

## **The Source of Safety Rules: Accidents (\*)**

**By Sefa Targit**

One of the most effective methods employed in the process of institution of the technical rules called Basic Safety Requirements is the analysis of the accidents by experts.

Unless the value of the priceless experience called accident is comprehended fully; the story of the accident is only discussed between the lawyers and those involved in the accident, which can only yield a legal consequence leaving the very significant lessons that can be derived from the accident into oblivion. Legal and technical analysis of the accidents should be assessed separately, and these unfortunate events must be used for extracting a social benefit.

Novel ideas for safety precautions are generated by those who can assess the picture fully and well. What others should do is nothing but translating these rules into their own legal frameworks. The United States of America seems to be singled out as a country properly using this process. Documentary TV channel Discovery presently broadcasts a documentary featuring this topic. The documentary explicitly delineates the process how past disasters have been used (in the USA) to extract lessons by recounting the past disasters, how they were analyzed, and which safety rules were borne by their analysis.

The answer to be given to the question of how and to what extent the experts analyzing these accidents should share their outputs with the society is critical. The delicate point here is to disclose the background of the accident and the detected reasons behind it without exposing and advertising against those responsible from the accident. Those who believe that this frail balance can not be maintained prefer to file these accidents into the archive following very superficial explanations or without bringing the details to the agenda at all.

The US Labor Department issued an elevator accident report in August. I think it will be helpful to give you an account of this report which I think is a good example both for its content and form. That's exactly how the report reads:

**U. S. Department of Labor  
Occupational Safety and Health Administration  
Directorate of Science, Technology and Medicine  
Office of Science and Technology Assessment**

### **Hazards of Improper Elevator Controller Wiring**

Safety and Health Information Bulletins SHIB 08-16-2004

This Safety and Health Information Bulletin is **not** a standard or regulation, and it creates no new legal obligations. The Bulletin is advisory in nature, informational in content, and is intended to assist employers in providing a safe and healthful workplace. The Occupational Safety and Health Act requires employers to comply with hazard-specific safety and health standards. In addition, pursuant to Section 5(a)(1), the General Duty Clause of the Act, employers must provide their

employees with a workplace free from recognized hazards likely to cause death or serious physical harm. Employers can be cited for violating the General Duty Clause if there is a recognized hazard and they do not take reasonable steps to prevent or abate the hazard. However, failure to implement any recommendations in this Safety and Health Information Bulletin is not, in itself, a violation of the General Duty Clause. Citations can only be based on standards, regulations, and the General Duty Clause.

## **Preface**

An employee was fatally injured when the elevator he was entering continued to move while the elevator doors were open. An investigation revealed that the interlock, which would have prevented movement of the elevator car with the doors in the open position, had been bypassed due to improper wiring. This incident highlights the importance of elevator maintenance and repair adhering to manufacturer design codes and applicable industry safety procedures and standards.

## **Purpose**

The purpose of this Safety and Health Information Bulletin (SHIB) is to:

- identify potential hazards of an incorrectly wired elevator controller;
- identify consensus standards applicable to elevators;
- provide information to employers regarding the importance of complying with consensus safety and maintenance standards for elevators; and
- notify employers of required testing and verification of proper elevator operation before releasing elevators into service.

## **Background**

The Occupational Safety and Health Administration (OSHA) Houston South Area Office investigated a fatality in Houston, Texas that involved improper elevator wiring. As a result of improper wiring of the elevator's controller, the hoistway door interlock circuit was bypassed, permitting the elevator car to travel at full-speed with the doors open. This condition resulted in fatal injuries to an employee entering the elevator while the elevator was moving.

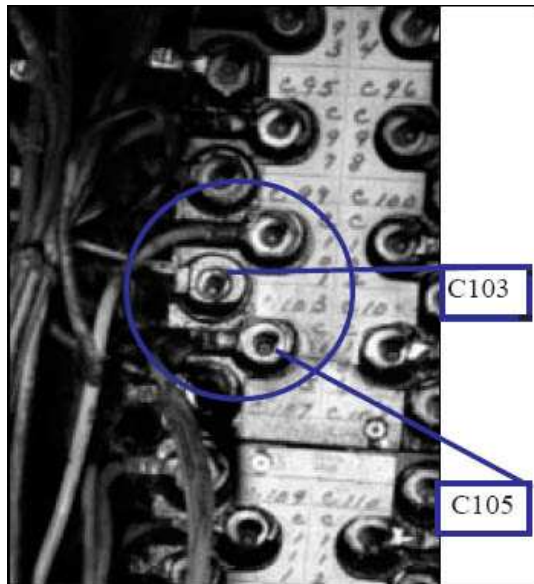
## **Accident**

## **Description**

Mechanics employed by a contracted maintenance company were assigned to install a new generator for an elevator at a hospital. In addition to installing the generator, the mechanics also reportedly found and repaired a short circuit in the system. The mechanics then tested the elevator and returned it to service. The fatal accident occurred about 25 hours later. There were no reports of malfunctioning between the time the elevator was returned to service and the time of the fatal accident.

The victim was trying to board the elevator. As he approached the elevator, the elevator doors were closing, and he extended his arms in an attempt to hold the doors open. The victim then put his leg up and tried to get into the elevator, which was moving up. The victim became pinned between the elevator doors. He was caught between the elevator car and the hoistway as the elevator continued to move up, and he died immediately.

The investigation of this accident was comprehensive and systematic. The investigation concluded that at some point wiring was removed and subsequently reattached incorrectly to an adjacent electrical terminal of the elevator car controller (see Figure 1), bypassing the hoistway-door interlocks and resulting in the elevator's ability to move with the doors in an open position. A review of the elevator's wiring diagram substantiated the improper wiring.



Controller

Figure

1

Panel

**Note two wires connected to Terminal C105 and no wires connected to Terminal C103.**

#### Other

#### Information

While there are no specific OSHA standards addressing the pattern of electrical wiring for elevator control panels, the Occupational Safety and Health Act requires employers to provide a workplace that is “free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.” To this end, employers need to take reasonable steps to assure that employees who perform work on elevators are adequately trained in, and knowledgeable of, elevator design specifications and proper maintenance procedures. Further, equipment must be maintained in accordance with manufacturer design specifications and operating procedures.

State governments also regulate the installation, maintenance, repair, and operation of elevators. Typically, the state Department of Labor and Industry or similar state agency oversees elevator installation and operation. Many of these agencies require compliance with industry standards and guidance for elevators, as discussed in the following paragraph. A directory of state elevator code authorities can be accessed through <http://www.neii.org/>. In some cases, local authorities regulate the installation, repair, maintenance, and operation of elevators; and employers need to ensure compliance with these local requirements.

The safe work procedures and equipment necessary to assure the safety of elevator passengers and maintenance workers have been developed over time by the elevator industry. Industry

standards and guidance documents related to this subject are provided by the American Society of Mechanical Engineers (ASME), the National Elevator Manufacturing Industry, Inc. (NEMI, also known as the National Elevator Industry, Inc. (NEII)), and the National Elevator Industry Educational Program (NEIEP).

Specific safety procedures and equipment that are necessary to prevent incidents similar to the fatality in Houston are included in the following:

ASME A17.1 - Safety Code for Elevators and Escalators, 2000  
ASME A17.2 – Guide for Inspection of Elevator, Escalators, and Moving Walks, 2001,  
(consolidation of A 17.2.1, A17.2.2, and A 17.2.3)  
ASME A17.3 – Safety Code For Existing Elevators and Escalators, 2002  
NEII - Elevator Industry Field Employees Safety Handbook – 2000

### **Conclusions**

The Houston, Texas accident illustrates the importance of assuring that elevator components are properly wired and procedures followed to assure that the elevator will operate properly before it is returned to service. Elevator maintenance companies and employers should take steps to ensure the integrity of elevator wiring performed during maintenance activities and adhere to the wiring diagrams specified by the elevator manufacturer. In addition, employees performing maintenance and repair work on elevators must be trained in, and knowledgeable of, applicable standards, including proper testing and verification mechanisms required before returning elevators to service.

### **Recommendations**

To ensure the safe operation of elevators and the protection of employees, employers need to assure that employees who install and maintain elevators are adequately trained and knowledgeable about proper installation, wiring, and maintenance procedures. The following guidelines will help reduce the risk of employee injury from malfunctioning elevators:

- **Integrity of electrical wiring.** Maintenance personnel should review the controller and advancer wiring. Wiring diagrams should be kept on site and reviewed to ensure that the controller and advancer panel wiring is correct, to make certain the door interlocks are operating properly, and to prevent operation of the elevator driving mechanism when either the hoistway door or elevator cab door is not properly closed.
- **Employee training.** Maintenance technicians, elevator inspectors, safety compliance personnel and consultation personnel should be familiar with the consensus safety standards applicable to elevators. Employers need to ensure that their personnel are knowledgeable of the safe procedures to positively control hazards and the recommended fail-safe measures to “test and verify” proper operation of an elevator following maintenance activities and prior to releasing an elevator into service.
- **Adherence to industry standards.** The referenced industry standards address proper elevator maintenance and post-maintenance procedures. Service personnel need to be

knowledgeable of proper procedures, and employers need to take reasonable steps to ensure that their personnel adhere to these procedures. Employers should implement effective maintenance control programs for elevator systems and ensure that methods are used to detect and correct any defects affecting safe operation of an elevator system following maintenance activities and before the elevator is returned to service.

I believe many of you share my opinion that such reports are the most beneficial instruction instruments. Followings are some of the requirements for creating the proper setting in which such reports can be soundly prepared and published:

- 1) Experts with due information about the elevators and elevator components who would approach the subject with the hat of a proper technical person should take their time for such reports.
- 2) Such experts should have the sole purpose of unearthing and disseminating the reality, secure from all commercial concerns.
- 3) These reports should be prepared and published only by experts, as in the above mentioned example, capable to collect and compile the related information, and reach conclusions.

The most striking emphasis comes at the introductory sentence of the report : [This Safety and Health Information Bulletin is \*\*not\*\* a standard or regulation, and it creates no new legal obligations. The Bulletin is advisory in nature, informational in content, and is intended to assist employers in providing a safe and healthful workplace.](#)

All written rules, novel or traditional, under whatever approach, render professionals of all occupations liable for maintaining their products in a state that do not harm their workers during the production process, and the users once marketed. This basic rule which we frequently underline is repeated in the above lines.

Every new rule should aim to assist and guide the benevolent people struggling to make the work places and products safer. Therefore, rules can be instituted by only those people who are experts of the subject, and, besides, who do not miss a chance to observe and make analysis.

That's why "Asansör Dünyası" Magazine will issue scientific and instructive articles as the one written by the US Labor Department. Publishing clippings from dailies as news of accident does not suit to an Association and to an Industry Publication; it serves no other purpose than provoking an elevator scare in society.

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