

STATE OF VERMONT
PUBLIC UTILITIES COMMISSION

Petition of Vermont Gas Systems, Inc., for a)
certificate of public good, pursuant to 30)
V.S.A. § 248 , authorizing the construction of)
the “Addison Natural Gas Project” consisting)
of approximately 43 miles of new natural gas) Case No. 17-3550-INV
transmission pipeline in Chittenden and)
Addison Counties, approximately 5 miles of)
new distribution mainlines in Addison County,)
together with three new gate stations in)
Williston, New Haven and Middlebury,)
Vermont)

CORRECTED PREFILED TESTIMONY OF GREGORY R. LIEBERT, PE

July 10, 2020

Corrected: July 31, 2020

Summary: Mr. Liebert is a Licensed Professional Engineer. He testifies that the ANGP was constructed based on Issued For Construction plans for the project that were not prepared under the charge of a responsible Vermont licensed professional engineer before the plans were used for construction. This violated generally accepted engineering practices and potentially has placed the public at risk of harm.

Exhibits: 1. Curriculum Vitae 2. Report submitted to PUC on 9/12/19 3. Report submitted to PUC on 11/7/19 4. Gregory Corso Letter dated 11/6/19

STATE OF VERMONT
PUBLIC UTILITIES COMMISSION

Petition of Vermont Gas Systems, Inc., for a)
certificate of public good, pursuant to 30)
V.S.A. § 248 , authorizing the construction of)
the “Addison Natural Gas Project” consisting)
of approximately 43 miles of new natural gas) Case No. 17-3550-INV
transmission pipeline in Chittenden and)
Addison Counties, approximately 5 miles of)
new distribution mainlines in Addison County,)
together with three new gate stations in)
Williston, New Haven and Middlebury,)
Vermont)

1 **CORRECTED PREFILED TESTIMONY OF GREGORY R. LIEBERT, PE**

2
3 **Q. Please identify yourself.**

4 A. I am Gregory R. Liebert. I am the principal of Liebert Engineering, Inc., in Charlotte, Vt.

5 I am a Licensed Professional Engineer. My CV is attached as **Liebert Exhibit 1**. I declare it is
6 accurate.

7 **Q. Please summarize your testimony.**

8
9 A. The Addison Natural Gas Project (ANGP), a project with potentially catastrophic public safety
10 consequences, was constructed based on Issued For Construction plans for the project that were
11 not prepared under the charge of a responsible Vermont licensed professional engineer before the
12 plans were used for construction. This violated generally accepted engineering practices and
13 potentially has placed the public at risk of harm.

14 **Q. Have you already prepared two reports about the ANGP that were filed with the**
15 **Commission?**

16 A. Yes, they are dated September 12, 2019 and November 7, 2019. They were previously filed
17 with the Commission. They are **Liebert Exhibits 2 and 3** of my testimony. They are accurate, and
18 I incorporate them into this testimony.

1 **Q. Since you wrote those reports, have you obtained additional information?**

2 A. Yes. Attorney Dumont had asked me to review a large quantity of documents produced by
3 Vermont Gas Systems, Inc. (VGS), about the ANGP before I wrote those reports. After I wrote
4 them, Mr. Byrd issued his report, and then Attorney Dumont served discovery requests pertaining
5 to these issues. VGS and Mr. Byrd responded to the discovery requests.

6 **Q. What have you concluded after reading Mr. Byrd's report and the responses to discovery**
7 **that were provided after he issued his report?**

8 A. The discovery answers and the discovery documents have reinforced my conclusion and
9 heightened my concerns that the ANGP was designed in violation of the laws of Vermont and
10 generally accepted engineering practices, as set forth in my two reports. Mr. Byrd's report fails to
11 address the relevant facts. Instead it relies on an irrelevant Office of Professional Regulation
12 decision regarding the documents submitted for the section 248 application.

13 **Q. Please explain why you have concluded that the ANGP was constructed in violation of**
14 **generally accepted engineering practices and places the public at risk.**

15 A. This is for a number of related reasons.

16 First, Vermont law governing the practice of professional engineering require that a
17 licensed professional engineer supervise and take responsibility for overall design of a potentially
18 hazardous project such as a gas transmission pipeline. That person, upon satisfying himself or
19 herself that all designs follow generally accepted engineering standards and applicable codes and
20 adequately protects the public, must then affix his or her seal and signature upon the Issued For
21 Construction (IFC) plans and specifications. Any subsequent substantial changes to the sealed and
22 signed plans and specifications must be reviewed and commented on by that responsible charge

1 engineer. That process was not followed for the ANGP. The IFC plans were issued on June 28,
2 2013. They were not sealed and signed until after the project had been completed, in 2018.

3 The depositions of Mr. LeForce and Mr. St. Hilaire provide confirmation of this gap. When
4 asked who the responsible charge engineer for the ANGP was, neither of them could identify an
5 engineer after Mr. Colantonio ceased working in that capacity. The billing records show that over
6 40 engineers worked on the ANGP. St. Hilaire deposition p.185-189 [REDACTED]
7 [REDACTED]; LeForce deposition pp.28-30 [REDACTED]
8 [REDACTED]; Engvall PFT p.4 (invoices for over 40 engineers).

9 Second, the IFC plans were sealed and signed in 2018 by a civil engineer, Mr. Hollowood,
10 who was not licensed when the IFC plans were prepared and issued. They were “Issued for
11 Construction” on June 28, 2013. Mr. Hollowood became licensed on September 5, 2013.

12 Third, the IFC plans were signed and sealed in 2018 by an engineer, Mr. Hollowood, who
13 in fact could not have served as the responsible charge engineer for these plans in 2013. An
14 engineer’s seal and signature indicate the drawings and specifications were prepared under the
15 licensee’s responsible charge, or that the licensee has performed a full and independent review and
16 assumes full professional responsibility for the work if prepared by others. The invoices obtained
17 in discovery demonstrate that the then-unlicensed Mr. Hollowood had spent only 5 hours on the
18 ANGP by June 28, 2013 when the IFC plans were issued. Ms. Engvall’s Prefiled Testimony
19 contains this data. Mr. Hollowood could not have been the responsible charge civil engineer for
20 this 41-mile long natural gas transmission project, nor could he have performed a full and
21 independent review, in five hours.

22 CHA’s Executive Vice-President, Mr. Corso, has written to VGS that Mr. Hollowood was
23 in “responsible charge” of the IFC plans and that he was “actively engaged” in the development

1 of those plans (Corso letter 11/6/19, **Liebert Exhibit 4**). If Mr. Corso were correct, Mr. Hollowood
2 would have been acting unlawfully, but the billing records show that Mr. Hollowood put in only
3 5 hours of work before the IFC plans were issued. He could not have been the responsible charge
4 engineer for the IFC plans for the 41-mile gas transmission pipeline, legally or illegally.

5 Fourth, CHA and later VGS permitted construction methods to be implemented that
6 differed from the IFC plans. This is common and perfectly appropriate – if the responsible charge
7 engineer reviews, approves and documents the change. In the voluminous discovery responses I
8 reviewed, I saw no document that contains Mr. Hollowood’s, Mr. Thomson’s or Mr. Fuller’s
9 approval of changes.

10 Fifth are the issues that arise from the project’s reliance on mechanical and electrical
11 designs for which there was no responsible charge engineer. Civil engineers lack the competence
12 to stamp and seal mechanical plans or electrical plans. When an engineering project involves
13 disciplines outside of the responsible charge engineer’s area of expertise, such as civil engineering,
14 a licensed engineer for the other discipline must serve as the responsible charge engineer for that
15 discipline and must seal and sign those plans.

16 Critical components of the ANGP were constructed without a responsible charge engineer
17 who sealed and signed the mechanical and the electrical plans for the ANGP at the time of
18 construction. Critical components of the ANGP that were designed by electrical and mechanical
19 engineers are the Cathodic Protection (CP) and AC Mitigation systems, which are necessary to
20 prevent corrosion of the pipe. These systems were designed by ARK Engineers. ARK has never
21 provided sealed and signed engineering plans for the CP and AC Mitigation systems. My
22 September 12 report addresses this.

1 Other critical components, such as M &R Stations, required plans drawn up under the
2 charge of a responsible electrical and mechanical engineer. While Mr Fuller and Mr. Thomson
3 have now stamped those plans, they were not the responsible charge engineers at the time. My
4 November 7 report addresses this.

5 **Q. Did Mr. Byrd's report allay your concerns?**

6 A. No. Mr. Byrd rejected my concerns on the basis of a ruling by the Vermont Office of
7 Professional Regulation (OPR) dated January 23, 2014, which dealt only with the progress drawing
8 filed by Mr. Colantonio for the 248 application, and not the Issued for Construction plans and
9 specifications issued in June of 2013. I believe the OPR was correct in their ruling. The ruling did
10 not address the issues now before the Commission.

11 The Certificate of Public Good had been issued on December 23, 2013, one month prior to
12 the OPR ruling. Construction started in the summer of 2014, after the ruling.

13 The OPR ruling responded to two claims that are totally irrelevant to this case. The first
14 was the claim was that some of the engineers who worked on the project, under the supervision of
15 a Vermont-licensed engineer, were not licensed in Vermont. There is and should be no rule that
16 only in-state licensed engineers should be allowed to work on a project under the responsible
17 charge of a state licensed engineer. OPR correctly dismissed this argument.

18 The second was that the licensed engineer, Mr. Colantonio was just "rubber-stamping" the
19 plans prepared by unlicensed engineers. Mr. Colantonio signed and stamped the "Not For
20 Construction" plans in 2012. I have not asserted that Mr. Colantonio failed to act appropriately in
21 2012 in preparing the "Not For Construction" plans. The public is endangered not by the "Not for
22 Construction" plans from 2012, but by the "Issued For Construction" plans dated June 28, 2013
23 that no Vermont licensed engineer sealed and signed at the time of construction.

1 This concludes my testimony.

GREGORY R. LIEBERT, P.E., CEM, GBE, CEA, HFDP
Principal Engineer

Qualifications

PROFESSIONAL EXPERIENCE

Principal with daily involvement in design projects whether as a lead investigator, construction administrator, project manager, project engineer, forensic engineer, building science and construction consultant, or general engineering consultant. Since 1980 I have been providing mechanical, process and controls design, applications engineering, forensic engineering, building construction and analysis, product design and development, engineering and technical management, business management, project and client management. Engineering and management experience gained while working in the Chemical Processing, Packaging, Building, and Consulting Engineering industries on machine design, machinery and process development, systems integration and general mechanical for building systems, building failure analysis, indoor air quality failures, and process engineering for food, pharmaceutical, microelectronics general chemical, industrial coatings among others.

Inventions: United States Patent Number 5,333,804 – August 2, 1994

Community Service: Planning Commission and Zone Hearing Board Member, Church Trustee Board Chairman

EDUCATION

B.S., Mechanical Engineering, Villanova University, 1981

Numerous Professional Development Hours / Courses as required to maintain professional engineering licenses, and Expert Witness Credentials.

REGISTRATIONS

Registered by the United States Council for International Engineering Practice (USCIEP) under the authority of the National Council of Examiners for Engineering and Surveying (NCEES), in the National Registry of Professional Engineers. Engineering experience and qualification records have been verified by NCEES.

LICENSES

Licensed Professional Engineer in the State of Vermont, Commonwealth of Pennsylvania, State of Maine, State of New Hampshire, Commonwealth of Massachusetts, State of New York, and State of New Jersey

CERTIFICATIONS

Certified Energy Manager (CEM) by the Association of Energy Engineers

Certified Green Building Engineer (GBE) by the Association of Energy Engineers

Certified Energy Auditor (CEA) by the Association of Energy Engineers

Micro Certified Mold Inspector (CMI) by the Micro Mold Inspection Consulting and Remediation Organization.

Micro Certified Mold Remediation Contractor (CMRC) by the Micro Mold Inspection Consulting and Remediation Organization.

ASHRAE Certified Health Care Facility Design Professional (HFDP)

MEMBERSHIPS

American Society of Mechanical Engineers (ASME)

American Institute of Chemical Engineers (AIChE)

Association of Energy Engineers (AEE)

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

MILITARY

Served in the Army, both Active and Reserve. Retired Major with 22 years service in the Special Forces, Military Intelligence, Infantry and Combat Engineers.

PRINCIPAL ENGINEER – LIEBERT ENGINEERING, INC.

Consulting engineering firm that provides clients with mechanical, instrumentation and controls, process and energy engineering, along with project management and construction administration services. Additionally provide forensic engineering and building science consulting (professional evaluation and analysis of conditions related to building, equipment, materials or system failures) for owners, contractors, manufacturers, insurance companies and legal firms.

FORENSIC ENGINEERING & CONSULTING EXPERT EXPERIENCE

Forensic Engineer and Consulting Expert for countless investigations and cases involving system, equipment, component, controls, and operator failures, all which led to property damage, material loss, and in some cases personal injury. Work for claims adjusters, insurance investigators, attorneys, and owners conducting investigations, analyzing technical and physical

data, collecting evidence, researching same or similar failures, and determining cause and origin, and then reporting findings and opinion. Provide expert testimony during depositions and trial.

UAI GROUP, INC., READING, PA/WILLISTON, VT

UAI Group, Inc.'s, Williston, Vermont Office and Regional Manager. Responsible for the operations, profitability and project management for this remote multi-discipline engineering office. Technical Administrative and Project Management responsibility for Mechanical, Electrical, Instrumentation & Controls, Structural and Architectural disciplines for multi-discipline infrastructure and process engineering projects. Additionally, provided forensic engineering services by conducting investigation, inspections, and preparing expert reports. Responsible for hiring and managing local sub-consultants for disciplines not maintained in the office.

Previously, the Process and Mechanical Engineering Division Manager and Partner and member of the Board of Directors for UAI Group, Inc.'s Pennsylvania Corporate Headquarters. Responsible for day-to-day management and strategic goal obtainment for the Machine Design, Mechanical, and Process Engineering Departments. Primarily responsible for the technical quality of all Division submittals, project resource planning and estimating and budget control.

PREMIER MILL CORP., READING, PA; DIRECTOR OF ENGINEERING:

With the assistance of five managers, directed all technical aspects of the business for this custom chemical processing machinery manufacturer. Responsible for machine design, mechanical and electrical engineering, laboratory operations, design & development, technical services and inspection. Developed and integrated new industry leading technology and acquired United States Patent. Provided support to the sales effort, via technical presentations, sales calls and commercial presentations as well as proposal construction. Team leader and technical director for a \$750K design and development project for a state-of-the-art process equipment project for the chemical processing industry.

MATEER - BURT CO., INC., WAYNE, PA; MANAGER OF ENGINEERING:

Served as the engineering department manager for this specialty packaging equipment manufacturer. Directed the engineering and machine design of various pieces of packaging machinery, and the subsequent line integration effort for the food, pharmaceutical, health care, cosmetic, agricultural, and general chemical industries. With an engineering staff of 11, inclusive of technical and electrical engineers and designers, software engineers, detailers and technical documents coordinator; developed several computer-controlled process and packaging machines. Provided direct support to owners and contractors involved in the installation, validation, start-up and trouble-shooting of the packaging lines. Typical packaging line projects involved the integration of bottle feeders, unscramblers and washers, inspection /reject stations, conveying and transfers, rotary and table-top accumulators, dry powder and liquid fillers, check weighing, cap feeding and capping, induction sealing, labeling, neck banding, case erecting, case loading and packing and palletizing. Either a PLC or a single-board computer or both, tied to a communications network controlled these lines.

ADTECH INCORPORATED, SKIPPACK, PA; ENGINEERING MANAGER:

Directed the design and engineering efforts of this specialty packaging equipment manufacturer. The customer base being primarily pharmaceutical (85%) with the balance being food, cosmetic, health care and industrial. Managed a 10 person staff inclusive of mechanical and electrical engineers/designers, detailers and information coordinators. Conducted design reviews, directed R & D and cost reduction efforts, scheduled the department work, provided technical sales and service support, maintenance of budgets and administration of personnel actions. Provided on-site and remote assistance during the installation, validation, start-up and trouble-shooting of the complete packaging line.

NETZSCH INCORPORATED, EXTON, PA; MANAGER OF PRODUCT DEVELOPMENT - USA:

In addition to normal manufacturing, material management and engineering coordination, the position carried the additional task of designing and starting-up domestic manufacturing of a \$5MM segment of the company's product line (slurry grinding and dispersion equipment). Inclusive in the start-up project was the responsibility for engineering, vendor procurement/approval, purchasing and configuration.

As manager of applications engineering, responsibilities included management of outside chemical processing applications, direction of laboratory operations, sales and rental machinery coordination. Outside sales and marketing support was an inherent requirement of the job, along with public speaking and customer training seminars.

WESTINGHOUSE ELECTRIC COMPANY (COMBUSTION TURBINE DIVISION), CONCORDVILLE, PA; FIELD SERVICE/RELIABILITY ENGINEER:

Reliability and availability of combustion turbine power plants. Maintained accurate and detailed information regarding product problems, modifications, design changes and field failures. Specific responsibilities included engineering solutions to generic problems, field failure analysis, initiating corrective action and implementing field evaluation program throughout the United States and Mexico.

SPANCO INCORPORATED, DOWNINGTOWN, PA; MECHANICAL DESIGNER:

Original designs, assembly and detail drawings, prototype fabrication and testing; for a line of material handling equipment (gantries, jib cranes and tri-pods).

September 12, 2019

James A. Dumont, Esq.
Counselor at Law
15 Main Street
PO Box 229
Bristol, VT 05443

Reference: Addison Natural Gas Project Safety and Regulatory Compliance

Subject: Report

Dear Attorney Dumont,

My resume is attached. Based upon my review of documents pertaining to the Addison Natural Gas Project (ANGP) that was constructed by Vermont Gas Systems, Inc., (VGS), I have reached the following conclusions:

1. The ANGP, a natural gas pipeline construction project, was a public project with potentially huge public safety risks. The ANGP was not exempt from generally accepted engineering standards and the Vermont laws that dictate when and how a Licensed Professional Engineer (LPE) must review, sign and seal plans and specifications. This engineer is referred to as the Engineer of Record. It was essential for protection of the public that an Engineer of Record sign and place his or her seal upon the "Issued for Construction" (IFC) plans prior to commencement of construction. The seal and signature indicate the drawings and specifications were prepared under the licensee's responsible charge, or the licensee has performed a full and independent review and assumes full professional responsibility for the work if prepared by others.
2. The records I have seen include plans that were submitted to VGS by James Colantonio, P.E., a Vermont licensed Civil Engineer in 2012. However, the samples I saw were labelled "Not for Construction."
3. Construction commenced in 2014, using IFC plans, but VGS and CHA have informed the Commission by letter dated January 25, 2019 that none of the IFC plans were signed and sealed by an LPE, regardless of discipline, prior to construction.
4. The IFC plans I reviewed for 2012 onward represent design work by civil, mechanical and electrical engineering disciplines.

5. In response to VGS President Rendall's request in late 2018, CHA provided to VGS civil IFC engineering plans that had been signed and sealed by Mr. Hollowood, a Vermont licensed Civil Engineer in 2018. The signing and sealing were of no value or in compliance with Vermont law, and would not have ensured public safety during or after construction.
6. Mr. Hollowood has not stated that he was the responsible charge engineer in June of 2013 or in 2015 or 2016. He was not licensed in Vermont until September 5, of 2013. He could not have been the responsible Vermont licensed engineer in June of 2013. (CHA's letter to VGS states he was the responsible charge engineer, but he could not have been because he was not licensed in Vermont at that time.)
7. The IFC plans that have been produced that were signed and sealed by Mr. Hollowood, in 2018, do not include IFC mechanical and electrical plans for the ANGP. Mr. Hollowood is a civil engineer. No mechanical or electrical IFC plans that I have seen have been signed and sealed by an LPE in those disciplines at any time. The mechanical and electrical plans for the ANGP pertain to components of the ANGP that, if improperly designed or constructed, could risk public safety.
8. A comprehensive Quality Assurance plan is necessary to protect the public in a large project such as the ANGP and should include or reference the Engineer of Record's signed and stamped IFC specifications, and in particular requirements for material submittals and testing prior to, and during construction. Furthermore, it should make clear how the contractor is to comply with these signed and stamped submittal and testing requirements. ANGP construction commenced and was completed without any signed and stamped IFC plans and specifications for civil, mechanical and engineering design, and without any QA plan to ensure that construction conformed to the signed and stamped IFC plans and specifications. Moreover, the flawed QA plan that was adopted began to take shape in the summer of 2015 and was completed in December of 2015, after two full construction seasons.
9. If the records I have reviewed are complete, the ANGP was constructed in a manner that repeatedly and fundamentally departed from generally accepted engineering standards and practices. As a result, public safety was not adequately protected.

Discussion

Vermont law, 26 V.S.A. §§ 1161 and 1163, exempts some project types from the requirement for Vermont licensed Engineer's responsible charge for the design. For example, a person who designs private buildings or a person who designs manufactured parts need not comply. A natural gas pipeline, however, is a public project, and the statutes explicitly state that utility projects are covered, except for certain telecommunications projects. Under generally accepted engineering practices, and Vermont law, the IFC plans and specifications for a natural gas pipeline must be signed and sealed by an LPE before they utilized for construction. Other

engineers may prepare (and place their initials on) plans or specifications, but the Engineer with responsible charge must have direct control and personally supervise this engineering work.

I have reviewed the plans and specifications that were collected by VGS for submission to Mr. Byrd, as well as the plans and specifications submitted to Mr. Byrd by Intervenors. As noted above, a civil engineer affixed his signature and seal to a cover letter to a plan labeled "Not for Construction." The letter was dated December 17, 2012. The engineer was James Colantonio.

Other plans were submitted to the Commission and the Department prior to the Commission's order of approval dated December 23, 2013. These plans were dated June 28, 2013. They stated they were "Issued for Construction." The Commission's order requires construction in conformity with these plans. However, none of the June 28, 2013, IFC plans were signed and sealed by the Engineer of Record.

I was dismayed to discover that construction commenced in 2014, and then continued until the pipeline was completed in early 2017, based entirely upon IFC plans and specifications that lacked the signature and seal of an LPE. It is difficult for me to understand how a large project such as this, with obvious public safety risks, could be constructed without the signature and seal of an LPE upon the IFC plans. Signing and sealing are intended to ensure that an LPE has exercised his or her professional involvement and judgement in preparing or in directly supervising others who are preparing all the plans and specifications, within his or her discipline, to ensure project safety. The National Transportation Safety Board report on the Lawrence, MA explosion partially blamed the accident on the failure to have an LPE sign and seal the plans, because Massachusetts law exempted all utility projects.

The LPE who signed and placed his seal on some of the 2015 plans in 2018, Mr. Hollowood, is a civil engineer, not a mechanical or electric engineer. A civil engineer generally is not competent or authorized by law to place his or her signature and seal upon mechanical or electrical plans and specifications, and Mr. Hollowood did not do so.

I was again dismayed to discover that no LPE has signed or placed his or her seal on any of the mechanical and electrical plans for the ANGP, from 2012 to the present, according to the records submitted to the Commission's investigator, Mr. Byrd, and those the intervenors provided to me. The mechanical and electrical plans for the ANGP pertain to components of the ANGP that, if improperly designed or constructed, could risk public safety. These include the plans for the Metering and Regulation stations and the Colchester Launcher and Tie-in Site. Failure to include mechanical and electrical design reviews of the demolition and new construction for the natural gas pipeline in Lawrence, MA caused the explosion, property damage and loss of life.

Typically, Quality Assurance plans are developed by the contractor as part of the contracting process and are reviewed by the Engineer of Record regarding their materials submittals, testing requirements and other requirements that insure their design will be constructed according to their signed and stamped IFC plans and specifications. Typically during construction, the Engineer reviews inspection and testing reports to ensure that the signed and stamped IFC plans are being complied with, and sometimes will personally inspect the construction site to ensure

compliance. Whether drafted by the Engineer of Record, the owner or the contractor, all parties must agree to these terms, the point of which is to ensure public safety during construction.

The documents I have reviewed demonstrate that ANGP construction commenced in 2014 and continued throughout 2015 without adoption of a complete Quality Assurance plan by VGS or its contractors or its engineers. The ANGP QA plan was not adopted by VGS until December of 2015, at the close of the second construction season.

The QA plan, once it was adopted, was deficient, because it was not designed to implement the signed and sealed IFC civil, mechanical and electrical plans.

I have been informed by counsel that VGS's senior management has testified in another Commission proceeding that VGS authorized the first general contractor, Over & Under, to commence construction before a contract was executed, that construction then proceeded for months without a signed contract, that there never was a signed contract, and that VGS and Over & Under ended up suing each other in federal court for millions of dollars. Regardless of who prevails or the terms of settlement of that litigation, the key point is that QA is the contractor's responsibility, that the terms of QA must be set forth in detail in the contract, and that without agreement on the terms of the contract there simply could not have been effective QA.

The Commission's order approving of the ANGP relied on an effective QA plan during construction. The Commission ruled: "Vermont Gas has provided ample evidence that its design for the project meets or exceeds all applicable federal and state standards and that the Company will implement robust operational and monitoring controls." ("Discussion" following Finding 284). In my view, there were no robust operational and monitoring controls during construction of the ANGP. Sections of the signed-and-sealed IFC specifications regarding requirements for material submittals and testing, should have been included in the QA plan to ensure that those requirements and all specifications in general were being followed. Instead, what I found in the record were numerous "Corrective Action Plans." Sometimes these were adopted after the Department of Public Service had reported violations of the plans or specifications that it felt were important. A robust QA plan would have reported to the Engineer of Record these problems encountered during construction involving design and testing, which would have prevented or corrected them. There should have been nothing significant for the Department's inspectors to find and report. VGS and its contractors had a duty of QA, not the Department.

I was surprised as well by the Department's actions. The Department was the delegated pipeline safety regulator under federal law as well as the Vermont Authority Having Jurisdiction (AHJ). The Department should have insisted that construction await production of civil, mechanical and electrical IFC plans that had been signed and sealed by a Vermont LPE within each discipline. The Department also should have insisted that VGS and its contractors adopt an effective QA plan prior to commencement of construction. While the independent inspections the Department provided were useful, they were no substitute for signed and stamped IFC plans and adoption of an effective QA plan by VGS and its contractors prior to commencement of construction.

Since there were no signed and stamped IFC plans, there was nothing that a QA plan could ensure conformity with. Having said that, the QA plan that was adopted, and the manner in which it was implemented, raise more questions about the quality assurance plan and its implementation that I cannot answer based on the records I have seen. These questions are set forth in Intervenor's Motion to Broaden the Scope of the investigation and their annotated and documented memo to Mr. Byrd.

One important example conveyed by the Intervenor is compaction. Compaction is required for safe construction of a gas pipeline. Inadequate compaction can cause breakage of the pipeline when farm equipment, trucks or other heavy vehicles cross over it, or from lifting or sagging of the pipeline. Intervenor's submissions allege that there is no record that any compaction occurred, or, more importantly, that compaction was tested, anywhere along the 41-mile long project – with the exception of 11 tests within the VELCO right of way, 6 of which failed. The documents attached to their memos support this allegation. I have not reviewed the hundreds of pages of inspection reports myself to see if there were occasions when compaction was inspected or tested outside the VELCO right of way. Because there was no signed and stamped IFC plans and specifications or a timely QA plan to set the standard for compaction, for recording of compaction, or for inspection of compaction, the absence of compaction testing would not be surprising to me.

Another example conveyed by the Intervenor is the laying of pipe directly on trench bottom. The June 28, 2103 plans submitted to the Commission forbade this. Subsequent specifications permitted this in certain specified circumstances. The Department inspector, during a site visit in 2014 of a pipeline section that had not yet been covered with backfill, saw that the section had been laid directly on trench bottom. The Department protested. VGS then agreed to cease the practice, but the records attached to Intervenor's memoranda suggest that zero sand or backfill was used as bedding throughout 2014, and during parts of 2015. Later, in 2016, a Department inspector, when visiting a section that had not yet been covered with backfill, again saw that it had been laid directly on trench bottom. VGS again agreed to cease the practice. Neither VGS nor the Department knows the extent to which the pipeline was laid directly on trench bottom, or in what circumstances, because at different times there either was no QA plan in effect or the QA plan did not require recording or inspection of where and why pipeline was being installed directly on trench bottom.

The fact that construction proceeded without a QA plan that included by reference the signed and stamped IFC plans and specifications may explain why the two construction methods approved of by the Commission, the trench method and HDD, were not used in the New Haven wetlands areas. It may also explain why many pipeline sections had coatings that were damaged and had to be repaired by the contractor, but were buried before inspection. The records attached to Intervenor's memoranda show that there were scores of complaints by coating inspectors, that repaired pipeline sections were being buried before the repaired sections could be inspected. The Intervenor don't know where these sections were located.

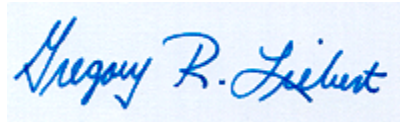
It is significant that CHA/VGS produced some 2015 IFC plans that were signed and sealed by Mr. Hollowood, but has not produced a set of as-built drawings for the civil, mechanical and

electrical plans to document the actual conditions that may be at variance with the IFC plans dated 2013, 2015 and 2016. The “as-built” plans that VGS provided to Intervenors and Mr. Byrd were prepared by a surveyor; they show only GIS positioning, not the actual conditions that vary from the civil, mechanical and electric IFC design plans.

The purpose of the generally accepted engineering practices summarized above and the requirements for a responsible Vermont licensed engineer to sign and seal plans and specifications is to protect the public. The failure to follow these practices, in my view, compels the conclusion the ANGP was constructed in a manner that does not adequately protect the public.

Sincerely,

Liebert Engineering, Inc.



Gregory R. Liebert, P.E., CEM, GBE, CEA, HFDP
Principal Engineer

November 7, 2019

James A. Dumont, Esq.
Counselor at Law
15 Main Street
PO Box 229
Bristol, VT 05443

Reference: Addison Natural Gas Project Safety and Regulatory Compliance

Subject: Report Amendment for AC Interference and Cathodic Protection Designs

Dear Attorney Dumont,

You recently provide the following two documents for my review:

1. Cathodic Protection System Design prepared for Vermont Gas System 12" Addison Natural Gas Project, prepared by ARK Engineering & Technical Services, Inc., and issued on May 20, 2016. Report Number: R-12145-Cp ISSUED FOR CONSTRUCTION.
2. AC Interference Analysis & Mitigation System Design prepared for Vermont Gas System 12" Natural Gas Project, prepared by ARK Engineering & Technical Services, Inc. (ARK), and issued on May 20, 2016. Report Number: R-12144-AC ISSUED FOR CONSTRUCTION.

Both documents included Issued for Construction design drawings with ARK and CHA title blocks, indicating CHA subcontracted the production of these Instruments of Service to ARK. Neither of these documents were sealed and signed by a Vermont Licensed Professional Engineer. As CHA's subconsultant, ARK was bound by Vermont State Statute Title 26 Professions and Occupations, Chapter 020 Professional Engineering, Subchapter 001 General Provisions. Specifically, like CHA they were required to have Vermont Licensed Professional Engineer seal and sign the documents indicating the Instruments of Service were prepared under a licensee's responsible charge as defined by 26 V.S.A. §1161(8).

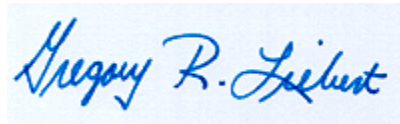
The primary purpose for Vermont Board of Professional Engineering that administers the licensing of engineers and enforcement of the statute is to "protect the public welfare and to safeguard life, health and property through the regulation of the practice of professional engineering".

If the cathodic protection design fails, the pipe line can corrode and eventually fail due to hole formation or structural failure, thereby putting the public at risk. Likewise, if the AC interference mitigation design fails the public and property are at significant risk. The following was extracted for the ARK AC Interference Mitigation report: “When metallic pipelines are located in shared rights-of-way with high voltage electric transmission circuits, the pipelines can incur high induced voltages and currents due to AC interference effects. This situation can cause a number of safety issues if not mitigated effectively. The possible effects of this AC interference can include: personnel subject to electric shock up to a lethal level, accelerated corrosion, arcing through pipeline coating, arcing across insulators, disbondment or degradation of coating, or possibly perforation of the pipeline”.

Lastly, it is important to recognize these documents were issued long after construction began on the pipeline, bringing into question what design was used for the construction of the pipeline protection system up to that point.

Sincerely,

Liebert Engineering, Inc.



Gregory R. Liebert, P.E., CEM, GBE, CEA, HFDP
Principal Engineer



November 6, 2019

Don Rendall
President and CEO
Vermont Gas Systems
85 Swift Street
South Burlington, Vermont 05403
DRendall@vermontgas.com

**Re: Review of Liebert Engineering, Incorporated Letter dated September 12, 2019
Addison Natural Gas Project**

Dear Mr. Rendall:

We are in receipt of the attached Liebert Engineering, Incorporated (Liebert) letter dated September 12, 2019, referencing Addison Natural Gas Project Safety and Regulatory Compliance. Clough, Harbour & Associates, LLP (CHA) provides the following response to the opinions expressed in the letter.

As an initial matter, Liebert does not question the integrity of the engineering of the Addison Natural Gas Project (ANGP) or opine that CHA's services did not meet the applicable standard of care, nor does the letter reference any specific technical standards or sources for quality assurance requirements. Contrary to Liebert's assertions, at all times, as set forth in more detail below, CHA's plans were prepared under the supervision of a Vermont-licensed engineer and in accordance with professional standards.

James J. Colantonio was the Vermont-licensed engineer overseeing the preparation of CHA's plans for the ANGP until October 2013. Liebert incorrectly asserts that Michael E. Hollowood could not have been CHA's engineer in responsible charge for the ANGP, since this role did, in fact, transition from Mr. Colantonio to Mr. Hollowood in October 2013. More specifically, the Issued for Construction (IFC) plans for ANGP were prepared under the responsible charge of engineers licensed in the relevant disciplines in the State of Vermont – namely, Michael E. Hollowood (civil, license number 018.0097764), Joseph J. Thomson (mechanical, license number 018.0090983) and James B. Fuller (electrical, license number 018.0009337). These licensed engineers were actively engaged during the development of the IFC plans and directly supervised the design. In December 2018, at the request of VGS, CHA provided copies of the original IFC plans previously issued to VGS, including mechanical and electrical plans, signed and sealed by the above-referenced engineers.

Prior to the commencement of construction, CHA provided VGS with final plans clearly labeled as IFC (an indication that the plans were suitable for construction), enabling VGS to establish a Quality Assurance Plan. CHA remained engineer of record throughout the ANGP, but VGS (not CHA) was responsible for the construction of the ANGP, the associated construction documentation (including a Quality Assurance Plan) and construction management.

The above responses confirm that the conclusions included in the Liebert letter relating to CHA's deliverables are without merit. If you have any additional questions or would like to discuss this matter further, please do not hesitate to contact me at (518) 453-8222 or by e-mail at gcorso@chacompanies.com.

Very truly yours,

Gregory S. Corso
Executive Vice President

/jrf

Attachment

v:\projects\lany\k3128757\corres\puc investigation\response to liebert eng_final_11.06.19.doc

70 South Winooski Avenue, Suite 2A, Burlington, VT 05401
T 802.735.0372 • F 802.318.4179 • www.chacompanies.com