Direct Testimony of Mark E. Armstrong

Introduction

Q. Please introduce yourself to the Commission.

A. My name is Mark E. Armstrong. I am the Utilities Team Leader at Kimberly-Clark Tissue Company's pulp and paper mill in Everett, Washington (the "Facility"). I hold a bachelor of science in mechanical engineering from the University of Washington and am a licensed professional engineer with the State of Washington. I have been with Kimberly-Clark, or its predecessor Scott Paper Company, since 1978, and I have held a variety of engineering and management positions relating to energy production and pulp and paper operations at the Facility. In my current position, I am responsible for operation and maintenance of the energy production facilities at the Facility, and I manage approximately 40 operations, engineering and mechanical staff.

Q. What is the subject of your testimony?

A. My direct testimony addresses the following subjects:

1. The energy production systems at the Facility;
2. Kimberly-Clark's preparations for the gas curtailment;
3. Disruption and successful operation of the back-up diesel fuel system; and
4. The conduct of Kimberly-Clark and Puget Sound Energy ("Puget") during curtailment.

Energy Production Systems at the Facility

Q. Please briefly describe the Facility.

A. The Facility is an integrated tissue manufacturing facility that consists of five tissue

manufacturing machines, a pulp mill, and a cogeneration facility. The cogeneration facility supplies heat energy that supports the tissue machines and the pulp process, and we use a mix of wood waste, No. 2 diesel oil, spent sulfite liquor, and natural gas to fire the cogeneration boilers. The Facility operates 24-hours per day year round, except for scheduled maintenance shut-downs that typically occur in July and October, and has over 900 employees.

Q. What are the fuel sources for the cogeneration system?

A. The cogeneration facility has two boilers -- Boilers No. 10 and No. 14. Boiler No. 10 primarily uses spent sulfite liquor, a byproduct from the pulp process, and natural gas is the backup fuel. Wood waste is the primary fuel used to run the No. 14 Boiler, and natural gas is the secondary fuel source. No. 2 diesel oil is the backup fuel source for Boiler No. 14.

Q. What are the fuel sources for tissue machines and the pulp mill?

A. The tissue machines and the pulp-making operations primarily run on heat energy supplied by the steam system, but three of the tissue machines also have natural gas fired drying hoods. Approximately 1,400 MMBtu's of natural gas per day is needed to operate the drying hoods. In addition, there are three boilers (Nos. 7, 8 and 9) that back up the tissue-making operation and the pulp-making operation. These backup boilers use natural gas as a fuel source. Boilers Nos. 8 and 9 use No.2 diesel oil as a back-up fuel.

Q. Could back-up Boilers Nos. 7, 8, and 9 generate sufficient power to run the Facility?

A. No. If we did not have Boiler 10 and Boiler 14 operating we could not run our tissue machines and the pulp mill. The 7, 8 and 9 boilers can provide supplemental heat energy, but not enough for the entire Facility, so we need to use either Boiler No. 14 or No. 10 at all times.

Q. Why do you have secondary and back-up fuel sources?

A. Two reasons. First, as a continuously operating system, it requires substantial lead time to shut down the Facility. It takes approximately 18 hours to shut down the boiler operation, and to shut down the rest of the Facility safely would take approximately another 18 hours. Kimberly-Clark incurs substantial productivity losses for each hour that the tissue machines are off-line, so we plan our energy production systems to operate without stoppage. Second, the fuel sources are subject to potential interruption or curtailment. For example, the spent sulfite liquor supply can run short in the winter because the pulping operation is susceptible to freeze-up due to the amount of water used. In addition, there are no guarantees of wood waste because the suppliers are mostly small mill and lumber operators who make wood waste deliveries to the Facility at their discretion – we pay them for whatever they are able to deliver. Finally, natural gas can be entitled or curtailed, usually for pressure or mechanical reasons on the pipeline. So, we balance the supply of these fuel sources with the No. 2 diesel oil that is stored on-site.

Q. Is it possible for the Facility's natural gas use to place stress on Puget's system?

A. Yes, that is my understanding. In fact, Puget has called my control room and requested load reduction to help relieve compressor station problems, mechanical

issues with the delivery system, or other entitlements that get passed down from Northwest Pipeline. The requests for load reduction varied from a matter of a few hours to being on curtailment or entitlement for days. And to my knowledge, Kimberly-Clark has always complied with Puget requests for load reduction.

Kimberly-Clark's Preparations for Curtailment

Q. When did you learn that Puget was declaring a curtailment?

A. On Friday December 18, 1998, we were notified early in the morning by a phone call from Duke Energy that there was a strong potential for a gas entitlement based on the weather forecast. At about 5:00 or 5:30 p.m. on December 18, I received a red fax alert from Puget notifying us that we were going to be entitled the following day. On Saturday December 19, 1998, Puget notified one of my operation leaders, Mr. Skip Walton, who informed me that evening of Puget's curtailment.

Q. Did you take any action regarding fuel supply in response to learning of the possibility of a curtailment?

A. Yes. We took a number steps immediately after learning from Duke Energy on December 18 that an entitlement was likely.

Q. Please describe those actions.

A. First, because of the amount of preparations that it requires and the fact that we were going into a weekend, I needed to know whether that entitlement was in fact going to occur. At that point, I attempted to contact our Puget account representative, Ms. Tam King, and I made numerous phone calls to her, leaving messages requesting information as to the status of the entitlement. At no time did I receive any phone

calls in return from her indicating that there was going to be an entitlement or there was not going to be an entitlement. I later on that morning went out in my control room and called the Puget gas control dispatcher requesting the same information. And at that time, the gas controller told me he had been instructed by Puget management to not talk to us regarding the status of the entitlement.

Q. What other actions regarding fuel supply did you undertake?

A. Also on December 18, after the notification from Duke Energy, we immediately activated diesel fuel delivery from Pacific Northern Fuel Corporation ("PN"). In October, I had negotiated a purchase order for diesel fuel supply with Mr. Kevin Buffum of PN that I could activate instantly.

Q. Did you undertake any response actions regarding wood waste or spent sulfite liquor?

A. Yes. We continued on our minimum wood firing strategy, that we had initiated earlier in December, to conserve wood fuel. Due to some mill closures and other supply factors, there was concern about having adequate wood waste during December 1998, and we reduced wood firing load to the minimum to conserve fuel supplies. I directed our wood waste buyer, Mr. Jim Short, to get whatever wood waste sourcing was possible, and we did receive a continuous but reduced supply of wood waste throughout curtailment. We discussed with pulp mill operations management the pulp mill production schedule that would ensure a continuous uninterrupted supply of spent sulfite liquor to fuel the No. 10 Boiler.

Q. Did you take any other fuel supply actions in response to learning of the

possibility of a curtailment?

A. Yes, we began preparations for lighting off the diesel fuel system for the No. 14 Boiler.

Disruption and Successful Operation of the Back-Up Diesel Fuel System

Q. What happened as you prepared to fire the No. 14 Boiler with diesel fuel?

A. As the temperature dropped, we discovered that caustic contamination in the diesel fuel bulk storage tanks was going to prevent us from drawing fuel from that system. It was early within the first day of the curtailment.

Q. Why were the bulk storage tanks contaminated with caustic?

A. Despite our best efforts, residual caustic from an earlier accident remained in the bulk storage system. In September of 1998, a driver of a tanker truck pumped approximately 10,000 gallons of 20 percent caustic, sodium hydroxide, into the diesel fuel oil system. Because of its density, the caustic settled to the bottom of the tanks. There was an immediate incident investigation to determine what happened and to identify corrective action. Kimberly-Clark hired an environmental remediation company to come in and investigate. They took samples from each of the tanks to determine the quantity of material that may be in the bottom of the tanks. And then the environmental remediation company used a procedure where pipettes were inserted to draw the caustic material out of the bottom of each of the tanks. After the remediation was complete, fuel oil tests were taken and the system was deemed ready to operate. So going into the freeze period, we were operating under the assumption that the system was available and that fuel oil in the bulk storage tanks was available

for use. However, as the temperature dropped, we believe the residual caustic in the piping system that was not cleaned up froze and plugged the system. Twenty percent sodium hydroxide freezes at around 38 degrees Fahrenheit. This system is outside and it's in an earthen containment area. So the first thing we had to do was to come up with a way to heat the piping systems or to apply heat to the piping systems in order to begin to thaw the residual caustic out. It was quite a large project that ended up taking weeks to do, and we began that work immediately.

Q. As a result of the caustic contamination incident in the fuel oil bulk storage tanks, was the fuel oil system inoperable during curtailment period?

A. No, we implemented temporary measures so that the fuel oil system worked during the curtailment. We installed a temporary piping system that bypassed the tank farm and delivered fuel oil directly to the day tank. The day tank holds a maximum of 15,000 gallons, enough supply for one day. Fuel oil is pumped directly from the day tank to Boiler No. 14. However, the limited size of the day tank required the use of smaller trucks which carry between 8,000 and 10,000 gallons.

Q. Did PN accommodate your need to modify the fuel oil delivery system?

A. Yes, until December 24. When we realized that we couldn't draw from the bulk storage tank due to the solidifying caustic, on about December 18, 1998, we changed the delivery arrangement with PN and Mr. Buffum. We set up a schedule with PN for around-the-clock deliveries, and the timing of that schedule was based on the fuel burning rate that we were having to do. PN made fuel oil deliveries to the day tank on December 18, 20, 21, 22, 23, and 24, 1998. Ex. ____ (MEA-1) (PN summary of

deliveries).

Q. How much No. 2 diesel fuel oil did PN deliver during the December 18-24 time period?

A. 108,082 gallons. Ex. ___ (MEA-1). Because we had uncontaminated clean fuel in the day tank system, the back-up fuel oil system worked to supply the Facility during the cold weather portion of the Puget curtailment.

Q. What happened on December 24, 1998?

A. Mr. Buffum of PN informed Kimberly-Clark that PN could not make any fuel oil deliveries after that day because of a shortage of truck drivers. The drivers are only permitted to work a certain number of hours per day, and Mr. Buffum informed us that no PN drivers would be available to make deliveries before December 28. So, our last fuel oil delivery during the Puget curtailment occurred on December 24.

Q. Did PN's suspension of fuel oil deliveries on December 24 surprise you?

A. Yes, because Mr. Buffum had assured me in meetings and discussions during the December 18-24, 1998 time period that PN could supply us with fuel oil for the day tank.

Q. Was it reasonable for Kimberly-Clark to rely on PN?

A. Yes. We had purchased fuel from PN for years, at least since I have been in a managerial position, and PN had historically been a reliable supplier.

Q. In sum, in your view, was Kimberly-Clark adequately prepared for this curtailment?

A. Yes. I felt adequately prepared for the curtailment with the knowledge that the diesel

fuel bulk tank system was adequately cleaned up and was prepared for use after the contamination incident. Only when it was discovered that there was residual caustic in the bulk tanks were we forced to switch to the plan of the smaller deliveries to the day tank. And at that point, obviously, we were into the cold weather and had to change our logistics plan. However, we ran that way for six or seven days, and it worked well. I feel we had enough fuel to handle the contingencies that we knew about going into the curtailment. We didn't know about the contingency of losing the tank farm. Nor did we know about the contingency of losing the delivery system to the diesel.

Conduct of the Parties During Curtailment

Q. As Utilities Team Leader, did you establish any operational policies or directives during the curtailment?

A. Yes. I established operational priorities for the Facility. The operational priorities were to keep the Facility operating, and to burn penalty gas if necessary unless doing so would interfere or cause problems on the natural gas system. If it came down to choosing between burning gas and shutting the mill down, that we would communicate with Puget of our need to burn gas to maintain Facility operations, and that based on that communication with Puget, we would choose to go ahead and burn penalty gas. We were very clear in our priorities that if Puget informed us that they were unable to sustain gas volumes due to pressure or supply constraints on their systems, that we would shut down the Facility. I instructed Mr. Walton to follow the operational priorities after December 23, 1998, when I left for vacation, and he did.

Q. Who made the decision to use non-firm gas at Facility on December 25 and during the remainder of the Puget curtailment?

A. Mr. Walton. He made the decision to use penalty gas according to the operating priorities. I established the operating priorities to address situation where we had a condition of either loss of spent sulfite liquor on the No. 10 Boiler or a loss of wood waste or diesel fuel on the No. 14 Boiler. Mr. Walton understood the operating priorities, and when he was notified of loss of supply of the diesel fuel, he, from my understanding, called Puget gas control and informed them of our need to burn gas to sustain operations. Based on Puget's response, Mr. Walton made the decision to use the gas.

Q. During the curtailment, did Puget ever inform you or any one else at Kimberly-Clark, to your knowledge, that the Facility's use of non-firm gas during the curtailment was causing or contributing to pressure problems?

A. No. If Puget had informed us that penalty gas was not available due to their system constraints, we would have shut down the Facility.

Q. Did you have any communications with Puget after the beginning of the curtailment?

A. A Puget person, whose name I can't remember now, notified me of the curtailment on December 19 on my voice mail. It was not Tam King, our account representative. And I attempted to call back and get some details on the status of the curtailment and what they thought of the possible length and conditions of the restriction. In previous years, before 1995, we have had curtailments where we are curtailed for hours, not

days. In other words, we've had a dynamic communication between Puget gas control and ourselves concerning load. And I was attempting to open that communication with Puget as to whether it was going to be a 24-hour-a-day curtailment or whether there was going to be any daily relief based on actual loads on the system. And again, I was not successful in getting any response during that time frame.

Q. In sum, was Puget's conduct during the curtailment consistent with their past practice?

A. No. Puget's past practice has been to call Kimberly-Clark and request load reduction. Requests for load reduction varied from a matter of a few hours to being on curtailment or entitlement for days. It's my experience in previous curtailments and entitlements, that we've been able to communicate quite directly with Puget accounts representatives regarding the status of the situation. During the December 1998 curtailment, the Puget account representative and gas control were unresponsive to our attempts to communicate.

Q. Does that complete your testimony.

A. Yes.