

PAIUTE PIPELINE COMPANY

Description of Company Operations

Paiute Pipeline Company ("Paiute") is a corporation duly organized and validly existing under the laws of the State of Nevada and has its principal place of business in Las Vegas, Nevada. Paiute is a wholly-owned subsidiary of Southwest Gas Corporation ("Southwest"), which is a corporation duly organized and validly existing under the laws of the State of California. Southwest's principal place of business is also located in Las Vegas, Nevada. Paiute is a "natural gas company" as defined by the Natural Gas Act. Paiute is primarily engaged in the transportation and storage of natural gas in interstate commerce for ultimate public consumption.

By order issued May 17, 1988, in Docket No. CP87-309-000, 43 FERC ¶ 61,257, the Federal Energy Regulatory Commission ("Commission") granted a certificate of public convenience and necessity to Paiute authorizing it to: (1) acquire and operate the certificated interstate natural gas facilities previously owned and operated by Southwest; (2) render interstate sales services in accordance with outstanding certificates of public convenience and necessity previously issued to Southwest; and (3) make sales of natural gas in interstate commerce to Southwest-Northern Nevada and Southwest-Northern California for resale. The Commission also granted permission and approval for Southwest to abandon its interstate natural gas facilities and the jurisdictional services performed through those facilities. On June 16, 1988, Paiute filed its notice of acceptance of the certificate of public convenience and necessity as issued by the Commission's May 17, 1988 order. Paiute commenced operations on August 1, 1988.

Paiute's interstate pipeline system extends from a point of interconnection with the facilities of Northwest Pipeline Corporation ("Northwest") on the Idaho-Nevada border at the Owyhee River to: (1) a point of termination on the Nevada-California state line immediately south of Lake Tahoe, where Paiute delivers natural gas to Avista Corporation ("Avista") for local distribution in El Dorado County, California; and (2) a point of termination on the Nevada-California state line immediately north of Lake Tahoe, where Paiute delivers natural gas to Southwest-Northern California for local distribution in Placer and El Dorado Counties, California.

From the interconnection with Northwest, Paiute's mainline extends approximately 225 miles to the Wadsworth Junction near Wadsworth, Nevada. Along the mainline, Paiute delivers gas into its Elko and Lovelock Laterals. Paiute can also receive gas into its mainline from its LNG storage facility, which is located near Lovelock, Nevada, approximately 61 miles upstream of the Wadsworth Junction. At the Wadsworth Junction, Paiute's mainline divides into two mainline extensions, the Reno Lateral and the Carson Lateral. The Reno Lateral extends to the cities of Sparks and Reno, Nevada. The Carson Lateral extends to the Carson City, Nevada area, where the lateral further divides into Paiute's North Tahoe and South Tahoe Laterals. Along the Carson Lateral, Paiute delivers gas at various delivery points and into several other lateral pipelines. On December 1,

2002, Paiute established, at the Wadsworth Junction, an interconnection with a second upstream pipeline, Tuscarora Gas Transmission Company ("Tuscarora").

On August 1, 1988, the date of Paiute's commencement of operations, Paiute began rendering wholesale natural gas sales service to four distributor customers: (1) Sierra Pacific Power Company ("Sierra Pacific"), which serves the cities of Reno and Sparks, Nevada, and surrounding areas in Washoe County, Nevada; (2) Southwest-Northern Nevada, which serves various communities in northern Nevada other than those areas served by Sierra Pacific; (3) CP National Corporation, the predecessor of Avista, which serves the city of South Lake Tahoe, California, and surrounding areas in El Dorado County, California; and (4) Southwest-Northern California, which serves various communities around the north shore of Lake Tahoe in Placer and El Dorado Counties, California.

By orders issued September 20, 1990 (52 FERC ¶ 61,311) and March 26, 1991 (54 FERC ¶ 61,338), the Commission approved a settlement offer in Docket No. RP88-227-000 with modifications. Pursuant to the settlement and the Commission's orders, on June 1, 1991, Paiute converted to a transportation only pipeline and began firm transportation service and contract liquefied natural gas storage service to the preceding distributor customers. Traditionally on Paiute's system, flowing supplies of customer owned gas have been delivered to the Paiute system through the facilities of Northwest. Under circumstances where demand exceeds flowing supply, Paiute, at customer direction, operates its LNG storage facility, which has the capability of providing peaking supplies as the need exists. With the addition of the Tuscarora interconnection in December 2002, customers have since had available a second receipt point for having flowing supplies of natural gas delivered into the Paiute system, as discussed further below.

On February 28, 1993, Paiute placed into service a major system capacity expansion project. As a result of the project, Paiute commenced firm transportation service for nine new commercial and industrial end user customers located across Paiute's system. Subsequently a tenth end user customer obtained firm transportation service from Paiute by means of a permanent capacity release.

No significant changes have been made to Paiute's system since the filing of Paiute's last FERC Form 2-A. Consequently, Paiute has not included a system map herein.

Recent Major Expansions

Since the conclusion of Paiute's previous rate case in Docket No. RP96-306 in 1997, Paiute has constructed three projects which increased the capacity downstream of Paiute's Wadsworth Junction:

(l) Docket No. CP94-29 – By order issued August 1, 1996 (76 FERC ¶ 61,144), the Commission authorized Paiute to construct its Lake Tahoe Area expansion project, which consisted of pipeline loop and pressure regulating and measurement facilities along its North Tahoe and South Tahoe Laterals. The purpose of the project was to expand the

capacity between the Wadsworth Junction and the terminus of Paiute's North Tahoe Lateral, where Paiute delivers gas to Southwest-Northern California, to provide 12,788 Dth/day of additional delivery capability to Southwest-Northern Nevada and Southwest-Northern California. Southwest-Northern Nevada received additional delivery capability of 2,455 Dth/day to its Incline Village area delivery points on the North Tahoe Lateral, and Southwest-Northern California received additional delivery capacity of 10,333 Dth/day from the Wadsworth Junction to its North Tahoe City Gate delivery point. The project was completed and placed into service on May 4, 1998. The total cost of the project was \$13,756,744. The Commission authorized incremental rates for this project.

(2) Docket No. CP99-599 – By order issued June 30, 2000, (91 FERC ¶ 61,352), the Commission authorized Paiute to construct certain pipeline loop and replacement pipeline facilities along its Carson and South Tahoe Laterals. The purpose of the project was to replace a deteriorating segment of 10-inch diameter pipeline on the Carson Lateral, and to provide additional firm transportation capacity of 10,800 Dth/day on the Carson Lateral and downstream laterals for Southwest-Northern Nevada by replacing the deteriorating segment with 20-inch diameter pipeline and adding two other segments of new loop pipeline. The project was completed and placed into service on October 30, 2000. The total cost of the project was \$4,844,763. In accordance with a settlement approved by the Commission, \$1,983,000 of the project cost is to be accorded rolled-in pricing treatment, and the remainder, \$2,861,763, is to be accorded incremental pricing treatment.

(3) Docket No. CP03-31 – By order issued July 14, 2003 (104 FERC ¶ 61,078), the Commission authorized Paiute to construct certain pipeline loop and replacement pipeline facilities along its Carson Lateral, along with certain pressure regulating facilities. The purpose of the project was to replace deteriorating segments of Carson Lateral pipeline and to provide additional firm transportation capacity of 5,868 Dth/day on the lateral for Southwest-Northern Nevada. The project was completed and placed into service on October 30, 2003. The total cost of the project was \$11,013,641. In accordance with a settlement approved by the Commission, a portion of the project cost, \$3,575,182, is to be accorded rolled-in pricing treatment, and the remainder, \$7,438,459, is to be accorded incremental pricing treatment.

All costs from the above projects are transmission function costs.

On December 1, 2002, as part of a capacity expansion project on Tuscarora's system, Tuscarora and Paiute established an interconnection between their systems at the Wadsworth Junction. Southwest-Northern Nevada and Southwest-Northern California obtained firm transportation capacity on Tuscarora's system to have gas delivered by Tuscarora into Paiute's system. As a result of the three Paiute construction projects described above, Paiute has established a takeaway capacity from its Wadsworth Junction receipt point with Tuscarora of 27,001 Dth per day. All of this capacity is committed to the two Southwest LDCs under their incrementally-priced firm transportation service agreements.

Description of Design and Procedure

Paiute utilizes the widely accepted unsteady-state module (USM[®]) of the SynerGEE software Version 3.35 developed by Advantica Stoner Associates Inc., to obtain optimum design flexibility. Paiute utilizes the Fundamental Equation within USM[®] while employing the Method of Characteristics. The equations utilized are found within Appendix A.

The design conditions used in USM[®] were developed using the best available data. For design purposes, allocation of a given customer's demand is based on the maximum historical hourly deliveries for that customer's individual delivery points, the sum of which cannot exceed that customer's daily contract demand. The hourly profile of the total daily demand is developed and periodically updated from SCADA data. Through the use of USM[®], a wide range of facility reinforcement or alternatives can be investigated.

If reinforcement of any segment of the system is required, or if a new system is being designed, numerous combinations of loop, new pipeline and/or horsepower additions are investigated to obtain the optimum facility arrangement. USM[®] uses length of pipeline or pipeline loop required, additional horsepower required, pressures at each delivery or intake point and compressor station operating data. The data, from the optimum facility arrangement, is transferred to the appropriate flow diagrams for design presentation, and material takeoff for cost estimating.

Paiute designs facilities in accordance with the Federal Safety Standards established by Title 49 of the Federal Code of Regulations, Parts 191 and 192; Transportation of Natural and Other Gas by Pipeline. Facility designs and costs are reviewed and approved by appropriate engineering management.

FLOW DIAGRAM DATA
ENGINEERING DESIGN DATA

1. Flow Formula

The Fundamental Equation with variable friction and efficiency is used in the GASUS Stoner model for calculating transient flows conditions. The formula is shown below.

$$Q = (n+1) 77.54 \frac{T_b}{P_b} D^{2.5} e \left[\frac{P_1^2 - P_2^2 - \frac{.0375 G (h_2 - h_1) P_a^2}{Z T_a}}{G T_a L Z f} \right]^{.5}$$

Where:

- Q = Flowrate (SCF/D)
- n = Number of additional pipes in parallel (dimensionless)
- T_b = Base temperature of the standard gas state (°R)
- P_b = Base pressure (PSIA)
- D = Inside diameter of pipe (Inches)
- e = Pipe efficiency (dimensionless)
- P₁ = Upstream pressure (PSIA)
- P₂ = Downstream pressure (PSIA)
- G = Gas specific gravity (dimensionless)
- h₁ = Upstream elevation (Feet)
- h₂ = Downstream elevation (Feet)
- P_a = Pipe average pressure (PSIA)
- Z = Gas compressibility factor (dimensionless)
- T_a = Pipe average temperature (°R)
- L = Pipe length (Miles)
- f = Pipe friction factor (dimensionless)

In this study, supercompressibility (Z) is calculated using a modified Benedict-Webb-Rubin type equation in terms of reduced temperatures and pressures which approximates the Z factor correlation of Standing-Katz (Trans AIME, Vol. 14b, p. 144, 942).

The friction factor (f) is calculated using the Shacham equation. The formula is shown below.

$$f = \left[-2 \log \left(\frac{\frac{\varepsilon}{d}}{3.7} - \frac{5.02}{N_{re}} \log (A_4) \right) \right]^{-2}$$

$$\text{where: } A_4 = \frac{\left(\frac{\varepsilon}{d} \right)}{3.7} + \left(\frac{14.5}{N_{re}} \right)$$

Where:

ε/d = Relative roughness (dimensionless)

N_{re} = Reynold's number (dimensionless)

2. Horsepower Formula

The theoretical horsepower is calculated as follows, except where a actual field measured performance map of each engine-compressor set is used:

$$Q = \frac{HP}{Z (K_1 R^{K_3} - K_2)}$$

Where:

Q = Flowrate (MMCF/D)

HP = Horsepower (Fundamental)

R = Compression ratio (dimensionless)

K_1 = Arbitrary constant (HP/MMCF/D)

K_2 = Arbitrary constant (HP/MMCF/D)

K_3 = Arbitrary constant (HP/MMCF/D)

Z = Gas compressibility factor (dimensionless)

The coefficients K_1 , K_2 , and K_3 can be derived from field data or from the theoretical adiabatic compression equation.

3. Assumptions and Bases

Paiute utilizes the following assumptions and bases:

Energy value = 1017 Btu/scf
Gas Specific Gravity = 0.60
Specific Heat Ratio = 1.3
Flowing Gas Temperature = 50° F
Base Temperature = 60° F
Base Pressure = 14.73 psia
Pipe Roughness = 0.0006
Compressor Station Inlet Losses = 5 or 10 psig
Compressor Station Outlet Losses = 5 or 10 psig

Locations, distances and elevations of modeled facilities were determined from U.S.G.S. quadrangle maps and construction records.