

**First Regular Session  
Seventy-fifth General Assembly  
STATE OF COLORADO**

**PREAMENDED**

*This Unofficial Version Includes Committee  
Amendments Not Yet Adopted on Second Reading*

LLS NO. 25-0798.01 Jery Payne x2157

**HOUSE BILL 25-1260**

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**HOUSE SPONSORSHIP**

**DeGraaf, Richardson, Suckla**

**SENATE SPONSORSHIP**

**Pelton R.,**

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**House Committees**

Energy & Environment  
Finance

**Senate Committees**

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**A BILL FOR AN ACT**

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

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**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.

- 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.

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

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

4 (a) According to the federal cybersecurity and infrastructure  
5 security agency, "The U.S. energy infrastructure fuels the economy of the  
6 21st century. Without a stable energy supply, health and welfare are  
7 threatened and the U.S. economy cannot function. Presidential Policy  
8 Directive 21 identifies the Energy Sector as uniquely critical because it  
9 provides an 'enabling function' across all critical infrastructure sectors.  
10 More than 80 percent of the country's energy infrastructure is owned by  
11 the private sector, supplying fuels to the transportation industry,  
12 electricity to households and businesses, and other sources of energy that  
13 are integral to growth and production across the nation."

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1 transformer damage; and

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

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

6 **40-2-125.6. Electrical generation and distribution resiliency -**  
7 **evaluation - report - rules - repeal.** (1) THE COMMISSION SHALL  
8 REQUEST, FOR ALL UTILITIES SUBJECT TO THE NORTH AMERICAN ELECTRIC  
9 RELIABILITY CORPORATION, A CRITICAL ENERGY INFRASTRUCTURE  
10 INFORMATION REPORT, AS DEVELOPED THROUGH THE FEDERAL ENERGY  
11 REGULATORY COMMISSION, DETAILING ANY DEFICIENCIES REGARDING  
12 REGULATIONS EOP-010-1 AND TPL-007-4 ADOPTED BY THE NORTH  
13 AMERICAN ELECTRIC RELIABILITY CORPORATION IN ORDER TO:

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

18 (I) FOR A G 5 RATED GEOMAGNETIC STORM:

19 (A) POWER GENERATION RESUMING WITHIN FIVE DAYS;

20 (B) RECOVERY OF CRITICAL INFRASTRUCTURE WITHIN ONE WEEK;

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


23 (D) COMMUNITY DISTRIBUTION OF ELECTRICITY WITHIN TWO  
24 WEEKS;

25 (II) FOR A G 4 RATED GEOMAGNETIC STORM:

26 (A) POWER GENERATION RESUMING WITHIN THREE DAYS;

27 (B) RECOVERY OF CRITICAL INFRASTRUCTURE WITHIN THREE

1 DAYS;  
2 (C) TRANSMISSION LINES AND NODES OPERATING WITHIN ONE  
3 WEEK; AND  
4 (D) COMMUNITY DISTRIBUTION OF ELECTRICITY WITHIN TWO  
5 WEEKS;  
6 (III) FOR A G 3 RATED GEOMAGNETIC STORM:  
7 (A) POWER GENERATION RESUMING WITHIN TWO DAYS;  
8 (B) RECOVERY OF CRITICAL INFRASTRUCTURE WITHIN TWO DAYS;  
9 (C) TRANSMISSION LINES AND NODES OPERATING WITHIN THREE  
10 DAYS; AND  
11 (D) COMMUNITY DISTRIBUTION OF ELECTRICITY WITHIN ONE  
12 WEEK; AND  
13 (IV) FOR A G 1 OR G 2 RATED GEOMAGNETIC STORM, NO MORE  
14 THAN A BRIEF INTERRUPTION OF ELECTRIC SERVICE; AND  
15 (b) EVALUATE THE CERTIFICATION OF HARDWARE AND SOFTWARE  
16 MONITORING AND CONTROLLING SYSTEMS FOR ENERGY GENERATION AND  
17 DISTRIBUTION.  
18 (2) (a) BY JANUARY 2027, THE DEPARTMENT OF REGULATORY  
19 AGENCIES SHALL INCLUDE, AS PART OF ITS PRESENTATION DURING ITS  
20 "SMART ACT" HEARING REQUIRED BY SECTION 2-7-203, THE RESULTS OF  
21 THE EVALUATION REQUIRED BY SUBSECTION (1) OF THIS SECTION.  
22 (b) THIS SUBSECTION (2) IS REPEALED, EFFECTIVE JULY 1, 2027.

23   
24 **SECTION 3. Act subject to petition - effective date.** This act  
25 takes effect at 12:01 a.m. on the day following the expiration of the  
26 ninety-day period after final adjournment of the general assembly; except  
27 that, if a referendum petition is filed pursuant to section 1 (3) of article V

1 of the state constitution against this act or an item, section, or part of this  
2 act within such period, then the act, item, section, or part will not take  
3 effect unless approved by the people at the general election to be held in  
4 November 2026 and, in such case, will take effect on the date of the  
5 official declaration of the vote thereon by the governor.