Proprietary Information - Withhold From Public Disclosure Under 10 CFR 2.390
The balance of this letter may be considered non-proprietary upon removal of Attachment 3.

Entergy Operations, Inc.
17265 River Road
Killona, LA 70057-3093
Tel 504-739-6660

John C. Dinelli
Site Vice President
Waterford 3

10 CFR 50.90

W3F1-2019-0040

July 11, 2019

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

Subject: Response to U. S. Nuclear Regulatory Commission Second Round Request for Additional Information Regarding License Amendment Request for Use of the TRANFLOW Code for Determining Pressure Drops Across the Steam Generator Secondary Side Internal Components

Waterford Steam Electric Station, Unit 3 (Waterford 3)
NRC Docket No. 50-382
Renewed Facility Operating License No. NPF-38

By letter dated April 12, 2018 (Reference 1), Entergy requested an amendment to revise the Waterford 3 Updated Final Safety Analysis Report (UFSAR), Section 3.9, "Mechanical Systems and Components," to incorporate the TRANFLOW computer code for determining the pressure drops across the steam generator secondary side internal components.

By letter dated June 1, 2018 (Reference 2), the NRC notified Entergy that the NRC staff reviewed the submittal and requested supplemental information to the application in order to complete its acceptance review. By letter dated June 13, 2018 (Reference 3), Entergy provided the supplemental information requested by the NRC.

By letter dated November 26, 2018 (Reference 4), the NRC staff issued the first round of requests for additional information (RAIs). By letter dated January 19, 2019 (Reference 5), Entergy provided the response to the first round RAIs.

By letter dated June 4, 2019 (Reference 6), the NRC staff informed Entergy that after reviewing the response to the first round RAIs, they have determined that additional information, that is, a second round of RAIs, is required to complete the review. A teleconference to discuss this second round of RAIs was previously held on May 29, 2019.

The additional information requested by the NRC in Reference 6 is provided in the Attachments to this letter.

Attached to this letter are:

- Westinghouse Letter LTR-CDMP-19-31 NP-Attachment, Rev. 0, "Responses to Round 2 Request for Additional Information Regarding Waterford 3 Amendment Request for Revision of UFSAR Section 3.9 to Incorporate the TRANFLOW Computer Code," (Non-Proprietary) (Attachment 1).

- Westinghouse Letter CAW-19-4914, Affidavit, Proprietary Information Notice, and Copyright Notice (Attachment 2).

- Westinghouse Letter LTR-CDMP-19-31 P-Attachment, Rev. 0, "Responses to Round 2 Request for Additional Information Regarding Waterford 3 Amendment Request for Revision of UFSAR Section 3.9 to Incorporate the TRANFLOW Computer Code," (Proprietary) (Attachment 3).

As Attachment 3 contains information proprietary to Westinghouse Electric Company LLC ("Westinghouse"), it is supported by an Affidavit signed by Westinghouse, the owner of the information. The Affidavit sets forth the basis on which the information may be withheld from public disclosure by the Nuclear Regulatory Commission ("Commission") and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations.

Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

Correspondence with respect to the copyright or proprietary aspects of the items listed above or the supporting Westinghouse Affidavit should reference CAW-19-4914 and should be addressed to Camille T. Zozula, Manager, Infrastructure & Facilities Licensing, Westinghouse Electric Company, 1000 Westinghouse Drive, Suite 165, Cranberry Township, Pennsylvania 16066.

This submittal contains no new regulatory commitments.

If you have any questions or require additional information, please contact the Regulatory Assurance Manager, Paul Wood, at (504) 464-3786.

I declare under penalty of perjury that the foregoing is true and correct. Executed on July 11, 2019.

Respectfully,

John Dinelli

JCD/mmz

References:

1. Entergy Operations, Inc. (Entergy) letter W3F1-2018-0014 to U. S. Nuclear Regulatory Commission (NRC), "License Amendment Request for Use of the TRANFLOW Code for Determining the Pressure Drops Across the Steam Generator Secondary Side Internal Components," dated April 12, 2018 (ADAMS Accession Number ML18106A074)

2. NRC letter to Entergy, "Waterford Steam Electric Station, Unit 3 – Supplemental Information Needed for Acceptance of Requested Licensing Action Re: Use of the TRANFLOW Code for Determining Pressure Drops Across Steam Generator Secondary Side Internal Components (EPID L-2018-LLA-0112)," dated June 1, 2018 (ADAMS Accession Number ML18145A265)

3. Entergy letter W3F1-2018-0031 to NRC, "Supplemental Information Supporting the License Amendment Request Regarding Use of the TRANFLOW Code for Determining the Pressure Drops Across the Steam Generator Secondary Side Internal Components," dated June 13, 2018 (ADAMS Accession Number ML18169A275)

4. NRC letter to Entergy, " Waterford Steam Electric Station, Unit 3 – Request for Additional Information Regarding License Amendment Request for Use of the TRANFLOW Code for Determining Pressure Drops Across the Steam Generator Secondary Side Internal Components (EPID L-2018-LLA-0112)," dated November 26, 2018 (ADAMS Accession Number ML18320A090)

5. Entergy letter W3F1-2019-0002 to NRC, "Response to U. S. Nuclear Regulatory Commission Request for Additional Information Regarding License Amendment Request Regarding Use of the TRANFLOW Code for Determining the Pressure Drops Across the Steam Generator Secondary Side Internal Components," dated January 19, 2019 (ADAMS Accession Number ML19019A025)

6. NRC letter to Entergy, " Waterford Steam Electric Station, Unit 3 – Second Round Request for Additional Information Regarding License Amendment Request for Use of the TRANFLOW Code for Determining Pressure Drops Across the Steam Generator Secondary Side Internal Components (EPID L-2018-LLA-0112)," dated June 4, 2019 (ADAMS Accession Number ML19151A603)

Attachment 1: Westinghouse Letter LTR-SGMP-19-31 NP-Attachment, Rev. 0
Attachment 2: Westinghouse Letter CAW-19-4914
Attachment 3: Westinghouse Letter LTR-SGMP-19-31 P-Attachment, Rev. 0

cc: NRC Region IV Regional Administrator
NRC Senior Resident Inspector – Waterford Steam Electric Station, Unit 3
NRR Project Manager
Louisiana Department of Environmental Quality, Office of Environmental Compliance, Surveillance Division

ATTACHMENT 1

W3F1-2019-0040

Westinghouse Letter LTR-CDMP-19-31 NP-Attachment, Rev. 0

Westinghouse Electric Company

Responses to Round 2 Request for Additional Information Regarding Waterford 3 Amendment Request for Revision of UFSAR Section 3.9 to Incorporate the TRANFLOW Computer Code

July 3, 2019

Authors:
Creed Taylor* (Question 1)
Component Design & Management Programs

David A. Rubolino* (Question 2)
Component Design & Management Programs

Verifier:
Timothy L. Norman* (Questions 1 and 2)
Computer, Software & Automation

Manager:
Michael E. Bradley*
Component Design & Management Programs

**Electronically approved records are authenticated in the electronic document management system.*

The following two pages and second round Request for Additional Information (RAI) questions are from:

ML19151A610 – WATERFORD STEAM ELECTRIC STATION, UNIT 3 – SECOND ROUND REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST FOR USE OF THE TRANFLOW CODE FOR DETERMINING PRESSURE DROPS ACROSS THE STEAM GENERATOR SECONDARY SIDE INTERNAL COMPONENTS (EPID L-2018-LLA-0112)

By letter dated April 12, 2018 (Agencywide Documents Access and Management System [ADAMS] Accession No. ML18106A074), Entergy Operations Inc. (the licensee) submitted a license amendment request to revise the Waterford Steam Electric Station Unit 3 (Waterford 3) Updated Final Safety Analysis Report (UFSAR) Section 3.9, "Mechanical Systems and Components," to incorporate the TRANFLOW computer code. By letter dated June 1, 2018 (ADAMS Accession No. ML18145A265), the U.S. Nuclear Regulatory Commission (NRC) staff requested supplemental information to the application to complete its acceptance review. A response to the request for supplemental information was provided by letter dated June 13, 2018 (ADAMS Accession No. ML18169A275).

Specifically, the license amendment would delete subsection 3.9.1.2.2.1.28 of the UFSAR, which describes that the computer code CEFLASH-4A is used to calculate internal loadings following a postulated main steam line break (MSLB). The deletion of this subsection would clarify that the pressure drops across the steam generator (SG) secondary side, due to a steam line break accident, are calculated by the TRANFLOW code.

By letter dated November 26, 2018 (ADAMS Accession No. ML18320A090), the NRC staff issued the first round of requests for additional information (RAIs). By letter dated January 19, 2019 (ADAMS Accession No. ML19019A025), the licensee provided a response to the first round RAIs. After reviewing the response to the first round RAIs, the staff has determined that additional information, that is, a second round of RAIs, is required to complete its review. The additional information needed to complete the review [*was provided to the licensee by the NRC in letter dated June 4, 2019 (ADAMS Accession Nos. Proprietary: ML19151A603 Non-Proprietary: ML19151A610)*].

Background

The licensee stated in the first-round RAI that TRANFLOW was used during the evaluation of the Waterford 3 replacement SGs, which were placed into service in 2013. However, the licensee's UFSAR incorrectly stated that CEFLASH-4A was used in the calculation of the pressure drops across the replacement SG secondary side internal components. This issue was documented in Problem Identification and Resolution Inspection Report 05000382/2016008, dated January 26, 2017 (ADAMS Accession No. ML17026A338), as a Severity Level IV non-cited violation, and was entered into the licensee's corrective action program. The request for review and approval for the use of TRANFLOW in this particular application is the licensee's intended resolution of this matter.

As discussed in Section 3.9.1, Revision 4, "Special Topics for Mechnaical Components," of NUREG-0800, "Standard Review Plan for the Review of Safety analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition," dated December 2016 (ADAMS Accession No. ML16088A068), most of the requirements that are pertinent to this review are contained in Title 10 of the *Code of Federal Regulations* Part 50, Appendix A, "General Design Criteria [GDC] for Nuclear Power Plants," specifically:

- Criterion 1, "Quality standards and records,"

- Criterion 2, “Design bases for protection against natural phenomena,”
- Criterion 14, “Reactor coolant pressure boundary,” and
- Criterion 15, “Reactor coolant system design.”

To demonstrate that the applicable GDC are met, the SG secondary side internal components are analyzed to the standard of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III. To reach the conclusion that the TRANFLOW code is acceptable for the intended application, the NRC staff needs to find that it is capable of adequately or conservatively determining the instantaneous pressure drop across the SG secondary side internal components following a break of the MSLB.

The licensee’s response to first round RAI 1 provided additional details on the drift flux model that was implemented in TRANFLOW following its original NRC approval in 1983. The key equations for the void modeling in the drift flux model were included on pages 5 and 6 of 34 in the RAI response dated January 19, 2019, and the reference provided for the derivation of the model was listed as MPR-663, Revision 0, “TRANFLO: A Computer Program for Transient Thermal Hydraulic Analysis with Drift Flux.” The NRC staff also reviewed this document and found that two assumptions were made in the development of TRANFLOW that may not be acceptable.

1. Round 2 RAI #1:

The void correlation chosen for TRANFLOW and provided on page 5 of the RAI response is discussed in more detail in MPR-663, which references [ ]^{b} as the source for the correlation. [ ]^{b}[1] This paper indicates that the void correlation selected for use in TRANFLOW is only applicable up to superficial steam velocities of 2 meters per second.

The NRC staff expects the superficial steam velocities experienced during a MSLB to be greater than this value. Please provide a justification for why the chosen void correlation is applicable to the conditions seen in a SG following an MSLB and results in an accurate or conservative prediction of SG component pressure drop. Support this justification with sensitivity studies and/or other data as necessary.

Response:

As stated in Reference 2 Round 1 RAI #6 Response:

> *Steam generator conditions at the start of the Main Steam Line Break (MSLB) event are assumed to be at [ ]^{b} conditions with saturated liquid and vapor at equilibrium conditions equal to 970 psia and 541°F. Of all defined operating conditions, the [ ]^{b} condition results in the highest secondary pressure and highest secondary fluid mass.*

Based on these initial operating conditions, the peak component pressure drop is predominantly due to high water flow loadings except for the secondary separator which are due to high steam flow loadings. The peak component pressure drops occur in the initial [ ]^{c} of the MSLB transient, generally in the first [ ]^{c} as summarized in Table 1. At the time of the component peak pressure drop, the superficial steam velocities are all less than 2 m/s (6.56 ft/s). Therefore, the [ ]^{b} void correlation is used within its stated bounds.

[1] [ ]^{b}

Table 1: Waterford 3 RSG MSLB Peak Component Pressure Drop and Superficial Steam Velocity

[ ] a,c

The following are two excerpts from MPR-663 (Reference 1):

> *The relative forces on water and steam in the flow are dependent on the relative velocity and the pressure gradient in the fluid…. Since there is data available for the terminal velocity in a gravitational field, (bubble-rise, fallback, etc.) one can solve for the proportionality constant.*
>
> *If one suddenly applies a pressure gradient to a two phase fluid initially at rest with no pressure gradient the terminal velocity will take some time to establish itself.*

MPR-663 indicates that Reference 3 is used to determine the proportionality constant for terminal velocity in a gravitational field due to a bubble-rise. It is noted that the conservatively higher terminal velocity is used in TRANFLOW despite the short timescales associated with the MSLB peak component pressure drops.

It is noted that the [ ]^{b} void correlation was developed based on experiments for water and steam in [ ]^{b}. The effect of [ ]^{b} in the SG would tend to decrease the relative velocity as compared to the experimental conditions in [ ]^{b} especially at higher void fraction. Therefore, the [ ]^{b} void correlation is conservative, resulting in higher relative velocities, when used in the SG tube bundle, especially at higher void fraction.

The void fraction correlation selection was made by the MPR code developer during an update to TRANFLOW as part of the implementation of the drift-flux model. The basis for this assumption could not be verified; however, an alternate correlation is compared herein.

Figure 1 shows a comparison of the [ ]^{b} void correlation (References 3 and 4) with the [ ]^{b} void correlation (Reference 5). It is noted in Reference 5 that the [ ]^{b} void correlation has been extensively benchmarked to test data for tube and rod bundles with operating conditions (pressures and temperatures) equivalent to the Waterford 3 RSG.

The implementation of the [ ]^{b} void correlation described in Reference 6 with the numerical treatments (traps and splines) is used for the comparison herein. These correlations were both evaluated on a common basis for this comparison. The common basis included: fluid properties consistent with the RSG during a MSLB condition and hydraulic diameter corresponding to the secondary side of the tube bundle. It is observed that the [ ]^{b} void correlation used in TRANFLOW produces higher relative velocities except for the region identified in the red box in Figure 1. This corresponds to the [ ]^{b} portion of the [ ]^{b} correlation.

b

Figure 1: Comparison of Void Fraction Correlations

To evaluate the impact on the component pressure drops due to this limited region of the relative velocity correlation, a multiplier was applied to the [ ]^{b} as shown in Figure 2 and described in the equation that follows. A modified version of the TRANFLOW executable was developed using this multiplier in the limited region of the relative velocity equation. SG component pressure drops were calculated using both versions and compared to show that the current version of TRANFLOW provides conservative, accurate results.

[a,c

]

In calculating [

]^{a,c} is selected by the TRANFLOW code.

b

Figure 2: Comparison of Modified Void Fraction Correlation

As stated in Reference 2 Round 1 RAI #6 Response:

> *[ ]c Steam Generator water levels were evaluated in the W3RSG TRANFLOW MSLB analysis: [*
>
> *]c*

Each of these water level cases was re-evaluated for this sensitivity study and the highest (conservative) component pressure drops are reported herein. Results of these TRANFLOW runs are tabulated in Table 2 and shown graphically in Figure 3 through Figure 8. The results of the sensitivity study using a multiplier [ ]b on the relative velocity, in the region described above, indicate that the original TRANFLOW analysis of record using the [ ]b void correlation produces bounding maximum component pressure drops during the MSLB. Therefore, TRANFLOW provides conservative, accurate results for the SG component pressure drops.

Table 2: Waterford 3 RSG MSLB Peak Component Pressure Drop Comparison

[a,c]

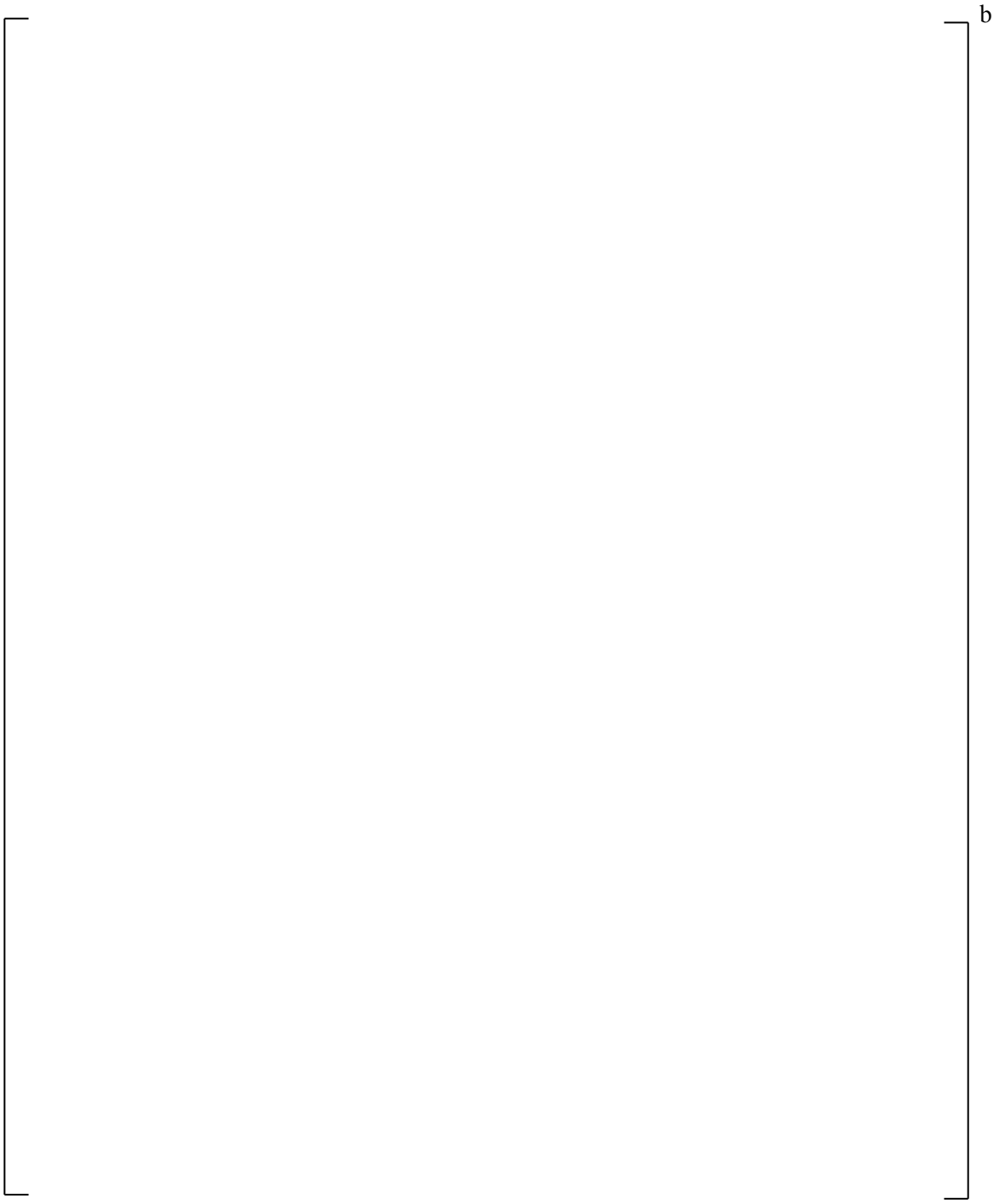

Figure 3: Comparison of MSLB Wrapper Barrel Pressure Drops with Modified Void Fraction Correlation

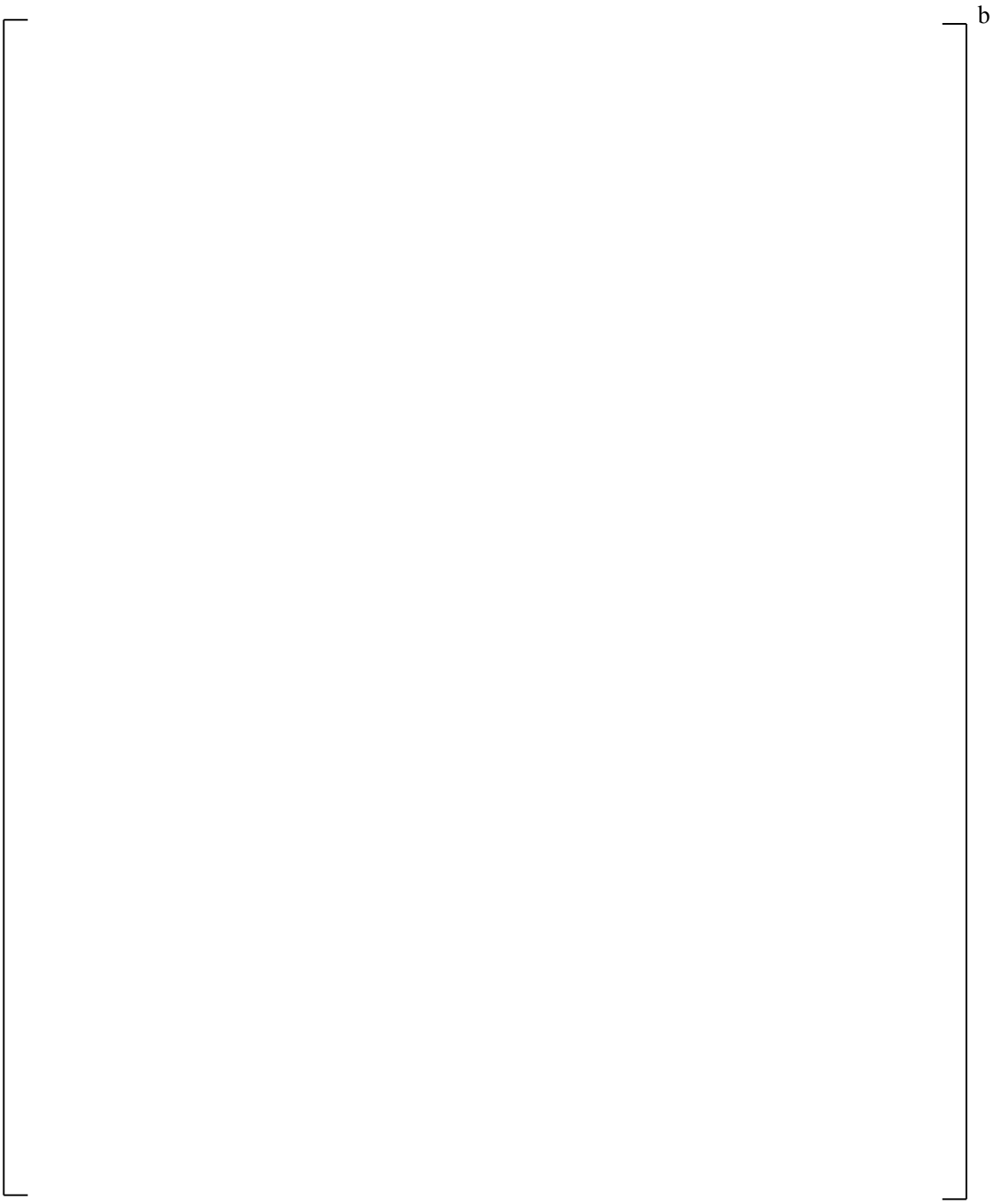

Figure 4: Comparison of MSLB TSP H Pressure Drops with Modified Void Fraction Correlation

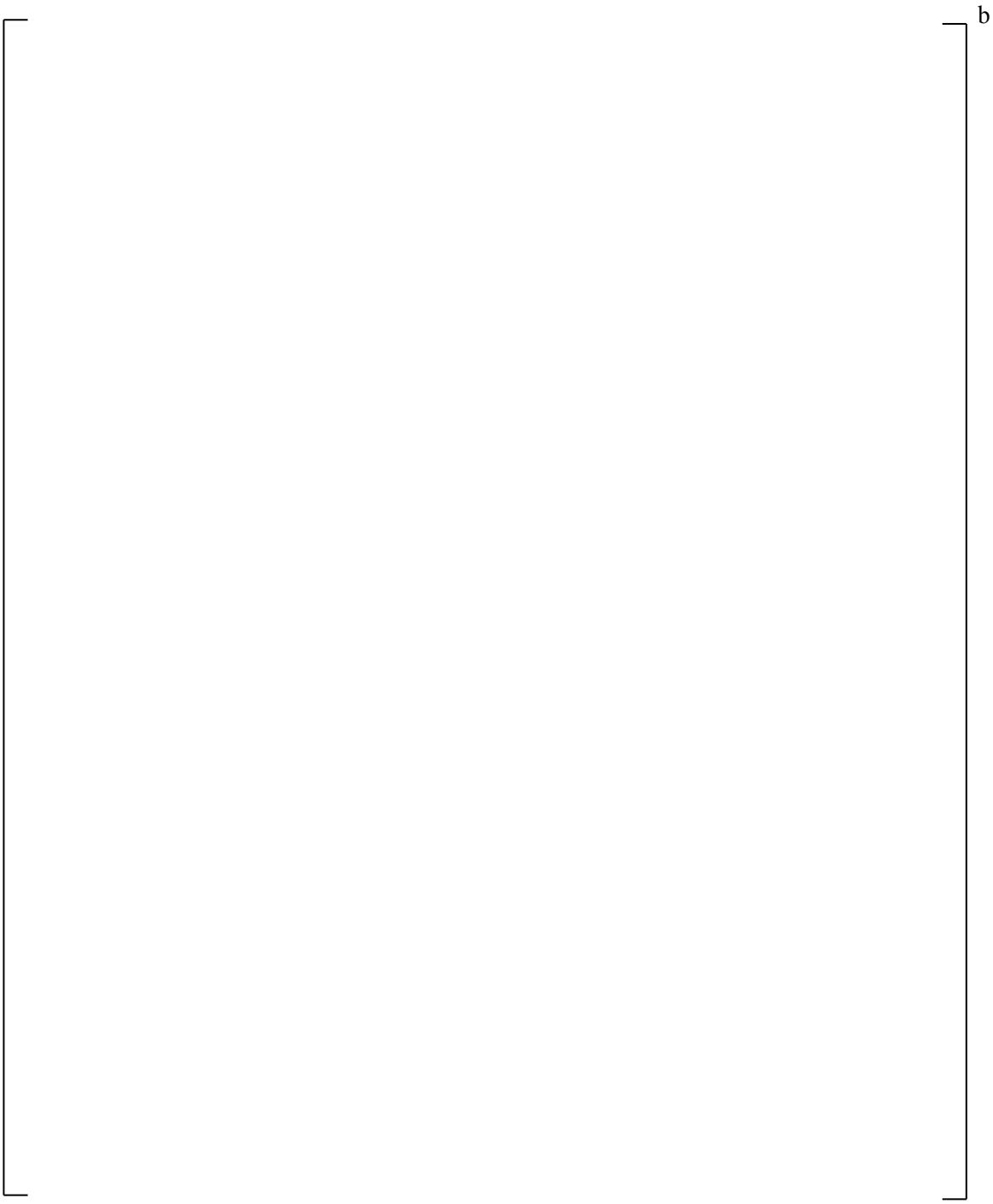

Figure 5: Comparison of MSLB LDP Pressure Drops with Modified Void Fraction Correlation

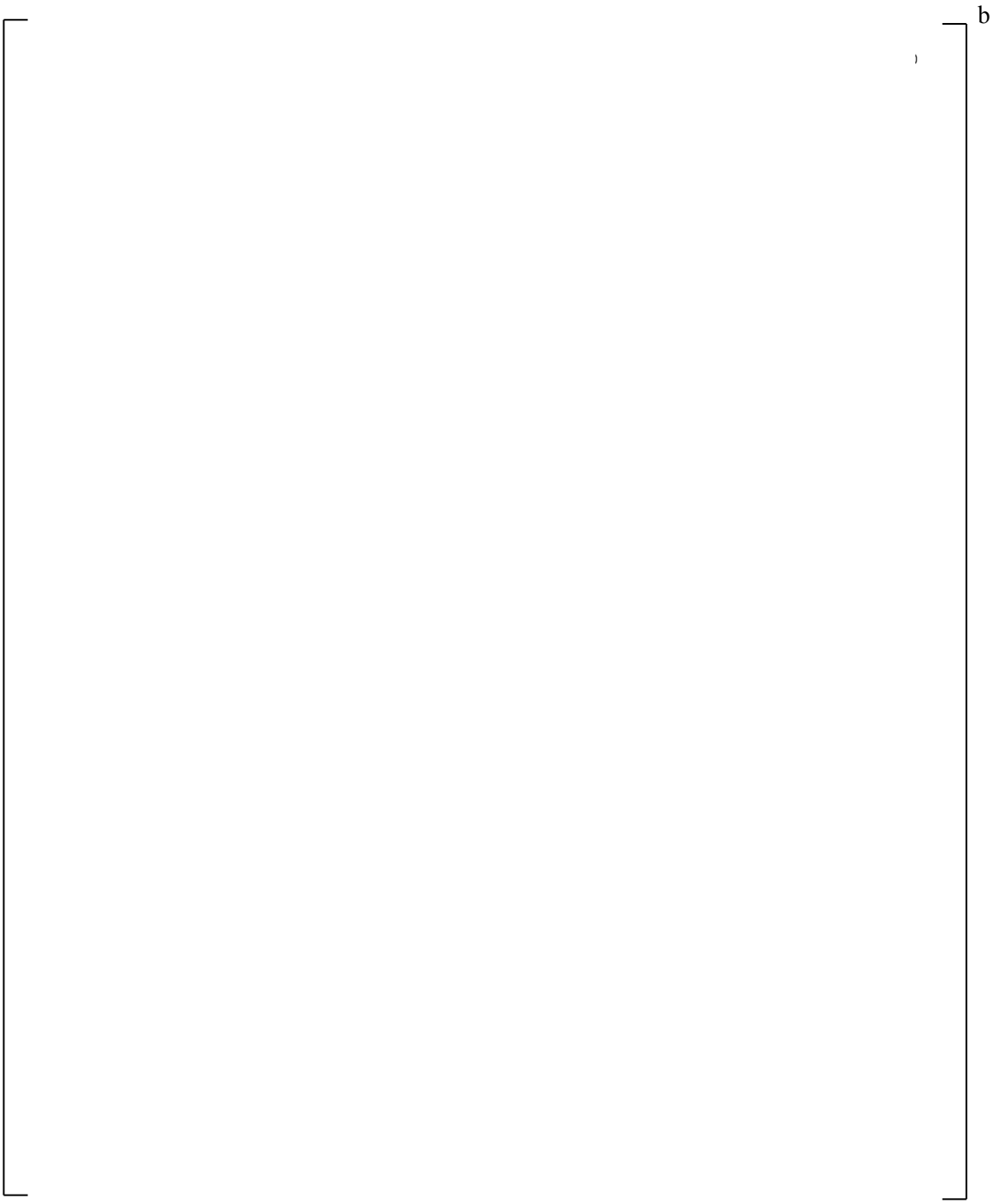

Figure 6: Comparison of MSLB MDP Pressure Drops with Modified Void Fraction Correlation

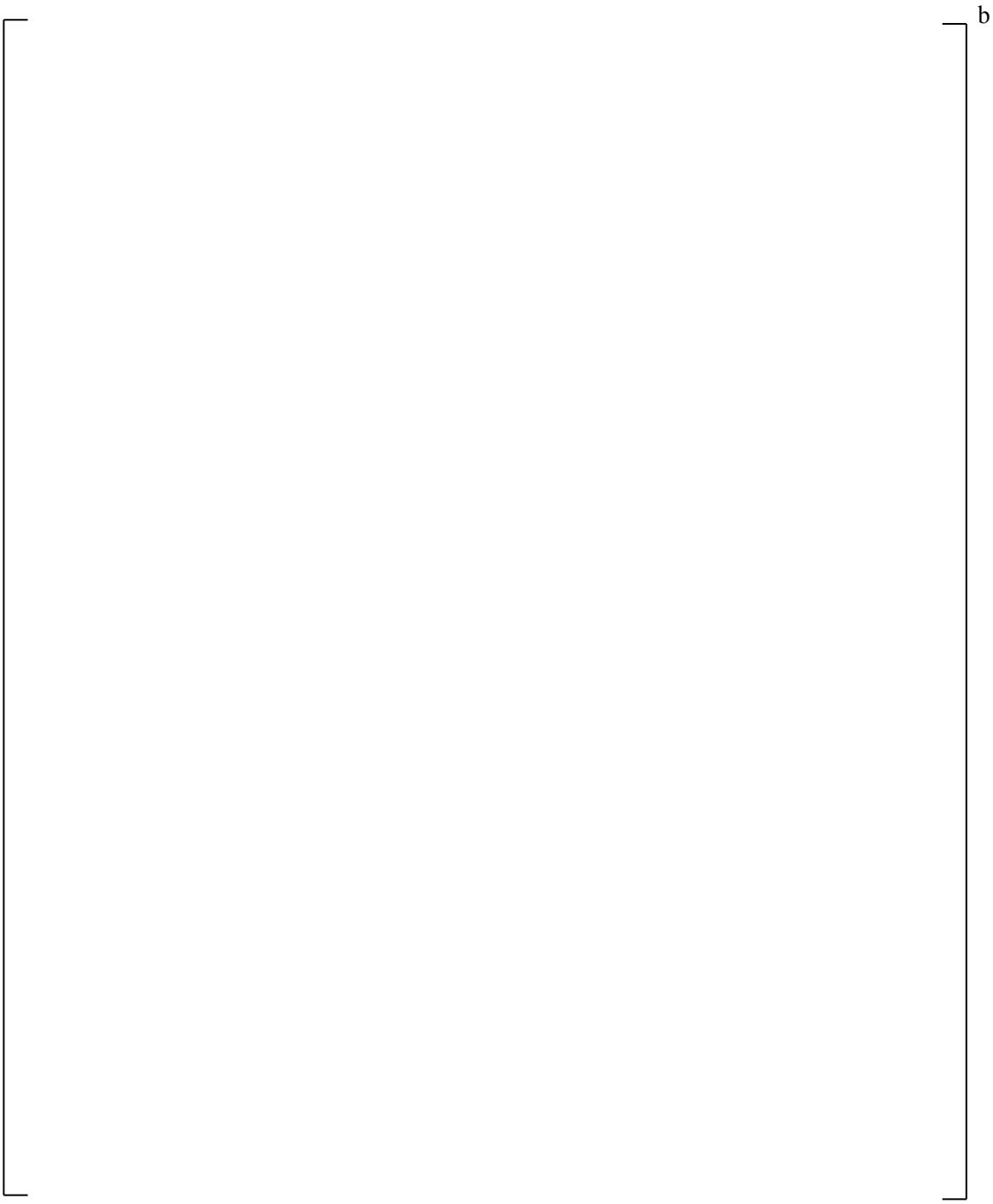

Figure 7: Comparison of MSLB Primary Separator Pressure Drops with Modified Void Fraction Correlation

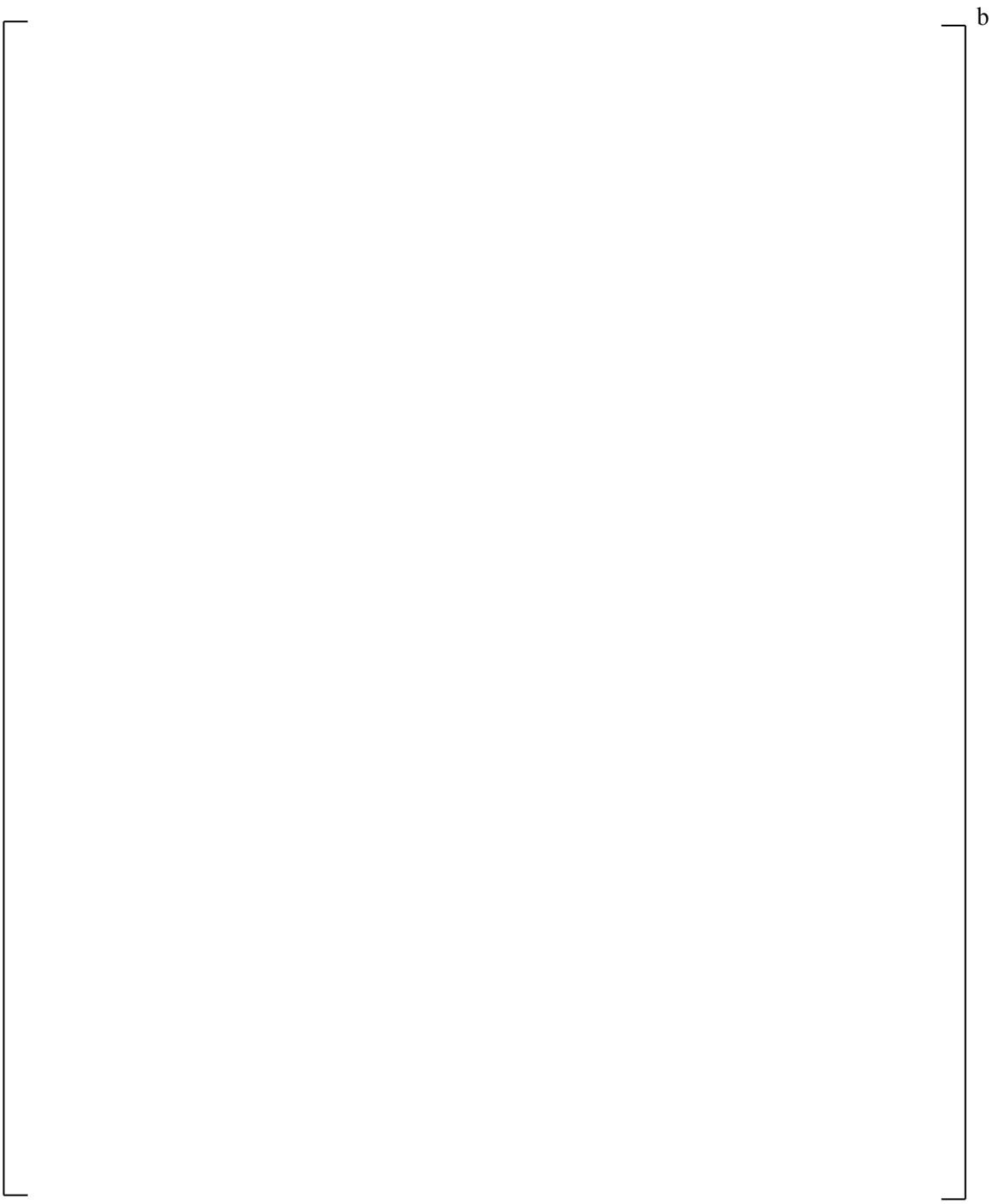

Figure 8: Comparison of MSLB Secondary Separator Pressure Drops with Modified Void Fraction Correlation

2. Round 2 RAI #2:

MPR-663 makes the following assumption in the derivation of the **[ ]**[b]

[ ][b]

It is not clear to the NRC staff why this assumption is appropriate, given that it does not appear to be consistent with typical definitions of the **[ ]**[b]. In the reference for the void correlation, **[ ]**[b], the following relationship appears to have been assumed in the development of Equation 5.12:

[ ][b]

This is more consistent with the NRC staff's expectation.

Please provide and support a justification for the assumption made in TRANFLOW. Demonstrate that the assumptions are sufficiently realistic and provide conservative or accurate results for the prediction of SG component pressure drop.

Response:

The TRANFLOW computer program was originally developed by MPR Associates, Inc., (as TRANFLO) for Westinghouse in the early 1970s to determine thermal-hydraulic conditions in the SGs during various transients in order to assist in the design and structural analyses of SGs and the verification of TRANFLO(W) has included comparison to test data, field data, hand calculations, and independent computer code prediction (Reference 7).

TRANFLOW uses a variety of well-known mathematical methods and empirical correlations to provide accurate solutions to thermal-hydraulic design problems using standard SG parameters and assumptions.

One of the models incorporated in TRANFLOW is a drift-flux model. The drift-flux formulation was added to TRANFLOW to obtain more realistic representation of low-velocity regions and to allow for the counter-current flow of steam and water. The counter-current flow between phases is dependent on the relative velocity and quality. The relative velocity term, [ ][b], in TRANFLOW is present in the energy conservation and momentum equations and represents the relative velocity between steam and water in a two-phase flow.

The calculation of [ ][b] in TRANFLOW is based on a correlation for [ ][b] found in Reference 3 along with the assumption mentioned in the question statement. Namely that:

[ ]***b***

The [ ]^{b} assumption was made by the MPR code developer during an update to TRANFLOW as part of the implementation of the [ ]^{b} model. The basis for this assumption could not be verified.

This assumption of [ ]^{b} is used in the exponent of the second term in the equation for [ ]^{b} in TRANFLOW (reproduced from Reference 2):

a,c

[ ]

To answer Round 2 RAI #2, a modified TRANFLOW executable was developed by Westinghouse where the typical definition of [ ]^{b} (as described in the NRC question) was used. SG component pressure drops were calculated by using both the current, unmodified version and the modified version of TRANFLOW. Results are compared to show that the current version provides conservative, accurate results.

A MSLB transient simulation for Waterford Unit 3 was performed using TRANFLOW with both the [ ]^{b} as currently implemented using [ ]^{b} and with a revised [ ]^{b} calculated using [ ]^{b}. Results for some key SG components are presented in Table 3.

The results show that the maximum hydraulic loads are bounded by the existing [ ]^{b} implementation and are conservative or show small differences relative to the case in which a revised [ ]^{b} is calculated using [ ]^{b} as seen in Table 3 and Figure 9 through Figure 14.

Table 3: Peak Pressure Loads for MSLB Transient Initiated from Full Load

a,c

b

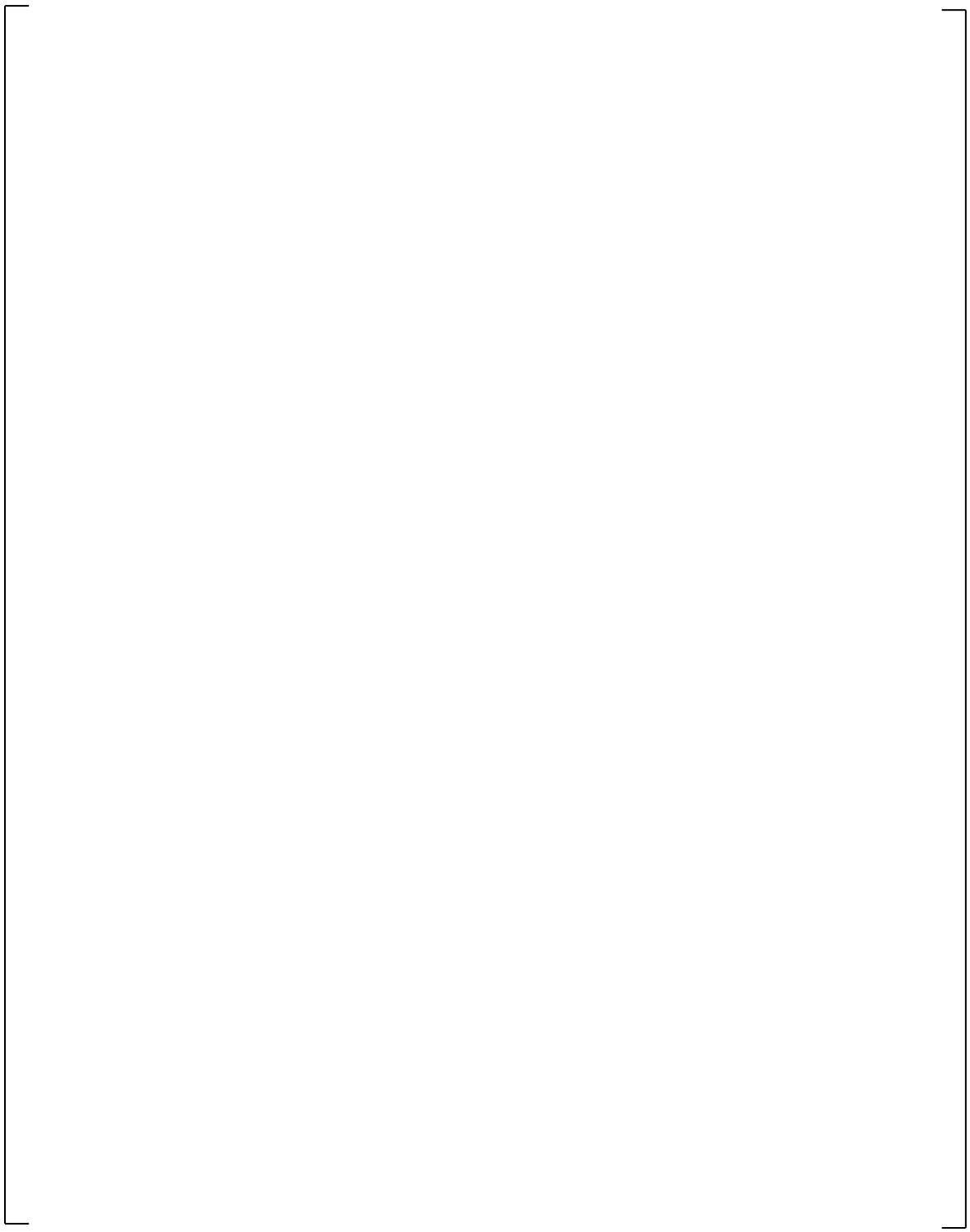

Figure 9: Steam Generator MSLB – 100% Power Pressure Difference Wrapper Barrel

b

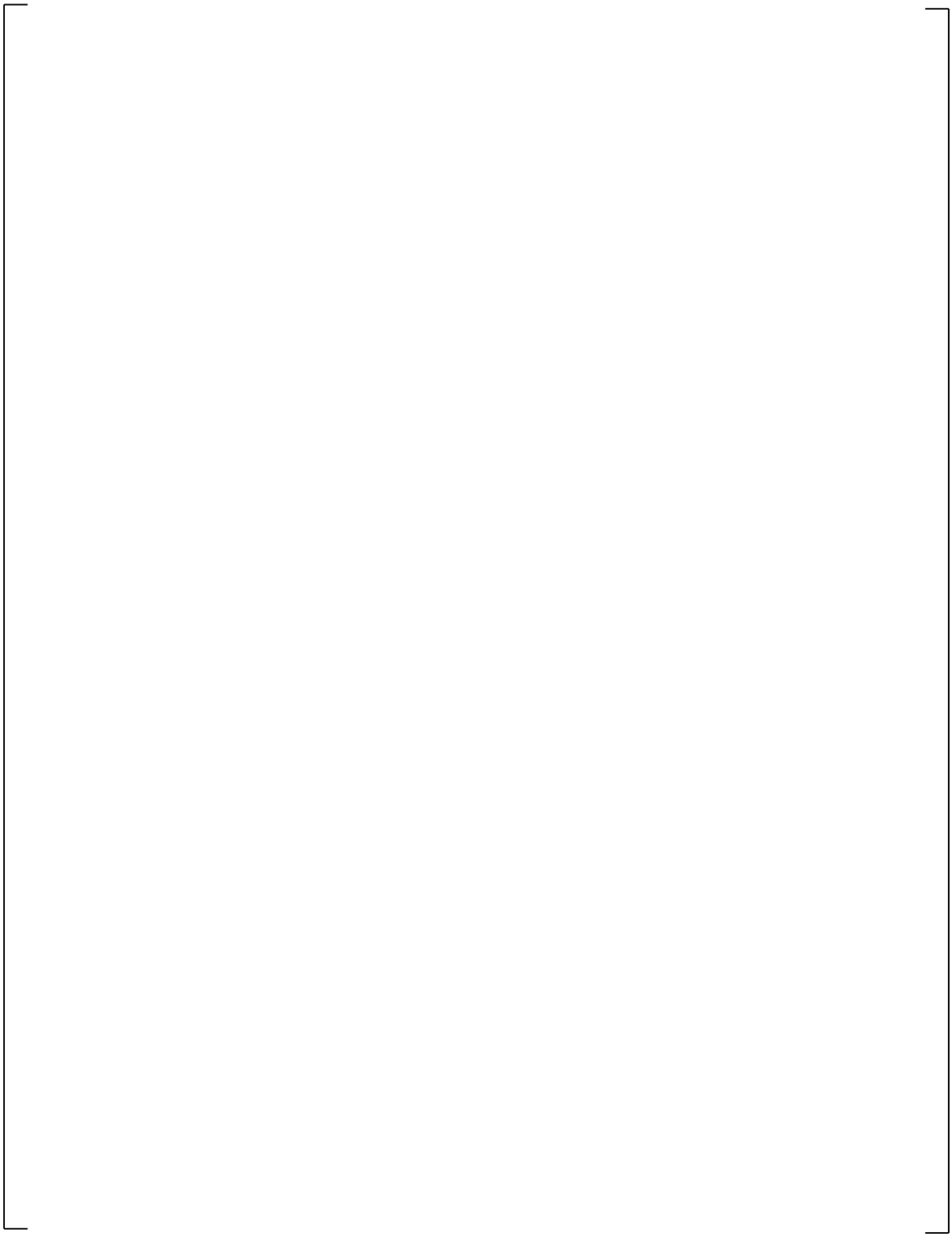

Figure 10: Steam Generator MSLB – 100% Power Pressure Difference TSP H (Top TSP)

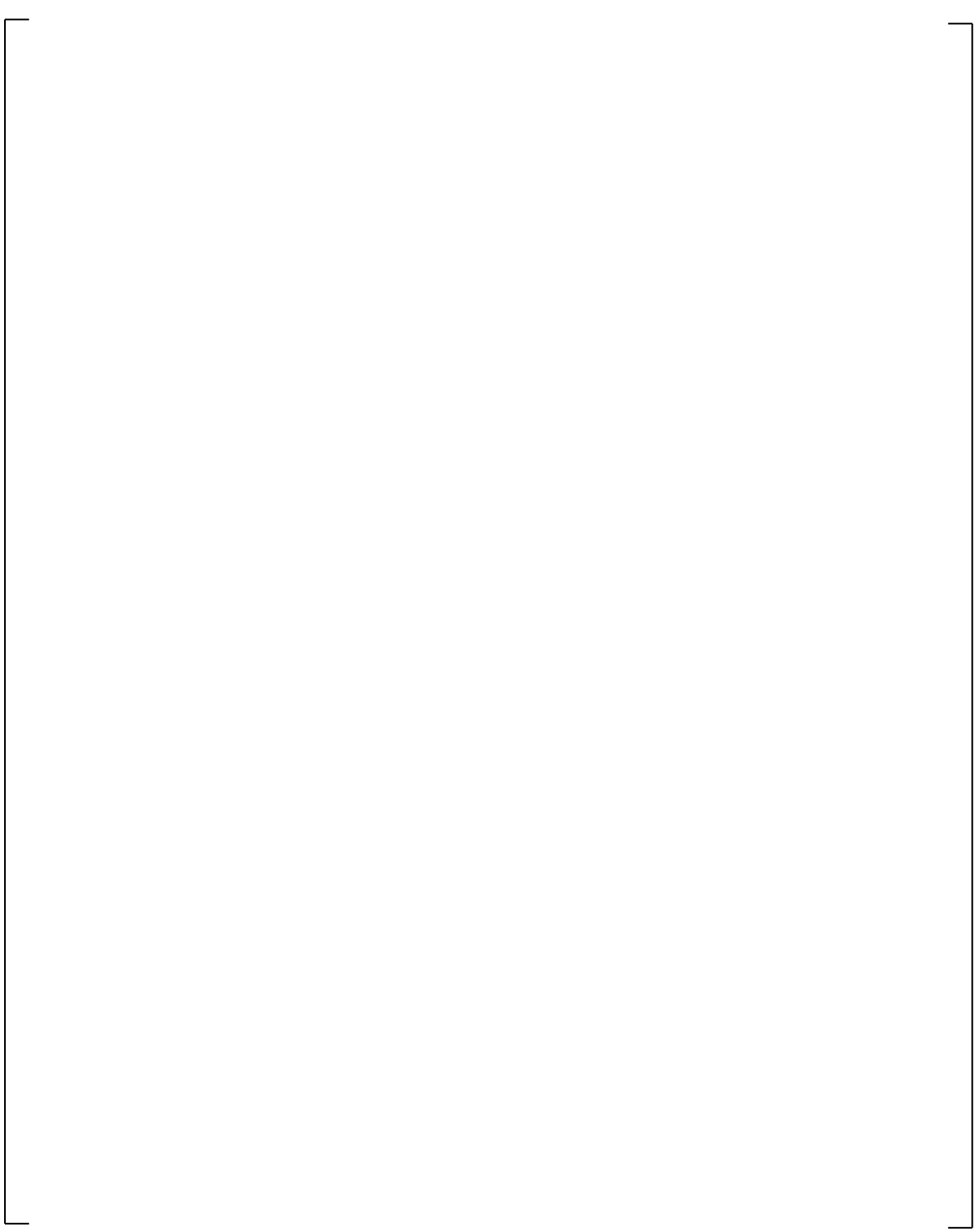

Figure 11: Steam Generator MSLB – 100% Power Pressure Difference Lower Deck Plate

b

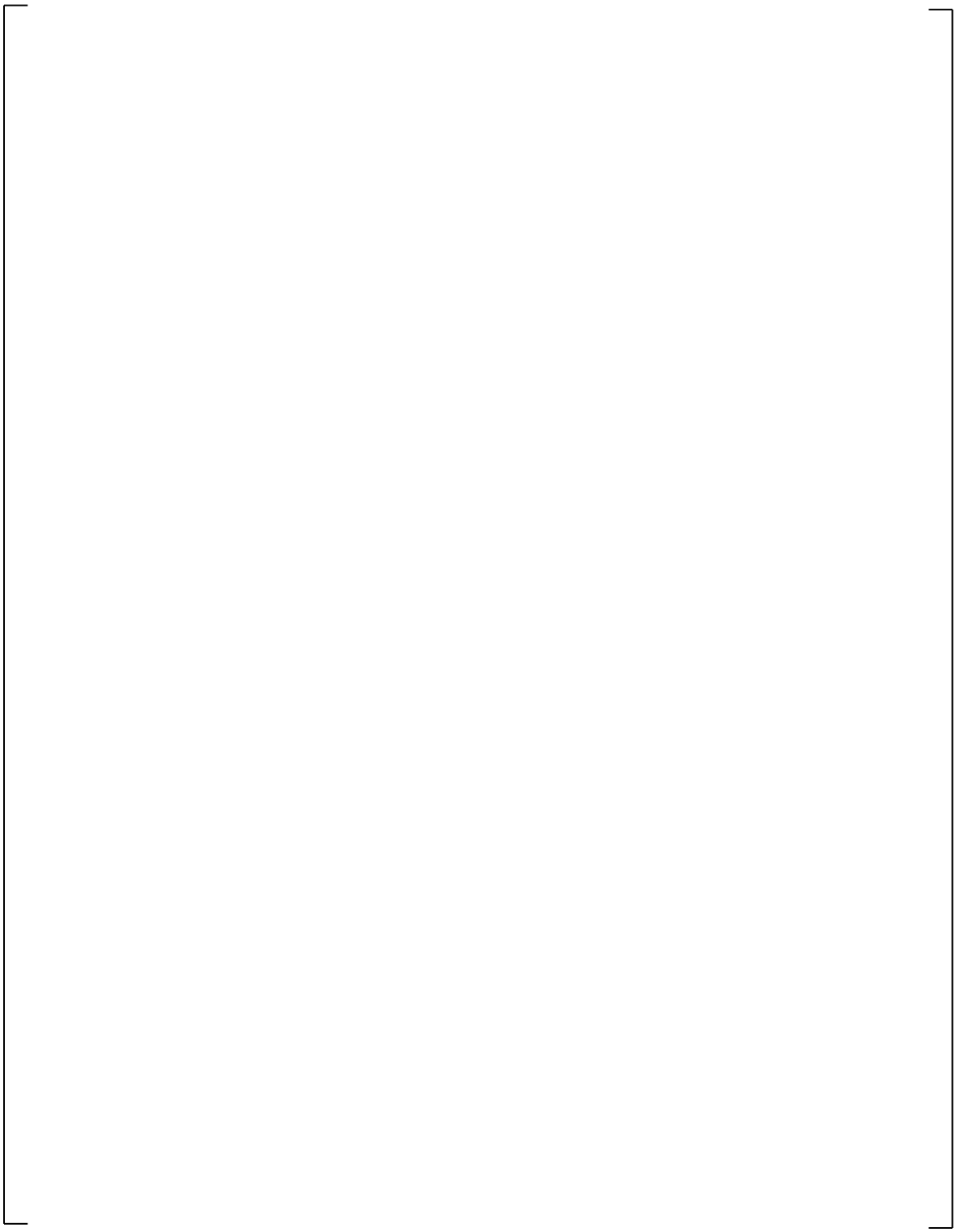

Figure 12: Steam Generator MSLB – 100% Power Pressure Difference Mid Deck Plate

b

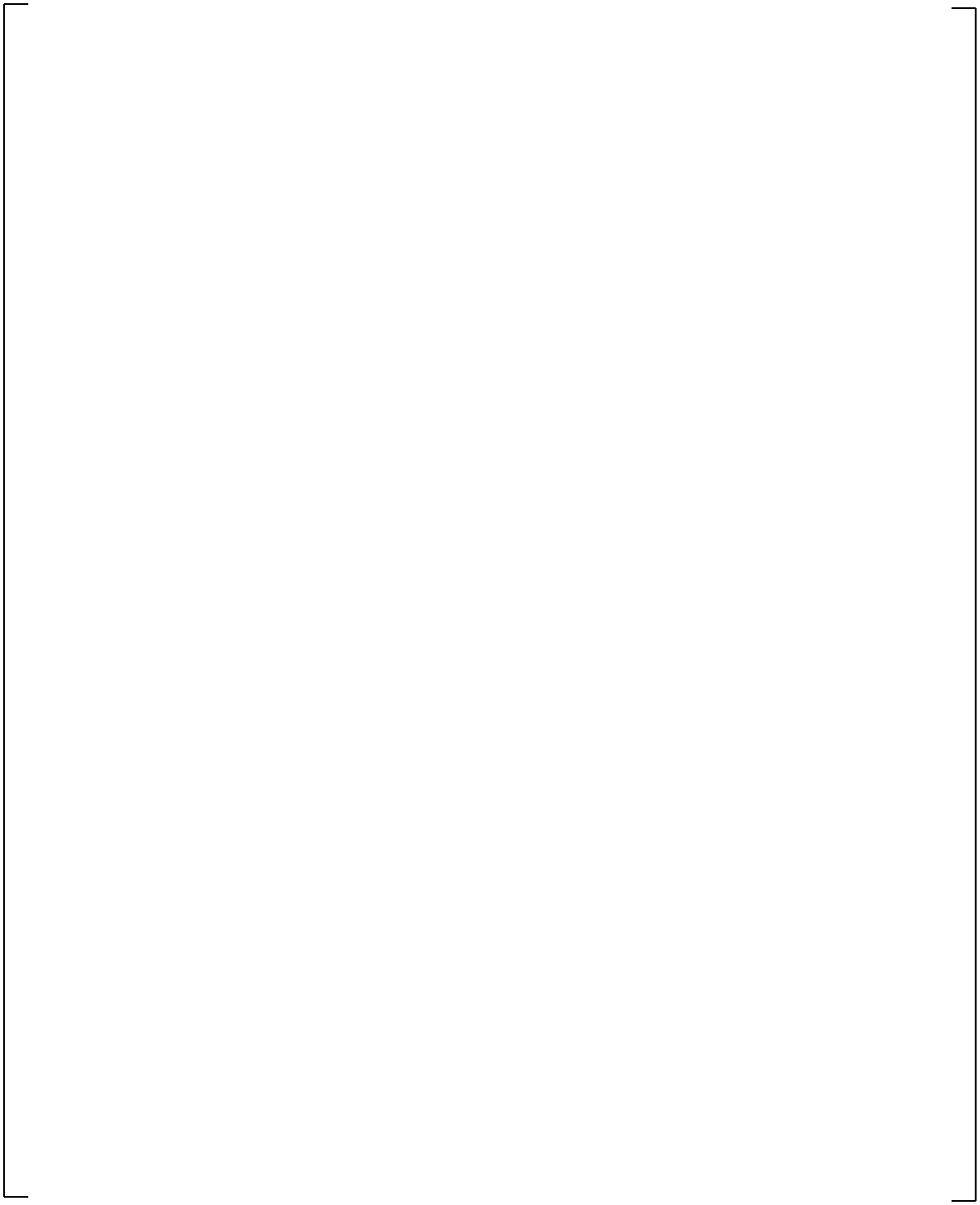

Figure 13: Steam Generator MSLB – 100% Power Pressure Difference Primary Separator

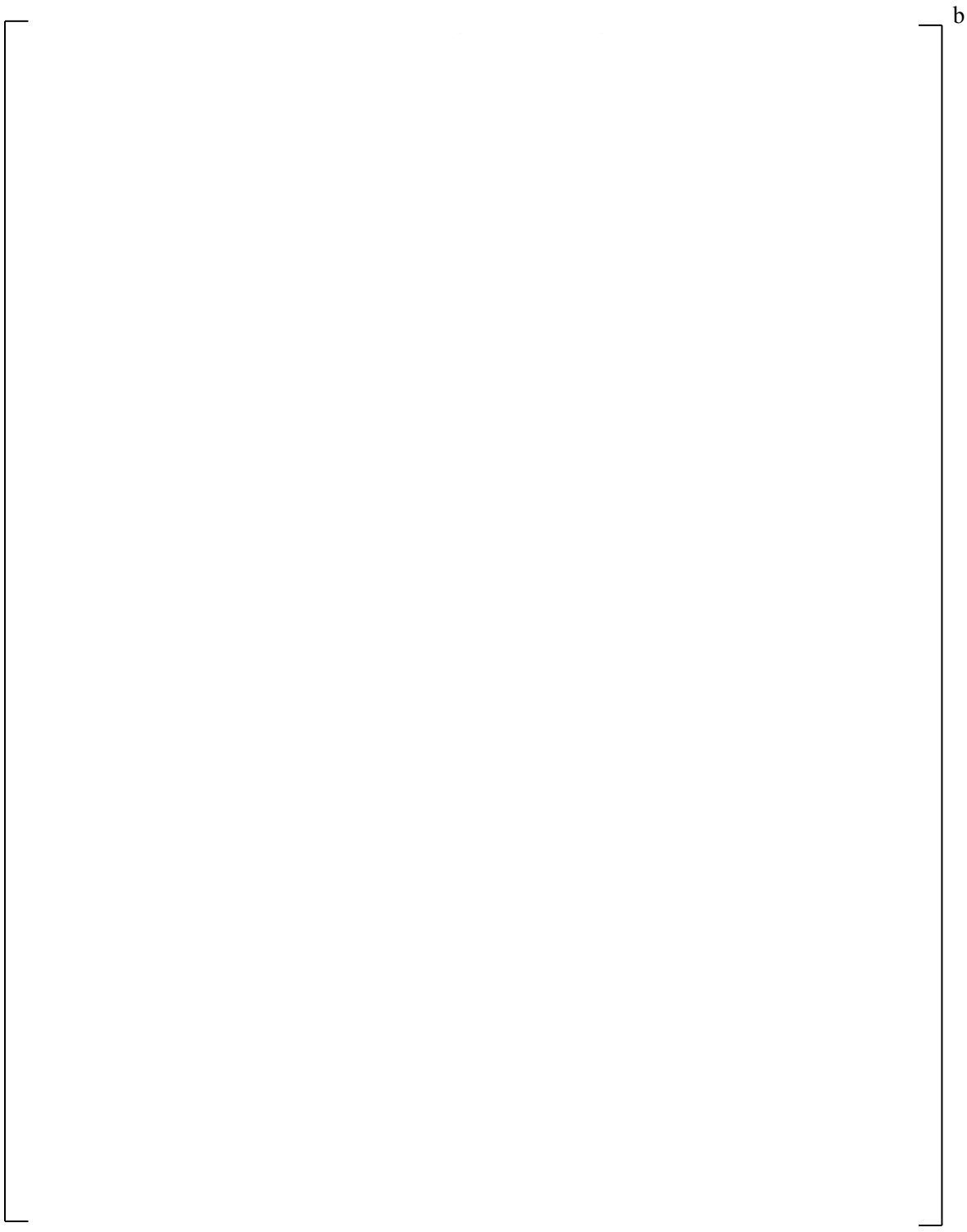

Figure 14: Steam Generator MSLB – 100% Power Pressure Difference Secondary Separator

TRANFLOW has been extensively validated and qualified by a variety of sources and methods (Reference 8). It has been shown that the results produced using TRANFLOW are acceptable when making engineering justifications for the design of the SG components.

The use of [ ]^{b} , as currently implemented in TRANFLOW, results in larger peak hydraulic loads than the peak hydraulic loads obtained using the typical definition of [ ]^{b} for the MSLB transient.

REFERENCES:

1. MPR Associates Report MPR-663, Revision 0, "TRANFLO: A Computer Program for Transient Thermal Hydraulic Analysis with Drift Flux," November 1980.

2. ADAMS Accession No. ML19019A025, LTR-SGMP-18-45 P-Attachment, Revision 0, "Responses to Request for Additional Information Regarding Waterford 3 Amendment Request for Revision of UFSAR Section 3.9 to Incorporate the TRANFLOW Computer Code," Westinghouse Electric Company LLC, January 2019.

3. [

   ]^{b}

4. [

   ]^{b}

5. [

   ]^{b}

6. [

   ]^{b}

7. 80FRSG-TR-E06, Revision C, "GENF/TRANFLOW Computer Codes Qualification Summary Report for EDF RSG 1300 MWe Project," Westinghouse Electric Company LLC, August 2013.

8. ADAMS Accession No. ML18169A275, LTR-SGMP-17-107, P-Attachment, Revision 0, "Acceptability of the TRANFLOW Computer Code for Steam Line Break Internal Pressure Loads for the Waterford Unit 3 Replacement Steam Generators," Westinghouse Electric Company LLC, February 2018.

9. CN-NCE-08-44, Revision 0, "Waterford 3 Replacement Steam Generator TRANFLOW Analysis: Emergency and Faulted Transients," Westinghouse Electric Company LLC, May 2009.

ATTACHMENT 2

W3F1-2019-0040

Westinghouse Letter CAW-19-4914

As Attachment 3 contains information proprietary to Westinghouse Electric Company LLC, it is supported by an Affidavit signed by Westinghouse, the owner of the information. The affidavit sets forth the basis on which the information may be withheld from public disclosure by the commission and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations.

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:
COUNTY OF BUTLER:

(1) I, Camille T. Zozula, have been specifically delegated and authorized to apply for withholding and execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse).

(2) I am requesting the proprietary portions of LTR-CDMP-19-31 P-Attachment Revision 0 be withheld from public disclosure under 10 CFR 2.390.

(3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged, or as confidential commercial or financial information.

(4) Pursuant to 10 CFR 2.390, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse and is not customarily disclosed to the public.

(ii) Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar technical evaluation justifications and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

AFFIDAVIT

(5) Westinghouse has policies in place to identify proprietary information. Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage (e.g., by optimization or improved marketability).

(c) Its use 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 a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

(6) The attached documents are bracketed and marked to indicate the bases for withholding. The justification for withholding is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters

AFFIDAVIT

refer to the types of information Westinghouse customarily holds in confidence identified in Sections (5)(a) through (f) of this Affidavit.

I declare that the averments of fact set forth in this Affidavit are true and correct to the best of my knowledge, information, and belief.

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

Executed on: 03 July 2019

Camille T. Zozula, Manager
Infrastructure & Facilities Licensing

PROPRIETARY INFORMATION NOTICE

Transmitted herewith are proprietary and non-proprietary versions of a document, furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the Affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

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