]P@11		6	23	FT			N	
@47	WIRE TERMINATION, BUTT	164L55[illegible]		X	XX					
@48	GREASE, SILICONE	175A[illegible]51P@@3		AR	22				N	

SUFFIX NUMBER ? C017

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3 DOC REV: CMPL-P:C CMPL-D:

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C C	S P C	A R C	C D
001	BOLT,EYE (SHOULDER)	175A9623P003		2	23				N	
002	NUT,HEX	NZ03P25C		2	23					
003	SHELL	163C1541P001		1	21					
004	WASHER,PLAIN #10	N402P9C		32	23					
005	SCREW,MACH,PNH #10-24X.38 LG	N00P17006C		32	23					
006	SUPPORT-WIRE	157C4702C002		3	16				N	
007	COVER - 12"	195B9746P06475		2	21					
008	STUD, THREADED ROD	176A157QP038		6	23				N	
009	WASHER,PLAIN	N402P45C		12	23					
010	WASHER,STL SPR LK FOR .50 BOLT C STL	N405P15C		12	23					
011	NUT,HEX .50-13	NZ03P29C		12	23					
012	HEADER RING-MACHINED	163C1889P001		1	21					
013	O RING	209A4117P029		7	23					
014	O RING	209A4117P030		7	23				B	
015	PLUG, MODULE	198B6099P001		1	21					
016	WIRE MODULE	164C5446ACG010		1	16					
017	PLUG, MODULE	198B6099P001		1	21					
018	WIRE MODULE	164C5446ACG002		1	16					
019	WIRE MODULE	164C5446ACG011		1	16					
020	WIRE MODULE	164C5446ACG010		1	16					
021	PLUG, MODULE	198B6099P001		1	21					
022	RING	235A1900P001		1	21				N	
023	CLAMP	2348905AP001		6	23				N	
024	WASHER,PLAIN .938IDX1.500DX.10THK SST	N400P19		12	23					
025	BOLT, HEX HEAD	235A1031P37040		12	23				N	
026	LUBRICANT	26ZA7893P001		AR	23					
027	WIRE,STAINLESS STEEL	175A8866P008		AR	21				N	
028	WASHER	26ZA7005P001		6	21					
029	PRESSURE GAUGE & VALVE	174B9475C001		1	16				N	
030	THREAD SEALANT	249A1067P001		AR	23					
031	RING, BUT	157C4939P005		1	21				N	
032	WASHER,SST SPR LK .375 SST	N406P12		8	23					
033	SCREW,MACH,PNH	N152P250312		8	23					
034	SET SCREW,SELF LOCK	209A5043P010		8	23				N	
036	PENETRATION, ELECTRIC	162L1902AC		1	16					
037	PENETRATION, ELECTRIC	204P6172		1	16					
040	GREASE, SILICONE	175A8251P003		AR	23				N	

A PARTS LIST VIA THE TERMINAL IS ROUGHLY 6 TIMES AS EXPENSIVE AS
REQUESTING IT THROUGH PDRAS. IF AN IMMEDIATE RESPONSE IS NOT REQUIRED,
PLEASE REQUEST VIA PDRAS. SEE EIS USERS GUIDE FOR FURTHER INFORMATION.

PARTS LIST NO ? 164C5446AC
SUFFIX NUMBER ? CW01

TITLE:WIRE MODULE PL REV: 6 DOC REV: 4 CMPL-P:C CMPL-D:C

							E C C	S P C	A R C	C D
001	WIRE,ELECTRICAL	164C5446P001		1	16					
002	CONNECTOR,PLUG	164C5446P002		1	16					
003	CONNECTOR,PLUG	164C5446P003		1	16					
004	CONNECTOR,PLUG	164C5446P004		1	16					
005	CONNECTOR,PLUG	164C5446P005		1	16					
006	CONNECTOR,PLUG	164C5446P006		1	16					
007	CONNECTOR,PLUG	164C5446P007		1	16					
008	CONNECTOR,PLUG	164C5446P008		1	16					
009	CONNECTOR,PLUG	164C5446P009		1	16					
010	CONNECTOR,PLUG	164C5446P010		1	16					
011	CONNECTOR,PLUG	164C5446P011		1	16					
012	CONNECTOR,PLUG	164C5446P012		1	16					
013	CONNECTOR,PLUG	164C5446P013		1	16					
014	CONNECTOR,PLUG	164C5446P014		1	16					
015	CONNECTOR,PLUG	164C5446P015		1	16					
016	CONNECTOR,PLUG	164C5446P016		1	16					
017	CONNECTOR,PLUG	164C5446P017		1	16					
018	CONNECTOR,PLUG	164C5446P018		1	16					
019	CONNECTOR,PLUG	164C5446P019		1	16					
020	CONNECTOR,PLUG	164C5446P020		1	16					
021	CONNECTOR,PLUG	164C5446P021		1	16					
022	CONNECTOR,PLUG	164C5446P022		1	16					
023	CONNECTOR,PLUG	164C5446P023		1	16					
024	CONNECTOR,PLUG	164C5446P024		1	16					
025	CONNECTOR,PLUG	164C5446P025		1	16					
026	CONNECTOR,PLUG	164C5446P026		1	16					
027	CONNECTOR,PLUG	164C5446P027		1	16					
028	CONNECTOR,PLUG	164C5446P028		1	16					
029	CONNECTOR,PLUG	164C5446P029		1	16					
030	CONNECTOR,PLUG	164C5446P030		1	16					
031	CONNECTOR,PLUG	164C5446P031		1	16					
032	CONNECTOR,PLUG	164C5446P032		1	16					
033	CONNECTOR,PLUG	164C5446P033		1	16					
034	CONNECTOR,PLUG	164C5446P034		1	16					
035	CONNECTOR,PLUG	164C5446P035		1	16					
036	CONNECTOR,PLUG	164C5446P036		1	16					
037	CONNECTOR,PLUG	164C5446P037		1	16					
038	CONNECTOR,PLUG	164C5446P038		1	16					
039	CONNECTOR,PLUG	164C5446P039		1	16					
040	CONNECTOR,PLUG	164C5446P040		1	16					
041	CONNECTOR,PLUG	164C5446P041		1	16					
042	CONNECTOR,PLUG	164C5446P042		1	16					
043	CONNECTOR,PLUG	164C5446P043		1	16					
044	CONNECTOR,PLUG	164C5446P044		1	16					
045	CONNECTOR,PLUG	164C5446P045		1	16					
046	CONNECTOR,PLUG	164C5446P046		1	16					
047	CONNECTOR,PLUG	164C5446P047		1	16					
048	CONNECTOR,PLUG	164C5446P048		1	16					
049	CONNECTOR,PLUG	164C5446P049		1	16					
050	CONNECTOR,PLUG	164C5446P050		1	16					
051	CONNECTOR,PLUG	164C5446P051		1	16					
052	CONNECTOR,PLUG	164C5446P052		1	16					
053	CONNECTOR,PLUG	164C5446P053		1	16					
054	CONNECTOR,PLUG	164C5446P054		1	16					
055	CONNECTOR,PLUG	164C5446P055		1	16					
056	CONNECTOR,PLUG	164C5446P056		1	16					
057	CONNECTOR,PLUG	164C5446P057		1	16					
058	CONNECTOR,PLUG	164C5446P058		1	16					
059	CONNECTOR,PLUG	164C5446P059		1	16					
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063	CONNECTOR,PLUG	164C5446P063		1	16					
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065	CONNECTOR,PLUG	164C5446P065		1	16					
066	CONNECTOR,PLUG	164C5446P066		1	16					
067	CONNECTOR,PLUG	164C5446P067		1	16					
068	CONNECTOR,PLUG	164C5446P068		1	16					
069	CONNECTOR,PLUG	164C5446P069		1	16					
070	CONNECTOR,PLUG	164C5446P070		1	16					
071	CONNECTOR,PLUG	164C5446P071		1	16					
072	CONNECTOR,PLUG	164C5446P072		1	16					
073	CONNECTOR,PLUG	164C5446P073		1	16					
074	CONNECTOR,PLUG	164C5446P074		1	16					
075	CONNECTOR,PLUG	164C5446P075		1	16					
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077	CONNECTOR,PLUG	164C5446P077		1	16					
078	CONNECTOR,PLUG	164C5446P078		1	16					
079	CONNECTOR,PLUG	164C5446P079		1	16					
080	CONNECTOR,PLUG	164C5446P080		1	16					
081	CONNECTOR,PLUG	164C5446P081		1	16					
082	CONNECTOR,PLUG	164C5446P082		1	16					
083	CONNECTOR,PLUG	164C5446P083		1	16					
084	CONNECTOR,PLUG	164C5446P084		1	16					
085	CONNECTOR,PLUG	164C5446P085		1	16					
086	CONNECTOR,PLUG	164C5446P086		1	16					
087	CONNECTOR,PLUG	164C5446P087		1	16					
088	CONNECTOR,PLUG	164C5446P088		1	16					
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090	CONNECTOR,PLUG	164C5446P090		1	16					
091	CONNECTOR,PLUG	164C5446P091		1	16					
092	CONNECTOR,PLUG	164C5446P092		1	16					
093	CONNECTOR,PLUG	164C5446P093		1	16					
094	CONNECTOR,PLUG	164C5446P094		1	16					
095	CONNECTOR,PLUG	164C5446P095		1	16					
096	CONNECTOR,PLUG	164C5446P096		1	16					
097	CONNECTOR,PLUG	164C5446P097		1	16					
098	CONNECTOR,PLUG	164C5446P098		1	16					
099	CONNECTOR,PLUG	164C5446P099		1	16					
100	CONNECTOR,PLUG	164C5446P100		1	16					

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C	S C	A P	R C	C D
#03	CONTACT (PIN & SOCKET)	159C4343P004		238	23						
#07	TUBING SHRINKABLE	175A823#P005		AR	23				N		
#12	CASTING RESIN	272A8185G#01		AR	16						
#14	WIRE	262A7898P#06K#08		600	23	FT					
#15	WIRE	2#9A418#P#03		600	23	FT			N		
#17	WIRE	2#9A418#P#01		600	23	FT			N		
#20	SLEEVE	262A684#P#02		2	21						
#23	SEALANT	262A7076P#01		AR	1F						

PARTS LIST NO ? 164C6#5446AC
SUFFIX NUMBER ? G#10

TITLE:WIRE MODULE

PL REV: 6 DOC REV: 4 CMPL-P:C CMPL-D:C

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C	S C	A P	R C	C D
			ASM	X							
#01	ASSEMBLY	163C1888G#05		1	16						
#02	MODULE	262A7#03P#01		238	23						
#03	CONTACT	175A823#P#05		AR	23				N		
#07	TUBING SHRINKABLE	175A823#P#07		AR	23				B		
#09	TUBING SHRINKABLE	272A8185G#01		AR	16						
#12	CASTING RESIN	262A7898P#06K#08		320	23	FT					
#14	WIRE	262A684#P#02		2	21						
#20	SLEEVE	176A15#6P#07		AR	23				N		
#21	TUBING SHRINKABLE	175A823#P#04		AR	23				B		
#22	TUBING SHRINKABLE	262A7#76P#01		AR	1F						
#23	SEALANT										

PARTS LIST NO ? 164C5446AC
SUFFIX NUMBER ? G#11

TITLE:WIRE MODULE

PL REV: 6 DOC REV: 4 CMPL-P:C CMPL-D:C

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C	S C	A P	R C	C D
			ASM	X							
#01	ASSEMBLY	163C1888G#02		1	16						
#02	MODULE	159C4343P004		238	23						
#03	CONTACT (PIN & SOCKET)	175A823#P#05		AR	23				N		
#07	TUBING SHRINKABLE	272A8185G#01		AR	16						
#12	CASTING RESIN	262A7898P#06K#08		12#0	23	FT					
#14	WIRE	2#9A418#P#03		600	23	FT			N		
#15	WIRE	262A684#P#01		2	21						
#20	SLEEVE	262A7076P#01		AR	1F						
#23	SEALANT										

PARTS LIST NO ? 286X11#0C
SUFFIX NUMBER ? G#13

TITLE:ELEC PENETRATION-LOW VOLT PL REV: 3 DOC REV: CMPL-P:C CMPL-D:

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SRC	E C	S C	A P	R C	C D
#01	BOLT-EYE (SHOULDER)	175A#42C#003		2	23				N		
#02	NUT-HEX	N.#.#.5C		4	23						
#03	SHELL	163C1541P#01		1	21						
#04	WASHER-PLAIN	N40.P.C		32	23						
	#10			22	23						

#07	COVER - 12"	195B9746P#6475	2	21	N
#08	STUD, THREADED ROD	176A157#P#38	6	23	
#09	WASHER,PLAIN	N402P45C	12	23	
#10	WASHER,STL SPR LK FOR .50 BOLT C STL	N405P15C	12	23	
#11	NUT,HEX .50-13	N203P29C	12	23	
#12	HEADER RING-MACHINED	163C1889P#01	1	21	
#13	O RING	209A4117P029	7	23	
#14	O RING	209A4117P038	7	23	B
#15	PLUG, MODULE	198B6#99P#01	1	21	
#16	WIRE MODULE	164C5446ACG#11	1	16	
#17	WIRE MODULE	164C5446ACG#02	1	16	
#18	PLUG, MODULE	198B6#99P#01	1	21	
#19	WIRE MODULE	164C5446ACG#10	1	16	
#20	PLUG, MODULE	198B6#99P#01	1	21	
#21	WIRE MODULE	164C5446ACG#10	1	16	
#22	RING	235A19##P#01	1	21	N
#23	CLAMP	234A9#56P#01	6	23	N
#24	WASHER,PLAIN .938IDX1.500DX.10THK SST	N4##P19	12	23	
#25	BOLT, HEX HEAD	235A1#31P37#4#	12	23	N
#26	LUBRICANT	262A7893P#01	AR	23	
#27	WIRE,STAINLESS STEEL	175A9866P#08	AR	21	N
#28	WASHER	262A7##5P#01	6	21	
#29	PRESSURE GAUGE & VALVE	174B9475C#01	1	16	N
#30	THREAD SEALANT	249A1#67P#01	AR	23	
#31	RING, BOX	157C4639P#05	1	21	N
#32	WASHER,SST SPR LK .375 SST	N40#P13	8	23	
#33	SCREW,MACH,PNH	N153P25#12	8	23	
#34	SET SCREW,SELF LOCK	209A5#43P#10	8	23	N
#36	PENETRATION, ELECTRIC	163C19#2AC	X	CC	
#37	PENETRATION, ELECTRIC	209A172	X	16	
#40	GREASE, SILICONE	175A8251P#03	AR	23	N

A PARTS LIST VIA THE TERMINAL IS ROUGHLY 6 TIMES AS EXPENSIVE AS
REQUESTING IT THROUGH PDEAS. IF AN IMMEDIATE RESPONSE IS NOT REQUIRED,
PLEASE REQUEST VIA PDEAS. SEE EIS USER'S GUIDE FOR FURTHER INFORMATION.

PARTS LIST NO ?

*** end of report ***

A*S4J3 HIS TIMESHARING ON 11/09/82 AT 8.231 CHANNEL 417: ETS

USER ID --ES04001710
PASSWORD--
[redacted]
#USERS=003 TSS=345K %MEM-USED=36 %IO=001% #ERR=3

23.53700 ***NEW SOFTWARE RELEASE JS3 HAS BEEN IMPLEMENTED.*

**23.64800 ***PLEASE ADVISE CUSTOMER SERVICE REGARDING ANY IRREGULARITIES/PROBLEMS.

PROGRAM NAME?

PROGRAM NAME? PL

EIS FILE DATED - 11/09/82

EXPLANATION OF REPORT HEADINGS ?

PARTS LIST NO ? 1630138D
SUFFIX NUMBER ? 0001

TITLE:MODULE

PL REV: 6 DOC REV: 5 CHFL-PIC CHFL-DIC

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SEC	C	I	F	C	E
001	HOUSING, ELECTRICAL	1258970[P031		1	EA						
002	SCREW,MACH,FNH	NI[redacted]2		1	EA						
004	NUT,MSCR,HEX #2-56 UNC-2B SST	N22[redacted]5		1	EA						
005	SEALANT	2[redacted]001		AR	EA						
006	ROD	2[redacted]003		4	EA						
007	ROD	2[redacted]003		2	EA						
008	ROD	2[redacted]004		2	EA						
011	SPACER BOARD	1[redacted]013		4	EA						
012	SPACER BOARD	1[redacted]013		2	EA						
013	GLASS FIBER, CHOPPED	1[redacted]001		AR	EA						

PARTS LIST NO ? [redacted]
SUFFIX NUMBER ? [redacted]

TITLE:MODULE

PL REV: [redacted] DOC REV: [redacted] CHFL-PIC [redacted] CHFL-DIC [redacted]

ITEM	NAME	IDENTIFICATION	STAT	QTY	UM	SEC	C	I	F	C	E

```
012  POTTING BOARD              163C1720P010          6 21
011  GLASS FIBER, CHOPPED       175A8122P001         AR 21          N

PARTS LIST NO ? 1648C1686
SUFFIX NUMBER ? 0006

TITLE:MODULE                    PL REV: 6  DOC REV: 5  CMPL-F:C  CMPL-D:C

                                                                 E C S A R C
ITEM  NAME                      IDENTIFICATION  STAT  QTY   UM SEC C C F C D

001  HOUSING, ELECTRICAL        1958B702P001           1 21
002  SCREW,MACH,PNH             N15CF5022              1 23
004  NUT,MSCR,HEX               NC26F5                 1 23
     #2-56 UNC-2B SST
005  SEALANT                    Z62A7075P001          AR 21
006  ROD                        Z62A6853P002          45 21
011  POTTING BOARD              163C1720P008           2 21
012  POTTING BOARD              163C1720P007           6 21
013  GLASS FIBER, CHOPPED       175A8122P001          AR 1F          N

PARTS LIST NO ? 1634C1888
ID NO. NOT IN FILE

PARTS LIST NO ? GOOG
ID NO. NOT IN FILE

PARTS LIST NO ?

*** end of report ***

PROGRAM NAME? BYE

**cost: $   0.84 to date: $82783.91* 83%
**on at  8.891 - off at  8.938 on  11/09/82
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LINE TERMINATED - CR