



## Federal Pacific Electric (FPE) Electrical Hazards Website

Information for building inspectors, home buyers, home owners, electricians exploring the background of possible hazards associated with Federal Pacific Electric Stab-lok circuit breakers and service panels.

Federal Pacific Electric "Stab-Lok" service panels and breakers are a latent hazard and can fail, leading to electrical fires. The problem is that some double-pole (240-Volt) FPE circuit breakers and possibly also some single-pole units simply may not work. We also have reports that independent of the breaker problems, there have been panel and panel-bus fires and arcing failures in some equipment. [The failure rates for these circuit breakers](#) were significant and are documented in [the CPSC study](#). Additional independent testing and research are on-going and will be reported here - watch for articles marked **NEW!**

### Federal Pacific Electric Stab-Lok Circuit Breaker Articles and Failures Research


- **NEW!** [2004 FPE Update: St. Louis ASHI Seminar](#) including: Hazard Summary & Independent Tests confirms Stab-Lok failures
- **NEW!** [2004 FPE Update: Exxon Buys a Scandal Along With A Company](#) Business Week Article 7/21/80 now available on line
- [2003 A Summary of the Main Problem: Federal Pacific Stab-Lok Electric Panel and Circuit Breaker Hazards](#)
- [2003 Federal Pacific Electric Breakers](#) - an encyclopedic account of FPE StabLok deficiencies and hazards by Renowned Home Inspector, Educator, and Code Check author Douglas Hansen. [Code Check](#) offers building code inspection guides for field use, and links on codes and failures. 11/2003



- [2000 FPE breakers fail in lab test of field-supplied panel 10/00](#)



- [1999 Failures continue: FPE breaker fails, results in fire: field report 12/99](#)

- 1999 The International Association of Electrical Inspectors (IAEI) published (6/99) an inaccurate article asserting that there is no hazard with FPE Stab-Lok equipment - [OUR REPLY disagreed and cited authoritative data](#) found here along with followup notes.
- [1999 Home Inspection Reporting Language and discussion for FPE panels](#)
- [1997 Schneider Canada Federal Pioneer circuit breaker recall](#)
- [1995 Federal Pacific Electric Panels: Fires Waiting to Happen, Debate Waiting to Be Ended](#) - original text article from which this summary was extracted.
- [1983 CPSC Investigation of FPE Circuit Breakers](#) Safety Information for Consumers
- [1982 CPSC Calibration and Condition Tests of Molded Case Circuit Breakers, Final Report](#) December 30, 1982, summary pages, indicating **failure rates found for FPE Stab-Lok circuit breakers**
- [1982 Reliance Electric Co. SEC Quarterly Report](#): Note C. reports litigation between Reliance and UV Liquidating Trust and contends that "... **improper and deceptive practices were employed for many years to secure UL listings** for Federal Pacific's circuit protective products..."
- [1980 Reliance Electric Co. Press Release](#): **improper practices** improper practices used to obtain UL Listing for most of FPE's circuit breakers and notes testing which indicates "possible defects." 1980, Reliance Electric Co.
- **For FREE home owner and home buyer information** see  [The Home Inspection and Construction Information Website](#)
- [Contact the Author](#)
- [FAQ: Website Credibility](#)

## A Summary of the Problem: Federal Pacific Stab-Lok Electric Panel and Circuit Breaker Hazards

Having reviewed documentation regarding this issue, and having discussed the issue with forensic experts in the field, I am convinced that a latent hazard exists where FPE Stab-Lok circuit breakers continue in use. The hazard is worst for double-pole breakers. Published reports of actual tests that were performed indicate that under certain conditions it is possible for one leg of these circuits to attempt to trip the breaker, resulting in a jammed breaker which will afterward not trip under any load condition. I infer from the Commission final press release in 1983 that the manufacturer and some Commission members were of the opinion that these conditions would not occur in the field.

This may be an erroneous conclusion. Some very common household appliances operate are powered by a two-pole 240V circuit (protected by the type of breaker under discussion) but use two or more independent 120V sub-circuits inside the appliance. Two obvious cases are electric clothes dryers and ranges. If, for example, the low-heat (110V) heater in a dryer were to short to the dryer case, a serious overcurrent would occur on one "leg" of the circuit.

Another wiring practice, using a single two-pole breaker to power a split circuit which uses a shared neutral, such as may be installed in kitchens in some areas, is nearly certain to have each leg of the circuit loaded independently and thus subject to single-leg overloading and subsequent breaker jamming. A breaker which jams and then fails to trip under this condition is, in my opinion, a serious fire hazard.

A careful reading of the [CPSC press release of March 3, 1984](#) suggests that the press release was very careful NOT to conclude that there is no hazard, but simply that the information at hand did not prove the hazard, and that the Commission did not have funds to pursue testing. In this document, the representation that no real hazard exists is made by the manufacturer of the device - not exactly a neutral party, and even that wording is cautious in tone: "FPE breakers will trip reliably at most overload levels." Readers should see the failure rates cited in the IAEI letter below.

### **It's the exceptions that cause fires.**

Consumers should read and follow the Commission's advice regarding circuit breakers. But this advice is insufficient. The Commission's admonition to avoid overloading circuits and to turn off and have examined devices which seem to be creating a problem is a poor substitute for reliable, automatic, overcurrent protection. It is precisely because dangerous conditions can and do occur without adequate recognition and action by a consumer that circuit breakers and fuses are installed to provide overcurrent protection in the first place.

Therefore it is hardly an adequate "fix" for FPE breakers to just tell consumers to handle these cases manually.

It is possible that some breakers may perform with adequate reliability, possibly those manufactured after the companies discovered safety defects and improper practices in listing the product, and possibly those manufactured in Canada. However, in absence of an explicit statement from the manufacturer and/or the US CPSC indicating that newer stock equipment is defect free, and considering that defects occur in both breakers and the panels themselves, and finally, that testing showed failures in both in-use equipment and new off-the-shelf devices, my advice to consumers and electricians is that these panels be replaced with newer equipment, particularly those which use 240-volt double-pole breakers described in the literature. In my opinion, if a fire or other hazard occurs with this device, neither the manufacturer nor the Commission, who have suggested in the press release that data was inconclusive or inadequate to establish a hazard, will accept responsibility for losses that may ensue.

However a building inspector, home inspector, or contractor who makes any warranty of safety, by virtue of his/her position close to the consumer, is certain bear this very liability.

### **Canadian FPE Stab-Lok panels and Federal Pacific or Federal Pioneer Circuit Breakers:**

(As of May 1999) I have learned from Schneider Canada that Federal pioneer circuit breakers sold by that company are re-named from Federal Pacific circuit breakers and that two 15-amp single-pole models NC015 and NC015CP made between August 1, 1996 and June 11, 1997 have been recalled. The [recall notice](#) is available here. I have asked the company to determine if Federal Pioneer and Federal Pacific components sold in Canada were made in the U.S. or if tooling used to produce them was identical with that used in the U.S. If this is the case (as one might expect based on economies of production) one should consider the possibility that other defects reported in the U.S. may also appear in Canadian installations. The Warranty Alert was issued by the Ontario New Home Warranty program in October 1997 and provides for circuit breaker replacement. Schneider Canada is an electrical supplier whose product lines combine those previously marketed under the names Federal Pacific Electric, Federal Pioneer, Square-D, Tele Mechanique, Modicon, and Merlin Gerin.

(As of February 1999) On speaking with an attorney who is researching FPE failures for a possible class action suit I have learned the following: Since a portion of the safety defect with FPE breakers may be due to variations during manufacture, and since Canadian breakers may be manufactured in a different plant from those made in the U.S., it's quite possible that the field performance of Canadian breakers may be different than the U.S. design. As of this date I have not had report of a failure in a Canadian breaker. NOTE that this website is not an official, nor a funded resource regarding this problem. There is no requirement that failures be reported to us for tabulation here. Absence of evidence is not evidence of absence of failures.

Also, having inspected a few Canadian FPE electric panels themselves, I have observed at least two ongoing concerns: 1.) the same bus design was used as in the U.S. equipment. I've seen very poor retention of breakers in the bus - in one house the breaker was held in place by duct tape, as the spring design in the contact of the breaker where it plugs into the special opening in the bus appears not to have held the breaker in place. I have also seen breakers modified with their inserting pins bent and modified to fit a breaker into a slot where it did not belong - a step that is impossible with other breaker designs. 2.) A similar or identical panel design may expose consumers to panel arcing and fires regardless of changes in the breakers themselves.

**Addendum: 7/99 Reply to IAEI International Association of Electrical Inspectors News Magazine re: FPE Public Relations PR Article asserts Federal Pacific Electric Stab-Lok panels are OK**

8/11/99

International Association of Electrical Inspectors  
ATTN: Philip H. Cox, Editor-in-Chief, IAEI Magazine  
PO Box 830848  
Richardson TX 75083-0848  
Dear Mr. Cox:

The May/June '99 IAEI News article by an unidentified FPE consultant asserts that Federal Pacific Electric Stab-Loks are UL-Listed and thus without any concern. The article fails to address a record of failures to trip, actual test results, field reports of failures, and improper UL listing practices. The FPE author and IAEI News failed to report on the actual website content, failed to contact the author, and failed to give the correct website address so that readers could judge for themselves. I am an IAEI member and the author of the informational website for home inspectors which was referred-to in the FPE article. The correct Internet website address is <http://www.inspect-ny.com/fpe/fpepanel.htm>

Publicly available information is compelling and sufficient to warrant warning contractors, inspectors, and consumers. The best data available substantiates that the 2-pole breakers cannot be relied upon to trip. CPSC found that was the case. FPE agreed that that was the case. Field reports confirm that that is still the case. Inspectors should work towards replacing breakers that won't trip, not towards whitewashing the problem.

The problem with FPE breakers is that a significant portion of them will not trip on overload or short circuit conditions in order to protect a building from fire ignition. Testing done by the CPSC showed that at a modest overload on both poles these failed 25% of the time, followed by a lockup. The breaker would never trip in the future at any overload. (See Table 1, Summary of Failures, CPSC-C-81-1429 December 30, 1982, attached.) There are other types of failures known to occur in FPE panels at lower probability and not as well documented as the 2-pole no-trip problem.

FPE did not refute the CPSC's test data. The no-trip problems with 2-pole Stab-Lok breakers were acknowledged by FPE. FPE claims that when their circuit breakers do not trip it does not constitute a hazard. The article in IAEI News by FPE is asking us to agree with FPE's position that breakers that won't trip are OK because they are "listed and labeled." Let's keep in mind that a breaker

that will not trip on certain overcurrent conditions is electrically the same as an Edison-base fuse with a penny behind it. No inspector should be encouraged to condone or whitewash the continued use of breakers that cannot be depended on to trip properly.

These problems were known. Reliance Electric Co. had bought FPE in 1979 when they discovered problems with FPE breakers. They sued the company they had bought FPE from, claiming undisclosed potential liability made FPE not what they had bargained for and citing evidence that "improper and deceptive practices were employed for many years to secure UL listings for Federal Pacific's circuit protective products? They wanted their money back. Reliance eventually settled the suit, kept FPE, and got back \$41.85 million in return for which they agreed to indemnify the company they'd bought FPE from for product liability claims arising from products made by FPE before the purchase.

Continuing problems can't be ruled out. For example, see the Federal Pacific/Federal Pioneer circuit breaker warranty alert issued by the Ontario New Home Warranty Program in 1997 (copy attached). These products are still present in the field! Reports from consumers and electricians indicate failures to trip, overheating, and fires.

Note also that the author of the FPE article did not want to have his or her name associated with it and that the FPE contact listed is an attorney retained (presumably) by FPE. The information address given in the article would have been more accurate if given as: Howard B. Abramoff Law Offices, 25700 Science Park Dr. Suite 260, Cleveland OH 44122. This is a law firm, not a circuit-breaker manufacturer. This confirms that the article is biased towards the defense of FPE rather than providing information on "the safe installation and use of electricity" (IAEI's mission statement in the magazine's masthead).

As a neutral professional, I'd be pleased to receive reliable information shedding new light on the situation. But a public relations article written by someone whose aim is to protect FPE's interests and which fails to address

legitimate concerns and the known failures and problems occurring around the country is not something I'd rely upon. Based on my experience and numerous reports from people with no axes to grind, it appears that FPE circuit breakers frequently fail to perform their function. A circuit breaker may sit in a building for twenty years, and as long as it never sees an overload or short circuit it may seem to work fine. But if it cannot perform its function to interrupt current when overloaded or short circuited, that circuit breaker is a latent fire hazard. Such equipment should be replaced.

Respectfully,

Dan Friedman, IAEI #195930

Attachments:

1. "Calibration and Condition Tests of Molded Case Circuit Breakers, Final Report: Contract CPSC-C-81-1429," December 30, 1982, Wright Malta Corporation, Summary Pages 1-3.
2. Reliance Electric Co. Press Release, July 7, 1980, stating that "Underwriters Laboratories labels for most of FPE's circuit breakers were obtained through improper practices,?"
3. Schneider Electric Canada Warranty Alert, recalling Federal Pioneer (Federal Pacific Canadian) circuit breakers NC015/NC015P, October 14, 1997
4. My resume/background
5. WEB Faqs: Website author, credibility
6. "Federal Pacific Electric (FPE) Panels, a Summary," website page from <http://www.inspect-ny.com/fpe/fpepanel.htm> (This is the root page of a collection of public documents and articles regarding this topic.)  
10-1-00 followup note: IAEI and Mr. Cox have declined to reply to this correspondence.  
03/01/03 followup note: IAEI has not retracted the un-signed article described above.  
Industry experts have confirmed that the IAEI article is inaccurate and dangerous in its advice as it exposes consumers to equipment which cannot be relied upon in event of an overcurrent. The result could be shock or fire. I have encountered one or two instances of electricians who, unfamiliar with FPE failures, cited this article in defense of a "no action" position, in all cases in defense of a home seller. My advice to consumers who are faced with denials that this equipment is a latent safety hazard to ask for that opinion in

writing. To date I have not had any reports of a professional who was willing to sign such a document.

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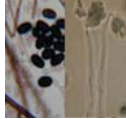
## More Information

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The Home Inspection Information Website

[The Home Inspection and Construction Information Website](#)



- [Mold Investigation, Sick Building Remediation Website - www.inspect-ny.com/sickhouse.htm](#) testing for mold, pollen, allergens, indoor air quality. Field and lab analysis & remediation
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