



Commonwealth Edison  
1400 Opus Place  
Downers Grove, Illinois 60515

March 30, 1990

Mr. A. Bert Davis  
Regional Administrator  
U.S. Nuclear Regulatory Commission  
Region III  
799 Roosevelt Road  
Glen Ellyn, IL 60137

Subject: LaSalle County Station Units 1 and 2  
Supplemental response to Inspection Report  
Nos. 50-373/86004 and 50-374/86004,  
Fire Detection Concerns  
NRC Docket Nos. 50-373 and 50-374

Reference: (a) H.J. Miller letter Cordell Reed dated  
February 14, 1990

Dear Mr. Davis:

Reference (a) requested that LaSalle County Station submit an additional response addressing the actions that have been taken or planned to be taken in regards to the lack of electrical supervision for the Unit 1 and Unit 2 local fire alarm circuits. Based on discussions with members of your staff and NRR personnel, Commonwealth Edison LaSalle County Station submits the following response.

In review of your February 14, 1990 letter, Commonwealth Edison shares your staffs concern that excessive spurious local alarm activations may confuse and diminish employee and fire brigade member confidence in the fire alarm system to the extent that it may be difficult to distinguish an actual fire alarm from a false one.

Upon further review of the NFPA Codes, specifically Volume 12, Formal Interpretations (F.I.), the intent of the requirement to supervise the interconnecting conductors of local alarms is clarified in the F.I. Number 85-12. This F.I. was issued in November of 1986, and therefore was not available when the local fire alarm system was designed, or when we prepared our first response to this issue.

9009140253 900330  
PDR ADDCK 05000373  
Q FDC

*LEOL*  
1/0

The LaSalle fire alarm system as it is presently designed, automatically sounds an alarm (siren) in the local area and at the control room upon activation of an ionization smoke detector. In the event of an actual fire, LaSalle's fire alarm procedures direct the control room to announce the occurrence and location of any fire and call the fire brigade members to assemble over the plant public address and radio systems prior to sounding the plant fire siren. Personnel granted unescorted access at LaSalle are currently trained to remain where they are when they hear the plant fire alarm, unless they are in the immediate vicinity of the fire. The verbal announcement is the primary method of assembling the fire brigade, notifying personnel, and evacuating areas as necessary. The sounding of the plant fire siren is a secondary alert. Any further directions for evacuation are announced as they arise. To assure that all necessary announcements are heard throughout the plant, the plant fire siren is sounded intermittently, with further announcements given in between each sounding. The station fire brigade assembles at the verbal request of the control room or the fire chief. The assembly location is determined by the fire chief based on the area, pre-plan, type of fire, and other plant conditions. Therefore, the assembly location may be at a fire brigade equipment cage, staging area, or a combination thereof. The fire brigade is trained to assemble at the verbal request of the control room or fire chief, not the local fire siren(s). This method of verbal instruction is preferred due to the complexities encountered at a nuclear power plant, and the control room's (operating personnel) expertise in assessing the event and the required actions necessary to assure protection of personnel and equipment.

In lieu of supervising the local alarm circuits, LaSalle proposes the combination of the following administrative controls and training to eliminate concerns that spurious local alarms may confuse and diminish employee and fire brigade member confidence;

1. All personnel granted unescorted access on-site will receive the following training regarding local fire alarm activation;
  - a. If a local fire siren sounds without a previous notification announcement over the public address system, personnel are to contact the control room and report that a fire siren has sounded and the location of the siren(s), and if they do or do not observe a fire. This will ensure that the control room is readily informed of any spurious local fire siren activations.
2. Based on the notification of a local alarm activation without a supervised ionization detector fire alarm up in the control room for that area, and no physical indications of a fire, the control room will then implement the following steps. (These requirements will be independent of, and have no effect on, the normal ionization detector alarm response procedures);

- a. An operator will be dispatched to investigate the area to determine that no fire exists, attempt to reset the siren, and report back to the control room.
- b. Upon determination that the siren has spuriously activated, the control room will announce over the public address system that the siren activation is spurious and that it is a non-fire condition.
- c. If the siren does not reset, action will be taken to silence the siren. To expedite this process the station will develop a procedure outlining the specific actions necessary to silence each fire siren in the plant.
- d. If required, a work request will be initiated to repair the alarm. The inoperable siren will be monitored with a fire protection impairment permit which assures that the fire marshall and control room personnel are aware of the inoperable siren. In the unlikely event that a fire occurred in the area with the inoperable siren, personnel in the area will be warned via the plant public address system.

It is our opinion that the unsupervised local fire alarm circuits will be acceptable, from a fire protection standpoint, based on the following;

1. The administrative controls and training outlined above will ensure that;
  - a. spurious local alarm activations do not confuse and diminish employee and fire brigade member confidence in the fire alarm system to the extent that it is difficult to distinguish an actual fire alarm from a false one,
  - b. personnel working in an area where a local alarm activates will immediately notify the control room of what they observed,
  - c. the control room will take appropriate actions to silence, repair, and monitor the inoperable local alarm,
  - d. and silencing the spuriously activated local siren will be performed in an expeditious manner.

2. If the local alarm circuits had been supervised in accordance with NFPA 72 A & D, the event that occurred on January 17, 1986 would not have given a trouble alarm indication in the control room. NFPA 72A & D require supervision only for the integrity of the "interconnecting conductors", so that the occurrence of a single open circuit or a single ground trouble condition in their "installation conductors" are automatically signaled to the central supervising station. These codes do not require supervision of the conductors within the equipment, devices or appliances (components and relays). The inspection report, dated February 28, 1986 identifies the failure as a wire to wire short. A review of work request L55466 revealed that the failure was caused by a single stuck contact of relay 1FR02, not a wire to wire short. If the circuits were supervised, the relay failure would not have alarmed in the control room. In addition, each siren failure documented during functional testing since 1985 was due to problems with the PC Board in the siren box or with the siren internals. Not one failure was due to an open circuit or wire to wire short, and therefore would not have been identified if the circuits were supervised. Therefore it is of our opinion that no significant benefits would be obtained in supervising these circuits.
3. All ionization smoke detection circuits at LaSalle are electrically supervised, therefore the possibility of the control room operators receiving a false fire alarm due to a circuit failure does not exist. Since the local alarm circuits are independent of the supervised ionization detector circuits, a failure in the local alarm circuits would not result in the loss of any other signal, specifically not the supervised ionization detector signal that would be received in the control room had there been a real fire. Such a failure could result only in the local devices not operating or, as identified in the inspection, a spurious local alarm activation.
4. The local alarms initiated by the relay modules in the fire panel are of a very reliable design. Dry contact outputs from the fire panel relay modules initiate relays in local control boxes located throughout the plant. These local control boxes provide power sources and additional relays that initiate the logic to operate the local sirens in various zones. The cables used to connect the relay module outputs to the local control boxes and the local control boxes to the local sirens are the same type used for safety-related circuits at LaSalle. This same cabling has been tested in accordance with and shown to meet the requirements of LaSalle's harsh accident environment and also meet IEEE-383. All cabling for this equipment is installed in conduit or solid bottom cable tray. The relays used in the control boxes are of a commercial quality, purchased from a major manufacturer, and are expected to have a low failure rate.

5. The local alarm sirens are verified operable through semi-annual functional testing (LES-FP-03 through 09, 16, 22, 107 and 207). There are 91 local sirens throughout the plant. A review of these surveillances performed since 1985 have indicated that there have been an average of only three failures a year. This is a failure rate of less than 2%. In each case documented since 1985, the failure was due to problems within the siren internals. There have been no documented siren failures to operate that were due to an open circuit or wire short, therefore these failures would not have been identified sooner if the circuits were supervised. Any failures of the local alarms identified during these tests are monitored through the fire protection impairment program and repaired in a timely manner via a Nuclear Work Request. Monitoring the inoperable fire siren with a fire protection impairment permit assures that the fire marshal and control room personnel are aware of the inoperable siren. In the unlikely event that a local fire siren failed to sound in the event of an actual fire, the primary verbal announcement is still available, and would be utilized, to assemble the fire brigade and warn personnel.

To summarize, we are confident that the proposed administrative controls and training will;

1. eliminate concerns that spurious local alarms will confuse and diminish employee and fire brigade member confidence, and

2. assure protection of personnel and equipment;

and that the unsupervised local fire siren circuits will be acceptable from a fire protection standpoint based on the following:

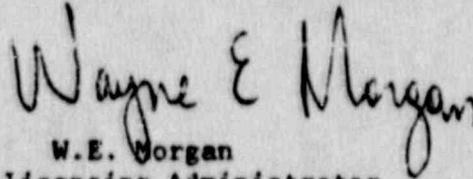
1. The implementation of the proposed administrative controls.
2. Any fire in these areas would be quickly detected by the supervised ionization detection circuits.
3. The design of the local siren components and circuitry is reliable.
4. The component (relay) failures would not be detectable if the interconnecting conductors were supervised.
5. The local sirens are functionally tested every six months, and these functional tests indicate a siren failure rate of only 2%.

Additionally, to determine if the number of occurrences is significant or not and warrants any further action (i.e. design, device, or component changes) the station will track spurious siren activations over the next five years.

March 30, 1990

If you have any additional questions regarding this matter, please contact this office.

Very truly yours

A handwritten signature in cursive script that reads "Wayne E Morgan".

W.E. Morgan  
Nuclear Licensing Administrator

cc: R. Pulsifer - NRR Project Manager  
NRC Resident Inspector - LSCS  
Dave Notley - NRR

/lmw:0848T