BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

IN THE MATTER OF THE REQUEST OF DOMINION ENERGY UTAH FOR APPROVAL OF A VOLUNTARY RESOURCE DECISION TO CONSTRUCT AN LNG FACILITY	Docket No. 18-057-03

DIRECT TESTIMONY OF MICHAEL L. PLATT

FOR DOMINION ENERGY UTAH

April 30, 2018

DEU Exhibit 3.0

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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Michael L. Platt. My business address is 1140 West 200 South, Salt Lake City, UT 84104.

Q. By whom are you employed and what is your position?

A. I am employed by Dominion Energy Utah (Dominion Energy, DEU, or Company) as the Manager of Engineering Systems. I am responsible for the System Planning and Analysis Group, Records Management, Research and Development, and both High Pressure and Intermediate High Pressure (IHP) geographic information system (GIS) teams. My qualifications are included in DEU Exhibit 3.01.

Q. Have you testified before this Commission before?

A. Yes. I provided testimony in Utah Dockets No. 17-057-09 and 17-057-20. I have also made presentations at technical conferences and Integrated Resource Plan workshops.

Q. Attached to your written testimony are DEU Exhibits 3.01 through 3.07. Were these prepared by you or under your direction?

A. Except as otherwise stated, they were prepared by me or under my direction. Those not prepared by me or under my direction are true and correct copies of the documents they purport to be.

Q. What is the purpose of your direct testimony?

A. The purpose of my direct testimony is to explain the probability that a supply disruption will occur that would impact the Company's ability to maintain safe and reliable service to the Company's firm customers. I will also discuss the consequences of failing to properly plan for such an event by acquiring additional reliability related resources, and the operational advantages of obtaining on-system storage.

II. PROBABILITY OF A SUPPLY DISRUPTION THAT WOULD REQUIRE RELIABILITY SOLUTIONS TO ENSURE SAFE AND RELIABLE FIRM SERVICE

Q. What kind of event would cause a supply disruption sufficiently significant to require the Company to turn to additional solutions to maintain safe and reliable service?

A. There are many events that could pose that risk. The most likely event would be a weather related supply disruption either on a very cold day, or for a prolonged time-period. Ms. Faust indicates that since 2013, the Company has experienced several supply disruptions caused by cold weather. As Ms. Faust testifies, though these colder temperatures were not nearly as cold as would be experienced on a Design Peak Day, natural gas production was disrupted because natural gas wells and/or processing plants did not operate due to freezing temperatures. When the wells stop producing, or the processing plants stop operating, the natural gas cannot travel through the interstate pipeline system to DEU's load center. Fortunately, none of these events occurred at or near Design-Peak Day[1] temperatures. Had the temperatures been closer to Design-Peak Day temperatures, these incidents would likely have affected service to DEU's residential customers. If the production had stopped for a longer period of time, it would have been more difficult, if not impossible, for the Company to continue to make up for the supply shortfalls.

Also, like other businesses and government entities with operations along the Wasatch Front, the Company has also been preparing to meet customer demands during and after a natural disaster, such as an earthquake. The Company typically designs pipelines installed across fault lines to withstand the impact of earthquakes. Notwithstanding the design, a major earthquake at any of the fault lines surrounding the DEU load center could damage a pipeline, which would significantly reduce the amount of gas supply being delivered to the DEUWI system.

1 The Design-Peak Day is a day with a daily mean temperature of -5 degrees Fahrenheit or lower in the Salt Lake Valley.

There are many other events that could, and regularly do, disrupt natural gas supplies to local distribution companies like DEU. These scenarios are discussed in greater detail in DEU Exhibit 2.12 – Supply Reliability Risk. These include events such as third-party damage (tear-outs), landslides, fires, flooding and cyber-attacks. Several of these events have actually occurred in recent history and have either disrupted, or threatened to disrupt natural gas service to DEU's customers. As a result, the Company believes that, as a prudent operator, it has an obligation to plan for and be prepared to respond to these risks.

Q. If these situations have occurred in the past and the Company has been able to maintain service, why does DEU need additional supply capability resources?

A. DEU and its customers have been fortunate that the temperatures have not been colder when shortfall events have occurred, and that the supply disruptions have not been prolonged. Other utilities and pipeline companies have not been so lucky. Given the amount of the supply shortfalls in relation to the total system demand and the limited duration of the shortfalls, the Company has been able to withstand the shortfalls with tools currently available to the Company. Had any of these supply disruptions occurred at colder temperatures or for a prolonged period of time, the Company's customers would have likely lost natural gas service. As Ms. Faust discusses in her testimony, we are aware that other utilities have had this very experience and many of their customers went without natural gas service for days, due to cold weather. DEU seeks to ensure that its customers have safe and reliable service even in the worst conditions, on dangerously cold days. Accordingly, DEU is assessing the system for potential risks and planning to provide reliable service even in the most difficult circumstances.

Q. What are the chances of any of these scenarios actually occurring?

A. In recent history, when the temperatures drop to about 10°F mean in Salt Lake, there are upstream freeze-offs (both at wellheads and at processing plants) due to extremely cold temperatures in the Wyoming gas production area,[2] where corresponding minimum temperatures reach approximately -15°F mean. The Company currently uses withdrawals from the aquifer facilities to replace disrupted supplies during moderate weather, but

2 Green River, Wyoming

when temperatures drop below that approximate 10 degree threshold, the Company needs the aquifer supplies to meet customer demand. DEU Exhibit 3.02 shows the Company's gas supply portfolio. The chart shows the components of the Company's gas supply portfolio, including spot purchases, peaking purchases, baseload purchases, cost-of-service production, withdrawals from Clay Basin, withdrawals from the Ryckman storage facility, and, lastly, withdrawals from Aquifer storage. When temperatures drop further, the Aquifers are no longer available to replace disrupted supplies. When temperatures drop below a 3°F mean, the Company is required to call upon all of its resources described in DEU Exhibit 3.02, and no longer has a back-up resource. Thus, at such a temperature, the Company cannot use any of its supplies to replace supplies disrupted by upstream events. Put otherwise, at extremely cold temperatures, the Company's supply portfolio is fully-utilized, and a supply disruption would result in a supply shortfall and loss of service to customers. I have conducted a temperature probability analysis and determined that the chances of experiencing these temperatures or colder in Salt Lake are approximately once every 14 years. See DEU Exhibit 2.12.

Q. What were the temperatures in Wyoming during the shortfalls the Company experienced in recent history?

A. The table below shows the mean daily temperatures in Green River, Wyoming during recent shortfall events.

	SLC Average Daily Temperature	Wyoming Average Daily Temperature
12/5/2013	31°F	22°F
1/6/2017	10°F	-11°F
2/20/2018	22°F	0°F

Q. Do you account for supply shortfalls in your Design Peak Day unsteady state and steady state modeling?

A. No. My models assume that all of the supply in the portfolio will show up on an extremely cold winter day. Historically over the last few years, when mean temperatures have reached single digits, there have been supply disruptions upstream. Based on this experience, it is extremely likely that if the Wasatch Front is experiencing a -5°F average day, the temperatures in Wyoming will be considerably colder, and there will be well freeze-offs or equipment failures throughout the production, processing, and gathering systems that DEU relies on to serve its firm sales customers.

Q. What other events result in supply shortfalls on the DEU system?

A. Supply shortfalls can occur and have occurred as a result of landslides, flooding, earthquakes, human error, upstream facility design inadequacies and maintenance, cyber-attacks, and third-party damage to pipelines serving the LDC. Each of these risks is discussed in greater detail in Exhibit 2.12.

Q. Would on-system storage be immediately available at a time of need?

A. Yes. On-system storage would not involve interstate transportation, and would therefore not be constrained by the NAESB-mandated nomination schedule, as discussed in DEU Exhibit 2.12. The Company's Gas Control department could call upon an LNG facility when it was needed. Therefore, on-system solutions are the most reliable way to ensure gas is available even when upstream issues prevent gas supply from reaching the DEUWI system and the Company's firm customers.

III. CONSEQUENCES OF FAILING TO OBTAIN A WORKABLE SOLUTION TO THE SUPPLY RELIABILITY RISK

Q. What consequences do you expect if the Company experiences a supply shortfall during a Design-Peak Day?

A. Using a 2017-2018 Design Peak Day model, I calculated that the Company would lose service to up to 650,000 customers if a supply shortfall of 150,000 Dth/day occurred. Even if one assumes the least extreme outcomes from such a shortfall, it is unlikely that this scenario would result in a loss of service to fewer than 130,000 customers as that is approximately the number of residential customers that burn this amount of gas on a Design-Peak Day. DEU Exhibit 3.03 shows the High Pressure (HP) system pressures that would occur, at times throughout the day, if DEU experienced a supply shortfall of 150,000 Dth/day on a Design-Peak Day.

Q. How is it possible to lose service to 650,000 customers when only losing about 10% of the Design-Peak-Day supply?

A. The progressive loss of pressure and continued lack of supply reduces system capability far more than 10 percent. As the lack of supply persists, the system pressures drop and the amount of line pack drops.

The low system pressures result in a capacity reduction at the regulator stations feeding the Intermediate High Pressure (IHP) system of 1.2 Bcf/day. This amount of reduced capacity ultimately results in 650,000 customers losing service.

Q. How did you calculate and determine that the Company would lose service to 650,000 customers?

A. Calculating the amount of customers impacted in this scenario was a complicated and long process. First, I ran a Design-Peak Day unsteady-state model. At two hours prior to the peak hour, I removed 150,000 Dth/day of supply at the Riverton gate station. Then, I stepped the model through until pressures at a regulator station dropped below 0.00 psig. When unsteady-state model pressures reach zero, the simulation stops. Each time a regulator station dropped below 0.00 psig, I stopped the analysis and re-profiled the demands at these zero pressure locations so that the demand drops to zero before the model crashes. I repeated this process until the model produced complete results.

At this point, I exported the model resultant pressures throughout the simulation. I used the pressures to recalculate the capacity at each regulator station. The capacity used in the models is based on a 125 psig inlet. When pressures drop below 125 psig, the resulting regulator capacity also drops. The summation of all regulator station reductions is 1.2 BCF. After recalculating the capacities, I imported them into the corresponding Intermediate High Pressure (IHP) model. Once each IHP model was solved, all locations that were less than 5 psig were considered lost service customers. This analysis resulted in a loss of 650,000 customers.

Q. Would disrupting service to firm industrial customers make up the same amount of supply shortfall?

A. Not necessarily. There is no way to know whether or not industrial customers' supplies would be delivered to the system on any given day. In fact, industrial transportation customers' supplies reach the DEU system through the same network of drilling fields, processing plants, and interstate pipelines that the Company's supplies use. It is highly likely that, if the Company's supply is disrupted upstream, transportation customers' supplies will also be disrupted. It is the Company's obligation to maintain safe and reliable service for all of its firm customers even in Design-Peak Day conditions. Larger customers generally have larger pipelines with higher pressures feeding their services. Even if the Company preemptively discontinued service to a select number of industrial, commercial, and residential customers, some customers would still lose service. My Gas Network Analysis shows that the impacts would be most severe for residential customers.

Q. Do you have other concerns about interrupting firm transportation customers to solve this problem?

A. Yes. The Company's firm customers presumably pay for firm service because their businesses and processes cannot be interrupted or would incur significant business harm if service were interrupted. If the Company were to confiscate gas from firm transportation service customers to maintain service to firm sales customers, the firm transportation customers could suffer significant property damage and business losses. The loss of natural gas service could result in the loss of heat, hot water, power generation, or industrial process shut-downs. The Company is committed to providing safe and reliable service to firm transportation customers, just as it is committed to provide such service to firm sales customers. Shutting firm customers off when upstream conditions result in a supply shortfall is not consistent with this commitment and the Company therefore opposes interrupting firm industrial customers as the means of addressing supply shortfalls.

Q. If the Company were to select this as a reliability solution, would you have other concerns not previously mentioned?

A. Yes. The Company cannot expect a one-for-one replacement by interrupting firm customers due to customer locations. Exhibit 3.04 is a map of large customer locations along the Wasatch Front. One could be tempted to think that these customers are all included in the same system and would have the same impact on overall supply if the Company interrupted their service. The reality is more complicated. These customers all have their gas supply planned at specific gate stations, and changing the demand alters the take-away capacity. Additionally, the Lake Side power plant has feed from two completely separate systems that do not typically flow bi-directionally. These practical issues significantly reduce the predictability and potential value of interrupting firm customers.

Q. Could the Company interrupt service to defined geographic areas of customers rather than losing customers at random locations across the system?

A. The Company seeks to maintain safe and reliable service to *all* firm customers and understands it has an obligation to do so. Because DEU is charged with providing safe, reliable service to its customers, the Company would oppose any gas supply plan that includes a plan to disrupt service to firm customers during a cold winter day.

Additionally, this approach would not remedy a significant supply shortfall. I conducted analysis and modeling that assumed DEU shed demand from predetermined locations to maintain adequate pressures to the remainder of the system. In order to make up a shortfall of significant magnitude by shutting off specific locations, DEU would need to isolate the entire Summit Wasatch system (which includes the towns of Park City, Coalville, and Heber City) as well as all service in Tooele County, and all service to customers north of Brigham City. It is not reasonable to *plan* to temporarily terminate service to those firm customers in the winter, and to put their health, safety and property at risk.

Q. Why do you think that there could be impacts to the health and safety of your customers?

A. When homes lose natural gas, they also lose their internal heat quickly. On a Design-Peak Day, an average sized home, with good insulation and no working heat sources contained within, would reach freezing temperatures within several hours of losing natural gas service. The estimated time needed to restore service to 650,000 customers is about 51 days. This means that without some other heat source, a number of homes will reach freezing temperatures very quickly and could be without heat for that period of time. Because many customers would not have an alternative heat source, their health and safety would be at significant risk.

IV. FINANCIAL CONSEQUENCES OF A SUPPLY DISRUPTION

Q. If the Company were to lose service to 650,000 customers, what would be the cost to restore service to those customers?

A. Restoring service to 650,000 customers over a period of approximately 51 days would cost between $10,450,000 and $104,600,000. There are two different ways to estimate the restoration costs. The lower limit is calculated by determining the number of internal employees and mutual aid workers necessary to restore service to each customer, and the costs of each individual per day. The higher estimate is an extrapolation of the Company's experience with an outage in Coalville, Utah in 2016. The Coalville event required the Company to reinstate service to approximately 600 customers, and it cost approximately $100,000. Using that number and extrapolating for a larger number results in the higher cost estimate.

Q. How long will it take the Company to restore service to that many customers?

A. The Company estimates that it could restore service to all 650,000 customers in 51 days. This figure was arrived at by assuming a three-minute shut-off time and 25 minutes to relight each customer. It also assumes 150 Company workers per shift for the first three days, and that when mutual aid from other companies would arrive, we would have an additional 225 workers assisting with re-lighting.

Q. Why would the Company shut off meters before restoring service?

A. When a system loses pressure, pilot lights on appliances will go out. The Company must then shut off meters before reintroducing gas to the system to ensure that it does not inadvertently introduce gas into a home where appliances do not have their pilot lights lit. Then, when the system pressures reach operational levels, service techs will open the meter and relight each applicable appliance within the home or business.

Q. Won't some customers relight their own service before day 51? Have you accounted for this in your estimate?

A. Presumably, some customers will choose to relight their own appliances during that time. The same is probably true for commercial customers. Regardless, DEU would nevertheless be required to visit each customer to ensure that service has safely recommenced.

Q. What other potential costs could result from a significant supply shortfall?

A. An outage of the magnitude identified above will likely result in safety risks, product damage, and property damage. As I mentioned earlier, a supply disruption is most likely to occur in winter months when temperatures are very cold. Leaving customers without service in such conditions for any period of time creates a health and safety risk. There is also a likelihood that pipes would freeze and that some customers would experience significant property damage. As Ms. Faust explains, that very type of damage was widespread when Southwest Gas experienced a supply shortfall in 2011. The Company is also aware that, when industrial customers on the DEU system have experienced supply disruptions, they have expressed concern about the significant costs associated with lost product and property damage.

To obtain an estimate of the total resulting cost to the State of Utah from such a service disruption, the Company retained the Kem C. Gardner Policy Institute at the University of Utah ("Institute") to analyze the economic impact of such an outage. The Institute determined that the impact from a significant shortfall on the Gross State Product (GSP) would likely fall between $1.4 and $2.4 Billion. The full Institute study report is attached as Exhibit 3.05.

V. OPERATIONAL BENEFITS OF ON-SYSTEM STORAGE

Q. Ms. Faust has indicated that the Company recommends an on-system LNG storage facility to address the risks associated with supply disruption. Are there operational advantages of an on-system facility like that proposed in this docket, when compared to other off-system options?

A. Yes. Gas distribution systems perform better when gas is sourced as close as possible to the demand centers at high pressures. Exhibit 3.06 shows a progression of pressure differences between on-system and off-system storage, after a supply shortfall occurs at 6:00 AM. In DEU Exhibit 3.06, there is a comparison of system pressures when using an on-system storage solution like the proposed LNG facility and the off-system storage solution 3A of DEU Confidential Exhibit 2.11. For purposes of this model, the Company assumed that the on-system storage is located in Magna, Utah and the off-system solution feeds supplies into the Payson gate. The modeling also assumes that no-notice and other services allow the flow of gas to follow intra-day demand swings as well as on-system storage solutions.

On DEU Exhibit 3.06, where contours show as red, this signifies superior pressures with on-system storage. Where contours show as green, the off-system storage solution outperforms the on-system option. Blue contours indicate that the off-system and on-system option perform similarly.

During the Peak Hour, on-system storage provides much higher pressures generally throughout the system than other off-system options would. In some cases, the pressures are 80 psig greater with an on-system LNG plant. Aside from all the risks that are associated with off-system gas supply options, an on-system LNG facility actually results in higher system pressures because it would be closer to demand centers than any other supply option.

An on-system solution like the proposed LNG facility also flows through a shorter length of pipe before reaching customers' meters. This is beneficial because the gas takes less time to transition from storage to customers, and because there is a shorter distance of pipeline that would be vulnerable to force-majeure events, third-party damage, or other scenarios discussed in the Risk Analysis document, DEU Exhibit 2.12.

DEU Gas Control would control the on-system facility. This direct control also provides an additional benefit. Direct supply control would remove third parties from the process. The value of this independence cannot be overstated. When DEU's customers require the gas, gas would flow immediately without reliance on third parties or any additional process to ensure gas flows. There would be no need to make a gas nomination with a third-party in accordance with the NAESB nomination cycles, as described by Ms. Faust. This is important because the Company may not be aware of the upstream issues or supply disruption at a time convenient to the NAESB nomination schedule. Waiting for another nomination opportunity would delay getting replacement supplies to customers. Every second of delay that the Company is able to remove from the equation increases the opportunity to maintain service to all our customers. A recent cyber incident involving Energy Services Group, Inc. in which several pipeline operators said their third-party electronic communications systems were shut down highlights yet another element of risk that may be avoided by an on-system solution.

Q. Did you conduct a similar analysis with respect to the Magnum option identified as Option 3D in DEU Confidential Exhibit 2.11?

A. Yes. I have attached that analysis as DEU Exhibit 3.07.

Q. Are there advantages to owning an on-system facility over contracting with an outside entity for an on-system solution?

A. Yes. If DEU owns the facility, after the initial investment, future costs will be limited to maintenance and operation costs. If an outside entity owned and operated the facility, the future pricing for service would be in question and subject to change over time. It would be possible for the storage prices to increase over time, and could even exceed originally anticipated prices.

Another benefit of owning and operating an on-system storage facility is that the design and maintenance would be within DEU's control. As explained in the testimony of Michael Gill, DEU could design and build the facility to include redundancy on all critical equipment. In addition, the Company would control scheduling to ensure that maintenance occurs outside the most critical times, even outside of the heating season.

Q. Are there any advantages of owning on-system LNG that differ from standard on-system storage?

A. Yes. On-system LNG would add another method to bring service to outlying communities. DEU could do this by placing satellite LNG storage facilities near communities that currently are not near enough to existing facilities to be economically viable. Liquefied natural gas could then be trucked from the main facility to these satellite LNG storage facilities for use there. Additionally, this would allow the Company to utilize LNG trailers to maintain service to communities during construction or force majeure – related shutdowns.

Q. Would upstream storage, combined with equal amounts of deliverability and No-Notice Transportation Service, be roughly equivalent to on-system storage?

A. No. If supply is disrupted at one point, replacement supply from another distant location may not adequately address the resulting supply shortfall. Since the Company should plan for supply shortfalls that occur upstream of all the pipelines leading into the demand center, a centrally located on-system option would be best.

Also, depending on where supplies enter the DEU system, off-system storage may create operational difficulties that limit its efficacy.

Additionally, meaningful risks to a pipeline are measured in probability per mile. For the reasons discussed in DEU Exhibit 2.12, the more miles of pipeline, the higher the probability of an incident. Reliable supply that is located adjacent to major demand centers is inherently superior to any less proximal solution.

Q. Can the Company use line pack to address the supply reliability concerns?

A. No. The Company already uses line pack in its current system to meet its current needs, and the available line pack is already factored into my unsteady-state models. Line pack is a measurement of the quantity of gas that is contained within a pipe or gas network at any given time. There are fluctuations in line pack throughout the day, just as there are fluctuations in pressure. While pressure is not line pack, the higher the pressure is in any given line, the higher the line pack, and these measurements correlate. Our models and real-time data both show that locations in the system approach operational pressure minimums at times during the day when temperatures are very cold, due to demand or other circumstances. This indicates that there isn't enough usable pack in the area to supply demand on a design-peak day.

Q. Could future feeder line projects be economically modified or enhanced to address the supply reliability concerns?

A. No, it isn't practical or economical. It would be a paradigm shift in how we have been designing the system. To build more line pack into the system, the Company would need to oversize reinforcements and replacements. The Company currently has approximately 1,700 miles of high pressure pipelines. Building more line pack into the system would require the Company to construct and install additional large diameter pipelines to add significant available line pack. Adding enough pipe to provide this support would cost hundreds of millions of dollars and would not increase line pack enough to address our supply reliability needs.

Q. Could you please summarize your testimony?

A. My analysis indicates that the probability of an event, that will require a supply-reliability resource(s), will occur once in 14 years. Any supply shortfall(s) that occur at these temperatures will be devastating. The Company could take as long as 51 days to relight the calculated 650,000 customers who are likely to experience disrupted service. The most reliable solution from a design and modeling standpoint is a resource that can deliver supplies real time to prevent pressures from dropping and to hold the system. This resource must allow for the continuance of natural gas service pending the extreme cold temperature event or resulting from other causes. The only solution analyzed that meets all these requirements is an on-system LNG facility. As the manager of engineering systems for DEU, I am not confident that other resources presented in DEU Exhibit 2.11 provide the necessary level of reliability to allow us meet our obligation to serve customers.

Q. Does this conclude your testimony?

A. Yes.

State of Utah)
) ss.
County of Salt Lake)

I, Mike Platt, being first duly sworn on oath, state that the answers in the foregoing written testimony are true and correct to the best of my knowledge, information and belief. Except as stated in the testimony, the exhibits attached to the testimony were prepared by me or under my direction and supervision, and they are true and correct to the best of my knowledge, information and belief. Any exhibits not prepared by me or under my direction and supervision are true and correct copies of the documents they purport to be.

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Mike Platt

SUBSCRIBED AND SWORN TO this _____ day of April, 2018.

____
Notary Public