

Proactive Seismic Loading Regulation Compliance

As regulations shift to mitigate risks from seismic activity, maintaining the integrity of aboveground storage tanks is more critical than ever. Washington State recently mandated strict seismic compliance regulations for existing storage tanks, and it is expected that similar regulations will soon be drafted in other areas of Western USA and Canada.

At Equity Engineering, our team provides specialized engineering expertise required to navigate these regulatory complexities to ensure tanks and terminals remain safe and operational. Reduce unnecessary risk, rather than waiting for the regulatory deadline or new regulations within your region. Equity Engineering helps you achieve seismic regulatory compliance by implementing a multi-disciplinary approach to aboveground tank safety.

The New Standard: WAC 173-180 Overview

The goal of Washington State's new legislation is to reduce the risk of seismic events causing spills or leakage in Class 1 facilities with existing storage tanks.

Critical Compliance Benchmarks:

- **Compliance Deadline:** Facilities must demonstrate compliance by July 2033 or align with their API 653 internal inspection schedule if the previous internal inspection predates July 7, 2023, whichever comes later.
- **Retrospective Application:** The law applies to existing infrastructure. All tanks constructed between May 1994 and July 2023 must meet or exceed recognized design standards (e.g., API 650, 1988 version). Seismic protective measures are required for all tanks regardless of year of construction, and there are several avenues to achieve compliance.
- **Required Analysis:** All tanks must have seismic calculations performed per API 650 (2020) Annex E by a storage tank engineer with a Washington State professional engineering (P.E.) license. The simplest route to compliance is passing these calculations (at either full or reduced fill height) including demonstrating adequate piping flexibility. Note that API 653 allowable stresses are not accepted for this compliance; new design allowable stresses must be utilized. Additional analysis and retrofit options are available for tanks that do not pass these calculations.

Our Approach: Evaluation & Mitigation

Equity Engineering applies a multi-disciplinary approach to accurately assess your risk profile and help you navigate the technical requirements to achieve compliance with the new seismic loading regulations.

STEP 1 Site Seismic Hazard Analysis

1 Navigating changes to ASCE 7 and how these impact analysis per API 650 Annex E is critical to determining appropriate seismic demands for each tank. We apply our nuanced understanding of these standards and have discussed code interpretations with state regulators to ensure the seismic analysis we perform follows acceptable protocols. We can also assist in establishing site soil classifications, determining tank seismic use group designations, and developing site-specific response spectra to potentially reduce design values to as low as 80% of mapped curves.

STEP 2 Comprehensive Compliance and Retrofit Engineering

2 If our analysis identifies vulnerabilities, we deliver practical and effective mitigation solutions. We provide detailed recommendations for approved protective measures, including operational adjustments like reduced fill heights, anchorage evaluation or retrofit, or piping flexibility analysis. Our goal is to find the most efficient path to compliance.

STEP 3 Documentation and Action Planning

3 We prepare clear and comprehensive documentation for compliance submission and are committed to working through the review and feedback process with owners and regulators. Whether the proposed solution is operational, analytical, or requires retrofit, communication is critical to achieving the common goal of reducing risk. We partner with our clients through this process to develop action plans including documenting any operational and maintenance changes required to ensure long-term reliability of critical storage tank assets.

BENEFITS



Mitigate Operational Disruption



Prevent Catastrophic Failure



Conduct Proactive Capital Planning



Comply with New Seismic Regulations

Proactive Strategy for Future Regulations

While WAC 173-180 is specific to Washington, it signals a trend toward more stringent seismic regulations in other regions. Engaging our team now allows you to "future-proof" your assets, ensuring you are prepared for upcoming legislation and can integrate necessary upgrades into long-term capital plans. Equity Engineering is committed to safety and reliability by providing the technical assurance you need.

Contact our Mechanical & Structural Engineering team for more information.