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The Next Generation in Elevator Safety and Security Systems

by Oliver Roydhouse

The Demand

Over the last five years, there has been a sharp increase in the demand for elevator security and safety solutions driven by global security issues and safety risks, including:

- Increased pressure for tightened security and access control following the rise in incidents of (and public concern over) terrorist activity.
- Increased levels of theft of valuable assets from within facility complexes, such as laptops within commercial office buildings.
- Increased requirements for facility managers to assess and manage exposure to public liability risks.

The Opportunity

In any high-rise multi-tenant facility, elevators:

- are a central point of traffic flow that deliver common and consistent traffic of all building users;
- have the potential for safety risks associated with equipment failure (passenger entrapment) and moving parts (passenger injury); and
- represent a confined and manageable area to record, analyze and track movements of people and assets.

This creates an ideal environment to implement effective security and safety measures.

The Challenge

Currently available elevator security and safety technologies do not adequately address a new era of demand. A lot of thought has gone into the possibilities of new and innovative applications, but no real breakthroughs have occurred. Elevator video-camera solutions still involve basic closed-circuit TV (CCTV) systems that have not significantly progressed in functionality since the 1990s. They are plagued with a range of issues that have prevented them from mass market adoption, including:

- They typically involve expensive and labor-intensive modifications to the lift system such as laying a new coaxial traveling cable.
- They are susceptible to electromagnetic interference, which can produce poor-quality video signals and increase implementation risks and complexity.
- They produce huge amounts of dumb" data, which makes them inefficient to use and incapable of delivering sufficient benefits to justify their expense.
- They don't deliver any real value-added features above and beyond simply capturing video footage and dumping it into a mass-storage device.

Public Liability Risks

Elevator-related liability claims are becoming increasingly frequent, especially in North America. The depth of the issue can be demonstrated by example cases from Elevator World Inc.'s *Elevator Industry Law & Liability (2nd Edition)* and the fact that many lawyers are now purporting to be specialist "elevator-accident lawyers."

While most liability claims relate to injuries, many deaths have also been reported. The Census of Fatal Occupational Injuries in the U.S. reported 207 elevator- and escalator-related deaths between 1992 and 2001. Of these, 61 were elevator passengers – people simply entering or riding in elevators while at work.

Most commonly, elevator-related claims relate to three main areas:

1) Tripping: A person claims that the landing level (i.e., the misalignment of the elevator floor and the landing floor at the elevator doors) caused him or her to trip and suffer injury while exiting or entering the elevator.
2) Free fall or aggressive stop: A person claims the elevator traveled at great speed, went into a "free fall" while riding in it, or it aggressively stopped, causing great distress and injury.
3) Door jam: A person claims that the

Oliver Roydhouse is the managing director of Inlink Technologies, an Australian-based company that develops integrated information systems for elevators.

doors closed on him or her with great force and caused personal injury.

The Consumer Product Safety Commission (CPSC) reports that over 17,000 people are injured each year on elevators and escalators in the U.S. alone. Example public liability claims and settlements include:

With escalators, injuries can be more serious, especially if they involve children getting their clothing or limbs caught in moving parts. In one case in Philadelphia, a five-year-old boy lost his foot in an escalator-related incident at a subway station. The case involved a settlement with the escalator manufacturer and a US$51-million verdict against the Southeastern Pennsylvania Transportation Authority.

Settlement	Case Description
US$1,550,000	A 32-year-old account manager at a financial institution was injured when the elevator he was in at work quickly dropped five floors and abruptly came to a stop. As a result, he was thrown into the side of the elevator, then to the floor. He sustained an injury to his shoulder, and injuries to his neck and back.
US$125,000	An elevator stopped six inches before the floor; as a woman attempted to exit, it lurched upward, causing her to fall and seriously injure herself.
US$400,000	A 42-year-old woman tripped and fell out of an elevator when exiting into the lobby of a building. Evidently, the level of the elevator floor was approximately one inch below lobby level.
US$110,000	A man was stepping into an elevator when it dropped a foot, causing him to fall into the elevator and injure his knee.
US$35,000	An elevator door closed hard on a woman, causing an injury to her shoulder.

Comparison of Generational Camera Technology

- Circa 1990-2004: Generation 1 involved the use of a traditional CCTV camera inside the elevator with the footage stored and searchable by date and time.
- 2004-2005: Generation 2 involved the use of overlay technologies that enhanced the CCTV system with the footage additionally stamped with elevator status information.
- 2007-2008: Generation 3 involves fully integrated video footage with real-time elevator and security access information, enabling comprehensive searching and analysis of surveillance footage, and providing the opportunity to track people and assets in real time. It also provides value-added features including two-way emergency-video communications.

Conclusion

We live in a new era of risk. These risks need to be managed, and technology can provide a solution. Existing elevator security and safety systems do not properly address the needs of the industry, and the industry must respond to this challenge.

One company, Inlink Technologies, is investing heavily in the development of next-generation elevator security and safety solutions. Its product suite, Intellicam, employs video footage analysis technology for security and public-liability risk management, and two-way emergency video conferencing for managing passenger entrapment events. Intellicam is currently in a trial phase and is to be launched to market in October 2007.