



Staff Response

In the matter, on the Commission's own motion, to commence an investigation into a January 30, 2019 fire at **CONSUMERS ENERGY COMPANY's** Ray Compressor Station in Macomb County.

Incident Date: January 30, 2019

Case No. U-20463

May 8, 2019

Sally A. Talberg, Chairman
Norman J. Saari, Commissioner
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Commission Request of Staff

On February 7, 2019, the Michigan Public Service Commission, on the Commission’s own motion, opened Docket U-20463 to commence an investigation into the January 30, 2019 fire at Consumers Energy Company’s (Consumers or Company) Ray Compressor Station in Macomb County. The fire took place during a period of extremely cold temperatures culminating in an unprecedented emergency request for residential customers to set thermostats to 65 degrees or less on January 30 through January 31, 2019. The Commission directed Consumers to file a report in this Docket no later than 5:00 p.m. on April 7, 2019, addressing the following:

- 1) The origin of the fire;
- 2) How Consumers responded to the fire, both at the site and at its corporate office;
- 3) The Company’s implementation of gas curtailment procedures;
- 4) Whether there is evidence of a failure on the part of Consumers to properly maintain its equipment or any non-compliance with Commission rules;
- 5) Whether the Company properly responded to the natural gas shortage;
- 6) Estimated reductions in natural gas usage from large customer curtailments and residential conservation over time during the emergency with corresponding timeframes of actions (e.g., public appeals, emergency alerts) by Consumers and the State of Michigan;
- 7) Consumers’ coordination and communication with State of Michigan officials and local emergency response agencies;
- 8) Actions directed toward physical security and cybersecurity before, during, and after the event; and
- 9) The total cost of the incident, including gas lost on site, emergency natural gas purchases, estimates of customer curtailment impacts, and repair of the facility.

On April 5, 2019, Consumers filed its report in Docket U-20463. The Commission Order directed Staff to file a response to Consumers’ filing by May 8, 2019, outlining the process and anticipated timeline for the subsequent Root Cause Analysis (RCA) that the Commission’s Gas Operations Section will provide, and recommending potential changes to utility operations or procedures, if such changes are identified. This report is being filed in Docket U-20463 by Staff in response to Consumers’ filing. The Commission Order also encouraged stakeholders, including end-use customers and local governments, to provide input by May 8, 2019. Consumers is directed to file a response by May 30, 2019.

Background on the Gas Operations Responsibilities

The Michigan Public Service Commission (Commission) participates in the federal Department of Transportation’s Pipeline and Hazardous Materials Safety Administration’s (PHMSA) pipeline safety program as authorized under 49 USC Chapter 601, which provides the statutory basis for the pipeline safety program and establishes a framework for promoting pipeline safety through federal delegation to participating states for all or part of the responsibility for intrastate pipeline facilities under annual certification or agreement. This participation by the State of Michigan is a voluntary practice, although most states do participate in a pipeline safety program in some capacity. The Commission participates

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in the pipeline safety program acting as an intrastate and interstate agent for PHMSA for natural gas pipelines.

The Commission’s authority is found in Public Act 165 of 1969 (MCL 483.151 *et seq.*) which states “AN ACT to authorize the public service commission to establish and enforce gas safety standards; and to provide penalties for violations there of.” The authority granted to the Commission in Public Act 165 allows for the Commission, among other things, to promulgate rules, conduct inspections and investigations, and issue accident reports. The Commission has promulgated the Michigan Gas Safety Standards (R 460.20101 *et seq.*) which establishes safety regulations for gas pipeline operators and incorporates the federal pipeline safety regulations by reference. Intrastate pipeline inspections and enforcement are wholly under the purview of the Commission. Consumers is an intrastate pipeline operator and therefore inspection and enforcement of the pipeline safety regulations falls solely under the purview of the Commission. It is the responsibility of the Commission Staff to ensure that Consumers is compliant with both the federal and State gas safety standards, in addition to conducting thorough incident investigations of Consumers when the need arises.

Incident Investigation Process

Commission Staff has the responsibility to take telephonic notice of pipeline incidents at any time and respond to the scene of the incident as necessary. Both PHMSA and the Commission have developed criteria defining an incident, and an intrastate pipeline operator such as Consumers has the responsibility to notify Staff of any event that meets *either* criteria. The federal regulations have defined an incident in 49 CFR 191.3 as –

Incident means any of the following events:

- (1) An event that involves a release of gas from a pipeline, gas from an underground natural gas storage facility, liquefied natural gas, liquefied petroleum gas, refrigerant gas, or gas from an LNG facility, and that results in one or more of the following consequences:
 - (i) A death, or personal injury necessitating in-patient hospitalization;
 - (ii) Estimated property damage of \$50,000 or more, including loss to the operator and others, or both, but excluding cost of gas lost; or
 - (iii) Unintentional estimated gas loss of three million cubic feet or more.
- (2) An event that results in an emergency shutdown of an LNG facility or an underground natural gas storage facility. Activation of an emergency shutdown system for reasons other than an actual emergency does not constitute an incident.
- (3) An event that is significant in the judgment of the operator, even though it did not meet the criteria of paragraph (1) or (2) of this definition.

The State of Michigan has promulgated more stringent reporting criteria of incidents, as defined in Michigan Rule 460.20503:

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- (b) An event resulting in estimated property damage of \$10,000.00 or more including loss to the operator and others, or both, but excluding the cost of gas lost. As used in this subdivision, an “event” means on or relating to an operator’s facilities that may or may not involve a release of gas.
- (c) An event resulting in the loss of service to more than 100 customers.
- (d) An event involving a customer's gas facility that results in a fatality or an explosion causing structural damage.
- (e) An event resulting in an unintentional release of gas estimated by the operator to be 1 million cubic feet or more or an unintentional activation of an emergency shutdown system of any portion of a compressor station involving the release of gas.
- (f) An event that causes the pressure of any portion of a distribution system to rise above its maximum allowable operating pressure plus the build-up allowed for operation of pressure limiting or control devices.
- (g) An event that receives or is likely to receive extensive news coverage or is significant in the judgment of the operator....

Significant incident investigations result in Staff responding on-site to the scene of the incident and remaining there until at least such time as the scene has stabilized. Many incidents require repeat inspections to the scene to collect evidence, conduct interviews of involved personnel, ensure the appropriate evidence has been tagged and preserved for investigation, and to determine whether there is any indication of non-compliance with the gas pipeline safety regulations by the involved pipeline operator. This is in accordance with PHMSA’s “Guidelines for States Participating in the Pipeline Safety Program” which states:

Pursuant to Federal/State regulations, a State agency shall conduct an investigation of each significant or reportable incident/accident involving jurisdictional pipeline facilities. The primary objective of the investigation activities is to minimize the possibility of recurrence of this operator and other operators in the state’s jurisdiction and to institute enforcement action where non-compliance with the safety standards has occurred.

Staff was onsite at the Ray Compressor Station on January 30, 2019, to investigate the incident. Once the fire was extinguished, Staff observed the incident site for possible sources of gas and sources of ignition. Staff worked with Consumers to review the sequence of events, including data from Consumers’ onsite control room and video surveillance system. Staff and Consumers were unable to determine the initial source of gas on this day; however, Plant 1 involvement was ruled out and Consumers initiated its return to service.

Staff returned to the site on January 31, 2019 to continue the investigation. Staff worked with the Michigan State Police (MSP) and the Federal Bureau of Alcohol, Tobacco, and Firearms to perform the investigation. This day primarily consisted of reviewing the data and performing site observations. The

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investigation preliminarily concluded that a Plant 3 fire-gate¹ likely occurred prior to the fire, however this could not be substantiated due to discrepancies in many data sets, including Consumers’ Historian database, its control room human machine interface (HMI) data, the Plant 3 control system (Det-Tronics), and unknown time differentials between these systems in relation to the video surveillance system. The investigation also preliminarily concluded that the Plant 2 thermal oxidizer was likely the ignition source.

Staff returned to the site on February 2, 2019 to continue the investigation. Staff continued reviewing the various data sets to attempt to determine the time differentials and to look for indications of an automatic Plant 3 fire-gate prior to the fire. Staff collected data to substantiate the investigation’s findings and continued to work with Consumers to review and evaluate new developments in the following days. To date, Staff has had numerous interactions with Consumers to further the investigation and continues to keep abreast of new developments related to this incident.

Incident Report, Compliance Actions, and Recommendations

Significant incident investigations are formally documented by Staff in the form of an incident investigation report or an RCA report. Such a report contains the system details, describes the events that led up to the failure, the emergency response undertaken by the involved pipeline operator, a summary of how the pipeline facility was returned to service, the investigation that was undertaken by both the pipeline operator and Commission Staff, and concludes with Staff’s findings and the contributing factors that led to the incident. In addition to the report, Staff will issue notices of probable violation to the operator if it was determined that there were instances where the federal or state gas pipeline safety regulations were not followed. These notices can contain penalties for violating the safety regulations that were found during the investigation. Lastly, where Staff has discovered shortcomings from the pipeline operator that are not in direct violation with the applicable gas safety standards, Staff will issue a formal recommendation letter to the operator informing them of the identified shortcomings and recommending the operator enhance its programs to close the relevant gaps.

Response to the Company’s Filing

The following items contain specific references to Consumers’ filed report with associated Staff comments.

Introduction

- Page 1 of Consumers’ report states in part that “The station’s evolving design, culminating with the addition of Plant 3 in 2013, is resilient...”

¹ Consumers defines “fire-gate” on page two of its April 5, 2019 report to the Commission in Docket U-20463. A fire-gate is a required (49 CFR 192.167) emergency shutdown system that, among other things, is manual or automatic activation that discharges the gas to atmosphere through blowdown piping from the compressor station. Compressor station fire-gate systems are also commonly known as emergency shutdown systems or blowdown systems.

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Staff’s Response – Staff is aware of numerous unintended releases of gas from Ray Compressor Station’s Plant 3, totaling more than 30 MMcf of gas loss since 2011. Staff will include a further analysis of these types of failures in its subsequent RCA report.

The Origin of the Fire (1)

- Page 2 of Consumers’ report states in part that “On Jan. 30, Plant 3 at the Ray Compressor station detected an abnormal operating condition in the Det-Tronics control system.”

Staff’s Response – It does not appear that Consumers included an investigation into the abnormal operating condition in the Det-Tronics control system in its report. Staff will include a further analysis of this failure in its subsequent RCA report.

- Page 3 of Consumers’ report states in part that “For Ray Plant 3, the natural gas is typically routed through a silencer which reduces the noise produced by the blow down to a level that is less disruptive to the surrounding community than traditional straight pipe high velocity vents. This is accomplished by reducing the velocity as the natural gas is discharged. With the slow exit velocity, the gas flow is more sensitive to the wind which can enhance the mixing of the natural gas with the surrounding air.”

Staff’s Response – Consumers does not discuss whether the silencer design and/or location contributed to the incident. It appears that this incident could have been avoided if the silencer had a different design or was installed in a different location. Staff will include a further analysis of the adequacy of the design of the blowdown piping in its subsequent RCA report.

- Page 5 of Consumers’ report states in part that “On the morning of Jan. 30 at 10:23:10 a.m. (Times have been normalized to align with the security camera timestamps), the Ray Compressor Station lost the pilot air pressure signal for the Plant 3 fire-gate system. As designed, this triggered Plant 3’s process equipment emergency shutdown. The plant experienced a priority 1 fire-gate alarm at 10:25:20 a.m. and the station was blown down at 10:25:33 a.m.”

Staff’s Response – Staff was unfamiliar with the pilot air pressure data point. Staff was originally provided with the 10:25:33 a.m. data point as the first data point indicating the activation of the emergency shutdown system. However, Staff was unable to see any significance to the 10:25:33 a.m. time in the data provided. As part of the RCA, Staff will work with Consumers to understand the timeline in relation to the data originally provided.

- Page 6 of Consumers’ report states in part that “Personnel at the Ray Plant manually fire-gated Plant 1 and Plant 2, as part of our standard safety protocols, at 10:27:58 a.m. and 10:28:22 a.m., respectively.”

Staff’s Response – Staff’s investigation identified that Plant 2 actually fire-gated at 10:27:58. Staff was unable to verify the Plant 1 fire-gate time due to that event not being recorded electronically. As part of the RCA, Staff will work with Consumers to understand the timeline in relation to the data originally provided.

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How Consumers Responded to the Fire (2)

- Page 7 of Consumers’ report states in part that “It also enabled fast, complete and transparent engagement with the Commission, State Emergency Operations Center (SEOC) and the Governor’s office throughout the event.”

Staff’s Response – Missing from this assertion is the fact that communication between Consumers and other utilities within the state appears to have been poor. During Staff’s investigation of the event, other utilities indicated that Consumers failed to notify them of the seriousness of the situation, in addition to not being provided any advance notice that there was going to be an emergency plea issued to residents within the State, many of whom did not have Consumers as a natural gas provider. Staff recommends to the Commission that this issue be addressed in the Statewide Energy Assessment report (SEA) in Docket U-20464.

The Company’s Implementation of Gas Curtailment Procedures (3)

- Page 10 of Consumer’s report states in part that “Our actions included initiating pre-curtailment procedures of requesting voluntary reductions of gas usage and implementing an OFO, dispatching peaker fields, purchasing incremental pipeline supply, asking for additional gas supply above the scheduled amount from interconnecting pipelines and implementing a curtailment (as discussed in section 3) pursuant to Rule C3.3 of the Company’s natural gas tariffs.”²

Staff’s Response – Based on the report provided, Consumers took appropriate steps leading up to and implementing a curtailment, including those discussed in the excerpt above. Consumers, however, does not provide statistics pertaining to the overall effectiveness of the mandatory curtailment, such as the load in Priorities Two through Five, as outlined in Rule C3.3, Section F of the Company’s Rate Book for Natural Gas Service, that was reduced as a result of the mandate. Further, the report does not describe the enforcement actions taken pursuant to Rule C3.3, Section I, nor does it provide discussion of penalties as described under Rule C3.3, Section J. As such, Staff is unable to opine as to whether the implementation, enforcement actions, and penalties were effective in ensuring curtailment. As discussed later in this response, the subsequent request for assistance from the SEOC and Governor Whitmer indicates that the effectiveness of curtailment could be improved. To this end, Staff recommends that Consumers should continue to evaluate the effectiveness of its curtailment procedures and the Commission may consider recommending a review of all natural gas utility emergency curtailment procedures as part of the SEA report in Docket U-20464.

² If implemented by the Company, an Operational Flow Order (OFO) invokes daily-balancing upon transportation customers and allows the Company to limit both transportation and storage customers' daily storage withdrawal volumes to that level authorized by the Company. Peaker fields are Consumers’ small storage fields that can deliver a high volume of gas to the system for a short duration and aid in balancing the available gas.

Evidence of a Failure on the Part of Consumers to Properly Maintain its Equipment or any Non-Compliance with Commission Rules (4)

- Page 10 of Consumers’ report states in part that “The current installation meets requirements of Michigan’s gas regulations.”

Staff’s Response – Considering the origin of the fire (Page 6 of Consumers’ report states in part that “[t]he blowdown gas vented through the silencers located at the southwest corner of the station property. This blowdown gas ignited. The wind pushed the flames north eastward. The first visible sign of fire was observed near the Plant 2 thermal oxidizer stack at 10:25:51 am. The fire increased in size and reached the top of the Plant 3 blowdown silencer by 10:26:22 a.m.”), it appears that the design does not meet the requirements of 49 CFR 192.167(a)(2).

49 CFR 192.167(a) states in part that “Each compressor station must have an emergency shutdown system that meets the following: ... (2) It must discharge gas from the blowdown piping at a location where the gas will not create a hazard.”

Whether the Company Properly Responded to the Natural Gas Shortage (5)

- Page 10 of Consumers’ report states in part that “The actions taken by Consumers Energy avoided unplanned customer gas outages due to this event.”

Staff’s Response – Staff agrees that there were no systems that completely lost gas and that the actions taken by Consumers, asking customers for voluntary curtailments, were not necessarily inappropriate; however, Staff considers the curtailments, voluntary outages, and voluntary conservation of gas as restrictions put on customers that impacted their ability to conduct business, generate electricity, or maintain their residences at their preferred temperatures during the harsh winter conditions, to be an unacceptable contingency plan. It was the willingness of businesses and residents to voluntarily curtail their gas usage and not solely the actions of Consumers to secure additional sources of supply that allowed the natural gas infrastructure in the State to be able to remain in service.

- Page 11 of Consumers’ report states in part that “The system was operating according to plan until 10:28 a.m. (Time based on gas logs; normalized time to video surveillance is 10:33am) on Jan. 30 when Gas Control received a Ray Plant 2 fire-gate alarm and the instantaneous rate at Ray reduced from approximately 1,800 MMcf/day (1.8 Bcf/day) to zero.”

Staff’s Response – Staff believes this is referencing the Plant 3 blow down which occurred at 10:25:33 a.m. As part of the RCA, Staff will work with Consumers to understand the timeline in relation to the data originally provided.

Estimated Reductions in Natural Gas Usage (6)

- Page 19 of Consumers’ report states in part that “In addition to the statewide emergency alert used by the SEOC, we maintained communications with stakeholders and customers through various media channels throughout the event.”

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Staff’s Response – As previously mentioned, there were significant communication shortcomings between Consumers and the other natural gas providers within the State. Staff recommends to the Commission that this issue be addressed in the SEA report in Docket U-20464.

- Page 19 of Consumers’ report states in part that “Our 9:00 p.m. Facebook Live post on Jan. 30 featuring CEO Patti Poppe, drew 5,000 viewers in real time and drew 21 times the average number of impressions (30,000) for a Facebook post.”

Staff’s Response – Staff does not agree that 5,000 viewers was significant and asserts that other channels of communication should have been utilized. This is less than one-half of one-percent of Consumers’ customers. Staff recommends to the Commission that this issue be addressed in the SEA report in Docket U-20464.

- Page 19 of Consumers’ report states in part that “Over the two days we sent 1 million emails to residential customers and 70,000 emails to business customers.”

Staff’s Response – This seems to conflict with the 535,000 residential and business emails referenced on page 26. A better data point for email notification would be the number of households contacted. This would help reduce the inaccuracies of multiple emails sent to the same email address and for where there may be more than one email address per account.

Coordination and Communication with State of Michigan Officials and Local Emergency Response Agencies (7)

- Page 16 of Consumers’ report states in part that “Given the adverse pressure trends shown in Figure 9, we worked with the SEOC and Gov. Whitmer’s office around 8:00 p.m. to utilize the Emergency Broadcast System along with public appeals from CEO Patti Poppe and Gov. Whitmer to ask residential customers to help reduce natural gas usage.”

Staff’s Response – Because system pressure was dropping since 11:00 a.m. on January 30, 2019, it may have been prudent to discuss options for public service announcements prior to 8:00 p.m., likely gaining better understanding and broader acceptance from Michigan residents.

- Page 20 of Consumers’ report states in part that “Consumers Energy quickly established an ICS structure with a meeting cadence designed to support ongoing and transparent briefings to the MPSC, State and Local Emergency Operations Centers (EOC), the Governor’s office, the Michigan State Police and state and federal legislators.”

Staff’s Response – Consumers maintained a comprehensive communication strategy with state and local officials, including the Governor’s Office, MSP, Commission, county emergency managers (EM), etc., throughout the event. The establishment of an on-site subject matter expert at the SEOC was met in a timely fashion and proved useful.

However, lack of coordinated conversations sometimes led to overlapping or conflicting information being shared with state entities and leadership. This inefficiency leads to

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confusing narratives, timelines, and wasted resources. At times, Consumers had conversations with 1) Governor’s office, 2) Legislature, 3) Michigan Public Service Commissioners, 4) Staff at SEOC, and 5) Commission Gas Operations Staff.

Efforts should be made to streamline these paths for future emergency events.

- Page 21 of Consumers report states in part that “Many communications occurred throughout the event to update the SEOC, local EOCs and the Michigan State Police on the Ray plant and natural gas system. Our Director of Corporate Security, Public Safety Outreach team and senior leaders exchanged multiple calls with the Michigan State Police to provide status updates, discuss potential community impacts, ensure support for local and SEOCs and answer questions.”

Staff Response – Although communication with Commission, MSP and local EMs was frequent and comprehensive, Consumers incorrectly identified areas of concern for loss of residential natural gas service. This resulted in some counties needlessly preparing for potential loss of residential service (e.g., warming centers, evacuations, etc.) and others not preparing at all. Ensuring proper identification and communication of risk is a critical component of maintaining proper situational awareness.

Staff recommends to the Commission that the issues associated with coordination and communication be addressed in the SEA report in Docket U-20464.

Actions Directed Toward Physical Security and Cybersecurity (8)

- Page 22 of Consumers’ report states in part that “Corporate Security dispatched three Corporate Security personnel to the site to assist in the response to the incident. Corporate Security also arranged for two private security personnel to be on site 24 hours a day during the event and subsequent response.”

Staff’s Response – Staff notes that Consumers’ efforts to leverage internal and external physical security personnel, the site’s physical intrusion detection systems, and law enforcement resources helped manage the incident and contributed to the protection of public health and safety.

- Page 22 of Consumers’ report states in part that “Cybersecurity was not initially involved during the first day of the incident as there was no indication that anything malicious occurred. While there continued to be no indication of malicious activity, we felt it best to conduct a deep-dive analysis to rule out a cyberattack as a root cause or contributing factor.”

Staff’s Response – Staff contends that Consumers’ decision to do a “deep-dive” cybersecurity review was warranted and appropriate. It notes, however, that “indications of malicious activity” should not be viewed as a critical element to initiate such a review. Staff argues this partly because the current threat environment demands an increasingly

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proactive cybersecurity approach, and partly because sophisticated actors take great care to mask their malicious actions.

Staff recommends to the Commission that the issues associated with security be addressed in the SEA report in Docket U-20464.

Total Cost of the Incident (9)

- Page 23 of Consumers’ report states in part that “The incremental cost of these purchases compared to the cost of gas in storage at the time was approximately \$7.2 million.” Page 24 of Consumers’ report states in part that “Immediately after the Ray Compression Station fire, we estimated a high level \$18 million risk based on whether the Ray Plant 2 dehydration system would have to be replaced (\$14 million) and repair/replacement of the Ray Plant 3 support systems (\$4 million). The project team is working on an order of magnitude, scope and forecast. We expect to refine the costs in the near future as more information is gathered.”

Staff’s Response – Staff will review the prudence of these costs in the Company’s next general rate case, power supply cost recovery case, and/or gas cost recovery case.

Outline of the Process and Anticipated Timeline for the Subsequent Root Cause Analysis Report

As of the date of this filing, Staff has performed the onsite incident investigation and has attended follow-up meetings in person and remotely. Subsequent to these submittals in response to Docket U-20463, as part of the RCA, Staff will work with Consumers to fully understand any remaining discrepancies and newly identified facts. Staff will then begin to draft its RCA report immediately after these follow-up meetings. It is Staff’s intention to have a preliminary draft of the incident report no later than 60 days after the last investigation piece has concluded. Staff is expecting to finalize its report by January 1, 2020.

Recommend Changes to Utility Operations or Procedures

At this point in Staff’s investigation, it appears that the blowdown silencer for Ray Plant 3 that was designed and placed into service in 2013 was located where gas would be discharged at a location where it could create a hazard due to its proximity to the thermal oxidizer. The decreased discharge velocity of the silencer design, in conjunction with the close proximity to a competent ignition source, allowed a gas plume to ignite. **Staff recommends that Consumers perform a system-wide study of compressor station blowdown methods and locations. The blowdown method considerations should include discharge velocity, volumetric flow characteristics, height of discharge, plume modeling, etc. The blowdown locations should be evaluated considering proximity to competent ignition sources, including equipment that can meet or exceed natural gas auto-ignition temperatures, open flames or sparks, and potential static electricity discharge. This study should include consideration of single failure of components that may have designs protecting against these ignition sources from being**

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exposed to atmosphere. Consumers should then develop an action plan to remediate all such instances identified in this study.

Conclusions

Although the ignition did not involve personal injury nor complete system outages, Staff contends that there was a potential for injuries or fatalities and larger scale outages. In addition to the root cause analysis, Staff requests that Consumers specifically focus on factors that could have increased the significance of this incident. Consumers should implement countermeasures to its findings to all facilities within its system. Consumers should also communicate lessons learned and best practices to its industry peers in Michigan and elsewhere to help ensure safe and reliable natural gas transportation. Subsequent to this response, the Commission will be submitting its Statewide Energy Assessment in response to Docket U-20464. Staff will also be working with Consumers to fully understand any remaining discrepancies and newly identified facts related to this incident and will subsequently be drafting its RCA report in the coming months. At the completion of the RCA report, Staff plans to identify potential violations and make additional recommendations based on the final conclusions of the RCA report.