PROPRIETARY INFORMATION - WITHHOLD UNDER 10 CFR 2.390

Nebraska Public Power District

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50.90

NLS2016021
April 21, 2016

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Subject: License Amendment Request to Revise Technical Specifications - Safety Limit Minimum Critical Power Ratio
Cooper Nuclear Station, Docket No. 50-298, License No. DPR-46

Dear Sir or Madam:

The purpose of this letter is for the Nebraska Public Power District (NPPD) to request an amendment to Renewed Facility Operating License DPR-46 in accordance with the provision of 10 CFR 50.4 and 10 CFR 50.90 to revise the Cooper Nuclear Station (CNS) Technical Specifications (TS). The proposed changes to TS Section 2.0, Safety Limits, will revise the two recirculation loop and the single recirculation loop Safety Limit Minimum Critical Power Ratio (SLMCPR) values to reflect results of a cycle specific calculation. NPPD has concluded that the proposed changes do not involve a significant hazards consideration and that they satisfy the categorical exclusion criteria of 10 CFR 51.22(c).

NPPD requests Nuclear Regulatory Commission (NRC) approval of the proposed TS changes and issuance of the requested license amendment by October 1, 2016. The changes are needed to support startup from Refuel Outage 29, which is scheduled for October 31, 2016, and for the subsequent operating Cycle 30. Once approved, the amendment will be implemented prior to startup from Refuel Outage 29. In addition, NPPD requests that Enclosure 2, which contains proprietary information, be withheld from public disclosure.

Attachment 1 provides a description of the proposed TS changes, the technical evaluation, the regulatory safety analysis, the no significant hazards consideration evaluation pursuant to 10 CFR 50.91(a)(1), and the environmental considerations evaluation pursuant to 10 CFR 51.22. Attachment 2 provides a marked up page with the specific changes to the current CNS TS. Attachment 3 provides the revised TS page in final typed format. No TS Bases pages are affected by this amendment request. Enclosure 1 contains a non-proprietary version of additional information provided by Global Nuclear Fuels (GNF). Enclosure 2 contains a proprietary version of additional information provided by GNF. Enclosure 3 contains the affidavit for withholding GNF proprietary information.

Note: Enclosure 2 to this letter contains Proprietary Information. Upon separation from Enclosure 2, the remainder of this document is decontrolled.

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A001
NRR

The proposed TS changes have been reviewed by the necessary safety review committees (Station Operations Review Committee and Safety Review and Audit Board). Amendments to the CNS Facility Operating License through Amendment 253 dated January 22, 2016, have been incorporated into this request. This request is submitted under oath pursuant to 10 CFR 50.30(b).

By copy of this letter, its attachments, and its enclosures, the appropriate State of Nebraska official is notified in accordance with 10 CFR 50.91(b)(1). Copies to the NRC Region IV office and the CNS Resident Inspector are also being provided in accordance with 10 CFR 50.4(b)(1).

This letter does not contain any new regulatory commitments.

If you have any questions concerning this matter, please contact Jim Shaw, Licensing Manager, at (402) 825-2788.

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

Executed on: 4/21/16
(Date)

Sincerely,

Oscar A. Limpias
Vice President – Nuclear and
Chief Nuclear Officer

/dv

Attachments:
1. License Amendment Request to Revise Technical Specifications - Safety Limit Minimum Critical Power Ratio
2. Proposed Technical Specifications Revision (Markup)
3. Proposed Technical Specifications Revision (Final Typed Format)

Enclosures:
1. GNF Additional Information Regarding the Requested Changes to the Technical Specification SLMCPR - Cooper Nuclear Station Cycle 30 (Non-Proprietary)
2. GNF Additional Information Regarding the Requested Changes to the Technical Specification SLMCPR - Cooper Nuclear Station Cycle 30 (Proprietary)

Note: Enclosure 2 to this letter contains Proprietary Information. Upon separation from Enclosure 2, the remainder of this document is decontrolled.

3. Affidavit for Withholding Proprietary Information Contained in the GNF Additional Information Regarding the Requested Changes to the Technical Specification SLMCPR - Cooper Nuclear Station Cycle 30

cc: Regional Administrator w/ attachments and enclosures
USNRC - Region IV

Cooper Project Manager w/ attachments and enclosures
USNRC - NRR Plant Licensing Branch IV-2

Senior Resident Inspector w/ attachments and enclosures
USNRC - CNS

Nebraska Health and Human Services w/ attachments and enclosures
Department of Regulation and Licensure

NPG Distribution w/o attachments and enclosures

CNS Records w/ attachments and enclosures

Note: Enclosure 2 to this letter contains Proprietary Information. Upon separation from Enclosure 2, the remainder of this document is decontrolled.

Attachment 1

License Amendment Request to Revise Technical Specifications - Safety Limit Minimum Critical Power Ratio

Cooper Nuclear Station, Docket No. 50-298, License No. DPR-46

Revised Page

2.0-1

1.0 SUMMARY DESCRIPTION

This evaluation supports a request to amend Renewed Operating License DPR-46 for Cooper Nuclear Station (CNS). The proposed changes are to revise the value of the Safety Limit Minimum Critical Power Ratio (SLMCPR) for two recirculation loop operation (TLO) and for single recirculation loop operation (SLO) in Technical Specifications (TS) 2.1.1.2 based on analysis performed for CNS operation in Cycle 30.

CNS requests approval of this license amendment request (LAR) by October 1, 2016. Once approved, the amendment will be implemented prior to startup from Refuel Outage RE29.

2.0 DETAILED DESCRIPTION

2.1 Proposed Change

Pursuant to 10 CFR 50.90, Nebraska Public Power District proposes to revise the Safety Limit in CNS TS Section 2.1.1.2 by changing the value of Minimum Critical Power Ratio (MCPR) for TLO from ≥ 1.11 to ≥ 1.12 and the value of MCPR for SLO from ≥ 1.13 to ≥ 1.14.

2.2 Need for Change

The current SLMCPR values for TLO and SLO (≥ 1.11 and ≥ 1.13 respectively) contained in the CNS TS are not applicable for the upcoming operating cycle due to core loading design. Based upon the core loading for the upcoming operating cycle, the cycle specific SLMCPR values were determined to be ≥ 1.12 for TLO and ≥ 1.14 for SLO.

2.3 Bases Changes

No changes to the associated Bases are needed.

3.0 TECHNICAL EVALUATION

3.1 System Description

CNS is a boiling water reactor (BWR) of General Electric BWR4 design, with a Mark 1 containment. The design of the BWR core and fuel is based on a proper combination of design variables, such as moderator-to-fuel volume ratio, core power density, thermal-hydraulic characteristics, fuel exposure level, nuclear characteristics of the core and fuel, heat transfer, flow distribution, void content, bundle power, and operating pressure. The CNS Cycle 30 core has 540 GNF2 and 8 GE14 fuel assemblies, and will be licensed by approval of the Cycle 30 Core Operating Limits Report (COLR). Cycle 30 is scheduled to end September 2018.

3.2 Updated Safety Analysis Report (USAR) Safety Design Basis

The safety design basis provided in USAR Section III-7 is that the thermal hydraulic design of the core shall establish a thermal hydraulic safety limit for use in evaluating the safety margin relating the consequences of fuel barrier failure to public safety. To ensure that adequate margin is maintained, a design requirement based on a statistical analysis was selected as follows:

> Moderate frequency transients caused by a single operator error or equipment malfunction shall be limited such that, considering uncertainties in manufacturing and monitoring the core operating state, at least 99.9% of the fuel rods would be expected to avoid boiling transition.

The lowest allowable transient MCPR limit which meets the above design requirement is termed the fuel cladding integrity SLMCPR.

A plant-unique operating limit MCPR is established to provide adequate assurance that the fuel cladding integrity safety limit (SL) is not exceeded for any anticipated operational transients. In general, the analysis basis for most of the transient analyses is the full power, full flow, end-of-cycle, all-rods out condition. Cycle specific delta critical power ratio (CPR) values are determined as part of the reload analysis and are reported in the Supplemental Reload Licensing Report.

3.3 Current TS Bases

The fuel cladding integrity SL is set such that no significant fuel damage is calculated to occur if the limit is not violated. Since the parameters that result in fuel damage are not directly observable during reactor operation, the thermal and hydraulic conditions that result in the onset of transition boiling have been used to mark the beginning of the region in which fuel damage could occur. Although it is recognized that the onset of transition boiling would not result in damage to BWR fuel rods, the critical power at which boiling transition is calculated to occur has been adopted as a convenient limit. However, the uncertainties in monitoring the core operating state and in the procedures used to calculate the critical power result in an uncertainty in the value of the critical power. Therefore, the fuel cladding integrity SL is defined as the CPR in the limiting fuel assembly for which more than 99.9% of the fuel rods in the core are expected to avoid boiling transition, considering the power distribution within the core and all uncertainties.

The MCPR SL is determined using a statistical model that combines all the uncertainties in operating parameters and the procedures used to calculate critical power. The probability of the occurrence of boiling transition is determined using the approved General Electric Critical Power correlations. Details of the fuel cladding integrity SL calculation are given in NEDE-24011-P-A, General Electric Standard

Application for Reactor Fuel (Revision specified in the COLR). The NEDE-24011-P-A also includes a tabulation of the uncertainties used in the determination of the MCPR SL and of the nominal values of the parameters used in the MCPR SL statistical analysis.

3.4 Analytical Methods

The requested changes to the TS SLMCPR values are $\geq$ 1.12 for TLO and $\geq$ 1.14 for SLO for CNS Cycle 30. The primary reason for the changes is that in the limiting case the core bundle-to-bundle MCPR distribution is generally flatter than the limiting case in the previous cycle. This difference causes the SLMCPR values to increase.

The SLMCPR calculation for CNS Cycle 30 are performed in accordance with the analytical methods described in the documents listed in CNS TS Section 5.6.5.b. Specifically, these documents are:

- NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel" (Revision specified in the COLR).
- NEDE-23785-1-P-A, "The GESTR-LOCA and SAFER Models for the Evaluation of the Loss-of-Coolant Accident," Volume III, Revision 1, October 1984.
- NEDO-31960 and NEDO-31960 Supplement 1, "BWR Owner's Group Long-Term Stability Solutions Licensing Methodology" (the approved Revision at the time the reload analysis is performed).

3.5 Technical Justification of Proposed Changes

The required information to justify the requested changes to the SLMCPR values is provided in the Global Nuclear Fuels report (Enclosures 1 and 2).

4.0 Regulatory Safety Analysis

4.1 Applicable Regulatory Requirements

4.1.1 10 CFR 50, Appendix A, General Design Criteria (GDC)

General Design Criterion 10, Reactor Design, "The reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences."

The fuel cladding must not sustain damage as a result of normal operation and abnormal operational transients. The reactor core safety limits are established

to preclude violation of the fuel design criterion such that at least 99.9% of the fuel rods in the core would not be expected to experience the onset of transition boiling.

As part of a reload core design, cycle specific transient analyses are performed to determine the required SLMCPR and the change in CPR for specific transients. To ensure that adequate margin is maintained, a design requirement based on a statistical analysis was selected, in that moderate frequency transients caused by a single operator error or equipment malfunction shall be limited such that, considering uncertainties in manufacturing and monitoring the core operating state, at least 99.9% of the fuel rods would be expected to avoid boiling transition. The lowest allowable transient MCPR limit which meets the above design requirement is termed the fuel cladding integrity SLMCPR.

NUREG-0800, Standard Review Plan, Section 4.4, "Thermal and Hydraulic Design," Acceptance Criterion 1.B, states in part, that the limiting (minimum) value of CPR is to be established such that at least 99.9% of the fuel rods in the core would not be expected to experience departure from nucleate boiling during normal operation or anticipated operational occurrences.

4.1.2 CNS USAR Appendix F

CNS was designed and constructed to meet the intent of the 70 General Design Criteria issued by the Atomic Energy Commission (AEC), as originally proposed in July 1967. These GDC constitute the licensing basis for CNS, except where specified commitments have been made to the 1971 GDC. The AEC conducted their technical review of the CNS design against the 1971 GDC, and concluded that the CNS design conforms to the intent of the 1971 GDC.

The 1967 Proposed GDC and CNS conformance with the criteria are discussed in Appendix F of the CNS USAR. Group II of the 1967 Proposed GDC is titled "Protection by Multiple Fission Product Barriers." Criterion 6, of Group II, is titled "Reactor Core Design." This criterion states:

> "The reactor core shall be designed to function throughout its design lifetime, without exceeding acceptable fuel damage limits which have been stipulated and justified. The core design, together with reliable process and decay heat removal systems shall provide for this capability under all expected conditions of normal operation with appropriate margins for uncertainties and for transient situations which can be anticipated, including the effects of the loss of power to recirculation pumps, tripping out of a turbine generator set, isolation of the reactor from its primary heat sink, and loss of all offsite power."

The equivalent criterion from the 1971 GDC, 10 CFR Appendix A, is Criterion 10, "Reactor Design."

4.2 Precedent

CNS submitted a LAR to revise TS SLMCPR in letter NLS2012040 dated May 30, 2012. This request was approved and the TS changed in Amendment 243 to the CNS license dated November 9, 2012.

4.3 No Significant Hazards Consideration

10 CFR 50.91(a)(1) requires that licensee requests for operating license amendments be accompanied by an evaluation of significant hazard posed by issuance of an amendment. Nebraska Public Power District (NPPD) has evaluated this proposed amendment with respect to the criteria given in 10 CFR 50.92(c).

The proposed changes would revise the Cooper Nuclear Station (CNS) Operating License by increasing the values of the Safety Limit Minimum Critical Power Ratio (SLMCPR) for two recirculation loop operation (TLO) and for single recirculation loop operation (SLO) in Technical Specifications 2.1.1.2. The TLO value of SLMCPR is increased from $\geq$ 1.11 to $\geq$ 1.12 and the SLO value of SLMCPR is increased from $\geq$ 1.13 to $\geq$ 1.14. The revised values of SLMCPR are based on analyses performed by Global Nuclear Fuels to determine the SLMCPR for the upcoming operating cycle 30.

1. Do the proposed changes involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The basis of the SLMCPR is to ensure no mechanistic fuel damage is calculated to occur if the limit is not violated. The new SLMCPR values preserve the existing margin to transition boiling. The derivation of the revised SLMCPR for CNS, for incorporation into the Technical Specifications and its use to determine plant and cycle-specific thermal limits, has been performed using Nuclear Regulatory Commission approved methods. The revised SLMCPR values do not change the method of operating the plant and have no effect on the probability of an accident, initiating event or transient.

Based on the above, NPPD concludes that the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Do the proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed changes result only from a specific analysis for the CNS core reload design. These changes do not involve any new or different methods for operating the facility. No new initiating events or transients result from these changes.

Based on the above, NPPD concludes that the proposed changes do not create the possibility of a new or different kind of accident from any previously evaluated.

3. Do the proposed changes involve a significant reduction in a margin of safety?

Response: No.

The values of the proposed SLMCPR provide a margin of safety by ensuring that no more than 0.1% of fuel rods are expected to be in a boiling transition if the Minimum Critical Power Ratio limit is not violated. The proposed changes will ensure the appropriate level of fuel protection is maintained. Additionally, operational limits are established based on the proposed SLMCPR to ensure that the SLMCPR is not violated during all modes of operation. This will ensure that the fuel design safety criteria are met (i.e., that at least 99.9% of the fuel rods do not experience transition boiling during normal operation as well as anticipated operational occurrences).

Based on the above, NPPD concludes that the proposed changes do not involve a significant reduction in a margin of safety.

4.4 Conclusion

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 Environmental Considerations

10 CFR 51.22(c) provides categories of actions which are categorical exclusions from performing an environmental assessment. An action which is a categorical exclusion does not require an environmental assessment or an environmental impact statement. 10 CFR

51.22(c)(9) allows as a categorical exclusion issuance of an amendment to a license for a reactor pursuant to 10 CFR 50 provided that (1) the amendment involves no significant hazards consideration, (2) there is no significant change in the types or significant increase in the amounts of any effluents that may be released off-site, and (3) there is no significant increase in individual or cumulative occupational radiation exposure.

NPPD has reviewed the proposed license amendment and concludes that it meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(c), no environmental impact statement or environmental assessment needs to be prepared in connection with issuance of the proposed license changes.

6.0 References

6.1 NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel" (Revision specified in the COLR).

6.2 NEDE-23785-1-P-A, "The GESTR-LOCA and SAFER Models for the Evaluation of the Loss-of-Coolant Accident," Volume III, Revision 1, October 1984.

6.3 NEDO-31960 and NEDO-31960 Supplement 1, "BWR Owner's Group Long-Term Stability Solutions Licensing Methodology" (the approved Revision at the time the reload analysis is performed).

Attachment 2

Proposed Technical Specifications Revision (Markup)

Cooper Nuclear Station, Docket No. 50-298, License No. DPR-46

Revised Page

2.0-1

2.0 SAFETY LIMITS (SLs)

2.1 SLs

2.1.1 Reactor Core SLs

2.1.1.1 With the reactor steam dome pressure < 785 psig or core flow < 10% rated core flow:

THERMAL POWER shall be ≤ 25% RTP.

2.1.1.2 With the reactor steam dome pressure ≥ 785 psig and core flow ≥ 10% rated core flow:

MCPR shall be ≥ ~~1.11~~ 1.12 for two recirculation loop operation or ≥ ~~1.13~~ 1.14 for single recirculation loop operation.

2.1.1.3 Reactor vessel water level shall be greater than the top of active irradiated fuel.

2.1.2 Reactor Coolant System Pressure SL

Reactor steam dome pressure shall be ≤ 1337 psig.

2.2 SL Violations

With any SL violation, the following actions shall be completed within 2 hours:

2.2.1 Restore compliance with all SLs; and

2.2.2 Insert all insertable control rods.

Attachment 3

Proposed Technical Specifications Revision (Final Typed Format)

Cooper Nuclear Station, Docket No. 50-298, License No. DPR-46

Revised Page

2.0-1

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MCPR shall be ≥ 1.12 for two recirculation loop operation or ≥ 1.14 for single recirculation loop operation.

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Enclosure 3

Affidavit for Withholding Proprietary Information Contained in the GNF Additional Information Regarding the Requested Changes to the Technical Specification SLMCPR - Cooper Nuclear Station Cycle 30

Cooper Nuclear Station, Docket No. 50-298, License No. DPR-46

Global Nuclear Fuel – Americas

AFFIDAVIT

I, Lukas Trosman, state as follows:

(1) I am Engineering Manager, Reload Design and Analysis, Global Nuclear Fuel – Americas, LLC (GNF-A), 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 GNF proprietary report GNF-000N6035-R1-P, "GNF Additional Information Regarding the Requested Changes to the Technical Specification SLMCPR, Cooper Nuclear Station Cycle 30," dated March 2016. GNF proprietary information in GNF-000N6035-R1-P is identified by a dotted underline inside double square brackets. [[This sentence is an example.{3}]] GNF proprietary information in some tables is identified with double square brackets before and after the object. In each case, 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, GNF-A 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, 975 F2d 871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704 F2d 1280 (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 GNF-A's competitors without license from GNF-A 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 GNF-A customer-funded development plans and programs, resulting in potential products to GNF-A;

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 GNF-A, 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 GNF-A, 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 GNF-A.

(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 GNF-A 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 details of GNF-A's fuel design and licensing methodology. The development of this methodology, along with the testing, development and approval was achieved at a significant cost to GNF-A.

The development of the fuel design and licensing methodology along with the interpretation and application of the analytical results is derived from an extensive experience database that constitutes a major GNF-A asset.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GNF-A's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GNF-A'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 GNF-A.

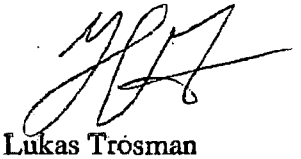
The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GNF-A's competitive advantage will be lost if its competitors are able to use the results of the GNF-A 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 GNF-A 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 GNF-A 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 10th day of March 2016.



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