NSP

NORTHERN STATES POWER COMPANY

MINNEAPOLIS, MINNESOTA 55401

MAY 17 1979

M. GROTENHUIS

See May 18, 1978 attachment 2 addressed each aspect of the Guidance attachments.

May 2, 1979

Director of Nuclear Reactor Regulation
U S Nuclear Regulatory Commission
Washington, DC 20555

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
Docket No. 50-282 License No. DPR-42
50-306 DPR-60

Nuclear Plant Fire Protection
Functional Responsibilities,
Administrative Controls, and Quality Assurance

In a letter dated February 6, 1979, from Mr A Schwencer, Chief, Operating Reactors Branch #1, Division of Operating Reactors, NSP was requested to provide additional information related to the Prairie Island Fire Protection Program. This information is provided in Enclosure (1) to this letter.

Enclosure (2) is a revision to the NSP Fire Protection Outline which was submitted for review on May 18, 1978. These changes are being made as a result of NRC Staff comments on our original outline in the areas of quality assurance, fire protection engineer qualifications, training, and procedures.

L. O. Mayer

L O Mayer, PE
Manager of Nuclear Support Services

LOM/DMM/deh

cc: J G Keppler
G Charnoff

Enclosures

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Enclosure (1) to NSP letter dated May 2, 1979 Director of NRR, USNRC

REQUEST FOR ADDITIONAL INFORMATION ON GUIDELINES NOT ADDRESSED
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

36. Fire Protection Engineer Qualifications

Describe the means provided to document (i.e., Fire Protection Plan) the minimum eligibility requirements of a fire protection engineer position, as outlined in our letter dated February 6, 1978.

Example:

Fire Protection Plant

1.0 Organization
  1.1 Administrative Organization
    1.1.1 Fire Protection Engineer
      1.1.1.1 Qualifications:
        Graduate of...
        Completed not less than...
        Three of which...

Response:

The services of a qualified fire protection engineer will be used. Examples of times when the services of a qualified fire protection engineer will be used include:

a. Major modification to a fire protection system.

b. Plant modification or procedural change which would introduce a major hazard not analyzed in the Fire Hazards Analysis.

c. Periodic independent fire protection inspections.

The fire protection engineer will possess the following qualifications:

a) A graduate of an engineering curriculum of accepted standing who has completed not less than six years of engineering attainment indicative of growth in engineering competency and achievement, three of which shall have been in responsible charge of fire protection engineering work, or

b) A member in the Society of Fire Protection Engineers.

This requirement has been included in a revision to the NSP Fire Protection Outline. Refer to Enclosure (2).

37. Quality Assurance (QA) Program Criteria Requirements

Identify which method, as outlined in our February 6, 1978 letter will be used to meet the fire protection QA Program criteria of Appendix A to BTP 9.5-1 or Regulatory Guide 1.120.

Response

We will implement fire protection QA criteria as part of the NSP Operational Quality Assurance Program. This program will be expanded to include quality assurance requirements for the fire protection program for safety related areas of operating nuclear power plants. Full implementation will take place by December 31, 1979.

The NSP Fire Protection Outline has been expanded to describe those fire protection QA program criteria which will be included in our Operational Quality Assurance Program. Refer to Enclosure (2).

Enclosure (2) to NSP letter dated May 2, 1979 Director of NRR, USNRC

NSP FIRE PROTECTION PROGRAM OUTLINE

1.0 Policy Statement

Northern States Power Company (NSP) has established a system of Administrative Control Directives (ACD's) that implement the Operational Quality Assurance Plan. This system will be used to implement the requirements of the operating nuclear power plant fire protection program. The basic requirements of the fire protection program are specified in this document.

The following 1977 NFPA publications will be used for guidance in developing the fire protection program:

No. 4	Organization for Fire Services
No. 4A	Organization of a Fire Department
No. 6	Industrial Fire Loss Prevention
No. 7	Management of Fire Emergencies
No. 8	Management Responsibilities for Effects of Fire on Operations
No. 27	Private Fire Brigades
No. 197	Initial Fire Attack, Training Standard On
No. 601	Guard Service in Fire Loss Prevention

2.0 Organization

2.1 General Requirements

NSP will be responsible for the establishment and implementation of the fire protection program. NSP may delegate to other organizations the work of establishing and implementing the fire protection program, or any part thereof, but will retain responsibility for the program.

The authority and duties of persons and organizations involved in the fire protection program will be clearly established and delineated in writing.

To assure adherence to the fire protection program, management measures will be established which provide that the individual or group assigned the responsibility for checking, auditing, inspecting, or otherwise verifying that an activity has been correctly performed, is independent of the individual or group directly responsible for performing the specific activity.

2.2 Fire Protection Organization Summary

The NSP organization as it pertains to fire protection responsibilities is summarized below and illustrated in Figure 1.

A. Executive Vice President

The Executive Vice President has overall responsibility for the nuclear plant fire protection program. The following persons implement this responsibility:

1. Vice President Plant Engineering & Construction

2. Vice President Power Production and System Operation

B. Vice President Plant Engineering & Construction

The Vice President Plant Engineering & Construction reports to the Executive Vice President. He has corporate line responsibility for fire protection system design, procurement, installation and testing in new nuclear generating plants, and for the fire protection program during their construction. He has the same responsibilities for modification projects assigned to him in NSP operating nuclear plants, except that construction activities must be in compliance with the plant fire protection program.

C. Vice President Power Production & System Operation

The Vice President Power Production & System Operation reports to the Executive Vice President and has corporate line responsibility for the development and implementation of a fire protection program for NSP's operating nuclear plants. Plants under construction are covered by this fire protection program 90 days prior to initial fuel loading to the extent compatible with construction activities. The following persons implement these responsibilities:

1. Manager Nuclear Support Services

2. General Manager Power Production

D. Manager Nuclear Support Services

The Manager Nuclear Support Services reports to the Vice President Power Production & System Operation and is responsible for technical support, independent review and audit of nuclear plant operation, and administration of NRC operating licenses, including the associated Technical Specifications.

E. General Manager Power Production

The General Manager Power Production reports to the Vice President Power Production & System Operation and is responsible for operation, maintenance, minor modifications, testing, fire protection, and overall management of all generating plants. The responsibilities associated with the fire protection program are implemented through:

1. General Superintendent Nuclear Power Plant Operation

2. General Superintendent Operational Quality Assurance

F. General Superintendent Nuclear Power Plant Operation

The General Superintendent Nuclear Power Plant Operation reports to the General Manager Power Production and has responsibility for the safe and reliable operation of the nuclear generating facilities. He has the responsibility for assuring that Plant Managers implement their responsibilities associated with the specific requirements of the fire protection program pertaining to their plants.

G. General Superintendent Operational Quality Assurance

The General Superintendent Operational Quality Assurance reports to the General Manager Power Production and is responsible for establishing and maintaining a Quality Assurance Program for General Office activities associated with operating nuclear plants. These responsibilities include the following specific items:

1. Preparing, reviewing and controlling Administrative Control Directives associated with the Operational Quality Assurance Program and issued by the General Office.

2. Reviewing and controlling Administrative Work Instructions associated with the Operational Quality Assurance Program and issued by the General Office.

3. Establishing and implementing a program for auditing activities of offsite groups.

4. Incorporating appropriate quality assurance requirements for the fire protection program in the NSP Operational Quality Assurance Program.

The General Superintendent Operational Quality Assurance is also responsible for power plant safety and providing support for plant fire protection programs.

H. Safety Coordinator Power Production

The Safety Coordinator Power Production is responsible for the Occupational Health and Safety Program of the Power Production Department. On matters pertaining to nuclear plant fire protection, he reports directly to the General Superintendent Operational Quality Assurance. His responsibilities include the review and inspection of each plant's fire protection program. He also serves as a fire protection consultant for the plants and assists in general plant fire protection training and fire brigade and support team training.

I. Nuclear Plant Managers

The Plant Managers of the nuclear plants report to the General Superintendent Nuclear Plant Operation and are responsible for the safe and reliable operation of their respective plants and for assuring that activities comply with applicable regulatory requirements. The Plant Manager's specific responsibilities associated with fire protection include:

1. Routine inspection of the plant for fire hazards.

2. Establishing Plant Fire Brigades and Fire Brigade Support Teams.

3. Procurement of equipment for the Fire Brigades and Fire Brigade Support Teams.

4. Establishing a training program for the Fire Brigades and Fire Brigade Support Teams.

5. Coordinating fire drills and determining their effectiveness.

6. Establish cooperation with the local Fire Department, including joint drills and training sessions.

7. Establishing storage requirements to insure no additional fire hazards are created.

8. Establishing a surveillance program for fire protection systems and fire fighting equipment.

9. Establishing a system to control non-conforming items.

10. Reviewing required work processes for fire hazards and possible reduction of fire protection system effectiveness.

11. Reviewing of design changes to determine if they would cause an unreviewed fire hazard or reduce the effectiveness of the fire protection systems.

12. Establishing a fire salvage program (when required).

13. Reviewing of purchase requisitions initiated by the plant that are related to fire protection.

14. Developing instructions for fighting fires in specific areas and identifying effects of fires in specific areas.

15. Establishing a policy for the involvement of the guard force during a fire.

16. Preparing news release information for NSP's Communications Department.

17. Establishing and implementing a program for auditing on-site activities associated with the requirements presented in plant directives.

The Plant Manager may delegate these responsibilities to members of the plant staff.

J. Nuclear Plant Fire Brigades and Fire Brigade Support Teams

A Fire Brigade of ~~three~~ five persons will be on-site at all times. In addition, a Fire Brigade Support Team will be on-site at all times to bring the minimum number of persons responding to any fire to five. The Fire Brigade Support Team may be drawn from the site security force. The Support Team assists the Fire Brigade by providing communications, bringing equipment to the scene, renewing air breathing bottles, and providing other support.

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Each Fire Brigade will have an appointed leader. This leader will not be the Shift Supervisor (the Unit No. 1 Shift Supervisor at Prairie Island).

Respiratory protection qualification testing will screen all Fire Brigade members for cardiopulmonary deficiencies. The program was established by NSP's corporate physician to insure that all respirator users, when subject to even the most severe working conditions, are physically fit to wear a respirator. The program includes pulse, blood pressure, and spirometry testing, and a medical history review in which the possibility of past or present heart disease is determined. The program will be administered by nursing personnel who will perform the necessary cardiopulmonary screening function.

2.3 Fire Protection Engineer

A Fire Protection Engineer will be used to provide the following types of services:

1. Review of design for major modification to a fire protection system.

2. Review of proposed plant modifications which would introduce major hazards not analyzed in the Fire Hazards Analysis.

3. Periodic independent fire protection inspections.

The Fire Protection Engineer will meet the following qualifications:

1. A graduate of an engineering curriculm of accepted standing who has completed not less than six years of engineering attainment indicative of growth in engineering compentency and achievement, three of which shall have been in responsible charge of fire protection enginering work, or

2. A member in the Society of Fire Protection Engineers.

3.0 Fire Protection Training

There are three levels of fire protection training. Each level consists of an initial training period followed by retraining.

3.1 Level I is general training given to operations and maintenance personnel assigned to nuclear power plants. Following initial training, these topics will be periodically reviewed in safety meetings at least annually. Level I will cover, as a minimum, the following areas:

1. Basic principles of fire chemistry and physics.

2. Fire hazards.

   a. Common fire hazards

   b. Combustibles, general

   c. Flammable liquids

   d. Flammable gases

3. Fire detection systems

4. Types of extinguishing systems

5. Special fire hazards associated with nuclear power plants

6. Emergency Plan with emphasis on fire emergency

3.2 Level II training will be given to all Plant Fire Brigade and Support Team members. An initial training program with annual retraining will be conducted. Retraining will repeat all Level II subject material over a period of approximately two years. Level II will include a detailed treatment of the subject matter in Level I. In addition, the following items will be covered:

1. The identification and location of fire hazards and associated types of fires that could occur in the plant.

2. The identification and location of fire fighting equipment in each fire area.

3. Familiarization with layout of the plant including access and egress routes in each area.

4. The proper use of fire fighting equipment.

5. Methods of fighting each type of fire.

6. Review of the plant fire fighting procedures with specific coverage of each individual's responsibilities.

7. Proper use of communication, lighting, ventilation and emergency breathing equipment.

8. Considerations of radiation and contamination in fire areas.

Only items 2, 3, 6, 7 and 8 will be required in training provided to Fire Brigade Support Team members.

3.3 Level III training will be presented to the Fire Brigade leaders. Initial training with annual retraining will be provided. Included will be a detailed review of Level I and II training and the following additional material:

1. The direction and coordination of fire fighting activities.

2. The proper method of fighting fire inside buildings and confined areas.

3. Evaluation of fire hazards.

3.4 Contractor Personnel

Basic instruction in fire protection will be given to contractor personnel before granting them unescourted access to safety related areas of the plant.

3.5 Training Documentation

Classroom training sessions, practice sessions, and drills for the Fire Brigade and Fire Brigade Support Team will be documented. The following should be included in the documentation for persons participating:

1. Name

2. Date

3. Summary of what was done

4. Evaluation by observer

4.0 Drills and Practice

4.1 Drills

Drills will be scheduled so that each fire brigade member will participate in at least two drills per year. The following types of drills will be scheduled:

1. Announced (with local on-duty Fire Department annually).

2. Unannounced, with observation and critique by qualified individual independent of the Plant. This will be done at least once a year for each brigade.

3. Back shift, conducted by the Fire Brigade leader on duty at the time. This will be scheduled at least once per year for each brigade.

All drills will be preplanned and critiqued. A meeting will be held after each drill to discuss the drill and repeat portions of the training program that are directed at the deficiencies noted during the drill.

To the extent practical, Fire Brigade and Fire Brigade Support Team members willuse protective equipment, suppression systems, and other equipment used to fight an actual fire during all drills. Written procedures will be tested during drills.

4.2 Practice

Practice sessions will be held at least once every year. These sessions will include:

1. Actual use of fire fighting equipment.

2. Use of breathing equipment.

3. Actual extinguishment of fire.

Practice sessions will be arranged by the Safety Coordinator, Power Production.

Brigade members missing a practice session will be rescheduled to attend a later session with another brigade. If this is not possible, they will be required to review the pre-fire strategies covered in the practice session.

5.0 Combustibles and Ignition Sources

5.1 Permanent and Temporary Storage

All areas containing safety related equipment or cables will be surveyed once each working day for fire hazards by a member of the plant staff. Storage of combustible materials will be permitted only in posted areas or in approved cabinets and containers.

During periods of construction or extensive maintenance in safety related areas, a survey of each area will be made during each working shift. This survey will determine if excessive accumulation of flammable liquids or other combustible materials has occurred. Clean-up or posting of a fire watch will be ordered if the accumulation is excessive.

Untreated wood in safety related areas will be limited to less than 2 cubic feet per area.

5.2 Cutting, Welding, Grinding and Open Flame

Cutting, welding, grinding and open flame work in safety related areas will be administratively controlled. A person designated as fire watch and equipped to prevent and combat fire will be assigned to areas where cutting, welding, grinding and open flame work is involved. The fire watch will remain in these assigned areas for 30 minutes after work is completed.

Smoking will be prohibited in all safety related areas, except those specifically designated by the plant management.

Fire Barrier penetration leak testing will be done with approved and reviewed procedures. Permission to do this leak testing will be obtained from the shift supervisor.

6.0 Fire Fighting Procedures

Fire Fighting Procedures or instruction shall be developed to cover the following areas:

1. Discovery of fire, including:

   a. Notification

   b. Attempts to extinguish fire

2. Action of Control Room Operator including:

   a. Announcement

   b. Sounding of fire alarm

   c. Who to notify

3. Selection and delineation of responsibilities of Fire Brigade and Fire Brigade Support Team members.

4. Coordination of off-site fire department activities.

5. Actions of security guards during a fire emergency.

6. Delineation of responsibilities of other plant personnel.

7. Instructions and pre-planned strategies for fighting fires in specific areas of the plant when the general instructions are not adequate. These instructions will include:

   a. Identification of combustibles in area.
   b. Identification of safe shutdown equipment in area and alternate equipment available for performing that function.
   c. Fire suppression equipment available in the area.
   d. Best way to approach a fire in the area.
   e. Identification of plant systems that should be managed to reduce the damage potential from a fire in the area.
   f. Identification of radiological and toxic hazards in the area.
   g. Ventilation system lineups to minimize spread of smoke and to remove smoke from the area.
   h. Identification of actions which must be coordinated with operations personnel.

   Instructions and pre-planned strategies will be tested during drills.

7.0 Design Change Control

Review of design changes for possible impact on plant fire protection provisions will be performed if determined required by a designated member of the plant technical staff. The following guidelines will be used in making this determination:

1. Could the change present a hazard not considered in the Fire Hazards Analysis? Will additional analysis be required?

2. Could the change have the potential to interfere with installed fire protection equipment or does it modify existing fire protection equipment?

3. Could the fire protection system require modification because of the change?

If a fire protection review is required, the individual assigned to perform the review will use the following as a guide:

1. Does the change reduce the fire protection provisions for safety related or "safe shutdown" equipment?

2. Will it be necessary to do a fire hazards analysis?

3. Does the design present an obstruction to installed fire protection equipment?

4. Will the installation of the equipment temporarily remove a fire protection system from service?

5. Does the design change involve thermal stress relieving, and if so have precautions been taken?

6. Will any fire barriers be affected by the design change?

A design change will be allowed to proceed only after satisfactory resolution of these concerns.

8.0 Procurement Control

Fire Protection Systems and Equipment will be purchased using one of the following methods:

1. Underwriters Laboratories (UL) and Factory Mutual (FM) directories will be reviewed to determine if the item is listed as being UL or FM approved. If the item is listed, a manufacturer will be identified and the item procured in accordance with NSP's "Uniform Nuclear Plant Procurement Process".

   The one exception for not buying an item that is UL or FM listed is; if it is a replacement of original equipment or NSP standard type, it will be identified as such and procured from the original supplier or manufacturer. As a minimum, the item or equipment will, by appropriate testing, meet NFPA standards.

2. If the item is not listed by UL or FM, the following process will be used:

   a. An evaluation will be made to determine the compatibility of the item to the existing system or component, or

   b. If the item has been manufactured for a long period of time, and

      i. The item is standardized, and

      ii. The item has a satisfactory performance history, and

      iii. Appropriate receipt inspection is identified in the procurement documents,

   then an evaluation is unnecessary. The fact that the supplier and item meets these requirements will be documented in the procurement files.

3. Parts of components and equipment that have UL or FM approval as a unit will be procured as follows:

   a. The part will be manufactured by the original manufacturer of the component or equipment whenever possible.

   b. The model number of the component or equipment will be identified.

   c. The specific part number will be identified.

   d. Documentation from the supplier will be requested that indicates the part delivered meets the specification of the part used in the original component or equipment. If the part has been changed, the manufacturer will be asked to indicate any changes in the operation of the component or equipment. In lieu of this documentation, the acceptance of the part shall be based on inspection or testing.

4. Purchased items will receive a receipt inspection. All Purchase Requisitions pertaining to fire protection systems and equipment will be reviewed by an individual designated by the Plant Manager.

9.0 Instructions, Procedures, and Drawings

The system of Administrative Control Directives (ACD's) will be used to delineate responsibilites and requirements for the fire protection program. Departmental instructions and procedures will be revised or issued to implement the fire protection program responsibilities and requirements contained in the ACD's. Fire protection maintenance, modifications, inspections, tests, administrative controls, drills, and training will be prescribed by written instructions, procedures, and drawings.

10.0 Surveillance and Inspection

The Technical Specifications specify the surveillance and inspection requirements for the fire protection system. Surveillance will be scheduled, performed, and documented in accordance with standard directives governing the surveillance testing program.

11.0 Conditions Adverse to Fire Protection

Administrative Control Directives will establish criteria for housekeeping.

Work control process procedures will be used to correct equipment failures, malfunctions, deficiencies, and defective components of fire protection systems.

As part of the training process, plant personnel will be instructed on how to identify adverse conditions and report them to their supervisor.

12.0 Records

Plant and General Office directives establish nuclear plant records, creation, and retention requirements. Fire protection records requirements will be included in the scope of these directives.

13.0 Audits

In addition to normal quality assurance audits, an independent fire protection and loss prevention inspection and audit will be performed annually at each plant utilizing either qualified off-site Northern States Power Company personnel or an outside fire protection consultant.

An inspection and audit by an outside qualified fire protection consultant will be performed at each plant at least every three years.

Audit and inspection results will be reported to levels of management having fire protection program responsibilities in those areas audited or inspected.

14.0 Program Implementation

The fire protection program as described in this Outline will be fully implemented by December 31, 1979.

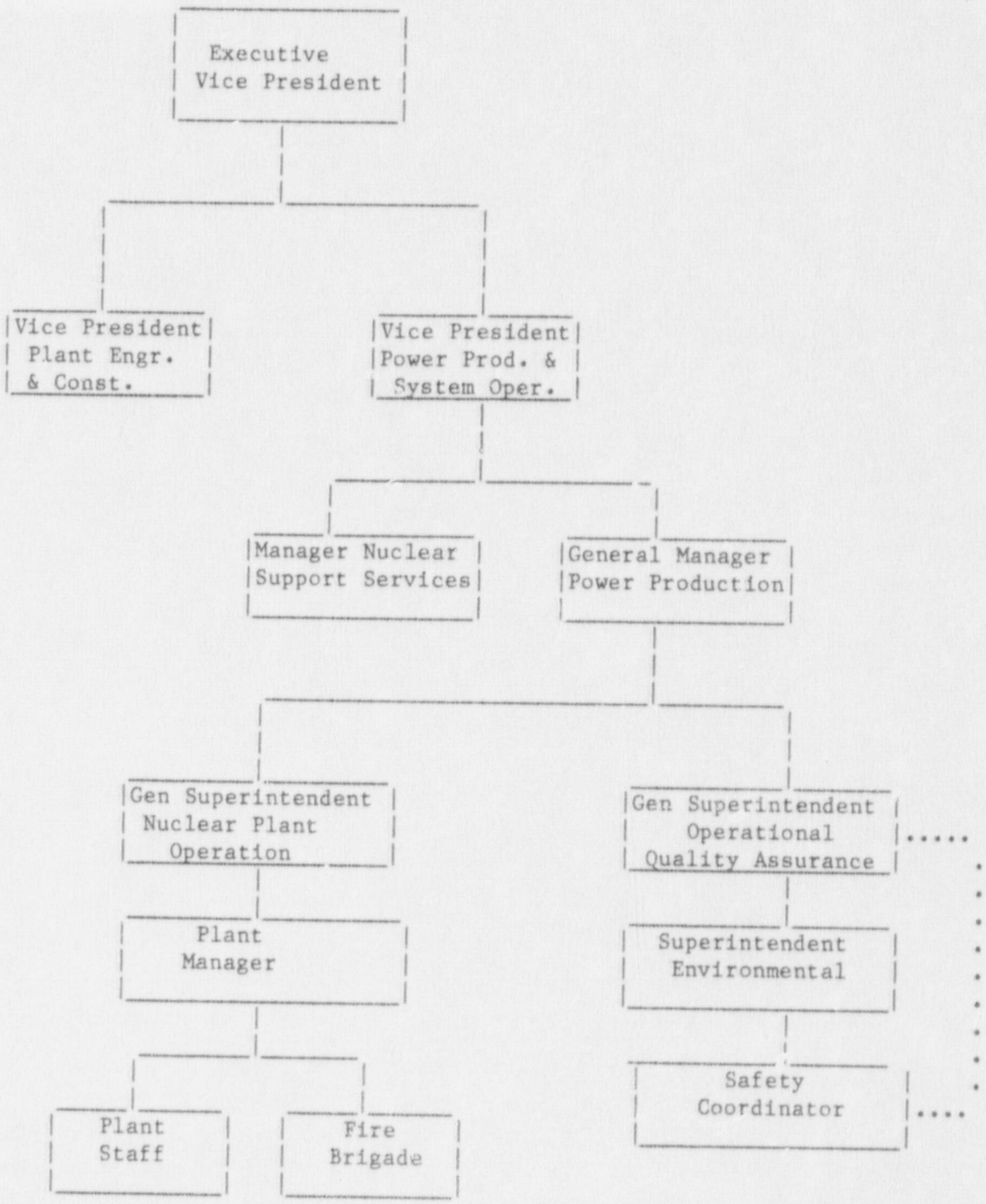

Figure 1. Northern States Power Company Fire Protection Organization