

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF COLORADO

DOCKET NO. 03A-265E

RE: IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF COLORADO FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE DENVER TERMINAL – DAKOTA - ARAPAHOE 230KV TRANSMISSION LINE PROJECT.

**COMMISSION ORDER GRANTING A CERTIFICATE OF
PUBLIC CONVENIENCE AND NECESSITY FOR THE
DENVER TERMINAL-DAKOTA-ARAPAHOE 230 KV
TRANSMISSION LINE WITH SPECIFIC FINDINGS**

Mailed Date: August 21, 2003
Adopted Date: August 20, 2003

I. BY THE COMMISSION

A. Statement

1. On June 20, 2003, Public Service Company of Colorado (Public Service or the Company) filed an application with the Commission pursuant to § 40-5-101, C.R.S., and 4 *Code of Colorado Regulations* (CCR) 723-1-55. In this application, Public Service requests a certificate of public convenience and necessity (CPCN) to construct the Denver Terminal–Dakota–Arapahoe 230kV Transmission Line Project (Denver Terminal-Dakota-Arapahoe Project or the Project), with specific findings regarding the reasonableness of the projected Electromagnetic Fields (EMF) and noise levels that the Company estimates will result from operation of the Project.

2. Public Service submitted sworn, direct testimony and exhibits of three witnesses in support of its application. Sandra Johnson, Manager, Transmission Planning, Xcel Energy Services Inc. (XES), testifies regarding the criteria used by the Company to evaluate the system

alternatives for the Denver Terminal-Dakota-Arapahoe Project. She also discusses the Project costs and the timeline for the Project. Ray LaPanse, Principal Transmission Planning Engineer, XES, explains the need for the Project, and identifies the system alternatives and the selection criteria used by the Company to evaluate the system alternatives. Andrew Schaller, Manager of Transmission Engineering, XES, describes the prudent avoidance measures selected by the Company to mitigate EMF and presents the resulting projected EMF profile. Mr. Schaller also provides the Company's estimates of the noise impacts of the Project and describes the measures the Company will employ to minimize noise levels. Lastly, Mr. Schaller explains why it is not feasible to construct the subject transmission line underground.

3. On June 24, 2003, the Commission issued notice of this application.

4. No interventions have been filed in this proceeding and the matter is not contested. As such, the Commission may determine this matter without hearing on the basis of the filed sworn testimony and exhibits under the Commission's modified procedure under 4 CCR 723-1-24.

B. Discussion

5. Public Service seeks a CPCN to construct the Denver Terminal–Dakota–Arapahoe Project. The Project entails constructing a new 230kV single circuit overhead transmission line from Denver Terminal Substation to Dakota Substation, converting Dakota Substation from 115kV – 13.8kV operation to 230 – 13.8kV operation, and replacing the existing 115kV Dakota – Arapahoe transmission line with a new overhead 230kV transmission line. The Project also includes installing 230kV breakers, switches, and associated protective relaying equipment at the Denver Terminal and Arapahoe Substations, line termination/sectionalizing load-break switches

at Dakota Substation, and re-tapping the existing 230 x 115 – 13.8kV transformer for 230kV operation at Dakota Substation.

6. Public Service asserts that the Project is needed to provide relief for contingency overloads on the 230kV underground and 115kV underground transmission systems in the metro-Denver area. The Project will also provide looped transmission service to the presently, radially-supplied Dakota Substation, thereby increasing the level of transmission reliability of the electric service provided to customers served from the Dakota Substation.

7. No party has contested the Company's assertions regarding the need for the Project.

8. The Commission has reviewed the application and the accompanying testimony and exhibits filed by the Company and finds that construction of the Denver Terminal-Dakota-Arapahoe Project is required in order to relieve contingency overloads on the 230kV underground and 115kV underground transmission systems in the metro-Denver area. The Commission further finds that the Project will result in additional benefits to the Company's transmission system, in that the provision of looped transmission service to the Dakota Substation will improve the reliability of the electric service provided to customers served from that substation. Accordingly, the Commission finds that the public convenience and necessity will be served by and requires construction of the Denver Terminal-Dakota-Arapahoe Project.

9. The Company also seeks specific findings regarding the reasonableness of the EMF and noise levels that the Company estimates will result from operation of the Project.

10. Exhibit No. AS-3 attached to Mr. Schaller's Direct Testimony quantifies the level of EMF the Company expects to result from operation of the Project during daily peaks in the

near future. Mr. Schaller explains that the load used to calculate the transmission line magnetic fields is developed from projected system normal and intact load flows. The Company asserts that higher currents could occur when the system is abnormal creating temporarily higher EMF levels.

11. The Company asserts that it has employed prudent avoidance measures to minimize the EMF levels from the Project. This is consistent with Commission rules that require the Company to employ prudent avoidance techniques to minimize EMF levels whenever possible. Specifically, in this case the Company has designed the structures of the Denver Terminal-Dakota-Arapahoe with a minimum buffer of three to five feet of additional ground clearance to provide a minor reduction in the EMF levels. The Company will also employ reverse phasing wherever feasible to minimize the EMF levels in those areas where the new line parallels an existing line. If reverse phasing is applied to parallel transmission lines, the magnetic field of one line will have a canceling effect on the field of the adjacent line.

12. Public Service's witness, Mr. Schaller, also estimates the noise levels expected to result from operation of the Denver Terminal-Dakota-Arapahoe Project. Exhibit No. AS-4 reflects the Company's noise level projections under both fair and damp weather conditions. These projections were developed using an industry recognized sound-modeling program that uses the specific Project characteristics to empirically project noise levels, but actual readings in the field may vary, due to the numerous environmental factors noted by Mr. Schaller that are beyond the Company's control. As Mr. Schaller explains in his testimony, noise levels can increase by as much as 25 dB(A) over the level that exists under fair weather conditions when there is moisture on the line. Mr. Schaller also testifies that the level of corona-generated audible noise will be substantially higher at higher altitudes, increasing by about 1 dB(A) for every

1,000 feet in elevation gain. Therefore, a transmission line constructed in the Denver area will have corona noise about 6 dB(A) higher than a similarly constructed line at sea level.

13. The Company asserts that it has no means of preventing the transmission line from becoming wet and emitting noise at substantially higher levels than exist under fair weather conditions. However, it will use industry-recognized prudent avoidance techniques to reduce the levels of corona-generated noise. Specifically, the Company plans to use large sized high quality conductors (1272 acsr kcmil). The Company will take steps to ensure that the conductor is handled and packaged properly so as not to damage it. The phases will be spaced adequately so as to avoid creating an excessive voltage gradient resulting in excessive corona.

14. No party has contested the Company's assertions regarding EMF and noise levels estimated to result from operation of the Project.

C. Findings of Fact

15. The Commission has reviewed the application and the accompanying testimony and exhibits and finds that the EMF and noise levels estimated by Public Service's witness, Mr. Schaller, in Exhibit Nos. AS-3 and AS-4 are reasonable. The Commission finds further that, given the public convenience and necessity requiring construction of the Denver Terminal-Dakota-Arapahoe Project, the imprecision in industry-recognized noise modeling, and the numerous factors that can contribute to noise as described by Mr. Schaller, the noise levels resulting from operation of the Project would still be reasonable even if they vary from the Company's modeling projections so long as Public Service has employed the prudent avoidance techniques described by Mr. Schaller.

II. ORDER**A. The Commission Orders That:**

1. The application of Public Service Company of Colorado for a certificate of public convenience and necessity to construct the Denver Terminal – Dakota – Arapahoe 230kV Transmission Line Project is granted.

2. Consistent with the above discussion, the prudent avoidance measures proposed by Public Service Company of Colorado to minimize the effects of Electromagnetic Fields and noise are reasonable.

3. The Electromagnetic Fields and noise levels projected by Public Service Company of Colorado to result from operation of the Denver Terminal – Dakota – Arapahoe 230kV Transmission Line Project are reasonable and would continue to be reasonable in the event they vary from Public Service Company of Colorado's projections, so long as Public Service Company of Colorado employs the prudent avoidance techniques described in its testimony accompanying the Application, given the public convenience and necessity that requires construction of the Denver Terminal – Dakota – Arapahoe 230kV Transmission Line Project.

4. The 20-day period provided for in § 40-6-114, C.R.S., within which to file applications for rehearing, reargument, or reconsideration begins on the first day following the effective date of this Order.

5. This Order is effective on its Mailed Date.

**B. ADOPTED IN COMMISSIONERS' WEEKLY MEETING
August 20, 2003.**

(S E A L)



ATTEST: A TRUE COPY

Bruce N. Smith
Director

THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

POLLY PAGE

JIM DYER

Commissioners

CHAIRMAN GREGORY E. SOPKIN
RECUSED HIMSELF.