Introduction

As airports and terminals expanded, the number of escalators used to move passengers and employees also increased. As a result, airport risk managers, safety managers, and claims managers have communicated that their airports were experiencing higher frequencies in the number of incidents and accidents on escalators.

Risk Managers who put the right policies and practices in place may be able to remove hazards, reduce incidents, and lower associated loss costs. In response to requests for assistance on escalator safety, this paper is supplied by ESIS, Inc. to provide a summary of this loss area, measures in place at a number of airports, and recommended controls for consideration.

This paper is for informational purposes only; it is not intended to, and does not, provide legal advice or advice for any particular airport or situation. Readers are advised to consult their own risk management and legal professionals.

Issues

- Escalator incidents occur frequently at airports (some airports experience several per month).
- The number of reported escalator claims has been trending upward since 2002.
- The average cost per claim spiked significantly after trending downward somewhat until 2008 (See attached charts – EXHIBIT A).
- Airports routinely subcontract the maintenance of escalators and moving sidewalks to outside vendors.
- Airports attempt to transfer liability for escalator accidents and can be successful, depending on the contract terms; however, as the frequency and severity of incidents on escalators increases, the costs of the accidents are often reflected in the future cost(s) of such contracts to the airport.
- The vast majority of accidents are not related to any malfunction of the escalator.
- Accident types include falls, caught-in moving parts (entrapments), property damage and electrical shocks.
• Falls are the highest frequency accident type, accounting for 79 percent of all escalator claims and 86 percent of related claim costs.

• Persons over 60 account for more of the fall incidents. It is reasonable to assume the number of travelers in this age group will continue to rise.

• Escalators are challenging to individuals with vision and mobility impairments especially with respect to entering and exiting escalators.

• Individuals entering escalators with all sizes and types (wheeled) of luggage contribute significantly to accidents on airport escalators.

• Clothing and baggage can get caught on loose screws or panels causing falls.

• Serious falls have occurred at the top of escalators between the floor opening guardrail and the escalator. Guardrails in these cases are not sufficient to prevent children from slipping through to the level below.

• Falls and laceration accidents have occurred on the side structures (often aluminum inclines) between the escalator and walls.

• Caught-in moving parts or entrapment claims are more severe; the average cost of claims for entrapment accidents is $2,964, compared to $1,851 for falls.

• Caught-in moving parts accidents usually involve children; shoes, feet, and hands become entrapped in the side or comb plates. The severity is great as entrapment incidents have been known to result in amputations of fingers and toes.

• Many airports have escalators of varying types, sizes, and ages in both terminals and parking garages; narrow escalators may restrict persons and luggage leading to falls.

• Elevators are often placed in remote locations out of the normal intended foot traffic flow and paths.

• Signage is often not in place to direct persons to elevators.

**Escalator Equipment**

• At least one escalator manufacturer offers a new technology in which escalator side skirts travel with the escalator step treads eliminating the gap and the potential for entrapments.

• Brush guards help prevent side entrapments by keeping feet and shoes from side skirts. Brush guards, illustrated below, can be specified for new equipment or added to existing escalators.
• Lighting beneath the step treads is often standard equipment

• Painted tread steps edges (yellow or red) and painted comb plates, as shown in the illustration, are recommended to help distinguish the separate treads and help guide persons to stand toward the center of the treads

• The speed of escalators can be adjusted

  “Speed Reduction
  Most escalators run at 90 or 100 feet per minute, but some run as fast as 120 fpm. Some customers request that we lower the speed to accommodate those who may benefit from additional time to get situated on the escalator. We can modify many escalators to run at speeds as low as 50 fpm.” ©2008 Schindler Management Ltd. www.us.schindler.com

• Maintenance subcontractors may try to avoid adjusting speeds, because they believe it is complicated and difficult to accomplish.

• Broken comb plate teeth can catch luggage straps, shoes, etc.; inspections should always include identification and replacement of broken comb plate teeth.

• Emergency stops should be visible and easily located and operated.
• Audio messages are provided through speakers directly on escalators to instruct escalator riders to face forward, hold handrails, stand in the center of the step, etc. Some airports have installed similar audio messages within the traditional paging systems.

• Cameras can be used for claims defense measures, however, in some airports cameras are not always positioned or directed adequately toward escalators.
• Permanent bollards have been used at some airports to prevent persons (and skycaps/porters) from taking large wheeled carts, wheelchairs, strollers onto escalators.

• Side structures (often aluminum inclines) between the escalator and walls can be attractive to children and young adults. Round medallions and/or physical barriers should be used to discourage sliding down the side panels. The structure should be able to withstand a person’s weight without collapse.

• Complete guarding should be used at the top of the escalator to prevent children (persons) from slipping between the floor opening guardrail and the escalator.

• Few airports have detailed or written design specifications and procurement requirements for escalators. Escalators are usually required only to meet ANSI/ASME A17.1-2007 Safety Code for Elevators and Escalators.

• Many states have specific regulations applicable to escalators. When making any changes or additions to the escalators, reference should be made to appropriate legislation.

**Signage**

• Escalator manufacturers’ product safety signs are not standardized. Many airports have multiple manufacturers’ equipment installed throughout the facility, and therefore have different safety signs on the equipment.
Some individuals use escalators because they don’t know they have the option of using and elevator; “way-finding” signs may not show the location of elevators.

Sign states “Escalator to Terminal”
- Precautionary signage on escalators varies and is not standardized
No elevator signs observed.
Elevator banks located in rear of escalators.

- Airports use different methods of signage to prohibit wheeled carts, strollers, and wheelchairs
Airports are making efforts to address entrapment claims with signage and posters that present the hazard verbally and with the use of photos.
Some airport departments are reluctant to install additional directional or precautionary signage in an effort to maintain aesthetics.

**Recommended Action Items**

1. **Safety Measures for Equipment**
   All escalator equipment within the airport and parking garages should be assessed and inspected for the applicable safety measures. Consideration should be given to including the following if not in place:
   - Brush guards
   - Yellow highlighted step tread edges
   - Yellow highlighted comb plates
   - Accessible and marked emergency stops
   - No loose screws on side panels
   - Step and handrail movement synchronized
   - Speed not excessive
   - Width of escalator adequate for use
   - Cleanliness of step treads/handrails
   - Round medallions on side panels between escalator and wall
   - Adequate guarding in place between the upper floor guardrail and the escalator

2. **Standardized Signage**
   For legal reasons, precautionary signage provided by manufacturers should be kept in place. Worn, torn, or obscured manufacturers’ labels should be replaced as necessary with original manufacturer’s labels.

   In addition, airports may benefit from standardized signage to alert persons to use caution when riding the escalator, not to ride with certain items, and to alert them to the location of the elevator. (See example)

   ![CAUTION](image)

   For your safety, use **Elevators** if you have:
   - Wheelchair
   - Walker
   - Cane
   - Crutches
   - Wheeled Cart
   - Stroller
   - Small children
   - Special needs

   Carrying onto escalators could lead to falls or other accidents.

   Signage to alert riders to the dangers of entrapment hazards is also warranted:
- Include a signal word “CAUTION” or “WARNING”
- Describe the hazard
- State how to avoid the hazard and
- State the consequences of failure to avoid the hazard

Photographs or pictographs are recommended to alert the rider visually to the hazard presented.

3. Audio Messages
Airports can install audio messaging at or near escalators to alert persons to the option of using the elevator, such as:

Attention Please:
For your safety and convenience, elevators are located in public areas. If you are a person with special needs, require a cane or walker, or utilize a wheelchair, we ask that you use the elevators. For persons with small children, strollers, carriers, oversized luggage and wheeled carts, we also request that you use elevators.

For your and your family’s safety, children should never ride escalators unsupervised. Please use extreme caution when wearing soft soled shoes and sandals and avoid the sides and edges of escalator steps to avoid being caught in the moving parts of the escalator. When riding the escalator, please step on and off promptly, step squarely on the center of the step tread, stay toward the center of the step, face forward, hold the handrails, keep loose clothing clear of sides, do not rest handbags or parcels on handrail, and pay close attention.

Thank you for your attention to this important message.

4. Video Message
Many airports are installing digital monitors for visual paging systems. A video/visual message could be added to monitors to alert persons with special needs that they should use elevators and that they can ask for assistance from airport personnel/ambassadors/volunteer organization.

The video may demonstrate examples of persons needing assistance, wheelchair, canes, walkers, crutches, large baggage, wheel carts, strollers, carriers, etc. and persons directing them to the elevators. It may also illustrate precautions for children and adults with improper shoes, such as plastic sandals, clogs, flip flops, etc.

5. Staff and Tenant Training
Airport personnel and other tenant personnel located near escalators should receive standardized training in escalator safety. Training should focus on knowing how to approach users in need, what assistance to provide, how to locate and operate the emergency stop button(s), what to do in case of an accident, and what information to provide to investigators.

6. Use of Airport Volunteers
Some airports use volunteers to provide information and hospitality to passengers. These individuals should also receive standardized training in areas mentioned above.
7. Educational Campaign for Children
Some airports have safety weeks and offer safety materials for children. One airport provided a safety coloring book on escalators and elevators. Some materials are available from the Elevator Escalator Safety Foundation. When children are observed playing on the escalator, these could be given to the child and parent.

8. Cameras
Cameras may deter hazardous behaviors and can be very beneficial in determining the causative factors surrounding an incident. Because of the high frequency of incidents on escalators, cameras should be placed at all escalators. The videos should be monitored and the airport terminal staff notified swiftly when unsafe actions or accidents are observed.
The following charts provide data on the number of escalator airport liability claims by year. This information shows the actual claims submitted to ACE for the particular years. The information is valued as of June 1, 2008. These are actual airport liability claims, not incidents. Airports experience many escalator incidents per month; however, not all incidents develop into claims, and incident data is not readily available.
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