Rep. Vose, Rock. 5
Rep. Mattson, Ches. 18
Rep. D. Thomas, Rock. 16
Rep. Schneller, Hills. 2
Rep. McGhee, Hills. 35
March 2, 2026
2026-0935h
04/09

Amendment to HB 1723

Amend the bill by replacing all after the enacting clause with the following:

1 Short title. This act shall be known as "Survey All Vulnerable Electric Transformers Act."

2 Findings.

I. America's electric grid is critical to modern life and faces existential threats from solar weather events (coronal mass ejections—CME), geomagnetic disturbances—GMDs, and high-altitude nuclear electromagnetic pulse—HEMP, all capable of disabling electric power systems.

II. High voltage transformers are especially vulnerable to geomagnetically induced currents—GICs—whether induced by GMDs or HEMP E3 component, entering the grid through ground-connected neutral wires.

III. Extra High Voltage (EHV) transformers (345 kV–765 kV) are most vulnerable and difficult to replace, with production lead times of up to 4–6 years.

IV. GIC vulnerability is influenced by transformer characteristics, ground conductivity, and the magnetic field intensity from GMD or E3 HEMP.

V. Aging transformers are more susceptible to GIC due to degraded insulating oil and coil condition.

VI. Federal and international standards highlight the importance of transformer assessment and protection against these threats.

VII. On July 23, 2012, a powerful CME erupted off the back side of the sun racing through Earth's orbit missing Earth by 9 days. It was measured by STEREO-A satellite and determined by the National Oceanic and Atmospheric Administration to be in all respects at least the size of the Carrington event of 1859.

VIII. In 2012, the United States Department of Energy's Idaho National Laboratory working with the United States Department of Defense's Defense Threat Reduction Agency conducted live grid E3 HEMP tests to analyze GIC harmonic threats to the electric power grid. The results showed transformer half-cycle saturation and generation of harmonics that exceeded the IEEE 519 Standard with GIC of 15 Amps in the neutral of the power transformer.

IX. In February 2013, the North American Electric Reliability Corporation (NERC) GMD committee of 8 respected space weather scientists estimated a reference storm. Preliminary results showed a peak electric field strength of 30 V/km to 40 V/km.

X. In May 2025, the International Electrotechnical Commission (IEC) updated the international standard IEC 61000-2-9 for E3 HEMP to 85 V/km.

XI. The NERC GMD Standard requires New Hampshire to model roughly 3 V/km.

XII. With the existence of validated GIC mitigation hardware that protects power transformers and improves grid resilience against these severe GIC events, reliance on load shedding or operating procedures which cannot block GIC are no longer justified.

3 Geomagnetic and Electromagnetic Disturbance Electric Transmission; Department of Energy; Vulnerability Investigation.

I. The department of energy shall investigate the vulnerability of electric transmission transformers and other system components to geomagnetically induced currents. The investigation shall answer the following questions:

(a) What studies and assessments have previously been performed that reviewed transmission system vulnerabilities to geomagnetic and electromagnetic disturbances?

(b) How were those studies conducted and what were the transmission system grid vulnerabilities identified?

(c) Given the current NERC GMD standard of 3 V/km and the IEC international standard of 85 V/km, did the magnetic field standard utilized adequately assess the vulnerability of the transmission system in New Hampshire to geomagnetic and electromagnetic disturbances?

(d) If the magnetic field standard utilized in previous studies did not adequately assess transmission infrastructure vulnerability, what standard should be used?

(e) What would be the cost to conduct a transmission infrastructure assessment at a higher standard than has previously been used?

(f) How long would an additional assessment at a higher standard take to complete?

(g) What mitigation strategies and response methods are currently utilized to protect transmission system infrastructure from geomagnetic and electromagnetic disturbances and are those strategies and methods adequate?

(h) What role can the state of New Hampshire play in assessing transmission system vulnerabilities that fall under the jurisdiction of the Federal Energy Regulatory Commission and in directing transmission-owning utilities to implement infrastructure and non-infrastructure solutions?

(i) What funding sources are available to conduct additional assessments or support the installation of equipment to further protect vulnerable transmission system infrastructure from geomagnetic and electromagnetic disturbances?

II. The department shall commence the investigation within 90 days of the effective date of this subsection and complete the investigation within a time period not to exceed 12 months of its commencement. At the conclusion of the investigation, the department shall issue a report of its findings and recommendations to the house science, technology and energy committee, the senate energy and natural resources committee, and the division of homeland security and emergency management and the department shall also send the report to the United States Secretary of Energy, the Federal Energy Regulatory Agency, and ISO-New England.

III. Notwithstanding any other law, rule, or order to the contrary, the department shall have the authority necessary to conduct this investigation and implement this subdivision, including, but not limited to, the authority to request information from public utilities, including transmission utilities, regarding transmission infrastructure located within the state of New Hampshire, and to specifically assess utilities an amount not to exceed $350,000 for this investigation.

IV. Confidentiality. All data submitted under this subsection shall be handled in accordance with critical energy infrastructure information protocols and location and purpose data shall be redacted from public reports. "Critical energy infrastructure information protocols" means specific engineering, vulnerability, or detailed design protocols and procedures related to proposed or existing critical infrastructure, whether physical or virtual, that relate to the production, generation, transmission, transportation, or distribution of energy, the unauthorized disclosure of which could pose a risk to the security, reliability, or integrity of the infrastructure; such protocols are designated as confidential and exempt from public disclosure, as their release could be useful to a person planning an attack or otherwise causing harm to the infrastructure.

4 Effective Date. This act shall take effect upon its passage.

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AMENDED ANALYSIS

This bill directs the Department of Energy to investigate vulnerabilities of electric transmission transformers to geomagnetic and electromagnetic disturbances and report findings with recommendations.