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THE CHAIRMAN'S DOCKET

Successful, Technology-Based Product Liability Litigation

by Edson Howard Rafferty
Chairperson, ATLA Automatic Door Litigation Group

More so than in any other type of case, the keys to successful technology-based product liability litigation are: (1) obtaining a complete understanding of the technology; (2) discovery, discovery and more discovery; and (3) choosing the right technical experts/expert witnesses.

1. Understanding the Technology

As the plaintiff's attorney you must understand the technology better than the defendant's attorney and at least as

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FEATURE ARTICLE

ANSI A156.10: A Standard in Decline

by Warren F. Davis

ANSI (American National Standards Institute) A156.10 is the most comprehensive national standard that pertains to the actual operation and performance characteristics of automatic pedestrian doors. Consequently, the relevance of the ANSI A156.10 standard is inevitably an important issue in personal injury cases involving such doors. While the

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ANNOUNCEMENTS

The ATLA Automatic Door Litigation Group Annual Meeting will take place at 1:00 PM to 3:00 PM on Monday, July 25, 1994, at the ATLA Annual Convention and Meeting, Hyatt Regency Chicago, 151 East Wacker Drive, Chicago, Illinois. The exact location of the Litigation Group Meeting will be listed in the ATLA Program available at this ATLA Convention.

The meeting is open to (i) all members of the Litigation Group, and (ii) all Regular, Sustaining or Life members of ATLA who will sign a sworn affidavit that, with regard to automatic door cases, they represent only the injured plaintiffs.

The program will begin with introductory remarks from the Group's Chairman, Edson Howard Rafferty, Esq., followed by a short presentation and a roundtable discussion of technical issues related to automatic pedestrian door cases by the following guest speaker:

Warren F. Davis, Ph.D. [Physics (M.I.T.)] of Davis Associates, Inc., West Newton, Massachusetts, (617)-244-1450, and plaintiffs' expert in numerous automatic door cases.

Dr. Davis is also available as a plaintiff's expert to Group Members.

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primary focus must be on the particulars of the version of the standard that applies to the door in question, the evolution of ANSI A156.10 sheds important light clarifying the intent of its authors in the relevant version.

At the time of writing, ANSI A156.10 exists in three versions as follows:

1. ANSI/BHMA A156.10-1979 (18 July 1979);
2. ANSI/BHMA A156.10-1985 (25 April 1985);
3. ANSI/BHMA A156.10-1991 (10 September 1991).

ANSI procedures require that each version be reaffirmed, revised or withdrawn no later than five years from the date of publication. Thus, a new version is anticipated no later than 1996.

While A156.10, by virtue of being an "ANSI" standard, appears at first blush to be an independent, detached national standard, it is in fact very much a product of the industry it is intended to guide or regulate. In particular, it is sponsored, published and copyrighted by the Builders Hardware Manufacturers Association (BHMA), an association that includes the major door and sensor manufacturers. Revisions are approved by ANSI under the member Canvass Method, which entitles the standard to the ANSI imprimatur but, otherwise, ANSI has very little to do with its content.

ANSI standards are supposed to represent "general agreement among maker, seller and *user groups*" [emphasis added]. Further, they are supposed to "reflect a national consensus of manufacturers, consumers and scientific, technical and professional organizations." Yet, to date, neither the ATLA Automatic Door Litigation Group nor its technical advisors have been invited to participate in A156.10 revision.

Generally, ANSI standards are voluntary. That is, the manufacturer is free to adopt processes and procedures that do not conform with the standards. It follows that the claim of compliance by the manufacturer is also voluntary. The manufacturer is, in most cases, under no pressure whatsoever to claim compliance if it is in fact not so. For information on exceptions, see **A156.10 Alert** elsewhere in this issue. In the case of automatic pedestrian doors, manufacturers use the claim of compliance as a marketing tool to increase saleability by promoting the safety of their products.

Wooden phantom test

One of the most controversial requirements of ANSI A156.10 is found in sections 5.1.2 and 5.2.1 of the 1985 version, which applies to many doors currently involved in personal injury suits. These sections require that the sensing devices used to detect an approaching person or object must be capable of detecting a certain wooden test object moving toward the door at the rate of 6 inches per second. The precise dimensions and wood type of the test object or "phantom" and the dimensions of the detection area are prescribed.

At the current time, most automatic pedestrian door motion sensors detect using a type of "radar" that employs X-band (10.525 GHz) microwaves. These sensors are designed to respond to slight variations of wavelength (Doppler effect) uniquely characterizing the microwave energy reflected from moving objects within the sensor beam. Obviously, if the strength of the microwave reflections is too low, the sensor will not be able to detect the approaching object or person.

For a recent case, I constructed and used the wooden test object specified by ANSI A156.10-1985 to test the motion sensor on the approach side of the door. To my astonishment, the sensor (a BEA, Inc. VG017-A X-band microwave motion sensor) utterly failed to detect the moving wooden object. The motion sensor otherwise appeared to be working normally as gauged by the flow of human traffic through the door. I have since repeated the test on another door employing Horton Automatics microwave motion sensors with similar results.

Typically, the response of the defense is to attempt to distance itself from the test results by claiming that the wooden phantom is "unrealistic." That is, that both the material of which the phantom is made and the way in which it moves do not well represent human beings, the actual users of the door. Remarkably, the manufacturer of the sensor in one case produced a document in discovery written by one of its principal engineers acknowledging that it is widely known within the industry that X-band microwave motion sensors are incapable of passing the ANSI A156.10-1985 moving wooden phantom test. Yet, manufacturers have, and continue, to promote their door systems as complying fully with the ANSI A156.10 standard.

Besides the obvious question of fraudulent advertising, a number of additional questions are raised by the defense's response.

First, realistic or not, the moving phantom test is part of a standard that was written by the industry for itself. Why would the industry include such a test within the standard only to distance itself later from that requirement? Furthermore, compliance with the standard is voluntary in most cases. Why would manufacturers voluntarily claim compliance, presumably aware that compliance is possible only with a complete redesign of their door sensor system, when they are under no legal obligation to do so? It is here that careful study of the evolution of the ANSI A156.10 standard severely restricts the possible answers to these questions and, moreover, suggests strongly that the industry intended the moving wooden phantom test to be the minimum acceptable safety test of the door sensor system.

Evolution of ANSI A156.10

We begin with the observation that radar is another application of microwaves and that radar has existed as a well developed discipline since at least World War II. That is, since the 1940's. Studies made in connection with the wartime development of radar by, for example, the M.I.T. Radiation Laboratory clearly elucidated the differential reflectivity of

microwaves from a wide range of materials, including wood and human flesh. Moreover, the expectation that human flesh would reflect microwaves much more readily than dry wood was obvious on theoretical grounds alone long before the development of radar. This is due to the water and electrolytic content of the living human body relative to that of dry wood. Thus there can be no recourse to the excuse that the industry was unaware that wood was an "unrealistic" reflector of X-band microwaves at the time that it wrote the 1985 ANSI standard. The obvious reason why wood was knowingly and purposefully chosen for the phantom was to make the test significantly more sensitive than what would, in fact, be required to detect living people.

"In so far as sensors are concerned, ANSI A156.10, as it has evolved, does not set standards at all but is merely a reflection of the designs that the industry has already achieved and is, apparently, not motivated to go beyond"

Based upon the sensor designs actually developed by the manufacturers, it is clear that door designers and engineers did not understand what they needed to do or how to do it. Furthermore, lacking such fundamental understanding, it is no wonder that the resulting sensor design would be inadequate. Thus, the claim of being unaware of the reflection properties of microwaves is either a fabrication or, if true, indicts the manufacturer on the grounds of gross incompetence. Either way, the manufacturer does not appear in a favorable light.

But, lest there be any doubt, consider the wording of §5.2 of the 1979 version of the A156.10 standard:

> **5.2** The detection pattern shall be defined as the zone in which an object measuring 24 in (610 mm) in height, 10 in (254 mm) in width and 6 in (152 mm) in depth, and *of a material equivalent to the human body in detection characteristics*, can be detected. [Emphasis added].

It is thus clear that in 1979 the industry was well aware that the human body possesses detection characteristics that require its differentiation from other materials, such as dry wood.

Equally clearly, the industry cannot claim with respect to the inability of X-band microwave motion sensors to pass the 1985 ANSI moving wooden phantom test that it unknowingly adopted an "unrealistic" test because it was unaware that the reflection characteristics of wood are markedly different from those of living human tissue. On the contrary, it is clear that wood was chosen for the 1985 ANSI A156.10 test because it was recognized that, being an inferior reflector, the ability to pass the test would build in a margin of safety that would assure that humans would be readily detectable under a range of circumstances. The creation of a wide margin of safety by deliberately setting difficult standards is nothing more than standard (and good) engineering practice.

So, what was the industry's response to the inability of X-band microwave sensors successfully to detect the moving wooden phantom? As reflected by the subsequent 1991 version of ANSI A156.10, simply to downgrade the standard to conform with the existing door designs rather than to upgrade sensor capabilities to meet a good and valid standard. There is no mention at all of the wooden phantom in ANSI A156.10-1991. Nor has a comparably rigorous standard been substituted. In particular, §5.1.2 of ANSI A156.10-1991 reads:

> **5.1.2** The sensing device shall detect a 28 in (711 mm) minimum high *person or equivalent* within the detection area and moving at a rate of 6 in (152 mm) per second perpendicular to the door for motion sensors and stationary for presence sensors. [Emphasis added].

Note that the wooden phantom specified by ANSI A156.10-1985 is also 28 inches high so that the entire margin of safety contributed by the differential reflection characteristics has been abandoned. It is thus clear that the industry has downgraded the standard to allow inferior door designs to "meet" the standard, rather than upgrading door designs to reflect a primary concern within the industry for the maintenance of public safety. The downgrading of the standard is all the more deplorable given that technology existed prior to 1991 that would have readily permitted the design, construction and deployment of inexpensive sensors that exceed the requirements of the 1985 ANSI standard.

Unfortunately, the 1991 downgrading of the 1985 standard with respect to sensors is not the only instance. In 1979, when control mats for door actuation were still dominant, §5.1 of ANSI A156.10 read:

> **5.1** When sensing devices are used [in place of mats] for untrained pedestrian traffic, the devices *must be adjustable to provide detection patterns equivalent to those required for mats*. [Emphasis added].

The then emerging beam sensor technologies failed to "provide detection patterns equivalent to those required for mats." Most obviously, the sensor beams were by their nature incapable of projecting a precisely rectangular detection area onto the floor matching that of a mat. Unlike the mat, which can provide uniform coverage along the entire width of the door opening, coverage in the vicinity of the jambs was sacrificed due to the generally elliptical nature of the cross section of the beam on the floor.

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Mats also provide other important advantages not specifically identified in the 1979 standard that were sacrificed in the transition to beam sensors; the area covered by mats is not subject to instrumental drift; detection using a mat depends only upon the weight of the pedestrian and not the state of motion; mat detection does not depend upon cooperative behavior on the part of the pedestrian – that is, the pedestrian is not required to move so as to produce sufficient Doppler shift; the pedestrian is not required to wear clothing that reflects microwaves sufficiently strongly; mat detection capability is essentially uniform over the entire area of the mat; detection sensitivity is not subject to instrumental drift or accidental or deliberate maladjustment; and mats are not subject to interference from reflections or emissions from remote sources.

As with the 1985-1991 example, the sacrifice of coverage in the vicinity of the jambs due to the elliptical beam cross section was dealt with by downgrading the 1985 version of the standard, rather than upgrading the technology to meet the requirements of the existing standard. Section 5.1.1 of the 1985 version of ANSI A156.10 simply institutionalized the effects of the beam cross section by stating for swinging doors:

> **5.1.1** Detection patterns shall be *generally elliptical* and have a minimum width equal to the width of the door opening measured 30 in (762 mm) from the face of the door. The length at the longest dimension from the face of the door shall be 48 in (1219 mm) minimum. Detection shall be to within 5 in (127 mm) from the door measured at the center of the door opening. [Emphasis added].

The detection pattern for sliding doors is identical except that the longest dimension is extended from 48 inches to 54 inches by §5.2.1. All mention of equivalency with the detection patterns of mats has been dropped. Again, the choice was to downgrade the standard to conform with the doors' design, rather than the other way around.

In so far as sensors are concerned, ANSI A156.10, as it has evolved, does not set standards at all but is merely a reflection of the designs that the industry has already achieved and is, apparently, not motivated to go beyond. Whereas new technologies are usually introduced because they enable enhanced performance both duplicating and exceeding existing methods, the opposite has been true in the case of the automatic pedestrian door industry. New sensor technologies and the downgrading of viable safety standards were, in fact, industry responses to perceived market pressures and considerations, in spite of the attendant performance sacrifices. By codifying this progression, ANSI A156.10 has since 1979 become a standard in decline.

ABOUT THE AUTHOR –

Warren F. Davis has a Ph.D. in theoretical physics from MIT and is president of Davis Associates, Inc., 43 Holden Road, West Newton, MA 02165, Tel. (617) 244-1450, FAX (617) 964-4917. He has extensive training and experience in RADAR and microwave radiation detection and analysis devices and systems. He has served and/or is serving as a technical expert for plaintiffs on numerous automatic door cases and has been qualified as an expert witness in every case in which he has been asked to testify.

"Red Flash Bulletin"

Stanley's secret documents discovered

After countless frustrated attempts over many cases to obtain full discovery from Stanley, the field notifications issued by Stanley Access Technologies, formerly Stanley Magic-Door, relating to automatic pedestrian doors have finally been identified. The bulletins, entitled *Red Flash*, are sent to all Stanley installers and technicians in the field on an as-required basis as a vehicle for disseminating important information that is too urgent to work its way through manual updates and other channels. The *Red Flash* bulletins, which date back at least to 1988, contain, among other things, information on problems reported with existing installed Stanley equipment, along with recommendations for their solution in the field.

If you have a case involving a Stanley door, you should consider asking for production of copies of any and all *Red Flash* bulletins of any date that pertain to problems, installation, servicing, maintenance, repair, upgrading, debugging, alignment, tune-in, etc. of the door and sensor types involved in your case.

A CAUTIONARY NOTE: Based on experience with previous cases, Stanley will evade a proper response if there is any basis, however tenuous, for them to claim that they have no doors in their records that are configured in precisely the same way as the door in your case or as described in your request. Since no two door systems are precisely identical, evasion is relatively easy unless you have formulated your request with care.

It is suggested that you use multiple requests for production of documents to discover the required information – perhaps one request that asks for all *Red Flash* bulletins for all doors and door combinations, one request that asks for all *Red Flash* bulletins for your model door under all configurations of size and sensors, and one request that asks for all *Red Flash* bulletins for your particular door configuration with regard to model number, size, type, and sensors.

A156.10 Alert

ANSI A156.10 may be mandatory in your state

Research by attorney William L. Bromagen of the firm of Blackwell and Walker in Miami, Florida, has turned up an important relationship between the ANSI A156.10 standard for automatic pedestrian doors and the statutes of that state. In certain jurisdictions in Florida, ANSI A156.10 has been elevated by statute to the status of a mandatory standard. This could have an important bearing on any pedestrian door case in any state where similar statutes apply.

ANSI A156.10, which is the primary national standard that applies to the operation of automatic pedestrian doors is, unfortunately, promulgated as a voluntary standard. As written, manufacturers are not required to be in compliance as can be seen from the following clause from the forward to the standard:

> The existence of an American National Standard does not in any respect preclude anyone, whether he has approved the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standard.

However, Florida Statutes §553.73 lists another standard, the Standard Building Code, as one of several alternatives that local government and state agencies with building construction responsibilities must adopt from the State Minimum Building Codes. Section 1114.3.3 of the Standard Building Code states that

> **1114.3.3** Power operated doors shall comply with ANSI/ BHMA A156.10.

Thus, in the jurisdictions in Florida in which the Standard Building Code has been adopted from the State Minimum Building Codes list, ANSI A156.10 has the full force of a mandatory standard, though compliance is otherwise only voluntary.

It is possible that other states have similar statutes that likewise elevate the ANSI A156.10 standard to mandatory status. Since this could have a significant impact on your automatic pedestrian door case, it is important that you research the statutes in your state to determine if similar statutes apply. If so, you are encouraged to share that information with the ATLA Automatic Door Litigation Group to assist other plaintiffs in your state.

In pursuing the research, you should be aware that the Standard Building Code may not be the only code that incorporates the ANSI A156.10 standard. Obviously, any code that is mandated by statute that incorporates the ANSI A156.10 standard will suffice.

Patent Tip

Cutting through the information barrier

Experience with recent pedestrian door cases has shown that the U.S. patent can be a source of invaluable information that otherwise may be very difficult or impossible to obtain through the usual discovery process. This pertains especially to the sensors used to trigger opening and closing of the door.

Virtually all current and past sensor technologies used to activate automatic pedestrian doors incorporate serious design flaws or naive assumptions that lead to accidents under certain traffic conditions. Identifying these flaws so that their possible relationship to the details of an accident can be established can be an extremely frustrating process. Manufacturers are loath to divulge the complete theory of operation, schematic circuit diagram and other technical information required by the plaintiff's expert to make a determination. Yet, if U.S. patents apply, a good deal of the required information may already be part of the public record and readily available.

Cases in point are provided by the Eye-Cue™ sensor by Besam, Inc. and the Sentrex™, OmniScan™ and Stan-Guard™ sensors by Stanley Access Technologies, formerly Stanley Magic-Door. As determined from recent cases, the relevant patents are:

Stanley Sentrex™	4,669,218	June 2, 1987
	4,698,937	October 13, 1987
Besam Eye-Cue™	4,736,097	April 5, 1988
Stanley Stan-Guard™	4,823,010	April 18, 1989
Stanley OmniScan™	4,967,083	October 30, 1990

Moreover, patent number 4,669,218 is a continuation-in-part of U.S. patent number 4,565,029 (January 21, 1986).

Be sure to ask the manufacturer of the door sensors for any, and all, patent numbers that apply in any way to the sensors. Note that the manufacturer of the sensors may not be the manufacturer of the door, either because the sensor was purchased from a third party for bundling with the door, or because the sensor has been replaced subsequent to the original door installation.

As with the research into state statutes mentioned above, you are urged to share any relevant patent information that you discover with the ATLA Automatic Door Litigation Group to assist other plaintiffs.

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well, if not better, than the defendant's expert witnesses. I am aware of only two ways through which you can accomplish this. The first way is the hardest – "get on board" with the technology. When I say "get on board" with the technology, I mean that you must spend the necessary hours, days and weeks reading the technical information, becoming intimately familiar with all the technical jargon and terms. You must understand exactly how each piece of the equipment involved in the accident/injury works and is used. This includes how they do NOT work, what their technical and functional shortcomings are, and what alternatives there are to the use of this equipment. You must become so technically competent that you can discuss the technical and functional aspects of the equipment in as clear and concise terms as you would the legal technicalities of a lawsuit. If you choose NOT to "get on board" in this sense, your only viable option is to associate yourself in some cooperative arrangement with another attorney who is either technically trained or who has successfully represented other clients in these particular types of high-technology lawsuits. He or she can thus handle the technical side of the lawsuit relative to pretrial discovery and relative to direct examination of your experts and cross examination of defendant's experts at the trial itself.

If you find you need the help of outside counsel experienced in these types of cases, the ATLA Automatic Door Litigation Group will be able to make appropriate attorney-referrals to you to obtain such help.

2. Discovery! Discovery! Discovery!

Discovery is the absolute key to successful, high technology product liability litigation. However, to obtain the discovery you will need, you must be prepared to go the full ten yards. You must first understand the technology or obtain the services of an attorney who does understand it. You must prepare a full and complete set of interrogatories, request for production of documents and request for admissions. You must take all the appropriate depositions of witnesses and defendants' experts. Finally, be prepared to act quickly to force reluctant defendants to furnish the discovery requested, including seeking sanctions whenever the defendants have failed to produce all the discovery requested. Your best potential helper in preparing your own discovery is your own expert witness – if you have selected the right one.

3. Choosing your Expert

In choosing your Expert, you will ideally need someone who can help you do the following things relative to your case:

(a) Help you educate yourself technologically so that you fully understand the product technically and functionally;
(b) Help you analyze the case properly;
(c) Help you develop the best strategy for preparing and trying the case;
(d) Help you prepare the technical discovery that you will want to force the defendants to produce or answer;
(e) Help you analyze the answers you get from defendants to your discovery;
(f) Help you prepare answers to defendant's discovery requests;
(g) Help you prepare for the deposition of the defendants and the defendants' experts;
(h) Help you prepare for the trial; and
(i) Help you prepare for your cross-examination of defendant's expert witnesses.

You will also need an expert who:

(a) Can be an impressive and knowledgeable deponent. The best way I know of to promote fair and equitable settlement of cases is to choose an expert who is impressive and knowledgeable with regards to the technology involved;
(b) Can testify as an Expert Witness at trial with credibility, veracity and believability;
(c) Can serve as a rebuttal witness at trial after defendants' experts have testified;
(d) Cannot be "out gunned" by defendant's expert – who can stand toe-to-toe with defendant's expert and battle it out tooth and nail – and come out on top;
(e) Will ultimately cause the defendants, and their counsel, to yell "uncle" first.

In summary, your first and most important job to successfully engage in technology-based product liability litigation is to CHOOSE THE RIGHT EXPERT.

The ATLA Automatic Door Litigation Group can help you in finding and choosing this expert. There are several experts that we have recommended in the past for these types of cases. However, the overwhelming choice of the ATLA Automatic Door Litigation Group is Warren F. Davis, Ph.D. He has his doctorate in physics from M.I.T. in Cambridge. He is smart, likable and tough, and it has been impossible for the defendants' experts or counsel to outclass him. In addition, his testimony comes across to the judge and jury as sincere, believable, credible and truthful. He can go toe-to-toe with the best that the defense can put up and he always comes out on top. In addition to knowing this man personally from a technological standpoint for many years, I have also known him professionally in the context of an Expert Witness over the last several years. I can personally recommend him, without reservation, as a Technical Expert and as an Expert Witness on all automatic door litigation cases.

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