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ACCESSION NBR:7904180252 DOC.DATE: 79/04/02 NOTARIZED: NO DOCKET #
FACIL:50-261 H. B. ROBINSON PLANT, UNIT 2, CAROLINA POWER AND LIGH 05000261
AUTH.NAME AUTHOR AFFILIATION
UTLEY,E.E. CAROLINA POWER & LIGHT CO.
RECIP.NAME RECIPIENT AFFILIATION
SCHWENCER,A. OPERATING REACTORS BRANCH 1

SUBJECT: FORWARDS ADDL INFO RE FIRE PROTECTION MODIFICATIONS REQUESTED BY NRC ON 790305.W/5 OVERSIZED DRAWINGS SENT TO T LEE.

[redacted]

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	12 AUXIL SYS BR	2	2	14 PLANT SYS BR	5	5
	19 WAMBACH	1	1	20 MURANAKA,R	1	1
	21 AD SYS/PROJ	1	1	OELD	1	0
EXTERNAL:	03 LPDR	1	1	04 NSIC	1	1
	22 ACRS	16	16			

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CP&L
Carolina Power & Light Company

April 2, 1979

FILE: NG-3514(R) SERIAL: GD-79-871

Office of Nuclear Reactor Regulation
ATTENTION: Mr. Albert Schwencer, Chief
Operating Reactors Branch No. 1
United States Nuclear Regulatory Commission
Washington, D. C. 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261
LICENCE NO. DPR-23
FIRE PROTECTION MODIFICATIONS-ADDITIONAL INFORMATION

Dear Mr. Schwencer:

In a telephone conversation with your staff on March 5, 1979, Carolina Power & Light Company was requested to provide additional information concerning certain fire protection modifications at the H. B. Robinson Plant, Unit No. 2. The additional information requested is attached. It is our understanding that this is all the information that was required as a result of the subject telephone call.

If you have any questions concerning this matter, please contact our staff.

Yours very truly,

M A McDuffie
for E. E. Utley
Senior Vice President
Power Supply

JJS/tl
Attachment

A006
5/1
1set drwgs
to Tim Lee

7904180252

411 Fayetteville Street ○ P. O. Box 1551 ○ Raleigh, N. C. 27602

CP&L Response to Staff Concern on SER Item 3.1.2

The following information is provided for your review regarding design details and information on the installation of detectors in the H. B. Robinson Plant:

1. Qualification of Mr. Alvin E. Kelley, President of Alarm Systems, Inc.

2. Qualifications of Mr. Jon Charles Larson, Regional Engineer for Pyrotronics

3. Zone-by-zone fire detection documentation

4. Pyrotronics drawing (3 sheets) showing detector locations and system layouts

We believe this information is responsive to your concerns and will demonstrate adequate investigation preceded detector placement by the designer and installer.

Alarm Systems, Inc.
FIRE AND COMMUNICATION SYSTEMS

Post Office Box 9541
Columbia, S. C. 29290
Phone 803/771-7676

Alvin E. Kelley
102 Cardiff Street
Columbia, South Carolina 29209

Personal Data

Date of Birth: July 4, 1935
Marital Status: Married

Education

Lower Richland High School, Hopkins, South Carolina 1953
University of South Carolina 1955-1958

Professional Experience Pertinent to this Project

1955 - 1960
Dixie Electronics, Columbia & Greenville, South Carolina
A communications contracting firm dealing in the sales and installations of sound and fire alarm systems.

1969 - 1972
Se-Com, Incorporated, Columbia, South Carolina
Manager in charge of and responsible for design, sales and installation of fire detection and intrusion detection systems.

1972 - Present
Alarm Systems, Incorporated, Columbia, South Carolina
Duties: President
A firm regularly engaged in the design, sales and installation of fire detection and suppression systems for commercial, industrial and special hazards applications.
An authorized distributor for Pyrotronics, Autocall, Notifier, and other fire alarm manufacturers.
An authorized distributor for Cardox and Safety First fire suppression systems.
We have designed and installed approximately 50 special hazard systems consisting of fire detection and suppression.
We work very closely with numerous engineering firms in our service area in the design of fire detection systems for such facilities as paper mills, computer rooms, flight simulators, switchgear rooms, industrial plant applications, chemical plants, high rise buildings, schools, hospitals, correctional institutions, and numerous government facilities.

Attend regularly on an annual basis sales and applications schools sponsored by Pyrotronics and Autocall. These schools deal with the design and application of various types of detection and equipment to protect hazards in accordance with the NFPA fire codes.
Responsible for obtaining and disseminating up to date fire code information to engineering firms in our sales area.
Conducts seminars for engineering, plant safety, and related groups concerning fire protection and up to date code requirements.

Jon Charles Larson
3572 Tewksbury Drive
Snellville, Georgia 30278
404/972-6246

PERSONAL DATA

Marital Status: Married
Children: 1 daughter, age 4
Date of Birth: March 24, 1949
Health: Excellent

EDUCATIONAL BACKGROUND

B.E.E.T. (Bachelor of Electrical Engineering Technology) from the Southern Technical Institute - 1972

Bass High School - Atlanta, Georgia - 1967

WORK EXPERIENCE

-- 1973 - to Present: Regional Engineer, Pyrotronics, Atlanta, Georgia

FUNCTIONAL RESPONSIBILITY

Reports to Regional Manager and is primarily responsible for supervision design and layout of all Pyr-A-Larm fire detection systems. Also, supervises the activities of certain exempt and non-exempt personnel and provides tech support to all regional personnel.

DUTIES

1. Supervises and coordinates layout of all Pyr-A-Larm fire detection systems in region.
2. Assists in and/or conducts fire tests and other test operations and collection of field and report data.
3. Oversees the work and training of engineered systems distributors.
4. Develops and maintains up to date regional library of technical materials, bulletins and other related data and information pertaining to fire codes as related to detection systems requirements.
5. Coordinates drafting and detailing with all design categories.

1974 - to Present: Instructor for the Pyrotronics National Maintenance Test and Service (MTS) School.

1974 - to Present: National Seminar Team for Pyrotronics.

-- 1970 - 1973: Western Carloading Company, Atlanta, Georgia
DUTIES:
1) Weekly/monthly Tonnage Reports.
2) OS & Y Ratings.
3) Responsible for claims and ratings on freight bills.
4) Billing.

FIRE DETECTION DOCUMENTATION
CAROLINA POWER & LIGHT COMPANY
HARTSVILLE, SOUTH CAROLINA

FIRE ZONE NO.	ROOM	* SQ. FT.	* AIR CHANGES PER HOUR	* CEILING HEIGHT & FEET	** ACCEPTABLE MAX. SQ. FT. PER DETECTOR	** ACCEPTABLE MIN. NO. DETECTORS	ACTUAL SQ. FT. PER DETECTOR	ACTUAL NO. DETECTORS
1	Diesel Gen. B	902	4.2	19	Special Generator Coverage	3	NA	3
2	Diesel Gen. A	902	4.2	19	Special Generator Coverage	3	NA	3
3	SIS Pump	856	7.74	19	740	2	214	4
4	Charging Pump	845	11.2	19	625	2	211	4
5	Component Cooling	2,340	11.75	15.5 19	625	4	390	6
6	Hot Chem. & Count Room	460 150	12	15.5 15.5	625	2	460 150	2
7	Aux. FW Pump	208	3.7	15.5	900	1	104	2
8	Boron Injection	365	2.7	15	900	1	182.5	2
9	Cable Vault N	267	2.5	22.5	900	1	72	4
10	Cable Vault S	676	60	22.5	125	6	113	6
11	Corridor (N)	1,024	5.6	19	585	4	256	8

FIRE ZONE NO.	ROOM	* SQ. FT.	* AIR CHANGES PER HOUR	* CEILING HEIGHT & FEET	** ACCEPTABLE MAX. SQ. FT. PER DETECTOR	** ACCEPTABLE MIN. NO. DETECTORS	ACTUAL SQ. FT. PER DETECTOR	ACTUAL NO. DETECTORS
12	Corridor (Cent.)	1,540	4.2	19	740	4	128	12
13	Corridor (S)	1,063	11.6	19	625	4	133	8
14	Solid Waste	1,085	4.9	19	271	4	90	12
15	Corridor	1,286	5.9	19	257	5	129	10
16	Battery Room	510	4.5	13	585	2	128	4
17	HVAC Equipment	826	6.9	10.5	740	2	207	4
18	Cable Room #1	609	5.2	10.5	740	1	304.5	2
19	Cable Room #2	1,032	32	10.5	180	6	129	8
20	Elect. Equip.	2,150	8.7	15.2	750	6	60	14
21	CRDM	802	14.3	11.5	500	2	267	3
22	Control Room	1,460	17	12	375	6	146	10
23	Relay Room	580	21.5	12	300	2	145	4
24	Reactor Bldg. Elev. 228'	NA	NA	NA	Local Application	4	Local Application	8

FIRE ZONE NO.	ROOM	* SQ. FT.	* AIR CHANGES PER HOUR	* CEILING HEIGHT & FEET	** ACCEPTABLE MAX. SQ. FT. PER DETECTOR	** ACCEPTABLE MIN. NO. DETECTORS	ACTUAL SQ. FT. PER DETECTOR	ACTUAL NO. DETECTORS
25	Reactor Bldg. Elev. 251.5'	NA	NA	NA	Local Application	3	Local Application	6
26	Reactor Bldg. Elev. 275'	NA	NA	NA	Local Application	4	Local Application	8
27	RHR	718	1.49	28	500	2	144	5
28	Pipe Space	1,696	3.7	19	410	6	242	7

* Information obtained from NUS Task #5137-AC Calculations

** Information obtained from charts and tables in NFPA72E, 1978 Edition including appendix A, manufacturer's recommendations and engineering judgement as stated in paragraph 4 - 3.1 NFPA72E, 1978.

FIRE DETECTION DOCUMENTATION
CAROLINA POWER & LIGHT COMPANY
HARTSVILLE, SOUTH CAROLINA

Zone 1 - Diesel Generator B

The UV Detectors are mounted at a height of 10 feet. This is highest possible height due to pipe obstructions. One detector is mounted on each side of the DG for optimum protection. Sensitivity is field adjustable for maximum performance.

Zone 2 - Diesel Generator A

Same as Zone 1.

Zone 3 - SIS Pump

Cable tray exist on both sides. Detectors mounted as close as possible to cable trays. Beam depth 12". Detector types cross-zoned for maximum coverage.

Zone 4 - Charging Pump

Beam depth 12". Detector types cross-zoned for maximum coverage.

Zone 5 - Component Cooling

Beam depth 12". Detector type cross-zoned for maximum performance.

Zone 6 - Hot Chem. & Count Room

Lay-in ceiling tile. Detectors located using engineering judgement.

Zone 7 - Aux. FW Pump

Same as Zone 6.

Zone 8 - Boron Injection

Beam depth 12". Detectors located using engineering judgement.

Zone 9 - Cable Vault N

Beam depth 12". Detector types cross-zoned. Detectors located over cable trays. Air handler discharge grilles located at 10 ft. level, well below detector mounting heights.

Zone 10 - Cable Vault S

Detector types cross-zoned. Detectors located over cable trays. Photoelectric detectors located for optimum back up efficiency. Beam depths 12".

Zone 11 - Corridor N

Beam depth 12". Cable trays both sides of hall. Detectors very difficult to locate due to obstructions. Detectors located between both cable trays. Detector types installed alternately.

Zone 12 - Corridor Cent.

Cable trays both sides. Beam depth 12". Large air handler duct located close as possible to cable trays. Bus duct between cable trays and ceiling. Detector types installed alternately.

Zone 13 - Corridor S

Beam depth 12". Detectors located over cable trays or as close as possible. Hall has large duct on side, cable tray on the other. Detectors mounted in 1 ft. space separating the two. Very conjested area.

Zone 14 - Solid Waste

12" beam depth. Detector types installed alternately on the circuits on circuit D. These detectors located in the bays between beams. Detectors on circuit C are installed on the beams for optimum coverage.

Zone 15 - Corridor

Large air handler ducts located on both sides of corridor mounted against the ceiling. Cable trays located on both sides of corridor. Detectors mounted in only area possible without sacrificing engineering judgement. Detectors cross-zoned for optimum coverage.

Zone 16 - Battery Room

Beam depth 12". Detectors cross-zoned for optimum coverage. Detectors primarily located over storage batteries.

Zone 17 - HVAC Equipment

Beam depth 12". Detectors cross-zoned for optimum coverage.

Zone 18 - Cable Room #1

Beam depth 12". Detectors located close to cable trays.

Zone 19 - Cable Room #2

Beam depth 12". Relay racks located on both sides. Detector types cross-zoned for optimum coverage. Detectors primarily located over cable trays and relay racks.

Zone 20 - Electrical Equipment

Beam depth 12". Detector types installed alternately on fire circuit A. B circuit detectors installed cross-zoned with circuit A. Detectors installed primarily over cable trays and motor control centers.

Zone 21 - CRDM

Beam depth 12". Detectors located over cable trays.

Zone 22 - Control Room

Lay-in ceiling tile. Detectors alternately installed on each fire circuit. Each adjacent detector circuit type is alternately installed. Detectors are primarily located over control cabinets.

Zone 23 - Relay Room

Lay-in ceiling tile detector types and circuits are cross-zoned for optimum coverage. Detectors primarily spaced over relay racks.

Zone 24 - Reactor Building - Elev. 228'

Detectors will be mounted to the underside of the catwalk grating with primary coverage over the cable trays. Detectors will be installed alternately by type, on each fire circuit to provide optimum coverage. Adjacent detectors will also be installed alternately.

Zone 25 - Primary Coolant Pumps

Detectors will be installed primarily for the protection of the coolant pumps and detection of fire resulting from spilled oil.

Zone 26 - Containment General Area

Heat Detectors will be mounted under the motor housing. Ionization detectors will be mounted on the underside of the large duct close as possible to charcoal filters in the return air supply.

Zone 27 - RHR Pump Pit

Detectors installed over RHR pumps. Combustion of oil is primary fire hazard.

Zone 28 - Pipe Alley

Detectors primarily located in center of hallway. Detector types alternately installed on each circuit. Each circuit alternately interlaced with each other to provide optimum coverage by detector type.

Partial Listing of Fire Detection Jobs by Pyrotronics

1. San Onofre
   Southern California Edison Company

2. Indian Point
   Consolidated Edison Company of New York, Inc.

3. Pacific Northwest Laboratories - Hanford
   Richmond, Washington

4. Peach Bottom
   Philadelphia Electric Co.

5. Enrico Fermi
   Detroit Edison Co.

6. Connecticut Yankee
   Connecticut Yankee Atomic Power Co.

7. Shippingport
   Duquesne Light Co.

8. Hatch
   Georgia Power Co.

9. Farley
   Alabama Power Co.

10. Tennessee Valley Authority Plants
    a) Sequoyah
    b) Watts Bar
    c) Bellefonte
    d) Hartsville
    e) Phipps Bend

CP&L Response to Staff Concern on SER Item 3.1.17

The following information is provided in response to the concerns in this area:

a) Regarding the service temperature of the hydrous calcium silicate material, the vendor, Johns-Manville, has informed CP&L that the indicated catalog temperature is 1500°F. In exposure situation, the material will begin to shrink at temperatures in excess of 1800°F. The amount of shrinkage is about 20 percent at a sustained temperature of 2000°F. The insulation will be applied, in accordance with the manufacturer's recommendations, in two layers with staggered joints to overcome the expected shrinkage. The thickness of the outer layer is two inches, while the thickness of the inner layer is one inch. In addition, an 18 gauge stainless steel jacket capable of 2800°F exposure has been specified for the outside wrapping.

   According to Mr. W. H. Doyle, damage (shrinkage) of the insulation at high temperatures involves endothermic loss of bound water of hydration. This results in the residue being a better barrier to heat transmission than in its original state and thus, more effective under fire situations.

b) Heat transfer for the fuel oil line was neglected because the oil would not be pumped into the room with the fire, therefore, there would not be a flow of oil to remove heat and protect the fuel oil line from achieving its flash point temperature. The effect of heat transfer was included in calculating the insulation thickness for the service water lines because there would be a known flow through the water lines while a fire was in progress in Diesel Generator Room "A".

c) The effect of using the standard time-temperature curve, rather than the true one, is to heighten the amount of heat transferred to the insulated pipe. In a ventilation limited fire, such as the one postulated here would be, the temperature would be below that of the standard time-temperature curve. The reference for this statement is, "Design of Buildings for Fire Safety," by T. Z. Harmathy, Fire Research Section, National Research Council of Canada, in "Fire Technology" Volume 12, No. 2, May 1976.

As a result, CP&L believes that the intended installation of insulation on the service water lines and oil lines in the Diesel Generator area is conservative and fully adequate to provide the desired degree of protection.

CP&L Response to Staff Concern on SER Item 3.1.21

Information on sizing of oil lines, drip pans, and other components to accommodate the maximum credible flow rate of oil from a spill, leak, or other failure in the lubrication oil system has not yet been received from the oil collection system designer. As has been discussed with your staff, CP&L intends to defer the installation of this system to allow further study of alternate means of controlling and suppressing a postulated reactor coolant pump oil fire. This will be addressed and justified in more detail in a subsequent submittal. If, after the studies are completed, it is intended to continue with installation of an oil collection system, the sizing information will be forwarded to you at that time for your review.

CP&L Response to Staff Concern on SER Item 3.1.24

One of the outstanding concerns following the telephone conversation with the Staff and its consultant on March 5, 1979, was the lack of data concerning a hose stream test for the H. B. Robinson cable tray penetration tested by Gold Bond Laboratories and reported in our letter of September 1, 1978.

In a report entitled "Report on Fire Stop Tests for Rancho Seco Nuclear Generation Station - Unit No. 1, February 24, 1978," the Sacramento Municipal Utility District performed fire stop qualification testing, including hose stream testing, on a three-hour fire barrier for cable tray penetrations similar to the Robinson barrier. The information may be found in Section IV of the report, which is on file with the Nuclear Regulatory Commission.

The differences between the Robinson barrier design and the Rancho Seco barrier design are as follows:

1. The Robinson barrier employs two layers of 1/2" maunite XL board instead of one layer as in the Rancho Seco barrier.

2. The Robinson barrier has a coating of 1/4" dry thickness of Flamemastic 77 instead of 1/8" dry thickness of Flamemastic 71A as in the Rancho Seco barrier.

3. The Robinson barrier has an internal filling of Kaowool Bulk Fiber instead of Flamemastic 71A as in the Rancho Seco barrier.

Except for the internal fill material of the barrier, the Robinson design is much more conservative than the Rancho Seco design, which successfully passed the hose stream test. As a result, CP&L believes that the Robinson design would have successfully passed the hose stream test and is suitable for use as a fire barrier in the plant.