

Emergency Transfer Switch Loads

Prepared by the NC Department of Insurance Office State Fire Marshal-Engineering Division State Property Code Services Section

The purpose of this document is to address the apparent ambiguity among designers and owners concerning the design of emergency, legally required, and optional standby systems supporting a building and what loads can be on an emergency transfer switch. The objective is to aid project reviewers, project managers, designers, field inspectors, and others who are involved with the construction and renovations of state buildings.

The following will help to clarify the issues concerning emergency generator loads, and how they are treated by the codes.

Definitions

Emergency Systems Definition: NEC section 700.1—"Emergency systems are those systems legally required and classed as emergency by municipal, state, federal, or other codes, or by any other governmental having jurisdiction".

Emergency power, not necessarily to be confused with life safety, is power provided for emergency systems, and those systems used to notify and evacuate a building or structure. There are a few exceptions and these distinctions are clearly made in sections 2702.2 through 2702.2.19 2006 NCBC. Once one or more emergency loads are connected to a generator the generator is then considered an emergency generator. The Emergency system in a hospital is basically split into two subsystems, the life safety branch, and the critical branch. These branches have to do with the care and safety of patients as covered in article 517 NEC.

Legally Required Standby Power Definition :NEC Section 701—"Those systems required and so classed as legally required standby by municipal, state, federal, or other codes or by any governmental agency having jurisdiction". Generally this is power that is provided for building systems required by other parts of the Codes. These loads are not defined as emergency power in (sections 2702.2-2702.19 NCBC). These loads shall be installed in accordance with article 701 NEC. Generally the code will allow additional optional standby loads to be placed on the legally required automatic transfer switch as well. An exception to this is smoke control systems as per section 909.11 NCBC.

Optional Standby power Definition NEC Section 702—"Those systems intended to supply power to public or private facilities or property where life safety does not depend on the performance of the system". Generally, *all other standby power used is for convenience. These loads may use manual or automatic Transfer switches. These loads shall be installed in accordance with article 702 NEC.*

INSTALLATION

Installation standards: *Emergency and standby power systems in general shall be installed in accordance with the NCBC, NEC sections 700,701,702, NFPA-110, and NFPA-111. The NCBC requires compliance with NFPA-110-111. If there appears to be a conflict between codes that concerns an electrical issue the NEC shall be used, or if a building issue is encountered, the building code shall be used.*

LIST OF LOADS THAT MAY BE PLACED ON AN EMERGENCY **AUTOMATIC TRANSFER SWITCH**

1. Voice alarm Communications systems in Group A occupancies as per section 907.2.1.2 NCBC.
2. Smoke control/or smoke management systems per NFPA-92A/92B and 909.11 NCBC when allowed by DOI.
3. Exit signs as per section 1011.5.3.NCBC.

4. Egress illumination as per section 1006.3.NCBC, and as required for security or process entry such as prisons. Illumination located in other than egress paths, where buildings do not evacuate during power outages, such as dormitories.
5. Fire alarm systems as allowed by NFPA-72 (99) section 1-5.2.3 and 1-5.2.6. As required in high rise buildings section 403.11.1 NCBC.
6. Semiconductor fabrication structures as per section 2702.2.7 NCBC in accordance 415.9.10 NCBC.
7. Group H occupancies as per section 414.5.4 NCBC.
8. High rise buildings systems as per section 2702.2.14 in accordance with 403.11 NCBC.
9. Group I-3 buildings as per section 2702.2.16 in accordance with 408.4.2 NCBC.
10. Others allowed by chapter 27 NCBC 2006 edition that in the opinion of the DOI, impact life and safety. This may include telephone systems used for emergency response notification and ARAs.
11. Security systems that control egress doors or doors that must be accessed by emergency responders as well as door actuators on accessible doors required for egress.
12. Exhaust fans for manifold fume hoods for hazardous or toxic fumes as per section 510.4 NMC.

The following list of potential loads on the emergency transfer switch will require a decision by the engineering division of the Department of Insurance. This decision will be made on a case-by-case basis by the State Property Code Services Electrical Reviewer. It will be necessary for the designer or owner to request this special permission. The procedure will be for the designer to submit the request to us as an alternate materials method, which will include justification for making the exception(s).

LOADS THAT WILL REQUIRE CONSULTATION AND CONCURRENCE FROM DOI.

1. Telephone systems.
2. Security systems, not controlling doors.
3. Lighting other than egress that is essential for security or safety.
4. Elevators
5. Special HVAC systems.
6. Special lab equipment.
7. Other special requests by agencies.
8. Special equipment that may not be specifically classified as "emergency" by code.

NATURAL GAS POWERED GENERATORS

If it is desired to fuel a generator that will supply power to an emergency system by natural gas you should contact DOI for further information. This will require an alternate materials submittal and an appropriate letter from the gas utility. We do not currently allow natural gas generators to power a fire pump.

If there are questions concerning the use of emergency and standby power contact Jim Yancey at 919-661-5880 Ext.266 or e-mail him at jyancey@ncdoi.net .