

## **Redundant Grounding**

### **Gary's Question:**

"I would like to see more details on test used to hint that health care facilities really need redundant grounding."

### **Working Electrician:**

Though the code does not supply tests, it does explain the reasons for the special wiring methods used in Health care Facilities. I think the Fine Print Note in 517.11 does a fairly good job of explaining

### **517.11 General Installation — Construction Criteria.**

"It is the purpose of this article to specify the installation criteria and wiring methods that minimize electrical hazards by the maintenance of adequately low potential differences only between exposed conductive surfaces that are likely to become energized and could be contacted by a patient.

**FPN:** In a health care facility, it is difficult to prevent the occurrence of a conductive or capacitive path from the patient's body to some grounded object, because that path may be established accidentally or through instrumentation directly connected to the patient. Other electrically conductive surfaces that may make an additional contact with the patient, or instruments that may be connected to the patient, then become possible sources of electric currents that can traverse the patient's body. The hazard is increased as more apparatus is associated with the patient, and, therefore, more intensive precautions are needed. Control of electric shock hazard requires the limitation of electric current that might flow in an electric circuit involving the patient's body by raising the resistance of the conductive circuit that includes the patient, or by insulating exposed surfaces that might become energized, in addition to reducing the potential difference that can appear between exposed conductive surfaces in the patient vicinity, or by combinations of these methods. A special problem is presented by the patient with an externalized direct conductive path to the heart muscle. The patient may be electrocuted at current levels so low that additional protection in the design of appliances, insulation of the catheter, and control of medical practice is required."

This fine print note recognizes the possibility of increased sensitivity to electric shock by patients whose body resistance may be compromised either accidentally or by a necessary medical procedure. For example, incontinence or the insertion of a catheter may render a patient much more vulnerable to the effects of an electric current. Therefore, it is essential that those responsible for the design, installation, and maintenance of the electrical system in patient care areas be well acquainted with at least the rudiments of the hazard as explained in this note.

Since the original recognition of this hazard in the 1971 Code, continued clinical

evaluation of the problem has provided a better understanding of the extent of the hazard, bringing about the changes in both value and wiring methods now found in the Code.

The Code assigns responsibility for the designation of the types of patient care areas to the governing body of the health care facility. Both the design and inspection of a patient care area must, therefore, be based on the governing body's designation rather than the superficial appearance of the area.

If more information is needed consult NFPA 101 -2000, Life Safety Code.