STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES

I/M/O THE PETITION OF PUBLIC SERVICE ELECTRIC & GAS COMPANY FOR APPROVAL OF THE SECOND ENERGY STRONG PROGRAM (ENERGY STRONG II)	**)** **)** **)** **)** **)**	**BPU Docket No. EO18060629 and GO18060630**

DIRECT TESTIMONY OF EDWARD A. McGEE
ON BEHALF OF THE
DIVISION OF RATE COUNSEL

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Dated: March 1, 2019

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DIRECT TESTIMONY OF

EDWARD A. McGEE

ON BEHALF OF THE

NEW JERSEY DIVISION OF RATE COUNSEL

BPU DOCKET No. EO18060629 and GO18060629

I. Introduction

Q. WOULD YOU PLEASE STATE YOUR NAME AND BUSINESS ADDRESS?

A. My name is Edward A. McGee. My business address is P.O. Box #1659, Bethany Beach, DE. I am Principal Consultant of McGee Consulting, LLC, and I am currently working as an Engineering Associate with the Acadian Consulting Group ("ACG"). ACG is a research and consulting firm that specializes in the analysis of regulatory, economic, engineering, financial, accounting, statistical, and public policy issues associated with regulated and energy industries. ACG is a Louisiana-registered Limited Liability Company, formed in 1995, and is located at 5800 One Perkins Place, Suite 5-F, Baton Rouge, Louisiana, 70808.

Q. DO YOU HOLD ANY ACADEMIC DEGREES?

A. Yes. I graduated from the University of Notre Dame with Bachelor and Master Degrees in Chemical Engineering. I also graduated from the University of Chicago with a Master's Degree in Business Administration ("MBA"). Attachment 1 provides my academic vita that includes a listing of my experience as a gas practice consultant and related positions in the energy industry.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I have been retained by the New Jersey Division of Rate Counsel ("Rate Counsel") to provide an expert opinion to the Board of Public Utilities ("BPU" or "Board") on gas operations

management and engineering issues associated with the Energy Strong II ("ES II") proposal by Public Service Electric and Gas Company ("PSE&G" or "the Company") filed on June 8, 2018. Dr. David Dismukes will also be testifying regarding a number of policy, gas program design, and economic impact issues associated with the ES II proposal.

Q. HAVE YOU PREPARED ANY EXHIBITS IN SUPPORT OF YOUR RECOMMENDATIONS?

A. Yes. I have prepared three exhibits in support of my direct testimony that were prepared by me or under my direct supervision.

Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

A. My testimony is organized into the following sections:

- Section II. Summary of Recommendations
- Section III. Overview of Proposed Energy Strong II Gas Program
- Section IV. Analysis of Proposed Curtailment Resiliency Subprogram
- Section V. Analysis of Proposed M&R Upgrade Subprogram
- Section VI. Conclusions and Recommendations

II. <u>Summary of Recommendations</u>

Q. WOULD YOU PLEASE SUMMARIZE YOUR PRIMARY RECOMMENDATIONS REGARDING THE PROPOSED ENERGY STRONG II CURTAILMENT RESILIENCY SUBPROGRAM?

A. My primary recommendation is that the Board reject the Company's proposed ES II Curtailment Resiliency subprogram for the following reasons:

- The Curtailment Resiliency subprogram and its cost/benefit analysis is based on an unrealistic assumption of zero gas supplies from a major Interstate Pipeline. In today's

era, gas in an Interstate Pipeline no longer flows in a single direction for the length of the line, so interruptions on one portion of the line can be compensated through changes in the direction of flow on other portions of the Interstate Pipeline. Additional gas supplies are available to the Interstate Pipeline at various locations to be moved to locations experiencing shortages, in order to help fulfill contracts. Gas supplies can also be secured from other Interstate Pipelines that connect with the pipeline having an emergency. Thus, the "problem" this subprogram is aiming to solve is not realistic and the program is unnecessary.

- The fourteen pipeline extensions proposed by the Company would likely be seldom used – if ever. The extensions would not meet the basic regulatory test of being "used and useful." In fact, there is a chance some of the proposed pipeline extensions would become "stranded" assets since they would not be used for the resiliency purposes for which they were justified.
- The proposed Liquefied Natural Gas ("LNG") facility would also have very little or no usage in most years for its intended purpose of curtailment resiliency.
- Many (five) of the proposed pipeline extensions have been sized too large for the specific purpose of "Curtailment Resiliency" and, if approved at all, should be downsized, or the increase in cost of the larger pipe should be excluded from the program. Sizing these lines for future growth does not fall under the purpose of the Infrastructure Investment Program ("IIP") rules.

Q. WOULD YOU PLEASE SUMMARIZE YOUR PRIMARY RECOMMENDATIONS REGARDING THE PROPOSED ENERGY STRONG II METERING & REGULATING ("M&R") UPGRADE SUBPROGRAM?

A. My primary recommendation is that the Board reject or modify most of the Company's proposed ES II M&R Upgrade subprogram for the following reasons:

- Only three of the seven proposed M&R stations (Camden, East Rutherford, and Central) should be included for complete rebuilds. These are older structures containing many major pieces of older equipment. Two of these stations (Camden and East Rutherford) are located within the 100-year flood plain. The Company has stated that, in the event this subprogram is not approved, the intent would be to rebuild these three stations as part of its base gas capital spending plan during the next twenty years.[1]
- Four of the M&R stations (Paramus, Westampton, Mount Laurel, and Hillsborough) should be upgraded on an as-needed basis under the Company's base capital spending, rather than be completely rebuilt. It appears that the Company even acknowledges that absent the approval of the proposed ES II Program, these four stations would be upgraded on an "as-needed basis"[2] indicating there is no extenuating circumstance that these stations need an accelerated complete rebuild within the next five years.

III. Overview of Proposed Energy Strong II Gas Program

Q. PLEASE DESCRIBE THE COMPANY'S ENERGY STRONG II GAS PROPOSAL?

A. On June 8, 2018, Public Service Electric and Gas Company ("PSE&G" or "the Company") filed its petition requesting approval of the ES II and associated cost recovery mechanism for a five-year period.[3] Under the ES II Gas Program the Company is proposing infrastructure investments to purportedly enhance safety, reliability, and/or resiliency through

[1] Company response to RCR-POL-70.
[2] Company's response to RCR-A-0001.
[3] Company's Petition, p. 2 at ¶ 3.

two gas subprograms.[4] The Company estimates that the proposed ES II Program will have an estimated investment of $0.999 billion in gas infrastructure over 5 years, with cost recovery based upon the Board's IIP rules.[5]

The gas portion of the ES II program consists of two subprograms: the Curtailment Resiliency Subprogram and the M&R Upgrade Subprogram.[6]

Q. WHAT IS THE PURPOSE OF THE COMPANY'S PROPOSED CURTAILMENT RESILIENCY SUBPROGRAM?

A. Under the Curtailment Resiliency subprogram the Company is proposing six projects that it states will improve the resiliency of PSE&G's gas distribution system to potential interstate gas pipeline supply curtailments.[7] The Company states that five of the proposed distribution facility projects would provide increased resiliency by moving gas supplies across PSE&G's service territory through new pipeline extensions it would build between areas served by the different Interstate pipeline systems.[8] The Company's proposed sixth project is an additional LNG facility that would inject additional gas into the system in a time of impending curtailment. The Company estimates that this subprogram will need an investment of $863 million.[9]

Q. WHAT IS THE PURPOSE OF THE COMPANY'S PROPOSED M&R UPGRADE SUBPROGRAM?

A. The Company's proposed M&R Upgrade Subprogram involves the rebuilding and modernization of seven gas M&R stations as well as the storm hardening of at least two of these stations that are located in recognized flood zones.[10] The Camden, East Rutherford, Central,

[4] Company Petition p. 2 at ¶4.
[5] Company Petition, p. 2 at ¶4.
[6] Company's Petition, pp. 6-7.
[7] Company's Petition, p. 6.
[8] Company's Petition, p. 6.
[9] Company's Petition, p. 6.
[10] Company's Petition, p.7.

Paramus, Westampton, Mount Laurel, and Hillsborough M&R stations are included in the proposed subprogram. Two stations in the subprogram, Camden and East Rutherford, are said to be located in recognized 100-year flood zones. The Company estimates this subprogram will have an investment of $136 million.[11]

IV. Analysis of Proposed Curtailment Resiliency Subprogram

Q. WHAT KIND OF AN EMERGENCY HAS THE COMPANY ASSUMED FOR ONE OF ITS INTERSTATE PIPELINE SUPPLIERS AS THE REASON FOR PROPOSING THEIR CURTAILMENT RESILIENCY SUBPROGRAM?

A. The Company and its consultant, Black & Veatch ("B&V") have analyzed the effect of an emergency on one of PSE&G's major supplying Interstate pipelines. PSE&G did not mention any specific amount of curtailment by any of its suppliers, however, for purposes of the cost/benefit analysis of the Curtailment Resiliency subprogram their consultant specified that the resulting curtailment would result in a total loss of supply from that pipeline.[12]

Q. UPON WHAT DID THE COMPANY BASE ITS ASSUMPTION OF CURTAILED FLOW FROM ONE OF ITS MAJOR SUPPLIERS?

A. The primary reason given by both the Company and its consultant for this assumption was the emergency that occurred on Texas Eastern's system in April of 2016. One of four parallel looped lines on the Texas Eastern East-West pipeline (the Penn-Jersey line) ruptured due to corrosion on one of these lines just East of its Delmont, PA compressor station. Following the rupture, three of the parallel lines were also shut down for precautionary below-ground inspections of their condition. The resulting drop in flow in the easterly direction amounted to a 78 percent reduction in gas supplies for about eleven days, followed by a 39 percent drop in flow

[11] Company's Petition, p. 7.
[12] Direct Testimony of the Cost-Benefit Analysis Panel Energy Strong II Program – Gas, 4:2-4.

for about six months.[13] PSE&G indicated that it was able to maintain its gas supplies to all of its customers during that curtailment only because the emergency happened during low-demand months (April to October). The Company states that if the same emergency happened during peak winter months, when demand for gas by the Company's firm customers is highest, that it would have resulted in major outages for its firm customers.[14]

Q. HOW DID THE OWNER OF TEXAS EASTERN (SPECTRA) CHARACTERIZE ITS DISRUPTION OF GAS SERVICE IN 2016?

A. Spectra's top officials told analysts during a company earnings call on the morning of May 4, 2016 (five days after the rupture) that they didn't expect the halt on the system to be a "long-term issue with respect to flows." There are many pipelines in the area, said Gregory Ebel, Spectra's CEO, and the industry is adept at finding workarounds.[15]

Q. WHAT WAS PSE&G'S PROPOSED SOLUTION IN THE EVENT OF A SIMILAR CURTAILMENT DURING THE WINTER?

A. The Company's response was to propose this Curtailment Resiliency Subprogram involving the construction of five pipeline extension projects and one LNG facility project.

Q. HAS ANY INDUSTRY GROUP COMMENTED ON THE TEXAS EASTERN EMERGENCY AND PRODUCED AN ESTIMATE OF THE EXPECTED FREQUENCY OF SIMILAR PIPELINE ACCIDENTS?

A. Yes. Cathy Landry, a spokeswoman for the Interstate Natural Gas Association of America, a pipeline industry trade group, said in response to the 2016 rupture of the Texas

[13] Direct Testimony of Wade E. Miller, 4:2-5.
[14] Direct Testimony of Wade E. Miller, 4:9-11.
[15] Litvak, Anya, "Corrosion found on Spectra Texas Eastern natural gas pipeline", Post Gazette [Pittsburgh], May 4, 2016. Online. Available at: https://www.post-gazette.com/business/powersource/2016/05/04/Corrosion-found-on-Spectra-Texas-Eastern-natural-gas-pipeline-that-exploded-Pennsylvania-Marcellus/stories/201605040191

Eastern pipeline near its Delmont compressor station: "Nearly 100 percent (99.999997 percent to be exact) of the natural gas transported by pipeline was delivered without incident last year. Our industry is committed to the goal of zero incidents, and we are working every day in pursuit of that goal."[16]

Q. HAS THE COMPANY OR ITS CONSULTANT PRODUCED AN ESTIMATE OF THE LIKELIHOOD OR FREQUENCY OF SUCH A WINTER-TIME EMERGENCY WHICH WOULD RESULT IN THE USE OF ITS PROPOSED PIPELINE EXTENSIONS AND LNG FACILITY?

A. No. Neither the Company nor its consultant (B&V) has quantified the likelihood or frequency of another emergency[17] nor the resulting expected frequency-of-use[18] of the fourteen proposed pipeline extensions and the LNG facility.

Q. DOES THE COMPANY ALREADY HAVE AN LNG FACILITY?

A. Yes. The Company owns an LNG facility at Burlington, NJ and has access to a very large LNG facility of Transco in Carlstadt, NJ. PSE&G also owns three LPA (liquid propane air) plants at Camden, Central, and Harrison, which perform a similar peaking function to the LNG facility.

Q. HOW OFTEN HAS THE COMPANY'S EXISTING BURLINGTON LNG PLANT BEEN USED?

A. The Burlington facility – like most peaking facilities – has shown a low average usage rate of about 35% over the past five years.[19]

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[16] Frazier, Reid R., "Explosion heats arguments over gas pipelines", Marketplace.org, June 5, 2016. Online. Available at: https://www.marketplace.org/2016/07/05/world/explosion-heats-arguments-over-gas-pipelines

[17] Company response to RCR-G-ENG-0035.

[18] Black & Veatch Energy Strong II Gas Program Cost-Benefit Analysis; Attachment 6; Schedule-BV-ES-II-GAS-5, p. 18.

[19] Company response to RCR-G-ENG-32.

Q. WOULD THE PROPOSED LNG FACILITY BE USED AS OFTEN AS THE EXISTING ONE?

A. No. The proposed facility is only planned to be used when the other peaking facilities are nearly exhausted. Thus, it would be used very little for the curtailment resiliency purpose for which it is planned. Its usage percent could well be in the single digits over a long period of time.

Q. IF THE LIKELIHOOD OF SUCH A SHORTAGE OF GAS SUPPLIES CANNOT BE REASONABLY ESTIMATED BY THE COMPANY, DOES THIS CALL INTO QUESTION THE PRIMARY JUSTIFICATION FOR CONSTRUCTION OF THE PROPOSED EXTENSIONS AND LNG FACILITY?

A. Yes. Very much so. It is not sound business practice to invest significant amounts of capital to protect against an emergency of unknown likelihood. Furthermore, the Company has stated that if the Curtailment Resiliency subprogram is not approved, and all recovery would be through base rates, PSE&G would not pursue any of the pipeline extensions or the LNG facility.[20]

Q. HAVE YOU MADE ANY ESTIMATE OF ITS OCCURRENCE AND THE CONSEQUENTIAL USAGE OF ANY OF THE PROPOSED PIPELINE EXTENSIONS?

A. Yes. It appears that the proposed pipeline extensions under the Company's proposed Curtailment Resiliency subprogram will have very little usage or need. Judging from the history of partial and complete curtailments on interstate pipelines[21] – particularly those interstates that are upstream of and carry gas to PSE&G – it appears that the following frequency of interruptions might be expected during peak winter months:

[20] Company response to RCR-A-0001(b).

[21] As presented both in the Direct Testimony of Mr. Wade Miller and by the Company's Consultant Black and Veatch, as well as shown in industry searches (see e. g. "Analysis of the Southern Reliability Link as a Response to Single Point of Failure Concern" at www.pinelandsalliance.org/downloads/pinelandsalliance_457.pdf

- Out of the fourteen pipeline extensions proposed for construction in this proceeding, I would estimate that possibly one-third of these extensions would be required once or twice over the course of the next decade for the specific purpose of Curtailment Resiliency for which they were proposed.
- Out of the fourteen pipeline extensions proposed for construction in this proceeding, I would estimate that possibly another one-third of these extensions would be required once or twice over the course of the next two or three decades for the specific purpose of Curtailment Resiliency for which they were proposed.
- Out of the fourteen pipeline extensions proposed for construction in this proceeding, I would estimate that the remaining one-third of these extensions would never be required or utilized at all for the specific purpose of Curtailment Resiliency for which they were proposed.

Although the Company - in its justification for the need for its proposed curtailment resiliency program - has discussed at length the various curtailments that have occurred across the U.S., it is important to note that in discovery the Company has admitted that it has not experienced any similar event or impact on its system in at least the last 10 years.[22] The Board should take caution that due to the extremely low expected frequency of use, the Company's proposed pipeline extensions and new LNG facility may not be the most practical or economic solution for the curtailment resiliency objective, and the Company should have reviewed alternative solutions prior to filing their petition.

Q. WHAT ALTERNATIVES SHOULD PSE&G HAVE REVIEWED PRIOR TO ITS FILING?

[22] Company's response to RCR-POL-0044, RCR-POL-0047, and RCR-POL-0048.

A. The Company should have evaluated the use of trucked LNG instead of construction of some of the smaller pipeline extensions, as well as the availability of increased supplies from other areas that could be made available to the Interstate Pipeline having the emergency, that could be brought to the Company from other directions or from other pipelines.

Q. ARE THE PROPOSED PIPELINE EXTENSIONS AND THE PROPOSED LNG FACILITY CAPABLE OF PREVENTING ALL CUSTOMER OUTAGES ON PEAK DAYS AND EXTENDED PIPELINE EMERGENCIES?

A. No. Many of the proposed facilities would only protect outages in some locations at temperatures of 20 or 30 degrees Fahrenheit, compared to PSE&G's peak design-day temperature of 5 degrees. Furthermore, extended pipeline emergencies could exhaust all available gas supplies, including the capacity of the LNG facility.

Q. IS THE COMPANY'S ASSUMPTION OF ZERO RECEIPTS FROM ANY OF ITS INTERSTATE SUPPLIERS REALISTIC?

A. No. The major interstate pipelines supplying PSE&G' gas were at one time uni-directional in flow. For instance, Texas Eastern's pipeline to the Gulf of Mexico used to only bring supplies north to the mid-Atlantic area. It is now bi-directional – as are several major interstate pipelines – and it flows southward as well as northward at times. Also, it now contracts for its supplies at many locations along the length of its route. Furthermore, the Texas Eastern system is now looped in many areas, permitting different routes for gas to flow if an emergency were to occur. Schedule EAM-1 illustrates the multiple lines existing today on the Texas Eastern system. Schedule EAM-2 illustrates that in its mid-Atlantic market the pipeline is looped through the Pennsylvania area where the Delmont rupture occurred, permitting backflows around emergencies on these lines. Thus the assumption of 100% outage for an extended period

of time is simply not realistic.

Q. ARE THE COMPANY'S PROPOSED PIPELINE EXTENSIONS APPROPRIATELY SIZED?

A. No. Certain proposed pipeline extensions (five of the proposed fourteen extensions) are oversized for the strict purpose of curtailment resiliency. Schedule EAM-3 details the five oversized proposed pipeline extensions. Note that one of the lines (Segment #5 in Project #3) is oversized by at least two pipe sizes (from its proposed size of twenty-four-inch diameter down to sixteen inches), and possibly more.

Q. CAN YOU EXPLAIN WHY THE LINES MAY BE OVERSIZED?

A. Yes. Designing pipe diameters for the strict purpose of curtailment resiliency is quite different from the way most gas utilities design pipe diameters for their every-day-usage pipes. For instance, the Company has apparently designed the diameter of Segment #1 in Project #5 to hold a very high pressure (close to 120 psig) the entire length of the extension. This would be proper if the line was in every-day use. But the only curtailment resiliency use for this extension, however, is to deliver gas to a new pressure regulator which immediately drops the pressure so that the gas can enter a 60 psig distribution system. Since the Company's only proposed curtailment resiliency use for the 7.3-mile extension is to end up with gas at about 75 psig at the end of this line, prior to entering the regulator, (just high enough to enable the regulator to be able to send gas into a 60 psig system), there appears to be no reason the pressure drop from 120 psig to 75 psig can't be taken over the entire 7.3 miles. This would be accomplished by downsizing the line to an 8-inch diameter pipe.

Q. DOES THE COMPANY AGREE THAT SOME OF ITS PROPOSED PIPELINE EXTENSIONS COULD BE DOWNSIZED?

A. No. PSE&G's main objection is that these trunk systems "will have extremely long in-service lives and it is practical to consider future load growth and extension of the systems for additional resiliency and reliability."[23] However, it should be noted that in the Company's response to the use of LNG instead of construction of certain of these pipeline extensions, the Company made no such assumption of future load growth and instead used exactly the same flows that I have used in my analysis of oversized lines.[24]

Furthermore, it should be noted that the Board's IIP rules are not intended to address issues related to future load growth but are instead to establish a uniform process in which a utility can petition the Board to seek approval for accelerated recovery of projects to construct, install, or remediate utility plant and facilities related to reliability, resiliency, and/or safety to provide safe and adequate service.[25] Thus, building and sizing these lines for further load growth is not approved for funding under the IIP rules.

Q. ARE YOU SUGGESTING THAT THE COMPANY SHOULD BE INSTALLING SMALLER-DIAMETER LINES IF THIS PROJECT WERE TO BE APPROVED?

A. No. It is important to note that it is ultimately the Company's decision to select the size and diameter of these pipeline extensions that they desire and can justify to install. However, the concern is that if the extensions are built larger than would be necessary for the strict purpose of curtailment resiliency, the Company should not be permitted to recover - as accelerated rate treatment in its proposed surcharge mechanism - any cost that is more than the cost of the smaller line. This is because the proposed surcharge mechanism is only for purpose of construction of assets designed for curtailment resiliency.

[23] Company response to RCR-A-0001 (b).
[24] Company response to discovery RCR-G-ENG-0036.
[25] Adopted New Rules, N.J.A.C. 14:3-2A, Infrastructure Investment and Recovery, 50 N.J.R. 630(a) (Jan. 16, 2018), N.J.A.C. 14:3-2A.1.

Thus, while this program should not be approved at all, if the Board elects to approve a portion of the Curtailment Resiliency subprogram, only a portion of the cost of the five oversized pipeline extensions should be approved for accelerated cost recovery.

V. Analysis of Proposed M&R Upgrade Subprogram

Q. HAS THE COMPANY JUSTIFIED THE COST OF ITS M&R SUBPROGRAM?

A. No. The Company's own CBA estimated that the monetary cost-benefit ratio for the M&R subprogram alone was far less than 1.0; in fact, it was only 0.26 ($35 million direct benefit/$135 million cost).[26] Dr. Dismukes, in his direct testimony, discusses in detail the deficiencies and flaws of the Company's CBA.

Q. HOW MANY M&R STATIONS HAS THE COMPANY PROPOSED TO INCLUDE IN THE SUBPROGRAM?

A. The Company's proposed M&R Upgrade Subprogram involves the rebuilding and modernization of seven gas M&R stations as well as the storm hardening of at least two of these seven stations that are located in recognized flood zones. The Camden, East Rutherford, Central, Paramus, Westampton, Mount Laurel, and Hillsborough M&R stations are included in the proposed subprogram. The Camden and East Rutherford stations are said to be located in recognized 100-year flood zones.

Q. HAS THE COMPANY SPECIFIED HOW MANY OF THESE STATIONS WOULD BE REBUILT IF THE PROPOSED ENERGY STRONG II M&R SUBPROGRAM IS NOT APPROVED?

A. Yes. The Company stated that if the ES II program is not approved, PSE&G would expect to rebuild the Camden, East Rutherford and Central M&R stations as part of its normal

[26] Black & Veatch Energy Strong II Gas Program Cost-Benefit Analysis; Attachment 6; Schedule-BV-ES-II-GAS-5, p. 66.

capital spending plan over the next 20 years.[27] The remaining M&R stations would be upgraded on an as needed basis in the future, but not completely rebuilt.

Q. GIVEN THE COMPANY'S TIME-FRAME TO REBUILD THREE M&R STATIONS OVER A TWENTY-YEAR PERIOD IF THIS SUBPROGRAM IS NOT APPROVED, SHOULD THESE THREE STATIONS STILL BE REBUILT UNDER AN ACCELERATED SCHEDULE?

A. Yes. After reviewing the ages of these stations and the ages of their major pieces of equipment, as well as the location of two of them in a flood zone, I concur that three M&R stations (especially the Camden station) are very old and any advancement in the timing of their rebuilds would appear to be in the best interests of safety and reliability. In addition to the Camden facility are the East Rutherford and Central stations.

Q. GIVEN THE APPARENT LACK OF URGENCY TO UPGRADE FOUR M&R STATIONS, SHOULD THESE FOUR STATIONS BE REBUILT?

A. No. These four stations (Paramus, Westampton, Mount Laurel, and Hillsborough) do not appear to be as urgent. The Company has indicated that without approval of the ES II program those stations will be upgraded on an as-needed basis at some unspecified time in the future.[28] These stations can continue to perform adequately with the Company's plan (if this petition is rejected) to upgrade them on an as-needed basis in the future, as opposed to a complete rebuild at this time.

VI. Conclusions and Recommendations

[27] Company response to RCR-A-0001(b).
[28] Company's response to RCR-A-0001.

Q. WHAT ARE YOUR MAJOR CONCLUSIONS AND RECOMMENDATIONS REGARDING THE COMPANY'S PROPOSED CURTAILMENT RESILIENCY SUBPROGRAM?

A. My primary recommendation is that the Board reject the Company's proposed ES II Curtailment Resiliency subprogram for the following reasons:

- The Curtailment Resiliency subprogram is based on an unrealistic assumption of zero gas supplies from a major Interstate Pipeline. In today's era, gas in an Interstate Pipeline no longer flows in a single direction for the length of the line, so interruptions on one portion of the line can be compensated through changes in the direction of flow on other portions of the Interstate. Additional gas supplies are available to the Interstate Pipeline at various locations to be moved to locations experiencing shortages, in order to help fulfill contracts. Gas supplies can also be secured from other Interstate Pipelines that connect with the pipeline having an emergency. Thus, the "problem" this subprogram is aiming to solve is not realistic and the program is unnecessary.
- The fourteen pipeline extensions proposed by the Company would likely be seldom used – if ever. The extensions would not meet the basic regulatory test of being "used and useful". In fact, there is a chance some of the proposed pipeline extensions would become "stranded" assets since they would not be used for the resiliency purposes for which they were justified.
- The proposed LNG facility would also have very little or no usage in most years for its intended purpose of curtailment resiliency.

- Many (five) of the proposed pipeline extensions have been sized too large for the specific purpose of "Curtailment Resiliency," and therefore, do not fall under the purpose of the IIP rules.

Q. WOULD YOU PLEASE SUMMARIZE YOUR PRIMARY RECOMMENDATIONS REGARDING THE PROPOSED ENERGY STRONG II M&R UPGRADE SUBPROGRAM?

A. My primary recommendation is that the Board reject or modify most of the Company's proposed ES II M&R Upgrade subprogram for the following reasons:

- Only three of the seven proposed M&R stations (Camden, East Rutherford, and Central) should be included for complete rebuilds. These are older structures containing many major pieces of older equipment. Two of these stations (Camden and East Rutherford) are located within the 100-year flood plain. The Company has stated that, in the event this subprogram is not approved, the intent would be to rebuild these three stations as part of its base gas capital spending plan during the next twenty years.[29]
- Four of the M&R stations (Paramus, Westampton, Mount Laurel, and Hillsborough) should be upgraded on an as-needed basis under the Company's traditional rate treatment, rather than be completely rebuilt. It appears that the Company even acknowledges that absent the approval of the proposed ES II Program, these four stations would be upgraded on an "as-needed basis"[30] indicating there is no extenuating circumstance that these stations need an accelerated complete rebuild within the next five years.

[29] Company response to discovery RCR-POL-70.
[30] Company's response to RCR-A-0001.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY FILED ON MARCH 1, 2019?

A. Yes it does. However, I reserve the right to supplement my testimony if any updated or additional information becomes available during the course of this proceeding.

ATTACHMENT

ATTACHMENT 1

CREDENTIALS OF EDWARD A. McGEE

PROFESSIONAL CAREER:

2012 – Present **Acadian Consulting Group** ***Engineering Associate***
As Engineering Associate for Acadian Consulting Group, I am responsible for assisting in studies performed for utility companies and Public Utility Commissions.

1999 – Present **McGee Consulting** ***Principal Consultant and Engineer – Energy Industry***
As Principal Consultant and Engineer, I am responsible for assisting larger consulting firms in their studies performed for utility companies and Public Utility Commissions.

1985 - 1999 **Stone & Webster Management Consultants, Inc.** ***Vice President/Director***
As Vice President of Stone & Webster Management Consultants, I was responsible for consulting studies in the Gas Practice area, where I performed consulting analyses in the gas planning and gas operations areas for gas utility companies and public utility commissions.

1982 - 1985 **Stone & Webster Engineering Corporation** ***Business Development Manager***
As Business Development Manager at Stone & Webster Engineering Corp., I was responsible for the construction of investment models for feasibility studies on largescale chemical and refining complexes.

1982 & earlier **W. R. Grace & Co.** ***Director of Energy Resources; Manager of Chemical Development***
As Director of Energy Resources for W. R. Grace, I advised the Chief Operating Officer on corporate energy consumption and production. I also assisted operating divisions in securing long-term energy resources.
As Manager of Chemical Development at W. R. Grace, I analyzed potential acquisition targets in specialty chemical and high technology fields, developing corporate strategies for selected expansions.

AMOCO Oil ***Supervisor of Technical Computer Programming; Internal Operations Research Consultant***
In a variety of engineering and computer modeling capacities at AMOCO Oil directed a staff of professionals in the development of technical programs in the refining, distribution and marketing areas.

EDUCATION:
University of Chicago, Master of Business Administration, Quantitative Analysis and Computers
University of Notre Dame, Master of Science in Chemical Engineering
University of Notre Dame, Bachelor of Science in Chemical Engineering

LICENSES & CERTIFICATES:
Licensed Professional Engineer (License Currently Retired) -- State of Indiana
U.S. Patent Holder -- Refinery Treating Process

PROFESSIONAL AFFILIATIONS:
American Institute of Chemical Engineers
The Institute of Management Sciences

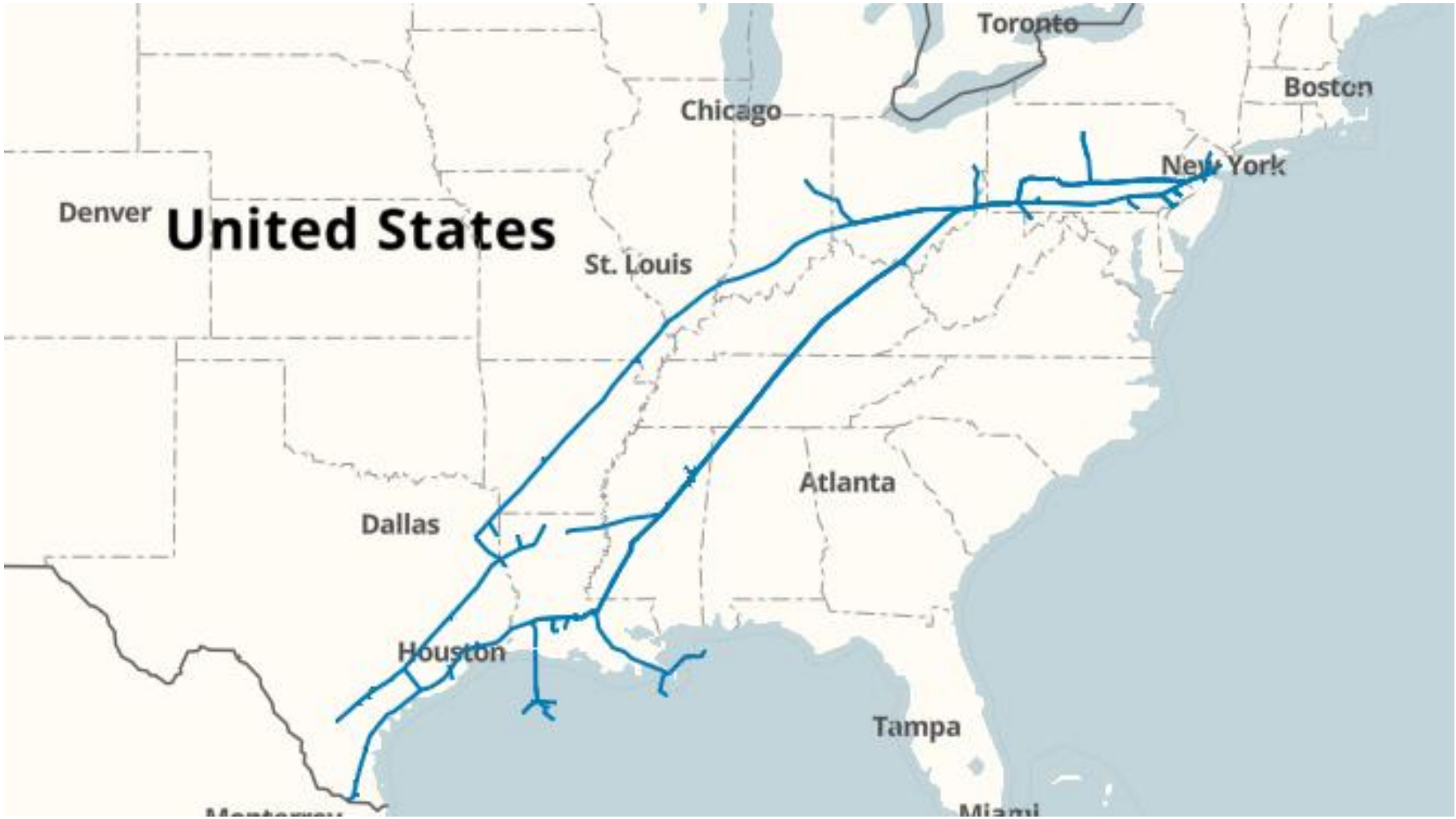
SAMPLE PUBLICATIONS AND PAPERS:
"Using a Personal Computer as a Gas Supply Planning Tool." ***Gas Industries*** lead article.
"Personal Computers and the Natural Gas Industry." ***Public Utilities Fortnightly***.
"Personal Computer-Based Long-Range Planning for Natural Gas Development and Supply Management." Presented at the ***International Gas Union's 18th World Gas Conference***, Berlin, Germany.
"Role of Optimization Models in Dispatching Gas Supplies." Presented at ***AGA Distribution/Transmission Conference***, Toronto, Canada.
"Experience With Gas Supply Optimization Models at Inland Natural Gas." Presented at ***IGT symposium on Personal Computers in the Gas Industry***, Chicago, Illinois.

SCHEDULES

Table of Schedules

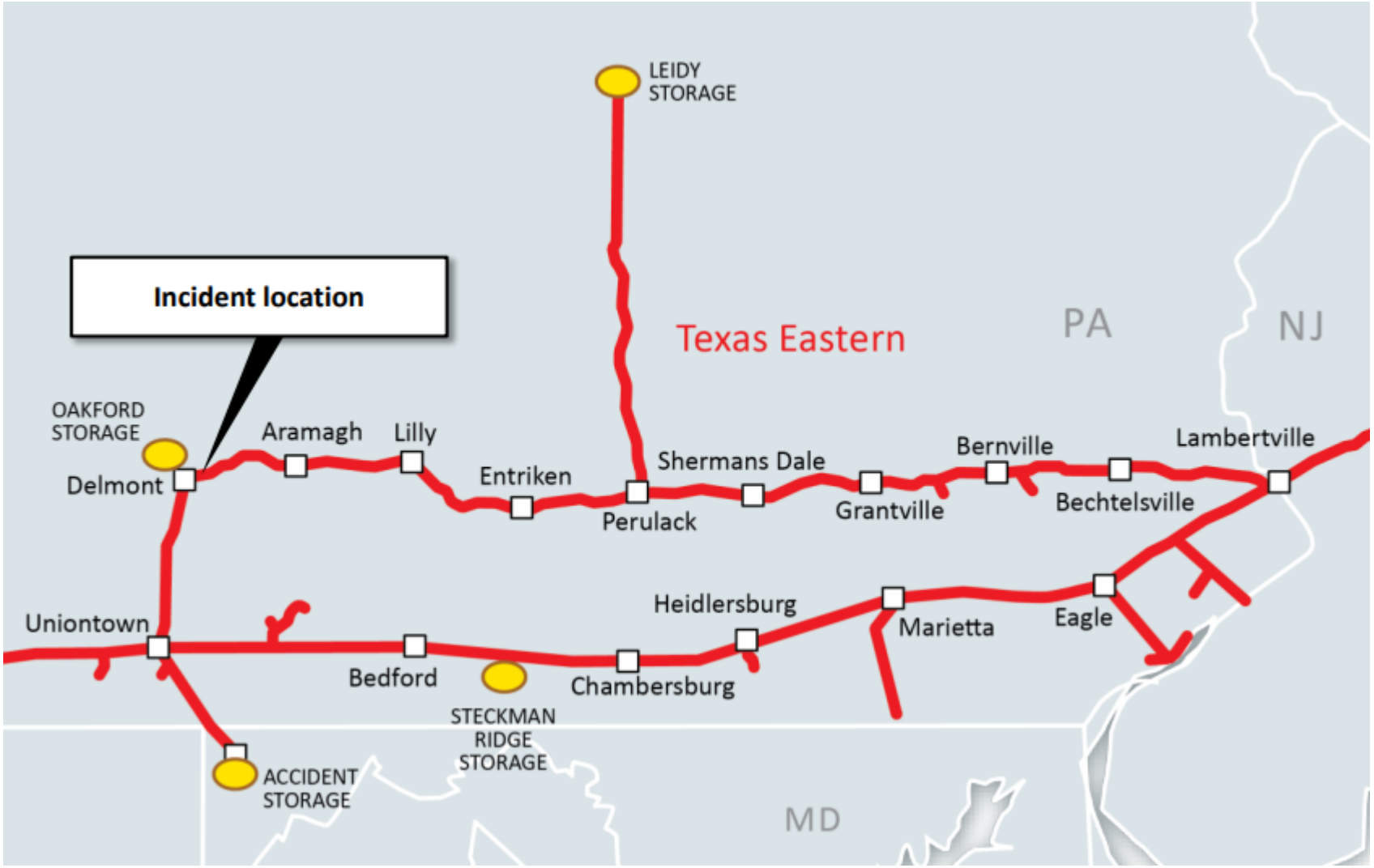
Title	Schedule
Map of Texas Eastern Transmission Pipeline System	Schedule EAM-01
Map of Texas Eastern's Mid-Atlantic Transmission Pipeline System	Schedule EAM-02
Oversized Proposed Pipeline Extensions	Schedule EAM-03

Map of Texas Eastern Transmission Pipeline System



Source: https://www.enbridge.com/map

Map of Texas Eastern's Mid-Atlantic Transmission Pipeline System



Source: https://www.spectraenergy.com/

Oversized Proposed Pipeline Extensions

Project	Segment	Length (Miles)	Proposed Diameter (Inches)	Minimum Diameter (Inches)
1	1	5.4	24	20
2	2	10.0	20	16
3	5	0.7	24	16[1]
4	1	10.3	20	16
5	1	7.3	12	8

Notes: [1] Project No. 3 Regulator inlet pressures indicate this minimum size could be even smaller; however, sizes below 16-inch were not analyzed for this segment.
Source: Company's Response to Data Request RCR-G-ENG-38, Attachment "RCR-G-ENG_0038_Curtailment Resiliency pipeline segment size comparison.xls"