

SOUTH CAROLINA ELECTRIC & GAS COMPANY

POST OFFICE BOX 764

COLUMBIA, SOUTH CAROLINA 29218

August 7, 1981

T. C. NICHOLS, JR.
VICE PRESIDENT AND GROUP EXECUTIVE
NUCLEAR OPERATIONS



Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: Virgil C. Summer Nuclear Station
Docket No. 50/395
Seismic Qualification of Equipment
SER Confirmatory Issue 1.7.21

Dear Mr. Denton:

SER Confirmatory Issue 1.7.21 listed several items to be submitted to the NRC involving seismic qualification of equipment. This letter provides a portion of that information and an update on our schedule for submitting the remainder.

Seismic Qualification Review Team Summary Forms

1. Filter Plenums - August 31, 1981
2. Radiation Monitoring Panels - August 31, 1981
3. Hydrogen Analyzer Panels - Submitted by this letter.
4. Post Accident Monitoring Indicators - September 30, 1980
5. Core Subcooling Monitors - September 30, 1981
6. Critical Systems Lead Monitoring Equipment - September 30, 1981

Seismic Qualification Reports

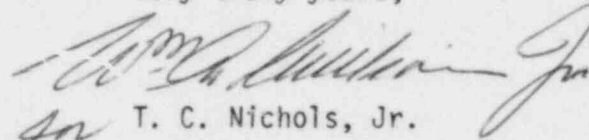
1. Hydrogen Analyzer Panels - Submitted by this letter.
2. Radiation Monitoring Panels - August 31, 1981
3. Post Accident Monitoring Indicators - September 30, 1981

If any of these dates change for any reason, we will let you know immediately.

Boo
5/1

Mr. H. R. Denton
August 4, 1981
Page Two

Very truly yours,


T. C. Nichols, Jr.

RBC:TCN:glb

cc: V. C. Summer
G. H. Fischer
T. C. Nichols, Jr.
H. N. Cyrus
J. C. Ruoff
D. A. Nauman
W. A. Williams, Jr.
R. B. Clary
O. S. Bradham
A. R. Koon
M. N. Browne
B. A. Bursey
J. L. Skolds
J. B. Knotts, Jr.
M. Reich
J. B. Cookinham
F. K. Mangan
NPCF
File

Qualification Summary of Equipment

I. Plant Name: Virgil C. Summer
Nuclear Plant Type:

1. Utility: SCE&G PWR X

2. NSSS: Westinghouse 3. A/E: GAI BWR

II. Component Name Hydrogen Analyzer and Analyzer Remote Control Panel

1. Scope: ☐ NSSS ☒ BOP
2. Model Number: K-III Quantity: 2 - Analyzers
2 - Remote Control
3. Vendor: Comsip, Inc.
4. If the component is a cabinet or panel, name and model No. of the devices included: See Attached "Bill of Materials", document
#05450, rev. 1.
5. Physical Description a. Appearance Free Standing Panels
Analyzer - 30"W x 30"D x 72"H
b. Dimensions Remote Control - 24"W x 30"D x 60"H
Analyzer - 1,470 lbs
c. Weight Remote Control - 96.4 lbs
6. Location: Building: XPN-7215A - Aux. Bldg. XPN-7258A - Aux. Bldg.
XPN-7215B - Fuel Bldg. XPN-7258B - Aux. Bldg.
Elevation: All - 463'-0"
7. Field Mounting Conditions ☒ Bolt (No. 6, Size 5/8") Dia. - XPN7215A
☐ Weld (Length) XPN7215B
☒ Bolt (No. 8, Size 1/4" Dia.) - XPN7258A
XPN7258B
8. Natural Frequencies in Each Direction (Side/Side, Front/Back, Vertical)
S/S: 29.6 Hz F/B: 29.6 Hz V: 29.6 Hz
9. a. Functional Description: Analyze hydrogen concentration of reactor
building atmosphere post-accident.
b. Is the equipment required for ☐ Hot Standby ☐ Cold Shutdown
☐ Both None
10. Pertinent Reference Design Specifications: SP-702

III. Is Equipment Available for Inspection in the Plant: ☒ Yes ☐ No

IV. Equipment Qualification Method: Test: _____

Analysis: _____

Combination of Test and Analysis: Yes
Engineering Analysis and Test Co., Inc.

Test and/or Analysis by 1035-1, 1035-2, 1035-5 (Rev. 1)
(name of Company or Laboratory & Report No.)

V. Vibration Input:

1. Loads considered: 1. ☒ Seismic only 2. ☐ Hydrodynamic only 3. ☐ Explosive only
4. ☐ Other (Specify) _____ 5. ☐ Combination of _____

6. Method of combining RRS: ☒ Absolute Sum ☐ SRSS ☐ _____
(other, specify)

2. Required Response Spectra (attach the graphs): _____

3. Required Acceleration in Each Direction:

S/S = .501 g F/B = .501 g V = .501 g

VI. If Qualification by Test, then Complete:

1. ☐ Single Frequency ☒ Multi-Frequency: ☒ random ☐ sine beat
2. ☐ Single Axis ☒ Multi-Axis ☐ _____

3. No. of Qualification Tests: OBE 5 SSE 1 Other _____
(specify)

4. Frequency Range: .35 Hz to 35 Hz

5. TRS enveloping RRS using Multi-Frequency Test ☒ Yes (Plot TRS on RRS graphs)
☐ No

6. Input g-level Test at S/S = 2 g's ZPA F/B = 2 g's ZPA V = 2 g's ZPA

7. Laboratory Mounting: Normal mounting attachments

1. ☐ Bolt (No. _____, Size _____) ☐ Weld (Length _____) ☐ _____

8. Functional operability verified: ☒ Yes ☐ No ☐ Not Applicable

9. Test Results including modifications made: The test demonstrates the adequacy of the H2 Analyzer to operate before, during, and after the application of the R.R.S.

10. Other tests performed (such as fragility test, including results): _____

Pump motor tested in accordance with Reliance Electric Company Report NUC-9 dated July 1, 1978. (See SQRT form for Reliance Fan Motors, PO 10222).

VII. If Qualification by Analysis or by the Combination of Test and Analysis, then

Complete: For Rack and Local Panel

- [illegible]

A. Identification—Location		Governing Load or Response Combination	Seismic Stress	Total Stress	Stress Allowab
Rack	Mounting Bolt	tensile	2966#/bolt	2966#/bolt	4520#
		shear	478#/bolt	478#/bolt	3070#
Local Panel	Mounting Bolt	tensile	65#/bolt	65#/bolt	634#
		shear	26.3#/bolt	26.3#/bolt	490#

B.	Max. Deflection	Location
1	0.000	0.000
2	0.000	0.000
3	0.000	0.000
4	0.000	0.000
5	0.000	0.000
6	0.000	0.000
7	0.000	0.000
8	0.000	0.000
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10	0.000	0.000
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92	0.000	0.000
93	0.000	0.000
94	0.000	0.000
95	0.000	0.000
96	0.000	0.000
97	0.000	0.000
98	0.000	0.000
99	0.000	0.000
100	0.000	0.000

Not available

Effect Upon Functional Operability

M. C. SUMMER UNIT #1
RESPONSE SPECTRUM ENVELOPE
FOR OBE

AUXILIARY BUILDING
ELEV. 463'-0" X - QUAKE

FIGURE 56X
REV. 3 MAY 15, 1975

----- ACTUAL BANDWIDTH

ACCELERATION (g)

generic TEST R.A.S.
1% DAMPING

0.005 EQUIPMENT DAMPING

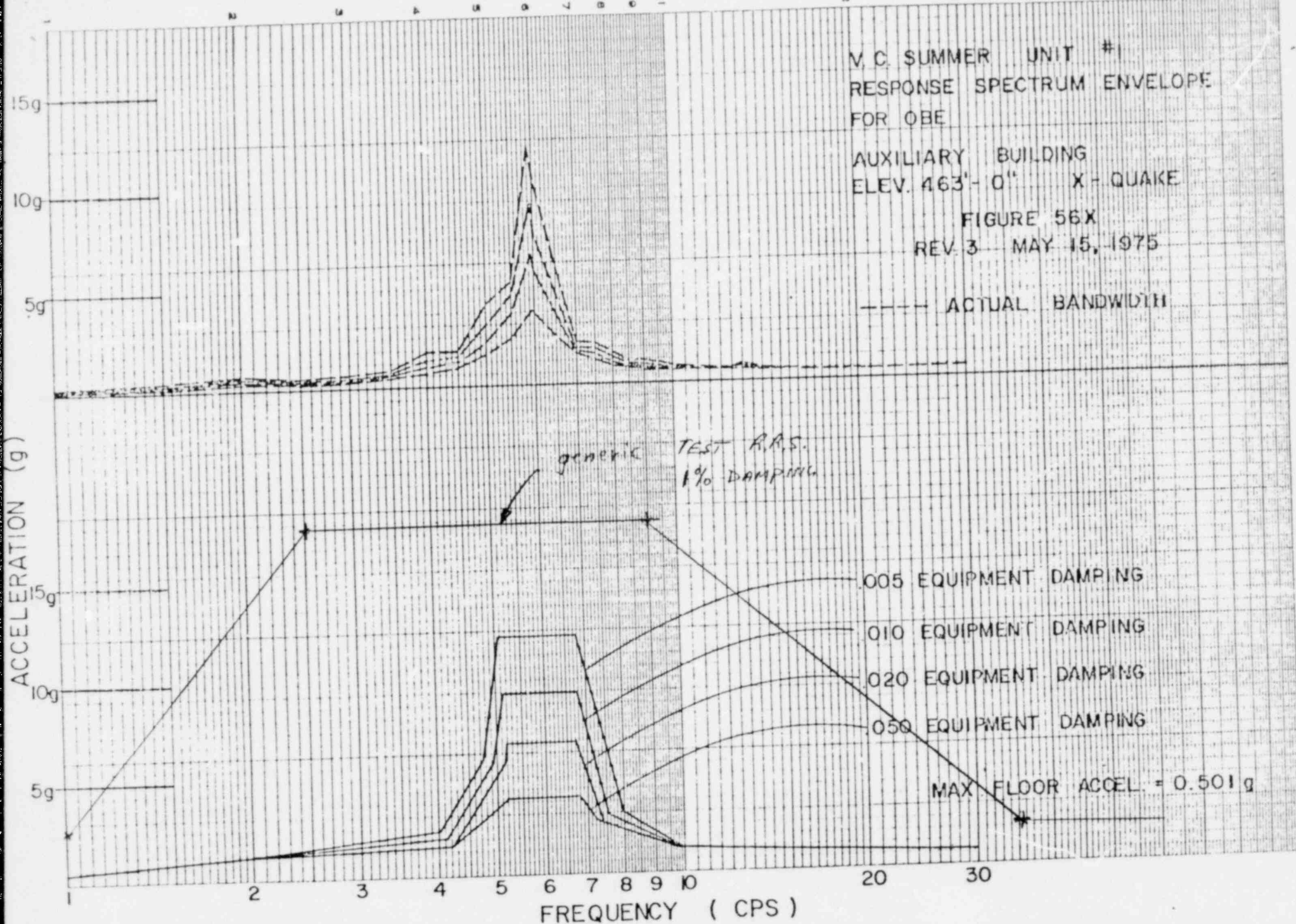
0.010 EQUIPMENT DAMPING

0.020 EQUIPMENT DAMPING

0.050 EQUIPMENT DAMPING

MAX FLOOR ACCEL. = 0.501 g

FREQUENCY (CPS)



COMSIP, INC.
WHITTIER, CALIFORNIA

80054

BILL OF MATERIALS

DOCUMENT NUMBER 05450
REVISION 1, MAY 7, 1981

POST-ACCIDENT ANALYZER SYSTEM
VCS NUCLEAR STATION
SOUTH CAROLINA ELECTRIC AND GAS COMPANY
PURCHASE ORDER NUMBER Q2625-84
CLASS 1E HYDROGEN ANALYZERS

PRODUCTION MANAGER Susan McVittie DATE 05-12-81
PROJECT MANAGER Bill Rohmeyer, Jr. DATE 5-12-81
QUALITY ASSURANCE William Smith, Jr. DATE 5-12-81

LIST OF REVISIONS

REVISIONS	DESCRIPTION	PROD. MGR.	PROJ. MGR.	Q.A.
1	"As Built"	<i>DM</i>	<i>SL</i>	<i>K2</i>

DWG. NO. 05000
FOR
K-III POST-LOCA
HYDROGEN MONITORING SYSTEM

PAGE 3 8

REV.	DATE	BY	DCS	ENG.	PROD.

ITEM NUMBER	QTY. PER SYSTEM	EQUIPMENT DESCRIPTION	MATERIAL CERTIFICATE REQUIRED:
1	2	API, mdl. no. 7045-N5-4702-0000, Indicating meter. Range: 0-200 μ A, blank scale, (Comsip, Inc. fabricates the $\frac{3}{4}$ H ₂ scale).	
2	2	ASCO, mdl. no. THT-8262C7N, 2-way solenoid valve. Normally closed, $\frac{1}{4}$ " NPT, 120VAC., 60Hz. (Reagent-Calibration)	<u>Body:</u> GR.303SS <u>Seals:</u> Buna "N" <u>Insulation:</u> Class II
3	1	ASCO, mdl. no. THT-8262A138N, 2-way solenoid valve. Normally open, $\frac{1}{4}$ " NPT, 120VAC., 60Hz. (Reagent gas pressure relief)	<u>Body:</u> GR.303SS <u>Seals:</u> Ethylene Propylene <u>Insulation:</u> Class II
4	1	Brooks, mdl. no. 1350-VR-2-15D, Flowmeter. Scale; 196A, Tube; 0-65mm., Range; 20-250 ccm (air), (Analyzer bypass)	<u>Seals:</u> Viton <u>Float:</u> GR.316SS <u>Fittings:</u> GR.316SS
5	2	Cinch-Jones, mdl. no.'s TS-6-141 and TS-12-141, 6 point and 12 point terminal strips, respectively.	
6	1	Comsip, Inc. mdl. no. 11719, Moisture Separator. (Comsip, Inc. modifies a Armstrong mdl. no. 11AV for this service).	<u>Body:</u> ASTM-A240, GR.304 <u>Fittings:</u> ASTM-A479, GR.304

DWG. NO. 05020
FOR
K-III POST-LOCA
HYDROGEN MONITORING SYSTEM

PAGE 4. 3

REV.	DATE	BY	DCS	ENG.	PROD.	Q.

ITEM NUMBER	QTY. PER SYSTEM	EQUIPMENT DESCRIPTION	MATERIAL CERTIFICATE REQUIRED:
7	1	Comsip, Inc. mdl. no. 11706, Sample Pump-Motor Assembly. Reliance motor spec's; 1hp., 460VAC, 60Hz., 3Ø, and 1.7 AMP	<u>Motor:</u> Certified to IEEE-34 (74) <u>Pumpheads:</u> ASTM-A351, GR.31 <u>Diaphragms:</u> Nylon reinforce
8	1	Comsip, Inc. mdl. no. 11749, Air Cooled Heat Exchanger.	<u>Tubing:</u> ASME-SA213, GR.316 <u>Fittings:</u> ASTM-A479, GR.316
9	1	Comsip, Inc. mdl. no. 11750, Sample Hot Box Assembly.	
10	1	Comsip, Inc. mdl. 37009, Local Analyzer Meter Trim Assembly. (Comsip, Inc. fabricates this trim assembly to convert the 0-1VDC analyzer output to 0-200 µA, for meter input.	
11	1	Comsip, Inc. mdl. no. 11727 (R ₁), Downstream pressure regulator. Set at 14.7 psia, 1" NPT. (Comsip, Inc. modifies a Conoflow mdl. no. H21XT-XXXX for this service.)	<u>Body:</u> ASTM-A351, GR.316 <u>Diaphragm:</u> GR.301SS
12	1	Comsip, Inc. mdl. no. 11728 (R ₂), Downstream pressure regulator. Set at -11 to -13in. Hg, 1" NPT. (Comsip, Inc. modifies a Conoflow mdl. no. H21XT-XXXX for this service).	<u>Body:</u> ASTM-A351, GR. 316 <u>Diaphragm:</u> GR.301SS

DWG. NO. 0543
FOR
K-III POST-LOCA
HYDROGEN MONITORING SYSTEM

PAGE 5 8

REV.	DATE	BY	DCS	ENG.	PROD.

ITEM NUMBER	QTY. PER SYSTEM	EQUIPMENT DESCRIPTION	MATERIAL CERTIFICATE REQUIRED:
13	1	Comsip, Inc. mdl. no. 11729 (R ₃), Differential pressure regulator and Fixed Orifice. Regulator set at 3 psig, 1/4" NPT. (Comsip, Inc. modifies a Conoflow mdl. no. H21XT-XXXX for this service). Fixed Orifice flow; 180 cc/min at 3 psid.	Body: ASTM-A351, GR.316 Diaphragm: GR.301SS F.O. Assembly: GR.316SS
14	2	Conoflow, mdl. no. H21XT-XDXK/SSN, Differential Pressure Regulator. Set at 3 psig., 1/4" NPT.	Body: ASTM-A351, GR.316 Diaphragm: Neoprene rubber
15a 15b	1	Delphi Instruments, mdl. no. B5, Hydrogen analyzer, (Thermal conductivity type). Consisting of the analyzer cell (15A) and analyzer indicating transmitter (15b). Dual range; 0-10% and 0-20% including calibration potentiometers, 0-1VDC output. (with additional AGM module)	Tubing: ASTM-A213, GR.316 Cell Block: ASTM-A479, GR. AMP board: I.R.T. certs
16	25	General Electric, mdl. no. ET-16, Indicating lamps. 17 with red lens and 8 with amber lens. 115VAC, 60Hz.	
17	8	General Electric, mdl. no.'s CR2940-UB203F (2), CR2940-UB203D (1), CR2940-UB203G (1), CR2940-WA202C (4). 115VAC, 60 Hz. with 10 AMP continuous rating.	
18	10	General Electric, mdl. no. EB25-A12WC, Terminal Block. 600V, 30AMP continuous rating.	

FOR

K-III POST-LOCA

HYDROGEN MONITORING SYSTEM

REV.	DATE	BY	DCS	ENG.	PROD.	Q

ITEM NUMBER	QTY. PER SYSTEM	EQUIPMENT DESCRIPTION	MATERIAL CERTIFICATE REQUIRED:
19	1	General Electric, mdl. no. CR206B102, magnetic motor starter. 460VAC, 60Hz., 3Ø, 18AMP. continuous rating, 5Hp. (maximum).	
20	1	General Electric, mdl. no. CR2810A14AJ, Relay. 600V, 60Hz., 10AMP. continuous rating.	
21	2	Hoke, mdl. no. SS-4212F4Y, Bellows seal valve.	<u>Bellows and Plug:</u> GR.316SS <u>Body:</u> ASTM-A276, GR.316
22	1	I.T.E. - Gould, mdl. no. P1515 and PL-2S, Breaker and breaker box, respectively. 15 AMP rating.	
23	1	Marshalltown, mdl. no. 52B, Compound pressure indicator. Range; 30 In. Hg to 60psig.	<u>Bourdon Tube and Stem:</u> GR.316SS
24	1	Matheson, mdl. no. FM-1050-V1, Flowmeter. Inlet mounted high performance valve, size no. 1 glass tube, Float; no. 1 glass, Range; 0-60 ccm (air), direct reading tube, 1" tube compression fittings, (Reagent gas)	<u>End Blocks and Fittings:</u> GR.316SS <u>Seals:</u> Viton

DWG. NO. 05430
FOR
K-III POST-LOCA
HYDROGEN MONITORING SYSTEM

REV.	DATE	BY	DCS	ENG.	PROD.

ITEM NUMBER	QTY. PER SYSTEM	EQUIPMENT DESCRIPTION	MATERIAL CERTIFICATE REQUIRED:
25	1	Matheson, mdl. no. FM-1050-V1, Flowmeter. Drilled and tapped end blocks with plug, size no. 2 glass tube, Range; 0-270 ccm (air), direct reading tube, 1/4" tube compression fittings. (cell flow).	End Blocks, Float and Fittings: GR.316SS Seals: Viton
26	1	Matheson, mdl. no. FM-1050-V1, Flowmeter. Inlet mounted utility valve, size no. 2. glass tube, Range; 0-270 ccm (air), direct reading tube, 1/4" tube compression fittings, (calibration gas).	End Blocks, Float and Fittings: GR.316SS Seals: Viton
27	1	Matheson, mdl. no. FM-1050-1V, Flowmeter. Drilled and tapped end block with plug, size. no. 8 glass tube, Range; 5-50 SCFH (air), direct reading tube, 1/4" tube compression fittings, (Bypass flow).	End Blocks, Float and Fittings: GR.316SS Seals: Viton
28	3	Nupro, mdl. no. SS-4CA-3, Check valve. Adjustable range; 3 to 50 psig. (Comsip, Inc. modifies this check valve for this service).	Body and Components: ASTM A479, GR.316 "O" Ring: Viton
29	6	Potter and Brumfield, mdl. no.'s KRP-11AG and KRP-14AG, (5) DPDT and (1) 3PDT relays, respectively. 115VAC, and 5AMP. rating.	
30	2	Static "O" Ring, mdl. no. 4N3-K5-MX-C1A Pressure switch. Set at 20 psig decreasing, 1/4" NPT.	Pressure Part, Diaphragm and Fittings: GR.316SS "O" Ring: Viton

DWG. NO. 05450

FOR

K-III POST-LOCA

HYDROGEN MONITORING SYSTEM

REV.	DATE	BY	DCS	ENG.	PROD.

ITEM NUMBER	QTY. PER SYSTEM	EQUIPMENT DESCRIPTION	MATERIAL CERTIFICATE REQUIRED:
31	1	Static "O" Ring, mdl. no. 54N3-K411-MX-CLA Vacuum switch. Set at 0 psig, 1" NPT.	Pressuré Part and Fitting GR.316SS
32	1	Nupro, mdl. no. SS-4CA-50, Check Valve. Adjustable range: 50 to 150 psig. Set at 85 psig. (Comsip, Inc. modifies this check valve for this service.)	Body and Components: ASTM - A479, GR.316 "O" RING: Viton