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Richard Stern
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U.S. Consumer Product Safety Commission
Washington, DC 20207-0001

March 7, 2006

Subject: FPE Circuit Breakers - Field incidents of fire and personal injury.

Dear Mr. Stern:

Regarding my request for CPSC to update its information on FPE circuit breakers, you have asked for supporting information on two points; that failing FPE circuit breakers are contributing to fire and personal injury losses, and that CPSC's 1983 press release on its FPE investigation is being misinterpreted and/or misused. This letter responds to the first point, and a companion letter will follow responding to the second.

Following are 50 summary accounts of some of the incidents that I am aware of. Most of these come to me via Mr. Daniel Friedman, who maintains a website for home inspectors and homeowners. Copies of the original documents are enclosed. Please note that the names and EMail addresses of the people involved should not be used or made public without their consent.

The hazards that are depicted in these incident reports are predictable from the results of the original CPSC investigation. I trust that this collection of fire and incident reports will motivate CPSC to revise its outdated and ambiguous consumer safety information on FPE breakers and panels.

Yours truly,

[original signed by]

Jessse Aronstein, Ph.D, P.E.

1. Newspaper Article, 2/3/99, "Home Fire Attributed to Circuit Breaker" (NJ, Dateline Journal)

"A Washington Avenue fire may have been caused by a faulty circuit breaker that has a long history of being undependable according to Fire Prevention Officer David Meisenberg, ..." " .. when rafters in the space between the attic and the ceiling of the room below caught fire from overheating wires." "...what probably happened at the Washington Avenue home is that the circuit breaker did not stop the flow of electricity through an abnormally stressed circuit. The wires overheat, like those in a toaster. Instead of burned toast, burned beams resulted, since the wires were tacked to them in accordance with the code. ..." "...identified the trouble prone switch box as an old Federal model ..."

2. EMail 8/7/99

"Last month a co-worker was responding to an apartment maintenance request ... he found the breaker on ... and no lights, he said he had power on the load side. Thinking that there was a loose connection at the first fixture he returned to the shop for a ladder. What we didn't know was that the problem was a short and that the Federal Pacific breaker had failed to trip. We never had a chance to return with the ladder, the fire department interrupted our repair. Nobody was at home so nobody was hurt. Five homes were left uninhabitable and the damages will probably reach $500,000. Not bad work for one faulty 15 amp breaker. ..."

3. EMail 8/17/99

"We sustained a horrible fire in January of this year. It was stated by the fire officials in our county that it was a BX blow out. Electrical wiring in the wall. We did have a FP electrical panel at the time. We were later told that the fire may not have occurred IF the FP electrical panel had done its job of "shutting" activity down so to speak. Forgive my poor terminology and my novice perspective. We have spoken to many electricians in the interim and were told that FP electrical panel was a horror. ..."

4. EMail 2/4/02

"I have a Federal Pioneer panel in my house with stab lock breakers. On two separate occasions breakers have failed to trip under a short circuit condition. One was a 15A single pole and the other was a 20A double pole. I am quite concerned about this ..."

5. EMail 6/24/02

"Doing an inspection last week, I found a Federal Pacific main panel with Stablock Breakers in place. No service disconnect, house not occupied, so I decided to trip some breakers. I tripped a 50 amp breaker to the kitchen oven and microwave unit in a newly remodeled kitchen. The breaker clicked to the off position with no problem, but the circuit stayed hot. Tripped it off and on several times and no change or loss of power to the oven set. I then tried the dryer circuit. Tripped a 30 amp breaker to the dryer then checked outlet with a stinger and found this circuit was still hot. Two out of three two-pole breakers were faulty. That's scary if you think of a home owner doing some repairs and modifications to something and expecting the circuits to be dead after flipping the breakers off. These things just don't work properly."

6. EMail 7/12/02

"We had a fire in my home Tues. due to over-current and FPE Stab-Lock Panel 100amp service. The panel failed to trip and fire occurred within a wall. We have been in this home one month. the home was inspected and we were given no warning about FPE panel. ..."

7. EMail 8/19/02

"I had the fuses in our home replaced by a Federal Pacific panel and breakers approx. 25 years ago. There have been 3 occasions when I thought the breaker should have tripped and it did not. The last time this happened was about 3 weeks ago. I consulted a electrician and he stated that these breakers are defective and should be replaced. ..."

8. EMail 10/22/02

"This story really helps to put in perspective that experiment that Alan, John, and I did a few years ago, where the FPE breakers wouldn't trip even though the service wires were whipping around from the high currents being carried through those breakers."

9. EMail 12/24/02

"... A gal in her 90's had an electrical fire a few nights ago. ..... I removed a burnt-up 240v electrical baseboard heater and discovered that the circuit remains hot with the main switched off. ..... It is a 200 Amp (doublethrow 100 amp) Federal Pacific Electric breaker. ..."

10. EMail 4/30/01

"I have made a report that has opened up a lot of discussion and concerns about FPE breakers and panels. These are located in all the ICBM sites. It seems (nobody is admitting, yet) a bad fire tood place at one of the sites and the strong suspect is the FPE breaker/panel. ..."

11. EMail 5/2/01

"My neighbor has a 1974 mobile home, the FPE panel is in... ... The Main breaker switch on the panel has been tripping during operation of - or when turning up the thermostat on - the furnace. The circuit breakers (4 ganged to two of 2 ea.) have not been tripping. Only the Main trips. ... "

12. EMail 5/14/01

" ... Just as I was screwing down the panel it blew up and flames shot out. It kept on arcing and buzzing. It kept on going and the main breaker didn't trip. Finally, I heard a power line fuse blow somewhere in the neighborhood and it finally stopped. ... "

13. EMail 10/13/01

" ... I have been a practicing electrician in Philadelphia for 15 years and have experienced some anecdotal evidence of problems with the FP single pole breakers... in each case, large scale fire involvement of the homes was prevented only by metallic wall cases which contained fire until the conductors themselves had melted 'open', thus interrupting current flow. The circuit breakers remained on! ..."

14. EMail 11/10/01

"If I had received this info sooner I would have held on to what was left of FPE TYPE-NEJ 240 VOLT 150AMP breaker and sent it to you ASAP. The inside of that breaker was in incredible condition, the rust was unbelievable it was like opening a rotten peanut ..."

15. EMail 1/7/00

" ... Last week I had to work on an electric furnace in an older mobile home that has a 200 amp FPE entrance panel in it. The problem turned out to be the 100 amp breaker that feeds the furnace. It was apparently original to the trailer and would not hold. The customer was able to locate a new 100 amp FPE breaker at a local home center (I was very surprised about that!) which they bought and I installed. This morning they called in to the office and said that the fire dept. had just left, and that the furnace had caught on fire. ... The customer told me that he heard what sounded like a loud firecracker and when he opened the front of the furnace he said that sparks were flying everywhere so he shut off the main breaker and threw water on the furnace. What I found was that something (chaffing?) had caused the wire to short and the new 100 amp breaker never did trip. It had arced enough to melt a hole in the bottom of the box where the electric feed enters the furnace. ..."

16. EMail, 5/16/00

" ... I was inspecting a project in Vancouver, when the manager was paged to respond to a fire that had just started in one of the units! Hot Damn! It was the 2-pole breaker for the clothes dryer that caught on fire. The bus bar was just about black in places. ..."

"Last year, I was inspecting a run-down shack that a friend of mine had just bought. ... I spied a Stab-Lok panel with its cover missing and cut live wires sticking out of it like a porcupine. I asked if we could do an experiment. We laid a pipe across an ironing board and touched the live wires to it. It made a dandy welder. We could make arcs all day and that breaker stayed in the on position like a real champ. Six out of the ten breakers in that panel behaved that way. The other four tripped reliably over and over."

17. EMail, 2/7/04

"... I just replaced a Stab Lock panel on 2/4/04. I've had some problems with breakers fail to trip."

18. EMail 7/3/04

"Here is a picture of a FPE panel where the aluminum single strand wire overheated for the AC condenser while I was inspecting it and the breaker did not trip. I tripped the breaker manually three times before the condenser would shut off."

19. EMail, 9/13/04

"I just found and read your articles about faulty circuit breaker boxes. They were very interesting to me as our house in Madera California burned down in Oct. of 1980 due to a faulty Reliance/Exxon circuit breaker. (It didn't trip.) Our fire inspector was Sam Garza who found the problem. Our insurance company (Farmers) ended up winning a lawsuit against Reliance/Exxon ..."

20. EMail 12/19/95

"I am a electrical contractor in south eastern Idaho ... my experience with FPE panels is they will not trip which causes fires and numerous other problems."

21. EMail 3/30/05

" ... I found out for myself these things do not work. I was fortunate there was no fire. Had I not been there when it happened, there probably would have. It does not trip."

22. EMail 2/23/03

" ... Also, we recently installed a window air conditioner in the master bedroom. We have used it plugged into a 15 amp wall duplex. At first it would trip the breaker if anything else plugged into the circuit was turned on. .... Recently, I checked it by turning on other appliances with the AC in operation. The 15 amp breaker did not trip but the AC seemed to load down when the compressor came on. Turning off other appliances on the circuit made the AC resume normal operation. In the test, the circuit breaker did not trip. ..."

23. EMail, 2/11/03

" ... I had a pair of Klein short handled needle nose pliers that I was using to remove a KO in the bottom of an old FPE breaker panel. ..... I didn't know the side of a #10 wire of a dryer circuit was pushing outwards at the hole opening. It became trapped in my twisting motion.

A massive WWAAAUUUUGGGGHHHHH arcing noise ensued and then stopped. The wire burned apart from the dead short I produced, burned a big notch in my pliers, and when I went to inspect the circuit it was still live. The 30 amp 2 pole FPE breaker turned steel to molten metal on my pliers in a dead short but did not trip."

24. EMail 3/7/03

"I'm an electrical contractor in the SF Bay area and have a lot of exposure to FPE panels. I will not work on one nor add any circuits to it unless the client absolutely cannot afford to replace it, and even then only with a letter of release of liability.

I did one service change for clients in Berkeley, where they were getting some very strange electrical behaviors, odd dimming and brightening of lights, trouble with computers, etc. until half the house went dead. They had a 100A, 240V main (FPE) in which one hot leg was very hot to touch, discoloration and cracking of the outer shell of the breaker, the breaker handle in the 'on' position, and the other hot leg open. It appeared that there had possibly been an overload condition on the one hot leg, the breaker had tried to trip and had jammed, and the clients had moved a lot of their loads to the other hot leg creating an overload condition on it. The breaker was not tripping. Pretty much the classic FPE failure."

25. EMail 4/26/03

"I am an electrician in Colorado Springs. While moving a single pole breaker in a Federal Stab Lock panel it caught fire. It completely melted the buss bar and smoked the homeowners home. It appears to be a buss bar failure. ..."

26. EMail 11/5/05

" ... I have had 2 instances where one could have expected a tripped circuit breaker. One was a locked rotor on my HVAC system outdoor unit fan. While this motor is impedance protected, I am suspect. The other instance was where a console TV set burned out.

I am a licensed master electrician in Virginia with 30+ years of experience ..."

27. EMail 2/3/98

" ... Back in late 1981 or early 1982 I accidentally drilled into my range feeder. Although I had recently exercised my breakers, and in spite of the fact that I vaporized the tip of an Irwin Speedbore drill bit, and about 3/8 inch of one side of a No. 6 service entrance cable, neither the feeder nor the 150 amp main tripped."

28. EMail 11/22/97

" ... I have tested a 20 amp FPE breaker with 72 amps on a 12 gauge wire. The explosion that occurred when I tried to turn off the breaker left permanent scars on my right hand and left arm. Also, a 3 pole 70 permitted a 10 HP 3 phase motor to melt the Allen Bradley Contactor, the load wires, and part of the line wiring, without tripping. The motor melted internally. ...

29. EMail 10/16/9

" ... Federal Pacific Electric ... I have some experience with them that may be interesting to you.

I have been working on making portable circuit breaker testers for a few years now. I tested one of them on my home' panel's breakers and it worked great. Then I went to my parents' house to show them the great thing their son had mad and no matter what I did their breakers did not respond (they would not trip). ... I did experiments where I would drop an 800 amp resistive load (virtually a short circuit) for a short period of time and also where I placed a 40 and 80 amp resistive loads for extended periods of time. I even wired up a separate circuit next to the panel with 12g wire so I wouldn't have to take the old wiring into account.

Nothing had any effect. They behaved as if they were pieces of wire. In fact, I have not been able to get them to trip under any circumstances! ... I purchased new FPE breakers, but they performed no better. ... Personally I can't believe there is still any sort of debate about all this. It's crazy."

30. EMail

"Back in 1993, my employee with ten years experience had to tackle a Federal panel. The problem was the main breaker had burnt up and it was during the winter months here in NJ. Being that we did not have a replacement he bypassed the main. After getting the power back on, as he was pushing and reseeding the breakers and all of a sudden the panel blew up in his face causing him to have first and second degree burns on his face and hands. Although bypassing the main wasn't the smartest thing he had done but for a temporary solution getting the power back on so that the pipes would not freeze. Just so you know this job was done at 11:30 PM so that a panel change or service change was out of the question. ... There is no doubt in my mind that Federal Pacific breakers and panels are dangerous ..."

31. EMail

" ... these panels fail at the contact point of the bus, causing extreme heat and cause the entire panel to fail."

32. EMail 1/4/99

" ... I have two FPE panels in my home installed around 1989. I have single pole 120V breakers that will not trip. I recently took a hot line and touched it to ground. The circuit draw was so large that every light in the house dimmed but the breaker never tripped. After this incident I began to check further. I placed a 40 amp load on a 20 amp circuit. Same result no breaker trip. ... I know I am sitting on a fire waiting to happen."

33. EMAil 2/10/99

" ... Our insured owns a large chicken broiler barn that is wired with FP panels and Stab-lok breakers. He is worried about an electrical fire as he has had more than one failure on those breakers. ..."

34. EMail 2/17/99

" ... I didn't know anything about FPE circuit breakers until I read on a local newspaper that a house fire was due to FPE breaker failure. Two days ago, my kid was playing Nintendo and suddenly the lights went off . Quickly, I went to check the service panel and the FPE breaker for that circuit failed to trip. I touch the circuit breaker and it felt hot. I manually shut the breaker off. A few hours later, I opened the service panel and the 12 gauge wire was completely burned. The 15 amp breaker had a hole burned on both sides. ... Also, I had to replace the breaker above and below it, because of burned damage. I am planning to replace the service panel to avoid a fire waiting to happen. ..."

35. EMail 3/19/99

" ... The 1974 house we moved into last July had this box. We recently had it replaced and found the breaker to the dryer fried in just the way described. Our electrician was astonished. Two others we had bids from dismissed our concerns with contempt. ..."

36. EMail 2/8/97

" ... There is a Federal Pacific main/distribution panel on the exterior and a Federal Pacific subpanel in the garage. The garage subpanel failed, either with a 240v breaker or at the connection to the bus bars. This caused a direct short (enough that when we energized it the service drop wires to the house bounced several FEET in the air from the suddenly induced magnetic fields). The FPE breaker feeding this subpanel did not trip, even under this direct short circuit condition. All it did was make a violent buzzing/clicking sound. So we had a multiple FPE failure. ..."

37. EMail 8/15/97

"In all my years as an electrician, since 1978, I have never witnessed anything so unreliable. I've seen 20A single pole breakers with dead shorts that just sat and buzzed and stank, but they did not trip. ... "

38. EMail 11/8/98

" ... My home was equipped with Federal breakers and on the morning of October 24th of this year they nearly caused a serious loss ... Life! The circuit that was supposedly "protected" failed to trip causing a fire in my sons bedroom and had he not awakened because of the heat and alerted the household to the fire, we surely would not be here today. ... "

39. EMail 3/25/98

"Dan, ran into a FP "stab-lok" yesterday. House built in mid 1960's, evidence of scorching at the main breakers behind the dead front panel. ..."

40. EMail 5/13/98

" ... An inspector I helped train in the Reading PA area was changing a door frame in his basement. With the jamb removed he gazed into the wall cavity and was dumbfounded when he observed that the wiring within the wall cavity was devoid of any insulation. It had all burned away. He called me to discuss this. My first question was what type of panel did he have? Federal Pacific Stablocks. The fried circuits were for his basement shop where he had always been amazed that he could run so many tools simultaneously and never cause the breakers to trip. ... "

41. EMail 8/4/98

" ... my wife was home doing the laundry, when all of a sudden the dryer was smoking profusely. She immediately pulled the plug and called me. I had her check the circuit breaker and sure enough, it was not tripped. The dryer motor was completely burned out. ... "

42. EMail 2/4/03

" ... I recently installed a ceiling fan and accidentally shorted the circuit, and no breaker kicked. ... "

43. EMail 6/18/98 (Towson University)

" ... We have been increasingly concerned over the past 5 years regarding the FPE breakers as during maintenance shutdowns and testing we found a number of them unable to open and at least half did not pass the most basic of tests.

On June 13, 1998 , we had a major failure in one of the 50 amp breakers causing a fire in our University Union building doing several thousand dollars worth of damage, fortunately no one was injured. Our failure occurred when the third leg of the switch failed to open and welded the contacts shut, the secondary breaker failed to open as well and the problem went straight to the primary.

Upon testing prior to restart of the system, we found that over half of the 18 breakers and switches in the panel would not pass.

We are in the process of removing all of the Federal Pacific breakers in our buildings as quickly as we can."

44. EMail 8/3/04

" ... a couple of months ago, my commercial field underwriter mentioned the problems with FPE equipment and, since my residence had been updated with a 200 amp FPE system in 1079, I thought perhaps I should have an electrician check things out.

The findings were identical to what you indicated in your article including but not limited to a "fried" 100amp main breaker in the sub-feed panel. ... It's just a shame the general public is not more aware of this very serious potential problem."

45. EMail 4/1/04

"Last week I was performing a service call and I tried to trip out a 1 pole, 15 Amp FPE circuit breaker at the receptacle side so that I could easily locate said circuit in the panel.

This is the honest to goodness truth, I COULD NOT trip out the circuit. ..."

46. EMail 3/8/04

" ... I accidently shorted the hot wire to the neutral and the wires welded themselves together, momentarily and the insulation on the wires actually flamed up! I couldn't believe the breaker didn't trip. ..."

47. EMail 3/8/04

"I am a homeowner who was looking for a replacement breaker for my panel and came across your information concerning the Federal Pacific double pole breakers. Approximately a year ago I had a 30 amp double pole that had actually been on fire enough to have charred the plastic. This was a breaker for my clothes dryer. ..."

48. EMail 3/12/03

"Recently there was a minor electrical fire in my house. ... The equipment is from Federal Pacific."

49. EMail 2/13/06

" ... and one of the Stab-Loc connectors had been previously arcing and had melted. ..."

50. EMail 5/10/97

" ... I do have one FPE tale to tell: A few years ago I was working on an old split bus panel. A 2 pole breaker was open circuited. There being no main in a split bus I began to pry out the offending breaker. To my horror I saw, too late, that the breaker had burned out leaving nothing but charred bakelite ... "