

IN THE MATTER OF
FIGGIE INTERNATIONAL, INC.

FINAL ORDER IN REGARD TO ALLEGED VIOLATION OF SEC. 5 OF THE
FEDERAL TRADE COMMISSION ACT

Docket 9166. Complaint, May 17, 1983—Final Order, April, 11, 1986

This final order requires, among other things, a Richmond, Va. manufacturer and seller of home heat detectors to provide notification that smoke detectors give earlier warning than heat detectors in nearly all residential fires to past purchasers of its heat detectors. Respondent must also disclose that fact in any future promotional materials that make claims about the residential fire protection provided by heat detectors. Additionally, respondent is prohibited from misrepresenting: (1) the performance characteristics of any heat or smoke detector, or any system containing both; or (2) any standard or recommendation established by the National Fire Protection Association or any other group concerning fire warning systems.

Appearances

For the Commission: *Christopher Schwartz* and *David M. Malone*.

For the respondent: *Edwin S. Rockefeller* and *Leslie Donovan, Schiff, Hardin & Waite*, Washington, D.C.

COMPLAINT

Pursuant to the provisions of the Federal Trade Commission Act, and by virtue of the authority vested in it by said Act, the Federal Trade Commission, having reason to believe that Figgie International, Inc., a corporation ("respondent") has violated the provisions of said Act, and it appearing to the Commission that a proceeding by it in respect thereof would be in the public interest, hereby issues its complaint stating its charges as follows:

PARAGRAPH 1. Respondent, Figgie International, Inc., is an Ohio corporation with its principal place of business at 1000 Virginia Center Parkway, Richmond, Virginia.

PAR. 2. Respondent maintains a substantial course of business, including the acts and practices set forth hereinafter, in or affecting commerce, as "commerce" is defined in the Federal Trade Commission Act.

PAR. 3. Respondent manufactures, advertises, offers for sale, sells and distributes residential fire alarm products including heat detectors and smoke detectors. Respondent's fire alarm products are some-

times identified by the trade name "Vanguard" and are sold to the public by respondent's distributors through in-home sales presentations. Respondent offers these products as fit for the purpose of affording fire warning protection to residential occupants.

PAR. 4. In order to sell its fire alarm products respondent has made numerous representations in various promotional and training materials it prepared and disseminated. Illustrative of respondent's representations are the following:

- (1) Heat detectors "will give immediate early warning."
- (2) Heat detectors provide "fast response to hot fires." [2]
- (3) Smoke detectors provide only "partial protection."
- (4) "Mechanical heat detectors are essential to provide the reliability that smoke detectors lack and to guard against the many types of fires where smoke detectors may be ineffective."
- (5) "The 'VANGUARD' Thermosonic 50-Ft. Heat Detector and the 'VANGUARD' Smokesonic Smoke Detector will provide the combination needed to give a greater measure of life safety."

PAR. 5. Through the use of these representations, and others of similar meaning, and by offering its fire alarm products as fit for the purpose of affording fire warning protection to residential occupants, respondent represents, directly or by implication, that:

- (1) In the event of fire, respondent's heat detectors provide sufficient warning to occupants to allow them to escape safely.
- (2) Respondent's fire alarm systems combining heat detectors and smoke detectors provide significantly greater fire warning protection for occupants than smoke detectors alone.

PAR. 6. In truth and in fact:

- (1) In nearly all residential fires, life endangering conditions will occur prior to the activation of respondent's heat detectors. Such heat detectors, therefore, do not provide sufficient warning to occupants in the event of fire.
- (2) Respondent's fire alarm systems combining heat detectors and smoke detectors do not provide significantly greater fire warning protection for occupants than smoke detectors alone.

Therefore, the statements and representations set forth in Paragraphs Four and Five were and are deceptive and unfair.

PAR. 7. Respondent's use of the aforesaid deceptive and unfair statements and representations has had and now has the capacity and tendency to deceive consumers and to induce purchases of substantial quantities of respondent's products. [3]

PAR. 8. The acts and practices of respondent, as herein alleged, were and are all to the prejudice and injury of the public and constituted,

and now constitute, unfair and deceptive acts or practices in or affecting commerce in violation of Section 5 of the Federal Trade Commission Act.

INITIAL DECISION BY

MONTGOMERY K. HYUN, ADMINISTRATIVE LAW JUDGE

OCTOBER 23, 1984

PRELIMINARY STATEMENT

On May 17, 1983, the Federal Trade Commission ("Commission") issued an administrative complaint charging Figgie International, Inc. ("Figgie") with a violation of Section 5 of the Federal Trade Commission Act, as amended (15 U.S.C. 45), in connection with certain product claims allegedly made by Figgie in the distribution and sale of heat detectors. On July 1, 1983, Figgie filed an answer denying that it violated the Federal Trade Commission Act as charged. On November 8, 1983, Paragraphs 5 and 6 of the complaint were amended so as to change several words. The amended complaint alleged generally that promotional materials supplied to and used by Figgie distributors during in-home sales presentations contain express and implied effectiveness claims for Vanguard heat detectors which are deceptive and unfair. More specifically, the amended complaint challenges the lawfulness of alleged product claims (1) that in the event of most fires Vanguard heat detectors provide the necessary warning to allow a safe escape in residential fires and (2) that Vanguard fire alarm system combining heat detectors and [2] smoke detectors provide significantly greater fire warning protection than smoke detectors alone.

Evidentiary hearings for the presentation of complaint counsel's case-in-chief began on April 30, 1984 and ended on May 9, 1984. Defense hearings began on June 13, 1984 and ended on June 20, 1984. Sixteen witnesses gave testimony. The transcript of hearings, including prehearing conferences, consists of some 1,700 pages and about 86 exhibits, including a number of slides and tapes, were received in evidence. The evidentiary record was closed on July 6, 1984.¹

The proposed findings and conclusions submitted by the parties and their arguments in support thereof have been given careful consideration by me and to the extent not adopted by this Initial Decision, in the form proposed or in substance, are rejected as not supported by

¹ By order of September 18, 1984, the Commission extended the due date of this initial decision to October 23, 1984.

the evidence or as immaterial. Any motion appearing on the record not heretofore or hereby specifically ruled upon either directly or by the necessary effect of the conclusions in this Initial Decision are hereby denied.

Upon consideration of the entire record in this proceeding and having considered the demeanor of the witnesses, I make the following findings of fact and conclusions of law and order based on the record considered as a whole:² [3]

FINDINGS OF FACT

I. JURISDICTION

1. Respondent Figgie International, Inc. ("Figgie") is a corporation organized and doing business under the laws of Ohio, located at 1000 Virginia Center Parkway, Richmond, Virginia (Ans. of Figgie, ¶ 1).

2. Figgie is now and has been engaged in the distribution, promotion, offering for sale and sale of heat and smoke detectors under the trade name "Vanguard" (CX 135, Respondent's Response to Complaint Counsel's Request for Admission No. 2).

3. Figgie, through its Interstate Engineering Division (hereinafter sometimes referred to as "Figgie-Interstate"), ships goods, including but not limited to Vanguard heat detectors and smoke detector, through interstate commerce (CX 135, Admission No. 6).

4. The Interstate Engineering Division of Figgie had total sales of about \$29,939,000 for the period January 1, 1981 through May 31, 1983 (CX 135, Admission No. 5).

5. Figgie-Interstate had total sales of about \$23,212,000 for the period January 1, 1979 through December 31, 1980 (CX 125).

6. In the course and conduct of its business, Figgie-Interstate has produced and disseminated promotional material through the United States mails pertaining to Vanguard smoke and heat detectors for the purpose of promoting the sale of Vanguard fire alarms (CX 135, Admission No. 8).

7. In the course and conduct of its business, and at all times relevant to the Complaint, Figgie-Interstate has maintained a substantial

² For the purposes of this initial decision, the following abbreviations were used:

F. - Finding of Fact in this decision
CPF - Complaint Counsel's Proposed Findings
RPF - Respondent's Proposed Findings
CR - Complaint Counsel's Reply
RR - Respondent's Reply
Tr. - Transcript of hearings, sometimes preceded by the name of the witness
CX - Complaint Counsel's exhibit
RX - Respondent's exhibit
Comp. - Complaint
Ans. - Answer

course of trade in these products, in or affecting commerce, as "commerce" is defined in the Federal Trade Commission Act (CX 135, Admission No. 10).

II. BUSINESS OF RESPONDENT

A. *Company History*

8. Figgie was known as A-T-O, Inc., until the name was changed in 1981 (Schoettler 1259). The name change did not signify any change in Figgie-Interstate's method of doing business (Schoettler 1259; McGee 602; Sterner 1575). [4]

9. Figgie is a diversified international operating company with 30 major divisions marketing industrial, consumer and technical products. Some of Figgie's better known products include American La-France fire apparatus and Rawlings sports equipment (CX 62B). Figgie claims to be the "World's Largest Integrated Manufacturer of Fire Protection and Security Equipment." Annual sales are in excess of \$700 million (CX 62B).

10. Interstate Engineering was at one time an independent corporation headquartered in California. In 1959, Interstate introduced the first Vanguard heat detector. In November 1967, Interstate merged into A-T-O and it is now an operating division of Figgie (CX 64L).

B. *Fire Alarm Products Offered For Sale*

11. Figgie-Interstate is now and has been, at all times relevant to the complaint, engaged in the manufacture of fixed-temperature heat detectors which are sold for the purpose of providing fire warning protection to residential occupants (CX 135, Admission Nos. 1 and 12).

12. Figgie-Interstate, at all times relevant to the complaint, has purchased the smoke detectors it sells from outside manufacturers (Sterner 1620).

13. Since 1971, Figgie-Interstate has offered for sale and sold Vanguard heat detectors containing either a 136° or a 175° fuse (Sterner 1614). An improved, 117° fuse was first offered for sale in April 1982 (CX 94A; Sterner 1614). In August 1983, the 117° fuse became the standard fuse used in a Vanguard heat detector (Sterner 1615).

14. Figgie-Interstate also offers for sale and sells both A.C.-D.C. photoelectric smoke detectors and battery operated ionization smoke detectors (CX's 93, 71Z-11). The photoelectric smoke detector currently sold by Figgie-Interstate is designed to activate once smoke density reaches approximately 1.5% (CX 64W).

C. Marketing Of Heat And Smoke Detectors

15. Figgie-Interstate offers for sale and sells Vanguard heat and smoke detectors to distributors located nationwide (CX 135, Admission No. 7; McGee 604) who in turn sell the products through in-home sales presentations to consumers (McGee 609; Hammack 231). Figgie-Interstate has a contractual relationship with these distributors (McGee 645).

16. Between January 1, 1981 and May 31, 1983, Figgie-Interstate has generated about \$2,354,000 in heat detector [5] sales. For the same time period, Figgie-Interstate has generated about \$620,000 in smoke detector sales (CX 127).

17. The standard package of heat and smoke detectors sent by Figgie-Interstate to distributors contains either five heat detectors and one smoke detector or six heat detectors alone (Schoettler 1269).

18. Sales figures from January 1, 1979 to May 31, 1983 indicate that Figgie-Interstate sells between four and five heat detectors for every smoke detector sold (CX's 127A, 125). Interstate currently sells both the 136° and 117° heat detector to distributors for \$32.75. Interstate charges distributors \$46.00 per unit for the smoke detectors (CX 127B). The testimony of Vanguard fire alarm purchasers called as respondent's witnesses indicate that they paid about \$100 per detector (Gwinn 1483; Hodja 1514) and have bought about five heat detectors for every one smoke detector (Hartley 1477; Shaw 1556; Hodja 1506; Gwinn 1477; Losito 1464).

19. Figgie-Interstate, in the regular course of its business, receives and maintains owner registration cards from distributors indicating the name and address of the purchaser, the number of Vanguard alarms installed, the purchase date and the name of the distributor responsible for the sale (CX 79; Hammack 2591).

20. Figgie-Interstate prepares, produces, and supplies promotional materials for use by its distributors during in-home sales presentations (CX 136, Amended Answer to Requested Admission No. 9; McGee 626-27, 632, 644; Hammack 212, 214, 218, 247, 250, 252). These materials contain detailed elements of the sales presentations to be made to consumers (Hammack 215; McGee 626).

21. Figgie-International, in the course and conduct of its business, and at all times relevant to the complaint, has exercised substantial control over the promotional practices of its distributors regarding the sale of Vanguard heat and smoke detectors, including the content of the sales presentation.

22. Until 1981, Interstate had relied upon a hierarchy of distributors referred to as divisional, regional and factory-direct. Divisional distributors had the largest sales territories and oversaw the activi-

ties of regional distributors. In turn, regional distributors were responsible for the factory-direct distributors operating within their respective regions. Figgie-Interstate paid a commission to divisional and regional distributors based on the purchase volume of those distributors for whom they were responsible (McGee 604-05, 608). Factory-direct distributors frequently establish subdistributors whom they supply (Hammack 206). [6]

23. During 1981, Interstate made all existing distributors factory-direct distributors. This change was prompted by Interstate's decision that divisional and regional distributors were not "giving them enough help" (McGee 608).

24. All factory-direct distributors, appointed by Figgie-Interstate, are assigned a primary area of responsibility as stipulated in a written agreement with Figgie-Interstate (Schoettler 1268; McGee 603). Figgie-Interstate also establishes sales quotas for those areas of primary responsibility (Schoettler 1268; CX's 85, 135, Admission No. 16).

25. Figgie-Interstate maintains a substantial role in the training of its distributors. It is recommended to all distributors that they rely upon the two-volume training manuals (CX's 64-65) for detailed information relating to hiring and training of their salesmen, and for sales presentations including scripts for opening and closing the sales presentation, lead generation and product information (Schoettler 1259; Sterner 1655). To date, Figgie-Interstate has sold about 5,000 copies of CX's 64 and 65 to its distributors (Interrogatory No. 34).

26. Figgie-Interstate holds regular sales meetings for Vanguard distributors where they are instructed by Figgie-Interstate personnel about sales presentations, lead generation and recruiting of sales people (CX's 87, 91-92, 96-97, 9P, 99-100).

27. Figgie-Interstate personnel regularly travel to various regions of the country to instruct distributors on how to stimulate sales and to show them how to do a proper sales presentation (Sterner 1656; CX 135, Admission No. 42; McGee 611). Distributors are further monitored by regular telephone calls from Interstate's Vice President for Marketing and its National Sales Director (Sterner 1660; CX 135, Admission No. 71).

28. Prior to November 1979, Interstate hired consultants, often known as National Trainers, to visit various distributorships and instruct them on such matters as day-to-day operation of the business, marketing of products and product information (CX 135, Admission No. 63; McGee 610).

29. On occasion, Figgie-Interstate instructs its distributors to memorize scripts prepared by Interstate for use in sales presentations (CX's 64Z-13, 88; Sterner 1655).

30. On occasion, distributors and Interstate personnel work to-

gether to develop new promotional material including the script for the slide presentation released by Figgie-Interstate in January 1983 (CX 135, Admission No. 59).

31. In order to stimulate sales, Figgie-Interstate sponsors sales contests among distributors and establishes award programs (CX 135, Admission Nos. 44 and 74). Figgie-Interstate has [7] provided funds to pay some of distributors' costs for advertisements recruiting salespersons (CX 89, 135, Admission No. 77).

32. In the course and conduct of its business, and at all times relevant to the complaint, Figgie-Interstate has produced and disseminated promotional materials which constitute a major portion of the sales presentation made by Vanguard distributors to consumers (Hammack 215; McGee 626).

33. Most of the promotional materials prepared, produced and distributed by Figgie-Interstate contain performance claims relating to Vanguard heat detectors (CX 136, Amended Response to Requested Admission No. 11; CX's 61C, G, 63, 66, 67M-N, P, S, 68B, 69C-D, 70B, E, G, 71Z-10, Z-12).

34. A method nationally employed by Vanguard distributors and recommended by Figgie-Interstate for purposes of generating sales leads included the offer of a free fire extinguisher to consumers who had filled out a registration card giving his or her name and address. The cards were deposited into drop boxes located in retail outlets and at trade fairs and were subsequently used by local Vanguard distributors to schedule sales presentations (CX 64Z-20; Hammack 228; Hodja 1504).

III. FIGGIE-INTERSTATE'S SALES PRESENTATION AND PROMOTION OF VANGUARD FIRE ALARM DEVICES

35. The sales presentation consists largely of promotional materials supplied to distributors by Figgie-Interstate. These in-home presentation materials include slide shows, testimonial letters, brochures and booklets, demonstration materials, government fire study excerpts and other materials, all intended to drive home the real danger of home fires and to induce the consumer to purchase Vanguard heat detectors, often in a system including a token number of smoke detectors. Figgie-Interstate recommends that heat detectors be installed in every room, including living rooms, bedrooms, kitchens, dens, basements, attics and garages; and perhaps a smoke detector outside the sleeping areas (CX 66M, 135, Admission No. 27; Sterner 1620).

A. *The Slide Presentation*

36. An important element of the sales presentation is a slide presentation with a synchronized audio tape, entitled "Home Safety Pro-

gram," which is prepared and disseminated by Figgie-Interstate. There have been two editions of the slide show. The first, CX 131 (CX 129, audio tape for old slide show; CX 130, transcript of CX 129), was in use from 1980 until early 1983. The second, CX 133 (CX 132, audio tape for new slide show; a [8] transcript of CX 132 appears on Tr. 1586-1604), has been in use since January 1983 (CX 135, Admission No. 59; Hammack 234; McGee 640, 644). Interstate's Vice President of Marketing, Irv Sterner, is of the opinion that the new slide presentation produced by Figgie-Interstate is the most effective piece of promotional material provided to Vanguard distributors for use during in-home sales presentations (CX 135, Admission No. 50).

37. According to Sterner, the new slide presentation (CX 133) is "totally different" from the old slide show (CX 131). Dr. Cohen, complaint counsel's expert witness, viewed both versions and characterized them as very similar in content and impact (Cohen 305-08). The evidence shows that the number of slides were reduced from 100 in the old version to 90 in the new, 64 of the old 100 slides were removed together with corresponding audio and, of the remaining 36 slides the accompanying audio was changed in many of them (Sterner 1573-74). The administrative law judge had occasion to view both versions and came away with a distinct impression that both versions conveyed a similar message regarding the real danger of night-time fires in homes and the effectiveness of Vanguard heat detectors as early warning devices, which have saved many lives.

38. The slide shows vividly depict residential fires, homes engulfed in raging flames and choking smoke and show alarming fire statistics regarding the real danger of night-time residential fires. In one fearful fire scene after another, the viewer is shown what a reliable fire warning device like Vanguard heat detector can do to save lives and property in residential fire situations.

39. The audio portion of the new slide show (CX 133) contains the following express representations:

a. The information you are about to hear may mean the difference between life and death for your family. So listen more carefully than you have ever listened before (Tr. 1587).

b. The purpose of our visit is to tell you how fires start, how they spread and, most important, how to survive (Tr. 1588).

c. Authorities say there are two things necessary to save you and your family in case of fire. "The first is adequate warning" (Tr. 1590).

d. When your fire occurs, it could be at night, the real danger time for your family. The vast majority of fire fatalities occur between the hours of 11:00 p.m. and 6:00 a.m. when most people are sleeping. Not more fires, more fire deaths (Tr. 1594). [9]

e. The most feared [toxic by-product of fire is] carbon monoxide. The gas is produced in abundance in every fire. It is odorless, colorless, and tasteless. A very short exposure

to this gas will not only induce sleep, but render you unconscious and, finally, death (sic; Tr. 1596).

f. However, regardless of the physical cause of fire fatalities, the real killer is time. If every family were warned of the fire in time, nighttime fire deaths and injuries could be virtually eliminated (Tr. 1598).

g. Under normal conditions with the bedroom door open a family had just 1.8 minutes from the time a fire started until it was too late. Even closing the bedroom door only gave them 5.6 minutes (Tr. 1598).

h. Imagine if an early warning system existed for your car that could warn you minutes before a fatal crash. We would all want one. A system like that of course does not exist. Yet, an early warning system does exist that will warn you minutes before a fatal fire condition exists in your home (Tr. 1599).

40. The audio portion of the old slide show (CX 130) contains the following express representations:

a. A few months ago we had a serious fire in our home that resulted in a financial loss and a much greater loss, the life of our nine year old son. We had one smoke detector and a false sense of security. The fire we had was so hot that by the time the smoke detector sounded it was too late. We now realize that to have adequate protection the home must have heat detectors as well as smoke detector (CX 130C).

b. We suggest that you watch the film and draw your own conclusions as to whether you want the protection provided by a cheap smoke detector or the protection offered by a combination system (CX 130C).

c. As the oxygen content in the air is burned up and the carbon monoxide increases your senses are gradually dulled so that you sleep more soundly. This is one of the main causes of residential fire fatalities (CX 130D). [10]

d. They die because the fire is not discovered in time for them to get out (CX 130E).

e. Vanguard can give you that extra measure of life safety when the fire starts (CX 130F).

f. We know we had made the right decision as we heard the life saving sound of the heat detector which warned us of an overheated furnace. Without this protection the result could have been a tragedy (CX 130F).

g. Tests show that you may have as little as 1.8 minutes to escape with your life (CX 130G).

h. We have all ready [sic] saved thousands of lives and million of dollars in property (CX 130M).

i. Numerous fire authorities recommend the Vanguard system (CX 130M).

j. Chief Joe Armstrong of the Andover Fire Department, Chief Boyd Tuttle, Columbia Fire Department and Chief Ray Gergeler, Eagleville Fire Department witness the activation of the first alarm only 15 seconds after the start of the fire in a demonstration house fire. The heat detector located on the ceiling at the top of the adjoining room activated only five seconds after the first detector. The third heat detector located on the ceiling at the top of the stairwell activated four seconds later. It took nearly 33 seconds for the smoke detector to activate (CX 130M).

k. Automobile accidents kill thousands of people each year just as fire does. If you could get a device that you could put on your car to let you know two or three minutes before you have a wreck to allow everyone to get safely out of the car, would you want one? Certainly you would. Everybody knows there is no such device for cars but there is for fire. That is exactly what Vanguard is (CX 130N).

B. Promotional Brochures And Booklets

41. CX 61, entitled *Disneyland Hotel is a Pioneer in Life Safety (Disneyland Hotel)* is a 8-page promotional piece copyrighted by Interstate Engineering in 1981, 1982 and 1983. The cover page bears, in addition to the title, a large [11] photograph of the Disneyland Hotel. During the in-home sales presentation, Vanguard distributors make CX 61 available to prospective purchasers (Hammack 247; McGee 638). Interstate produces and distributes CX 61 and has sold about 14,000 copies to its distributors (CX 61, Interrogatory No. 34). Irv Sterner, Interstate's Vice President of Marketing, is of the opinion that CX 61 is the third most effective pieces of Vanguard heat detector promotional literature (CX 135, Admission No. 51).

42. CX 61, *Disneyland Hotel*, purports to report the results of an activation test of 175 Vanguard heat detectors that had been in use in the Disneyland Hotel in Anaheim, California, since January 1960. The test was conducted at Interstate's facilities on October 16, 1980 (CX 61C).

43. According to CX 61, in this first-time-anywhere, large-scale "dependability test" of mechanical heat detectors, all of the 175 Vanguard heat detectors, each of which had remained at its installation site without service for as long as 20 years, "responded within the designated temperature range by sounding a loud alarm lasting four and five minutes."

44. CX 61C also contains the following statements:

This proof of long-term dependability did not surprise the manufacturer. VANGUARD heat detectors came into existence in 1959 and since then Interstate Engineering has received over one thousand letters evidencing the saving of thousands of lives through the use of millions of VANGUARD heat detectors.

The VANGUARD heat detectors used in the activation had been installed in the two-story garden style guest rooms of the Disneyland Hotel in January, 1960 and since VANGUARD heat detectors do not require maintenance, each remained at its installation site without service. The Disneyland Hotel estimates that, since the heat detectors were installed, 4,343,255 people have stayed in rooms having VANGUARD heat detectors. Because the heat detectors performed so well, the Disneyland Hotel installed the latest model of the VANGUARD Thermosonic Heat Detector (as well as a smoke detector) in each room already having a VANGUARD heat detector when those rooms were remodeled.

Interstate Engineering also markets VANGUARD smoke detector alarms, fire escape ladders and fire extinguishers. [12]

45. CX 61C, which is followed by three pages of photographs, bears a notation printed in bold types, at the bottom of the page, which reads:

IMPORTANT

The presence of representatives from the Disneyland Hotel, the Los Angeles County Fire Department and the Orange County Fire Department in no way represents an endorsement of the items tested.

The United States Government, fire authorities, Interstate Engineering (a Figgie International Company), and VANGUARD distributors strongly recommend the installation of an adequate number of early fire warning detection devices.

46. The following page, CX 61D, shows two photographs. The top half of the page shows a large number of heat detectors arranged on a long table. Standing behind the table is a small group of men. The legend to the left of this photograph reads: "Participating in the test were IEC personnel and Captain Richard Schiehl, (third from right) Los Angeles County Fire Department and Fenton Hill, (second from right) Disneyland Hotel." The bottom half shows a partial view of a table bearing several rows of heat detectors and two uniformed officers, standing behind the table, and one examining a detector held in his hands. The legend to the left of this photograph reads: "(l-r) Captain Richard Schiehl, Los Angeles County Fire Department and Captain Charles Pister, Orange County Fire Department timing the four to five minute alarm cycle."

47. CX 61E shows two photographs. The top half of the page shows a man, standing by a table bearing a number of heat detectors, examining a detector held in his hands. Standing next to the man is a uniformed officer holding a notepad in one hand and looking at the detector hand-held by the other man. The legend to the right of the picture reads: "Captain Charles Pister, Orange County Fire Department and Fenton Hill, Disneyland Hotel observing the condition of the VANGUARD heat detectors prior to the test." The bottom half of the page shows a long display table bearing rows of heat detectors and a man holding a hair-dryer like apparatus over a heat detector. Opposite him across the table stands a uniformed officer looking on and picking up a heat detector. The legend to the right reads: "(l-r) John Kelly, IEC director of consumer relations activating VANGUARD heat detectors while Captain Richard Schiehl of the Los Angeles County Fire Department checks the gauge type thermometer in order to note the temperature at which the activation occurs." [13]

48. CX 61G contains the following statement:

New VANGUARD heat detector alarms were recently installed in the Garden Villas at The Disneyland Hotel.

Features that made early models of the VANGUARD heat detector so reliable have been maintained while some outstanding improvements have been made. VANGUARD'S latest innovations over the heat detectors formerly in use at the Disneyland Hotel include:

- A doubling of the sensitivity range
- Increased escape time due to a faster response time
- The decibel level of the alarm has been raised
- The duration of the alarm sound has been increased
- The state of fail-safe readiness is assured because the heat detector cannot be fused unless the alarm is fully powered.

The Disneyland Hotel now has the benefit of all these improvements in their heat detectors, and in addition smoke detectors have also been installed.

49. The top half of the last page, CX 61H, shows a large photograph of a five heat detector/one smoke detector configuration. The legend which appears below the photograph reads:

VANGUARD Thermostatic Heat Detector Alarms and VANGUARD Smokesonic
Smoke Detector Alarm

50. CX 63 is a one-page promotional piece styled as a red-letter news release bulletin directed to Interstate distributors, issued in July 1978, and features quotations attributed to a U.S. National Bureau of Standards official. The headline quotation reads: "HEAT DETECTORS HAVE PROBABLY SAVED MORE LIVES AND [14] PROPERTY THAN ANY OTHER FIRE DETECTION DEVICE." The narrative portion of this "news release bulletin" prints two quotations purportedly taken from a speech by Richard W. Bukowski, U.S. Bureau of Standards, Center for Fire Research, given at the National Fire Protection Association (NFPA) Annual Meeting in Anaheim, California. The bulletin then states:

We are pleased to see the U.S. National Bureau of Standards recognize these important facts. Those of you who have been protecting families with Vanguard know from first-hand experience how true these National Bureau of Standards statements are. They exactly summarize the position Vanguard has taken in recommending "combination systems" through the years.

It means the **only** way to provide complete and sure fire-warning protection is by using both smoke detectors and heat detectors, by using completely non-electrical devices in addition to the electrical devices and by combining long-lived reliability with timely response.

If one is **not** going to have a fire, it is a total waste of money to install even one detector. But, if one is going to have a fire, he had better have complete and sure fire-warning protection. At the present state-of-the-art, there is no other way to accomplish this except with a "combination" system of smoke detectors guarding the approaches to the bedrooms and mechanically-powered heat detectors in the other major rooms.

51. During the sales presentation, Vanguard distributors make CX 63 available to prospective purchasers (Hammack 247). Interstate prepares and distributes CX 63 (CX's 63, 77B).

52. CX 67, entitled *The Purpose of My Visit* is a promotional piece used by Vanguard distributors and made available to consumers during in-home sales presentations and contains materials copyrighted between 1973 and 1980 (CX 67; McGee 628). CX 80 is an updated version of CX 67 (McGee 631) and contains similar material with a few changes. Figgie-Interstate prepares and produces CX 67 and CX 80 and has sold about 4,200 copies to date (CX 136, Interrogatory No. 34).

53. CX 67 and CX 80 contain the following express representations:
[15]

a. The cover page announces the purpose of a salesman's visit to be (CX's 67A, 80A):

To present your family vital life saving information on home fire safety.

To give information on what to do in the event a fire strikes your home.

To show you outstanding products that could benefit you and your family for many years.

b. CX 67D and CX 80E are identical and headlined "Fire Can Happen To You" and state:

Of the nearly 1 million building fires that occurred in 1971, almost seven out of ten occurred in residential occupancies. The chances are that the average family will experience one fire every generation serious enough to have the fire department respond. Residential fires account for about half of all fire deaths and a third of all property losses. (If the losses from non-building fires are excluded, residential fires account for about 87 percent of the deaths and 39 percent of these property losses.)

The right-half of the page is devoted to a graphic percentage comparison of life losses, property losses and number of fires between residential and non-residential fires.

c. CX 67G and CX 80H are identical and headlined "Night Time Is The Danger Time" and feature the following message:

The large percentage of multiple death fires occur between the hours of 11 p.m. and 6 a.m. when most people are asleep. . . .

d. CX 67I and CX 80J are identical and headlined "The National Commission Reports 'HOW TO DIE IN A FIRE'" and lists asphyxiation, attack by superheated air or gases, smoke, toxic products [16] and flames, and concludes "The Real Killer Is Time."

e. CX 67L and CX 80L are identical and headlined "There Is a Solution." These pages then show "recommendations" of the Report of the National Commission on Fire Prevention and Control. One excerpted paragraph reads in part:

The National Fire Protection Association, the Department of Housing and Urban Development, and the International Association of Fire Chiefs, among others, support the use of early warning detectors in homes. . . . At a minimum, most advocates feel, there should be an early-warning detector on the ceiling near each sleeping area in the house. Some believe a system of heat detectors is an adequate substitute, but only if there are many more of them located throughout the house. . . . The Commission urges Americans to protect themselves and their families by installing approved early-warning fire detectors and alarms in their homes.

f. CX 67M and CX 80M are identical and purport to present a "Life Safety Plan" recommended by Interstate. The recommended plan consists of:

- Home fire safety education
- Fire escape plan (operation EDITH)
- Home inspections for fire hazards
- An Early Warning System to detect hot fires and smoldering fires in the very early stages.

g. CX 67N and CX 80N contain similar material and both prominently feature a photograph of a Vanguard heat detector. In CX 80N, the textual material is printed below a headline "UNEQUALED RELIABILITY" and reads as follows: [17]

- Limited 25-year warranty
- Self-contained—no wires or batteries
- High sound warning level
- Multiple temperature rating
 - 117°—70 ft. space rating
 - 136°—50 ft. space rating
 - 175°—50 ft. space rating
- Sealed and permanently lubricated
- Protected against corrosion
- Listed by "UL" of U.S.A., "ULC" of Canada and California State Fire Marshall
- Endorsements by many fire authorities
- Over one thousand testimonial letters from thankful Vanguard owners
- Over four million Interstate alarms installed
- A confirmed leader in residential fire detection
- Quality engineering

h. CX 67O and CX 80P both prominently feature a photograph of Vanguard Smokesonic 8-22 AC-DC smoke detector but each employs a slightly different format. CX 80P characterizes the photo electric smoke detector as "the ultimate in SAFETY, QUALITY and DESIGN," and then the product features as follows:

- Two Power Sources for 24 hour protection
- Space age technology
- LED light source (Estimated 40 year life)

- Utilizes solid state components [18]
- Will not alarm to gases or to aerosols other than smoke
- Transformer reduces voltage within detector to a safe 9 volts
- Will not false alarm to high air flows
- Fast response to a slow smoldering fire
- Minimum maintenance required
- U.L. listed

i. CX 67P and CX 80Q are identical and are headlined "TYPES OF FIRE PROTECTION—THE CHOICE IS YOURS!" The left half of the page purports to compare the various features of available devices and appears to suggest the best way is a Vanguard mechanical heat detector/smoke detector combination system. The right half of the page is devoted to a photographic presentation of what appears to be a five heat detector/one smoke detector "Vanguard Combination System." This photograph (CX 67Q and CX 80Q) of a five heat detector/one smoke detector configuration appears to be identical to the full-page photograph on CX 71Z-13, another Interstate promotional piece, discussed hereinafter.

j. CX 67Q is headlined "A Basic Early Warning System for the Average Home" and purports to illustrate, using a vertical diagram (house plan) and a horizontal floor plan, recommended locations where heat detectors and smoke detectors may be installed. The vertical diagram shows one smoke detector in the upper level bedroom and one smoke detector in the top of a stairwell between two lower level bedrooms. The floor plan diagram shows one heat detector in the kitchen, one heat detector in each of the three bedrooms, one heat detector in the utility room, one heat detector in the living room (making up six heat detectors in all) and one smoke detector in the central hallway. The textual material [19] appearing to the left of the diagrams reads:

While full protection calls for adequate heat and smoke detectors in all rooms and in all other enclosed areas where fire can occur, such a system is not always economically possible for the homeowner.

One of the most important factors to consider in a home fire alarm system installation is the location, type, and number of the fire detecting devices.

While it is logical to assume that partial protection can provide some degree of life safety, it should be the goal of every family to protect themselves to the very best of their ability with adequate heat and smoke detection devices.

This page (CX 67Q) was evidently deleted from the updated version, CX 80.

54. CX 68, copyrighted in 1980, is a promotional brochure entitled *Are Smoke Detectors Really Enough Protection From Fire?* CX 68 is

used by Vanguard distributors to generate sales leads (McGee 632; Hammack 249). It is prepared and disseminated by Figgie-Interstate and about 2,500 copies have been sold to distributors (Interrogatory No. 34).

55. CX 68B and C appear to answer the question "are smoke detectors really enough protection from fire?" in the negative, by pointing out, in bold types, that "SMOKE MAY NOT REACH THE DETECTOR," "SMOKE DETECTORS ONLY RESPOND TO CERTAIN TYPES OF FIRES," "ELECTRONIC DEVICES ARE SUBJECT TO MALFUNCTION," "POWER SOURCES MAY FAIL," and "SMOKE DETECTORS CAN FAIL WITHOUT NOTICE." The above material is followed by a statement:

Smoke detectors save lives and Vanguard smoke detectors are of the best quality. Yet, people who have depended only on smoke detectors as an early warning device have been injured and died as a result of fire. It is possible that some of the victims may have experienced a false sense of security previous to their fire. [20]

To the lower right of the above-quoted statement appears the following statement printed in a boxed frame:

NO VANGUARD OWNER HAS EVER DIED IN A FIRE AS A RESULT OF A VANGUARD MECHANICAL HEAT DETECTOR PRODUCT FAILURE. NO SMOKE DETECTOR CAN MATCH VANGUARD'S LONG TERM RECORD OF DEPENDABILITY (CX 68C).

To the left of the above boxed statement appears the following statement:

A BETTER WAY

Mechanical heat detectors are essential to provide the reliability that smoke detectors lack and to guard against the many types of fires where smoke detectors may be ineffective. VANGUARD distributors support the approach expressed by a top expert in the United States National Bureau of Standards Center for Fire Research. That is: The systematic combination of various types of detectors to maximize chances of fire survival.

VANGUARD has received well over a thousand letters and fire reports from families who might not be alive today if it had not been for VANGUARD mechanical heat detectors. These testimonials clearly indicate that a carefully planned system that includes an adequate number of mechanical heat detectors is a sensible and proven method (CX 68B).

56. CX 69, copyrighted in 1981 and 1983 by Interstate, is a promotional brochure entitled *If You're Serious About Fire Protection, Install Vanguard, The Reliable Combined Fire Protection System*. Figgie-Interstate prepares and distributes CX 69 to Vanguard dis-

tributors, who in turn use it during in-home sales presentations (Hammack 250; McGee 638). To date, Interstate has sold 6,000 copies of CX 69 to distributors (Interrogatory No. 34).

a. CX 69A prominently features the now familiar photograph of a five heat detector/one smoke detector combination, [21] which also appeared in CX 71Z-13, CX 67P and CX 80Q, discussed hereinabove.

b. CX 69C contains the following statements:

NFPA 74 was revised in 1974. It incorporated in the NFPA Standard the four levels of protection. These depict the importance of incorporating the concept of reliable heat detectors with an approved smoke detector as a part of the complete system.

1975 - The National Fire Prevention and Control Administration published Highlights of the National Household Fire Survey. It showed the danger areas where solutions must be found.

We feel a practical solution would be to give early warning in areas where most fires start.

Below the above statements appears a graphic presentation showing where household fires start, including such locations as kitchens, bedrooms, basements and bathrooms. A statement printed below the graph reads: "Kitchen fires involving cooking constitute 40% of all household fires. Non-cooking kitchen fires account for another 25% of the total."

The material printed in the right column of CX 69C includes the following statements:

Due to high fire incidents in these areas, there must be provided U.L. approved type heat detectors which will give immediate early warning. The "VANGUARD" 50-FT. rated heat detector will provide reliable, service-free, long-lasting protection in these critical fire areas.

* * * * *

The "VANGUARD" Thermosonic 50-FT. Heat Detector and the "VANGUARD" Smokesonic Smoke Detector will provide the combination needed to give a greater measure of life safety. This [22] system, when properly installed per the recommendations set forth in the latest edition of NFPA 74, constitutes the finest system on the market today!

c. CX 69D refers to "NFPA Standard No. 74" and gives the Fire Equipment Manufacturers' Association "recommendations":

Since 1967, the National Fire Protection Association Standard No. 74 has required fire detection equipment to warn against fire in the home. The Fire Equipment Manufacturers' Association, Inc. (FEMA) endorses this requirement in general. . . .

Because of the infinite number of variables involved, and because of differences in judgment as to what constitutes "adequate" protection, this question may not be precisely answered. However, general guidelines have been established by FEMA.

The Fire Equipment Manufacturers' Association, Inc. (FEMA) recommends:

1. That one smoke detector be installed to guard each separate sleeping area. (A "separate sleeping area" comprises the hallway and all the bedrooms opening onto that hallway.)
2. That both smoke detectors and self-contained, mechanically powered heat detectors be used in every household fire warning system and that neither type ever be used alone.

* * * * *

Every fire warning system for homes should include both heat detectors and smoke detectors, properly applied, and located in accordance with their best usage. [23]

57. CX 70, entitled *Highlights of Over One Thousand Vanguard Activations in Real Fire Situations*, is a promotional brochure copyrighted by Interstate in 1981 and 1983. It purports to present in chart form "pertinent information" based on some "1,107 letters about Vanguard residential fire alarms in real fire situations which occurred between 1959 and 1980" (CX 70A-B). The express statements and graphic presentations contained in CX 70 include the following:

a. In the interest of the life safety of those who depend only on smoke detectors as an early warning device, we feel that the following information as revealed in this brochure should be especially noted:

734 of the reported fires were due to heating, cooking and electrical fires. (Chart A). The figures suggest that these types of fires might be responded to best by heat detectors.

569 of the reported fires started in kitchens, furnace [sic] rooms, garages or attics (Chart B). The National Fire Protection Association publishes, "NFPA No. 74-1980 Standard for the Installation, Maintenance, and Use of Household Fire Warning Equipment" which states, "The installation of smoke detectors in kitchens, attics (finished or unfinished), or in garages is not normally recommended as these locations occasionally experience conditions which may result in improper operation" (CX 70B).

b. We are glad to know that VANGUARD heat detectors installed during the past twenty years, and even earlier, are still protecting people today. We estimate that the number of people VANGUARD has warned of a fire situation could be as much as ten times higher than our testimonial letters indicate. This belief is based on the fact that in 1980 alone we had more than 2,000 requests for replacement fuses for VANGUARD heat detectors. In most instances, when a fuse needs to be replaced, it is usually because a fire [24] has occurred [sic] and the fuse has activated (CX 70B).

c. Therefore, on the basis of the information in this brochure, we are confident you will agree with Interstate—that for maximum life safety—the VANGUARD combination system of heat and smoke detectors should be in every home. **We think deaths, injuries and property losses related to home fires would decrease dramatically if everyone followed the guidelines in the booklet, "NFPA No. 74-1980 Standard for the Installation, Maintenance, and Use of Household Fire Warning Equip-**

ment." The latest edition of this booklet can be purchased at nominal cost from the National Fire Protection Association, Batterymarch Park, Boston, Massachusetts 02269 (CX 70B).

d. CX 70G prominently features in the center of the page a photograph of five heat detector/one smoke detector configuration under a headline caption across the top of the page, which reads:

**IF YOU'RE SERIOUS ABOUT FIRE PROTECTION INSTALL VANGUARD
THE RELIABLE COMBINED FIRE DETECTION SYSTEM**

CX 70G format is identical to CX 69A. Similar photographs of five heat detector/one smoke detector combination also appear in CX 61H, CX 67P, CX 71Z-13 and CX 80Q.

58. CX 71 is a 42-page booklet used by Vanguard distributors in their sales presentations to consumers. CX 71, copyrighted in 1981, is produced and distributed by Figgie-Interstate (CX 71; Hammack 240; McGee 634). CX 71 was first made available in March of 1982; approximately 100 have been sold to distributors since that date (Hammack 210; Interrogatory No. 34).

59. CX 71 purports to present "the home fire problem," drawing upon authoritative sources of information, and advises what can be done about it by the use of Vanguard heat detectors and smoke detectors. The source of information is given as: (1) National Fire Protection Association ("NFPA"); (2) U.S. Government sources; (3) Leading fire authorities; and (4) documented incidents (CX 71D). Most of the textual material is printed over photographic montages and paintings depicting [25] leaping flames, a sleeping woman, burning appliances and stairways and a toy-strewn nursery engulfed in flames.

60. CX 71 contains many express representations in textual matter. The following are illustrative:

a. Night Time Is The Danger Time

The large percentage of multiple death fires occur between the hours of 11 p.m. and 6 p.m. when most people are asleep. . . . (CX 71S).

b. SECONDS CAN COUNT

Once on the loose, within a minute after, a fire can reach 1000 F.

The time span of 2 to 4 minutes, from first flames to deadly conditions is not unusual (CX 71U).

c. IN A HOME FIRE

Bedrooms some distance from the fire can become death traps in 2 minutes.

Two minutes is just about the length of time you would need to rouse your children and get them out of the house. Source: NFPA Bulletin FR 72-2 (CX 71V).

d. The Commission [National Commission on Fire Prevention and Control] urges Americans to protect themselves and their families by installing approved early warning fire detectors and alarms in their homes (CX 71Z-6).

e. EXPERTS AGREE

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Initial Decision

The Ideal Residential Fire Detection System Must Meet These Requirements:

- One: Sensitivity
- Two: Self Contained
- Three: Portable
- Four: Lifetime of Protection

(CX 71Z-8).

f. CX 71Z-9 is devoted to a large photograph of a heat detector, identified on the top as "Vanguard Thermosonic Heat Detector." Next follows a full-page of textual material, printed in large, bold types, which reads: [26]

UNEQUALED RELIABILITY

- Limited 25-year warranty
- Self-contained—no wires or batteries
- High sound warning level
- Multiple temperature rating
 - 117°—70 ft. space rating
 - 136°—50 ft. space rating
 - 175°—50 ft. space rating
- Sealed and permanently lubricated
- Protected against corrosion
- Listed by "UL" of U.S.A., "ULC" of Canada and California State Fire Marshall
- Endorsements by many fire authorities
- Over one thousand testimonial letters from thankful Vanguard owners
- Over four million Interstate alarms installed
- The confirmed leader in residential fire detection
- Quality engineering

g. CX 71Z-10 is devoted to a large photograph of a VANGUARD Smokesonic, designated as 8-22 A.C.-D.C. This page is followed by a full-page textual matter which reads:

Photo Electric Smoke Detector

The ultimate in SAFETY, QUALITY, and DESIGN.

- Two Power Sources for 24 hour protection
- Space age technology [27]
- LED light source (Estimated 40 year life)
- Utilizes solid state components
- Will not alarm to gases or to aerosols other than smoke
- Transformer reduces voltage within detector to a safe 9 volts
- Will not false alarm to high air flows
- Fast response to a slow smoldering fire
- Minimum maintenance required
- U.L. listed (CX 71Z-11).

h. CX 71Z-12 purports to compare different types of fire protection

devices, including sprinkler system, electrical heat detectors, battery-operated heat detectors, ionization-battery-operated smoke detectors, photoelectric 110 volt smoke detectors, mechanical heat detectors, and photoelectric LED/AC-DC smoke detectors, and suggests "the best way" to be "The Vanguard Combination system" of mechanical heat detectors and photoelectric LED/AC-DC smoke detectors. The textual matter for the combination system reads:

THE BEST WAY
The Vanguard Combination System

Mechanical	Photoelectric
● Portable ● No maintenance ● No false alarms ● 25 year warranty ● Inexpensive long term cost ● Fast response to hot fires ● Millions installed ● Thousands of lives saved	- L.E.D./A.C.-D.C. ● No false alarms ● Two power sources for 24 hour protection ● Can be installed in most locations ● Light emitting diode has an estimated 40 year life ● Transformer reduces voltage to a safe nine volts ● Energy efficient ● Fastest response to slow smoldering fires [28]

i. The above presentation is followed by a full-page photograph showing a five heat detector/one smoke detector configuration of the combination system, under the caption "THE CHOICE IS YOURS!" (CX 71Z-13).

61. At the conclusion of each sales presentation, Vanguard distributors also use testimonial letters provided to them by Figgie-Interstate in order to persuade the prospective purchaser (CX's 72, 76; Hammack 253; Sterner 1660, 1667).

C. The Cardboard House Demonstration (CX 81)

62. During the sales presentation, Vanguard distributors perform a demonstration of how a Vanguard heat detector works. This demonstration involves placing a lit candle inside a cardboard house (CX 81), a piece of tissue serving as the roof of the house, and the heat detector is placed directly on top of the tissue. Within seconds the heat detector alarm is activated while the tissue remains unscorched. Interstate recommends that its distributors perform this demonstration and provides them with the cardboard house and a script that they are told to memorize. Interstate first offered the demonstration house in May 1981. To date, 1,900 have been sold to Vanguard distributors (Interrogatory No. 34; CX 88A, C; Hammack 240, 246).

D. The Warranty Book (CX 66)

63. CX 66, entitled *Safe at Home*, is a 23-page warranty book which, at the conclusion of a successful in-home presentation and sale, is left with a Vanguard heat detector purchaser. It contains Interstate's "fire replacement guarantee" and "limited 25 year warranty," together with various product information regarding Vanguard heat detectors and their installation (CX 66; Hammack 249; McGee 639). Interstate prepares and distributes CX 66 for use by Vanguard distributors. Some 650,000 copies of CX 66 have been sold to distributors (Interrogatory No. 34). CX 66 also contains useful information explaining how to conduct a home fire drill and family member instruction (CX 66S-U), planning fire escape plan (CX 66V) and a convenient "home fire safety check list" (CX 66W). CX 66 also contains the following statements:

a. "Vanguard" is skillfully engineered for highly reliable performance, and you have made a wise decision in selecting this equipment to help protect your loved ones. [29]

Fire can strike in countless ways, and there is no way to guarantee against injury or loss in a fire. "Vanguard," together with your Escape Plan and Fire Drills, is intended to help reduce the risk of injury or tragedy!

This booklet is designed to acquaint you with "Vanguard," the reasons for its development, and the Company behind the product. It will suggest sound methods to protect yourself and your family against the dangers of fire and what to do when fire strikes. Never forget that the one who can do the most to protect your family from fire is you! (CX 66E).

b. Interstate developed the "Vanguard Thermosonic" Alarm to help reduce the increasing loss of life and injuries from fire. A reliable, non-electric, non-battery heat detector was needed to warn of danger when fire occurred. Since the greatest loss of life occurs in the home, the "Vanguard Thermosonic" was designed specifically for the home (CX 66F).

c. There are two extremes of fire to which household fire warning equipment must respond. One is the rapidly developing, high heat fire. The other is the slow, smoldering fire. Either can produce smoke and toxic gases. The "Vanguard Thermosonic" Heat Detector is designed to detect abnormally high temperatures. The "Vanguard Smoke-sonic" Smoke Detector is designed to detect abnormal quantities of smoke. Every fire warning system for homes should include both heat detectors and smoke detectors, properly applied, and located in accordance with their best usage (CX 66F).

d. CX 66M is devoted to a section entitled "LOCATION AND QUANTITY OF HEAT DETECTORS AND SMOKE DETECTORS" and discusses NFPA Standard 74-1980. The textual material includes a lengthy quotation of NFPA Standard Section 2-1.1.1. Below the quotation appears the following: [30]

CAUTION:

The smoke detector(s) required by Section 2-1 of the NFPA 74 Standard will provide only partial protection. While it is logical to assume that the required partial protection

can provide a degree of life safety, it should be the goal of every family to provide themselves with the highest level of protection economically possible. You should consider the life safety involved and the level of protection best suited to you and your family's needs.

Additional heat detectors are recommended in the following areas: kitchens, living rooms (dens, family rooms, studies, recreation rooms, etc.), furnace rooms, basements, bathrooms and storage or porch areas, garages, laundry rooms and attics (CX 66M).

CX 66 also contain the following statements:

e. "Vanguard" Heat Detectors at the proper temperature rating may be installed in any room (CX 66"O").

f. The 50-foot "Spacing rating" of the "Vanguard Thermosonic" Model V-50 ft. Heat Detector means that Underwriters' Laboratories rates a single V-50 ft. detector as capable of monitoring rooms up to 50 by 50 feet in size for dangerous heat producing fires (CX 66P).

g. Of course, the rooms in most homes are much smaller than the 50' by 50' rating of the "Vanguard Thermosonic," but the higher thermal efficiency of the detector is not wasted in these small rooms. Instead, this extra protective range is translated into even faster activation and more time to escape and into more flexibility in the allowable locations for the detectors so that it can still monitor the entire room even when it is not mounted in the center of the room (CX 66Q). [31]

64. Interstate recommends to homeowners that heat detectors be installed in all major areas of the home including kitchens, living rooms, dens, family rooms, studies, recreation rooms, furnace rooms, basements, bathrooms, storage rooms, porch areas, garages, laundry rooms and attics (CX's 66M, 135, Admission No. 27).

65. Vanguard distributors are instructed by Figgie-Interstate to have consumers sign a release acknowledging that only "partial fire detection protection" has been purchased if less than the recommended number of heat detectors is ordered (CX 75; Hammack 257).

IV. FIGGIE-INTERSTATE MADE REPRESENTATIONS ALLEGED IN PARAGRAPH FIVE OF THE AMENDED COMPLAINT

A. *Standards For The Determination Of The Meaning of Advertisements*

66. In determining whether a sales presentation and promotional material discussed in Section III hereinabove made a particular representation, the appropriate standard is whether, taking the material individually or as a whole, the representation is a reasonable interpretation of that material. The question is whether the representation at issue is an interpretation of the material to which more than an insubstantial number of reasonable consumers would adhere. Since more often than not several reasonable interpretations of a

given material are possible, it is not necessary that the claim found to have been made be the only or the most reasonable interpretation of the material.

67. The primary evidence with respect to the meaning of the promotional materials is the representations contained in those materials, when considered individually or as a whole. The record also contains evidence as to the meaning of the promotional materials in the form of expert testimony provided by Dr. Joel Cohen.

68. In determining the issue of representations, I have primarily relied on my own knowledge and experience to determine what impression or impressions a promotional piece as a whole is likely to convey to a reasonable consumer. When my initial determination agreed with Dr. Cohen's testimony, I rested. When my initial determination disagreed with Dr. Cohen's testimony, I reexamined the material before reaching a final determination. I have not relied on Dr. Cohen's testimony when, after careful study and reflection, I found it to be unpersuasive and contrary to the weight of evidence. [32]

*B. Expert Testimony Concerning The Meaning Of
Vanguard Heat Detector Promotional Material*

69. Joel Cohen, Ph. D., is a professor of marketing and director of the Center for Consumer Research at the University of Florida. He specializes in consumer behavior and impression formation and attitudes (Cohen 270-71). The Center for Consumer Research studies consumer behavior and facilitates research on consumer behavior. It is formally related to both the marketing department and the consumer psychology program at the University (Cohen 272-73). In addition to his work with the Center for Consumer Research, Dr. Cohen teaches undergraduate and graduate courses in consumer behavior, cognitive psychology and consumer information processing (Cohen 274). He has taught in the marketing department at the University of Illinois, developing a consumer behavior curriculum and has been the director of the social and behavioral science division of National Analysts, a major marketing and social science research organization (Cohen 276). In this last position, Dr. Cohen was named vice president of the parent firm, Booz, Allen & Hamilton. In that position, he conducted surveys and studies concerning consumers' interpretation and evaluation of advertising claims for various products, including medications and automobiles (Cohen 277). His area of specialization, based upon this education, training and experience, is "consumer information processing," the process by which consumers interpret and evaluate the advertising or promotional materials presented to them, and the effect that those materials have upon the consumers (Cohen 278-

79). Dr. Cohen has testified previously as an expert in consumer information processing before the Federal Trade Commission, the Senate of the United States, and various state government agencies. He has also written extensively in the area of consumer behavior and consumer information processing, as shown by the articles and studies identified in his *curriculum vitae*, CX 59 (Cohen 279-81).

70. Based upon his background, training, education, experience and study of respondent's sales methods and materials, Dr. Joel Cohen is well-qualified as an expert in the field of consumer behavior and consumer information processing, and he is fully competent to assist the Commission by providing his expert testimony on the meaning and effect of respondent's advertising and promotional representations concerning Vanguard heat detectors. Dr. Cohen's opinions are based upon his application of his expertise to a review and analysis of CX 61 - CX 81 and CX 129 - CX 133 (Cohen 271).

71. Dr. Cohen discussed in detail the Vanguard heat detector promotional material he reviewed and testified that the material he reviewed and discussed contains the representations [33] alleged in Paragraph Five of the amended complaint (*see* Cohen 302-09, 381-83, 390-428, 442-43).

72. It is also Dr. Cohen's view that the promotional materials he reviewed "all contribute to the very clear net impression that is alleged in Paragraphs 5(1) and 5(2)" of the amended complaint and further that to conduct a study designed to determine whether the promotional materials he reviewed do in fact convey the alleged claims to consumers "would be a waste of taxpayer's money" because "the record is very clear" and such a study is not needed (Cohen 430-31).

73. On cross-examination, Dr. Cohen also agreed that:

a. Respondent did not represent that heat detectors will provide the necessary warning to all occupants of a house no matter where the detectors are installed (Cohen 446) or where the occupants are located (Cohen 447) or where the fire occurs (Cohen 452) or what type of fire occurs (Cohen 452) or under all circumstances (Cohen 452).

b. Respondent did not represent that installation of a single heat detector anywhere in a house will ensure that all occupants of the house will be given the necessary warning to escape safely (Cohen 443-47).

c. Respondent did not represent that in the event of most fires heat detectors alone will provide the necessary warning to occupants to allow them to escape safely under all circumstances nor is it likely that a consumer would derive such an impression from the sales material (Cohen 457-58).

d. Respondent did not represent that its heat detectors will perform equally well no matter where they are placed (Cohen 446). [34]

C. Vanguard Heat Detector Promotional Material Containing Representations Alleged In The Amended Complaint

74. The representation alleged in Paragraph 5(1) of the amended complaint that "in the event of most fires, respondent's heat detectors provide the necessary warning to occupants to allow them to escape safely" is made directly or by implication in the following promotional material:

a. The old and new slide presentations (CX's 129-33; Tr. 1586-1604), discussed in F. 36-40, *supra*;

b. CX 61, *Disneyland Hotel*, a promotional brochure discussed in F. 41-49, *supra*;

c. CX 63, *News Bulletin*, a promotional piece discussed in F. 50, *supra*;

d. CX 67 and CX 80, *The Purpose of My Visit*, promotional pieces discussed in F. 52-53, *supra*;

e. CX 68, *Are Smoke Detectors Really Enough Protection From Fire?* a promotional piece discussed in F. 54-55, *supra*;

f. CX 69, *If You're Serious About Fire Protection*, a promotional piece discussed in F. 56, *supra*;

g. CX 70, *Highlights of Over One Thousand Vanguard Activations in Real Fire Situations*, a promotional piece discussed in F. 57, *supra*;

h. CX 71, a promotional booklet, discussed in F. 58-60, *supra*;

i. The Cardboard House (CX 81) demonstration, discussed in F. 62, *supra*; and

j. The warranty book (CX 66), discussed in F. 63, *supra*.

75. In CX 61 (*Disneyland Hotel*) and the Cardboard House demonstration (CX 80), the single message that is conveyed to the consumer is that Vanguard heat detectors are dependable fire protection devices and will give early fire warning for a safe escape in most residential fires. [35]

76. In the other promotional and the so-called warranty book (CX 66) referred to in F. 63, *supra*, the claim that Vanguard heat detectors are dependable fire warning devices that have saved many lives is made, along with a companion claim that the Vanguard combination system provides increased fire protection. The degree of emphasis placed upon the effectiveness of Vanguard heat detectors vis-a-vis smoke detectors varies from one promotional piece to the next. However, there can be no disputing that every one of them clearly conveys the effectiveness claim for Vanguard heat detectors alleged in Paragraph 5(1) of the amended complaint.

77. Another way the effectiveness claim alleged in Paragraph 5(1) of the amended complaint is made in the photograph of five heat detector/one smoke detector configuration so prominently featured in a number of promotional pieces, including CX's 61H, 67P, 69A, 71Z-13, and 80Q. A picture speaks a thousand words. Any reasonable consumer viewing these photographs will come away with the message that Vanguard heat detectors are effective residential fire warning devices and should be the core of any residential fire protection system.

78. Virtually all of the promotional materials discussed hereinabove, with the exclusion of CX 61 *Disneyland Hotel* and the Cardboard House demonstration (CX 80), contain express and implied claims that the combination system combining Vanguard heat and smoke detectors significantly increase the level of fire warning protection than smoke detectors alone, as alleged in Paragraph 5(2) of the amended complaint.

79. Some pieces are entirely devoted to conveying this single message to the consumer. They include CX 68, *Are Smoke Detectors Really Enough Protection From Fire?*, discussed in F. 54-55, *supra* and CX 69, *If You're Serious About Fire Protection, Install Vanguard The Reliable Combined Fire Protection System*. Indeed, respondent's dispute with this complaint allegation is indefensible.

80. In addition, CX 66 and CX 69 also contain express and implied statements and material which tend to confuse and mislead reasonable consumers as to what the standard-setting bodies in the field of fire protection and fire alarm devices had to say about the simple or comparative effectiveness of heat detectors and smoke detectors.

81. For example, CX 66M (warranty book) discussed in F. 63(d), *supra*, confuses and misleads readers into believing that the message which follows the subheading "CAUTION" is a continuation of Section 2-1 of the NFPA, when in fact the cautionary portion in the text is not a statement made by NFPA or contained in NFPA 74-1980, but rather Interstate's own. [36]

82. CX 69D, discussed in F. 56(c), *supra*, refers to and discusses NFPA Standard No. 74 in such a way as to leave the reader with a distinct impression that a standard setting body named the National Fire Protection Association regards both smoke detectors and heat detector equally effective when in fact both the 1978 and 1980 versions of current Standard 74 made installation of smoke detectors in certain areas of a household *mandatory* while at the same time making installation of *additional* heat detectors *optional* along with installation of additional smoke detectors.

83. It is only fair to point out here that the bulk of the Vanguard heat detector promotional material discussed hereinabove also con-

tains, in addition to the claims alleged in the amended complaint, useful information which will make the consumer more aware of the real danger of residential fires and think about the need for appropriate fire protection measures, including installation of dependable early fire warning devices.

84. The fact that the promotional materials are presented to the consumer through in-home sales presentations by a salesman heightens the impact of the materials because the captive consumer's attention is focused for the duration of the sales presentation (Cohen 572).

85. The effectiveness of Figgie-Interstate's promotional materials in convincing consumers that heat detectors provide the necessary warning and to increase significantly the level of fire protection than smoke detectors alone is demonstrated by the fact that Vanguard purchasers buy between four and five heat detectors for every one smoke detector (F. 18, *supra*; CX's 125, 127).

V. THE RESIDENTIAL FIRE PROBLEM AND FIRE WARNING DEVICES—
THE NEW LEARNING

A. *The Expert Witnesses*

86. Burton A. Clark, called by complaint counsel, is a teacher at the National Fire Academy of the Federal Emergency Management Agency (FEMA). Mr. Clark has been in the fire service for over 14 years, as a fire fighter, consultant on fire safety and teacher and has created educational programs on residential fire protection equipment (Clark 652-56). In 1978, the National Fire Academy invited him to join its teaching staff, where he has since taught a national course in fire detection devices (Clark 657). Mr. Clark is a member of the National Fire Protection Association (NFPA) and the International Society of Fire Service Instructors, and has published a paper in the *Fire Engineering Journal*, entitled, "Systems Analysis of Early Warning Residential Fire Detection Concepts" (Clark 660-61). He participated in the California Fire Chiefs Association Fire Detector Tests, helping to develop the tests and the data [37] collection and observation methods (Clark 664). Based upon his training and experience with fires and fire detection devices, Mr. Clark is qualified as an expert in the field of fire science.

87. Richard W. Bukowski, called by complaint counsel, is a research engineer at the National Bureau of Standards ("NBS"). Since 1975, Mr. Bukowski has been involved in the NBS testing and research on fire protection devices, fire alarm systems, flammability characteristics of building contents, and the behavior of fire as it spreads throughout a building (Bukowski 950-51). Mr. Bukowski is a licensed professional engineer and member of the National Fire Protection

Association (NFPA) and also a member of both the NFPA committee which creates and reviews standards for fire detection devices for commercial building and of the NFPA committee on household fire detection equipment, which sets standards for the installation and use of fire detectors and fire detection equipment in homes known as the "NFPA Standard 74" (Bukowski 952-53). He had been a project engineer at Underwriters' Laboratories, where he had the primary responsibility for testing fire detection devices, including the Vanguard heat detector, for compliance with Underwriters' Laboratories standards (Bukowski 1025). Mr. Bukowski also worked on Underwriters' Laboratories Standard 539, for single station, mechanically-powered, heat detectors, such as those manufactured by Figgie-Interstate (Bukowski 947). In recent years, Mr. Bukowski has been involved in the development and evaluation of tests of fire detection systems aboard the NASA space shuttle and is currently working with the Houston Manned Space Flight Center on a fire detection system for the NASA space station. He has also worked with the Smithsonian Institution on fire detection systems and has been consulted by the Secret Service regarding the fire protection system in the White House (Bukowski 957).

88. Mr. Bukowski was involved in the deliberations of the NFPA committee related to the 1978 revision of NFPA 74 which became NFPA 74-80. He is familiar with residential fire tests conducted in this country in recent years and is particularly knowledgeable with the Indiana Dunes Test I and II, discussed hereinafter. He was instrumental in designing the Indiana Tests and assisted in the conduct of these tests (Bukowski 952-53, 966-70; CX 23B-C).

89. Based upon his background, training, education and experience, Mr. Bukowski is well-qualified as an expert on the behavior of fire and the effectiveness of household fire warning equipment including heat detectors.

90. Wayne M. Martin, called by complaint counsel, is a fire protection engineer, currently with the fire department of the city of Los Angeles. During the past ten years, he has been responsible for the research unit in that fire department's Fire Prevention Bureau, as well as for the fire inspection of the San Fernando Valley portion of the city of Los Angeles. Mr. Martin [38] is a licensed professional engineer, both in civil engineering and in fire protection engineering, and a member of the California Fire Chiefs' Association and of the California State Association of Fire Educators. He teaches "Building Construction for Fire Protection" and "Fire Protection Equipment and Systems" at Los Angeles Valley College and at U.C.L.A., and a course called "Life Safety Factors" at U.C.L.A. He has also taught at the National Fire Academy, covering topics including smoke detec-

tors and life safety checking of building plans (Martin 737-53). Mr. Martin was the site engineer for the California Fire Chiefs' Association Fire Detector Tests ("Cal Chiefs' Tests"), discussed hereinafter. Based upon his education, training and experience, Mr. Martin is qualified as an expert in the field of fire science.

91. John E. Lee, called by respondent, is a retired fire-chief now working in a public relations function for Figgie-Interstate. Until he retired at the end of 1982, he had been Chief of the Charlotte Fire Department, Charlotte, North Carolina for over 11 years (Lee 1522-23, 1539-40). During his pre-retirement years, Mr. Lee was active in the International Association of Fire Chiefs ("IAFC") as a division president, and a board member and served as IAFC's International President, 1980-1981. Mr. Lee also served for five years as Chief of Oak Ridge Fire Department, Oak Ridge, Tennessee, as chief of training of the St. Petersburg, Florida Fire Department and as fire fighter, company officer and training officer in the North Miami, Florida Fire Department (Lee 1523-24). Based on his professional training and experience in the municipal fire protection field, Mr. Lee is qualified as an expert on household fire warning devices. However, he indicated that he has read the fire tests discussed hereinafter but he was not an engineer and not familiar with the technical details regarding their methodology (Lee 1537-39).

92. John Patrick Ward, called by respondent, is currently Commissioner of Public Health and Safety in Springfield, Illinois, a position he has held for over nine years. He has served as Fire Chief at Fort Leonard Wood, Missouri, and as Director of Public Safety, State Colleges and Universities of Illinois. At various times, he was also Project Director for the U.S. Department of Commerce Fire Protection Master Plan, a technical service specialist at the National Fire Prevention Control Administration, project director for the development of a national arson training program, and served on several committees at the National Fire Academy. Mr. Ward also served as a fire protection consultant to local, state and federal government agencies and to private manufacturing firms. Mr. Ward is also experienced in the installation and operation of fire protection systems, including sprinkler and early warning systems, and has been involved in various committees in research projects around the country, including the San Francisco Sprinkler Test (Lee 1696-1701). Based on his training and experience, Mr. Ward is [39] qualified as an expert in the field of fire protection and related systems and devices.

B. The Residential Fire Problem

93. About three million fires were reported in 1981 in the United States, causing over 30,000 civilian injuries, 7,500 deaths and some

\$6.5 billion in property losses. Although residential fires accounted for only 25% of all reported fires, they claimed 80% of fire deaths, 65% of fire injuries and 46% of property losses from fire. Thus, residential fires represent the largest threat to life and safety (Clark 669-70; CX 28J-L).

94. In terms of causes of residential fires, smoking led the death list with 27% although it accounted for only 8% of such fires, while heating and cooking combined, accounting for over 40% of residential fires, caused 17% of residential fire deaths (Clark 673; CX 28L). Thus, smoking is by far the leading cause of residential fire deaths in the United States.

95. And most fire deaths occur at night during the sleeping hours when residents may not become aware of the fire until it becomes too late for a safe escape (Clark 675; CX 23P).

96. The 1973 Report of the National Commission on Fire Prevention and Control, entitled *America Burning*, also called attention to what it calls "the living victims" of fire (CX 29, p. 11, also quoted in CX 71I):

Fire kills. But fire has its *living* victims too: those who grieve the loss of loved ones killed by fire, . . . those who are left homeless or jobless or impoverished because of fire. The victims most poignant to consider are those maimed and disfigured by burn injuries. About half of these victims are children. . . .

Among the illnesses and injuries that require long hospitalization, few are as traumatic as severe burns.

* * * * *

The average hospital stay for a burn victim is over three times that of medical and surgical patients. An individual's hospital stay and later treatment can add up to \$60,000 or more. . . . [40]

97. Fires resulting in deaths typically originate in living rooms or bedrooms (Clark 675). They do not typically originate in kitchens or furnace rooms. A study conducted by the National Fire Protection Association indicates that living rooms and bedrooms are the point of origin in 67% of all "fatal" fires (RX 14, p. 23).

98. The most likely victims of fire are the very young (ten years of age and under), the old (65 and over) and the infirm (Clark 670). This is explained in part by the fact that these groups are the least capable of taking care of themselves and therefore need more time to escape (Clark 670-71).

99. The majority of fires resulting in fatalities are started by smoking materials dropped on upholstered furniture or bedding. These types of fires typically smolder for long periods of time and generate toxic gases and large quantities of smoke without significant heat buildup (Clark 674; Martin 830).

100. The 1973 Report of the National Commission on Fire Preven-

tion and Control listed the five ways in which fire can kill in declining importance and had this to say (CX 29, pp. 62-63, also quoted in CX 71H):

a. *Asphyxiation*. Fire consumes oxygen from the surrounding atmosphere, thus reducing its concentration. If the oxygen concentration falls below 17 percent, thinking may be an effort and coordination difficult. Below 16 percent, attempts to escape may be ineffective or irrational, wasting vital seconds. With further drops, a person loses his muscular coordination for skilled movements, and muscular effort leads rapidly to fatigue. His breathing ceases when the oxygen content falls below 6 percent. At normal temperatures, he would be dead in 6 to 8 minutes.

b. *Attack by superheated air or gases*. With temperatures above 300° F., loss of consciousness or death can occur within several minutes. In addition, hot smoke with a high moisture content is a special danger since it destroys tissues deep in the lungs by burning.

c. *Smoke*. Inhalation of smoke—or, more correctly, of the products of incomplete combustion—kills people who suffer no skin burns at all. In addition to carrying toxic products, such as carbon monoxide and hydrogen [41] cyanide, thick smoke may be laden with organic irritants, such as acetic acid and formaldehyde. In the early stages of a fire, the irritants, which attack the mucous membranes of the respiratory tract, are often the more important danger. Smoke often blocks the visibility of exits.

d. *Toxic products*. Many toxic components of smoke are responsible for the damage done—including oxides of nitrogen, aldehydes, hydrogen cyanide, sulfur dioxide, and ammonia, to name only a few. There is ample evidence that the hazard of two or more toxic gases is greater than the sum of the hazards of each. Moreover, low oxygen and high temperatures increase the toxic effects. In addition to toxic gases that attack the lungs, there are irritants that attack the eyes with blinding effect, preventing escape. Some fire gases dull the senses of the victim or his awareness of injury.

e. *Flames*. Since the aforementioned factors can debilitate, confuse, blind, or kill without warning, the person who goes to sleep confident that advancing flames will provide sufficient warning for escape may be taking a fatal gamble.

Also see Martin 816-26.

101. Detectable quantities of smoke precede detectable levels of heat and the development of hazardous conditions in nearly all residential fires (CX's 1Z-18, 23K; Lee 1539; Martin 875; Bukowski 1013).

102. Hazardous levels of heat, smoke and toxic gases can occur within several minutes of fire ignition (Clark 697; CX's 66F, 71V, 133).

103. The most common cause of fire-related death is carbon monoxide poisoning (Clark 676). Carbon monoxide is a by-product of nearly all fires and can reach lethal levels without significant heat build-up (Clark 674, 677).

104. During sleeping hours most of the residential fire deaths are attributable to smoke in combination with gases. Most bodies are found with no burns on them. This shows that most of residential fire deaths are caused by smoldering fires and not by a flaming ignition (Martin 829-30). [42]

105. The purpose of a fire detection device is to warn occupants of

the existence of a fire in time to allow a safe escape through normal means of egress prior to the onset of hazardous conditions (Clark 677; Bukowski 973; CX 1G).

106. Fire scientists define "escape time" as the time lapse between detector alarm activation and the reaching of hazardous levels or "tenability limits," of heat, smoke or toxic gases within the room (Martin 815-17; CX 1G).

107. There is no unanimity among experts regarding precisely where tenability limits should be set for heat, smoke obscuration and carbon monoxide levels. The National Bureau of Standards has been engaged in on-going research in this area (Bukowski 1224). These levels cannot be set scientifically without taking into account many physiological factors beyond the expertise of engineers (Bukowski 1124, 1223). The tenability limits will no doubt be further refined as a better understanding of their chemical and physical nature as well as their physiological effects provide a surer foundation of knowledge for improved methodology in residential fire tests.

108. In recent years, in a series of residential fire tests discussed hereinafter, a broad consensus has emerged regarding the realistic tenability limits, largely reflecting the current knowledge available to fire science and the judgment of fire experts based on experience.

109. In these fire tests involving household fire warning devices, the tenability limits for heat were set at or near 150° F.; for smoke obscuration, between 10% and 11%; and for carbon monoxide, between 400 and 1,000 per million (F. 127-32, 142, *infra*). However, it has been conceded that carbon monoxide level of 400 per million (used in the Dunes I) was too low (F. 132, *infra*).

1. UL Listing Of Heat Detectors Does Not Assure Their Capability To Provide Adequate Escape Time In Real Fire Situations

110. Underwriters' Laboratories ("UL") is a non-profit organization whose purpose is to maintain and operate laboratories for the examination and testing of devices, systems and materials (RX 13, p. 2). UL also establishes performance standards against which various products are tested. When a device meets the applicable standard it receives a UL listing, signifying that the product has been tested by UL and satisfied UL's standard requirements (Bukowski 1021-22). [43]

111. Vanguard heat detectors have been tested and listed by UL. However, UL tests are not intended to demonstrate the effectiveness of any detection device under real fire conditions (Bukowski 1029). There are three principal tests for heat detectors: the water bath test, the oven test and the fire test (Bukowski 1023).

112. The water bath test consists of immersing a heat detector in

water, the temperature of which is increased at a rate of 1° F. per minute. The water temperature is recorded at the time of alarm activation. This test is designed only to determine whether the fuse element of the detector will melt when it reaches its stated temperature (Bukowski 1023).

113. The oven test consists of placing a heat detector in a circulating air oven, the temperature of which is increased from 80° F. to 240° F. over a four-minute period. The time and temperature are recorded at the instant the heat detector goes into alarm (RX 13, p. 8). Oven test results show that the Vanguard 136° heat detectors do not activate until oven temperature reaches 185° to 200° (Bukowski 1025).

114. The oven test results are a clear demonstration of the principle of thermal lag (Bukowski 1024). "Thermal lag" refers to the time lag before the fuse of a heat detector absorbs sufficient heat from the surrounding air to activate. Thus, in the event of a fire, a 136° heat detector will not activate when ambient temperature reaches 136° but will activate at some later time when the fuse itself reaches 136°. During this interim period, a developing fire will have raised ambient temperature well in excess of the heat detector's stated activation temperature. The faster a fire develops, the greater the thermal lag will become (Bukowski 978).

115. All heat detectors, including Vanguard, are subject to thermal lag (CX 135, Admission No. 21). For this reason, UL requires that each heat detector be marked with the following statement:

Operation - Responds to a heat producing fire only. Unit will activate when the temperature of the surrounding air reaches the marked temperature rating (plus or minus a few degrees) provided the air temperature increase is 1° F. (0.6° C.) per minute or less. At faster rates of temperature rise, the surrounding air temperature at which the unit will activate will be above the marked rating, the temperature differential depending on the rate of rise of temperature produced by a fire. This temperature differential results from the time lag before the temperature element absorbs the [44] necessary heat from the surrounding air to activate. This notice is placed on the back of the heat detector (RX 13, p. 17).

116. Thermal lag is one reason why heat detectors cannot provide immediate early warning (Bukowski 1038). Since residential fires can jump as much as 750 degrees in 10 seconds (that is, 70 degrees per second), thermal lag is a serious problem (Martin 820, 931).

117. In UL's fire test, two large pans of alcohol, with a total surface of 18 square feet, are ignited. The heat release rate of this fire is equivalent to that generated by 24 home furnaces operating simultaneously. In UL fire test, the heat detectors which are located no more than 35 feet from a point directly over the fire, activated in two minutes or less. Air temperature at the time of activation was not

measured. The amount of heat generated in UL's fire test is not likely to be duplicated in any but the final stages of a residential fire (Bukowski 1027-29).

118. Therefore, no conclusions can be drawn about heat detector performance under actual fire conditions from UL tests or from the fact the Vanguard heat detectors are UL listed (Bukowski 1035), except that thermal lag causes delayed detector activation.

119. Similar concerns were reflected in the 1973 National Commission Report excerpts of testimony given to the Commission by William J. Christian, consulting engineer, United Laboratories, Inc., on the subject of fire detectors, which stated in part (CX 29, p. 121):

a. Three types of fire detectors are most commonly used in this country. These are known by the generic terms as heat detectors, smoke detectors, and flame detectors. Only heat and smoke detectors appear to have application to the household fire detection system. . . .

b. In the late 1950's, self-contained non-electrical fire alarm units were being sold door-to-door. A unit of this type consisted of a heat detector . . . Because these units respond only to a temperature rise, they are intended for use in areas where a fire producing a great deal of heat is likely to occur, such as near a furnace, but they have also [45] been employed throughout other rooms in a home. . . .

c. In order to be of value in providing life safety, a fire detection system must make provision for detecting a small smoldering fire soon enough that alarm can be given and the building evacuated before untenable smoke conditions are reached. In addition, but of less relative importance, the fire detection system ought to be capable of early detection of rapidly developing hot fires.

d. Smoke detectors of the photoelectric and ionization types provide means for detecting smoke from either type of fire. . . . Heat detectors, on the other hand, provide early warning of hot fires in their immediate area only. . . .

120. The National Fire Protection Association (NFPA) is an independent, non-profit organization which operates by way of numerous volunteer committees composed of experts from all corners of the fire protection field, including engineers and fire detection equipment manufacturers. The Association serves as a clearinghouse for fire protection information and establishes various standards that are used as model codes for adoption by state and local governments. Standard 74 relates to the location and type of fire detection devices to be installed in a residence (Bukowski 952; CX 23).

121. In 1966, the NFPA tentatively adopted a new draft NFPA 74. Following extensive discussion of the 1966 draft, NFPA 74 was revised several times, most recently in 1978. The 1978 edition was approved by the American National Standards Institute as an American National Standard. The 1980 edition of NFPA 74 (CX 23) was adopted and released in the late months of 1980. Public authorities are urged by the NFPA to adopt this document by reference into laws, ordinances and regulations (CX 23B).

2. The Indiana Dunes Tests

122. The Indiana Dunes Tests were conceived as a result of proposed amendments to the National Fire Protection Association's Standard 74 raised at its 1974 annual meeting (Bukowski 964-65). These amendments involved a departure from the earlier standard, which mandated a heat or smoke detector in every room of the home. The amendment as adopted in 1974 established four levels of protection, varying from each other in terms of the [46] number and type of detection devices required. The minimum level consisted of smoke detectors alone in the vicinity of bedrooms and on every other level of the home. To address the concerns of some fire marshalls who felt that a detector in every room was necessary for adequate fire protection in homes, the Indiana Dunes test was conceived (Bukowski 964-66).

123. The Indiana Dunes Tests were designed and conducted through the joint efforts of the National Bureau of Standards and Underwriters' Laboratories (Bukowski 968). The tests were conducted in actual homes and the kinds of fires set were determined by NFPA statistics illustrating typical residential fire scenarios (Bukowski 969). In keeping with national statistics, 60% of the fires involved smoldering ignitions, such as cigarettes dropped on upholstered furniture, and 40% of the test fires involved flaming ignitions (Bukowski 969-70). The homes were extensively instrumented with measuring devices for such factors as heat, smoke and carbon monoxide. The instrumentation was located in the room of fire origin and at strategic locations along the "primary escape paths" within the home, that is, hallways and stairwells leading to the outside (Bukowski 971).

124. In the first series of tests, Dunes I, smoke detectors of varying sensitivity available on the market were tested along with rate-of-rise heat detectors. Thermocouples, a heat measuring device, were used to simulate the performance of a fixed-temperature heat detector, such as the Vanguard (Bukowski 973-74, 1136). A thermocouple provides a continuous read-out of surrounding temperature. It functions in the same way as a fixed-temperature heat detector, so that when the thermocouples register 136°, heat detector activation was presumed. Because thermocouples are subject to virtually no thermal lag, however, their response time to fire is faster than that of an actual fixed-temperature fuse heat detector (Bukowski 977-78).

125. All the various detection devices were mounted side by side and placed in the rooms of fire origin and in the hallways on each level of the home (Bukowski 982-83).

126. After the fires were set, all detection devices were monitored for time of activation after ignition. Performance of each detector was

evaluated based upon the amount of escape time provided between activation and the onset of hazardous conditions which would impede or prevent escape (Bukowski 987).

127. There is substantial agreement among fire science experts that a temperature of 150° F. measured at a level five feet from the floor constitutes an untenable environmental condition which will seriously impede successful escape (Bukowski 985; Clark 684; Martin 819; CX 135, Admission No. 31; RX 16, p. 97). According to Mr. Bukowski, human tolerance to temperature is in part a function of the relative humidity of the air and the level of exertion of that person. Under very dry [47] conditions when the evaporative cooling system of a human works most efficiently, the absolute upper limit of heat tolerance would be 212° F. Mr. Bukowski testified that assuming average humidity and a high level of exertion as would be found in an individual escaping a fire, 150° is a reasonable tenability limit (Bukowski 993-94). However, in a later sprinkler test in which Mr. Bukowski was involved, the assumed safe level of temperature was 200° (Bukowski 910, 937).

128. According to Mr. Martin, 150° represents the temperature at which most fires will experience accelerated growth leading to considerably higher temperature within short periods of time. For example, instances have been reported in which ambient temperature has climbed from 150° to 700° in ten seconds (Martin 820, 931).

129. In any event, 150° was chosen as the heat tenability limit for the Dunes test. If a detector failed to activate in advance of 150°, it was concluded that the device provided no escape time (Bukowski 985).

130. Smoke buildup also constitutes a potentially hazardous environmental condition, the effect of which can impede safe escape. Smoke can induce panic and disorientation in addition to causing eye, skin and lung irritation and impeded respiration (Clark 679-80). Reliable technical literature indicates that smoke obscuration of 7% to 15% per foot effectively blocks escape routes (100% smoke obscuration per foot equals no light transmission through one foot of smoke) (Bukowski 1000; Clark 682). The 7% figure is generally accepted in the literature as appropriate where people must travel long distances through unfamiliar surroundings to escape; the 15% per foot figure is appropriate where people have shorter distances to travel in familiar surroundings, such as their own homes (Bukowski 1000). Expert testimony indicates that, at the "midway" point of 11% obscuration, a person could not distinguish a male from a female standing only 15 feet away (Martin 824).

131. In one reliable study involving human subjects and smoke obscuration levels, it was determined that a completely blindfolded person suffering from none of the side effects of smoke could exit a

building faster than those who were exposed to smoke obscuration of 15% (Bukowski 1001). Smoke obviously does more than merely impair vision. Mr. Bukowski chose 15% smoke obscuration as the tenability limit for the Dunes test. If a detector failed to alarm in advance of 15% smoke obscuration, it was concluded that such a device provided no time for escape (Bukowski 985).

132. There is a substantial agreement among fire science experts that exposure to carbon monoxide in a concentration of between 800 to 1,000 parts per million for a period of 30 minutes will seriously impede a safe escape (Martin 821-22; Bukowski 1003-04; Clark 678-79). The tenability limit of 400 parts per [48] million for carbon monoxide chosen for the Dunes test was thus too low. However, this tenability limit did not affect the results of the Dunes test because the smoke tenability was reached first in every test (Bukowski 1004-05).

133. The results of the Dunes I tests indicate that in the 37 tests conducted a heat detector was never the first device to be activated (Bukowski 986). In 14 of the 37 tests no heat detector alarmed at any time (Bukowski 986). The average escape time provided by heat detectors for all 37 tests was a negative 2.2 minutes, which means that heat detectors failed to alarm until 2.2 minutes *after* a tenability limit had been exceeded (Bukowski 987). The corresponding escape time provided by smoke detectors was a positive 18.6 minutes (Bukowski 988).

134. An analysis of the Dunes I data indicates that smoke detectors located on every level of the home provided at least three minutes warning in 89% of the experiments. And, the addition of fixed temperature heat detectors in every room of the home, along with the every-level smoke detectors, provided no increase in escape time (Bukowski 988-89).

135. Dunes II, conducted in the fall of 1975 through the summer of 1976, employed methodology similar to that of Dunes I, except that actual heat detectors, including Vanguards, were used in lieu of thermocouples (Bukowski 990). This change was made in response to criticism from Edward Gallagher, Figgie-Interstate's chief engineer, who reviewed and criticized Dunes I. Mr. Gallagher believed that Figgie's heat detectors would perform better than the thermocoupled devices (Bukowski 991-92). However, the performance of the actual heat detectors, subject to thermal lag, was considerably slower than that of the thermocouples used in Dunes I. Not one of the heat detectors tested provided 3-minute escape time in any one of the 22 tests in Dunes II (Bukowski 991).

136. The Dunes test results reviewed hereinabove are consistent with the results of similar fire tests conducted over the years (Bukowski 1005-06).

3. The Cal Chiefs' Tests

137. The California Fire Chiefs' Association Residential Fire Detector Test Program, also known as the "Cal Chiefs' Tests," were conducted by the Los Angeles City Fire Department in 1978 (Martin 754). The executive summary of this report is included in the record as CX 1A through CX 1Z-19. The objective of this study was to investigate and report on the amount of escape time afforded by various fire detection devices under actual residential fire conditions (CX 1C). [49]

138. The test was sponsored by the fire service and manufacturers of various kinds of detectors (Martin 757-58). Figgie-Interstate donated both funds and Vanguard heat detectors to aid in the conduct of the tests (CX 135, Admission No. 35; Martin 759). Edward Gallagher, then Chief Engineer for the Interstate Engineering division of Figgie, performed a major role in planning test procedures (Martin 759).

139. The test houses were typical one- and two-story homes and were completely furnished. As in the Dunes tests, instrumentation was installed to monitor heat, smoke obscuration and carbon monoxide. In both test homes, panels of eight detectors each were mounted in the living rooms, bedrooms, kitchens, attics, heater rooms and hallways. Each panel consisted of three ionization smoke detectors, three photoelectric smoke detectors and two 136° fixed-temperature heat detectors (CX 1D-E). Every detector panel in every test included a Vanguard heat detector (Martin 818).

140. Eleven test scenarios were developed based upon a statistical survey entitled "California Fire Incident and Reporting System" prepared by the California State Fire Marshall. The scenarios chosen represented typical fatal residential fires of both the flaming and smoldering type (CX 1E). Each scenario was repeated a number of times in each house under varying conditions, i.e., bedrooms doors and windows open or closed, furnace on or off. Although the original test design involved only typical fatal fire scenarios, Edward Gallagher of Figgie, insisted that more flaming type kitchen fires be included in the test. Despite the fact that a relatively small number of fatalities are caused by kitchen fires the design was revised to include 24 kitchen fires in 71 tests (Martin 762-63).

141. As the test fires were ignited, the activation time of each detector was monitored. Evaluation of detector performance was based upon the amount of time provided between detector activation and the onset of any one of the tenability limits (Martin 815).

142. Consistent with the Dunes tests and the opinion of fire researchers, the California tests employed 150° F. as the tenability limit for heat (Martin 819). The tenability limit chosen for carbon monoxide concentration was 1,000 parts per million. Based on available scientific

ic literature, exposure to this level of carbon monoxide for a period of 30 minutes may render the victim unable to walk (Martin 821-22). The tenability limit chosen for smoke obscuration was 11% per foot. At 11% smoke obscuration, it is difficult to perceive the outline of a doorway only 15 feet away (Martin 824).

143. Although the Dunes tests used a smoke obscuration limit of 15% per foot and California 11%, the results of the two tests are similar. This is understandable because the time [50] difference between reaching 11% obscuration and 15% obscuration was under a minute in most cases (Bukowski 1002-03).

144. At the conclusion of the 71 test fires in the Cal Chiefs' tests, data analysis was performed under a contract between the International Association of Fire Chiefs' Foundation and California State University, Los Angeles. The staff at California State University then prepared a report in 1979 that was distributed in draft form (Martin 775).

145. Richard Bukowski of the National Bureau of Standards reviewed the 1979 draft report and identified some instances in which transposition errors in the labeling of data points had occurred. Uncertain as to the qualitative effects of the transposition errors, NBS recommended that the report not be published in that form (Bukowski 1008). Wayne Martin, the on-site project coordinator for the California tests (Martin 739), and other members of the Los Angeles Fire Department Research Unit undertook to verify the accuracy of the California State report and to make corrections where necessary (Martin 775, 783). After a review of the actual charts generated by recording instruments during the test fires and the audio tapes made for each test fire, the Los Angeles Fire Department was able to correct the instances of transposition errors contained in the 1979 draft (Martin 774, 777). A final report incorporating the corrections (CX 1) was prepared in 1983 (Martin 792). The 1983 report has been reviewed by Mr. Bukowski against his prior critique and comments, and he has found it to incorporate all the necessary corrections (Bukowski 1008).

146. CX 1 accurately summarizes the results of the California Fire Chiefs' Tests (Martin 803) and is considered to be a reliable authority by fire experts (Clark 700; Bukowski 1010). The National Fire Protection Association (NFPA) has recently expressed an interest in publishing the report (Martin 806).

147. The California tests indicate that the escape time provided by smoke detectors for both smoldering and flaming fires ranged between two to six minutes in advance of the onset of any hazardous condition or "tenability limit" (Martin 815). In only 8% of all test fires did a heat detector activate before a tenability limit was reached (Martin 878). In only 4% of all test fires did the heat detectors provide

at least two minutes advance warning before the onset of a hazardous condition (Martin 878). In all tests, the fastest acting heat detector never responded before a smoke detector (Martin 879).

4. The Minneapolis And Bloomington Tests

148. The California results are consistent with the results of other fire detection device studies, including "Minneapolis," [51] "Bloomington," "New South Wales," and "Indiana Dunes" (Clark 698; Bukowski 1009). The Minneapolis test, conducted in 1976 by the Minneapolis Fire Department, is another in a series of full-scale burn tests conducted in residential dwellings. Fire detection devices were evaluated by measuring activation time relative to monitored environmental conditions, such as heat, smoke obscuration and carbon monoxide concentration. One of the more relevant conclusions of this test was that heat buildup in the room of fire origin was highly uneven and greatly affected by the size of the room and the amount of air movement. On the other hand, smoke appeared to diffuse evenly throughout the room. The practical import of these facts is that a heat detector in one part of the room may not be exposed to the activation temperature when temperatures at other locations in the room may reach or exceed hazardous levels. The test report further concluded that smoke buildup in detectable amounts consistently occurred well in advance of detectable temperature increases. Fire experts agree that the Minneapolis test report is a reliable authority (Clark 690-96, 700; Bukowski 1012).

149. The Bloomington tests, conducted in 1969 by the Bloomington Fire Department, is an earlier burn test conducted under actual fire conditions. Smoke and heat detector performance was evaluated. The results of the tests indicated the general ineffectiveness of heat detectors. In one test scenario, a flaming kitchen fire elevated temperatures to 1,000° within one minute of ignition. The heat detector placed in the kitchen took over three minutes to activate while a smoke detector located in an adjacent hallway activated at three minutes. Fire experts regard this test to be reliable (Clark 689, 696-97, 700; Bukowski 1011-12).

150. Reliable residential fire tests conducted in recent years by fire service professionals show that heat detectors, including Vanguard heat detectors, will not provide occupants with enough time to escape safely before hazardous conditions of smoke, gases and heat develop in most residential fires. These tests include the Indiana Dunes Tests, conducted during the period 1975-1976, and the California Fire Chiefs' tests, conducted in 1978. These fire tests generally confirmed the findings of earlier fire tests, including the Minneapolis Test of 1976 and the Bloomington Tests of 1969. The Indiana Dunes Tests are

of particular significance for the reason that they were conceived largely to determine whether a detector should be required in every room for adequate fire protection as some fire marshalls felt in the amended NFPA 74 (Bukowski 964-66).

151. Based on the Indiana Tests, Cal Chiefs' Test and other fire tests discussed hereinabove, which were designed and conducted for the purpose of testing the actual performance and effectiveness of household fire warning devices, including heat detectors and smoke detectors, Messrs. Bukowski, Clark and Martin, concluded that hazardous or life endangering conditions (Martin 816-17) will develop before a heat detector activates in [52] most residential fires and that, therefore, heat detectors cannot be relied on to provide necessary warning to allow a safe escape in most residential fires (Clark 698; Martin 880; Bukowski 1005, 1009, 1013).

152. Mr. Bukowski also testified that heat detectors are not necessary in a household fire warning system (Bukowski 1058).

153. Messrs. Bukowski, Martin and Clark also testified that there was a general agreement among fire professionals that heat detectors do not give occupants sufficient early warning to allow a safe escape in residential fires for the reason that in most cases untenable environmental conditions would have developed which will seriously impede or block a safe escape (Clark 698-99, 703-04; see Martin 880; Bukowski 1013).

154. At the same time, Messrs. Clark and Martin conceded that heat detectors have a role in residential fire safety (Clark 705, 707; Martin 893). Mr. Bukowski also acknowledged that heat detectors are appropriate for use as fire warning devices in some areas of the home, such as attics, furnace rooms, garages, and kitchens, and that they are sometimes capable by themselves of providing necessary warning to allow residential occupants to escape safely (Bukowski 1185, 1200-01, 1212-13).

155. Messrs. Clark, Martin and Bukowski also acknowledged that a combination system of smoke and heat detectors offers a higher level of fire protection and a margin of safety (Clark 713; Martin 926; Bukowski 1203-04).

156. In its proposed findings, respondent faulted the qualifications of complaint counsel's expert witnesses, characterized them as advocates of smoke detectors, and criticized the methodologies employed in the Indiana and Cal Chiefs' Tests discussed hereinabove and suggested that their opinions are not entitled to much weight (see RPF 64-108).

157. As to the test methodology, the record shows a lack of unanimity among expert witnesses regarding the precise tenability limits for heat, smoke obscuration and the carbon monoxide level. Indeed, as

more knowledge and understanding is gained through further research, these limits may be further refined and a stronger consensus developed among fire scientists and fire professionals in the future. This is the nature of all scientific progress. However, record leaves no doubt that there is substantial agreement now among fire scientists, on the basis of current learning, as to what these limits should be, and they appear to have a rational, scientific basis (see F. 127-32, 142, *supra*).

158. Moreover, the brunt of respondent's criticism is directed to the 150° F. heat limit used in the Indiana and Cal Chiefs' tests (see RPF 87-93). Mr. Martin used 200° F. heat limit in a sprinkler activation test he was involved in (Martin [53] 910, 937). It may well be that healthy adults can survive a 200° F. heat exposure for a period substantially longer than three minutes, depending on such factors as the clothing and humidity (Bukowski 1112). However, for the purpose of residential fire safety, protection of the very young, the very old and the infirm is an important consideration. Therefore, 150° F. heat tenability limit appears to be reasonable.

159. More importantly, however, the record is clear that the majority of fires resulting in deaths are smoldering fires which generate large amounts of smoke and gases without significant heat buildup and that the combination of smoke and gases is the leading killer, most bodies showing no sign of heat damage (Clark 674; Martin 830). The record is also clear that in the Indiana and Cal Chiefs' tests, the smoke tenability was usually the first to be reached (Bukowski 986). Thus, the most crucial tenability limit in terms of life safety is smoke obscuration limit. And the record shows that both the 15% used in the Indiana test and 11% used in the California test have a firm scientific basis (Clark 682; Martin 824; Bukowski 985, 1000-03). In these circumstances, detectors which fail to activate when the smoke limit is reached but do so later when the ambient heat exceeds 150° F. cannot be relied on to give "early" or adequate fire warning in most residential fires.

160. Respondent also criticizes the 3-minute warning requirement set by Messrs. Bukowski, Clark and Martin (see RPF 84-85). However, the record shows that there is substantial agreement regarding the three minutes among fire scientists. The fact that some persons may be able to escape successfully in a shorter time after a tenability limit is reached in some residential fires does not invalidate the 3-minute standard.

161. At the same time, respondent would give great weight to the largely conclusionary statements of Messrs. Ward and Lee, mostly based on their professional experience, that heat detectors are reliable and effective residential fire warning devices. Neither of them

seemed to be familiar with the details of the Indiana and Cal Chiefs' tests.

162. Respondent also places heavy reliance on Vanguard heat detector purchaser testimonials and the testimony of several purchaser witnesses it called. Respondent asserts that these testimonials and consumer testimony give the true facts as to Vanguard heat detector's effectiveness (see RPF 9-22; CX 72). However they are at best anecdotal and do not rise to the same level as the fire tests designed and conducted by fire scientists.

163. Respondent also points to a few sprinkler tests and argue that they showed heat detector activation before "critical" or "real" or "actual" tenability limits were reached or exceeded (see RPF 95-98). According to Mr. Gardner, Interstate's chief engineer, in a series of four tests conducted in October 1983 by [54] the San Francisco Fire Department using heat detectors, smoke detectors and sprinklers, heat detectors activated before the sprinkler system in all four tests (Gardner 1342).

164. However, the record does not permit an informed evaluation of these "tests" for the purpose of determining whether Vanguard heat detectors can be relied on to provide adequate warning in most residential fires, for the simple reason that the record does not include these test reports and there is not much to evaluate except the brief conclusionary statements regarding the test results.

165. On the other hand, Mr. Ward, called by respondent, expressed his opinion, based on many years of experience as a fire safety professional, that heat detectors are effective residential fire warning devices (Ward 1696-1747). However, he did not offer any cogent criticism regarding the recent fire tests relied on by complaint counsel.

166. Messrs. Ward and Lee expressed the belief that common sense combined with actual experience suggest that a combination system incorporating both heat and smoke detectors is better than either heat or smoke detectors alone (Lee 1531, 1534; Ward 1709).

167. Mr. Lee also pointed out heat detector's reliability factor due to its mechanical operation, which becomes important in the event a smoke detector should fail because of a dead battery or a power failure, which is a significant problem (Lee 1525-28; RX's 1, 2, 4, 5).

168. Upon a closer examination of the evidence contained in the record as a whole and a careful consideration of the qualifications of the experts, it is found (1) that the reliable scientific evidence shows that heat detectors typically cannot be relied on to give household occupants the necessary warning to allow a safe escape in most residential fires because hazardous conditions seriously impeding or barring a safe escape will have developed before heat detector activation

in most fires; (2) that heat detectors have a limited role to play in certain areas of residences where smoke detectors are not suitable, such as kitchens and garages; and (3) that common sense and experience show that incorporation of heat detectors into a combined smoke-and-heat detector fire warning system can reasonably be expected to provide a significantly increased level of fire warning protection in most residential fires.

5. The 1982 Introduction Of Vanguard 117° F. Fused Heat Detectors

169. Figgie-Interstate has introduced 117° F. fuse heat detectors for sale for the first time in April 1982 (CX 93, Sterner Tr. 1614) and made it standard for Vanguard heat [55] detectors in August 1983 (Sterner 1615). The results of the UL test of the 117° detector show that it did not activate until the ambient temperature reached 157° F., indicating that thermal lag remains a serious problem (Bukowski 1042). A recent UL test involving 117° heat detectors (RX 19) activated only two to ten seconds faster than the earlier 136° detector (Bukowski 1044).

170. An analysis of the Indiana Dunes I data indicates that a 117° detector would have provided three minutes warning in only two more test fires, compared to the 136° detector. (The 136° detector provided three minutes warning in only five of the 37 test fires.) Moreover, this analysis is based on an assumption, favorable to the respondent, and that the 117° detector would not be subject to thermal lag (Bukowski 1040), that is, that the 117° detector would activate when the surrounding air reached 117° F.

171. From the foregoing, it is found that the new Vanguard 117° F. fuse heat detectors do not show sufficient improvement in performance to materially affect or alter the conclusions based upon the residential fire tests discussed hereinabove.

VI. REFLECTING THE NEW LEARNING FIRE PROTECTION PROFESSIONALS REVISED NFPA-74 IN 1978 SO AS TO MAKE INSTALLATION OF SMOKE DETECTORS IN CERTAIN AREAS OF THE HOUSE MANDATORY WHILE ACCEPTING HEAT DETECTORS AS AN OPTION ONLY IN A SUPPLEMENTARY SYSTEM

172. After the results of the Indiana Dunes tests were published and communicated by Richard Bukowski to the NFPA committee charged with responsibility for Standard 74 (Standards For Household Fire Warning Equipment), the Committee amended the Standard in 1978 to require smoke detectors on each level of the home and outside each sleeping area. All mention of heat detectors was dropped from the text of Standard 74 which refers to the required level of fire warning

protection. The pertinent portions of the 1980 edition of NFPA Standard 74 are the same (Bukowski 1015-16; CX 23K).

173. The 1980 edition of NFPA Standard 74 recommends that the homeowner consider additional smoke detectors for inside the bedrooms and for those areas separated by a door from the areas protected by the required smoke detectors (CX 23N).

174. The 1980 edition of NFPA Standard 74, however, refers to heat detectors in a footnote in a chapter entitled "Basic Requirements," as follows (CX 23F):

2-1.1.1 Smoke detectors shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms and on each additional story of the family [56] living unit including basements and excluding crawl spaces and unfinished attics.*

* * * * *

* The provisions of 2-1.1.1 represent the minimum number of detectors required by this standard. It is recommended that the householder consider the use of additional smoke or heat detectors for increased protection for those areas separated by a door from the areas protected by the required smoke detectors under 2-1.1.1 above. The recommended additional areas are: living room, dining room, bedroom(s), kitchen, attic (finished or unfinished), furnace room, utility room, basement, integral or attached garage, and hallways not covered under 2-1.1.1 above. However, the use of additional detectors remains the option of the householder.

The same footnote is repeated in reference to a later chapter entitled "Markings and Instructions," containing markings required in all sales, advertising, instruction or operating manuals where instructions for use are given (CX 23K).

175. Fire protection professionals also recognize that the installation of smoke detectors *required* by NFPA Standard 74 does not provide adequate protection for the occupants from a fire starting within their bedrooms or for those areas separated by a door from the protected areas and, for these reasons, recommend the use of additional smoke detectors for those areas for increased protection. Such additional areas include: basement, bedrooms, dining room, furnace room, utility room, and hallways not protected by the *required* smoke detectors. See NFPA Standard 74, App. B-2.2 (CX 23N).

176. At the same time, fire protection professionals recognize that certain areas in a house, such as kitchens, attics and garages, are not suitable for a smoke detector because these locations occasionally experience conditions which may result in improper smoke detector operation. See NFPA Standard 74, B-2.2 (CX 23N). For these reasons, NFPA Standard 74 recommends that the householder consider using, *in addition to smoke detectors required by Standard 74*, additional heat detectors in such areas as kitchen, dining room, attic, furnace room, utility room, basement and garage. For bedrooms, Standard 74

prefers a smoke [57] detector for protection of the occupants from fires in their bedrooms. See NFPA Standard 74, App. B-3.1 (CX 23N-O).

177. Neither of respondent's two expert witnesses expressed any disagreement with the 1978 revision of NFPA 74 discussed hereinabove.

178. The consensus among responsible fire protection professionals, as reflected in the revised NFPA 74 discussed hereinabove, is further evidenced by the 35 states in this country which have residential fire detector laws requiring the use of smoke detectors in lieu of heat detectors (Clark 701-02).

VII. THE CLAIM THAT VANGUARD HEAT DETECTORS PROVIDE THE
NECESSARY WARNING FOR SAFE ESCAPE IN RESIDENTIAL FIRES
IS MISLEADING AND DECEPTIVE UNLESS IT IS COUPLED WITH
A DISCLOSURE OF THE MATERIAL FACT THAT HAZARDOUS
CONDITIONS MAKING SAFE ESCAPE DIFFICULT OR IMPOSSIBLE WILL
DEVELOP BEFORE HEAT DETECTOR ACTIVATION

179. The fact that Vanguard heat detectors will not give necessary warning to allow a safe escape in most residential fires because hazardous conditions of smoke and gases will have developed by the time they activate is a material fact.

180. Therefore, the claim that Vanguard heat detectors are reliable fire warning devices in residential fires are misleading and deceptive unless such a claim also discloses the material information that hazardous conditions of smoke and gases will have developed before detector activation which will hinder a safe escape in most residential fires.

181. It is well-settled that failure to disclose material information may cause an advertisement to be deceptive even if it does not state false claims. *Simeon Management Corp. v. FTC*, 579 F.2d 1137, 1145 (9th Cir. 1978); *Bristol-Myers Co. v. FTC*, 738 F.2d 554, 563 (2d Cir. 1984); *Sterling Drug, Inc. v. FTC*, No. 83-7700, slip op. at 19-20 (9th Cir., Aug. 28, 1984).

VIII. FIGGIE-INTERSTATE'S HEAT DETECTOR DEMONSTRATIONS
ARE MISLEADING AND DECEPTIVE

182. The ineffectiveness of heat detectors in most residential fires is explained in large part by the problem of thermal lag and by the physical characteristics of heat movement in a given environment. Heat, unlike smoke, tends to diffuse unevenly through a room (Clark 692-93; Bukowski 1038-39). In the early stages of a fire, the ceiling will absorb about 90% of the thermal energy generated by a fire (Bukowski 1037). Therefore, unless the heat detector is located directly over the point of [58] origin of the fire, activation will be delayed

until air temperature in the entire room has reached the necessary level (Bukowski 1039).

183. For this reason, the cardboard house demonstration (F. 62, *supra*) is misleading. Reasonable consumers will infer from the demonstration that the response time of the Vanguard heat detector during this demonstration is indicative of response time under actual fire conditions. In this demonstration the candle, located about six inches away from the heat detector fuse, generates a hot air flow which is channeled by the cardboard house directly across the fuse element. Under actual fire conditions, it would be completely fortuitous for a heat detector to be located in the direct flow of hot air. Moreover, given the close proximity of the candle and fuse, the heat detector is absorbing significant radiant heat. For similar conditions to occur under actual fire conditions, the heat detector would have to be located directly above the point of fire origin. The most dramatic aspect of the demonstration—activation of the heat detector prior to the tissue burning—is also misleading. Given the fact that the ignition temperature of paper is 450°, the activation of a 136° heat detector before tissue ignites is to be expected. The demonstration merely shows that the detector fuse melts by 450° and no more (Bukowski 1056–57).

184. The *Disneyland Hotel* demonstration, referred to in CX 61 and cited as evidence of heat detector reliability, also does not fairly reflect heat detector performance under actual fire conditions. In this demonstration, a hair dryer was used to blow hot air directly across the surface of a 136° fuse. A measuring device was placed in the air stream to monitor the temperature at activation. Because the efficiency of heat transfer by means of convection is directly proportional to air velocity, the stronger the flow of hot air, the faster the device will activate—even if the temperature of the air flow remains constant. Under actual fire conditions, it is unlikely that the velocity of hot air would approximate the high-speed air flow from a hair dryer. Consequently, CX 61 misleads reasonable consumers to form an impression that heat detectors are reliable in the context of providing the necessary warning for a safe escape in residential fires (Bukowski 1044–46).

185. It is well settled that a determination of false advertising can be based on deceptive visual representations. *Standard Oil Co. of California v. FTC*, 577 F.2d 653, 659 (9th Cir. 1978); *American Home Products Corp. v. FTC*, 695 F.2d 681, 688 (3rd Cir. 1982). And it is within the Commission's expertise to determine what inferences consumers may draw from visual representations. *Sterling Drug, Inc. v. FTC*, *supra* at 14. [59]

IX. THERE IS NEAR UNANIMITY AMONG FIRE PROFESSIONALS THAT AFTER SMOKE DETECTORS ARE INSTALLED OUTSIDE SLEEPING AREAS AND ON OTHER LEVELS OF THE HOUSE, INSTALLATION OF ADDITIONAL HEAT DETECTORS OR SMOKE DETECTORS IN A COMBINATION SYSTEM CAN INCREASE THE LEVEL OF FIRE PROTECTION IN THE HOME

186. The evidence discussed hereinabove clearly and convincingly shows that there is a near unanimity among fire protection professionals as well as fire scientists that installation of a combined system incorporating both smoke detectors and heat detectors, *in addition to* the installation of smoke detectors outside each sleeping area and on each level of the house, can provide increased protection in residential fires.

187. However, a representation that a combined system offers increased or improved level of fire protection is misleading unless it also discloses the material information that any combination system must include smoke detectors outside each sleeping area and each additional story of the house as a minimum.

X. RELIEF

188. The record clearly shows that the principal claim contained in Figgie-Interstate's promotional material discussed herein is that heat detectors will provide the necessary warning to enable occupants to escape safely in most residential fires. Figgie-Interstate promotional materials discussed herein also recommend that a homeowner purchase heat detectors for every major living area of the home in addition to attics, basements, closets, storage areas and garages. And the sales figures showing the disproportionate ratio of smoke and heat detectors sold provide a sound basis for concluding that consumers have in fact acted upon Figgie-Interstate's representations.

189. In the absence of an appropriate order, consumers will continue to suffer substantial economic injury from the purchase of Vanguard heat detectors in the belief that they provide the necessary warning to allow a safe escape in most residential fires. Moreover, to the extent that heat detectors are purchased in lieu of smoke detectors in reliance of respondent's misleading claims, a threat to life safety may be posed.

190. The evidence shows that, although Figgie-Interstate knew or should have known the limitations of heat detector performance, Figgie-Interstate has disseminated and continues to disseminate promotional materials containing false performance claims for Vanguard heat detectors while disparaging smoke detectors. [60]

191. In order to prevent further consumer injury and threat to life safety in residential fires, it is necessary and appropriate in this case

to require Figgie-Interstate to cease and desist from making false and deceptive claims in the future that directly or impliedly represent that Vanguard heat detectors will provide the necessary warning to occupants to allow them to escape safely without disclosing the material fact that hazardous conditions of smoke and gases will have developed before heat detector activation in most residential fires.

192. It is reasonable to conclude from the record evidence that consumers purchased Vanguard heat detectors in reliance upon respondent's express and implied claim that heat detectors will provide necessary warning to allow a safe escape in most residential fires and that they will not be able to determine or find out for themselves, until it is too late for them, that hazardous conditions of smoke and gases will develop before a heat detector activates in most residential fires. In order to correct this grave situation involving the life safety of a substantial number of Vanguard heat detector purchasers and their families, it is important that the past purchasers of Vanguard heat detectors be notified of this critical material information, which should have been disclosed to them before they purchased Vanguard heat detectors.

193. Respondent should also be prohibited from misrepresenting the existence of any standards related to residential fire safety devices or systems or the contents thereof, as evidenced by F. 80-82, *supra*. [61]

DISCUSSION

1. Respondent's Liability For Misleading And Deceptive Representations

It is true that the Interstate distributors (and their sales representatives), who conducted in-home sales presentations and made the misleading and deceptive representations directly to consumers about Vanguard heat detectors, were not employees or agents of Figgie International, Inc. or its Interstate Engineering Division. Rather, these distributors promoted and sold Vanguard heat detectors under a distributorship contract with Interstate. However, the record is also clear that (1) Figgie-Interstate developed, produced and sold or distributed the promotional materials containing the challenged claims to its contract distributors for the very purpose of promoting and selling Vanguard fire alarm products, including heat detectors, to consumers, (2) it advised and encouraged the use by its contract distributors of the promotional materials in in-home sales presentations, (3) it trained its contract distributors in the use of the promotional materials in in-home sales presentations of Vanguard heat detectors

and (4) it knew of and approved the use of its promotional materials by its contract distributors in in-home sales presentations. In these circumstances, the Section 5 liability of Figgie-Interstate for the deceptive representations made by its distributors to consumers in in-home sales presentations of Vanguard heat detectors is beyond dispute. See, e.g., *National Housewares, Inc., et al.*, 90 F.T.C. 512 (1977).

2. There Is Sufficient Agreement Among Fire Professionals
Regarding The Serious Limitations Of Heat Detectors And
Respondent Should Be Required To Disclose This Material
Information When Promoting Heat Detectors

The evidence shows that a large number of heat detectors have been sold through in-home sales presentations to American householders since the early 1960's and that respondent has been a leader among the sellers of heat detectors in this country. In the course of promoting its fire protection products, respondent and its dealers have been instrumental in making a significant segment of American households aware of the real need for an effective fire protection measure for every home. As a result of respondent's endeavors of many years, a large number of American homes have purchased and relied on, and continue to purchase and rely on, respondent's heat detectors for fire protection. For many years, heat detectors were regarded by fire professionals as [62] an acceptable residential fire warning device either by themselves or in combination with smoke detectors.

However, the situation changed in a fundamental way during the mid-1970's. As the scientific knowledge regarding the behavior of fires increased, a question arose among fire scientists and fire protection professionals as to the relative capability of heat detectors and smoke detectors and the appropriate places for them in a residential fire protection system. These concerns culminated in the 1974 proposal to amend the National Fire Protection Association Standard For The Installation, Maintenance and Use of Household Fire Warning Equipment (often referred to simply as NFPA-74). The proposed amendment sought to eliminate the prior requirement for heat detectors from NFPA-74 and accepted a minimum level of protection consisting of smoke detectors alone in the vicinity of bedrooms and on every other level of the home. And, in order to settle the question as to whether it was necessary to install a heat detector in every room in a home, fire scientists and fire protection professionals, with the cooperation and contribution of fire alarm product manufacturers, designed and conducted a series of residential fire tests known as the Indiana Dunes test during the years 1975 and 1976. The results of

these tests convincingly demonstrated important limitations of heat detectors vis-a-vis smoke detectors, the most important of which being the finding that hazardous levels of smoke, heat and carbon monoxide gas developed before heat detector alarm went off in most tests. After the test results were communicated to NFPA, NFPA-74 was revised in late 1978 so as to incorporate the 1974 amendments. The revised NFPA-74 became the 1980 edition of NFPA-74. In short, in 1978, the NFPA, reflecting the new knowledge and consensus among fire scientists and fire protection professionals, downgraded heat detectors from its former position of a required device to that of an optional and supplemental device acceptable only after the required smoke detectors are in place in a home.

As amply documented in the record, respondent, in the face of the new reality as embodied in the 1978 revision of NFPA-74, sought to continue, and have continued, promoting its heat detectors as an effective household fire alarm devices without disclosing to the consumer the crucial and material information that hazardous levels of smoke, heat or carbon monoxide gas may develop and seriously impede a safe escape before a heat detector alarm goes off in most residential fires. This state of affairs should not be allowed to continue.

It is true, as respondent vigorously contends, that the fire science is an evolving discipline and that the fire test methodology may be further refined as scientific knowledge regarding the behavior of fire and related chemical and physiological factors expands in the future. It is also true that the new consensus regarding the limitations of heat detectors as a residential fire alarm device is not entirely free [63] of thoughtful dissent. However, we know enough to convince us now that heat detectors have serious limitations as household fire protection devices and that respondent should not be permitted to continue as before.

In view of the above discussion, what the Order seeks is not to impose a flat ban on the promotion of heat detectors as household fire protection devices, but merely to require that the important and material information regarding the limitations of heat detectors be communicated to the consumer when promoting heat detectors and similarly that any combination system must include the minimum number of smoke detectors as required by the NFPA-74 (1980).

3. There Is Near Unanimity Among Fire Professionals That Once The Required Smoke Detectors Are Installed, Installation Of Additional Heat Detectors Or Smoke Detectors Can Increase The Level Of Fire Protection In Homes

At the same time, reflecting the universal agreement among fire professionals that installation of additional smoke or heat detectors *after* the required number of smoke detectors are installed can significantly increase the level of fire protection in homes, the revised NFPA-74 accepts additional smoke detectors as an option in a supplementary system. Therefore, respondent should be permitted to promote heat detectors in the future as a component of a combination system provided respondent also discloses to the consumer that any combination must include a smoke detector outside sleeping areas and other levels of the house.

4. Order Provisions

A. *Affirmative Disclosure Requirements*

The Commission's authority to require affirmative disclosure with respect to product performance even when the required disclosure runs counter to the interest of the product advertiser or promoter is well established. *Simeon Management Co.*, 87 F.T.C. 1184 (1976), *aff'd*, *Simeon Management Co. v. FTC*, 579 F.2d 1137 (9th Cir. 1978). And it is not necessary that a failure to disclose a material fact must be specifically alleged in the complaint as long as the need for an affirmative disclosure requirement is supported by the evidence. *J.B. Williams Co. v. FTC*, 381 F.2d 884, 888 (6th Cir. 1967). [64]

In determining the reasonableness of a required affirmative disclosure, the factors to be considered include the existence of health or safety issues (*see American Home Products Corp. v. FTC*, 695 F.2d 681, 714 (3d Cir. 1982)) and the gravity and deliberateness of the violations (*see FTC v. Colgate-Palmolive Co.*, 380 U.S. 374, 395 (1965); *Standard Oil of California v. FTC*, 577 F.2d 653, 662 (9th Cir. 1978)).

B. *Part I of the Order*

A cease and desist order coupled with appropriate affirmative disclosure requirements is imperative in this case in order to effectively prevent continuation of the deceptive performance claims which involve the potential fire safety of a large number of families. Without a clear disclosure of the serious limitations of heat detectors in residential fires, as have been so convincingly shown in recent fire tests and generally recognized by fire professionals, any unqualified effectiveness claim for heat detectors will continue to mislead consumers

into believing that heat detectors can be relied on to give adequate warning for a safe escape for them and their families in case of a fire.

In the disclosure related to a simple effectiveness claim (I A(1)), the language is carefully circumscribed in order to convey the material information which must be conveyed to consumers without unduly frustrating the legitimate promotion of heat detectors by respondent and its contract distributors. It does not require, as complaint counsel propose, that the disclosure statement say "heat detectors will not help you get out of the house in time" or "heat detectors will not protect you from most fires." Instead, it requires a simple and straightforward statement that "dangerous levels of smoke, heat or carbon monoxide gas may develop before a heat detector alarm goes off."

In the disclosure related to a combination system (I A(2)), the language is designed to convey the crucial and material information to the householder that any residential smoke/heat detector combination fire warning system must include a smoke detector outside each sleeping area and on each additional level of a house as required by NFPA-74, without unduly frustrating the legitimate promotion of a supplementary, smoke/heat detector combination system. This provision would leave respondent free to say, for example, that "after you install a smoke detector outside each sleeping area and on each additional story, it is a good idea to install additional heat detectors or smoke detectors in other areas of the house for increased protection" or a variation thereof.

Part I B is necessary to prevent misrepresentations of performance characteristics of heat detectors or smoke detectors [65] in any form and to prevent misrepresentations regarding the existence of any standard governing residential fire alarm system, or content of such standard, or compliance of any heat detector with such standards.

Part I C is a broad proscription against heat detector performance claims of any kind not substantiated by competent and reliable scientific evidence.

C. Part II of the Order

Part II specifically mandates inclusion of a clear and straightforward affirmative disclosure message in all future promotional material used for heat detectors sold by respondent. This provision is designed to ensure that the disclosure required in I A(1) is included in every heat detector promotional material disseminated by respondent and shown or made available to householders in in-home sales presentations.

Complaint counsel's proposal to require all Interstate dealers and their sales representatives to secure a signed form from every heat

detector purchaser that a required disclosure notice has been furnished and received is rejected. It is my view that such a requirement is unnecessary and unduly onerous.

D. Part III of the Order

Part III requires respondent to communicate the required affirmative disclosure to householders who are known to have purchased Vanguard heat detectors since January 1, 1979. It is designed to ensure that the critical limitations of heat detectors are communicated to past purchasers who relied on respondent's misleading performance claims when they purchased heat detectors and continue to rely on such claims as true, thereby leaving themselves and their families with a false sense of safety in the event of a fire. This situation is attributable to respondent's deliberate and continued dissemination of misleading claims for Vanguard heat detectors after the 1978 amendment of NFPA 74, discussed hereinabove (F. 172). And, the record shows that respondent in fact possesses the names and addresses of purchasers of Vanguard heat detectors (F. 19, *supra*). The notification requirement is necessary to effectively remedy the violation found in this case which in a real sense is continuing to this day as regards the past purchasers. *Cf. FTC v. Virginia Homes Mfg. Corp.*, 509 F.Supp. 51, 57 (D. Md. 1981). In these circumstances, equity and concern for life safety in residential fires dictate no less. [66]

E. Part IV Of The Order

Part IV is designed to promote compliance with this order by all echelons of Figgie-Interstate organization, including its dealers who sell fire alarm products.

CONCLUSIONS OF LAW

1. The Federal Trade Commission has jurisdiction over the marketing and promotion of Vanguard heat detectors under Section 5 of the Federal Trade Commission Act.

2. Respondent's use of false, misleading and deceptive statements and representations as herein found is likely to mislead reasonable consumers into believing that such statements and representations were and are true and induce them into the purchase of substantial quantities of Vanguard heat detectors by reason of those mistaken beliefs.

3. In the absence of an appropriate order, the purchasing public is likely to continue to purchase substantial quantities of Vanguard heat detectors because the public believes respondent's statements and representations regarding the capacity of the Vanguard heat

detector to provide the necessary warning for safe escape in most residential fires.

4. The acts and practices of respondent as herein found were and are all to the prejudice and injury of the public and constitute unfair and deceptive acts and practices in commerce in violation of Section 5 of the Federal Trade Commission Act.

5. The following order is proper and necessary under applicable legal precedent and the evidence in this case. [67]

ORDER

I.

It is ordered, That respondent, Figgie International, Inc., its successors and assigns, and respondent's officers, agents, representatives and employees, directly or through any corporate or other device, in connection with the advertising, offering for sale or distribution of any heat detector or any residential fire alarm system containing a heat detector, as the term *heat detector* is defined by the National Fire Protection Association's Standard 74, in or affecting commerce, as "commerce" is defined in the Federal Trade Commission Act, do forthwith cease and desist from:

A. Representing in any manner, directly or by implication:

(1) That in the event of a fire, a heat detector (or detectors) will provide the necessary warning to occupants to allow them to escape safely, without also stating that dangerous levels of smoke, heat and carbon monoxide gas will build up before a heat detector alarm goes off in most fires; or

(2) That a heat and smoke detector combination system will provide better [68] or significantly increased fire protection, without also stating that any combination system must have a smoke detector outside each sleeping area and on each additional story of the house, as required by the National Fire Protection Association Standard 74 or by the State.

B. Misrepresenting in any manner, directly or by implication:

(1) The performance characteristics of any heat detector or any residential fire alarm system containing a heat detector including, but not limited to, the capability of the heat detector to provide the necessary warning to occupants to allow them to escape safely in the event of fire; or

(2) The existence or content of any standard or recommendation established or made by the National Fire Protection Association or

any other entity regarding the location, number or type of fire protection devices to be installed in a residence, or [69] compliance of any heat detector or residential fire alarm system containing a heat detector with any such standard or recommendation; or

(3) The performance characteristics of any smoke detectors or any residential fire alarm system containing a smoke detector.

C. Representing in any manner, directly or by implication, the performance characteristics of any heat detector or any fire alarm system containing a heat detector including, but not limited to, the capability of the heat detector to provide fire warning protection, unless at the time of making any such representation respondent possesses and relies upon competent and reliable scientific evidence which substantiates such representation.

II.

It is further ordered, That respondent shall, within 120 days from the date of service of this order, include the following notice in all print advertising or print promotional material for [70] all heat detectors manufactured or sold by respondent or for any fire warning system containing such heat detectors:

CAUTION: In most residential fires dangerous levels of smoke, heat and carbon monoxide gas will build up before the heat detector alarm goes off.

The above-required language shall be printed in a typeface and color which are clear and conspicuous, and, in multipage documents, shall appear on the cover or first page. Nothing contrary to, inconsistent with, or in mitigation of the above-required language shall be used in any advertising or promotional materials.

With respect to any film, video tape, or slide promotional material, the above-required language shall be included both orally and visually within the first minute of the presentation, in a manner designed to ensure clarity and prominence.

III.

It is further ordered, That respondent shall, within 180 days after service of this order, send by first-class mail, to each identifiable purchaser of respondent's fire alarm products since January 1, 1979, the disclosure required by Part II. [71]

Purchasers shall be deemed identifiable if they can be traced using warranty cards or testimonial letters in respondent's possession and/or using sales records maintained by respondent's dealers.

IV.

It is further ordered, That respondent shall distribute a copy of this order to all of its officers and to all employees, agents or representatives having sales or promotional responsibilities with respect to the subject matter of this order. Respondent shall also distribute a copy of this order to each dealer of its fire alarm products.

V.

It is further ordered, That respondent shall maintain documents as will demonstrate compliance with this order for a period of three years from the date the document is created or used, whichever is later. Such documents shall be made available to the Commission or its staff for inspection and copying upon reasonable request and shall include, but not be limited to, the following:

- (a) Copies of each nonidentical form of promotional and training materials disseminated by respondent; [72]
- (b) The name and last known address of each dealer of respondent's fire alarm products; and
- (c) The name and last known address of each purchaser identified under Part IV of this order.

VI.

It is further ordered, That respondent shall notify the Commission at least thirty (30) days prior to any proposed change in the corporate respondent such as dissolution, assignment or sale resulting in the emergence of a successor corporation, the creation or dissolution of subsidiaries or any other change in the corporation which may affect compliance obligations arising out of the order.

VII.

It is further ordered, That respondent shall, within 120 days after service upon it of this order, file with the Commission a [73] report, in writing, setting forth in detail the manner and form in which it has complied with this order.

OPINION OF THE COMMISSION

BY AZCUENAGA, *Commissioner*:

I. INTRODUCTION

Figgie International, Inc. ("Figgie") is an Ohio corporation that manufactures and sells a variety of industrial and consumer fire protection, safety and security equipment. Figgie's Interstate Engineering division ("Interstate") markets two different types of "Vanguard" residential fire warning devices: heat detectors¹ (which Interstate manufactures) and smoke detectors² (which Interstate purchases from other manufacturers). Interstate sells both types of detectors to independent local dealers, whose salesmen make in-home sales presentation to consumers. From January 1, 1981, through May 31, 1983, Figgie's revenues from sales of Vanguard heat detectors totalled \$2,354,000; during the same time period, Figgie's revenue from Vanguard smoke detector sales was \$620,000. (CX 127)³ [2]

On May 17, 1983, the Commission issued a complaint alleging that Figgie had violated Section 5 of the Federal Trade Commission Act. The complaint was amended on November 8, 1983. As amended, Paragraph 5 of the complaint alleges that Figgie represented (1) that its Vanguard heat detectors provide the necessary warning to allow safe escape from most residential fires and (2) that fire alarm systems combining Vanguard heat and smoke detectors provide significantly greater fire warning than smoke detectors alone. Paragraph 6 of the complaint alleges that those representations were unfair and deceptive.

Administrative Law Judge ("ALJ") Montgomery K. Hyun filed his initial decision on October 23, 1984. Judge Hyun found that Figgie's claim that Vanguard heat detectors would provide the necessary warning to allow safe escape from most residential fires was deceptive unless it was accompanied by a disclosure of the fact that dangerous

¹ Vanguard heat detectors are fixed-temperature heat detectors. When the fuse in a fixed-temperature heat detector reaches a certain temperature, it melts and the alarm sounds. Vanguard heat detectors are available with 117° or 136° fuses. Rate-of-rise heat detectors activate when the air temperature increases by more than a certain amount in a certain time period (e.g., more than 15° in one minute).

² Vanguard smoke detectors include both photoelectric and ionization detectors. Photoelectric detectors activate when smoke obscures a certain amount of the light transmitted by a light source built into the detector. Ionization detectors detect the presence of particulate matter produced by combustion.

³ The following abbreviations are used in this opinion:

ID - initial decision
IDF - initial decision finding
Tr. - transcript of testimony
CX - complaint counsel's exhibit
CAP - complaint counsel's appeal brief
CAB - complaint counsel's answering brief
RX - respondent's exhibit
RAP - respondent's appeal brief

levels of smoke, heat, and carbon monoxide develop before the heat detectors alarm. He also found that any representation that a combination fire alarm system with both heat and smoke detectors provided significantly greater warning than smoke detectors alone was misleading unless it also disclosed that fire protection standards required that a smoke detector be placed outside each sleeping area and on each additional story of the residence. His order prohibits Figgie [3] from making those claims without the specified affirmative disclosures and also forbids misrepresentations of National Fire Protection Association standards, misrepresentations of heat and smoke detector performance characteristics, and unsubstantiated heat and smoke detector performance claims.

Both Figgie and complaint counsel have appealed the ALJ's initial decision to the Commission. Figgie's principal argument on appeal is that the record evidence shows that heat detectors do provide the necessary warning to allow safe escape in most residential fires. Figgie also argues that it was not given adequate notice of matters of fact asserted in the proceeding and that the ALJ's decision is based on theories not alleged in the complaint. Complaint counsel generally agree with the ALJ's decision, but argue that his order should be modified to close certain "loopholes." Complaint counsel also argue that Figgie's distributors should be required to obtain from each heat detector purchaser a signed form acknowledging that the purchaser has seen the affirmative disclosure required by Part II of the order.

This opinion results from the Commission's independent review of the record in this case, including the transcripts of testimony and oral argument, exhibits, pleadings, briefs, and the ALJ's initial decision. The opinion contains findings of fact and conclusions of law that the Commission believes are supported by the preponderance of the evidence on the record as a whole, as required by law.⁴ Where the initial decision is inconsistent [4] with the findings and conclusions contained in this opinion, it is set aside. The order issued against the respondent consists of those provisions deemed necessary to prohibit the respondent from engaging in the misrepresentations identified here and to deter the respondent from similar unfair or deceptive practices in connection with any future sales of heat detectors.

II. DID FIGGIE MAKE THE REPRESENTATIONS ALLEGED IN PARAGRAPH 5 OF THE COMPLAINT?

The Commission will find an act or practice deceptive⁵ if three

⁴ 5 U.S.C. 556(d) (1983); *Steadman v. SEC*, 450 U.S. 91, 95-102 (1981).

⁵ Paragraph 6 of the complaint alleges that the representations at issue were unfair as well as deceptive. Since the trial record and the initial decision focus on deception rather than unfairness, this opinion also analyzes the representations in terms of deception. The Commission's deception jurisdiction has been described as a "subset" of our unfairness jurisdiction. *International Harvester Co.*, 104 F.T.C. 949, 1060 (1984); see also, *Southwest Sunsites, Inc.*, Docket No. 9134, slip op. at 103 n. 81 (January 15, 1985) [105 F.T.C. 7], *aff'd*, No. 85-7182 (9th Cir. April 1, 1986). Put another way, unfair practices are not always deceptive but deceptive practices are always unfair.

requirements are met. First, there must be a representation, omission, or other practice likely to mislead consumers. Second, the consumers must interpret the message reasonably under the circumstances. Third, the misleading representation, omission, or practice must be material—that is, likely to affect consumer decisions or conduct. Our deception analysis focuses on [5] risk of consumer harm; actual injury to consumers need not be proved.⁶

Before deciding whether Figgie's claims are deceptive, we must first determine whether Figgie's promotional materials make the representations alleged by the complaint.⁷

A. Figgie's Promotional Materials

The promotional materials that Figgie supplied its local distributors for use at in-home sales presentations—including a slide show (accompanied by a taped narration), sales brochures and the cardboard demonstration house—make several express representations. [6]

First, the promotional materials point out that anyone could suffer death, injury, or serious property damage from a residential fire. This message was communicated in a particularly dramatic and effective way by the two slide presentations prepared by Figgie.⁸ Both versions of the slide show depict houses engulfed in smoke and flames. After reciting some sobering statistics concerning deaths, injuries, and property losses resulting from residential fires, the narrator of the newer show states that fire "can happen to you tomorrow." (Tr. 1589) "Fire can occur in your home," the narrator says later. "Don't believe that a household fire is something that happens only to other people." (Tr. 1590) *The Purpose of My Visit*, a brochure shown to consumers during sales presentations, contains a page headlined "Fire Can Happen To You," which states:

The chances are that the average family will experience one fire every generation serious enough to have the fire department respond. (CX 67D, 80E)

⁶ *International Harvester Co.*, 104 F.T.C. 949, 1056 (1984); *Cliffdale Associates, Inc.*, 103 F.T.C. 110, 164-66 (1984). As Commissioner Bailey noted in her Concurring and Dissenting Statement in *Cliffdale*, she believes that a deceptive act or practice is best analyzed as one that has the tendency or capacity to mislead a substantial number of consumers in a material way. While we have followed the analysis used in *Cliffdale*, we agree that respondent's practices in this case were deceptive under either analysis of a deceptive act or practice.

⁷ When it examines an advertisement to determine whether the ad does or does not make a particular claim, the Commission often distinguishes express and implied representations. Either type of representation may be deceptive. An express claim is one that is communicated in words or images so plain and unambiguous that virtually every reader or viewer of the advertisement will perceive it. An implied claim may arise from a statement that may be reasonably interpreted in several different ways or from an express claim that leads to an additional inference. In some cases, an examination of the advertisement will allow the Commission to conclude that it makes a particular implied claim; in other cases, surveys, copy tests, expert opinion, or other extrinsic evidence that it is reasonable to interpret the ad as making the implied claim will be necessary. *Thompson Medical Co.*, 104 F.T.C. 648, 788-90 (1984).

⁸ The original slide show (CX 129-31) was replaced by a newer version (CX 132-33, Tr. 1586-1604) in 1983. (CX 135 Admission No. 59)

Next, the promotional materials emphasize the importance of early fire detection and warning. As the slide show narrator says, "Authorities say there are two things necessary to save you and your family in case of fire. The first is adequate warning." (Tr. 1589-90) "[T]he real killer is time. If every family were warned of the fire in time, nighttime fire deaths and injuries could be virtually eliminated." (Tr. 1597-98) [7]

Imagine if an early warning system existed for your car that could warn you minutes before a fatal crash. We would all want one. A system like that of course does not exist. Yet, an early warning system does exist that will warn you minutes before a fatal fire condition exists in your home. (Tr. 1599)

What is that "early warning system"? According to one Figgie brochure, "the only way to provide complete and sure fire-warning protection is by using smoke detectors and heat detectors." (CX 63) According to another, *The Best Way* to protect yourself is "The Vanguard Combination System," which incorporates both smoke and heat detectors. (CX 71Z-12) According to a third, *If You're Serious About Fire Protection, Install Vanguard, The Reliable Combined Fire Protection System*. (CX 69A) Together, Vanguard heat and smoke detectors are "the combination needed to give a greater measure of life safety." (CX 69C)

Why are heat detectors as well as smoke detectors necessary? Figgie's promotional materials offer three different answers to that question.

First, many residential fires start in kitchens and other rooms "which occasionally experience conditions which may result in improper operation" of smoke detectors. (CX 70B) For example, "smoke detectors should not be installed near kitchens" because "fairly routine cooking occurrences" will cause them to activate. (CX 69C) Vanguard heat detectors provide "immediate early warning" of fires in these areas. (CX 69C)

Second, heat detectors are more reliable and dependable because they are maintenance-free and mechanically rather than electrically operated. According to another Figgie sales [8] brochure, a 1980 test of 175 Vanguard heat detectors that had been installed in the Disneyland Hotel twenty years earlier proved the "long-term dependability" of these detectors, which "do not require maintenance." (CX 61C) Unlike smoke detectors, the Vanguard heat detector "does not rely on electricity or batteries and has no electronic parts to fail." (CX 68B) Also, "[s]moke detectors are vulnerable to dust, lint, invisible grease vapors, unseen insects, corrosion, and varying climactic conditions that can . . . render them ineffective." (CX 68B-C)

Third, "heat detectors are essential . . . to guard against the many types of fires where smoke detectors may be ineffective." (CX 68B)

Safe At Home, the Vanguard owner's manual and warranty book, explains that "[t]here are two extremes of fire to which household fire warning equipment must respond. One is the rapidly developing, high heat fire. The other is the slow, smoldering fire." (CX 66F) Vanguard heat detectors provide "fast response to hot fires" (CX 71Z-12) that "generate heat but little smoke until it is too late for escape." (CX 68B-C) To demonstrate how quickly Vanguard heat detectors responded to hot fires, Vanguard salesmen used a cardboard demonstration house.⁹ First, the salesman put a lighted candle inside the small demonstration "house," which had four walls but no roof. After placing a piece of tissue on top of the house, the salesman held the heat detector just above the tissue [9] "roof." The heat detector usually alarmed before the tissue was even scorched.

Finally, Figgie's promotional materials clearly represent that heat detectors contribute more to residential fire safety than do smoke detectors. While both heat and smoke detectors should be installed, "Heat Detectors Have Probably Saved More Lives And Property Than Any Other Fire Detection Device." (CX 63) One brochure states that kitchen fires account for 65% of household fires. (CX 69C) Another contains a graph showing that 569 of 992 (57.2%) fires of known origin that resulted in Vanguard fire alarm activations started in kitchens and other areas where installation of smoke detectors is not recommended. (CX 70B, E) It also states that 734 of 1107 (66.2%) reported activations were the types of fires that "might be responded to best by heat detectors." (CX 70B) The original slide show presentation portrayed a demonstration fire in which three heat detectors gave quicker warning than a smoke detector. (CX 130M) Illustrations showing where Vanguard detectors should be installed always indicate more recommended locations for heat detectors than smoke detectors. (CX 66O, 67Q) Figgie's sales brochures usually depict a combination system consisting of five heat detectors and one smoke detector. (CX 61H, 67P, 69A, 70G, 71Z-13, and 80Q).

*B. Did Figgie Claim That Vanguard Heat Detectors
Provide The Necessary Warning To Allow Safe Escape
From Most Residential Fires?*

The ALJ concluded that Figgie did represent, as alleged in Paragraph 5(1) of the complaint, that "[i]n the event of most fires, [10] respondent's heat detectors provide the necessary warning to occupants to allow them to escape safely." We agree that consumers reasonably would have interpreted Figgie's promotional materials as

⁹ Although this demonstration house (CX 81) was designed and first used in sales presentations by a Vanguard distributor in Houston, Figgie then offered all Vanguard distributors the house and a suggested script for salesmen to follow when performing this demonstration. (CX 88)

making that claim.¹⁰

That alleged representation can be thought of as two separate but closely related representations. The first is that Vanguard heat detectors provide enough advance warning for safe escape from at least some fires; in other words, that Vanguard heat detectors are effective residential fire warning devices. The second is that Vanguard heat detectors are effective fire warning devices in most residential fires, not just in rare or unusual situations.

The first claim is implied by the mere offering for sale of Vanguard heat detectors as residential fire warning devices. It is made expressly in statements that “thousands of lives [have been] saved” (CX 71Z-12) by Vanguard heat detectors, which provide “fast response to hot fires” (CX 71Z-12), “immediate early warning” and “reliable, service-free, long-lasting protection.” (CX 69C) It is also expressly present in the statement that the Vanguard combination fire protection system, which incorporates both heat and smoke detectors, is an “early warning system . . . that will warn you [11] minutes before a fatal fire condition exists” (Tr. 1599) and by the numerous other representations of the virtues of the combination system discussed above.¹¹

The second part of the representation alleged by Paragraph 5(1)—that Vanguard heat detectors provide the necessary warning in most fires—is explicit or implicit in several claims quoted above. For example, one Figgie brochure states that 734 of 1107 (66.2%) reported fires that resulted in activation of a Vanguard fire warning device were of the type that “might be responded to best by heat detectors.” It also states that over 57% of those reported fires that were of known origin started in kitchens and other areas where smoke detectors should not be installed. (CX 70B) The implication of the second statement is that heat detectors provided the necessary warning for safe escape in at least 57% of those fires.

Figgie argues correctly that its promotional materials do not represent that Vanguard heat detectors will provide the necessary warning to all occupants of a residence “no matter . . . what type of fire occurs” or “under all circumstances.” (RAB 19) But the complaint contains no allegation of such a representation. It alleges only that Figgie represents that its heat detectors are effective “in the event of *most* fires” (emphasis added). [12]

¹⁰ Our conclusion is based on our own examination of Figgie’s promotional materials. We note, however, that our conclusion is corroborated by complaint counsel’s expert witness, Dr. Cohen, whose testimony is the only extrinsic evidence on the record of how consumers would interpret Figgie’s promotional materials. (Tr. 303)

¹¹ The Vanguard combination system comprises two different subsystems: one designed to detect abnormally high heat, the other designed to detect smoke. Neither subsystem’s operation is dependent upon the other. Therefore, a claim for the combination system generally is really a claim for each subsystem.

C. Did Figgie Claim That Its Combined System of Heat Detectors and Smoke Detectors Provides Significantly Greater Fire Warning Protection Than Smoke Detectors Alone?

The ALJ also found that Figgie did represent, as alleged in Paragraph 5(2) of the complaint, that its "fire alarm systems combining heat detectors and smoke detectors provide significantly greater fire warning protection for occupants than smoke detectors alone." Again, we agree.¹²

This representation is made expressly in a number of Figgie's promotional materials. For example, the owner's manual and warranty book states:

The "Vanguard Thermosonic" Heat Detector is designed to detect abnormally high temperatures. The "Vanguard Smokesonic" Smoke Detector is designed to detect abnormal quantities of smoke. Every fire warning system for homes should include both heat detectors and smoke detectors, properly applied, and located in accordance with their best usage. (CX 66F)

The original version of the slide show presentation tells the story of one fire victim who learned too late that "to have adequate protection the home must have heat detectors as well as smoke detectors." (CX 130C) A Figgie sales brochure claims that a "systematic combination" of heat and smoke detectors is needed "to maximize chances for fire survival," and that "people who have depended only on smoke detectors . . . have been injured and died as a result of fire." (CX 68B, C) [13]

As described in Section II.A. above, Figgie's promotional materials offer three reasons why heat detectors are needed in addition to smoke detectors. First, heat detectors provide "immediate early warning" of fires that start in kitchens and other areas where the installation of smoke detectors is not recommended. (CX 69C, 70B) Second, heat detectors are more reliable because they "do not require maintenance" (CX 61C) and "[do] not rely on electricity or batteries." (CX 68B) Third, heat detectors provide "fast response to hot fires" (CX 71Z-12) that "generate heat but little smoke." (CX 68B-C)

III. WERE FIGGIE'S CLAIMS MATERIAL?

Having concluded that Figgie made the representations alleged in the complaint, we must next decide whether those representations were material. A material representation is one that is likely to affect a consumer's choice of, or conduct regarding, a product or service because it involves some characteristic of that product or service that

¹² Complaint counsel's expert, Dr. Cohen, came to the same conclusion. (Tr. 303) Figgie does not contest that it made this representation. (RAP A-8, No. 79)

is important to consumers.¹³

The two representations that are alleged in the complaint here are presumed material for two reasons. First, express claims are presumed material.¹⁴ Second, claims that concern the central characteristics of the product or service are presumed [14] material.¹⁵ Both of these representations concern the single most important characteristic of the Vanguard heat detector: its effectiveness as a fire warning device. The first representation is that Vanguard heat detectors give enough warning of most fires to allow safe escape. The second representation is that a fire warning system incorporating Vanguard heat detectors provides significantly more protection than one that does not. It is hard to imagine that any consumer who was considering the purchase of a fire warning device would not find those two performance claims—one absolute, the other relative—extremely material.¹⁶ The Commission will always consider relevant evidence offered to rebut such presumptions of materiality, but Figgie has offered no such evidence here. We conclude that the representations at issue are material.

IV. WERE FIGGIE'S CLAIMS LIKELY TO MISLEAD CONSUMERS?

Having concluded that the representations made by Figgie were material, we must next determine whether those claims were likely to mislead consumers. Some representations are deceptive because they are false. Other representations are deceptive because qualifying information needed to correct misimpressions created by the representations is omitted. Even silence can be [15] deceptive if the circumstances are such that an implied but false representation is communicated.¹⁷

The ALJ found that both the representations at issue here were deceptive because Figgie failed to disclose certain qualifying information. We agree with some of his findings, but disagree with others.

A. The Evidence Presented By Complaint Counsel

Complaint counsel base their allegations that heat detectors neither provide the necessary warning to allow escape from most fires nor provide significantly greater protection when used in combination with smoke detectors on the results of several fire detection

¹³ *Cliffdale Associates, Inc.*, 103 F.T.C. 110, 165 (1984).

¹⁴ *International Harvester Co.*, 104 F.T.C. 949, 1057 (1984).

¹⁵ *Id.*

¹⁶ Figgie sells four to five times as many heat detectors as smoke detectors (CX 125, 127A), which indicates that those claims are persuasive.

¹⁷ For example, the very act of offering goods for sale creates an implied representation that the goods are reasonably fit for their intended uses and free of gross safety hazards. Silence in circumstances that create no implied representations—often termed a “pure omission”—is not deceptive although it may be unfair. *International Harvester Co.*, 104 F.T.C. 949, 1057–60 (1984).

device test programs and on the testimony of three experts on fire science and fire detection devices.

1. The California Fire Chiefs' Tests

The 1978 California Fire Chiefs' Association Residential Fire Detector Test Program is the most relevant of those fire detection device tests because it tested the performance of Vanguard heat detectors directly. The objective of the "Cal Chiefs' Tests," which were jointly sponsored by the California Fire Chiefs' Association and the Los Angeles City Fire [16] Department, was "to investigate and report on residential fire detector response, reliability, and life safety potentials under realistic conditions (i.e., uncontrolled fire development in actual dwellings)." (CX 10) The tests were funded by contributions from the International Association of Fire Chiefs, local and state government agencies, and a number of fire detection device manufacturers, including Figgie's Interstate Engineering division. Interstate's chief engineer, Mr. Gallagher, was a consultant to the test program's planning committee. (CX 1L)

One of the houses used in this series of tests was a one-story, three-bedroom dwelling with a typical central hall floor plan. The other test house was a two-story dwelling with basement. The houses were completely furnished with furniture, carpets, drapes, curtains, books, and bedcovers during the tests. After each test fire, the structure was restored to its original condition and refurnished before the next test fire was set. (CX 1Q-R)

Fifty-six fire detectors were installed in the one-story test house and 64 in the two-story house. The detectors were arranged in eight-detector panels. Each panel consisted of three ionization smoke detectors, three photoelectric smoke detectors, and two fixed-temperature heat detectors, one of which was always a Vanguard 136° heat detector. Locations of the detector panels in the one-story test house included the living room, two bedrooms, hall, kitchen, attic and furnace room. In the two-story test house, panels were placed in those seven locations and [17] also in the dining room. At each test site, an adjacent house was used as a "command center." Each detector was wired to a clock in the command center. The clock stopped when the detector first alarmed. An oscillograph recorded the complete operational cycle of each detector. (CX 1V-W)

Temperature-measurement devices known as thermocouples were installed at five different heights in each room where detectors were placed. Environmental gas sampling equipment was used to measure levels of oxygen, carbon monoxide, and carbon dioxide at five locations: two bedrooms, the hall (or the upstairs landing in the two-story house), kitchen, and living room. Smoke obscuration—that is, the

reduction in light transmission caused by the presence of smoke—was measured by a light beam aimed at a photoelectric cell. Four such beams were used: one in each of two bedrooms, the entry way and the hall (or the upstairs landing in the two-story house). In addition, videotape recorders with time and date generators were used to film each test. Sound level measurements were also taken to determine the loudness of the alarm sounded by each detector throughout the house. (CX 1V-Z4)

Eleven test fire scenarios were developed based upon the California State Fire Marshall's "California Fire Incident and Reporting System" statistics on fatal fires.¹⁸ "Flaming" fire scenarios included cotton fabric placed against a wall heater, a [18] lighted candle placed under clothing in a closet (to simulate a child playing with matches in a closet), an overheated coffeemaker under kitchen cabinets and gasoline in a garage ignited by a water heater. "Smoldering" fire starts were represented by a lighted cigarette on a living room couch, a cigarette on a bed, cooking oils on a kitchen stove, overheated electrical wire under carpeting, an overheated motor in a forced air unit and overheating in a gas-fired wall furnace. Each scenario was repeated a number of times in each test house under varying conditions. For example, one test of each scenario was conducted with bedroom doors and windows open and the heater off. (CX 1R-U) Each test fire was allowed to develop at its own rate. Data was collected until the fire self-extinguished, all the detectors activated or certain extreme temperatures or atmospheric conditions were reached.¹⁹ (CX 125) A total of 71 test fires were set, and over two million pieces of data were recorded. (CX 128)

Evaluation of detector performance was based on the amount of "escape time" each detector provided—in other words, how long before certain hazardous conditions developed did the detector activate? Smoke detectors usually provided two to six minutes escape time before any of the hazardous conditions, or [19] "tenability limits," developed.²⁰ Heat detectors never gave more than 1.3 minutes escape time; in 92% of the test fires, the earliest-sounding heat detector alarmed after one or more tenability limit was exceeded. (Tr. 815-16) In one test fire, the earliest-sounding heat detector and earliest-sounding smoke detector activated at the same time. But in every other test fire, the first detector to sound a warning was a smoke detector. (Tr. 879)

¹⁸ At the request of Interstate's chief engineer, a relatively large number of kitchen fires were also included although kitchen fires rarely result in fatalities. (Tr. 762)

¹⁹ For example, the test was terminated if the air temperature in the room where the fire started reached 500° or the carbon monoxide level reached one percent.

²⁰ As defined for the tests, tenability limits were a temperature of 150° F., 1000 parts per million (ppm) carbon monoxide or smoke obscuration of 11% per foot (i.e., smoke that is dense enough that 11% of the amount of light coming from a source such as a lamp or a window is obscured one foot away from that source). (Tr. 817)

2. The Indiana Dunes Tests

The Indiana Dunes Tests, designed and administered by the National Bureau of Standards and Underwriters' Laboratories in 1974-76, were also conducted in actual homes under conditions that closely simulated those that would exist in typical residential fires. (Tr. 967-70) The testing methodology was generally similar to that used in the Cal Chiefs' Tests. (Tr. 971-72) Tenability limits were set at 150°, 400 ppm carbon monoxide and smoke obscuration of 15% per foot. (Tr. 985) [20]

In the first series of tests ("Dunes I"), smoke detectors and rate-of-rise heat detectors were tested. Thermocouples were used as surrogates for fixed-temperature heat detectors.²¹ (Tr. 980) In each of the 37 Dunes I test fires, the first detector to sound an alarm was a smoke detector. The earliest-sounding smoke detectors provided an average escape time of 18.6 minutes, but the earliest-sounding thermocouples provided an average escape time of negative 2.2 minutes. In other words, the first thermocouples to alarm in the 37 test fires sounded an average of 2.2 minutes after one of the tenability limits was exceeded. (Tr. 986-88)

In response to criticism of "Dunes I" from Interstate's chief engineer, Vanguard heat detectors were tested directly in a second series of tests ("Dunes II"). The Vanguard heat detectors used in Dunes II, however, performed "considerably poorer" than the thermocouples used in Dunes I. (Tr. 990) For example, the thermocouples gave three minutes or more escape time in five of [21] 37 Dunes I test fires, but Vanguard heat detectors never provided as much as three minutes escape time in 22 Dunes II test fires. (Tr. 991-92)

3. Expert Testimony

Based on the results of the Cal Chiefs' Tests, the Indiana Dunes Tests and other tests of fire detection devices, complaint counsel's three experts on fire science and fire detection devices agreed that heat detectors sounded after the development of hazardous conditions in most residential fires.

According to Mr. Clark, a member of the staff of the National Fire Academy of the Federal Emergency Management Agency, the consensus among fire service professionals is that "[h]eat detectors do not

²¹ Thermocouples measure temperature and transmit temperature readings continuously. When the Dunes I data was analyzed, it was assumed that a Vanguard 136° heat detector would have activated at the same time that the thermocouple reading reached 136°. In fact, the Vanguard heat detector would probably have alarmed some time after the thermocouple indicated 136° because, unlike the thermocouple, the Vanguard heat detector would have been affected by "thermal lag." When a frozen dinner is taken from the refrigerator and placed in a preheated oven, quite a bit of time will pass before the dinner absorbs enough heat to reach the same temperature as the air in the oven. Similarly, in the event of fire, a 136° heat detector does not alarm as soon as the air temperature reaches 136°. By the time the heat detector fuse absorbs enough heat to reach 136°, the ambient temperature will have risen considerably above that temperature. (Tr. 977-79)

supply early warning to fires.” (Tr. 699) He testified that “[t]he literature indicates that in terms of heat detectors, the occupants would not have enough time to evacuate their home because their exit paths would become untenable either due to smoke, carbon monoxide, or even the heat levels.” (Tr. 699) He also testified that “in terms of life safety . . . it doesn’t make any difference if you have . . . heat detectors” in addition to smoke detectors; “in terms of property protection,” he added, “it may make a difference to have those additional heat detectors.” (Tr. 712)

Mr. Martin, a Los Angeles Fire Department fire protection engineer who was the assistant site director for the Cal Chiefs’ Tests, said that “Vanguard heat detectors do not give sufficient warning . . . to the occupants of a house to escape during a [22] fire.” (Tr. 880) He also testified that “a combination of the heat detectors and smoke detectors do not give you significant additional alarm over smoke detectors alone.” (Tr. 880)

Mr. Bukowski, a National Bureau of Standards research engineer who helped design and administer the Indiana Dunes Tests, concluded that heat detectors “just don’t appear to be effective.” (Tr. 1005) According to him, the fire detector test results indicate that “smoke detectors provide adequate escape time in many, many more of the cases and in fact that the heat detectors provided very little in the way of escape time and warning.” (Tr. 1009) In other words, “in most fires life-endangering conditions typically occur prior to the activation of heat detectors and activation of smoke detectors generally occur prior to the occurrence of life-endangering conditions.” (Tr. 1013–14) He testified that it was generally not necessary to supplement smoke detectors with heat detectors, and that installing heat detectors in attics, garages, and other areas where smoke detectors could not be installed gave a “marginal at best” increase in protection. (Tr. 1058)

B. The Evidence Presented By Figgie

Figgie’s defense to complaint counsel’s allegations is based on the Underwriters’ Laboratories listing of Vanguard heat detectors, the National Fire Protection Association’s Standard 74, Vanguard purchaser testimonials and the testimony of two experts on fire detection devices. [23]

1. The Underwriters’ Laboratories Listing of Vanguard Heat Detectors

Underwriters’ Laboratories (“UL”) is a well-known organization that establishes product standards, tests various products and gives a UL listing to those products that meet its standards. Vanguard heat detectors have been tested by UL and listed as meeting UL’s standard

for heat detectors, UL-539. (Tr 1285-87) Figgie argues that the UL listing demonstrates the effectiveness of Vanguard heat detectors. (RAP 9)

2. The National Fire Protection Association's Standard 74

The National Fire Protection Association ("NFPA") is an independent standard-setting organization that establishes model fire protection codes. Many state and local government regulations incorporate NFPA's code provisions. NFPA Standard 74, which sets standards for household fire warning equipment, discusses the proper installation, maintenance and use of both smoke and heat detectors. Appendix B to the 1980 edition of Standard 74 states that "areas lending themselves to protection with heat detectors are: kitchen, dining room, attic (finished or unfinished), furnace room, utility room, basement, and integral or attached garage." (CX 23N-O) Figgie argues that the discussion of heat detectors in this standard implies that NFPA recognizes heat detectors as effective residential fire warning devices. (RAP 9-10) [24]

3. Consumer Testimonials

Five Vanguard heat detector purchasers testified that those heat detectors supplied them with the warning necessary to prevent or escape safely from fires in their residences. The record also includes dozens of letters from Vanguard heat detector purchasers attesting to the effectiveness of those heat detectors as fire warning devices and a description of 1107 Vanguard heat detector activations between 1959 and 1980 that is based on purchaser testimonial letters. (CX 72, 70)

Figgie argues that "[t]he record contains no evidence of a single instance in which a Vanguard heat detector failed to provide the necessary warning to allow a safe escape" from a residential fire. (RAB 4) Both Figgie's and complaint counsel's experts testified that they were unaware of any such incident. (Tr. 722, 900, 1536-37, 1702)

4. Expert Testimony

Figgie's experts on fire detection devices testified that heat detectors are effective fire warning devices and that a combination fire warning system incorporating heat and smoke detectors offers more protection than smoke detectors alone.

Mr. Ward, the Springfield, Illinois, Commissioner of Public Health and Safety, disagreed with complaint counsel's expert testimony that heat detectors do not provide the necessary warning in most residential fires (Tr. 1715-16) and that the combination of heat and smoke detectors do not provide [25] significantly greater warning than

smoke detectors alone (Tr. 1717). He testified that heat detectors are "extremely reliable" devices that "can and do provide the necessary warning" (Tr. 1702) and that "the combination of smoke and heat [detectors] serves probably the best interests of protecting those who are residents in structures for normal habitation." (Tr. 1703)

Mr. Lee, the retired Chief of the Charlotte, North Carolina, Fire Department, testified that a combination of heat and smoke detectors has two advantages over smoke detectors alone. First, heat detectors function better in "the kitchen, garage, a utility room, a furnace room, or in areas where the temperature gets extremely high or low." Second, "there is a reliability factor due to the mechanical makeup of a heat detector that provides a backup . . . in the event of the failure of a smoke detector through a power failure or battery failure or what have you." (Tr. 1525)

C. An Evaluation Of the Record Evidence

1. Does The Evidence Demonstrate That Vanguard Heat Detectors Provide The Necessary Warning To Allow Safe Escape From Most Residential Fires?

After a careful review of the evidence introduced by both parties, we conclude that the most probative evidence on the issue of whether heat detectors provide the necessary warning to allow safe escape in most residential fires is found in the [26] results of the Cal Chiefs' and Indiana Dunes tests (and the expert testimony concerning those results).

Both sets of tests were designed and administered by expert professionals working on behalf of respected fire protection organizations, private testing laboratories and government agencies. The test fire scenarios closely resembled actual residential fire situations. Elaborate scientific instrumentation was used to collect millions of individual data concerning the environmental conditions produced by the test fires and the performance of the fire detection devices being tested. The data were carefully analyzed, and detailed reports describing those analyses were published. These reports are considered reliable authority by residential fire protection experts and have resulted in numerous revisions to state and local regulations setting minimum standards for residential fire detection devices. (Tr. 701-02)

As discussed above, the Cal Chiefs' and Indiana Dunes tests show that smoke detectors provide significantly earlier warning of potentially dangerous conditions resulting from a residential fire than do heat detectors. More importantly, heat detectors often provide no advance warning at all. In the Cal Chiefs' Test, for example, the earliest-sounding heat detector alarmed after a tenability limit was

exceeded in 92% of the test fires. We agree with the expert witnesses who concluded that these tests demonstrate that heat detectors do not provide the necessary warning to allow safe escape in most residential fires.²² (Tr. 699, 880, 1013-14) Figgie's experts disagreed with that [27] conclusion, but we give their opinions little weight because we do not believe that their opinions were adequately supported.²³

Figgie offers several criticisms of the methodology used in those testing programs. First, Figgie points out that these tests involved fires in unoccupied houses and argues that the conclusions drawn from such tests are necessarily based on unrealistic assumptions about what would have happened if people had actually been present during those fires. While the Cal Chiefs' and Indiana Dunes test fire scenarios were carefully designed to resemble actual residential fire circumstances as closely as possible, it is true that the fire experts who analyzed the data from those tests had to make assumptions about the effects on humans of certain levels of smoke, heat, carbon monoxide and other environmental conditions. Since no responsible researcher would expose human subjects to the dangers of fire for the purposes of an experiment, any residential fire test must be based on such assumptions. The real issue, therefore, is whether the particular tenability limits chosen by the Cal Chiefs' and Indiana Dunes researchers are reasonable indicators of conditions that could result in serious injury or death. [28]

Figgie argues that the tenability limits used to evaluate heat and smoke detector performance were too conservative. According to Figgie, the test methodology assumed "that people in their own homes will remain still and die in a fire rather than attempt escape through a temperature of 150° Fahrenheit . . . or . . . through smoke in which visibility is obscured beyond ten feet." (RAP 13)

It is true that limited exposure to 11% or 15% smoke obscuration or 150° heat does not necessarily cause death or serious injury. The record, however, contains evidence that such conditions can seriously impede escape. For example, one expert testified that smoke has physiological and psychological effects that make a successful escape less likely. Smoke irritates the eyes, nose and throat, and makes breathing difficult. Smoke also obscures vision, causes disorientation and induces panic. (Tr. 679-80) One study of the effects of smoke obscuration found that blindfolded subjects walked through a smokeless corridor faster than non-blindfolded people walked through the same corridor after a 15% smoke obscuration level had been created.

²² The Vanguard heat detectors that were tested were equipped with 136° fuses. Recently, Interstate began to offer 117° heat detectors for sale. It is reasonable to assume that the 117° heat detectors provide earlier warning than 136° heat detectors, but analysis of the Indiana Dunes Tests data indicates that the improvement in performance from the substitution of 117° fuses would likely be marginal at best. (Tr. 1040)

²³ See *Thompson Medical Co.*, 104 F.T.C. 648, 790 n. 11 (1984).

(Tr. 1000-02) And while humans may be able to tolerate a constant 150° temperature under carefully controlled conditions, fire temperatures can increase rapidly once 150° is reached. According to one expert, a residential fire burning at 150° could be 700° (or even hotter) only ten seconds later. (Tr. 931) While some people might escape if given warning after smoke [29] or temperature levels exceeded these tenability limits, it is reasonable to assume that many others would suffer death or serious injury.

Figgie also argues that the evidence it introduced concerning the performance of Vanguard heat detectors in actual residential fires deserves more weight than evidence of performance in test fires. The Cal Chiefs' and Indiana Dunes tests indicate that heat detectors provide the necessary warning in very few fires. While the limited anecdotal evidence from Vanguard purchasers introduced by Figgie may prove that Vanguard heat detectors have sounded warnings early enough to allow escape from some residential fires, it says nothing about whether Vanguard heat detectors provide the necessary warning in most fires. We conclude that the reports of successful heat detector performance introduced by Figgie, which may be representative only of relatively unusual situations, do not deserve as much weight as the Cal Chiefs' and Indiana Dunes findings. [30]

Neither the Underwriters' Laboratories listing of Vanguard heat detectors nor the mention of heat detectors in National Fire Protection Association Standard 74 prove that Vanguard heat detectors provide the necessary warning in most fires. As a former UL testing engineer testified, UL tests "are not intended to demonstrate the performance of any kind of detection device under real fire conditions." (Tr. 1029) In the UL "water bath test," a heat detector is immersed in water. The temperature of that water is increased one degree per minute until the heat detector's alarm sounds. This test determines whether the fuse of a heat detector melts at or near its stated temperature but says nothing about whether that heat detector gives the necessary warning in most residential fires, because, among other things, it avoids the problem of thermal lag.

The UL "oven test" demonstrates that heat detectors are subject to thermal lag. In that test, a heat detector is placed in a circulating air oven. The temperature of the air in the oven is then raised from 80° to 240° at a rate of 40° per minute. In one series of oven tests, Vanguard heat detectors with 136° fuses did not activate until the oven temperature reached 185° to 200°—or well over a minute after the oven temperature reached 136°. (Tr. 1025) Since actual residential [31] fire temperatures can rise much more rapidly than 40° per minute, the temperature at which the detector would alarm in a real

fire could be hundreds of degrees higher.²⁴

In the UL "fire test," two nine-square-foot pans of alcohol are ignited and the response time of the heat detector is noted. The temperature in the test room at the time the heat detector's alarm sounds is not recorded, but it can be assumed from the amount of thermal energy generated by such a fire that the temperature would be extremely high. The fact that a heat detector alarms when subjected to such extreme conditions does not necessarily indicate that it will provide enough warning for safe escape from most residential fires.

NFPA Standard 74 sets standards for the installation, maintenance and use of residential fire warning equipment. Both heat detectors and smoke detectors are discussed in Standard 74, but only smoke detectors are required under this standard. Section 2-1.1.1 states that "[s]moke detectors shall be installed outside of each separate sleeping area . . . and on each additional story of the family living unit." (CX 23F) A footnote to that section recommends that residents "consider the use of additional smoke or heat detectors for increased protection for those areas separated by a door from the areas protected by the required smoke detectors." (*Id.*) And Appendix A to the standard says that "this standard utilizes smoke [32] detectors as the primary life protection equipment" because "detectable quantities of smoke precede detectable levels of heat in nearly all" residential fires. (CX 23K) The mere mention of heat detectors in NFPA Standard 74 does not prove that heat detectors provide the necessary warning for safe escape in most residential fires.

The preponderance of the evidence on the record demonstrates that Vanguard heat detectors do not provide the necessary warning to allow safe escape from most residential fires. Therefore, we conclude that Figgie's representations that Vanguard heat detectors did provide such warning are deceptive.

2. Does The Evidence Demonstrate That A Fire Alarm System Combining Heat and Smoke Detectors Provides Significantly Greater Fire Warning Protection Than Smoke Detectors Alone?

As discussed in Section II.A. above, Figgie claimed that a combination fire alarm system combining heat and smoke detectors provides significantly greater fire warning protection than smoke detectors alone for three reasons. First, according to Figgie, heat detectors will provide early warning of the many residential fires that start in kitchens and other rooms where the installation of smoke detectors is not recommended. Second, heat detectors are more reliable than smoke detectors because they are maintenance-free devices that do

²⁴ One expert witness told of one test fire in which the temperature reached 1000° before a heat detector located in the room where the fire was set alarmed. (Tr. 696-97)

not operate on electricity or batteries. Third, heat detectors respond more quickly to hot, flaming fires. [33]

The ALJ considered these three distinct claims, each of which is made expressly in Figgie's promotional materials, as one general claim of superiority and concluded that a combined system "can provide increased protection." (IDF 186) We believe it is preferable to evaluate each claim individually.

a. Heat Detectors May Provide Additional Protection That Some Consumers Would Consider Significant In Areas Where Smoke Detectors Should Not Be Installed

Certain areas in the house are not suitable locations for smoke detectors. Cooking smoke, automobile exhaust and other atmospheric contaminants or extremely high or low temperatures can cause false alarms in such areas. (Tr. 1525) As NFPA Standard 74 says, "[t]he installation of smoke detectors in kitchens, attics (finished or unfinished), or in garages is not normally recommended as these locations occasionally experience conditions which may result in improper operation." (CX 23N)

Two experts, however, testified that relatively few fatal fires originate in those areas. (Tr. 763, 1059) For example, only about 0.6% of the deaths and 2.2% of the injuries caused by fires in 1981 resulted from residential garage fires. (CX 28K) Also, smoke detectors located in other parts of a house might give earlier warning of a fire that starts in a kitchen, attic, or garage than a heat detector in the kitchen, attic or garage itself. (Tr. 696-97, 724, 1059) Therefore, it is reasonable to [34] assume that the installation of heat detectors in those areas where smoke detectors are not recommended will provide additional protection from death or serious injury in only a relatively small number of residential fires. As one expert testified, the additional protection provided by such heat detectors is "marginal at best." (Tr. 1058)

That is not to say, however, that a slightly better level of fire protection is not significant. As used in the complaint, "significant" simply means "important" or "meaningful." Whether a slightly better level of protection is significant may depend on the seriousness of the harm that could result if the protective device failed to operate. Even a very small amount of additional protection from death or serious injury caused by fire would no doubt be considered significant by some consumers. The record in this case contains no testimony or survey evidence on how much additional protection from fire-related death, injury or property loss would be considered significant by consumers. Complaint counsel have failed to prove that the additional protection is not significant.

The statement concurring in part and dissenting in part states that the expert testimony and test data introduced at trial establish that heat detectors in kitchens, garages, and attics provide "virtually no" additional protection because smoke detectors "almost always" alarm earlier than heat detectors "regardless of their respective locations." First, the partial dissent cites the results of the 1969 Bloomington, Minnesota, fire tests. In one of those test fires, a kitchen fire caused [35] the smoke detector in the adjacent hallway to alarm before the heat detector in the kitchen itself. It would be unwise to draw any conclusions from the results of this single test fire. The fact that a smoke detector located in an adjacent hallway only a few feet from the fire's starting point alarmed earlier provides little, if any, evidence that a smoke detector in any other part of the house would also have alarmed earlier. Second, the partial dissent states that the results of the Cal Chiefs' and Indiana Dunes fire tests "confirm" that smoke detectors outperform heat detectors "regardless of location." Those tests, however, compared the performance of heat detectors and smoke detectors located in the same room. There is considerable evidence in the record that smoke detectors alarm more quickly than heat detectors when both are located in the same room. Since it is not practical, however, to put smoke detectors in kitchens and garages, tests of comparative heat and smoke detector performance in the same room provide little or no meaningful evidence on this issue. Finally, the partial dissent notes the testimony of two fire science experts who concluded that the additional protection provided by the combined system was "marginal" (Tr. 1058) or "slightly better" (Tr. 711). As discussed above, it is not clear that a "marginal" or "slightly better" level of protection would not be considered significant by some consumers. These experts did not say that the additional protection provided by heat detectors would be considered insignificant by consumers, and they would not have been qualified to do so. [36]

Therefore, representations that heat detectors provide significant additional protection when installed in areas where smoke detectors would not function properly are not necessarily deceptive. Such claims, however, must be substantiated, must not exaggerate the extent of that additional protection and must disclose any qualifying information needed to correct misimpressions the claims would otherwise cause.

*b. Heat Detectors May Provide Additional Protection That
Some Consumers Would Consider Significant Because
They Are More Reliable Than Smoke Detectors*

In the words of one of complaint counsel's experts, heat detectors are "highly reliable." (Tr. 724)

They are pretty simple in terms of their construction. They are not electrically operated. They are mechanical in nature. There are fewer things to go wrong with them.

So when the conditions reach the level that they would normally activate, you are pretty sure they are going to activate. (Tr. 723)

Smoke detectors, on the other hand, do require occasional cleaning and will not function if the household's electrical power supply is interrupted or if batteries are not replaced periodically. Battery-powered smoke detectors sound an alarm [37] when the battery needs to be replaced, but some people may ignore that warning or fail to replace the old battery after removing it. Estimates of the percentage of battery-operated smoke detectors that are not functioning at any given time range from eight percent (Tr. 1048) to from 50 to 80 percent. (RX 5) One of complaint counsel's experts estimated the failure rate at "30 to 40 percent." (Tr. 904-06)²⁵

Obviously, an operating heat detector provides greater protection than a nonoperating smoke detector. The Cal Chiefs' and Indiana Dunes Tests show that heat detectors do not provide the necessary warning to allow safe escape in most residential fires, but heat detectors did provide warning before one or more tenability limits was exceeded in some test fires. The amount of additional protection provided by heat detectors is relatively large if the higher estimates of the failure rate of smoke detectors are accepted and relatively small if the lower estimates are used. But as we previously concluded, even a relatively small amount of additional protection from death or serious injury could be considered significant by some consumers. Complaint counsel have failed to prove that the [38] additional protection provided by the greater mechanical reliability of heat detectors is not significant.

Therefore, claims that heat detectors provide some additional protection because they are maintenance-free and mechanically rather than electrically operated are not necessarily deceptive. Again, unsubstantiated or exaggerated claims about the extent of that additional protection would be deceptive, and the disclosure of certain qualifying information may be required in advertising or promotional materials that make claims about the performance of heat detectors.

²⁵ The dissent states that all those failure rates should be discounted because smoke detectors that had a dead battery (or missing battery) or that did not meet the Underwriters' Laboratory smoke sensitivity standard were included in the "failed" category. We see no reason to lower the failure rate by arbitrarily excluding insufficiently sensitive detectors or detectors with dead batteries from the "failed" group. Dead batteries and gradual sensitivity loss due to dust accumulation are exactly the sort of problems to which heat detectors are not subject. Heat detectors are more reliable than smoke detectors not only because they have fewer or simpler parts but also because they don't require regular maintenance.

*c. Heat Detectors Do Not Respond More Quickly
To Hot, Flaming Fires*

The Cal Chiefs' and Indiana Dunes Tests measured the response of heat and smoke detectors to hot, flaming fires and smoky, smoldering fires. Although Figgie claims that heat detectors are needed because they provide early warning of hot, flaming fires, the Cal Chiefs' and Indiana Dunes test results show that smoke detectors give earlier warning of both smoldering fires and flaming fires. As the National Fire Protection Association concluded, "the results of full-scale experiments conducted over the past several years . . . indicate that detectable quantities of smoke precede detectable levels of heat in nearly all cases." (CX 23K) [39]

Therefore, we find that Figgie's claims that its heat detectors provide significant additional protection because they respond more quickly than smoke detectors to hot, flaming fires are false.

V. FIGGIE HAD ADEQUATE NOTICE OF THE MATTERS
OF FACT ASSERTED IN THIS PROCEEDING

Figgie argues that the Commission violated Section 554(b) of the Administrative Procedure Act²⁶ by failing to provide notice of "the matters of fact . . . asserted" in this case. Specifically, Figgie claims that the term "life endangering conditions," which appears in Paragraph 6(1) of the amended complaint, was never clearly defined. Consequently, Figgie argues that it was unable to understand and respond to the complaint's allegation that Figgie's claims that its heat detectors provide the necessary warning to allow safe escape in most fires are deceptive because "life endangering conditions will occur prior to the activation of [Figgie's] heat detectors" in nearly all residential fires. (RAB 13-20)

It is clear now that complaint counsel intended the term "life endangering conditions" to refer to the presence of smoke, heat or carbon monoxide at levels sufficient to impede or bar safe escape from a residential fire. It is hard to imagine that a manufacturer of fire detection devices would not have immediately assumed that smoke, heat and carbon monoxide, which are obvious fire-related dangers, were among the "life endangering conditions" mentioned in the complaint. After [40] prehearing conferences and pretrial discovery, including depositions of complaint counsel's expert witnesses and an examination of complaint counsel's documentary exhibits, it should have been completely clear that the term "life endangering conditions" included excessive levels of smoke, heat or carbon

monoxide.²⁷ Because it was "apprised of the issues actually at stake and in fact litigated them throughout the proceeding,"²⁸ we conclude that Figgie had adequate notice of the matters of fact asserted.

VI. THE ALJ'S DECISION WAS NOT BASED ON "ALTERNATIVE THEORIES" NOT ALLEGED IN THE COMPLAINT

According to Figgie, the complaint essentially alleges that heat detectors are "virtually worthless" or "virtually useless." (RAP 21) The ALJ found that heat detectors are not worthless or useless but still concluded that Figgie had violated [41] Section 5. Therefore, Figgie argues, the ALJ wrongly imposed liability based on "alternative theories" not pled in the complaint.

The theory of the complaint is that Figgie made certain deceptive representations. The case was tried and defended by Figgie on that theory. The ALJ concluded that Figgie had made the alleged representations, that those representations were deceptive and that an order correcting those misrepresentations was appropriate. Complaint counsel admit that they believe heat detectors to be virtually worthless (CAB 23), but the complaint does not contain that allegation.

The ALJ did not conclude that heat detectors are virtually worthless, but he did conclude that the allegations in the complaint were proved by complaint counsel. Those conclusions are not inconsistent, and we affirm them.

VII. THE ORDER

We conclude that an order prohibiting Figgie from engaging in the same or similar deceptive acts and practices in the future is in the public interest. Unless we issue an appropriate order, future purchasers of Vanguard heat detectors may continue to be misled. It is also important that past purchasers of Vanguard heat detectors be provided with accurate information about the performance of Vanguard heat detectors. We reject the respondent's contention that "[i]f there is a problem here, there is no reason it should not be left to the free market to resolve it." (RAP A-26) [42]

After considering the record in this case and the arguments of counsel for both parties, we have decided to issue an order that differs

²⁷ For example, complaint counsel stated at the first prehearing conference on July 18, 1983, that they intended to show that heat detectors would not give warning of "life endangering conditions" created by "smoke [and] carbon monoxide." (Tr. 5) Complaint counsel's document list, which was filed on November 8, 1983, includes several documents reporting the results of the Cal Chiefs' and Indiana Dunes tests. In both of those tests, residential fire detectors were evaluated on the basis of whether they alarmed before certain levels of smoke, heat or carbon monoxide developed. Finally, Figgie cross-examined complaint counsel's expert witnesses extensively on the appropriateness of the smoke, heat and carbon monoxide levels that were used as tenability limits in those and other residential fire detector tests. (Tr. 714-18, 894-98, 907-24, 1069-70, 1086-89, 1092-1124)

²⁸ *ITT Continental Baking Co. v. FTC*, 532 F.2d 207, 216 (2d Cir. 1976).

in some respects from the ALJ's order. Our discussion of each section of the final order will include an explanation of why those changes have been made.

A. Part I of the Order

Part I.A.(1) of the ALJ's order prohibits representations that heat detectors will provide the necessary warning to allow safe escape unless an affirmative disclosure that hazardous conditions usually develop before heat detectors activate is included. As complaint counsel argue, an order provision requiring an affirmative disclosure to help correct a misrepresentation does not obviate the need for an order provision prohibiting the misrepresentation directly. (CAP 4-7) We have modified Part I.A.(1) accordingly.

Part I.A.(2) of the ALJ's order prohibits representations that a combination system of heat and smoke detectors provides significantly increased protection unless an affirmative disclosure concerning standards for smoke detector location is included. Because we found that claims that a combined system provides increased protection because heat detectors respond more quickly to hot, flaming fires is deceptive, we have substituted a new provision to prohibit such misrepresentations. Of course, this provision is not intended to prevent truthful, substantiated representations that heat detectors may provide some additional protection because they can be installed in certain areas where [43] smoke detectors cannot and because heat detectors are maintenance-free and do not depend on electricity or batteries.

Parts I.B. and I.C. of the ALJ's order have not been changed.

B. Part II of the Order

Part II of the ALJ's order required that Figgie place the following affirmative disclosure on all promotional materials: "CAUTION: In most residential fires dangerous levels of smoke, heat and carbon monoxide gas will build up before the heat detector alarm goes off." Complaint counsel proposed making that disclosure even stronger: "CAUTION: Heat detectors will *not* help you get out of the house in time in most fires. Heat detectors will *not* protect you from most fires because dangerous levels of smoke, heat and carbon monoxide gas can build up before the heat detector goes off." (CAP 7-9)

We have concluded that the following affirmative disclosure would be more appropriate: "NOTICE: Smoke detectors give earlier warning than heat detectors in nearly all residential fires. That is because detectable amounts of smoke almost always develop before detectable levels of heat." This disclosure, which is a paraphrase of a statement found in Appendix A to NFPA Standard 74, is preferable to the disclo-

tures proposed by the ALJ and complaint counsel for two reasons. First, it is more accurate because it is not clear from the evidence that dangerous levels of smoke, heat and carbon monoxide gas developed in the Cal Chiefs' and Indiana Dunes test fires before heat detectors [44] alarmed. Second, we believe that it is particularly important to inform consumers of the relative performance of heat and smoke detectors. The fact that smoke detectors almost always provide earlier warning than heat detectors would seem to be the single most useful piece of information that could be provided to potential purchasers of residential fire protection systems.

This disclosure must appear on all promotional materials that expressly or impliedly represent that heat detectors provide the necessary warning to allow safe escape in the event of fire or that a combination heat and smoke detector system provides significantly greater protection than smoke detectors alone.

C. Part III of the Order

Part III of the ALJ's order has not been changed.

D. Part IV of the Order

Complaint counsel appealed the ALJ's decision not to include an order provision requiring Figgie's dealers to obtain signed acknowledgements from purchasers of its heat detectors indicating that they had seen the affirmative disclosure required by Part II of the ALJ's order. According to complaint counsel, the dealers have an incentive to alter the brochures and other promotional materials prepared by Figgie but distributed to consumers by the dealers in order to delete or obscure the required affirmative disclosure. [45]

The ALJ's order does not apply to dealers, and there is a danger that some dealers may alter the required disclosure or otherwise deceive consumers. We therefore agree with complaint counsel that a "fencing in" provision aimed at preventing dealer misconduct is appropriate.

Complaint counsel's proposal to require dealers to obtain signed acknowledgements indicating that consumers have seen the required disclosure would burden honest dealers unnecessarily, yet would do nothing to remedy other deceptive practices by dealers. Part IV of the order, therefore, requires Figgie to obtain written assurances that its dealers will conform their practices to this order, to cease selling fire warning devices to any dealer who does not provide such assurance, and to investigate and make good faith efforts to resolve any consumer complaints about deceptive practices by its dealers.

E. Part V of the Order

Part V of the ALJ's order has been amended to require Figgie to maintain and make available for our inspection copies of each complaint it receives about a dealer's sales practices and records of its investigation and disposition of each of those complaints. [46]

F. Parts VI and VII of the Order

Parts VI and VII of the ALJ's order have not been changed.

VIII. CONCLUSION

The ALJ's initial decision is affirmed in part and modified in part, and the attached order is entered.

STATEMENT OF COMMISSIONER PATRICIA P. BAILEY
CONCURRING IN PART AND DISSENTING IN PART

The Commission rules today that respondent Figgie International, Inc. (Figgie) misrepresented the performance of its Vanguard heat detectors. I agree. Figgie claimed that its heat detectors "provide the necessary warning to occupants to allow them to escape safely" from residential fires. That is untrue for nearly all residential fires, and the Commission's order prohibits Figgie from repeating that claim.

The complaint in this matter also alleged that respondent claimed that its "fire alarm systems combining heat detectors and smoke detectors provide *significantly greater* fire warning protection for occupants than smoke detectors alone." Complaint para. 5 (emphasis added). The Commission agrees that this claim was made in three forms, but concludes that complaint counsel failed to prove that two of them were false.¹ I believe [2] complaint counsel adequately proved that heat detectors do not provide "significantly greater" protection in any of the three fashions claimed, and so I dissent from that part of the Commission's opinion.

Figgie made the following statements, all of which contribute to the notion that heat detectors provide significantly greater protection from fires than smoke detectors alone: "HEAT DETECTORS HAVE PROBABLY SAVED MORE LIVES AND PROPERTY THAN ANY OTHER FIRE DETECTION DEVICE" (CX 63); combining heat detectors with smoke detectors gives consumers "the combination needed to give a greater measure of life safety" and is needed "to maximize

¹ The opinion examines three different ways in which Figgie represented that its heat detectors were significantly better than smoke detectors alone: in their response to hot, flaming fires; in their ability to be located where smoke detectors are not recommended; and in their mechanical reliability. The Commission rules the first claim deceptive, and I agree. My dissent focuses on the resolution of the second two claims. I join the Commission's opinion and order in all other respects.

chances for survival" (CXs 69, 68); and "to have adequate protection, the home must have heat detectors as well as smoke detectors." (CX 130) In the face of this and other evidence, the ALJ found that a claim of "significantly greater benefit" was made, and the Commission expressly adopts that conclusion. Opinion at 11 & n. 12.

The record evidence of how heat detectors actually perform compared to smoke detectors contrasts sharply with the picture Figgie painted in its advertising and marketing materials. For example, Figgie claimed that its heat detectors are significantly more protective because they can be placed where smoke detectors are not recommended (such as kitchens, garages, and attics). However, the expert testimony and test data introduced at trial establish that this confers virtually no life safety protection benefit over smoke detectors because smoke detectors almost always alarm before heat detectors, regardless of their [3] respective locations.² Figgie also claimed that heat detectors provide significantly more protection because they are mechanically reliable. Smoke detectors, which rely on outside power sources, are theoretically less reliable than mechanically operated heat detectors. But the most reliable empirical data in [4] the record suggests that the difference is quite small so that characterizing it as "significantly greater" life safety protection is inaccurate.³

Moreover, this record demonstrates that: (1) smoke detectors provide the best protection for saving lives in case of fire; and (2) heat detectors, wherever placed, do not alarm soon enough to allow safe

² The record includes a test report in which a heat detector was placed in a kitchen and a smoke detector was placed in an adjacent hallway; after a fire was set in the kitchen, the smoke detector located elsewhere in the house alarmed before the heat detector located in the same kitchen. (I.D. 149) While this represents the result of only a single test, the conclusion about the respective performance of the devices holds true in almost all cases, according to experts who testified. They asserted that smoke detectors would almost always alarm before heat detectors because smoke disperses quickly and evenly throughout a home, while heat buildup is highly uneven. Detectors that react to smoke are not limited in space coverage the way that detectors that react to heat are. As a consequence, these experts testified that heat detectors would *not* significantly increase consumers' life safety potential and would provide only marginal benefits by increasing property protection. (Bukowski Tr. 1058-59; Clark Tr. 711-12).

Other test data in the record confirm that smoke detectors virtually always outperform heat detectors, regardless of location. For example, the Indiana Dunes I and II tests, showed that heat detectors provided no increase in escape time compared to smoke detectors. (Bukowski Tr. 988-91) In Dunes I, heat detectors never activated first and in one-third of the tests no heat detectors ever activated at all. (Bukowski Tr. 986) In Dunes II, not one heat detector alarmed in time to provide three minutes of escape time. (Bukowski Tr. 991) The California Fire Chiefs' tests, which included tests where fires were set in the kitchen, similarly reported that heat detectors never responded first to fires. (Martin Tr. 879) The Commission's opinion discounts the results of these tests because it claims the tests measured only comparative heat and smoke detector performance in the same room. However, each test involved detector arrays in several locations in each house, so that the responses of heat and smoke detectors in different rooms were recorded and compared. The results show that smoke detectors alarmed in time to give the necessary three-minute warning in 89 percent of the tests in Dunes I, and that heat detectors added *no* increase in protection. (Bukowski Tr. 980, 982-83).

³ The only objective data on comparative smoke detector reliability are from three tests, one showing a failure rate of approximately two percent per year, another showing a failure rate of eight percent over several years, and a third showing that 16 percent of smoke detectors surveyed in the field over an indeterminate period were not operational. (Bukowski Tr. 1048) Because the definition of failure used to compile these figures encompasses a range of performance well short of mechanical failure—such as slight decreases in smoke detector sensitivity and removal of batteries (Bukowski Tr. 1051)—the rates of actual smoke detector failure are even lower than these figures suggest.

escape in most residential fires. Since heat detectors do not allow consumers to escape safely from most fires, but smoke detectors do, it is difficult to understand how heat detectors could be said to provide "significantly greater" protection than smoke detectors, or even any "significant" degree of protection at all.

The Commission's failure to enter a finding that Figgie's "significantly greater" benefit claims are deceptive stems primarily from what I believe to be a misreading of the complaint and complaint counsel's burden. The Commission agrees that the relevant claims were made and reaches conclusions not too dissimilar from my own about what level of increased protection heat detectors provide in the two situations in dispute. However [5] the Commission then asks not whether that level of increase is "significant," but whether even a small or slight increase might nevertheless be "important" or "meaningful" or "significant" to at least some consumers. This is the crux of the Commission's error: a shift in emphasis away from the complaint's focus on whether the *increase* is significant and towards a new focus, not pled in the complaint and thus not litigated at trial, on whether the *protection* is or may be significant to some consumers.⁴

While this may appear to be only a subtle shift in emphasis, it reverses the result in the case. I would prohibit Figgie from repeating any claims to the effect that heat detectors provide "significantly greater" protection than smoke detectors, although I would permit the company to publicize whatever marginal increases in protection are demonstrated by the evidence because I agree with the opinion's conclusion that some consumers might consider even slight increases in fire protection "important" (particularly if they are highly risk averse). The Commission appears to agree that at least some of Figgie's increased benefit claims are false (concluding, for example, that placement of heat detectors confers only a "slightly," not a significantly, better level of protection), but refuses to ban those false claims [6] outright because complaint counsel failed to prove that no one would find slight increases in fire protection significant.⁵

I think the opinion is trying to say that if consumers have no other protection, then heat detectors in their garages may help to prevent property damage, and that should consumers with smoke detectors fail to maintain them then a heat detector may provide an alarm that

⁴ This focus is especially curious since the actual claims Figgie made did not by any stretch of the imagination suggest that heat detectors added only slight increments of protection that could be important to some people. To the contrary, Figgie repeatedly stressed that consumers' chances for survival were significantly greater, or "maximize[d]," with heat detectors and that smoke detectors alone were inadequate to save them and their families from death by fire.

⁵ The suggestion that complaint counsel should have provided testimony or survey evidence to show what level of additional protection consumers find "significant" is in my view unwarranted. See Opinion at 33. Once the Commission determines what claims Figgie made, this case simply does not present questions of consumer perception. Surely the Commission does not mean to suggest that complaint counsel must prove first that a claim is false as a matter of scientific fact and second that it is false in the subjective view of consumers.

is late, but better than nothing. In other words, the Commission believes Figgie should be allowed to continue selling heat detectors to consumers who are sufficiently risk averse that they are willing to spend between \$500 and \$600 for a heat detector system that adds at most a slight increment of protection to smoke detectors. I do not disagree with that goal. I simply disagree with the notion that Figgie can continue to sell its heat detectors by convincing consumers that they are more valuable, and more beneficial in protecting the lives of consumers and their families, than the evidence shows to be true.

My dissent is tempered only by the fact that the order entered in this case prohibits Figgie from making performance claims for its heat detectors which cannot be substantiated. I believe the record of this proceeding contains clear evidence that Figgie cannot substantiate claims that its heat detectors [7] provide "significantly greater" life safety protection than do smoke detectors alone. For that reason, therefore, the order should have the effect of restraining Figgie indirectly from making exaggerated claims of this kind in the future. But there is not the slightest reason, on this record, to have left open any doubt on this point. Figgie's heat detectors do not provide "significantly greater" fire warning protection for occupants than smoke detectors alone, and Figgie should have been told directly in the order not to make that claim again or any of the statements that contributed to it.

FINAL ORDER

This matter has been heard by the Commission upon the appeals of respondent and complaint counsel from the initial decision, and upon briefs and oral argument in support of and in opposition to the appeals. For the reasons stated in the accompanying opinion, the Commission has denied the appeal of the respondent and has granted in part and denied in part the appeal of complaint counsel.

It is ordered, That the initial decision of the administrative law judge be adopted as the findings of fact and conclusions of law of the Commission except where it is inconsistent with the accompanying opinion. Other findings of fact and conclusions of law of the Commission are contained in the accompanying opinion.

It is further ordered, That the following order to cease and desist be entered:

I.

It is ordered, That respondent, Figgie International, Inc., its successors and assigns, and respondent's officers, agents, representatives

and employees, directly or through any corporate or other device, in connection with the advertising, offering for sale or distribution of any heat detector or any residential fire alarm system containing a heat detector, as the term "heat detector" is defined by the National Fire Protection Association's Standard 74, in or affecting commerce, as "commerce" is defined in the Federal Trade Commission Act, do forthwith cease and desist from: [2]

A. Representing in any manner, directly or by implication:

(1) That heat detectors provide the necessary warning to allow safe escape from most residential fires; or

(2) That fire alarm systems combining heat detectors and smoke detectors provide significantly greater fire warning protection than smoke detectors alone because heat detectors give earlier warning of hot, flaming fires.

B. Misrepresenting in any manner, directly or by implication:

(1) The performance characteristics of any heat detector or any residential fire alarm system containing a heat detector including, but not limited to, the capability of the heat detector to provide the necessary warning to occupants to allow them to escape safely in the event of fire; or

(2) The existence or content of any standard or recommendation established or made by the National Fire Protection Association or any other entity regarding the location, number or type of fire protection devices to be installed in a residence, or compliance of any heat detector or residential fire alarm system containing a heat detector with any such standard or recommendation; or

(3) The performance characteristics of any smoke detectors or any residential fire alarm system containing a smoke detector; or

C. Representing in any manner, directly or by implication, the performance characteristics of any heat detector or any fire alarm system containing a heat detector including, but not limited to, the capability of the heat detector to provide fire warning protection, unless at the time of making any such representation respondent possesses and relies upon competent and reliable scientific evidence which substantiates such representation.

II.

It is further ordered, That respondent shall, within 120 days from the date of service of this order, include the following notice in all print advertising or print promotional material for all heat detectors manufactured or sold by respondent or for any fire warning system

containing such heat detectors, if that advertising or promotional material expressly or impliedly represents that heat detectors provide the necessary warning to [3] allow safe escape in the event of fire or that a combination system of heat and smoke detectors provides significantly greater protection than smoke detectors alone:

NOTICE: Smoke detectors give earlier warning than heat detectors in nearly all residential fires. That is because detectable amounts of smoke almost always develop before detectable levels of heat.

The above-required language shall be printed in a typeface and color that are clear and conspicuous, and, in multipage documents, shall appear on the cover or first page. Nothing contrary to, inconsistent with, or in mitigation of the above-required language shall be used in any advertising or promotional materials. With respect to any film, video tape, or slide promotional material, the above-required language shall be included both orally and visually within the first minute of the presentation, in a matter designed to ensure clarity and prominence.

III.

It is further ordered, That respondent shall, within 180 days after service of this order, send by first-class mail, to each identifiable purchaser of respondent's fire alarm products since January 1, 1979, the disclosure required by Part II.

Purchasers shall be deemed identifiable if they can be traced using warranty cards or testimonial letters in respondent's possession and/or using sales records maintained by respondent's dealers.

IV.

It is further ordered, That respondent shall:

A. Distribute a copy of this order to all of its officers and to all employees, agents or representatives having sales or promotional responsibilities with respect to the subject matter of this order. The respondent shall also distribute a copy of this order to each dealer of its fire alarm products.

B. Provide each of its dealers with a form clearly stating that dealer's intention to conform his or her sales practices to the requirements of this order.

C. Cease selling its fire warning devices to any dealer who does not

sign and return that form to respondent or fails to conform his or her sales practices to the requirements of this order. [4]

D. Investigate and make good faith efforts to resolve any complaints it receives that any dealer has failed to conform his or her sales practices to the requirements of this order.

V.

It is further ordered, That respondent shall maintain such documents as will demonstrate compliance with this order for a period of three years from the date the document is created or used, whichever is later. Such documents shall be made available to the Commission or its staff for inspection and copying upon reasonable request and shall include, but not be limited to, the following:

(a) A copy of each nonidentical form of promotional and training materials disseminated by respondent;

(b) The name and last known address of each dealer of respondent's fire alarm products;

(c) The name and last known address of each purchaser identified under Part III of this order; and

(d) A copy of each complaint it receives that any of its dealers has failed to conform his or her sales practices to the requirements of this order, and a record of the investigation and disposition of the complaint.

VI.

It is further ordered, That respondent shall notify the Commission at least thirty (30) days prior to any proposed change in the corporate respondent such as dissolution, assignment or sale resulting in the emergence of a successor corporation, the creation or dissolution of subsidiaries or any other change in the corporation which may affect compliance obligations arising out of the order. [5]

VII.

It is further ordered, That respondent shall, within 120 days after service upon it of this order, file with the Commission a report, in writing, setting forth in detail the manner and form in which it has complied with this order.

Commissioner Bailey concurred in part and dissented in part and Commissioner Strenio did not participate.

IN THE MATTER OF
FLOWERS INDUSTRIES, INC.

MODIFYING ORDER IN REGARD TO ALLEGED VIOLATION OF SEC. 5 OF THE
FEDERAL TRADE COMMISSION ACT AND SEC. 7 OF THE CLAYTON ACT

Docket 9148. Consent Order, Nov. 3, 1983—Modifying Order, April 16, 1986

The Federal Trade Commission has modified a 1983 consent order with Flowers Industries, Inc. [102 F.T.C. 1700], a Thomasville, Ga. baker, by appointing a trustee to divest two bakeries and extending for six months the deadline for the divestitures.

ORDER MODIFYING ORDER TO DIVEST

On November 3, 1983, the Commission issued its order in this matter requiring, *inter alia*, that respondent Flowers Industries, Inc. ("Flowers") "divest itself absolutely and in good faith of the High Point Bakery Plant . . . [and] of the Gadsden Bakery Plant to an Eligible Person including, without limitation, land, buildings, fixtures attached thereto, machinery and equipment." As of the date of this order, neither plant has been divested by Flowers. Because it appeared that the public interest would be served by modifying the order to allow for the appointment of a trustee to accomplish divestiture, on March 19, 1986, the Commission issued its Order To Show Cause Why Order Requiring Divestiture Should Not Be Modified ("order to show cause") pursuant to Section 3.72 of the Commission's Rules of Practice. The order to show cause proposed the insertion of a new Paragraph VII of the order to appoint Graham Humes of Mellon Bank (East) N.A. as trustee. On March 31, 1986, the order to show cause was served on Flowers, and Flowers answered on April 2, 1986, stating that it consents to the modifications.

After reviewing Flowers's answer and the materials submitted with its compliance reports, the Commission has concluded that the public interest warrants modifying the order as proposed in the order to show cause. As the Commission observed in the order to show cause, the appointment of the trustee appears likely to advance the remedial objectives of the order.

Accordingly,

It is hereby ordered, That pursuant to 15 U.S.C. 45(b), and Section 3.72 of the Commission's Rules of Practice, 16 C.F.R. 3.72, (1) Paragraphs VII, VIII, IX, X and XI of the order in this matter be modified to renumber these Paragraphs VIII, IX, X, XI, and XII respectively, and (2) a new Paragraph VII be added to the order, as follows: