

#5

Safety-Related

☐ Active
☒ Passive

COMMONWEALTH EDISON COMPANY
LA SALLE COUNTY NUCLEAR STATIONS
6093-00

NSSS EQUIPMENT QUALIFICATION

Equipment Name: Temperature Element

Equipment Number: B21-N004 A/H, J/N, P, R, S, U & V.

Manufacturer: Pyco

Model Number: 133D9679

This folder contains the following Qualification Documents for the above equipment.

1. SQRT Form & Table I.
2. Seismic Qualification
3. EMD File # 019856
4. # 912-E31-N*3-P6- dated 3-15-76
5. GE Drawing # 133D9679, Rev.# 2.
- 6.
- 7.
- 8.
- 9.
- 10.

Reviewed by: *Chongfang Lee* Date 4/9/80

Approved by: *[Signature]* Date 5-12-81

EMD File # *EMD-030764*
Date:
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LA SALLE NUCLEAR STATIONS
UNIT 1 & 2

NSSS EQUIPMENT QUALIFICATION SUMMARY

EQUIPMENT NAME: Temperature Element # 133D9679

EQUIPMENT NO: B21-N004 A/H, J/N, P, R, S, U, V.

LOCATION: Primary Containment, PC-4, Locally mounted on pipe.

EQUIPMENT CLASSIFICATION: ☐ ACTIVE ☒ PASSIVE

QUALIFICATION METHOD: Simplified dynamic analysis using high seismic g' values

QUALIFICATION DOCUMENT REFERENCES:

1. Seismic Qualification
2. EMD File # 019856
3. # 912-E31-N*3-P6 - dated 3-15-76
4. GE Drawing # 133D9679 Rev.2.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

LOAD COMBINATIONS CONSIDERED IN QUALIFICATION:

1. Normal Operating Loads + OBE + $[SRV_{ASY-TQ} + SRV_{ALL-TQ}]$ ENVELOP
2. Normal Operating Loads + SSE + $CO_{LEVY-2} + [SRV_{ASY-TQ} + SRV_{ALL-TQ}]$ ENVELOP
3. Normal Operating Loads + SSE+Chugging + $[SRV_{ASY-TQ} + SRV_{ALL-TQ}]$ ENVELOP
4. Normal Operating Loads + SSE + AP
5. Normal Operating Loads + SSE + CO_{LEVY-1}

QUALIFICATION:

PREPARED BY: *Rickard Dzitaski*

Date 4/9/80

REVIEWED BY: *Chongfang Lee*

Date 4/9/80

APPROVED BY:

DATE

SARGENT & LUNDY

ENGINEERS
CHICAGO

QUALIFICATION SUMMARY

Seismic Qualification Method:

1. Natural frequency calculated:

Thermowell: $f_{n_{CS}} = 396.5 \text{ Hz}$

$f_{n_{SS}} = 387.4 \text{ Hz}$

$f_{Wake_{CS}} = 287.0 \text{ Hz}$

$f_{Wake_{SS}} = 266.7 \text{ Hz}$

Temperature Element:

$f_n = 79 \text{ Hz}$ mode # 1

$f_n = 1189 \text{ Hz}$ mode # 2

2. Simplified dynamic analysis using 10g's in each of the 2 horizontal and 1 vertical directions.
3. 10 g's acceleration used, is sufficient to account for the amplification from the piping system.
4. Acceleration from piping analysis at the temperature element locations are not expected to exceed 6 g's in each direction.

Qualification Summary of Equipment

I. Plant Name:

LaSalle County 1&2

Type: _____

1. Utility: CECO
2. NSSS: GE
3. A-E: S&L

PWR

BWR 100-1000

II. Component Name

Temperature Element

1. Model Number 133D9679 Quantity: _____
2. Vendor Pyco
3. If the component is a cabinet or panel, name and model No. of the devices included: N.A.
4. Physical Description a. Appearance See drawings(Ref. #2)
b. Dimensions _____
c. Weight Temp. Element Approx. 5 lb.
5. Location: Building: Primary Containment
Elevation: Locally mounted on Pipe
6. Field Mounting Conditions [] Bolt (No. _____, Size _____)
Thermowell welded to pipe [X] Weld (Length _____)
Temp. Element with Threaded [X] Threaded
Conn Thermowell: 387.4/ss
Natural Frequencies in Each Direction: 596.5/cs
7. h1: _____ h2: _____ V: _____ Temp. Element: 79Hz in Mode #1
8. a. Functional Description: Measure Temperature of Fluid in Pipe
b. Is the equipment required for [] Hot Standby [] Cold Shutdown
[] Both
[X] PASSIVE
9. Pertinent Reference Design Specifications: _____

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

Comments: _____

IV. Equipment Qualification Method:

Test: _____

Analysis: Simplified dynamic

Combination of Test and Analysis: _____

Test and/or Analysis by Sargent & Lundy EMD -
(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 1&2
2. Required Response Spectra (attach the graphs):
N.A.

3. Required Acceleration in Each Direction: N.A.

h1 = _____ h2 = _____ V = _____

VI. If Qualification by Test, then Complete: N.A.

1. ☐ Single Frequency ☐ Multi-Frequency

2. ☐ Single Axis ☐ Multi-Axis

3. Frequency Range: _____

4. TRS enveloping RRS using Multi-Frequency Test ☐ Yes (Attach TRS graphs)

5. g-level Test at h1 = _____ h2 = _____ V = _____ ☐ No

6. Laboratory Mounting:

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

7. Functional operability verified: ☐ Yes ☐ No ☐ Not Applicable

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

VII.

Complete:

1. Description of Test including Results:

2. Method of Analysis:

☐ Static Analysis ☐ Equivalent Static Analysis ☒ Dynamic

☐ Response Spectrum ☐ Time-History

3. Model Type: ☐ 3D

[] Finite Element[] Beam

4. ☐ Computer Codes: N.A.

Frequency Range and No. of modes considered:

[·] Hand Calculations

5. Damping: N.A.

6. Support Considerations in the model: High g- values used to account for piping flexibility.

7. Critical Structural Elements:	Governing	Seismic Total Stress
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A.	Identification	Location	Response	Combination	Stress	Stress Allowable
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Thermowell: @ Socket Weld: SA-105 S_{max}= 11409.55 < 17,500
(Critical Materials
used) SA-182-F304 S_{max}= 10704.03 < 15,900

Temperature @ Temp.Element & S_{max} = 25123.36 < 27,000
Element: Extension Pipe.

@ Extension Pipe & Socket Weld $S_{\max} = 3012.78 < 18,000$

Wall mounted Temp. Indicator $S_{\max} = 551.49 < 9,000$
 (#8-32UNC Bolt)

B. Max. Deflection

Location

Effect Upon Functional
Operability

N.A.