AUTOMATIC DOORS
Choosing the Appropriate Automatic Door Operator

By Michael Panish, Door & Gate Expert Witness

"An analysis of low-energy door standards and the forensic implications of improper product placement. This discussion outlines operator types, regulatory requirements, and the common failure points in installation and maintenance that result in personal injury litigation."

One of the biggest mistakes uninformed architects and building designers make is to specify a low energy door (knowing act or handicap accessible) operator in place of a standard pedestrian automatic door system that is fully protected by multiple sensors.

A low energy knowing act automatic door is an automatic door that only moves with an intentional input such as the push of a wall plate, swiping of a keycard, fob proximity to a receiver, or entering a keypad code. Activation occurs only with conscious action by the user.

In comparison, a fully automatic standard pedestrian door operator relies upon a multitude of sensor inputs to assess pedestrian locations and integrate with motor controls to move the doors opened or closed without any pedestrian input.

The problem with incorrect installation placement and usage of these two very different operating systems is that many architects and building designers think that any type of automated door system is interchangeable or equivalent in daily functional capabilities. These assumptions of interchangeability are incorrect and can be dangerous to pedestrian users.

The misspecification of low-energy door operators by architects and design professionals frequently represents a conscious prioritization of cost-minimization over occupant safety. Through a process of value engineering, designers often substitute a low-energy 'knowing act' device where high-traffic, fully automatic systems are functionally required. This intentional and deliberate selection of incorrect product is often an inferior safety profile to satisfy budgetary constraints. This practice constitutes a superficial and inappropriate attempt to simulate facility automation while circumventing the financial and technical obligations inherent in a compliant, high-energy door installation.

Misapplication of low-energy door operators can lead to pedestrian user injuries. The choice to use or specify a low energy door operator is frequently based upon a lack of practical experience on the part of the specifier, lower purchase price for the door operator, lack of knowledge of the product capabilities, and salesmen pitching design firms an alternative to door automation at a reduced cost.

Low energy door systems operate under basic low force principles that are described in low energy door standards. The industry accepted standards for low energy door systems are listed in ANSI A156.19 (American National Standards Institute). There are separate and distinct operating requirements for low energy doors with no need for sensors that differ greatly from standard pedestrian automatic door systems with comprehensive sensors, described in ANSI A156.10.

These two ANSI standards have different and unique requirements, but both require daily safety inspections. Per industry manufacturers and professional service providers recommendations, in depth maintenance and oversight of all components of the system should be performed at least on an annual basis. Proactive inspections and preventive maintenance are often non-existent.

Properly adjusted and maintained low energy door systems typically open, remain open, and close in a metered manner where the door moves very slowly and exhibits forces not to exceed 15 pounds at any point in the path of travel. It is important to know that the standard allowed forces are maximum values, not the minimum possible to obtain for safe operations.

All low energy door types that exhibit compliant forces must move to the fully open position in a period of between 5 to 8 seconds once activated. The minimum hold-open time is 5 seconds. Hold open times must increase if the activation switch is positioned over 4 feet from the activated door. If multiple doors are activated and ganged together the distance between the two doors needs to be factored into the hold open time of each doorway independently. After appropriate hold, the door should take approximately 5 to 8 seconds to fully close. A properly functioning low energy door cycle includes all three phases of movement to safely open and close the door.

There are three types of low energy "knowing act" systems in common usage:

1. **Fully powered Bi-Directional Operators**

An electric motor controls both the opening and closing cycles. Triggered by a "knowing act" such as a push plate, keypad, key fob, or magnetic card swipe. The door is controlled under power at all times**.** From a liability standpoint, a critical safety feature of this type is its obstruction sensing: if the door encounters resistance, it is designed to stop, stall, or automatically reverse.

2. **Power-Open / Hydraulic Door Closer System Close**

This system has an electric operator to open and a manual hydraulic closer to close. This door is also a knowing act system that requires some form of user input to begin opening the door. The difference in operation compared to the first type described is that

the door closer, which is typically a manual hydraulic device only causes the door to close and does not automatically reopen when an obstruction is encountered. As with all manual door closers, ADA (American with disabilities act) forces are incorporated into this movement. ADA requires that no more than 5 pounds of force is present during movement of the door while closing unlike the allowed 15 pounds that is acceptable within the ANSI A156.19 standards.

3. "Push and Go" Low-Energy Systems

In typical operation the door will open when manually pulled or pushed upon. This stimulus will activate the door operator, and this installation will also include the required knowing act push plate or other activation device. Multiple operational features are common to these devices that are not always available in other operator systems.

The Installer’s Duty: Verification and Configuration Liability

A significant source of liability in low-energy door failures arises from installers who lack a comprehensive understanding of the specific hardware being installed. Some lower priced devices in the marketplace that move doors (compared to a fully automatic door operator) are manufactured by sophisticated automatic door conglomerates. These products have potential to be used as both a low energy operator and a standard pedestrian door system that requires a full sensor array. The settings and defaults programmed at the factory need to be manually verified by the installer when installation occurs to ensure that the operators are working for the intended purpose.
These products may come set up for low energy compliance or need to have parameters changed to make them function as a low energy system. Installers need to test operational speeds and movement forces when installing these multi use products for low energy door compliance purposes in order to protect all users of these operators. Failure to perform these manual adjustments results in a system that may appear compliant to the casual observer but poses a significant kinetic hazard to users, particularly the elderly or disabled. In a litigation context, this oversight often constitutes a breach of the standard of care, as the installer has failed to ensure the product is functioning as the specific safety designation requires.

All automatic door systems, whether low energy or standard pedestrian automatic door operators that require full sensor packages, need to have instructions provided to the end user. Any competent installer should turn over the operating manuals to their clients at the time when the installation is completed. The installers should instruct and inform the end user about the requirements for daily safety testing, annual product inspection, and how to monitor the door for safe operation prior to allowing the general public

access through the doorway each and every day. When an installer fails to provide appropriate owner's manuals, it demonstrates negligence on the part of the installer, however, product owner's manuals are usually available online or through the manufacturer, if requested. In all cases those in control of all automatic door systems (the end users) are responsible for understanding and mitigating the potential hazards these doors can present to the public.

There are generally multiple parties involved in the placement of a low energy door system. In the case of new construction, these would include the designer or architect, project manager, installer, service provider, general contractor, or site manager. When a low energy door operator is ordered for an existing doorway, the owner, manager, or service provider, in addition to other vendors, may be involved in choosing the installation product. Any competent supplier or installer should know and understand what the automatic operator is capable of and provide a product that has been assessed for the intended placement and meets the functional daily needs of the location.

Many owners that request the installation of a low energy door system are doing so to either accommodate patrons with disabilities or just think that having an automatic door of any kind is a good thing.

Part of the duties of a competent and responsible professional door service provider who follows industry standards and practices is to inform, instruct, and educate customers about what is needed to properly maintain any automatic door system. Most competent service providers will offer inspection programs and provide maintenance for all door systems. However, many building owners opt to ignore their responsibility for the condition of their automatic doors and only call upon an outside service provider when in-house attempts to repair or adjust are unsuccessful.

This unfortunately includes many healthcare facilities that have been repeatedly offered and reminded of the ongoing need for automatic door inspection and maintenance. Due to financial considerations many medical centers fail to properly understand and inspect automatic door systems. Most end users that own medical buildings where automatic doors are in place fail to perform the manufacturer required and industry standard daily safety checks. This is a particularly dangerous situation, as many mobility impaired patrons which typically make up a significant part of the users of this kind of facility are often negatively affected by unmaintained automated doors of all kinds.

Low energy automatic doors were originally designed and created to assist people with disabilities in wheelchairs. When the original handicap accessibility standards were being developed, people in wheel chairs were offered training and were advised of the proper usage of the wall push plates to allow access into a building, how long the door would remain open, and how they should navigate through a low energy doorway. The

standards were created and described through part of ADA (Americans with Disabilities Act) 404.2.7 and 404.2.8. These accessibility standards have now been in place since the early 1980’s in most states.

In the years following the enactment of the Americans with Disabilities Act (ADA), low-energy door systems have frequently been commissioned or maintained in a non-compliant manner. In many facilities, these systems are improperly situated in high-traffic interior corridors, inviting use by the general public without sufficient notice that the doors lack the safety sensors found on fully automatic systems.

Furthermore, the reliance on safety decals to mitigate risk is often insufficient; such signage is frequently not visible, obscured when the door is in the open position, and fails to provide the 'average untrained pedestrian' with an effective warning of the door's closing cycle.

Some facilities that have low energy door systems have attempted to modify them using sensors to keep doors open longer than the normal required duty cycle, guard against pedestrian tailgaters or outswing collisions. Adding a sensor is typically done to doors that have proven to be problematic to users. This does not eliminate the problem. In many instances, service providers who recommend adding sensors to low-energy systems fail to remediate the underlying misapplication of the hardware, opting instead for a supplemental equipment sale. The installation of a sensor on a low energy door is proof that another type of door system is preferable and most likely needed.

When a low energy door is improperly maintained or not correctly adjusted for the required force of operation, a low energy door closing upon an unknowing pedestrian user often results in injuries.

Pedestrian users of all low energy doors are generally accustomed to fully automatic pedestrian doors that have proximity and presence detection sensors to keep them in an open condition if the door swing or sliding threshold is occupied. When most pedestrians see an open doorway, they assume that the doors will remain open. Facilities that are uninformed or have no appropriate maintenance or operational concerns often attempt to hold low energy door systems open for extended periods of time. The average pedestrian user seeing an open door will typically not know or think that the door system will close as they are passing through the opening. That is one significant reason why doors held open for extended periods after activation become dangerous to users.

In numerous personal injury legal cases when an injured party was questioned about why they went through a doorway without pushing an activation switch, typical answers have included that the door was always open when they had seen it. They thought it

was the kind held open by a magnet catch, or they did not see any push plate and did not know that the door ever moved away from the wall.

It is essential to remember that the ANSI standards for low energy doors have minimum/maximum hold open periods that allow a person in a wheelchair adequate time to open the door, transition the door, and leave the opening without door impact. Unlike fully automatic systems, these doors do not possess the function to “monitor” the opening for obstructions.

They were designed and intended to allow a person in a wheelchair adequate hold-open time to pass through the doorway, not keep the door held open indefinitely if the opening is obstructed by a slow moving pedestrian user that is unaware of the door operation.

To reiterate, unlike fully automatic pedestrian door systems, these doors do not possess components needed to "monitor" the opening for obstructions. Once the programmed hold-open interval expires, the door begins its closing phase regardless of whether the path is occupied. This creates a significant liability trap for an end user when such doors are installed in high-traffic environments.

Installation of a low energy door system in an environment requiring a fully automatic and sensor controlled pedestrian system is dangerous and often leads to door impact events. Unsuspecting pedestrian users who, unlike trained or informed "knowing act" users, do not anticipate the door’s closing cycle.

When a design professional or construction entity intentionally specifies a low-energy operator to circumvent the costs associated with a standard pedestrian system, they have effectively operated below the industry standard of care. In such instances, the decision-maker, whether an architect, specifier, or contractor, bears direct responsibility for the resulting injuries, as they have prioritized budgetary concerns over foreseeable pedestrian safety.

If a building owner or developer opts for a low-energy operator while possessing any understanding of the safety limitations compared to a standard system or has chosen a low energy door operator based upon a lower cost, this choice may rise to the level of gross negligence. By knowingly installing a "blind timer" system in a high-traffic area to save on capital expenditures, the owner exhibits a conscious disregard for the safety of others, establishing a clear path for direct liability in the event of a pedestrian injury.

GLOSSARY

ADA (Americans with Disabilities Act) Requirements Federal civil rights standards for accessibility. In the context of doors, it specifically mandates that the force for

pushing or pulling open a door (or the force of a hydraulic closer) shall not exceed 5 lbs, a stricter threshold than some commercial ANSI standards.

ANSI A156.10 The national safety standard for **Power-Operated (Fully Automatic) Pedestrian Doors**. These systems require active sensors to detect presence and prevent the door from closing on a user.

ANSI A156.19 The national safety standard for **Low-Energy Power-Operated Doors**. These are "knowing act" doors that operate with lower speeds and forces and **do not** require presence sensors.

Blind Timer / Time Delay A mechanical or software setting that determines how long a door remains open before closing. Because low-energy doors lack presence sensors, they close strictly based on this timer, regardless of whether a person is still in the doorway.

Gross Negligence (in Specification) In this context, it refers to a "conscious disregard" for safety, such as when a building owner or architect intentionally selects a low-energy operator for a high-traffic area—knowing it lacks sensors—strictly to save money.

Kinetic Hazard The potential for injury caused by the energy of a moving object. In litigation, this refers to a door that moves with enough mass and velocity to cause blunt force trauma or a fall.

Knowing Act A deliberate action performed by a user to initiate the door's opening. This includes pushing a wall plate, swiping a card, or a "Push and Go" physical stimulus. It assumes the user is aware the door is about to move.

Low-Energy Operator A door motor designed to move a door at slow speeds and with limited force. These are intended for infrequent use by specific individuals, not for general high-volume pedestrian traffic.

Obstruction Sensing A safety feature (common in fully electric operators) that detects resistance. If the door hits an object, the motor is designed to stall or reverse to mitigate injury.

Presence Sensor An electronic device (infrared or microwave) that detects a person standing in the path of a door. These are standard on A156.10 doors but usually absent on A156.19 low-energy doors.

Push and Go A feature where the user manually pushes or pulls the door a few inches, triggering the motor to take over and open the door the rest of the way. While convenient, it can be hazardous if the user does not realize the door will move toward or away from the pedestrian and eventually close on a timer.

Strike Zone / Path of Travel The physical area swept by the door as it moves from fully open to fully closed. This is the "danger zone" where impact injuries occur.

Tailgating Pedestrian When a person walks through a door opened by someone else instead of triggering the entry mechanism themselves.

Value Engineering An industry term for reducing costs during the design phase. In litigation, it is often framed as "choosing profit over safety" when a cheaper, less safe door operator is substituted for a more appropriate one.

MORE AUTOMATIC DOOR ARTICLES by Michael Panish.

- **The Ins and Outs of Automatic Door Operation**
  A basic primer in how they work, what to look for, and how to analyze defects vs. deferred maintenance. Expert witness for automatic doors, Michael Panish, takes you through the basics for your case.
- **Automatic Doors - The Importance of Checking your Doors Daily**
  Daily safety checks for automatic doors.
- **Automatic Doors & Daily Safety Inspections**
  An explanation of automatic door sensors and how they work, why it is important to check them daily, and how they protect pedestrians.
- **Automatic Door Sensors - The Evolution of Automatic Door Sensors**
  How door sensor technology has advanced and how automatic doors have become safer

Mike Panish *is an internationally renowned expert in automatic door systems and the premier consultant for related legal claims. With a career dating back to the mid-1970s, he played a pivotal role in the early development of ADA standards in California. Through his company, Panish conducted critical performance evaluations of early low-energy access products, providing the manufacturers with the essential data that helped shape today's national handicap accessibility requirements.*

For additional information regarding ADA accessibility or incidents involving low-energy door systems and other automatic door systems, visit www.Constructionwitness.com. Contact Sharon at 888-902-4272 to secure the industry's leading expert for your next automatic door case.