First Regular Session
Seventy-fifth General Assembly
STATE OF COLORADO

ENGROSSED

This Version Includes All Amendments Adopted on Second Reading in the House of Introduction

LLS NO. 25-0798.01 Jery Payne x2157

HOUSE BILL 25-1260

HOUSE SPONSORSHIP

DeGraaf and Velasco, Richardson, Suckla

SENATE SPONSORSHIP

Pelton R.,

House Committees
Energy & Environment
Finance

Senate Committees

A BILL FOR AN ACT

CONCERNING THE RESILIENCY OF THE SYSTEMS THAT PROVIDE ELECTRICITY IN RELATION TO GEOMAGNETIC STORMS.

Bill Summary

(Note: This summary applies to this bill as introduced and does not reflect any amendments that may be subsequently adopted. If this bill passes third reading in the house of introduction, a bill summary that applies to the reengrossed version of this bill will be available at http://leg.colorado.gov.)

The bill requires the public utilities commission (commission) to evaluate electrical generation and grid resilience against geomagnetic storms (evaluation) and report the findings of the evaluation to the general assembly. The bill sets standards for the evaluation. Based on the evaluation, the commission shall adopt rules requiring an electrical utility to meet resiliency standards for geomagnetic storms. The rules include:

Shading denotes HOUSE amendment. Double underlining denotes SENATE amendment.
Capital letters or bold & italic numbers indicate new material to be added to existing law.
Dashes through the words or numbers indicate deletions from existing law.

HOUSE
Amended 2nd Reading
April 11, 2025

- Requiring the monitoring of the space weather prediction center of the national oceanic and atmospheric administration in order to isolate large power transformers and power generation from the grid;
- Mechanically isolating critical components if or when a coronal mass ejection is likely to cause geomagnetically induced currents;
- Restricting or closing fuel pipeline valves to mitigate damage in a sectional failure;
- Installing automatic neutral ground blocking devices in large power transformers;
- Ensuring that computer equipment can be mechanically isolated from the grid and sheltered from geomagnetically induced surges;
- Requiring all networked systems that operate electrical generation and distribution to be electronically and physically separable from the outside networks; and
- Requiring the cyber-certification of hardware and software that operate electrical generation and distribution.

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. Legislative declaration. (1) The general assembly finds and declares that:

(a) According to the federal cybersecurity and infrastructure security agency, "The U.S. energy infrastructure fuels the economy of the 21st century. Without a stable energy supply, health and welfare are threatened and the U.S. economy cannot function. Presidential Policy Directive 21 identifies the Energy Sector as uniquely critical because it provides an 'enabling function' across all critical infrastructure sectors. More than 80 percent of the country's energy infrastructure is owned by the private sector, supplying fuels to the transportation industry, electricity to households and businesses, and other sources of energy that are integral to growth and production across the nation."

(b) Coronal mass ejections and solar flares are natural and

unavoidable, and therefore are essential considerations for mitigation in "advancing climate resilient development" that must be considered "in the design and planning of settlements and infrastructure", according to the Intergovernmental Panel on Climate Change Summary for Policymakers, Climate Change 2021: The Physical Science Basis, Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 3-32; and

(c) The participation of transmission utilities in organized wholesale markets and the implementation of the "Colorado Electric Transmission Authority Act", article 42 of title 40, Colorado Revised Statutes, will assist transmission utilities and the Colorado electric transmission authority in ensuring the resilience of the electric grid and its resistance to both natural disasters and intentional attacks. Accordingly, the public utilities commission should use all available means to support these entities in preparing for, and documenting their ability to mitigate, any threats identified in the 2016 Colorado energy assurance emergency plan.

(2) The general assembly further finds and declares that:

(a) Geomagnetic storms are a type of geomagnetic disturbance of earth's magnetosphere that occur when there is a very efficient exchange of energy from solar wind into earth's environment. The storms transfer energy into the earth's magnetosphere, resulting in major changes in currents, plasmas, and fields. These changes are often preceded by coronal mass ejections, which are massive eruptions of plasma expelled from the sun's corona.

(b) Solar flares emit radiation in all bands of the electromagnetic spectrum, affect little more than radio communication, and arrive in 8 minutes;

(c) Coronal mass ejections often occur with solar flares, but each can take place in the absence of the other. Coronal mass ejections take several days to reach the earth.

(d) Coronal mass ejections are large expulsions of plasma and magnetic field from the sun's corona. They can eject billions of tons of coronal material and carry an embedded magnetic field morphing polarities as it travels in space and that is stronger than the background solar wind interplanetary magnetic field strength. Coronal mass ejections travel outward from the sun at speeds ranging from slower than 250 kilometers per second to as fast as nearly 3,000 kilometers per second. The fastest earth-directed coronal mass ejections can reach our planet in as little as 15 to 18 hours. Slower coronal mass ejections can take several days to arrive.

(e) The polarity of a coronal mass ejection can usually be determined at the Lagrange point, which is the gravitationally balanced point between the earth and the sun and is approximately 1.5 million kilometers from earth;

(f) At the Lagrange point, coronal mass ejections are 10 to 45 minutes from earth;

(g) If a coronal mass ejection is the same polarity as the earth's geomagnetic field, the coronal mass ejection will tend to be deflected. If a coronal mass ejection is opposite the earth's polarity, however, the earth's magnetic field will act to draw the energy into the earth's poles, creating disturbances in the earth's magnetic field, inducing electrical

currents in metal objects such as pipelines and electrical wires, or generating destructive heat in transformers due to an offset direct current charge.

(h) The result of geomagnetic storms is that electric current is generated in the magnetosphere and ionosphere, which generates electromagnetic fields at the ground level. The movement of magnetic fields around a conductor induces an electrical current. The excess current can cause voltage collapse or permanent damage to large transformers.

(i) Geomagnetic storms and geomagnetic disturbances are classified G 1 to G 5 based on a quasi-logarithmic classification system developed by the national oceanic and atmospheric administration. The strongest storms are G 5 class storms. The smallest ones are G 1 class storms (near background levels). These levels are classified as follows:

(I) G 5 means extreme, which is expected to occur for 4 days in each 11-year cycle, leading to widespread voltage control problems and possibly protective system problems. Some grid systems may experience complete collapse or blackouts. Pipeline currents can reach hundreds of amps.

(II) G 4 means severe, which is expected to occur for 4 days in each 11-year cycle, leading to possible widespread voltage control problems and some protective systems mistakenly tripping. Induced pipeline currents may affect preventive measures.

(III) G 3 means strong, which is expected to occur for 60 days in each 11-year cycle, possibly necessitating voltage corrections and triggering false alarms;

(IV) G 2 means moderate, which is expected to occur for 360 days in each 11-year cycle, with long duration storms possibly causing

transformer damage; and

(V) G 1 means minor, which is expected to occur for 900 days in each 11-year cycle and which may induce weak power-grid fluctuations.

SECTION 2. In Colorado Revised Statutes, **add** 40-2-125.6 as follows:

40-2-125.6. Electrical generation and distribution resiliency - evaluation - report - rules - repeal. (1) EACH ELECTRICAL UTILITY THAT IS SUBJECT TO THE JURISDICTION OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION SHALL ANNUALLY SUBMIT A CRITICAL ENERGY INFRASTRUCTURE INFORMATION REQUEST TO THE FEDERAL ENERGY REGULATORY COMMISSION REGARDING REGULATIONS EOP-010-1 AND TPL-007-4 ADOPTED BY THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION AND ANY CONTINGENCY ACTION PLAN. IF THE UTILITY RECEIVES THE PERMISSION, EACH ELECTRICAL UTILITY THAT IS SUBJECT TO THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION'S JURISDICTION SHALL ANNUALLY BRIEF THE COLORADO GENERAL ASSEMBLY ON THE UTILITY'S CONTINGENCY ACTION PLAN AND ANY INFORMATION NECESSARY TO:

(a) EVALUATE THE ABILITY OF AND IDENTIFY SHORTFALLS TO RESTORING ELECTRICAL POWER OPERATION, FUEL DELIVERY, AND EQUIPMENT FUNCTION WITHIN THE FOLLOWING TIMELINES FOR THE FOLLOWING TYPES OF GEOMAGNETIC STORMS:

(I) FOR A G 5 RATED GEOMAGNETIC STORM:

(A) POWER GENERATION RESUMING WITHIN FIVE DAYS;

(B) RECOVERY OF CRITICAL INFRASTRUCTURE WITHIN ONE WEEK;

(C) TRANSMISSION LINES AND NODES OPERATING WITHIN TWO WEEKS; AND

(D) COMMUNITY DISTRIBUTION OF ELECTRICITY WITHIN TWO WEEKS;

(II) FOR A G 4 RATED GEOMAGNETIC STORM:

(A) POWER GENERATION RESUMING WITHIN THREE DAYS;

(B) RECOVERY OF CRITICAL INFRASTRUCTURE WITHIN THREE DAYS;

(C) TRANSMISSION LINES AND NODES OPERATING WITHIN ONE WEEK; AND

(D) COMMUNITY DISTRIBUTION OF ELECTRICITY WITHIN TWO WEEKS;

(III) FOR A G 3 RATED GEOMAGNETIC STORM:

(A) POWER GENERATION RESUMING WITHIN TWO DAYS;

(B) RECOVERY OF CRITICAL INFRASTRUCTURE WITHIN TWO DAYS;

(C) TRANSMISSION LINES AND NODES OPERATING WITHIN THREE DAYS; AND

(D) COMMUNITY DISTRIBUTION OF ELECTRICITY WITHIN ONE WEEK; AND

(IV) FOR A G 1 OR G 2 RATED GEOMAGNETIC STORM, NO MORE THAN A BRIEF INTERRUPTION OF ELECTRIC SERVICE; AND

(b) EVALUATE THE CERTIFICATION OF HARDWARE AND SOFTWARE MONITORING AND CONTROLLING SYSTEMS FOR ENERGY GENERATION AND DISTRIBUTION.

(2) (a) BY JANUARY 2027, THE DEPARTMENT OF REGULATORY AGENCIES SHALL INCLUDE, AS PART OF ITS PRESENTATION DURING ITS "SMART ACT" HEARING REQUIRED BY SECTION 2-7-203, THE RESULTS OF THE EVALUATION REQUIRED BY SUBSECTION (1) OF THIS SECTION.

(b) THIS SUBSECTION (2) IS REPEALED, EFFECTIVE JULY 1, 2027.

SECTION 3. Act subject to petition - effective date. This act takes effect at 12:01 a.m. on the day following the expiration of the ninety-day period after final adjournment of the general assembly; except that, if a referendum petition is filed pursuant to section 1 (3) of article V of the state constitution against this act or an item, section, or part of this act within such period, then the act, item, section, or part will not take effect unless approved by the people at the general election to be held in November 2026 and, in such case, will take effect on the date of the official declaration of the vote thereon by the governor.