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 CURTIS, N.W. Pennsylvania Power & Light Co.
 RECIPIENT NAME RECIPIENT AFFILIATION
 SCHWENCER, A. Licensing Branch 2

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SUBJECT: Forwards portions of GE report, "Seismic Qualification Reevaluation of Class IE Equipment, Susquehanna Steam Electric Station Units 1 & 2," addressing level switch dynamic qualification as referenced in SSER 3.

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Pennsylvania Power & Light Company

Two North Ninth Street • Allentown, PA 18101 • 215 / 770-5151

Norman W. Curtis
Vice President-Engineering & Construction-Nuclear
215/770-7501

JAN 10 1984

Director of Nuclear Reactor Regulation
Attention: Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
LEVEL SWITCH DYNAMIC QUALIFICATION
SSER 3, PARAGRAPH 3.10.2.2
ER 100450/100508 FILE 148-01
PLA-2036

Docket Nos. 50-387
50-388

Dear Mr. Schwencer:

Enclosed attachment contains the summary dynamic qualification report for part numbers E41-N014, E41-N015A, B, and E41-N018 referenced in SSER 3, paragraph 3.10.2.2.

The qualification of switch E41-N014 was achieved by reanalysis which lowered the required response g-level to within the qualification test g-levels. The qualification of switches E41-N015A, B and E41-N018 was achieved by an analysis of the circuitry design from which it was concluded that the 130 ms contact chatter measured at the test response level was acceptable for satisfying the required function of these devices.

Please contact us if you wish to discuss the information which is attached.

Very truly yours,

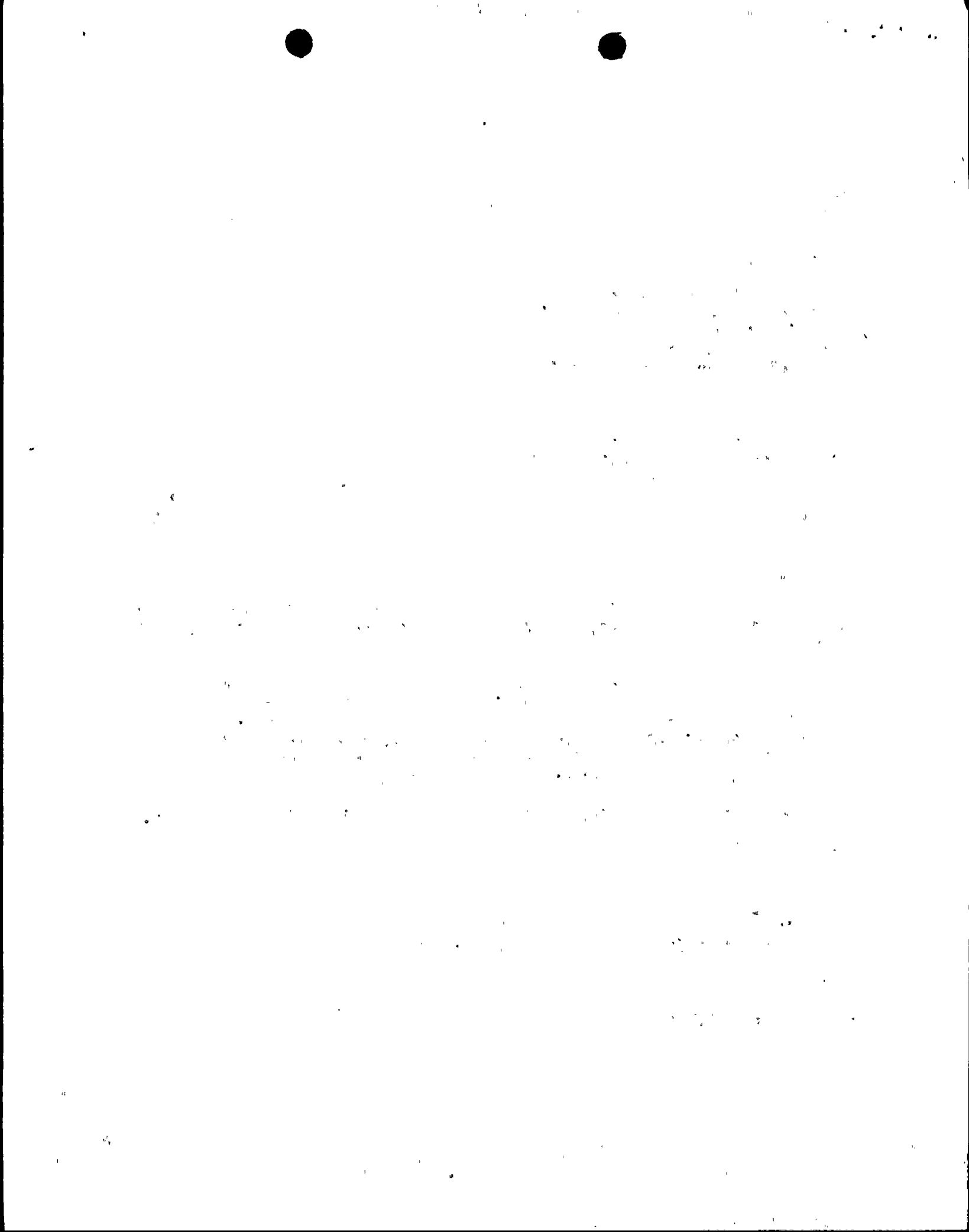
N. W. Curtis
Vice President-Engineering & Construction-Nuclear

Attachment

cc: R. Perch - USNRC
A. Lee - USNRC

8401160215 840110
PDR ADOCK 05000387
E PDR

Bos /
11



SUSQUEHANNA
STEAM ELECTRIC STATION
UNITS 1&2

SEISMIC QUALIFICATION REEVALUATION
CLASS 1E EQUIPMENT

DRF A00-1147, REV 5, VOL.3

COMPONENT NAME: SHIPPING GROUP PARTS
MPL OR EDL ITEM NO.: AS ATTACHED
MPL REFERENCE: B21-5110, B21-5120, B31-5110, C12-5120,
C41-5110, C51-5110, C72-5110, E11-5110,
E21-5110, E32-5110, E41-5110, E51-5110,
G33-5110

THE SEISMIC QUALIFICATION REPORT(S) IDENTIFIED HEREIN HAVE BEEN EVALUATED AND REQUALIFIED WHERE NECESSARY TO SHOW THAT THE ABOVE-MENTIONED COMPONENT IS CAPABLE OF MEETING THE NUCLEAR REGULATORY COMMISSION SEISMIC QUALIFICATION REVIEW TEAM (SQRT) REQUIREMENTS.

PREPARED BY: DIANE B. SHAMIS *Diane Shamis* 8-6-82

ORGANIZATION: GENERAL ELECTRIC CO., CONTROL ROOM DESIGN ENGINEERING

REVIEWED BY: R.W. HARDY *RW Hardy* DATE 5/2/83
SQRT PROGRAM MANAGER

APPROVED BY: N. LURIA, *N. Luria* DATE 8/6/82
QUALIFICATION ENGINEERING MGR.

GENERAL  ELECTRIC

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SECTION 3.0

TABLES

TABLE 1
DEVICES QUALIFIED TO IEEE 344-1975

<u>Shipping Group</u>	<u>MPL</u>	<u>PPD</u>
B21-5120	B21-N004 A-H, J-N,P,R,S B21-N010 A-D B21-N014 A-D B21-N016 A-D	133D9679 145C3224 145C3224 145C3224
B31-5110	B31-N014 C,D B31-N023 A,B B31-N024 A,B	163C1561 159C4520 163C1561
C12-5110	** C12-N013 A-F	159C4361
C41-5110	** C41-N003 C41-N004 * C41-R003	157C4629 163C1563 163C1184
C51-5110	C51-J004 A-E	136B1302
E11-5110	E11-N008 A,B E11-N009 A-D E11-N013 E11-N015 A,B E11-N018 E11-N021 A,B E11-N002 A,B ** E11-N023 A,B ** E11-N024 E11-N029 A-D * E11-N030 A-D	145C3156 145C3224 163C1560 163C1560 145C3011 145C3008 164C5359 159C4361 159C4361 145C3224 145C3224
E21-5110	E21-N003 A,B E21-N006 A,B E21-N007 A,B	163C1560 145C3008
E32-5110	E32-N006 B,F,K,P	163C1107
E41-5110	** E41-N002 ** E41-N003 → E41-N014 → ** E41-N015 A,B → ** E41-N018 * E41-N024 A,B * E41-N028 A,B * E41-N029 A,B * E41-N030 B E41-R002	159C4294 159C4294 159C4361 159C4294 159C4294 145C3224 145C3224 145C3224 145C3224 169C8974

Shipping Group

MPL

PPD

E51-5110

** E51-N010	159C4361
* E51-N011 A,B	145C3224
* E51-N021 A,B	145C3224
* E51-N022 A,B	145C3224
E51-N023 A,B	145C3224
* E51-N025 A-D	145C3224
* E51-N026 A-D	145C3224
E51-N027 A,C,D	145C3224
E51-R005	169C8974

G33-5110

G33-N016 A-F	145C3224
G33-N022 A,E,F	145C3224
* G33-N022 B-D	145C3224
G33-N023 A-F	145C3224
G33-N044 A	145C3008

* Device qualification level is greater than required accelerations, but less than 1.5 times required acceleration in at least one direction. Since the device does not have any resonant frequencies less than 60 Hz and cross-coupling would not be expected for a temperature element or level switch, the 1.5 factor is not required for qualification to IEEE 344-1975.

** Note above applies. Also, a 130 msec change of state occurred during tests used to establish qualification levels for these devices.

SECTION 5.1

DEVICES QUALIFIED BY TEST

SUSQUEHANNA
STEAM ELECTRIC STATION
UNITS 1&2

SEISMIC QUALIFICATION REEVALUATION
CLASS 1E EQUIPMENT

COMPONENT NAME: LEVEL SWITCH
MPL OR EDL ITEM NO.: PPD'S 159C4294 & 159C4361
MPL REFERENCE: SEE DEVICE LISTS FOR SHIPPING GROUP PARTS
LISTS MPL REFERENCE

THE SEISMIC QUALIFICATION REPORT(S) IDENTIFIED HEREIN HAVE BEEN EVALUATED
AND REQUALIFIED WHERE NECESSARY TO SHOW THAT THE ABOVE-MENTIONED
COMPONENT IS CAPABLE OF MEETING THE NUCLEAR REGULATORY COMMISSION
SEISMIC QUALIFICATION REVIEW TEAM (SQRT) REQUIREMENTS.

PREPARED BY: D.B. SHAMIS *D Shamis* DATE 5-11-82

ORGANIZATION: GENERAL ELECTRIC CO., CONTROL ROOM DESIGN ENGINEERING

REVIEWED BY: R.W. HARDY *RwHardy* DATE 8/6/82
SQRT PROGRAM MANAGER

APPROVED BY: N. LURIA, *N Luria* DATE 6/17/82
QUALIFICATION ENGINEERING MGR.

GENERAL  ELECTRIC



.....

Qualification Summary of Equipment

159C4294, 159C4361
(GE PPD Number)

- I. Plant Name: Susquehanna Type:
- 1. Utility: Pennsylvania Power & Light Co PWR _____
 - 2. NSSS: GE 3. A/E: Bechtel BWR- 4 Mk II

II. Component Name Level Switch

- 1. Scope: NSSS BOP
- 2. Model Number: GE PPD's 159C4294 & 159C4361 Quantity: 5 of 159C4294
11 of 159C4361
- 3. Vendor: Magnetrol
- 4. If the component is a cabinet or panel, name and model No. of the devices included: N/A
- 5. Physical Description a. Appearance See purchase part drawing (PPD)
b. Dimensions See PPD
c. Weight Approx. 28 LB
- 6. Location: Building: See Table 6 of G.E. DRF A00-1147 Rev. 2, Vol. 3.
Elevation: See Table 6 of G.E. DRF A00-1147 Rev. 2, Vol. 3.
- 7. Field Mounting Conditions Bolt (No. _____, Size _____)
 Weld (Length _____)
 Pipe Mounted
- 8. a. System in which located: See device list for system in which each device is located.
b. Functional Description: Instruments perform IE function in the system indicated on device lists
c. Is the equipment required for Hot Standby Cold Shutdown
See Table 6 of G.E. DRF A00-1147 Rev. 2, Vol. 3.
 Both Neither
- 9. Pertinent Reference Design Specifications: PPD # 159C4294, 159C4361

Note: 159C4294 and 159C4361 are qualified by similarity to Magnetrol model BCS 751.

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

IV. Equipment Qualification Method:

Test Analysis Combination of Test and Analysis

Qualification Report*: Wyle Rept. #43235-1, Rev. A

(No., Title and Date) Wyle# 43235-1, Rev. A, "Type Test Program on liquid level Controls", May 2, 1977

Company that Prepared Report: Ogden Technology Labs, Inc.

Company that Reviewed Report: Ogden Technology Labs, Inc.

V. Vibration Input:

- 1. Loads considered: a. Seismic only
- b. Hydrodynamic only
- c. Combination of (a) and (b)

2. Method of Combining RRS: Absolute Sum SRSS (other, specify)

3. Required Response Spectra (attach the graphs): N/A, Dominant Frequency & Required Accelerations are shown on device lists.

4. Damping Corresponding to RRS: OBE N/A SSE 2%

5. Required Acceleration in Each Direction: ZPA Other At location (specify)

OBE	S/S =	<u>N/A</u>	F/B =	<u>N/A</u>	V =	<u>N/A</u>
SSE	S/S =	<u>**</u>	F/B =	<u>**</u>	V =	<u>**</u>

6. Were fatigue effects or other vibration loads considered?

Yes No

If yes, describe loads considered and how they were treated in overall qualification program: N/A

*NOTE: If more than one report complete items IV thru VII for each report.

12/80

**See device list for individual component required accelerations. Required accelerations were provided by Bechtel Power Corporation [Reference: Bechtel Letter BLG 2709 dated January 6, 1981, with Attachment, and BLG 2884 dated March 17, 1983]

SECTION 4.0

DEVICE LISTS

PPD	MPL	BUILDING	ELEV.	HOT	STANDBY &	REQUIRED FOR	RRS
				COLD	SHUTDOWN	NEITHER	
145C3224P001	G33-N023A	RX	771'-1"			x	1
145C3224P001	G33-N023B-D	RX	753'-7"			x	1
145C3224P001	G33-N023E,F	RX	771'-1"			x	1
157C4629P001	C41-N003	RX	750'-10"			x	5
*159C4294P001	E41-N015A-B	RX	670'		x		2
*159C4294P001	E41-N018	RX	645'		x		2
159C4294P002	E41-N002	RX	670'		x		NO RSS
159C4294P002	E41-N003	RX	670'		x		NO RSS
159C4361P004	E11-N023A-B	RX	670'		x		2
159C4361P004	E11-N024	RX	670'		x		2
159C4361P005	C12-N013A-D	RX	719'		x		4
159C4361P006	C12-N013E,F	RX	719'		x		4
*159C4361P006	E41-N014	RX	645'		x		2
159C4361P006	E51-N010	RX	645'		x		2
159C4520P004	B31-N023A-B	RX	704'			x	N/A
163C1090P001	C72-N005A-D	RX	705'-7"		x		NO RRS
163C1107P001	E32-N006B,E,K,P	RX	719'			x	4
163C1184P017	C41-R003	RX	753'-9"			x	1
163C1303P001	C72-N006A-D	Turbine Bldg.	NOT INSTALLED		x		NO RRS
163C1560P532203	E11-N013	RX	~687'-6"		x		1
163C1560P542203	E11-N015B	RX	688'-6"		x		1
163C1560P542203	E21-N003A-B	RX	687'		x		1
163C1560P642203	E11-N015A	RX	~687'-6"		x		1
163C1561P522203	B31-N014C-D	RX	687'-6"			x	1
163C1561P522203	B31-N024A-B	RX	~687'-6"			x	1
163C1563P942203	C41-N004	RX	753'-7"			x	1
163C1855P001	B21-N056A-D	RX	~753'		x		NO RSS
164C5359P001	B21-N015A-D	Turbine Bldg.	~704'		x		NO RSS
164C5359P001	C72-N003A,C	Turbine Bldg.	704'-		x		NO RSS
164C5359P001	C72-N003B,D	Turbine Bldg.	703'-6"		x		NO RSS
164C5359P001	E11-N022A	RX	~687'-6"		x		3
164C5359P001	E11-N022B	RX	686'-6"		x		3
164C5359P001	E21-N007A	RX	753'-7"		x		5
164C5359P001	E21-N007B	RX	754'-1"		x		5
169C8974P02053	E51-R005	RX	645'		x		2
169C8974P03051	E41-R002	RX	645'		x		2

NOTE: LOCATIONS ARE PER BECHTEL LETTER BLG 2756 DATED 3/5/82.

SEISMIC QUALIFICATION REEVALUATION OF NUCLEAR SAFETY RELATED EQUIPMENT

SH GP MPL REFERENCE: E41-5110 TITLE: HPCI LCL INSTR : PL 328X167AEG001 :
 LOCATION: LOCALLY MOUNTED : REV 2 :

EQUIPMENT NAME	DESCRIPTION	IDENTIFICATION	E: SEISMIC CAPABILITY / MALFUNCTION LIMIT			MAXIMUM EXPECTED ACCELERATION AT LOC.			SUPPORT DOMINANT FREQUENCY (Hz)	
			F-B	S-S	V	F-B	S-S	V	HORIZ.	VERT.
TEMPERATURE INDICATOR		169C8974P03051	P							
E41 R002				QUAL. BY STRESS ANALYSIS			1.36	1.36	0.6	
TEMPERATURE ELEMENT		145C3224P001	A							
E41 N024 AB				5	5	5	1.70	1.70	4.90	>100 14
E41 N025 AH				5	5	5				
E41 N028 AB				5	5	5	5.00	5.00	0.70	21 >100
E41 N029 AB				5	5	5	5.00	5.00	0.70	21 >100
E41 N030 A				5	5	5	4.90	4.90	1.60	81 18
LEVEL SWITCH		159C4294P001	A							
E41 N015 AB**				4.6*	4.6*	3.6*	3.80	3.80	3.00	
E41 N018**				4.6*	4.6*	3.6*	3.80	3.80	3.00	
LEVEL SWITCH		159C4294P002	A							
E41 N002				4.6*	4.6*	3.6*	4.00	4.00	3.00	
E41 N003				4.6*	4.6*	3.6*	4.00	4.00	3.00	
LEVEL SWITCH		159C4361P006	A							
E41 NC14				2.0	2.0	1.1	1.4	1.4	0.52	
TEMPERATURE ELEMENT		145C3224P001	A							
E41 N030 B				5	5	5	3.40	3.40	1.60	29 60

*NOTE: 130 msec. change of state occurred during 4.6g horizontal/3.6g vertical input

**NOTE: See PLG-2347 dated 2/16/83 and GP-83-69 dated 3/17/83 for rationale for accepting 130 msec chatter for these switches.