

SYSTEM DESCRIPTION
FOR
RADIO CONTROLLED
PROMPT ALERT AND NOTIFICATION SYSTEM
FOR
CATAWBA NUCLEAR STATION
NEWPORT, S. C.

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EL40101Y

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SYSTEM DESCRIPTION
PUBLIC NOTIFICATION SYSTEM
CATAWBA NUCLEAR STATION

1.0 SCOPE

The public notification system as required by 10CFR50 and NUREG-0654, Appendix 3 will be implemented using fixed sirens in the Emergency Planning Zone around the Catawba Nuclear Station. Large area warning systems are most economical and effective where the action necessary, once the siren is sounded, is simple and understood by the public. The public will be made aware of the purpose of the siren sounding which is notice to listen to the Emergency Broadcast System (EBS) radio or television station for specific information and instructions concerning the situation at the Catawba Nuclear Station. The Common Program Control Station (CPCS-1) is designated as WEZC-FM located in Charlotte, N. C. The sirens will be sounded in the "ALERT" (Civil Defense) signal mode which is a three (3) minute steady signal.

2.0

REFERENCES

NUREG-0654, Appendix 3/FEMA-REP-1, Revision 1, "Criteria for Preparation and Elevation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," (U. S. Nuclear Regulatory Commission, Washington, D. C. and Federal Emergency Management Agency, Washington, D. C.).

CPG-1-17, "Outdoor Warning System Guide," dated March, 1980 (U. S. Federal Emergency Management Agency, Washington, D. C.).

Guidance Memorandum #13, June 17, 1980 (U. S. Federal Emergency Management Agency, Washington, D. C.).

3.0 DESIGN CRITERIA

System design criteria is as follows:

- 3.1 Within fifteen (15) minutes of the State/County determination that public protective actions are necessary, provide Alert (sirens) and Notification (EBS) to the population within the Catawba Nuclear Station Emergency Planning Zone.
- 3.2 Provide a siren system with an acceptable dissonant sound level 10 dB above average daytime ambient background noise of 50 dB(a) for areas with a population below 2000 persons per square mile, and 10 dB above average daytime ambient background noise of 60 dB(a) for areas above 2000 persons per square mile. (Density to be determined in 1 mile radial, 22½° sectors.)
- 3.3 Locate sirens considering the demography, topography, and heavy industry within the area.
- 3.4 Limit siren sound level received by any person to less than 123 dB(c).
- 3.5 Limit siren sizes/models to 125 dB and 113 dB (dB(c) at 100 feet) to minimize the number of different models which simplifies the task of long-term support.
- 3.6 Use a conservative sound propagation loss factor of 10 dB per distance doubled to compute siren coverage. This results in the 125 dB model providing a 9050' radius coverage and the 113 dB model providing a 3950' radius coverage per Table 3.1 (Range calculated per the formula shown in figure 3.1).
- 3.7 Radio-controlled tone activation from each county for those sirens within their boundaries.
- 3.8 Existing alerting equipment, such as Volunteer Fire Department sirens, will not be utilized in this primary system.
- 3.9 Provide adequate all-weather maintenance access.
- 3.10 Paint equipment to provide blending with the surroundings to minimize the prominence of the siren installation.
- 3.11 All equipment will be designed for a forty (40) year life in an outdoor environment with normal maintenance and parts replacement.
- 3.12 The siren equipment shall be capable of producing both the Civil Defense "Alert" (steady) signal and "Attack" (wavering) signal. The counties may actuate either of these two (2) signals with the proper encoder code selection.
- 3.13 The siren equipment will be designed to provide continuous duty (sized for continuous repetitive three (3) minute cycles).

TABLE 3.1

THEORETICAL SIREN COVERAGE/RANGE IN FEET WITH 10 dB LOSS PER DISTANCE DOUBLED

<u>Minimum Level Coverage in dB(c)</u>	<u>125 dB(c) Rated Siren</u>	<u>113 dB(c) Rated Siren</u>
85	1600'	-
80	2250'	1000'
75	3200'	1400'
73	3700'	1600'
70	4500'	2000'
68	5200'	2250'
65	6400'	2800'
60	9050'	3950'

Note: All ranges rounded off to nearest 50 ft.

RANGE CALCULATIONS

$$R_x = R_o \times 2^{\frac{L_o - L_x}{d}}$$

WHERE:

R_x = RANGE IN FEET

R_o = RANGE IN FEET WHERE SL^* IS KNOWN

L_x = DESIRED SL^* AT RANGE R_x

L_o = SL^* AT RANGE R_o

d = LOSS IN dB PER DISTANCE DOUBLED

* SL = SOUND LEVEL IN dB (C)

FIGURE 3.1

4.0 SYSTEM DESCRIPTION

The Emergency Planning Zone (EPZ) around the Catawba Nuclear Station includes areas in York County, South Carolina and Mecklenburg County, and Gaston County, North Carolina.

The siren system network to provide a minimum of 60 dB(c) area coverage will consist of sixty-four (64) fixed siren locations as shown on Figure 4.1. Sixty-three (63) of this total will be of the 125 dB(c) siren rating each covering a 9050 feet radius area and the remaining one (1) will be 113 dB(c) rated covering a 3950 feet radius area. Table 4.1 lists additional siren siting information.

The sirens will be radio-controlled, tone actuated, for each of the counties for those sirens located within their boundaries. The counties will be provided with a tone encoder to be connected to an existing radio transmitter to be designated by county officials. York County will control forty-nine (49) sirens, Mecklenburg County will control ten (10) sirens, and Gaston County will control five (5) sirens.

The sirens will be located along existing highways and roads that traverse the Emergency Planning Zone. The major transportation routes for the 0-10 mile radius area are shown in Figure 4.2.

The siren installation will consist of the siren components (model dependent), a radio receiver/tone decoder, radio antenna, motor starter control box, and miscellaneous electrical service components. The mounting height of the siren horn assembly will be a minimum of fifty (50) feet above the ground with all siren and support components mounted on a wood pole.

Equipment from the pole top to the ground will be painted brown and the equipment above the pole top will be painted gray.

The proposed siren system provides reasonable assurance that coverage approaching the design objectives will be achieved. However, there are limitations in employing an outdoor warning system with the expectation of achieving 100 percent notification to the public. This is because of the many variables including weather conditions, tree foliage, local topography, and competing noise sources inside and outside dwellings. The majority of the people not alerted by the siren sound due to other noise sources or sound attenuation variables may well be watching TV or listening to radio. In that case the special emergency announcements made on the EBS radio and TV stations would attract their attention. Even with a higher level siren signal, there is a possibility that the system could not assure alerting everyone who is indoors in a high ambient noise area.

CATAWBA 1 & 2
PUBLIC NOTIFICATION SYSTEM - SIRENS
SITE INFORMATION TABULATION
01-10-83
Table 4.1

SITE NO.	LOCATION	SIREN SIZE	MOUNTING HEIGHT	COVERAGE	UTILITY	PWR. SERVICE	LAND STATUS	COMMENTS
1	NC 49 (York Road) at Lake Shore Drive approximately .3 mile from Buster Boyd Bridge	125	50'	9050'	DP Co.	240V 1Ø	R/W	Mecklenburg County
2	SC 49 Just past Buster Boyd Bridge on right side near Hungry Fisherman Restaurant	125	50'	9050'	DP Co.	240V 1Ø	R/W	York County
3	Off SC 49 on road to River Hills rear entrance (west side Trans. R/W near River Hills Church)	125	50'	9050'	DP Co.	240V 1Ø	R/W	York County
4	Cook Road off SC 55 (approximately 150' from intersection)	125	50'	9050'	DP Co.	240V 1Ø	Private	York County
5	SC 49 next to Crowder's Creek access area	125	50'	9050'	York	240V 1Ø	R/W	York County
6	SC 274 near 70KV R/W (at road leading to Catawba Nuclear Station)	125	50'	9050'	York	240V 1Ø	R/W	York County
7	SC 1099 at end of pavement (1.8 mile from Five Points)	125	50'	9050'	York	240V 1Ø	R/W	York County
8	Intersection SC 49 & CR 114	125	50'	9050'	York	240V 1Ø	R/W	York County
9	Intersection CR 815 & 817	125	50'	9050'	York	240V 1Ø	R/W	York County

CATAWBA 1 & 2
 PUBLIC NOTIFICATION SYSTEM - SIRENS
 SITE INFORMATION TABULATION
 01-10-83
 Table 4.1 (Continued)

SITE NO.	LOCATION	SIREN SIZE	MOUNTING HEIGHT	COVERAGE	UTILITY	P.L.R. SERVICE	LAND STATUS	COMMENTS
10	SC 274 near Trans. R/W approximately 200 yards from intersection with CR 195	125	50'	9050'	DP Co.	240V 1Ø	R/W	York County
11	Allison Creek Road, CR 1081 approximately 1 mile from SC 274	125	50'	9050'	York	240V 1Ø	R/W	York County
12	Off CR 1182 beyond Catawba Station entrance, left at pavement end on dirt road at 44KV R/W	125	50'	9050'	York	240V 1Ø	R/W	York County
13	SC 195 across from China Grove A.M.E. Zion Church, approximately 300 yards from 195/658 intersection	125	50'	9050'	York	240V 1Ø	R/W	York County
14	SC 658 (west side) approximately 200 south of Museum Road intersection	125	50'	9050'	DP Co.	240V 1Ø	R/W	York County
15	SC 195 at corner of Falconwood Road across from Lakewood Baptist Church	125	50'	9050'	York	240V 1Ø	R/W	York County
16	SC 741 near Trans. Line R/W	125	50'	9050'	York	240V 1Ø	R/W	York County
17	Tega Cay, Molokia Drive prior to Clubhouse entrance (right side of road 100' prior to transformer box).	125	50'	9050'	DP Co.	240V 1Ø	Private Tega Cay	York County

CATAWBA 1 & 2
PUBLIC NOTIFICATION SYSTEM - SIRENS
SITE INFORMATION TABULATION
01-10-83
Table 4.1 (Continued)

SITE NO.	LOCATION	SIREN SIZE	MOUNTING HEIGHT	COVERAGE	UTILITY	PWR. SERVICE	LAND STATUS	COMMENTS
18	SC 160 at rear entrance (gravel road) to Big Highway 160 junkyard	125	50'	9050'	York	240V 1Ø	R/W	York County
19	McKee Road (CR 1102) at curve (east side)	115	50'	3950'	DP Co.	240V 1Ø	R/W	Mecklenburg County
20	Snug Harbor Road at S8/9 gravel road	125	50'	9050'	DP Co.	240V 1Ø	R/W	Mecklenburg County
21	Corner Hamilton Road and Youngblood Road across from A.M.E. Zion Church	125	50'	9050'	DP Co.	240V 1Ø	R/W	Mecklenburg County
22	Carowinds Blvd. (1441) across from intersection with SC 22 (Carowinds side of road)	125	50'	9050'	DP Co.	240V 1Ø	R/W	York County
23	Westinghouse Blvd. across from Titan Building Products near fire hydrant	125	50'	9050'	DP Co.	240V 1Ø	R/W	Mecklenburg County
24	NC 160 across from Aplix Plant, approximately 300 yards from Sam Neely Road intersection	125	50'	9050'	DP Co.	240V 1Ø	R/W	Mecklenburg County
25	Sandy Porter Road (1142) at end of white fence approximately 500' from intersection with Brown Grier Road	125	50'	9050'	DP Co.	240V 1Ø	R/W	Mecklenburg County
26	Shopton Road west (1116) in curve at power pole with address 10220 marked	125	50'	9050'	DP Co.	240V 1Ø	R/W	Mecklenburg County

CATAWBA 1 & 2
PUBLIC NOTIFICATION SYSTEM - SIRENS
SITE INFORMATION TABULATION
01-10-83
Table 4.1 (Continued)

SITE NO.	LOCATION	SIREN SIZE	MOUNTING HEIGHT	COVERAGE	UTILITY	PWR. SERVICE	LAND STATUS	COMMENTS
27	Shopton Road west at Winget Road (opposite side from road marker)	125	50'	9050'	DP Co.	240V 1Ø	R/W	Mecklenburg County
28	NC 273 just prior to trailer park at telephone pedestal #9 approximately ¼ mile from end of road	125	50'	9050'	York	240V 1Ø	R/W	Gaston County
29	Pole Branch Road (177) approximately 1000' beyond bridge	125	50'	9050'	Ruthford Elect.	240V 1Ø	R/W	Gaston County
30	Ratchford Road (2431) off 2485 about 200' from intersection	125	50'	9050'	DP Co.	240V 1Ø	R/W	Gaston County
31	NC 274 approximately 400' north of 2429/274 intersection across from "Curve" Road sign	125	50'	9050'	DP Co.	240V 1Ø	R/W	Gaston County
32	SC 435 ~ 200' from old grocery store	125	50'	9050'	York El.	240V 1Ø	R/W	York County
33	SC 2427 & 564	125	50'	9050'	DP Co.	240V 1Ø	R/W	Gaston County
34	Intersection 64/27 next to gravel road	125	50'	9050'	DP Co.	240V 1Ø	R/W	York County
35	SC 557 south side of road beyond road to Amity Estates	125	50'	9050'	DP Co.	240V 1Ø	R/W	York County

CATAWBA 1 & 2
PUBLIC NOTIFICATION SYSTEM - SIRENS
SITE INFORMATION TABULATION
01-10-83
Table 4.1 (Continued)

SITE NO.	LOCATION	SIREN SIZE	MOUNTING HEIGHT	COVERAGE	UTILITY	PWR. SERVICE	LAND STATUS	COMMENTS
36	Intersection 557/55 (northeast side)	125	50'	9050'	York El.	240V 1Ø	R/W	York County
37	Clover, back of parking lot behind Clover Police/Fire Department	125	50'	9050'	DP Co.	240V 1Ø	Private-Clover	York County
38	SC 64 across from gravel road .2 mile north of Johnson Branch Bridge	125	50'	9050'	York	240V 1Ø	R/W	York County
39	SC 732 approximately 150' from intersection 732/738, north side of road	125	50'	9050'	York	240V 1Ø	R/W	York County
40	SC 172 (north side) just past intersection 64/172	125	50'	9050'	York	240V 1Ø	R/W	York County
41	SC 819 near intersection 819/818	125	50'	9050'	York	240V 1Ø	R/W	York County
42	SC 161 past A.M.E. Zion Church near softball field backstop fence	125	50'	9050'	DP Co.	240V 1Ø	R/W	York County
43	York, at rear of DP Co. Retail Office parking lot	125	50'	9050'	DP Co.	240V 1Ø	Private-DP Co.	York County
44	Intersection SC 1451/347	125	50'	9050'	York	240V 1Ø	R/W	York County
45	SC 195 across from DP Co. pole #36	125	50'	9050'	DP Co.	240V 1Ø	R/W	York County

CATAWBA 1 & 2
 PUBLIC NOTIFICATION SYSTEM - SIRENS
 SITE INFORMATION TABULATION
 01-10-83
 Table 4.1 (Continued)

SITF NO.	LOCATION	SIREN SIZE	MOUNTING HEIGHT	COVERAGE	UTILITY	PWR. SERVICE	LAND STATUS	COMMENTS
46	SC 202, near intersection of CR 1108	125	50'	9050'	York	240V 1Ø	R/W	York County
47	Rock Hill, intersection Rawlinson Road & SC 5 between two schools	125	50'	9050'	DP Co.	240V 1Ø	R/W	York County
48	Rock Hill, Friedheim Road at rear of Sunset Park Elem. School property	125	50'	9050'	Rock Hill Util.	240V 1Ø	Rock Hill York County School Sys.	
49	Rock Hill, Spruce & Sylvia St. at Sylvia Elem. School near 3Ø power pole at dumpster	125	50'	9050'	Rock Hill Util.	240V 1Ø	Rock Hill York County School Sys.	
50	Rock Hill, Northside Elem. School (Anafrel St.), existing RH siren site	125	50'	9050'	Rock Hill Util.	240V 1Ø	Rock Hill York County School Sys.	
51	Rock Hill, at Water Works Office on Columbia Ave. (corner of fence at parking lot)	125	50'	9050'	Rock Hill Util.	240V 1Ø	Rock Hill York County R/W	
52	Rock Hill, Herlong Road at Village Shopping Center (existing RH siren site)	125	50'	9050'	Rock Hill Util.	240V 1Ø	R/W	York County
53	Rock Hill, India Hook Road across from Ebinport Elem. School at Animal Clinic	125	50'	9050'	Rock Hill Util.	240V 1Ø	R/W	York County

CATAWBA 1 & 2
PUBLIC NOTIFICATION SYSTEM - SIRENS
SITE INFORMATION TABULATION
01-10-83
Table 4.1 (Continued)

SITE NO.	LOCATION	SIREN SIZE	MOUNTING HEIGHT	COVERAGE	UTILITY	PWR. SERVICE	LAND STATUS	COMMENTS
54	Rock Hill, Cherry Road at McNair St. (existing RH siren site)	125	50'	9050'	Rock Hill Util.	240V 1Ø	Rock Hill	York County
55	Rock Hill, Dave Lyle Blvd. at Industrial Park Ent. (Garrisons and Gaskins Road)	125	50'	9050'	York	240V 1Ø	R/W	York County
56	SC 21 across from Celanese Celriver Plant near road sign	125	50'	9050'	Rock Hill Util	240V 1Ø	R/W	York County
57	Doby Bridge Road at corner of Williams Road	125	50'	9050'	DP Co.	240V 1Ø	R/W	York County
58	Fort Mill, Massey Road next to Cook's Big A Auto Parts (near Water Tower & Fort Mill Ret. #1 substation)	125	50'	9050'	DP Co.	240V 1Ø	Private- DP Co.	York County
59	Steele Road (Rt. 270) just past intersection with Merritt Road across from peach orchard entrance	125	50'	9050'	York	240V 1Ø	R/W	York County
60	SC 160 at CR 49 & entrance to I-77 South access ramp (near telephone pedestal)	125	50'	9050'	York	240V 1Ø	R/W	York County
61	Gold Hill Road (SC 98) near Trans. R/W approximately 300' from I-77 South ramp	125	50'	9050'	York	240V 1Ø	R/W	York County

CATAWBA 1 & 2
 PUBLIC NOTIFICATION SYSTEM - SIRENS
 SITE INFORMATION TABULATION
 01-10-83
 Table 4.1 (Continued)

SITE NO.	LOCATION	SIREN SIZE	MOUNTING HEIGHT	COVERAGE	UTILITY	PWR. SERVICE	LAND STATUS	COMMENTS
62	Bus. 21 near intersection with CR 1480 (side next to corn field)	125	50'	9050'	York	240V 1Ø	R/W	York County
63	Pineville, at Vol. Fire Dept. near southwest corner of building	125	50'	9050'	Pineville Util.	240V 1Ø	Fire Dept. Mecklenburg County Pineville	
64	SC 5, prior to Fishing Creek (north side before curve)	125	50'	9050'	York	240V 1Ø	R/W	York County

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5.0 AREA POPULATION DISTRIBUTION

Several communities are located in the Emergency Planning Zone around the Catawba Nuclear Station. The larger communities include River Hills Plantation (approximately four (4) miles north), Tega Cay (approximately two (2) miles southeast), Lakewood (approximately three (3) miles south), and Newport (approximately five (5) miles southwest). Note Table 5.1 from the Final Safety Analysis Report for Catawba projecting 11,859 people in 1981 in the 0-5 mile radius area of 78.5 square miles. This yields approximately 150 persons per square mile which is well below the "rural" classification of 2000 or less people per square mile.

In the 5-10 mile area of the EPZ are the cities of Rock Hill, York, Clover, Pineville, and Fort Mill. For alerting purposes, each of the city limit areas are considered above 2000 persons per square mile although portions of Rock Hill are the only areas above that figure at this time.

TABLE 5.1
 Catawba Nuclear Station
 1981 Projected Population Distribution

0-10 Miles (0-16.1 km)

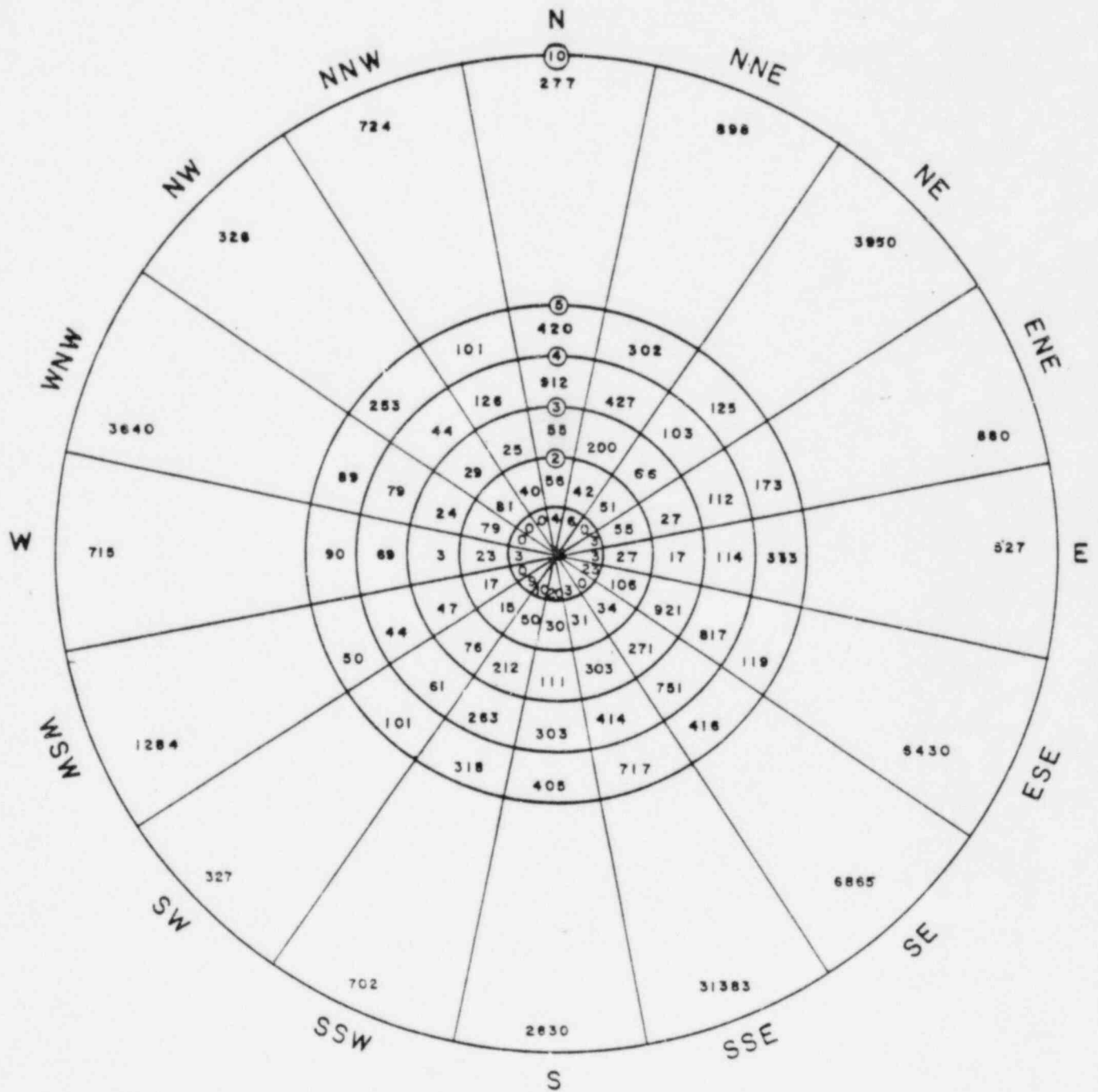
SECTOR	0-1 MILE	1-2 MILES	2-3 MILES	3-4 MILES	4-5 MILES	5-10 MILES	TOTAL
N	4	56	55	912	420	277	1,724
NNE	6	42	200	427	302	898	1,875
NE	0	51	66	103	125	3,950	4,295
ENE	3	55	27	112	173	880	1,250
E	3	27	17	114	333	527	1,021
ESE	23	106	921	817	119	6,430	8,416
SE	0	34	271	751	416	6,865	8,337
SSE	3	31	303	414	717	31,383	32,851
S	20	30	111	303	405	2,830	3,699
SSW	10	50	212	263	318	702	1,555
SW	9	15	76	61	101	327	519
WSW	0	17	47	44	50	1,284	1,442
W	3	23	3	69	90	715	903
WNW	0	79	24	79	89	3,640	3,911
NW	0	81	29	44	253	326	733
NNW	0	40	25	126	101	724	1,016
TOTAL	84	737	2,387	4,639	4,012	61,758	73,617

POPULATION

BY SECTOR, 0-10 MILE EPZ

FIGURE 5.1

0 - 1 MILE =	84	CUMULATIVE	1 MILE =	84
1 - 2 MILE =	737		2 MILE =	821
2 - 3 MILE =	2,387		3 MILE =	3,208
3 - 4 MILE =	4,639		4 MILE =	7,847
4 - 5 MILE =	4,012		5 MILE =	11,859
5 - 10 MILE =	61,758		10 MILE =	73,617



6.0 POWER DISTRIBUTION AND RELIABILITY

The electrical power distribution for the siren system is very reliable as shown on Figure 6.1. The power is derived from more than five (5) power stations in the EPZ vicinity and flows in from at least five (5) directions. In addition to this redundancy, the more than six (6) substations within the area are interconnected. The loss of an individual substation or power source would not result in a total siren system failure.

TO GASTONIA JCT.

TO CLOVER TIE

TO ALLEN

BETHEL
CHURCH
RETAIL

RIVER
HILLS

TO WOODLAWN

TO PACOLET

TEGA CAY

CATAWBA

E.M.C.

TO YORK TIE

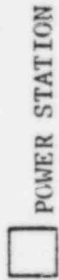
WYLIE HYDRO

E.M.C.

E.M.C.

TO GREAT FALLS

NEWPORT



POWER STATION



SUBSTATION SWITCH OR TAP

CATAWBA NUCLEAR POWER STATION

POWER DISTRIBUTION GRID

DRAWN BY: K.A. YORK

FIGURE NO.

DATE: 4-19-82

6.1

7.0 SYSTEM CONTROL

The siren system will be radio-controlled from each county using an existing county selected radio frequency. A tone encoder will be installed in the county communications center which provides specific tones and timing sequences to be sent to the transmitter. The tone encoder requires a key to enable its functions. These siren sites within the county boundaries will actuate in the selected mode as the tones are received and decoded at each site. Radio control tone commands include three separate codes which are "Alert", "Attack", and "Cancel". The "Alert" code activation will produce a three (3) minute steady signal or shorter if the "Cancel" code is sent. Only the "Alert" and "Cancel" commands are used for the Catawba EPZ procedures. The county may elect to use the "Attack" mode for other purposes.

Local manual controls are provided at each siren site within locked enclosures for maintenance and checkout purposes.

County emergency preparedness authorities having system activation responsibility are as follows:

York County

Mr. James L. Carroll, Director, York County Emergency Management located in York, S. C.

Mecklenburg County

Mr. Kenneth Williams, Director, Civil Preparedness located in Charlotte, N. C.

Gaston County

Mr. Robert Phillips, Director, Gaston County Emergency Management Agency, Gastonia, N. C.

8.0 SYSTEM TESTING AND MAINTENANCE

The tests listed per Table 8.1 will be routinely performed on the indicated schedule to insure siren system reliability and operational readiness.

The Silent test will be conducted by the county control center personnel.

The quarterly Grawl test will normally be performed by Duke Power Company personnel locally at each siren site. County personnel will also be required if the Grawl test is conducted remotely from the control center. Additionally, during this test, normally conducted locally at the siren site, the mechanical counter recording the number of silent tests will be confirmed.

The annual full cycle test will be conducted during the formal preparedness exercise and will be a cooperative effort of all involved.

Preventive and corrective maintenance for the siren system will be provided by Duke Power Company personnel. Optionally, the tone encoders at the county control centers may be maintained as part of the transmitter equipment by county contracted personnel.

SYSTEM TESTING AND MAINTENANCE
TABLE 8.1

TEST	FUNCTIONS TESTED	PROCEDURE	SCHEDULE
1. SILENT	Transmitter, tone encoder, receiver/decoder, and mechanical counter.	Activate tone encoder and enter "Cancel" code, depress "Page" button, deactivate tone encoder once LED display decimal point goes out (approximately 6-10 seconds).	Every two weeks, log entry.
2. GROWL	All system components except 3 minute timer, transmitter, and encoder.	Activate locally at each siren site using test transmitter/encoder. Manually cancel within a few seconds after activation.	Quarterly and during PM.
3. FULL CYCLE	All components except "Cancel" tone and mechanical counter.	Activate tone encoder and enter "Alert" code, depress "Page" button to send, wait until decimal point goes out, deactivate encoder.	Annually during formal exercise.
4. PM (Preventative Maintenance).	All components.	Per manufacturers instructions.	Annually.