

# White Paper: Understanding UL2200

What you need to know for specifying compliant and reliable standby power systems

by the Generac Industrial Energy Team



## What is UL2200?

UL2200 is the Underwriters Laboratories safety standard for stationary engine generator assemblies. It applies primarily to permanently installed, stationary generator sets used in standby and prime power applications, including those supporting life safety systems, mission-critical infrastructure, and industrial facilities.

Issued by UL, a globally recognized safety science company, the standard outlines the construction, performance, and testing criteria that ensure generator sets meet specific fire, electrical, and mechanical safety requirements.

### Who It Applies To:

- **Generator manufacturers:** Must ensure gensets are constructed, tested, and listed by an OSHA-recognized Nationally Recognized Test Lab (NRTL) to UL2200 criteria.
- **Consulting/specifying engineers:** Responsible for specifying UL2200-listed systems in construction documents to meet code, ensure safety, and reduce liability.
- **AHJs (Authorities Having Jurisdiction):** confirm the generator has the UL2200 mark during inspections to verify equipment compliance with national and local codes which might vary

## Why UL2200 Matters in Standby Power Applications

In today's regulatory and performance-driven environment, specifying UL2200-listed generator sets is not just a best practice—it's a baseline requirement in many jurisdictions and applications. For consulting engineers, understanding why UL2200 matters is crucial to ensuring reliable, safe, and code-compliant standby power systems.

## 1. Regulatory Compliance

UL2200 is often referenced directly or indirectly in:

- **NFPA 70 (NEC-National Electrical Code):** Articles involving emergency and standby systems. Specifically relating the "approval of equipment" function defined in NEC Article 90.4.
- **NFPA 110:** Standards for emergency and standby power systems, particularly for life safety.
- **IBC (International Building Code) and local building codes:** Refer to UL standards for equipment certification.
- In some cases, UL2200 also references the NFPA standards. By specifying UL2200-listed generator sets, engineers reduce the risk of failed inspections and costly redesigns.

## 2. System Reliability & Safety

UL2200 addresses several aspects including:

- Wiring and grounding integrity
- Combustion and fuel system safety
- Temperature and vibration limits
- Control panel safety
- Short-circuit performance

These factors directly affect generator longevity, maintainability, and uptime—especially in critical power environments such as hospitals, data centers, and water treatment plants.

## 3. Risk Mitigation and Liability Protection

Non-compliance can expose projects to:

- Delays due to AHJ rejection
- Warranty invalidation
- Insurance complications
- Legal exposure in the event of injury, fire, or failure



## Key UL2200 Requirements for Generator Sets

UL2200 is a comprehensive safety standard that evaluates the generator set as a complete assembly, including the engine, alternator, control systems, wiring, fuel systems, and enclosures (if equipped). Below are the most critical areas that consulting engineers should be familiar with when specifying listed equipment.

### 1. Electrical System Integrity

UL2200 specifies rigorous guidelines for:

- Wiring insulation, routing provisions, and overcurrent protection
- Proper bonding and grounding
- Short-circuit withstand ratings based on tested fault current levels

**Specifying Tip:** Ensure the generator's short-circuit rating aligns with the available fault current at the installation site.

### 2. Control Panel Safety

Control systems must meet safety requirements as described in ULC6200 including:

- Over-speed shutdown
- High temperature/fault shutdown
- Fail-safe logic to prevent hazardous operation

**Specifying Tip:** Confirm that listed generators include ULC6200- control panels as part of the UL2200 certification.

### 3. Thermal and Mechanical Safety

The standard sets limits for:

- Surface temperatures on accessible components
- Exhaust temperatures and proximity to flammable surfaces
- Vibration testing for fuel hose assemblies to validate mechanical stability during operation

**Specifying Tip:** Look for factory test data and certifications demonstrating compliance with these parameters—especially in rooftop or enclosed installations.

### 4. Enclosure and Environmental Protection

UL2200 requires:

- Rain proof or rain tight enclosures for outdoor gensets
- Adequate ventilation and cooling design

**Specifying Tip:** Opt for factory designed, tested, and produced enclosures when feasible. This ensures the entire system is certified to UL2200 opposed to certified as 2 separate items.

# Critical Considerations for Specifying Engineers

Specifying UL2200-Listed generator systems goes beyond simply stating “UL2200” as a compliance requirement . It requires detailed evaluation of performance, configuration, and third-party documentation. Here are the most important points for engineers to keep in mind.

## 1. Don’t Assume All Generators Are UL2200-Certified

Not all generator sets on the market are UL2200 listed—especially in custom or modified configurations. Some manufacturers may supply “UL components” without listing the entire genset assembly to UL2200.

**Best Practice:** Look for UL listing decal or decal from independent third party nationally recognized testing laboratory marking with file number stating it has been evaluated to the requirements in UL 2200

## 2. Understand the Difference Between UL Recognized and UL Listed

- UL Recognized components (like relays or boards) are not the same as UL Listed assemblies.
- UL2200 applies to complete assemblies, so mixing and matching UL Recognized parts does not equate to UL2200 certification.

**Best Practice:** Specify “UL2200 listed generator assembly” rather than vague terms like “UL approved” or “UL compliant.”

## 3. Site-Specific Considerations Matter

UL2200 ensures baseline safety, but environmental and local code conditions can necessitate additional design features:

- Seismic bracing (IBC/OSHPD compliance)
- Wind-rated enclosures (especially in hurricane zones)
- Sound attenuation (dBA limits in urban or healthcare settings)

**Best Practice:** Include a site-specific compliance matrix as part of your specification and submittal review process.

## 4. Fire Marshal Review

- UL2200-listed gensets must meet fire and safety regulations for fuel systems—but site-specific fire marshal requirements such as site pressure testing, overfill, or spill prevention can vary and override national standards. Engineers who fail to engage early may need to redesign tanks, fuel lines, or even relocate equipment.

**Best Practice:** Engage local AHJs and fire marshals during design development, not just at permitting.

## 5. Enclosure Requirements in Harsh Environments

- A generator might be UL2200 Listed, but the enclosure still must meet wind, seismic, sound, and ingress standards. Mismatched or under-rated enclosures are a frequent cause of costly change orders—especially in coastal or healthcare environments.

**Best practice:** Review location driven requirements such as; seismic certifications , wind and impact ratings, and sound level during the design development..



# Key Differences Between UL 2200 2nd and 3rd Editions

As the demand for more advanced and reliable standby power systems grows, UL has updated its standards to reflect evolving technologies and safety expectations. The third edition of ANSI/CAN/UL/ULC 2200, initially published in 2020 with an effective date of March 31st, 2026, introduces several important changes from the second edition that specifying engineers should be aware of.

## 1. Bi-National Harmonization

- **What Changed:** The third edition is now a bi-national standard recognized in both the United States and Canada.
- **Why It Matters:** A single C-UL-US Mark now satisfies certification requirements in both countries, simplifying cross-border projects and compliance documentation.

## 2. Expanded Scope and Risk-Based Approach

- **What Changed:** The third edition introduces a requirement for safety risk assessments as part of the certification process.
- **Why It Matters:** Engineers and manufacturers must now consider functional safety and hazard analysis during design and specification, especially for systems with complex control logic or software.

## 3. Enhanced Control System Requirements

- **What Changed:** There is a stronger emphasis on control system reliability, including functional safety logic and redundancy.
- **Why It Matters:** This aligns with the increasing use of digital controllers and remote monitoring. Engineers should verify that control systems meet updated reliability and safety criteria.

## 4. Software and Firmware Validation

- **What Changed:** The third edition includes new requirements for software and firmware used in generator controllers including the use of UL6200 listed controllers.
- **Why It Matters:** Systems with programmable logic or remote diagnostics must now demonstrate software integrity as part of UL certification.

## 5. Clarifications and Revisions to Existing Requirements

- **What Changed:** Several requirements from the second edition were clarified or revised to align with industry norms and harmonize with other standards. Diesel systems specifically call out the use of UL142A, or ULC-S601 tanks and natural gas systems call out compliance with NFPA 54

**Why It Matters:** These changes reduce ambiguity and improve consistency in how UL2200 is interpreted and enforced by AHJs.

## 6. Medium Voltage Generator Systems

- **What Changed:** The third edition introduces new requirements for generator assemblies operating above 600 volts, reflecting the increased use of medium voltage (MV) systems in critical facilities such as data centers, hospitals, and utility installations.
- **Why It Matters:** These requirements ensure enhanced safety and reliability for MV generator systems by specifying safety testing, increased clearance and creepage distances, and integration with related standards for switchgear and circuit breakers (UL 1558, UL 347). Coordination with NEC Article 490 and NFPA 70E is now required to address arc flash and personnel protection. Engineers must verify that MV generator systems are factory-tested and UL2200-listed as complete assemblies, including all necessary switchgear and protection equipment.

## 7. Walk-In Enclosures

- **What Changed:** The third edition formally recognizes walk-in generator enclosures and introduces new construction and safety requirements. It gives requirements that align with Electrical enclosures, compartments or specific areas within the generator that are likely to require a service person to enter the enclosure or housing to wire, examine, adjust, or perform maintenance. The design must comply with Article 110.26, Spaces About Electrical Equipment, of NFPA 70 and Rules 2-308 and 2-310 of the Canadian Electrical Code, Part I. It also sets requirements for walk in enclosures for medium voltage units.
- **Why It Matters:** By requiring walk-in enclosures to be UL2200-certified as part of the generator assembly, not just field-assembled, these changes ensure comprehensive compliance with both electrical and mechanical safety standards.

## 8. Selective Catalytic Reduction (SCR) System Requirements

- **What Changed:** The third edition introduces expanded and more detailed requirements for SCR emissions control systems. One of the key additions is that a failure of the SCR system cannot shut the generator down when used in a Life Safety application. Inducement override capability is therefore required on Tier 4 certified generator sets.
- **Why It Matters:** These updates ensure emissions compliance is robust, reliable, and fully addressed within the UL2200 certification, supporting both regulatory and operational integrity.



## Conclusion — Specifying with Confidence

UL2200 plays a critical role in ensuring the safety, reliability, and code compliance of standby power systems—especially in the high-stakes environments consulting engineers serve.

By understanding what UL2200 covers—and just as importantly, what it doesn't—engineers can:

- Design generator systems that meet AHJ expectations the first time.
- Reduce project risk, liability, and change orders.
- Align with broader requirements in NFPA 70, NFPA 110, and IBC.
- Protect lives, property, and the integrity of essential systems.

With thoughtful specification and proactive coordination, UL2200 becomes a tool for design assurance rather than a late-game hurdle. Use the provided checklist, maintain close communication with AHJs, and partner with generator manufacturers who are transparent and experienced with UL standards.

