

PROCEEDINGS
IN
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:)
)
POWER AUTHORITY OF THE STATE)
OF NEW YORK) Docket No. 50-549
)
(Greene County Nuclear Power Plant))

TESTIMONY OF
ROBERT SHROPSHIRE
AND
BRUCE E. PODWAL
ON
EMERGENCY PROCEDURES CONTENTIONS
July 22, 1977
(Revised November 3, 1978)

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1 PROFESSIONAL QUALIFICATIONS

2 BRUCE E. PODWAL

3 ASSISTANT VICE PRESIDENT

4 PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC.

5
6 My name is Bruce E. Podwal. My business address is
7 One Penn Plaza, New York, New York 10001. I am an assistant
8 vice president with the firm of Parsons, Brinckerhoff, Quade
9 & Douglas, Inc.

10
11 I supervised the evaluation of the effects of site-
12 generated traffic upon highway transportation facilities
13 providing access and egress to the proposed Greene County
14 Nuclear Power Plant. In addition, I am also responsible for
15 the development of alternative improvements to minimize the
16 effects of plant traffic and for supervising the preparation
17 of the environmental analyses dealing with site-generated
18 traffic.

19
20 I joined Parsons, Brinckerhoff, Quade & Douglas, Inc. in
21 1961 and, for the past 10 years, have been a project manager
22 participating in the administration and management of the

BRUCE E. PODWAL

1 firm's highway planning, design and technical inspection of
2 construction for major construction projects. I was a member
3 of the project management staff on the West Side Highway
4 project in New York City, a multi-discipline assignment
5 involving engineering management and environmental studies
6 for a combined public hearing. Also, I was the project manager
7 for new highways and railroad relocations in Albany, New York
8 with construction costs of over \$100 million. For that project
9 I testified as an expert witness at a public hearing held by
10 the New York State Public Service Commission.

11
12 Currently, I am the Deputy Technical Director for Parsons,
13 Brinckerhoff, Quade & Douglas, Inc.'s Civil-Highway efforts,
14 responsible for general supervision of the firm's staff in the
15 management, planning and design of civil-highway projects. I
16 am also Project Manager for the highway location studies and
17 related input for the environmental impact assessment and public
18 participation process for several major projects including the
19 relocation of 18 miles of Route 31 in New Jersey; 30 miles of
20 proposed Interstate Routes 95 and 695 in New Jersey; and the
21 Camden, New Jersey Traffic Operations Program to Increase
22 Capacity and Safety.

BRUCE E. PODWAL

1 Prior to joining Parsons, Brinckerhoff, Quade & Douglas,
2 I was employed for two years by Brill Engineering Corp. of New
3 York City and was involved in all phases of highway planning
4 and design for a variety of state and local government projects
5

6 I am the co-author of "Highway Engineering." Chapter 16
7 of the Standard Handbook for Civil Engineers, 2nd edition, and
8 I am the co-author of a paper on the subject of the
9 "Transportation Impacts of Large Power Projects" pre-
10 sented at the Joint Power Generation Conference in September,
11 1977.
12

13 I received my degree of Bachelor of Civil Engineering
14 from the College of the City of New York in 1959. Subsequently
15 I obtained the degree of Master of Science, Civil Engineering
16 from the Polytechnic Institute of Brooklyn in 1963. I am a
17 member of the American Society of Civil Engineers and the
18 Metropolitan Association of Urban Designers and Environmental
19 Planners, and am a registered Professional Engineer in the
20 States of New York, New Jersey and Connecticut.
21
22

1 PROFESSIONAL QUALIFICATIONS

2 ROBERT SHROPSHIRE

3 SENIOR RADIOLOGICAL ENGINEER

4 POWER OPERATIONS DIVISION

5 POWER AUTHORITY OF THE STATE

6 OF NEW YORK

7
8 My name is Robert Shropshire. My business address is Power
9 Authority of the State of New York, 10 Columbus Circle, New York
10 New York 10019. I am employed as the Senior Radiological
11 Engineer by the Power Authority of the State of New York.

12
13 I have worked in various phases of the nuclear fuel cycle
14 for approximately fifteen years, to include: obtaining
15 Nuclear Reactor Operator Licenses on U.S. Navy Reactors,
16 A1W and S5W, the Brookhaven National Laboratory Graphite
17 Research Reactor, and the Cornell University TRIGA Reactor;
18 decontamination and decommissioning of "Hot Cell" facilities
19 and the Walter Reed Army Institute of Research Reactor
20 Facility; radiation shielding design; preparation of
21 applicable sections of safety analysis and environmental
22 reports; participating as an expert witness on radiological

ROBERT SHROPSHIRE

1 issues before the Atomic Safety & Licensing Board and the
2 Advisory Committee on Reactor Safeguards for pressurized
3 water nuclear power plants (Dockets No. 50-434 and 435).

4
5 From 1959 to 1964, I served in the U.S. Navy which included
6 service aboard the nuclear submarine U.S.S. Sam Houston SSB(N) 600
7 in the capacity of reactor operator/reactor technician.

8
9 From December, 1964 to June, 1966, I was employed by Brookhaven
10 National Laboratory as a nuclear reactor operator. I participated
11 in the startup, operation, maintenance and shutdown of the
12 Brookhaven Graphite-Moderated Air-Cooled Research Reactor.

13
14 From July, 1966 to July, 1969, I was employed by Columbia
15 University in the City of New York as assistant reactor
16 supervisor. In that capacity, I was responsible for
17 designing in-plant systems to comply with the Hazards
18 Survey Report, writing of procedures, technical specifications
19 and corrections and amendments to the Hazards Survey Report,
20 and installation and selection of Radiation Monitors for the
21 facility, working with the Health Physicist.

22

ROBERT SHROPSHIRE

1 I also had the responsibility for establishing a maintenance
2 program, and ensuring that all conditions of applicable
3 government licenses and regulations would be fulfilled.

4
5 From December, 1968 to December, 1972, I was employed as a
6 consultant to Atcor Inc. I participated in decontamination
7 efforts at various nuclear installations, including Pratt
8 and Whitney's Middletown Connecticut facilities. My
9 responsibilities included those of the Health Physicist for this
10 project as well as supervisor of the decontamination of "Hot Cell"
11 and packaging and removal of radioactive material to a
12 licensed burial site.

13
14 I also supervised the decommissioning of Lockheed Georgia's
15 Nuclear Facility at Dawsonville, Georgia, and assisted in the
16 decontamination efforts of Commonwealth Edison's Dresden
17 Station. The latter job involved the decontamination of a
18 highly radioactive auxiliary system at the Dresden BWR,
19 Plant I. My responsibility was to ensure that the decontamina-
20 tion was carried out safely with minimum exposure to personnel
21 and that the radioactive waste was packaged and shipped in
22 accordance with both local and AEC regulations.

1 I was also Field Manager, responsible for the overall
2 operation of the decontamination efforts for the U.S. Radium
3 Corporation plant in Danville, Pa. I was initially
4 responsible for bidding the job, and when the contract was
5 awarded, supervised both technicians and laborers until the
6 licensed area was "released" by AEC authorities.

7
8 From January 1973 to April 1976 I was employed by Stone &
9 Webster Engineering Corporation. I was responsible for
10 reviewing licensing material and client and vendor correspondence
11 for completeness, technical accuracy and conformance with
12 Company policies and Regulatory requirements.

13
14 I was also responsible for the radiation protection effort
15 on Virginia Electric and Power Company's (VEPCO) nuclear
16 units Surry 3 & 4. As Radiation Protection Engineer, my
17 duties included: shielding studies, accident analysis,
18 contributing to the writing of the Preliminary Safety
19 Analysis (PSAR) and Environmental Report (ER), responding to
20 NRC staff questions, interpreting the applicability of NRC
21 Regulatory Guides, insuring that the release of radioactive

22

ROBERT SHROPSHIRE

1 material to the environment met the "as low as reasonably
2 achievable" (ALARA) objectives promulgated by regulatory
3 agencies, responding to Advisory Committee on Reactor
4 Safeguards, Atomic Safety and Licensing Board and Radiological
5 Hearings for the Surry Power Station Units 3 & 4. I also
6 administrated and directed the overall operation of the
7 Radiation Protection Group, assisted in the hiring and the
8 training of personnel to ultimately accept responsibility for
9 a given nuclear project, maintained and implemented
10 State-of-the-Art knowledge within the Group, interfaced
11 with other offices to make use of the expertise within all
12 Radiation Protection Groups, and entertained and supported
13 generic studies in the field of radiation protection. I
14 directed the radiation protection efforts for the Jamesport
15 Nuclear Power Station, and had final radiation protection
16 responsibility for the Greene County Nuclear Power Plant.

17
18 From April, 1976 to the present I have been employed by the
19 Power Authority as the radiological engineer responsible
20 for establishing, administering, and maintaining State-of-the-
21 Art knowledge within the disciplines of Radiochemistry,
22 Meteorology, Environmental, Radiation Protection and

ROBERT SHROPSHIRE

1 Nuclear Safety. I assure that the operation of the nuclear
2 facilities and contractors under the jurisdiction of the
3 Power Authority of the State of New York conform to the
4 highest standards of radiation protection and nuclear
5 safety within criteria established by applicable regulatory
6 bodies.

7
8 I received a Bachelor of Science Degree in Nuclear Engineering
9 from Columbia University in 1975. I have also taken advanced
10 courses in nuclear engineering at Columbia University,
11 participated in the Health Physics Certification Course
12 sponsored by the American Health Physics Society in 1974,
13 the Senior Reactor Operator Training Course, Cornell
14 University, 1966, the Nuclear Power Reactor Safety Course
15 at M.I.T. Boston, Massachusetts, 1973, and Environmental
16 Surveillance Course, Harvard School of Public Health;
17 Boston, Massachusetts, 1974. I am a member of the American
18 Nuclear Society, the Health Physics Society, and the
19 Standards Committee, ANS 18.1.
20
21
22

CONTENTIONS

1
2
3 Some intervenors have raised issues concerning the
4 Emergency Procedures that would be associated with the
5 proposed Greene County Nuclear Power Plant.
6

7 Consolidated Intervenors Shirley A. Brand and Mid-Hudson
8 Nuclear Opponents raise the issue of notification to the public
9 in the event of a plant emergency. Their Contention 1 states:

- 10 1. Petitioners contend that the Applicant's PSAR does not
11 contain sufficient information to satisfy the
12 Commission's construction permit requirements regarding
13 measures to be taken in the event of an emergency
14 at the proposed facility requiring evacuation in that:
- 15 a. there is insufficient information regarding
 - 16 the means of notification to the general public;
 - 17 b. there is insufficient information whether the
 - 18 highways and public transportation within the
 - 19 vicinity of the plant site are adequate to
 - 20 effect evacuation of persons within the LP2 of
 - 21 the proposed facility;
 - 22

1 c. there is insufficient information regarding
2 the adequacy of medical facilities for emergency
3 treatment.

4
5 Stipulation Contention 2 of Intervenor Lehigh Portland Cement
6 Company states:

7 2. The Petitioner contends that the Applicant's PSAR
8 does not provide reasonable probability that appropriate
9 measures would be taken to protect the employees of
10 Lehigh in the event of an accident, especially
11 in light of the limited ingress and egress allowed
12 by Highway 9W.

13
14 Stipulated Contention I.B. of Intervenor Cementon Civic
15 Association states:

16 The Petitioner contends that the Applicant's PSAR
17 does not provide reasonable probability that
18 appropriate measures could be taken to protect the
19 community of Cementon in the event of an emergency
20 at the proposed facility, especially in view of the
21 limited ingress and egress by Highway 9W.

22

R. SHROPSHIRE
B. PODWAL

1 In its Memorandum and Order of February 14, 1977, the Atomic
2 Safety and Licensing Board accepted as rewritten Unstipulated
3 Contention B-6 of Intervenors Columbia County Survival
4 Committee and Arthur L. Reuter. That Contention as rewritten
5 states:

6 Applicant has not complied with the requirement of
7 Appendix E, 10 CFR in that sufficient information
8 has not been provided to assure that emergency
9 plans can be developed particularly with respect to
10 the surrounding populations

11
12 RESPONSE

13
14 It is Applicant's judgment that an accident will not
15 occur at the proposed Greene County Nuclear Power Plant
16 requiring any offsite evacuation. Applicant has reached this
17 conclusion for the following reason: the design basis
18 accidents (DBA's), evaluated to ensure the safety of a proposed
19 nuclear station such as Greene County, cover all of the
20 hypothetical accidents that the NRC considers to be credible.
21 In NRC terminology, these accidents are numbered in Classes
22 1 to 8. An event of Class 8 proportion (such as the most

1 severe Greene County DBA, a "large break" loss of coolant
2 accident or LOCA) is described by the NRC in 10 CFR 100.11

3 (a) n.1 as a:

4 . . . major accident, hypothesized for purposes
5 of site analysis or postulated from considerations
6 of possible accidental events, that would result in
7 potential hazards not exceeded by those from any
8 accident considered credible.

9
10 For safety analysis purposes highly conservative assump-
11 tions are employed in determining radiation doses. Thus,
12 unrealistically high doses result from the DBA calculations.
13 For purposes of determining the environmental impacts that
14 would actually result should a DBA occur, realistic doses
15 are calculated. The NRC Regulatory Staff's Draft Environmental
16 Statement on Greene County, NUREG-0045, (DES) explains the
17 difference between the conservative estimates of accident
18 doses made for safety purposes, on the one hand, and the
19 realistic calculation of accident doses made for
20 environmental analysis purposes, on the other hand. The DES
21 states on page 7-1:

22 The probability of the occurrence of accidents and

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1 the spectrum of their consequences to be considered
2 from an environmental effects standpoint have been
3 analyzed using best estimates of probabilities and
4 realistic fission product release and transport
5 assumptions. For site evaluation in the Commission's
6 safety review, extremely conservative assumptions are
7 used to compare calculated doses resulting from a
8 hypothetical release of fission products from the fuel
9 with the 10 CFR siting guidelines. Realistically
10 computed doses that would be received by the population
11 and environment from postulated accidents would be
12 significantly less than those to be presented in the
13 Safety Evaluation.

14
15 Nonetheless, for purposes of emergency planning, the NRC
16 requires in 10 CFR 50, App. E that nuclear power plants be
17 prepared to deal with the hypothetical consequences of the
18 most severe design basis accident. At the construction permit
19 stage, only sufficient information to assure that emergency
20 plans can be developed is required. Section 13.3 of
21 Applicant's Preliminary Safety Analysis Report (PSAR) describes
22 the emergency planning Applicant has performed. As

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1 indicated in that section, emergency plans and procedures will
2 be developed to cover both actions to be taken in case of a
3 nonradiological as well as a radiological emergency. Applicant
4 therein has stated that the plans and procedures will conform
5 to 10 CFR 50, App. E.
6

7 New York State oversees any emergency arrangements beyond
8 the Greene County Nuclear Power Plant exclusion area.
9

10 In New York State, local authorities are subject to state
11 direction for purposes of planning for, and dealing with any
12 radiological emergencies. The New York State Department of
13 Health, in turn, is the "lead" state agency for the response
14 to these emergencies. Thus the Department of Health prepares
15 and maintains radiation response plans, which are part of the
16 state's overall disaster planning effort and support its basic
17 "Emergency Operations Plan." The State Commissioner of Health
18 is the official who recommends or orders, depending on the
19 circumstances, protective action to prevent or minimize offsite
20 radiation exposure of the public.
21

22 The state's disaster coordination agency is the Division

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1 of Military and Naval Affairs in the Executive Department.
2 To carry out this disaster coordination function, the Division
3 of Military and Naval Affairs has created within its organization
4 the Office of Disaster Preparedness (ODP). ODP manages the
5 assistance furnished to the State Department of Health by
6 various federal and state departments and agencies, local
7 government forces, and quasi-public and private organizations.
8 ODP works out of the Emergency Operating Center, which is
9 located in the Public Security Building on the State Office
10 Building campus in Albany. At this location, there is a state
11 warning point which is manned 24 hours a day.
12 In case of an emergency the State Department of Transportation
13 and the Bureau of Radiological Health, State Department of
14 Health will be notified for their appraisal of the event. When
15 they have categorized it, they will take appropriate action
16 according to procedure. The plant will notify the Greene County
17 Sheriff's Department to create roadblocks as necessary and the
18 U.S. Coast Guard to keep waterborne craft from the river if it
19 is affected. Plant radiation protection personnel will sample
20 the area and inform the Coordinator who in turn keeps the
21 Bureau of Radiological Health up-to-date. If necessary, the
22 Radiological Assistance Team for Region I (at Brookhaven

1 National Laboratory) will be asked for assistance.

2

3 The legal basis, notification procedures, public information
4 duties, and overall functions of the various state agencies
5 which have radiological emergency responsibilities are set out
6 in the State's "Emergency Plan for Major Radiation Accidents
7 at Fixed Nuclear Facilities," revised January 1977.

8 This plan provides for a coordinated effort by state, local
9 and federal agencies to prevent or minimize hazards to the
10 public in the event of an accident at a nuclear facility.

11 While the plan does not deal directly with an accident confined
12 strictly to a power plant site, the state would be available
13 for consultation and assistance to the plant operators if
14 such were requested.

15

16 The plan is purposely general in nature. More detailed
17 arrangements are contained in the "Specific Operating Procedures"
18 (SOP) developed for each nuclear power plant before it operates.
19 (The potential contamination of milk, food and water is
20 addressed in New York State's "Supplemental Radiation Emergency
21 Response Plan to Provide for Monitoring, Surveillance, and
22 Control over Milk, Milk Products, Agricultural Products and

1 Water Sources Following an Accident at a Fixed Nuclear
2 Facility," issued in September 1975.)
3

4 In the unlikely event of an accident, or during emergency
5 drills, members of the GCNPP operating staff then
6 present at the plant site will begin immediate protective
7 measures and otherwise set the emergency plan in motion. The
8 ranking member of the operating staff actually on site will
9 take initial charge. Management personnel will be notified
10 of the emergency and summoned to the site as necessary. The
11 coordination of emergency efforts will be assumed by the
12 Emergency Director when he arrives at the station.
13

14 Members of the GCNPP emergency organization will be
15 notified, through the plant intercommunication system for those
16 persons onsite, and by means of public telephone, Authority
17 internal telephone lines between its operating plants and
18 headquarters located in the City of New York, or by the
19 Authority emergency radio system for those persons who must
20 be summoned from offsite.
21

22 Identification and characterization of an accident will

1 be made by personnel in the control room through interpretation
2 of equipment status and through readouts from temperature,
3 pressure and radiation instrumentation located in plant areas
4 where serious accidents could occur. Judgments made in this
5 fashion will be supplemented by observation reports from
6 plant personnel and survey teams as necessary.

7
8 Dose projections require two basic inputs, meteorological
9 conditions and radioactivity release data. In the control
10 room there will be available a continuous readout of temperature
11 differences, wind speed and wind direction, as measured at an
12 onsite met tower. Releases will be determined either from
13 surveys conducted by plant personnel or from fixed radiation
14 instrumentation located about the site. Actual dose estimates
15 will be made either through use of sets of curves that have
16 dose plotted as function of time and distance for different
17 meteorological conditions and radiological releases, or
18 through the use of a computer that takes instrument input
19 directly and calculates doses.

20
21 State and local emergency authorities will be notified
22 by telephone. Authority personnel would notify state

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1 and county emergency communication centers, manned around
2 the clock. These centers would then inform the appropriate
3 state and local authorities. The names, addresses and
4 telephone numbers of these authorities will be set out
5 in preexisting, up-to-date lists.

6
7 The attached map is a composite of portions of United
8 States Geological Survey maps for Columbia, Greene and Ulster
9 Counties. Concentric rings for mileages from the plant site
10 have been drawn and marked with radii distances. Roads
11 referred to in the discussion have been highlighted for
12 emphasis as have specific political entity names referenced
13 in the text. Specific major employment units or units with
14 employees dispersed individually or in small groups over a
15 wide area are shown with a code.

16
17 Major emergencies would mandate that a sector 22.5
18 degrees on either side of the line of wind flow be evacuated.
19 However, for the purpose of general planning and review of
20 conditions, a considerably larger portion of the LPZ is
21 included within our analysis zone than would be defined by a
22 45 degree sector for evacuation. The evacuation routes

1 anticipated and named below do not include either relocated
2 Route 9W or the Catskill By-Pass.

3

4 COLUMBIA COUNTY (EAST OF THE HUDSON RIVER)

5

6 The largest affected residential settlements included
7 within the LPZ in Columbia County are Germantown, North
8 Germantown and Cheviot. All three communities are within the
9 Town of Germantown. The year 2000 population for the Town
10 of Germantown is projected (by the NYS Economic Development
11 Board) as 3,030, and projecting this growth for an additional
12 20 years produces an assumed 2020 population of 4,318
13 residents.

14

15 The primary north-south roadway on which evacuation would
16 take place is New York Route 9G. Route 9G south of North
17 Germantown is a heavy-duty road. North of the heavy-duty
18 section, Route 9G is a medium-duty road. South of the hamlet
19 of Germantown, Woods Road and Route 9G provide access to areas
20 of the Town of Clermont outside of the 2.5 mile LPZ boundary.
21 To the east, medium duty roads from the North Germantown area
22 and from the Germantown area allow evacuation beyond the LPZ.

1 These roads are sufficient to provide evacuation even
2 assuming all 4,318 residents are within the LPZ. Based on an
3 actual emergency evacuation situation, it can be expected that
4 a four persons per car average occupancy would occur¹ and also
5 during this emergency evacuation that normal available road
6 capacities could be greatly exceeded by the evacuation vehicles.
7 The evacuation analysis for the Greene County nuclear power
8 plant conservatively uses three persons per vehicle occupancy
9 average and the normal road capacity. The available hourly
10 capacity of the roadways leaving the LPZ is 2,500 vehicles.
11 Approximately 1,440 vehicles would be necessary to evacuate
12 4,318 persons, assuming three persons per car. Thus, the road
13 system is capable of supporting this evacuation within one hour.

14
15 WEST OF THE HUDSON RIVER - ULSTER COUNTY, TOWN OF SAUGERTIES

16
17 A call for evacuation within the LPZ would impact only
18 a small portion of the Town of Saugerties. The largest
19 affected community is West Camp. Based on projections by
20 the NYS Economic Development Board the assumed 2020 population
21 for the portion of Ulster County within the LPZ will be
22 5,525. West Camp is located on Route 9W which provides

¹Evacuation Risks - An Evaluation, U.S. Environmental Protection Agency, Office of Radiation Programs, June 1974 (EPA - 520/6-74-002), pg. 42

1 southerly egress. West Camp Road provides westward movement
2 to Asbury outside the LPZ. Alternately, West Camp Road traffic
3 could proceed south on Kings Highway to areas beyond the LPZ.

4
5 The existing highway network around the hamlet of West
6 Camp has sufficient capacity to accommodate the anticipated
7 number of evacuation vehicles. Using a three persons per
8 vehicle occupancy, 1,832 vehicles would be used to evacuate
9 this area of Ulster County. Assuming use of both West Camp
10 Road and Route 9W, the available capacity is over 2,000
11 vehicles per hour. Evacuation of this portion of Ulster
12 County within one hour is feasible with the existing road
13 system.

14
15 WEST OF THE HUDSON RIVER - GREENE COUNTY, TOWN OF CATSKILL

16
17 Based on the 1970 census, there were 5, 115 persons
18 residing in the Town of Catskill outside the limits of the
19 Village of Catskill. This non-village area is considerably
20 larger than the portion of the Town within the LPZ. A
21 conservative approach is to assume that 90 percent of the
22 non-village Town population resides within the LPZ. Thus

1 4,604 persons are assumed to have resided in the zone in 1970.
2 Using NYS Economic Development Board projections, there will
3 be 12,417 persons resident in the Town of Catskill portion of
4 the LPZ in 2020.

5
6 The present available capacity of Route 9W is limited
7 to 800 cars per hour by the one-way operation at the railroad
8 underpasses on either side of the hamlet of Cementon.

9
10 Using the extremely conservative assumption that one
11 half the total population of 12,417 persons are in the
12 Cementon area between the underpasses at the start of evacuation,
13 then less than three hours would be required to evacuate, to
14 either the north or south, the approximately 2000 cars
15 (at three persons per car) from the Cementon area.

16
17 It is assumed that the remaining population of the LPZ
18 would be evacuated northward on Route 9W. This is conservative
19 because Kings Highway and Embought Road are also available
20 for evacuation. If all traffic from the Cementon area were
21 heading north on 9W, the total northbound 9W traffic would
22 be approximately 4000 cars. The normal available capacity

1 of Route 9W north of the underpasses is in excess of 1000
2 vehicles/hour. Thus the existing road system has the capacity
3 to support the evacuation of all 4000 cars from the entire
4 LPZ within four hours.

5

6 Personnel working at the nearby cement plants and quarries
7 are included in these calculations.

8

9 WEST OF THE HUDSON RIVER - NEW YORK STATE THRUWAY

10

11 In the event of an emergency evacuation, the portion of
12 the New York State Thruway between interchanges 20 and 21
13 would have to be closed to traffic.

14

15 RIVER TRAFFIC - HUDSON RIVER

16

17 In the event of an emergency, activity on Hudson River
18 will be controlled, as the situation dictates, by the U.S.
19 Coast Guard.

20

21

22

1 AVAILABLE EVACUATION TIME

2
3 An analysis has been performed to determine how much
4 time is available to evacuate persons within the LPZ without
5 exceeding recommended Environmental Protection Agency Protective
6 Action Guidelines (see response to NRC question 422.1 in
7 GCNPP-PSAR). Figure Q422.1-34 shows the extent of the area
8 that would require evacuation within eight hours to meet these
9 guidelines. As indicated on this figure, the great majority
10 of the LPZ is outside the eight hour evacuation zone. The
11 hamlet of Cementon, the Lehigh Portland Cement Company
12 production facilities, and all cement Company quarries fall
13 well outside the eight hour evacuation zone. Therefore, there
14 is reasonable probability that the employees of Lehigh
15 Portland Cement Company and the community of Cementon can be
16 protected in the event of plant emergency.

17
18 The above analysis considers evacuation times utilizing
19 only the existing road networks. There will be a need to
20 provide some road improvements in order to facilitate
21 construction of the Greene County nuclear power plant. The
22 existence of any road improvements would result in a greater

1 ability of the road network to support an emergency evacuation
2 from the LPZ. As discussed above, however, the presently
3 existing road network is sufficient to evacuate personnel
4 from within the LPZ in a timely manner.

5
6 NEED FOR PUBLIC TRANSPORTATION DURING EMERGENCIES

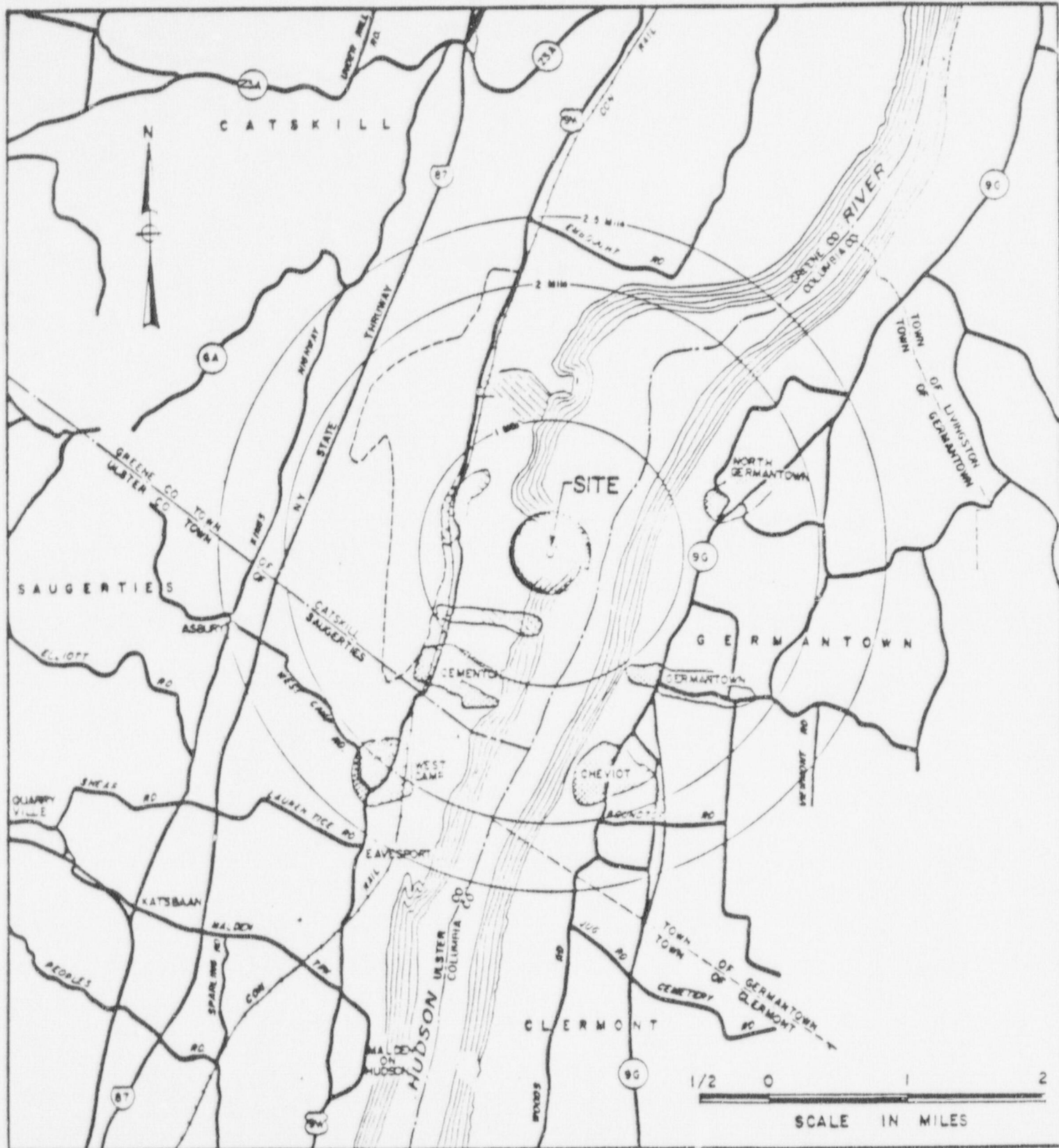
7
8 It is recognized that certain individuals will not have
9 use of their own private vehicles during LPZ evacuation.
10 However, there is no need to rely on regular public
11 transportation for these evacuees. These individuals will
12 carpool or will be accommodated by emergency units such as
13 police cars and ambulances. Detailed procedures for
14 evacuation of these persons will be formulated at the Greene
15 County nuclear power plant operating license stage.

16
17 MEDICAL FACILITIES





18
19 With regard to the adequacy of medical facilities for
20 emergency treatment the Authority has addressed two situations,
21 both involving radiation. One case deals with minor
22 emergencies that could be handled at a local hospital and the

1 other case deals with major medical emergencies, exceeding
2 the capabilities of the local hospitals, which would be
3 handled by the Albany Medical Center.
4

5 The Authority has established preliminary contact with
6 local hospitals which have pledged their willingness to assist
7 in the event an emergency situation arises. When a more
8 formal agreement is executed, the Authority will provide the
9 designated hospitals with the necessary equipment and
10 supplies to adequately respond to a contaminated-injured
11 individual. These hospitals will be provided with
12 decontamination supplies, protective clothing, and contaminated
13 waste disposal equipment. Further, the Authority staff will
14 ensure that hospital personnel and ambulance drivers will
15 receive radiation protection training to the extent necessary
16 to facilitate their handling of injured-contaminated personnel.
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LEGEND

-  MAJOR ROADS
-  POPULATION UNITS
-  EMPLOYMENT UNITS
-  ACTIVE QUARRY AREA

POWER AUTHORITY OF THE STATE OF NEW YORK
 GREENE COUNTY NUCLEAR POWER PLANT
 CEMENTON SITE

**TRANSPORTATION ASPECTS
 OF EMERGENCY PLANNING**

PREPARED BY
 PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC

DWG NO. 06. 90