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August 17, 2011

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	Docket Nos. 52-012-COL
)	52-013-COL
NUCLEAR INNOVATION NORTH AMERICA LLC)	
)	
(South Texas Project Units 3 and 4))	August 17, 2011

**SURREBUTTAL TESTIMONY OF APPLICANT WITNESS ADRIAN PIENIAZEK
REGARDING CONTENTION DEIS-1-G**

I. BACKGROUND

Q1. Please state your full name.

A1. My name is Adrian Pieniazek.

**Q2. Have you previously presented testimony in this proceeding related to
Contention DEIS-1-G?**

A2. Yes. I sponsored the “Direct Testimony of Applicant Witness Adrian Pieniazek Regarding Contention DEIS-1-G” (“Direct Testimony”) (Exhibit STP000001) and the “Rebuttal Testimony of Applicant Witness Adrian Pieniazek Regarding Contention DEIS-1-G” (“Rebuttal Testimony”) (Exhibit STP000028).

Q3. Did your Direct Testimony describe your educational and professional qualifications?

A3. Yes. My responses to Questions Q2 and Q3 in my Direct Testimony summarized my current employment position and my educational and professional qualifications. My professional and educational qualifications are also described in Exhibit STP000002. In summary, I am currently the Director of Market Policy for NRG Energy, Inc. (“NRG Energy”).

My current responsibilities include representing NRG Energy's interests at the Electric Reliability Council of Texas ("ERCOT") and the Public Utility Commission of Texas.

Q4. Would you please describe Contention DEIS-1-G?

A4. As admitted by the Licensing Board (LBP-11-07, page 48), Contention DEIS-1-G states as follows: "NRC Staff's DEIS analysis of the need for power is incomplete because it fails to account for reduced demand caused by the adoption of an energy efficient building code in Texas, the implementation of which could significantly reduce peak demand in the ERCOT region." In that regard, the Licensing Board noted on pages 42 and 47-48 of LBP-11-07 that Texas had adopted an energy efficient building code in June 2010 that had not been accounted for in the Draft Environmental Impact Statement ("DEIS") (which predated the code).

As a basis for Contention DEIS-1-G, the Intervenor stated in their May 19, 2010 "Motion for Leave to File New Contentions Based on the Draft Environmental Impact Statement" (page 4) that a proposed Texas energy efficient building code based on the International Energy Conservation Code ("IECC") "has the potential to reduce peak demand by 2,362 MW annually by 2023 in the ERCOT region." As support for this contention, the Intervenor cited to a March 2007 report by the American Council for an Energy Efficient Economy ("ACEEE") entitled "Potential for Energy Efficiency, Demand Response, and Onsite Renewable Energy to Meet Texas' Growing Electricity Needs" ("ACEEE Report") (Exhibit STP000008).

Q5. Please briefly summarize the purpose of your Surrebuttal Testimony.

A5. The purpose of my Surrebuttal Testimony is to respond to statements regarding energy savings from renovations made by Mr. Philip H. Mosenthal in his rebuttal testimony for Contention DEIS-1-G ("Mosenthal Rebuttal Testimony") (Exhibit INT000041). As detailed

below, the ACEEE Report and other savings estimates referenced by the Intervenors already accounted for renovations, Mr. Mosenthal has overestimated the savings from renovations of buildings, and even if the savings predicted by the Mosenthal Rebuttal Testimony were accepted as valid, those savings do not change the conclusion that there is a need for power from STP Units 3 and 4.

II. RESPONSE TO MOSENTHAL REBUTTAL TESTIMONY REGARDING RENOVATIONS

Q6. Have you reviewed the Mosenthal Rebuttal Testimony and the exhibits cited in that testimony?

A6. Yes, I have reviewed the Mosenthal Rebuttal Testimony and the referenced exhibits.

Q7. Please describe Mr. Mosenthal's statements regarding energy savings from renovations.

A7. Mr. Mosenthal made the following statements regarding the potential energy savings from renovations of buildings in the Mosenthal Rebuttal Testimony (page 10, lines 10-19):

Finally, I note that my estimate is likely significantly low because I only estimated savings from new construction, which typically represents only a percent or two of the total electrical load in any given year. The new statewide standards apply to major renovations as well as new construction. Assuming a typical renovation cycle of around once every 25 years for many buildings, this would imply fully 4% of existing building energy consumption would turnover and become applicable to the codes each year. This represents potentially 2-3 times more savings than I have modeled in my analysis. As a result, my estimates of 1,404 and 2,419 MW savings in 2020 and 2025, respectively, could in fact rise to more like 2,800-4,200 MW in 2020 and 4,800-7,200 MW in 2025.

Q8. Did you discuss renovations in either your Direct Testimony or Rebuttal Testimony?

A8. No. Mr. Mosenthal raised these issues regarding energy savings from renovations for the first time in the Mosenthal Rebuttal Testimony. Therefore, I have not previously had the opportunity to address his statements regarding savings from renovations.

Q9. Please respond to Mr. Mosenthal's statement (Mosenthal Rebuttal Testimony, page 10) that his estimate of savings only accounted for savings from new construction and not renovations.

A9. The estimate of savings in the Direct Testimony of Philip H. Mosenthal ("Mosenthal Direct Testimony") (Exhibit INT000001) indirectly accounted for the savings from renovations, because that estimate was based upon the ACEEE Report.

As explained on page 4, lines 16-18 of the Mosenthal Direct Testimony, Mr. Mosenthal's estimates of savings from the new energy efficient building code "builds off" of the ACEEE Report. As explained on pages 5 through 8 of the Mosenthal Direct Testimony, Mr. Mosenthal used the ACEEE Report's estimated savings of 2,362 MW in 2023 as the starting point in his calculation, and then made adjustments to that estimate to account for certain factors, such as the fact that the ACEEE Report used earlier ERCOT forecasts of need for power that were higher than forecasted by ERCOT several years later.

Page 48 of the ACEEE Report (Exhibit STP000008) indicates that the 2,362 MW of savings in 2023 pertains to new building codes. As I stated on page 19 of my Direct Testimony, the new energy efficient building code rules apply to both new construction and modifications, including renovations. Furthermore, Table C.1 of the ACEEE Report (pages 52-53) contains a detailed breakout of savings from renovations of existing residences, and Table C.3 on page 57

of the ACEEE Report contains a detailed breakout of savings from renovations of existing commercial buildings. Thus, the ACEEE Report, which was the starting point for Mr. Mosenthal's estimates, already accounts for savings from renovations of existing buildings.

Additionally, the savings estimated in the ACEEE Report and other reports referenced by the Intervenor are based upon a comparison of savings from the earlier and later versions of the building codes. For example, the ACEEE Report (Exhibit STP000008, page 25) assumes that the "new residential and commercial building codes . . . would reduce energy use by 15% relative to current codes." Similarly, Mr. Mosenthal references Exhibit INT000016 and states (Mosenthal Direct Testimony, page 7): "Savings for the residential sector is assumed to be 20%, based on an analysis done by Energy Systems Laboratory (ESL) at Texas A&M University." As discussed on page i of INT000016, the ESL analysis was based upon a comparison of the savings from the 2009 version of the IECC versus earlier versions of that code. Because the new and earlier versions of the code apply to renovations as well as new buildings, the estimated savings in both the ACEEE Report and the ESL analysis apply to both new buildings and renovations.

For these reasons, estimates based on the ACEEE Report and other savings estimates referenced by the Mosenthal Direct Testimony already account for energy savings from renovations. Any attempt to add to the savings to account for renovations would double-count the savings.

Q10. Page 10 of the Mosenthal Rebuttal Testimony states that the savings from new construction typically represent only 1 or 2% of the total electrical load in a given year, and that savings from renovations would be 2 to 3 times the savings from new construction, given an assumed renovation cycle of once every 25 years or 4% of existing buildings per year. Please comment on that analysis.

A10. There are a number of errors in that analysis.

First, it is not appropriate to compare directly the 1 or 2% savings from new construction with the assumption that 4% of existing buildings are renovated each year. Such a comparison is equivalent to comparing apples and oranges. Mr. Mosenthal's assumption regarding 1 or 2% savings from new construction is based on a comparison of the load from new construction to total electrical load. Mr. Mosenthal's 4% renovation assumption, on the other hand, is based on a comparison of the number of buildings renovated to total buildings. The percentage of total electrical load is not directly comparable to a percentage of buildings because electric load also includes load from transportation and other sources (*e.g.*, energy use from computers and appliances, industrial processes) not impacted by the 2010 energy efficient building code. Thus, the savings from renovations would be less than that assumed by Mr. Mosenthal.

Second, it is not appropriate to assume that, because a building may be renovated once every 25 years, 4% of all buildings are renovated each year. In that regard, the ages of existing buildings are skewed toward newer buildings. For example, the U.S. Census Bureau found that 33% of Texas homes were built after 1990 (Exhibit STP000033, page 4 of 5). Furthermore, the U.S. Energy Information Administration found that, as of 2003, 26% of commercial buildings were built after 1990 (Exhibit STP000034, page 17 of 20). Therefore, given the relatively high

percent of new buildings relative to total buildings, 4% of all buildings are not likely to be renovated each year, but instead a lesser percent will be renovated.

Third, renovation is unlikely to achieve the same amount of energy savings as new construction, because renovation typically would not be as wide-reaching as new construction. In other words, unlike construction of a new building, renovating a building typically would not replace all of the aspects of construction, such as walls and insulation, that would be covered by the 2010 energy efficient building code. Furthermore, renovation of residential buildings often entails modification to a single room (such as a kitchen or bathroom), and not the entire building. Therefore, the energy savings from renovating a building would be less than from constructing a new building.

Fourth, renovations of existing buildings often entail additions, such as the addition of a new room onto an existing house. Such renovations will result in a net increase in electricity usage associated with cooling, heating, and lighting of the new room.

Finally, new buildings tend to be larger than existing buildings. For example, the U.S. Department of Energy found that the size of the average single family home increased from 2,666 square feet in 1970-1979 to 3,680 square feet in 2000-2005—a 38% increase (Exhibit STP000035). Everything else being equal, larger buildings consume more energy than smaller buildings. Therefore, there is a greater potential for energy savings from the 2010 energy efficient building code from new (larger) buildings than from existing (smaller) buildings. Mr. Mosenthal did not account for this in his analysis.

In summary, it is not appropriate to calculate the amount of savings from renovations based on a comparison of the savings from new buildings.

Q11. Is Mr. Mosenthal’s statement that savings from renovations would be 2 to 3 times the savings from new construction consistent with his other testimony?

A11. No. That statement is inconsistent with page 6 of the Mosenthal Rebuttal Testimony, where Mr. Mosenthal discusses new construction and major renovations. In particular, on line 9 of page 6 Mr. Mosenthal states that “codes primarily impact new construction.” It is inconsistent to state that the codes primarily impact new construction, but then claim that the savings from renovations would be 2 to 3 times larger.

Q12. Based upon the analysis provided on page 10 of the Mosenthal Rebuttal Testimony, he concludes that when the energy savings from renovations are included, the savings discussed in Table 1 of the Mosenthal Direct Testimony (1,404 MW and 2,419 MW savings in 2020 and 2025, respectively) could rise to 2,800 MW to 4,200 MW in 2020 and 4,800 MW to 7,200 MW in 2025. Do these estimates include savings from future building codes that have not yet been enacted by Texas?

A12. Yes. As shown on pages 9-10 of the Mosenthal Direct Testimony and Exhibit INT000004, Mr. Mosenthal’s estimates of 1,404 MW and 2,419 MW savings in 2020 and 2025, respectively, account for savings from future building codes that have not yet been enacted by Texas. In particular, as shown on Exhibit INT000004, Mr. Mosenthal’s estimated annual savings increase from about 100 MW prior to 2015 to almost 200 MW in 2020, and most if not all of that increase appears to be attributable to the speculation that there will be code updates in the future. In fact, it appears that Exhibit INT000004 attributes about one-third of the cumulative annual MW savings in 2020 and 2025 to speculative future code updates. Because estimates in the Mosenthal Rebuttal Testimony of 2,800 MW to 4,200 MW in 2020 and 4,800 MW to 7,200 MW in 2025 are simply multiples of the values from Exhibit INT000004 (which

include savings from future code updates), the estimates of savings from renovations in the Mosenthal Rebuttal Testimony also include savings from future building codes that have not yet been enacted by Texas. As I discuss on pages 12-14 of my Rebuttal Testimony, (1) these future updates are not part of the energy efficient building code enacted in Texas in 2010, and therefore are unrelated to Contention DEIS-1-G, and (2) Mr. Mosenthal's assumptions regarding future savings are not supported and are speculative.

Q13. If no credit were given for the speculative savings from future building code updates, how would that affect the estimated savings in Mr. Mosenthal's testimony?

A13. The values in the Mosenthal Direct Testimony of 1,404 MW and 2,419 MW savings in 2020 and 2025, respectively, would drop to approximately 900 to 1,000 MW peak load savings in 2020 and approximately 1,600 MW peak load savings in 2025. Those values are slightly higher than calculated by the NRC Staff witnesses and me, but are of the same general magnitude.

When those values are multiplied by a factor of two or three per the Mosenthal Rebuttal Testimony, they become approximately 1,800 to 3,000 MW peak load savings in 2020 and 3,200 to 4,800 MW peak load savings in 2025. As I discussed previously in A9 and A10, I do not believe it is appropriate to multiply the savings by a factor of two or three to account for renovations, but nevertheless have done so to account for Mr. Mosenthal's assumptions related to renovations.

Q14. Assuming Mr. Mosenthal's estimates of energy savings from renovations were correct, would there be a need for power from STP Units 3 and 4?

A14. Yes. Even assuming the increased savings from renovations provided in the Mosenthal Rebuttal Testimony are correct, there is still a need for power from STP Units 3 and

4. Table 8-3 of the Final Environmental Impact Statement (“FEIS”) (Exhibit NRC00003C) shows a net need, when accounting for retirements of old generating plants, of 17,551 MW in 2020 and 30,158 MW in 2025. Even if these amounts are decreased by 4,200 MW in 2020 and 7,200 MW in 2025 as specified in the Mosenthal Rebuttal Testimony, there is still a significant need for power during these years that is much greater than the approximately 2,600 MW of net electrical output that would be provided by STP Units 3 and 4. This conclusion is very conservative because, as discussed above, the values in the Mosenthal Rebuttal Testimony account for savings from future building codes that have not yet been enacted by Texas. For these reasons, even considering Mr. Mosenthal’s new arguments regarding renovations, there is still a need for power from STP Units 3 and 4.

Furthermore, even if retirements of old plants are not considered, there still would be a need for STP Units 3 and 4 even given Mr. Mosenthal’s assumptions related to renovations. In particular, FEIS Table 8-3 shows a need of 5,115 MW peak load power in 2020, when retirements are not considered. Subtracting the savings of 2,800 – 4,200 MW in 2020 provided on page 10 of the Mosenthal Rebuttal Testimony (which includes the inappropriate factor for renovations as well as credit for speculative future building code updates), there still would be a need of 915 to 2,315 MW in 2020, which is somewhat less than the capacity of STP Units 3 and 4. However, when the credit for the speculative future building codes is discounted from Mr. Mosenthal’s numbers, the need increases. As discussed in A13, Mr. Mosenthal’s savings from future building codes drops to approximately 900 to 1,000 MW in 2020, when savings from future code updates are discounted. Multiplying that value by Mr. Mosenthal’s factor of 2 to 3 to account for renovations yields a savings of 1,800 to 3,000 MW in 2020. Subtracting that value

from the need of 5,115 MW as provided in the FEIS yields a need of approximately 2,115 to 3,315 MW, which is sufficient to encompass the capacity of STP Units 3 and 4.

Q15. Your previous answer appears to be based upon the need for peak load power. How would your answer be affected if it were based upon the need for baseload power?

A15. Energy efficient building codes primarily affect the demand for peak power, not baseload power. In that regard, I agree with Mr. Mosenthal when he states on page 11 of the Mosenthal Direct Testimony that the effect of the building codes is to “somewhat flatten the load curve.” Because the savings from new building codes (including savings from renovations) primarily affect the demand for peak power, the need for baseload power from STP Units 3 and 4 as discussed in the FEIS is not affected in any appreciable degree by the new energy efficient building code.

III. SUMMARY AND CONCLUSIONS

Q16. Please summarize your conclusions regarding energy savings from renovations.

A16. The ACEEE Report and other savings estimates used in the Mosenthal Direct Testimony already accounted for renovations. Thus, the Mosenthal Rebuttal Testimony is engaging in double-counting by including an additional factor for renovations.

Additionally, even if that double-counting is ignored, Mr. Mosenthal has overestimated the savings from renovations of buildings by inappropriately basing his estimated savings from renovations upon the estimated savings from new buildings. Furthermore, his estimated savings from renovations also inappropriately account for speculative savings from future building codes that have not yet been enacted by Texas.

Finally, even if the savings predicted by the Mosenthal Rebuttal Testimony were accepted as valid, those savings do not change the conclusion that there is a need for power from STP Units 3 and 4, when retirements of old plants are considered. Even if retirements are not considered and Mr. Mosenthal's estimated savings from renovations are considered, there still would be a need for power from STP Units 3 and 4 in 2020 when the speculative savings from future building code updates are excluded.

Q17. Are true, accurate and correct copies of each of the new exhibits referenced in your testimony attached?

A17. Yes.

Q18. Does this conclude your testimony?

A18. Yes.

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

Executed on August 17, 2011.

Executed in Accord with 10 C.F.R. § 2.304(d)

/s/ Adrian Pieniazek

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**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)

NUCLEAR INNOVATION NORTH AMERICA LLC)

(South Texas Project Units 3 and 4))

Docket Nos. 52-012-COL
52-013-COL

August 17, 2011

CERTIFICATE OF SERVICE

I hereby certify that on August 17, 2011, copies of “Surrebuttal Testimony of Applicant
Witness Adrian Pieniazek Regarding Contention DEIS-1-G,” Exhibits STP000033 to
STP000035, and NINA Hearing Exhibits (Revised: August 17, 2011) were served by the
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