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April 6, 2020

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

James A. FitzPatrick Nuclear Power Plant
Renewed Facility Operating License No. DPR-59
NRC Docket No. 50-333

Subject: Response to Request for Additional Information in support of License Amendment Request – Proposed Changes to the Technical Specifications to Primary Containment Hydrodynamic Loads

References:

1. Letter from J. Barstow (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request – Proposed Change to Technical Specifications to Primary Containment Hydrodynamic Loads" (ML19248B085) dated September 12, 2019

2. E-mail from Samson Lee (Nuclear Regulatory Commission Project Manager for the James A. FitzPatrick Nuclear Power Plant) to Enrique Villar (Exelon Nuclear Senior Licensing Engineer) titled "FitzPatrick request for additional information for LAR on primary containment loads" (EPID: L-2019-LLA-0197), dated February 5, 2020

By letter dated September 12, 2019, Agencywide Documents Access and Management System (ADAMS) Accession No. ML19255D988, Exelon Generation Company, LLC (Exelon) submitted a license amendment request (LAR) for changes to the James A. FitzPatrick Nuclear Power Plant (JAF) Technical Specifications (TSs).

The proposed changes would delete TS Limiting Condition for Operation (LCO) 3.6.2.4, Drywell-to-Suppression Chamber Differential Pressure, associated Actions and Surveillance Requirements; revise the upper level in LCO 3.6.2.2, Suppression Pool Water Level from 14 feet (ft) to 14.25 ft; and revise the Allowable Value for Table 3.3.5.1-1, Emergency Core Cooling System Instrumentation Function 3.e. Suppression Pool Water Level – High from 14.5 ft to 14.75 ft.

By electronic mail dated February 5, 2020, (Reference 2), the NRC identified areas where additional information was necessary. These additional Request for Additional information (RAIs) were discussed with the NRC Staff in a clarification call held February 19, 2020, and it was agreed to a response by April 10, 2020.

Attachment 1 contains the response to the RAIs. Attachment 2 contains the proprietary GE report, and should be held from public disclosure per 10 CFR 2.390; Attachment 3 contains a redacted version of Attachment 2; and Attachment 4 contains the GE affidavit.

Exelon has reviewed the information supporting a finding of no significant hazards consideration and the environmental consideration provided to the NRC in Reference 1. The information attached to this letter does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration. Furthermore, the information attached to this letter does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

There are no commitments contained in this response.

If you should have any questions regarding this submittal, please contact Enrique Villar at (610) 765-5736.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 6th day of April 2020.

Respectfully,

David T. Gudger
Sr. Manager, Licensing
Exelon Generation Company, LLC

Attachments:

1. Response to Request for Additional Information
2. 005N1724-P Revision 1 March 2020 "Exelon Generation Company, LLC - James A. FitzPatrick Nuclear Power Plant -Short-Term Containment Analysis for Zero Drywell-to-Wetwell Pressure Differential" (Proprietary)
3. 005N1724-NP Revision 1 March 2020 "Exelon Generation Company, LLC - James A. FitzPatrick Nuclear Power Plant -Short-Term Containment Analysis for Zero Drywell-to-Wetwell Pressure Differential" (Non-Proprietary)
4. Affidavit

cc:		
	Regional Administrator – NRC Region I	w/Attachments
	NRC Senior Resident Inspector – JAF	w/Attachments
	NRC Project Manager, NRR – JAF	w/Attachments
	A. L. Peterson, NYSERDA	w/o Attachments 2 and 4

ATTACHMENT 1

Response to FitzPatrick request for additional information: Amendment Request for Change to the Technical Specifications to Revise the Allowable Value for Reactor Water Cleanup (RWCU) System Primary Containment Isolation (EPID: L-2019-LLA-0190)

By letter dated September 12, 2019, Agencywide Documents Access and Management System (ADAMS) Accession No. ML19255D988, Exelon Generation Company, LLC (Exelon, the licensee) submitted a license amendment request (LAR) for changes to the James A. FitzPatrick Nuclear Power Plant (FitzPatrick) Technical Specifications (TSs). The proposed changes would delete TS Limiting Condition for Operation (LCO) 3.6.2.4, Drywell-to-Suppression Chamber Differential Pressure, associated Actions and Surveillance Requirements; revise the upper level in LCO 3.6.2.2, Suppression Pool Water Level from 14 feet (ft) to 14.25 ft; and revise the Allowable Value for Table 3.3.5.1-1, Emergency Core Cooling System Instrumentation Function 3.e. Suppression Pool Water Level – High from 14.5 ft to 14.75 ft. The NRC staff has reviewed the LAR and determined that additional information is required to complete the review. The NRC staff's requests for additional information (RAIs) are listed below. These RAIs are in the nuclear systems performance area. A clarification call was held on February 19, 2020. The Exelon staff indicated that there was no proprietary or sensitive information. The Exelon staff requested, and NRC agreed, to a RAI response by April 10, 2020.

Containment Pressure and Temperature Response

Regulatory Basis:

GDC-16 as it relates to the containment and associated systems be provided to establish an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment and to assure that the containment design conditions important to safety are not exceeded for as long as postulated accident conditions require.

GDC-50 as it relates to the reactor containment structure, including access openings, penetrations, and the containment heat removal system shall be designed so that the containment structure and its internal compartments can accommodate, without exceeding the design leakage rate and with sufficient margin, the calculated pressure and temperature conditions resulting from any loss-of-coolant accident.

SNSB RAI-1:

Define the most limiting design basis loss-of-coolant accident (DBLOCA) on which the proposed short-term containment response is based. Provide all initial conditions and key inputs, and assumptions used in the DBLOCA short-term containment pressure and temperature response. Justify if the conservatism in any of the inputs and assumption is reduced from those used in the NRC accepted current analysis of record (AOR) documented in NEDC-33087P, Revision 1.

<u>Exelon's Response to SNSB RAI-1</u>:

Attachment 2 of this letter is design analysis 005N1724 "Short-Term Containment Analysis for Zero Drywell-to-Wetwell Pressure Differential." As stated in Assumption four of 005N1724, "A double-ended instantaneous guillotine break of the recirculation suction pipe is the most limiting Loss of Coolant Accident." All initial conditions and key inputs, and assumptions used in the DBLOCA short-term containment pressure and temperature response can be found in Sections 2.1 and 2.2 of 005N1724.

<u>SNSB RAI-2</u>:

For the suppression pool swell response to a DBLOCA, the postulated break is the reactor recirculation suction line break (RSLB) that draws water from the annulus area of the reactor in which the break effluent is subcooled. The LOCA mass and energy (M&E) analysis would be non-conservative if the break fluid is assumed saturated because of its lower density as compared to subcooled. For the subcooled break fluid, the higher mass released should result in a higher drywell peak pressure, and therefore higher suppression pool swell loads acting upon structures and components located in the wetwell within the suppression pool swell zone. Provide the reactor water pressure and temperature input for the M&E release analysis and confirm that the break fluid is subcooled. Provide justification if the break fluid is not assumed to be subcooled.

<u>Exelon's Response to SNSB RAI-2</u>:

The reactor water pressure and temperature input for the M&E release analysis are 1060 psia and 423.9 °F respectively. These inputs can be found in Section 2.1, Table 1 of 005N1724 (Attachment 2 of this letter). The break fluid is considered subcooled as indicated by the input pressure and temperature values used in the M&E release analysis.

<u>SNSB RAI-3</u>:

The AOR documented in NEDC-33087P, Revision 1, Section 9.0 provides evaluation and results of the following short-term analysis cases of DBLOCA containment pressure and temperature response for normal feedwater temperature (NFWT) and final feedwater temperature reduction (FFWTR). The results of these analyses were used for evaluating the containment hydrodynamic loads.

- Case 1 which corresponds to 102% of current licensed thermal power (CLTP) and 100% of rated core flow (RCF).
- Case 2 which corresponds to 102% of CLTP, with 105% of RCF (i.e., increased core flow (ICF)).
- Case 3 which corresponds to 102% of CLTP, with 79.8% of RCF (i.e., on the maximum extended load line limit analysis (MELLLA) line).

- Case 4 which corresponds to 62% of CLTP, with 36.8% of RCF (Minimum Pump Speed (MPS) on the MELLLA line).

Provide containment pressure and temperature response evaluation and results, both graphs and peak values, for the above cases based on the proposed change in the suppression pool TS maximum level. In case all of the above 4 cases are not re-analyzed, provide the results of the most limiting case with quantitative justification showing that it bounds the remaining 3 cases.

Exelon's Response to SNSB RAI-3:

Section 5.0 of 005N1724 (Attachment 2 of this letter) provides justification as to why above cases 1 and 2 are the bounding cases for this analysis. Containment peak pressure and temperature were recalculated for both cases and the results are provided in Table 3 of 005N1724. The bounding pressure and temperature histories are plotted in Figure 11 and Figure 12 of 005N1724.

LOCA Containment Hydrodynamic Loads

Regulatory Basis:

GDC-4 as it relates to structures, systems, and components shall be appropriately protected against dynamic effects, including the effects of missiles, pipe whipping, and discharging fluids, that may result from equipment failures and from events and conditions outside the nuclear power unit.

SNSB RAI-4:

The AOR documented in NEDC-33087P, Revision 1, Section 9.0 provides assessment of the following containment LOCA hydrodynamic loads based on the short-term containment pressure and temperature response analysis:

- Pool Swell
- Vent Thrust
- Condensation Oscillation
- Chugging

(a) Provide assessment of these loads based on the revised containment pressure and temperature response for the bounding case.

(b) The pool swell loads depend on the drywell pressurization rate. NEDC-33087P, Revision 1, the third paragraph in Section 9.3.2 states:

> The test condition pressurization rate and scale factor for the JAF quarter scale tests (Reference 19 [NEDE-21944-P, "Mark I Containment Program 1/4 Scale

Pressure Suppression Pool Swell Test Program: Plant Unique Tests," Volume 1, March 1979.]) are 31 psi/sec and 0.2627, respectively. From Reference 19, the composite scaling factor then becomes √0.2627 so that the pressurization rate in full scale is 31.0 / √0.2627 = 60.48 psi/sec. The pool swell loads evaluation reviews the drywell pressurization rate obtained from Case 5 and compares it to the Reference 19 pool swell test condition scaled up to full-scale.

An initial drywell pressurization rate of 58.9 psi/sec was calculated for Case 5.

As stated above, in the current analysis, the initial pressurization rate of 58.9 psi/sec is bounded by the derived full-scale test value of 60.48 psi/sec. Provide the most limiting drywell pressurization rate based on the proposed TS changes to confirm that it remains bounded by the full-scale drywell pressurization rate of 60.48 psi/sec.

(c) Based on the proposed TS changes, provide bounding values of the vent thrust loads based on which the structural analysis given in Attachment 6 of the LAR is performed.

Exelon's Response to SNSB RAI-4:

(a) Assessment of these loads based on the revised containment pressure and temperature response can be found in Section 4.0 of 005N1724 (Attachment 2 of this letter).

(b) The most limiting pressurization rate based on the proposed TS change can be found in Section 4.1 of 005N1724. The maximum pressurization rate as found in section 4.1 of is 005N1724 bounded by the full-scale drywell pressurization rate of 60.48 psi/s.

(c) Bounding values of the vent thrust loads are provided in Table 2 of 005N1724. The structural evaluation given in Attachment 6 of the LAR considered these loads in Section 5.2.4.

Main Steam Line Break Response

Regulatory Basis:

GDC-16 as it relates to the containment and associated systems be provided to establish an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment and to assure that the containment design conditions important to safety are not exceeded for as long as postulated accident conditions require.

GDC-50 as it relates to the reactor containment structure, including access openings, penetrations, and the containment heat removal system shall be designed so that the containment structure and its internal compartments can accommodate, without exceeding the design leakage rate and with sufficient margin, the calculated pressure and temperature conditions resulting from any loss-of-coolant accident.

SNSB RAI-5:

Confirm that based on the proposed TS changes, the containment pressure and temperature response and the drywell pressurization rate for the most limiting main steam line break is bounded by the RSLB DBLOCA.

<u>Exelon's Response to SNSB RAI-5</u>:

The containment pressure and temperature response and the drywell pressurization rate for the most limiting main steam line break is bounded by the RSLB DBLOCA as explained in assumption 4 of 005N1724 (Attachment 2 of this letter).

ATTACHMENT 3

Response to Request for Additional Information in support of License Amendment Request – Proposed Changes to the Technical Specifications to primary Containment Hydrodynamic Loads

James A. FitzPatrick Nuclear Power Plant
Renewed Facility Operating License No. DPR-59
NRC Docket No. 50-333

005N1724-NP Revision 1 March 2020 “Exelon Generation Company, LLC – James A. FitzPatrick Nuclear Power Plant -Short-Term Containment Analysis for Zero Drywell-to-Wetwell Pressure Differential” (Non-Proprietary)

GE Hitachi Nuclear Energy

005N1724-NP
Revision 1
March 2020

Non-Proprietary Information

Exelon Generation Company LLC

James A. FitzPatrick Nuclear Power Plant

Short-Term Containment Analysis for Zero Drywell-to-Wetwell Pressure Differential

INFORMATION NOTICE

This is a non-proprietary version of the document 005N1724-P Revision 1, which has the proprietary information removed. Portions of the document that have been removed are indicated by an open and closed bracket as shown here [[ ]].

REVISION SUMMARY

Rev #	Section Modified	Revision Summary
0	N/A	Initial Release
1	2.2	Assumption 4 is expanded to include confirmation to support an RAI response.

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1.0 PURPOSE AND SCOPE

FitzPatrick currently has a Technical Specification requirement to maintain a pressure differential between the drywell and the wetwell during normal operation. This report has been prepared to support the removal of this requirement, and also to support increasing the Suppression Pool high water level to 14.25 ft. The evaluations include the effects on,

- short-term containment pressure and temperature response to the limiting Design Basis Loss of Coolant Accident,
- containment hydrodynamic loads.

This evaluation uses the same methods that have been used previously in the current analysis of record (Reference 2).

2.0 INPUTS AND ASSUMPTIONS

2.1 Inputs

Table 1. Initial Conditions and Key Inputs

Parameter	Peak Pressure / Temperature	Vent Loads	Condensation Oscillation Loads
Analysis Power (102% of rated) (MW)	2587		
Normal Feedwater Temperature (°F)	423.9 at rated power		
Dome Pressure (psia)	1060 psia		
Initial Drywell Pressure (psig)	3.0	1.95	1.95
Initial Wetwell Pressure (psig)	3.0	1.95	1.95
Drywell Initial Temperature (°F)	100	135	135
Suppression Pool Initial Temperature (°F)	95	70	95
Drywell Free Volume (ft^3)	154,476		
Drywell Initial Humidity	20%		
Wetwell Free Volume (ft^3)	109,850		
Suppression Pool Volume (ft^3) (1)	111,360		
Suppression Pool Level (ft)	14.25		

(1) [[

]]

2.2 Assumptions

1. The analysis uses ANS 5 (1971) decay heat plus 20% adder for uncertainties.
2. Moody's critical flow model using Homogenous Equilibrium Model. This is the same model used to calculate the containment peak pressure and temperatures reported in the analysis of record (Table 9-3 of Reference 2).
3. [[

]]
4. A double-ended instantaneous guillotine break of the recirculation suction pipe is the most limiting Loss of Coolant Accident. Section 2.1 of Reference 6 defines the design basis accident as the guillotine break of recirculation suction line for Mark I plants employing jet pumps. This was concurred by the NRC in Section 3.2.1 of NUREG-0661 (Reference 9), which states,

"The DBA for the Mark I containment design is the instantaneous guillotine rupture of the largest pipe in the primary system (the recirculating line)." This assumption was further confirmed by rerunning the largest main steam line break case [[

]]

5. Main Steam Isolation Valves start to close in 0.5 seconds and are completely closed in 3.5 seconds.
6. Feedwater is assumed to stop at 0 seconds conservatively.
7. Recirculation pump is assumed to stop at 0 seconds.
8. There is no injection by the Emergency Core Cooling System since the peak pressures, temperatures and the hydrodynamic loads occur within the first 20 seconds.

3.0 EVALUATION METHOD

The evaluation method used in this report is the same method that has been used previously in the analysis of record (Reference 2) and approved by the NRC.

Mass and energy release from a double-ended guillotine break of recirculation suction line is calculated by using the LAMB code (Reference 4). The break mass and energy release obtained from the LAMB output is used as input in the M3CPT code (Reference 3) to calculate the drywell, wetwell and Suppression Pool pressure and temperatures, as well as the flow rates through the vent system.

The output of the M3CPT code is used to calculate all components of the vent thrust loads, in accordance with the methodology described in the Load Definition Report (Reference 6). The output of the M3CPT code is also used to evaluate the effects on the other containment loads.

4.0 RESULTS FOR THE CONTAINMENT HYDRODYNAMIC LOADS

4.1 Pool Swell Loads

Pool swell loads are evaluated by comparing the pressurization rate [[ ]] test data (Reference 7). The maximum pressurization rate is calculated as [[ ]] for zero initial drywell-to-wetwell pressure differential. This is below the pressurization rate of [[ ]] derived from the test data, which confirms that the existing pool swell test data is still valid for FitzPatrick. However, appropriate correction to the loads should be made in the application of the pool swell loads in accordance with Section 4.3.1.1 of Reference 6.

4.2 Condensation Oscillation Loads

Condensation Oscillation loads are evaluated by comparing the root mean square of the pressure oscillations to the full scale test data (Reference 8). The maximum value of the root mean square of the pressure oscillations was calculated as approximately [[ ]], which is less than the peak value of [[ ]] in the test results. This comparison shows that the existing Condensation Oscillation loads remain valid.

4.3 Chugging Loads

Chugging loads are derived from the full scale test facility test results. [[ ]] The existing chugging loads remain valid.

4.4 Vent Thrust Loads

The vent thrust loads calculated in Reference 5 were confirmed to remain valid in Reference 2. The vent thrust loads have been recalculated in this analysis using the initial conditions in Table 1, [[ ]] The bounding loads are listed in Table 2, and compared to the current design and licensing basis loads, which are those corresponding to the operating ΔP in the Plant Unique Load Definition report (Reference 5).

The comparisons in Table 2 show that the vent thrust loads for the downcomer mitre bend (F3V, F3VT and F3H) exceed the current design and licensing basis loads. All other loads are still less than the loads in the Plant Unique Load Definition report for operating ΔP.

The vent thrust loads are plotted in Figure 1 through Figure 8. The pressure histories used in calculating the vent thrust loads are plotted in Figure 9 and Figure 10.

Table 2. Vent Thrust Loads and Comparison to the Current Licensing Basis Loads Zero ∆P, 14.25 ft Initial Suppression Pool Level

Force (*)	Description	Calculated value	Current licensing basis (**)
F1V1	Vertical force on a single main vent end cap	-43.3	-50.0
F2V	Vertical force on vent header per mitre bend	42.5	49.8
F3V	Vertical force on a single downcomer mitre bend	1.00	0.92
F1V1T	Total main vent end cap vertical force	-346.5	-400
F2VT	Total vent header vertical force	679.5	797
F3VT	Total vert. force on the downcomer mitre bends	95.8	88
F1H1	Horizontal force on a single main vent end cap	-116.7	-134.4
F2H	Horizontal force on vent header per mitre bend	17.7	20.4
F3H	Horizontal force on single downcomer mitre bend	-3.73	-3.5
FNETV	Net vertical force	469.4	479

(*) See also Reference 5 for definition and illustration of the loads

(**) The loads in this column were obtained from Reference 5 for operating ∆P within the accuracy of reading from the plot images.

5.0 RESULTS FOR THE CONTAINMENT PEAK PRESSURE AND TEMPERATURE

It has been previously demonstrated by several sensitivity studies in Reference 2 that [[

]]

Containment peak pressure and temperature have been recalculated using the same method described in Section 3, with the initial conditions listed in Table 1 at [[ ]] The results are shown in Table 3 and compared to the analysis of record (Reference 2). [[

]]

The bounding pressure and temperature histories are also plotted in Figure 11 and Figure 12. The trend is similar to the trends in Reference 2.

Table 3. Peak Drywell Pressure and Temperature

	[[	**Peak Values** **105% of Rated Core Flow**	**Reference 2**
Peak Drywell Pressure (psia)		57.8	54.5
Peak Drywell Temperature (°F)	]]	289.6	285.9

6.0 REFERENCES

1. TODI-JAF-DM-19-01, “JAF Task 0400A Design Inputs,” January 24, 2019.
2. NEDC-33087P Revision 1, “J. A. Fitzpatrick Nuclear Power Plant, APRM/RBM/Technical Specifications / Maximum Extended Operating Domain (ARTS/MEOD),” September 2005.
3. NEDM-10320, “The General Electric Pressure Suppression Containment Analytical Model,” March 1971.
4. NEDE-20566-P-A, “General Electric Company Analytical Model for Loss-of-Coolant Analysis in Accordance with 10CFR50 Appendix K,” September 1986.
5. NEDO-24578 Revision 1, “Plant Unique Load Definition, James A. FitzPatrick Nuclear Power Plant,” August 1981.
6. NEDO-21888 Revision 2, “Mark I Containment Program Load Definition Report,” November 1981.
7. NEDO-21944, “Mark I Containment Program Quarter Scale Plant Unique Tests,” June 1979.
8. NEDO-24539, “Mark I Containment Program Full Scale Test Program Final Report,” August 1979.
9. NUREG-0661, “Safety Evaluation Report, Mark I Containment Long-Term Program, Resolution of Generic Technical Activity A-7,” July 1980.
10. 004N9005 Revision 0, “ECCS-LOCA, Appendix R and Containment System Response Analyses for Bounding GNF2 Decay Heat,” April 2019.

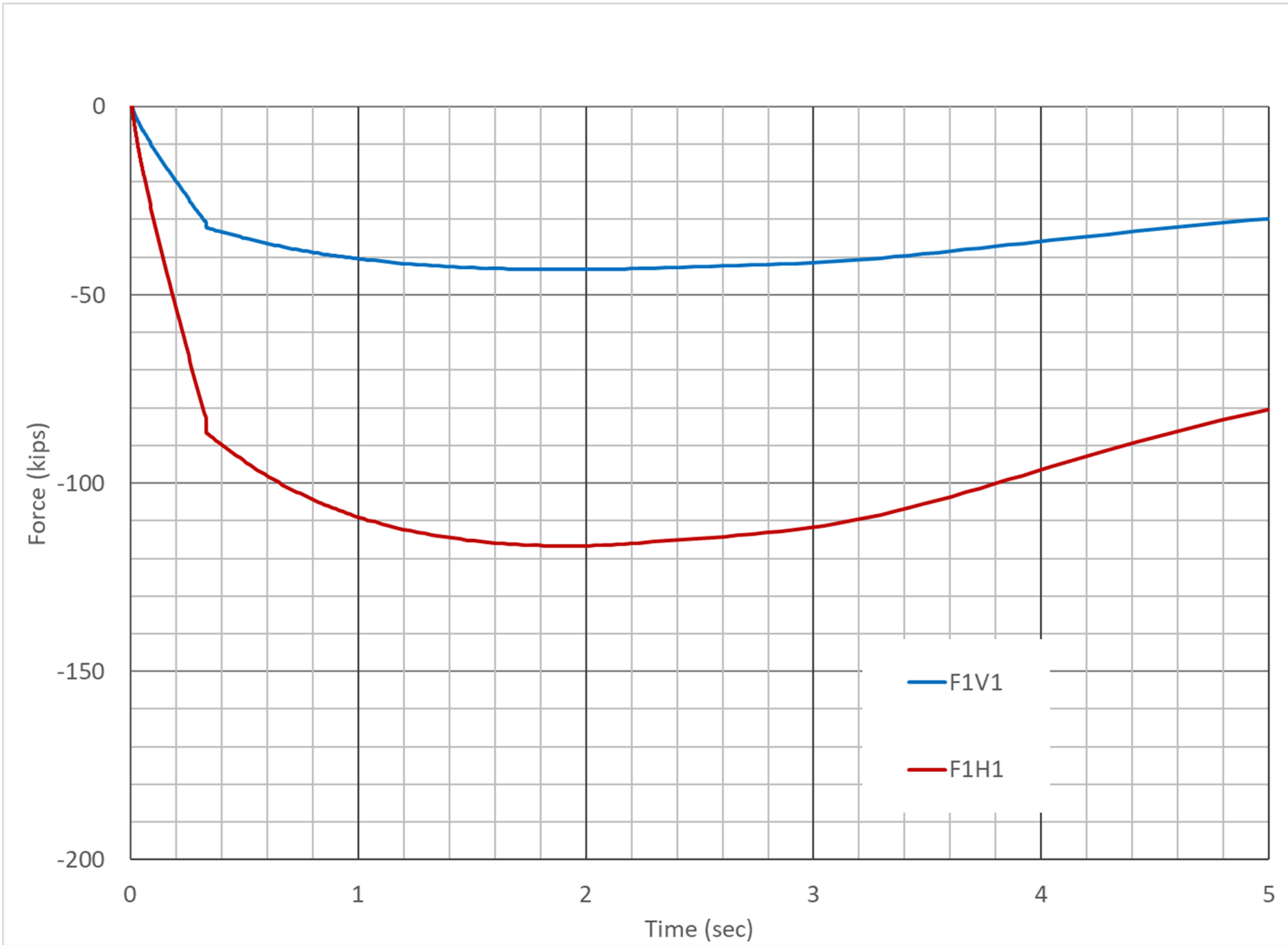

Figure 1. Single Main Vent Forces (0 – 5 sec), Zero ΔP.

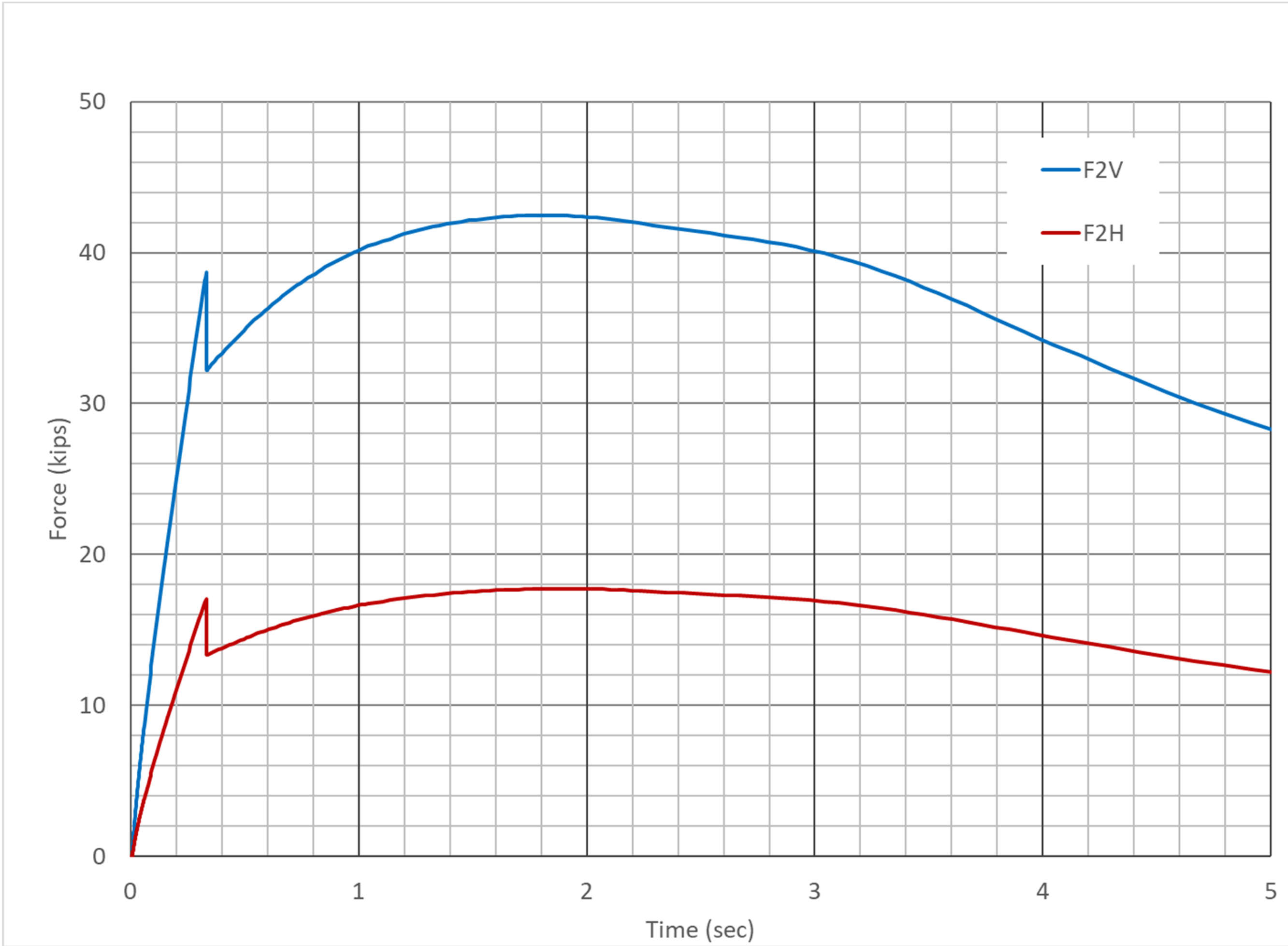

Figure 2. Vent Header Forces per Mitre Bend (0 – 5 sec), Zero ΔP.

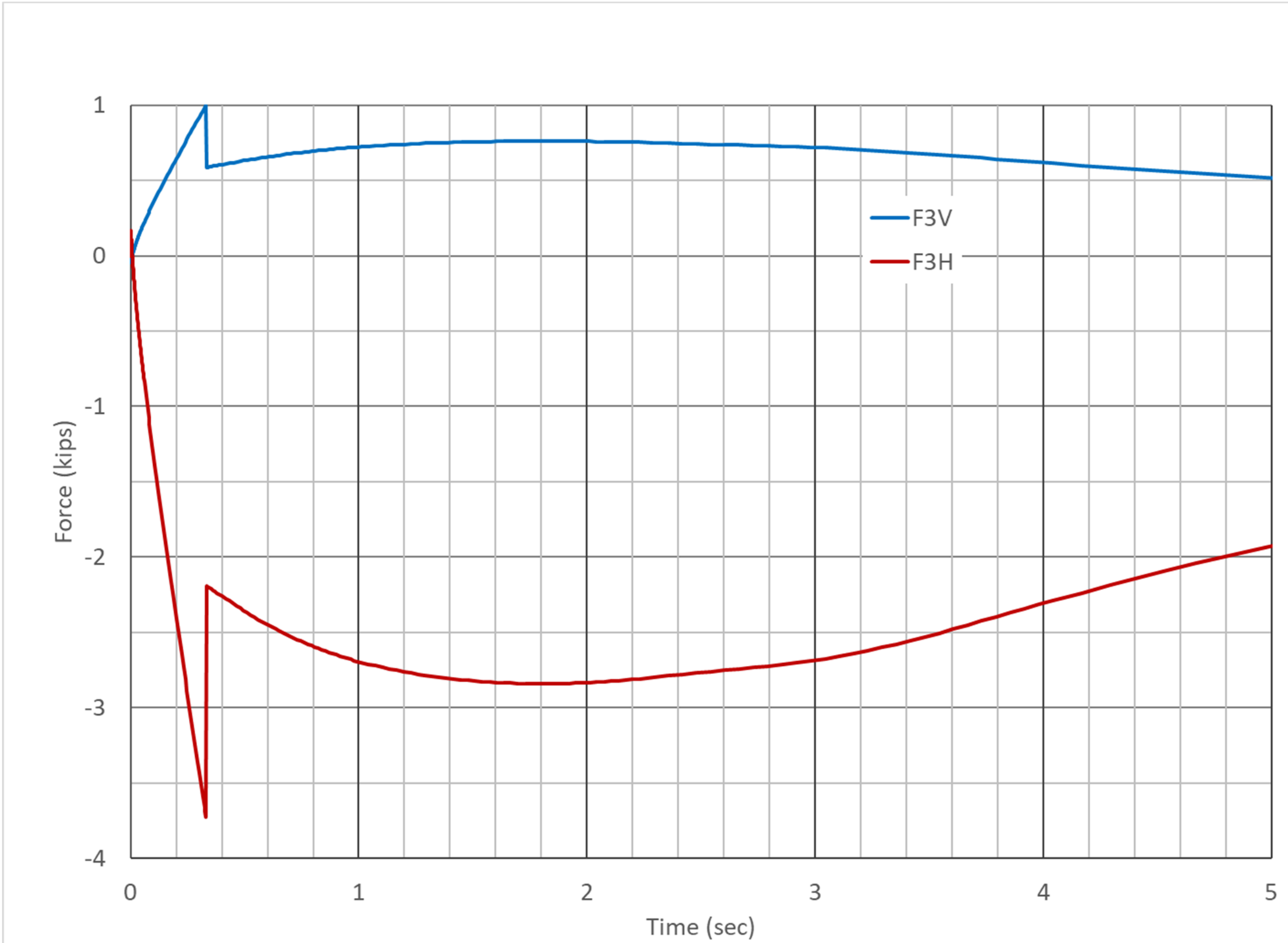

Figure 3. Single Downcomer Forces (0 – 5 sec), Zero ΔP.

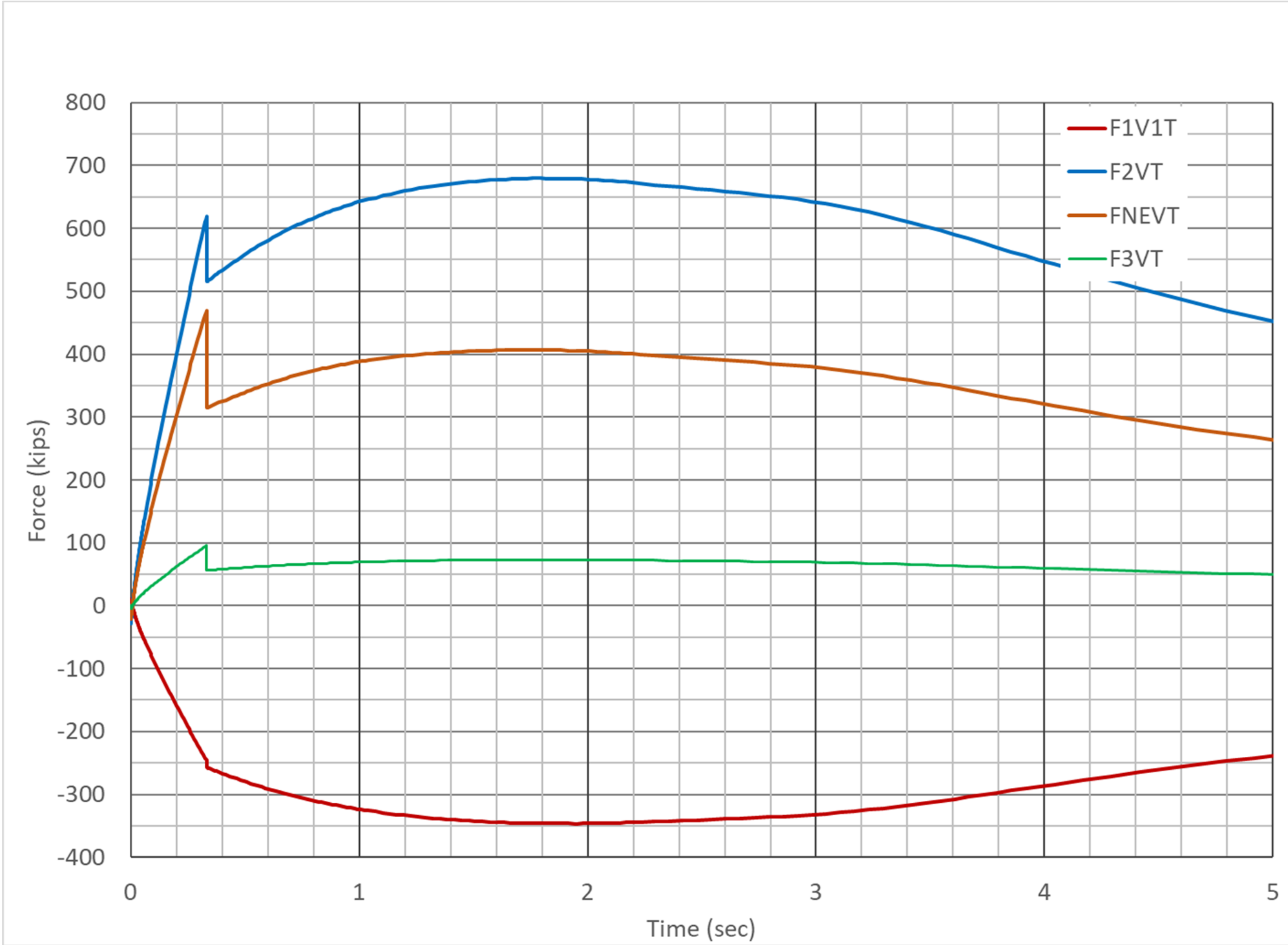

Figure 4. Total and Net Vertical Forces (0 – 5 sec), Zero ΔP.

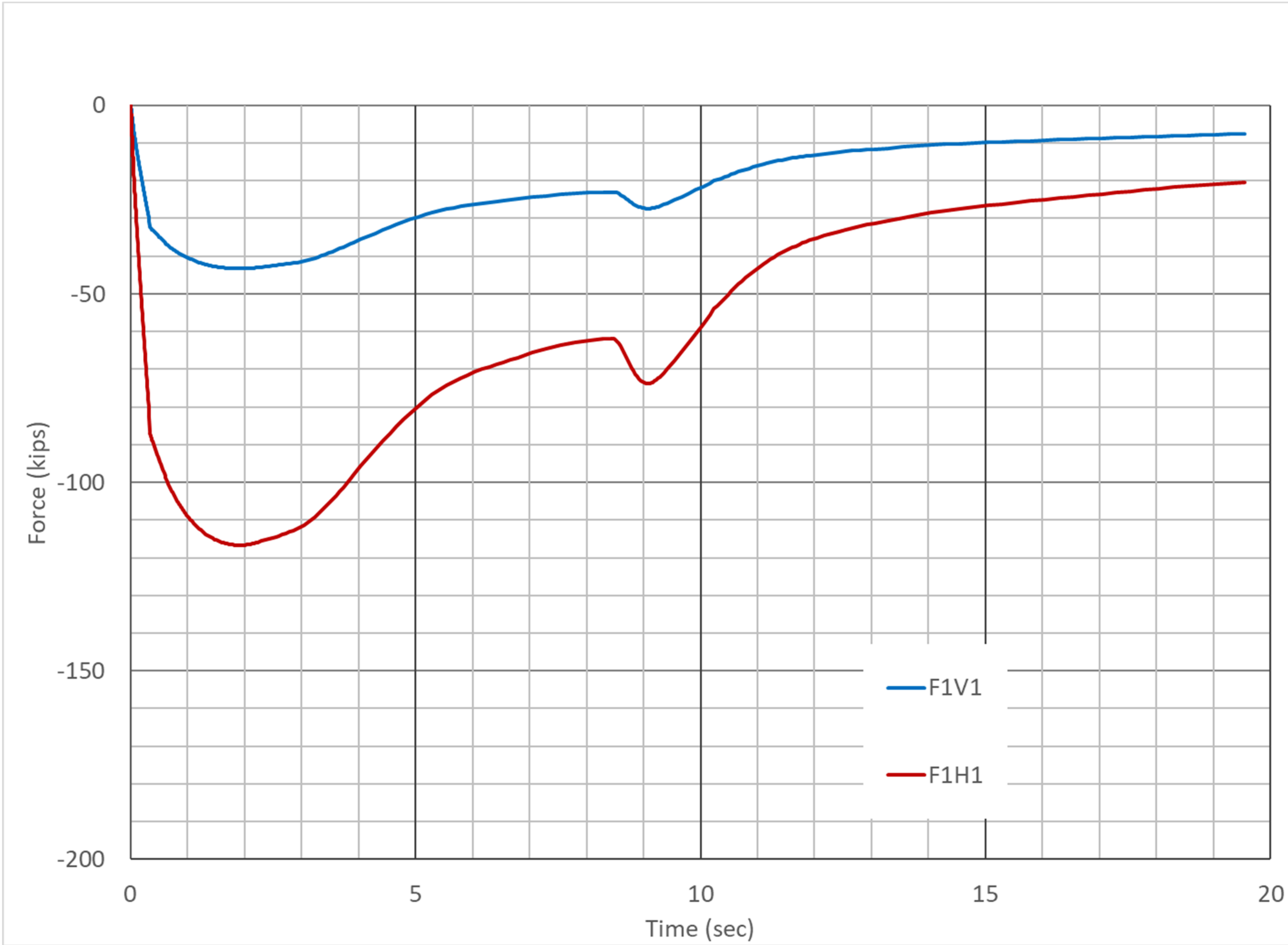

Figure 5. Single Main Vent Forces (0 – 20 sec), Zero ΔP.

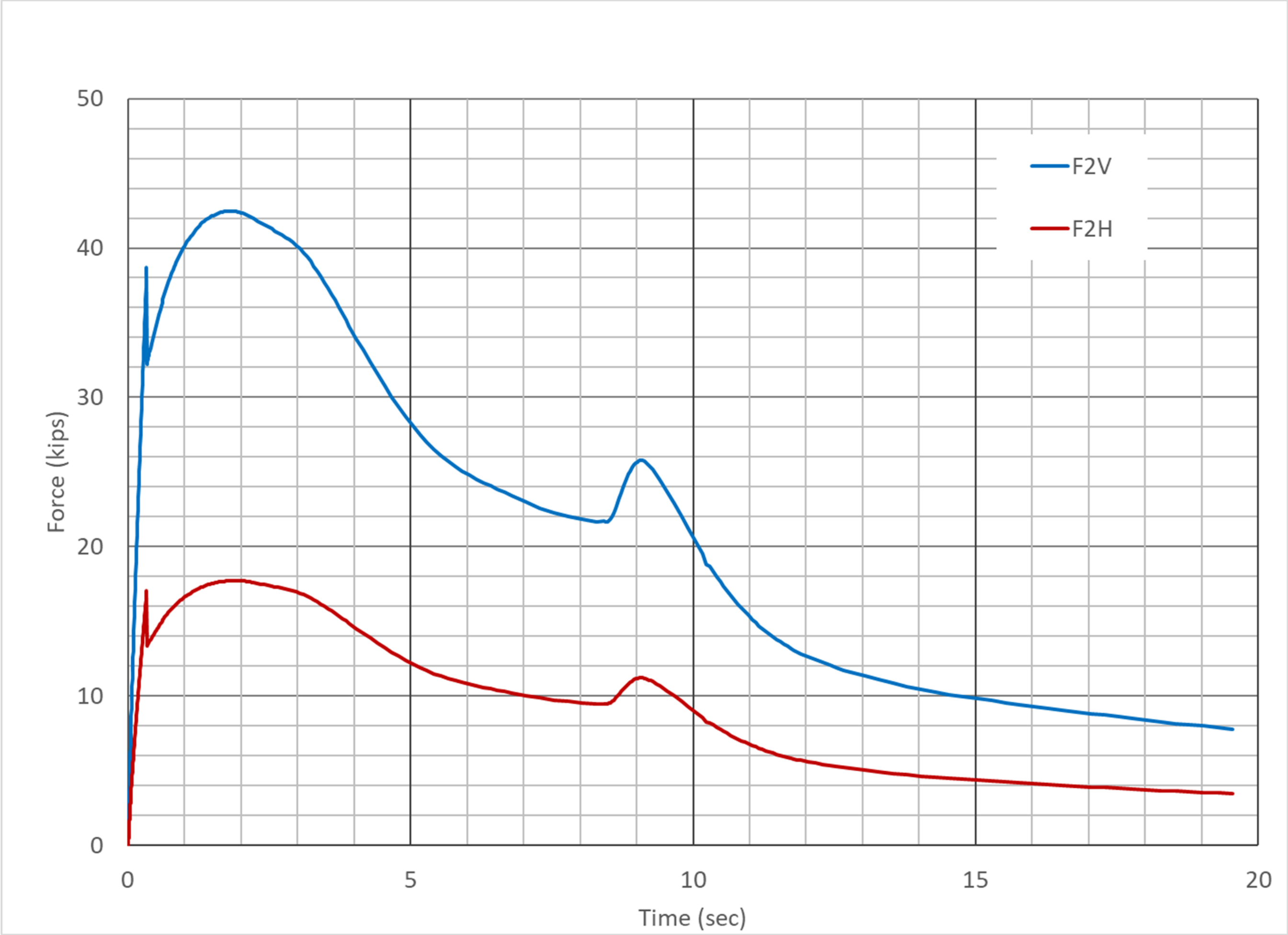

Figure 6. Vent Header Forces per Mitre Bend (0 – 20 sec), Zero ΔP.

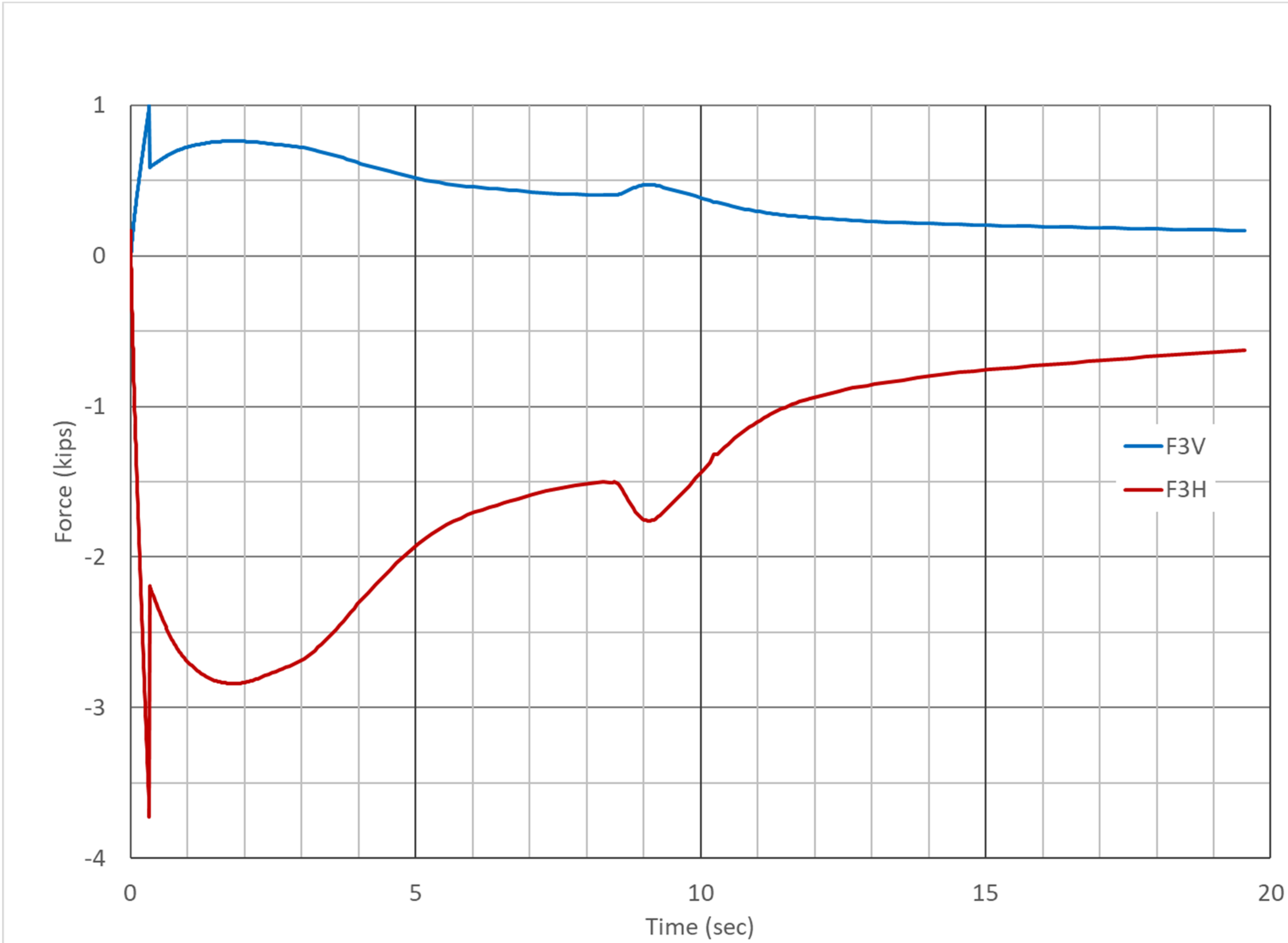

Figure 7. Single Downcomer Forces (0 – 20 sec), Zero ΔP.

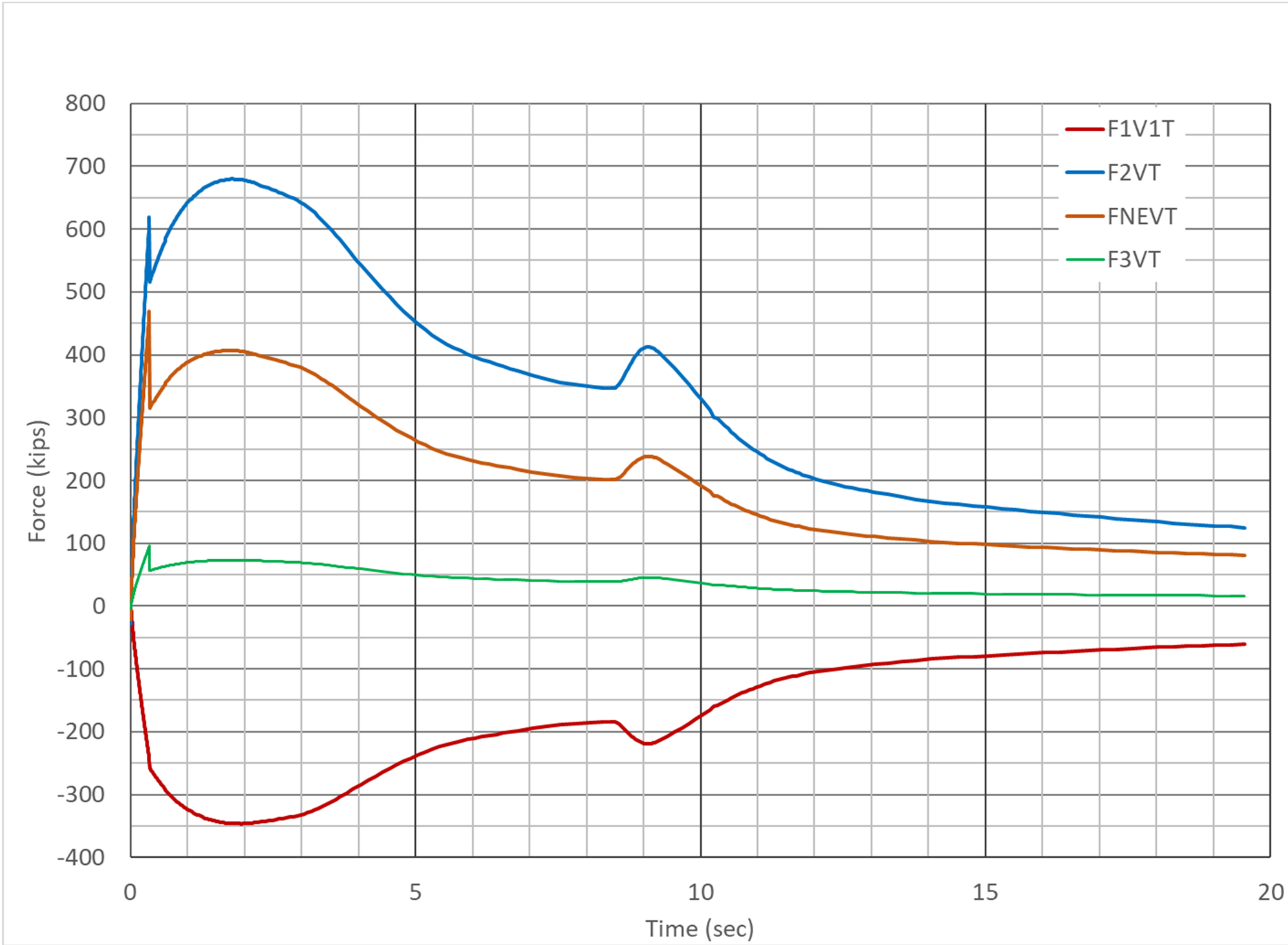

Figure 8. Total and Net Vertical Forces (0 – 20 sec), Zero ΔP.

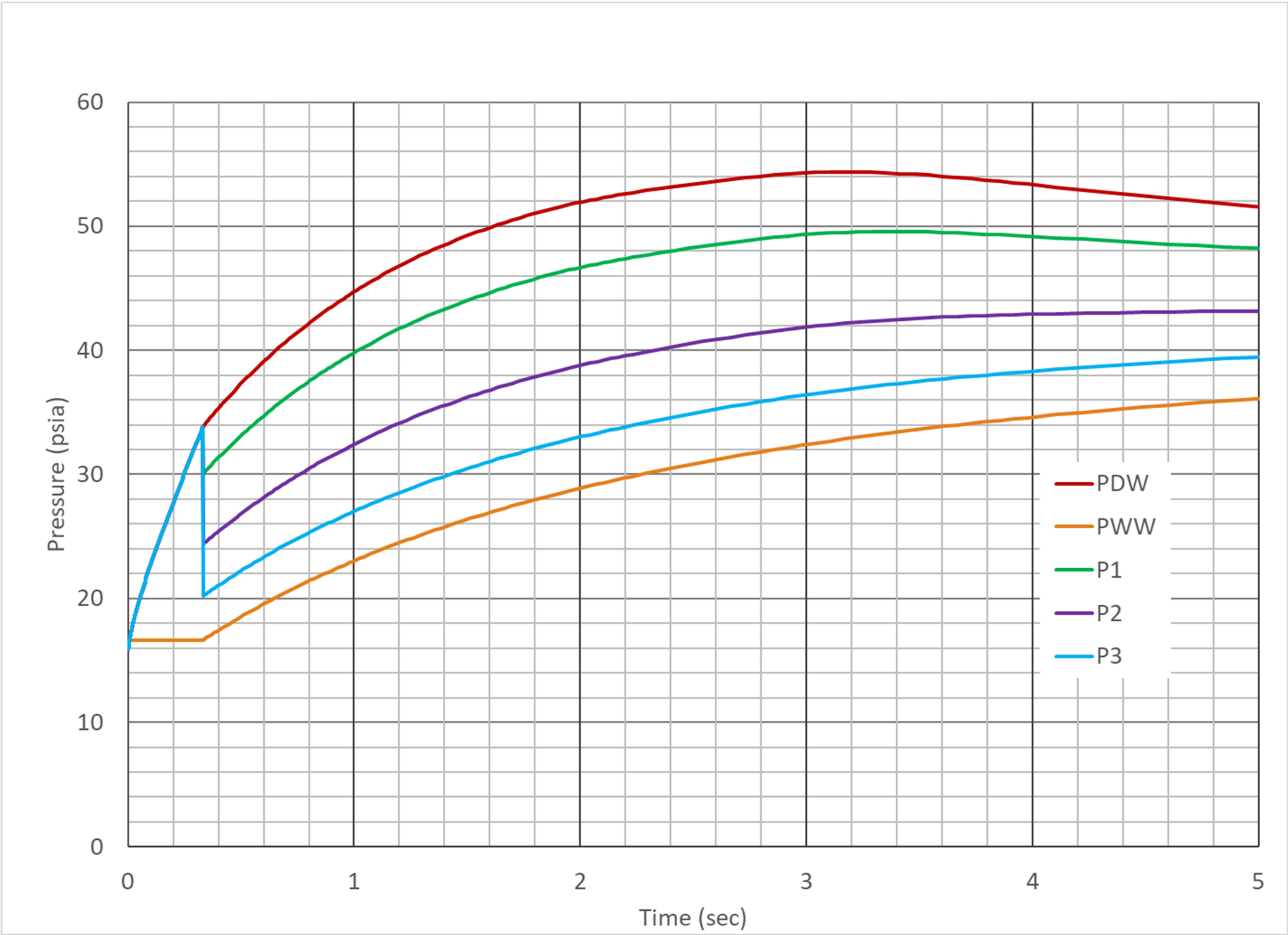

Figure 9. Pressure Time Histories (0 – 5 sec), Zero ΔP.

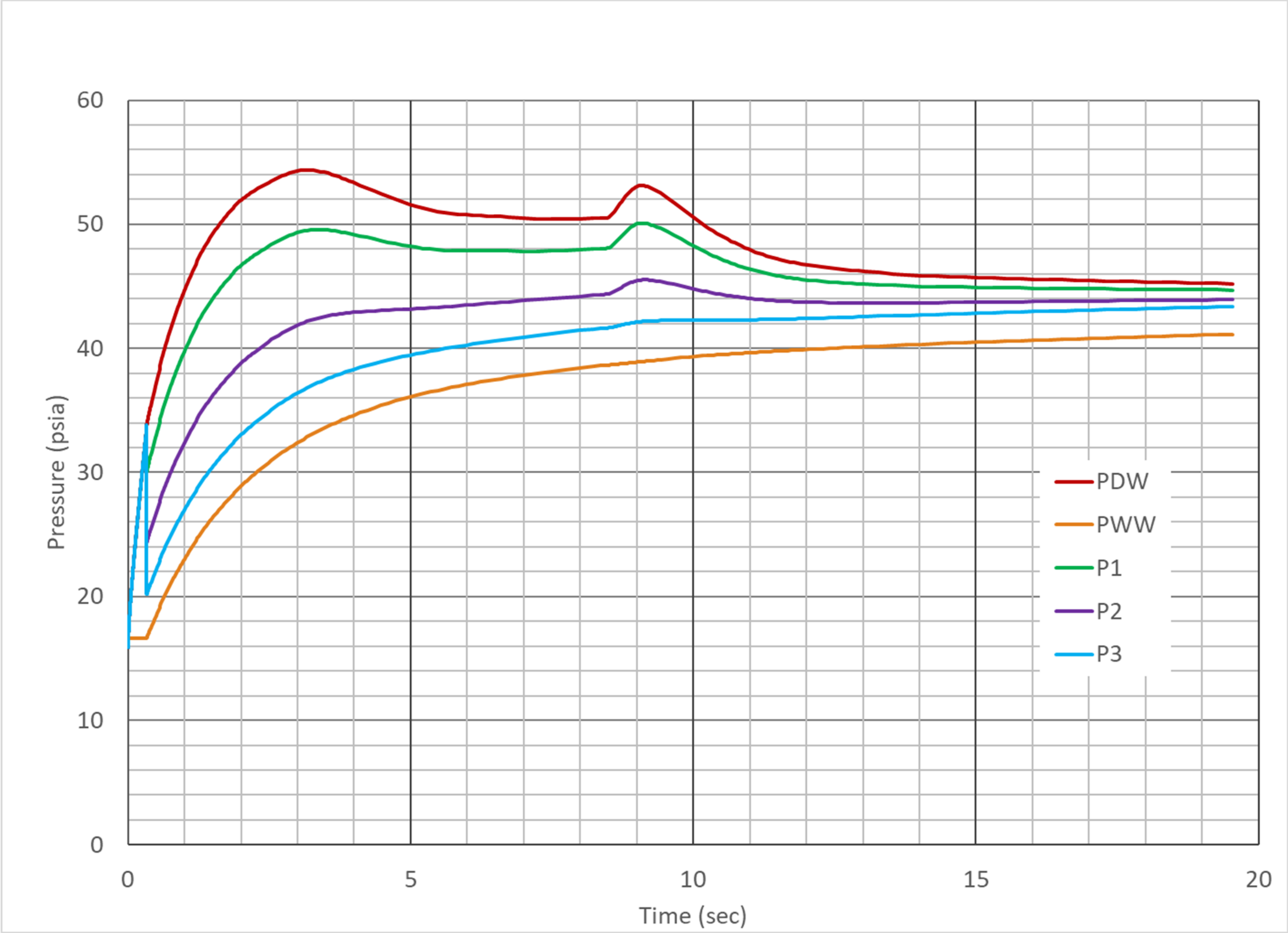

Figure 10. Pressure Time Histories (0 – 20 sec), Zero ∆P.

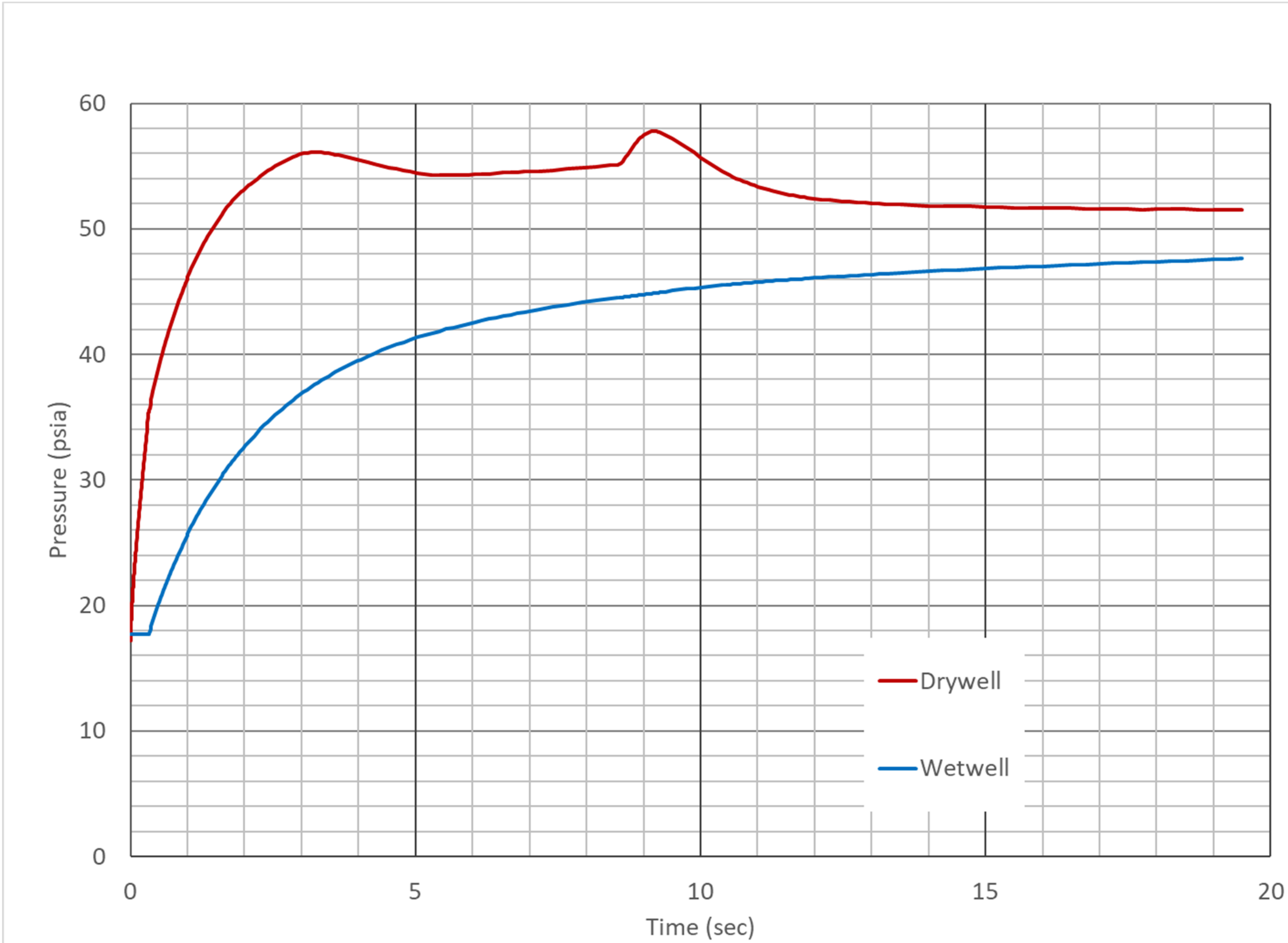

Figure 11. Containment Peak Pressure.

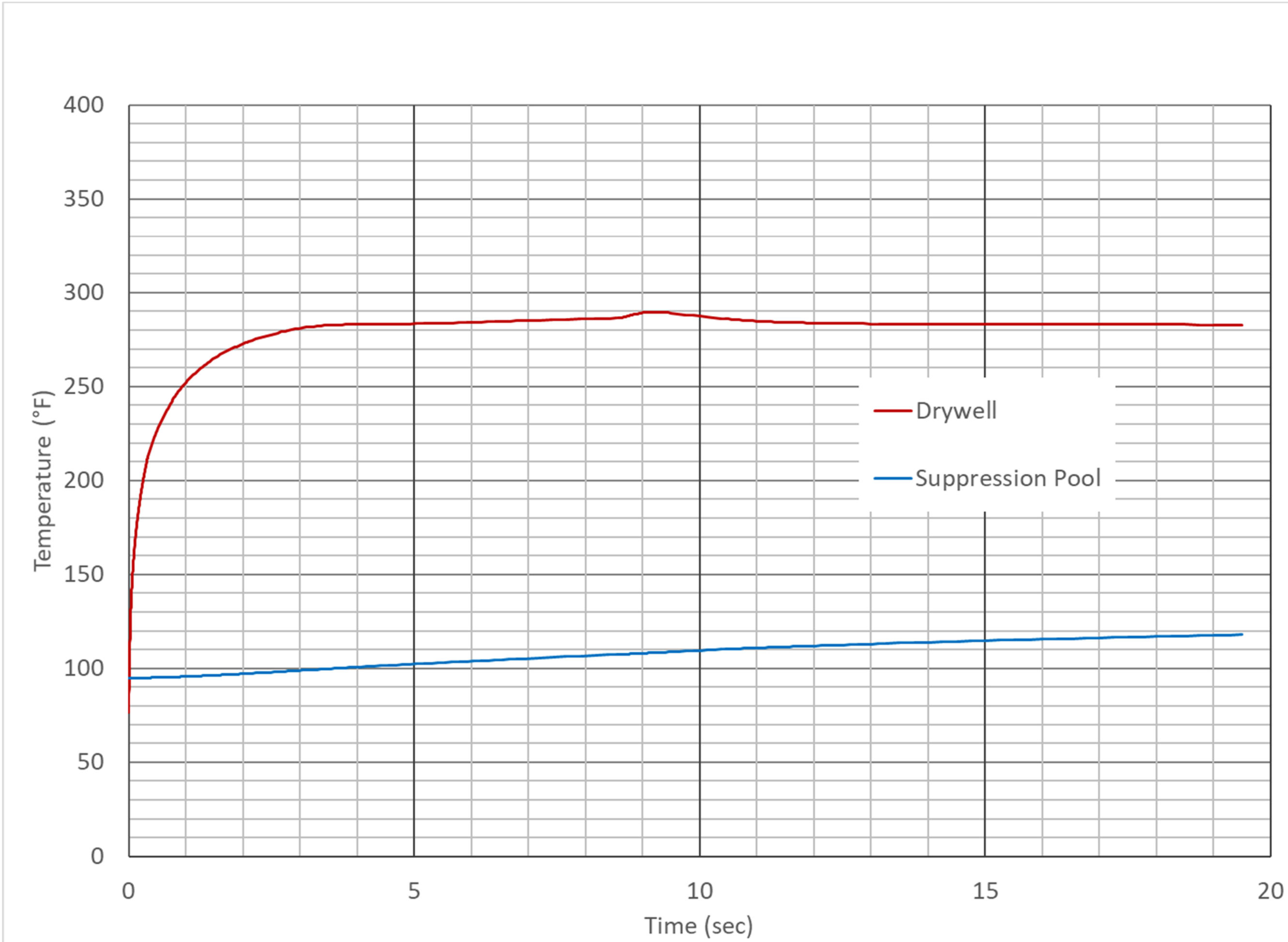

Figure 12. Containment Peak Temperature.

ATTACHMENT 4

Response to Request for Additional Information in support of "License Amendment Request – Proposed Changes to the Technical Specifications to Primary Containment Hydrodynamic Loads"
James A. FitzPatrick Nuclear Power Plant
Renewed Facility Operating License No. DPR-59
NRC Docket No. 50-333

AFFIDAVIT

AFFIDAVIT

I, Kent Halac, state as follows:

(1) I am a Senior Engineer, Regulatory Affairs, GE Hitachi Nuclear Energy Americas ("GEH"), and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.

(2) The information sought to be withheld is contained in 005N1724-P Revision 1, *Exelon Generation Company LLC, James A. FitzPatrick Nuclear Power Plant, Short-Term Containment Analysis for Zero Drywell-to-Wetwell Pressure Differential*, March 2020. GEH proprietary text is identified by a dotted underline inside double square brackets. [[This sentence is an example. {3}]] Figures and large objects containing GEH proprietary information are identified with double square brackets before and after the object. In all cases, the superscript notation {3} refers to Paragraph (3) of this affidavit, which provides the basis for the proprietary determination.

(3) In making this application for withholding of proprietary information of which it is the owner or licensee, GEH relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), and 2.390(a)(4) for "trade secrets" (Exemption 4). The material for which exemption from disclosure is here sought also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

(4) Some examples of categories of information which fit into the definition of proprietary information are:

a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by GEH's competitors without license from GEH constitutes a competitive economic advantage over other companies;

b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

c. Information which reveals aspects of past, present, or future GEH customer-funded development plans and programs, resulting in potential products to GEH;

d. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs (4)a. and (4)b. above.

(5) To address 10 CFR 2.390 (b) (4), the information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GEH, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GEH, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.

(6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge, or subject to the terms under which it was licensed to GEH.

(7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GEH are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

(8) The information identified in paragraph (2) is classified as proprietary because it contains detailed data and results including the process and methodology for the design and application of LOCA containment analysis methods to boiling water reactors. The development, evaluation, and design details of LOCA containment analysis methods and their application to boiling water reactors was achieved at a significant cost to GEH or its licensor.

The development of LOCA containment analysis methods and its application to boiling water reactors along with the interpretation and application of the analytical results is derived from an extensive experience database that constitutes a major GEH asset.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GEH's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GEH's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical, and NRC review costs comprise a substantial investment of time and money by GEH.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GEH's competitive advantage will be lost if its competitors are able to use the results of the GEH experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GEH would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GEH of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing and obtaining these very valuable analytical tools.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 25th day of March 2020.

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