New Checklist Helps Electricians Assess Whether Damaged Electrical Systems Should be Repaired or Replaced After a Natural Disaster

The past few months have produced a number of powerful and damaging natural disasters across the US. From earthquakes and wildfires in the west to tornadoes in the Midwest and hurricanes across our northern and southern states, no one part of the country has been immune to the mighty force of nature.

In the midst of this trying time, and with the worst of the hurricane season still to come (hurricane season runs from June to November), building owners and managers of industrial and commercial facilities are facing (and will continue to face) the daunting process of disaster recovery. More specifically, when electrical systems are damaged in a natural (and yes, even man-made ones, too!) disaster, electricians need to make a critical decision about whether the electrical equipment that was damaged can be salvaged or not.

So where to start? Let NFPA lend a hand. We've created a new checklist for electricians to help highlight and simplify key aspects of this decision-making process. The checklist builds off of recommendations in Chapter 32 of NFPA 70B, *Recommended Practice for Electrical Equipment Maintenance** (2019 edition).

The checklist includes such things as:

- A list of disaster scenarios, which can inflict damage of varying degrees to facilities
- Steps for assessing equipment
- A Priority Assessment Table
- Steps to help identify factors for replacement or repair

… and more.

Still, even with the help of the checklist, the choice between repair and replace will not always be an easy one. Following these simple suggestions can be the difference, however, between an impossible task and an informed decision.

Before your community experiences a disaster, and review the contents. Having this information at your fingertips will be extremely valuable should your community call on you for your electrical experience and assistance in the aftermath of a storm or other weather-related event.

Additional disaster-related resources can be found on NFPA's disaster webpage, including tip sheets, related code information, articles, and more.

**The complete current edition of NFPA 70B and related resources are available for free access or to purchase at www.nfpa.org/70B.*

NATURAL DISASTER ELECTRICAL EQUIPMENT CHECKLIST: REPAIR OR REPLACE?

When electrical systems are damaged in a natural or man-made disaster, electricians need to make a critical decision about whether the electrical equipment that was damaged can be salvaged or not. This checklist is intended to highlight and simplify key aspects of this decision-making process and builds off of recommendations in Chapter 32 of NFPA 70B, *Recommended Practice for Electrical Equipment Maintenance* (2019 edition). The numbers in parenthesis refer to the sections within NFPA 70B. This checklist is not a part of the recommendations of NFPA 70B. For the complete document, visit nfpa.org/70B.

Types of Natural Disasters

Disaster scenarios include, but are not limited to, the following, which can inflict damage of varying degrees to facilities (32.2.1).

- Fire: Soot, material and equipment damage, water damage, structural damage
- Flooding: Water damage, structural damage
- Hurricane: Water damage, structural damage, utility infrastructure damage
- Tornado: Water damage, structural damage, utility infrastructure damage
- Earthquake: Structural damage, utility infrastructure damage

Steps for Assessing Equipment

Step 1. Assess Initial Damage. (32.2.6)

- ❑ Gather all pertinent drawings and documentation available.
- ❑ Perform a walkthrough of the entire facility or area.
- ❑ Document any damaged electrical components or equipment in accordance with 32.2.7 of NFPA 70B.

Step 2. Assess Equipment Priority. (32.2.6.2)

Equipment repair priorities should be assessed with a focus on the highest priority equipment, in accordance with the specific safety and operational needs of the facility. Examples of typical equipment categories are shown in the table below.

Priority Assessment Table

Category	Type	Description
Category 1	Medium-voltage equipment including distribution transformers	Medium-voltage equipment typically serves as the backbone to the electrical power system and should be the primary focus of the initial recovery activities.
Category 2	Low-voltage distribution equipment	Affected components of low-voltage equipment should be removed to facilitate cleaning and drying of the structures. During the removal of the equipment, care should be taken to keep all wiring for each component well marked and together.
Category 3	Electric motors	When a disaster event involves water, electric motor repair is a major component of a flood recovery project.
Category 4	Balance of plant electrical repair	The balance of plant consists of all equipment other than medium-voltage equipment, low-voltage distribution equipment, and motors. These devices are typically repaired by replacement. Power and control wiring should be tested to determine serviceability. (See Section 11.21, Cables.)

NATURAL DISASTER ELECTRICAL EQUIPMENT CHECKLIST: REPAIR OR REPLACE? *(continued)*

Step 3. Identify Factors for Replacement or Repair. (32.2.7.7)

The factors listed below should be used to determine whether the damaged equipment will be repaired or replaced.

Can the damaged electrical equipment be repaired?

Yes	No	
❑	❑	Will equipment performance be compromised if repaired?
❑	❑	Can the equipment be effectively repaired?
❑	❑	Is the repair contractor qualified for the task?
❑	❑	Is the manufacturer still in business?
❑	❑	Will the authority having jurisdiction allow repair?
❑	❑	Can the repairs take place on site?
❑	❑	Does the equipment need to be sent to a repair facility?

What is the financial impact of repairing the equipment? _____

What is the total outage time required? _____

Can the equipment be replaced?

Yes	No	
❑	❑	Is the equipment currently manufactured?
❑	❑	Are there long lead times to replace with new?
❑	❑	Is the manufacturer still in business?
❑	❑	Will the authority having jurisdiction allow replacement?

What is the financial impact of replacing the equipment? _____

What is the total outage time required? _____

Additional factors to consider for repair or replacement:

What is the age of the equipment? _____

What is the reliability requirement? _____

Learn More

For more details on this topic, visit NFPA Xchange™ at community.nfpa.org to view an installment of NFPA Live on what you need to know in assessing electrical systems after a flood.