

PALISADES AND BIG ROCK POINT NUCLEAR POWER PLANTSEVALUATION OF FIRE PROTECTION SER OPEN ITEM3.2.4 Fire Brigade Size

By letter dated September 15, 1978, as a follow-up to a meeting held at Bethesda on August 31, 1978, the licensee proposed to maintain a trained fire brigade size of three firefighters and provided his justification therefore.

The licensee's bases for a three man fire brigade are as follows: (1) the three man brigade exists only during periods of minimal activity under normal operating conditions, i.e., only during the early morning hours and on holidays; (2) the three man brigade can effectively accomplish the necessary fire brigade functions of: (a) extinguishing incipient fires, (b) controlling or preventing the spread of the fire until addition help arrives, (c) providing back-up and support of fixed suppression equipment and (d) protecting and reducing property damage from fire, water and smoke; (3) it is considered extremely remote to have a fire progress beyond the incipient stage because of: (a) strict control of combustibles and ignition sources, (b) immediate detection of postulated fires, (c) immediate notification and response of fire brigade and offsite fire department, (d) compartmentation of plant, (e) operation of automatic fixed suppression and (f) the competency of the fire brigade, (4) the fire brigade is fully self-sufficient for at least 15 minutes by which time offsite assistance will be available; and (5) after modifications, including installation of alternate shutdown systems for most areas, an unmitigated fire if contained within an area will not affect safe shutdown capability.

The staff and its consultants evaluated the licensee's bases and found that the plant specific justifications were not sufficient to support the proposal for the following reasons:

1. Although the potential for fires may be reduced during back, holiday, and weekend shifts as a result of limited work activities, the potential for fire is not eliminated.
2. The on-site fire brigade is not self-sufficient to promptly extinguish fires beyond the incipient stage. Undue reliance is placed on offsite response. It does not provide any margin to cope with adverse events such as delayed detection, failure of automatic systems or personnel injury.
3. (a) Administrative control of combustibles and ignition sources do not provide absolute protection.
(b) Fires are not always immediately detected.

7
2910020 842

- (c) Varying factors may delay response of the fire brigade and the offsite fire department, i.e., injury to a brigade member; other fire commitment by offsite fire department.
- (d) Automatic suppression systems do not always operate properly.
- (e) The specific conditions that exist at the time of the fire cannot be accurately predicted.

At the meeting in Bethesda on August 31, 1978, the licensee and their consultants provided a plant specific analysis of Palisades (applicable also to Big Rock Point) to demonstrate that the proposed three man brigade will be feasible for this location. The presentation provided a scenario for fighting a fire in a safety related area with a three man fire brigade. The functions of the fire brigade for any fire were described by flow chart. (Reference flow chart, FIRE BRIGADE FUNCTIONS, that is part of CPC letter of September 15, 1978.) Fighting a fire in the cable spreading room was presented as a possible worst case scenario because of the layout and type of combustibles, the fire loading and the large size of the area. (Reference, FIRE BRIGADE RESPONSE, flow chart, Attachment 1 of 9/15/78 letter from CPC.) Injury to fire brigade personnel was considered remote. (Reference INJURY TO FIRE BRIGADE MEMBERS chart, Attachment 1 of 9/15/78 letter from CPC).

As described in the submittals by the licensee, the fire brigade will be made up of one senior licensed operator (leader) and two operations personnel, all fully trained brigade fire fighters. Additionally, one or more security personnel may be available for activity that will support the fire brigade. Security personnel are not trained as fire fighters and cannot perform as fire attack personnel.

We have reviewed the licensee's presentation and arguments for having a three man fire brigade shift size. We deem this organization deficient in the following areas:

1. The fire brigade leader cannot effectively function as a leader if he also must undertake manual fire suppression actions. (See NRC report "Evaluation of Minimum Fire Brigade Shift Size, June 9, 1979)
2. The assumption that there will not be injuries to fire brigade members thereby negating the need for replacement personnel is unacceptable. Fire fighting is a dangerous and hazardous operation; professional firefighters are prone to injuries at a rate greater than any other occupation. To assume that a fire brigade will not suffer injuries is an erroneous position that could jeopardize the fire suppression effort. To purposely not consider injuries is totally ill-advised.

3. Where manual fire fighting is required to suppress a fire to limit damage to safety systems, the extinguishing media must be directed at the source of the fire. To expect that this can be accomplished from the doorway to a room or compartment without advancing into the fire area is unacceptable. One individual cannot effectively apply water from a 1-1/2" hose line in an interior fire fighting situation that requires mobility. All fires require mobility to some degree.
4. Utilization of the fire brigade leader as a relief person for an injured fire brigade member reduces the fire brigade to a total of two individuals and reduces the effectiveness of the fire brigade leader.
5. The position that the fire brigade need be self-sufficient for only the first 15 minutes of a fire is not acceptable. Too great a reliance is placed on response by the offsite public fire suppression forces or the call back of plant personnel which may not be available. A fire brigade is considered self-sufficient when they are capable of adequately handling any fires that might occur and when they rely on offsite fire suppression assistance only for the major fire that is beyond the brigade's capability. To rely on offsite support at the initial stages of a fire does not meet the self-sufficient criteria.

Staff Position

1. Each of these operating plant sites should have an onsite fire brigade* shift complement of at least five trained persons.
2. One member should be assigned as fire brigade leader, and at the time of the fire he should be free of all duties so that he can devote his attention to assessment of the fire situation and direction of fire fighting activities.
3. Four members should be capable of acting individually or as teams to perform the spectrum of basic fire fighting action which may be required, e.g., locating the fire, operation of portable extinguisher or hose lines, transporting equipment to the fire scene, or rescue work.

* Additional bases for the staff position is set forth in "Evaluation of Minimum Fire Brigade Shift Size," June 8, 1979.

4. We prefer that all fire brigade members receive training in accordance with the staff guidelines set forth in "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance," June 14, 1977:

- Attachment 1: Fire Protection Organization
- Attachment 2: Fire Brigade Training
- Attachment 5: Fire Fighting Procedures

Where the five man fire brigade has two levels of training, at least three members shall have training which fully conforms to the staff guidelines; however, two members may be excepted from the training requirements listed below:

1. Attachment 2:

- 1.0a (6) The direction and coordination of the fire fighting activities.
- 1.0a (9) Detailed review of fire fighting procedures and procedure changes.*
- 1.0a (10) Review of latest plant modifications and changes in fire fighting plants.

The excepted personnel should have general training in these subjects.

*The only portion of this item excepted is that associated with the fire fighting strategies which have been developed to conform with Attachment 5, Item d, the strategies established for fighting fires in all safety-related areas and areas presenting a hazard to safety-related equipment.