

Child Injury: Forensic Human Factors Points to the Need for Better Product Designs

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The members of this panel will describe a set of cases concerning a child's injury in which there are several human factors/ergonomics (HFE) issues. Each panelist will set the stage by describing an injury or death of a child with a brief overview of the events that occurred in a particular case(s). The processes involved in litigation will not be emphasized but main HFE issues will be presented and discussed, frequently within the framework of the hazard-control hierarchy of designing out, guarding against and warning about hazards. Consideration is not only given to children but also caretakers in the design of useable and safe products. A secondary purpose of the panel is to determine if there is sufficient interest in forming a special interest or technical group on children's HFE issues.

ELEVATOR CAR ENTRAPMENT

Panelist Rani Lueder

In December 2010, a tragic event occurred involving a 37-month old boy. He became entrapped in the gap between the hoistway and elevator car doors of his family's residential elevator when his mother called for the elevator from the floor above.

The child arrived at the hospital immobilized in a coma, undergoing full respiratory / cardiac arrest signs of blunt injuries to his neck, head and chest. Figure 4 depicts an area of the elevator in which a small child could be entrapped.

Discovery during the lawsuit that followed indicated that the elevator manufacturer was well aware of the risk to children.

They played key roles in the development of minimum safety guidelines for ASME A17.1 (section 5.3.1.7.2) and also knew that similar entrapments had caused at least two other children's deaths. Yet they did not warn their vendors, installers or purchasers of the associated entrapment risk to children.

It has long been known that small children are easily entrapped in small spaces, and that entrapment risk varies by opening size and shape. Yet the manufacturer failed make any of the downstream parties aware of viable design solutions that would have protected the children from injury.



Figure 4. *Space of an elevator can entrap children*

Children exposed to these accordion-type elevator doors continue to be at risk today. The aim of the initial panel presentation is to briefly present and discuss the confluence of organizational and design factors led to the design that was used, as well as the alternative designs that would have prevented their occurrence.