DEC 1 5 1980

REGULATORY DOCKET FILE COPY

Docket No. 50-244

LS05-80-12016

DISTRIBUTION:
Docket
NRC PDR
Local PDR
TERA
NRR Reading
SEPB Reading
WRussell
DCrutchfield
HSmith
RSnaider
TJCarter
OELD
OI&E (3)
ACRS (16)
NSIC, JBuchanan
JWetmore
RDiggs
JRoe
DEisenhut
RPurple
TNovak
RTedesco
GLainas
GCwalina
CBerlinger
SEP File

Mr. Leon D. White, Jr.
Vice President
Rochester Gas & Electric Corporation
89 East Avenue
Rochester, New York 14649

Dear Mr. White:

SUBJECT: GINNA - SEP TOPIC II-2.A, SEVERE WEATHER PHENOMENA

The SEP review of Topic II-2.A, "Severe Weather Phenomena" has been completed. Enclosure 1 is the staff's safety evaluation (SE) for the site. The review was done in conformance with Standard Review Plan 2.3.1 and covers extreme temperatures, lightning strikes, snow and ice loads and wind and tornado loadings. The wind and tornado loadings analysis was performed by the Texas Tech. University, Institute for Disaster Research. Enclosure 2 is the Texas Tech. report. Please inform us if your as-built facility differs from the licensing basis assumed in our assessment within 30 days of receipt of this letter.

You will note that the SE identifies a design basis tornado with a probability of 10^{-7} per year and is consistent with a Regulatory Guide 1.76 design basis tornado. The staff intends to evaluate the structural characteristics of specific structures, systems and components important to safety to determine their ability to withstand the severe weather loadings. The plant design parameters will then be compared to the probability of occurrence of the wind as a part of our structural evaluation. This comparison will be used to evaluate the necessity of design changes.

Sincerely,

Original signed by

Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
Division of Licensing

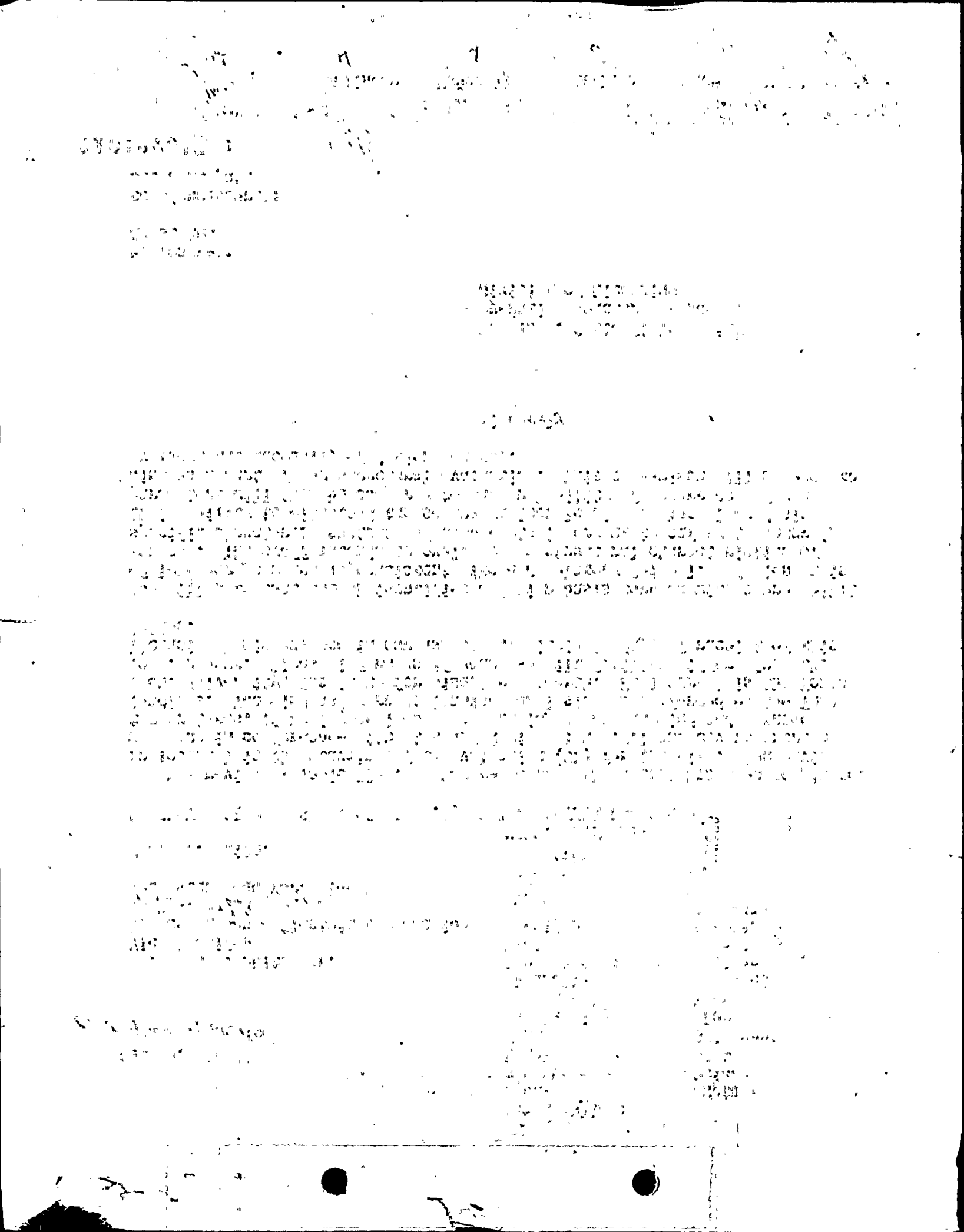
Enclosures:
As stated

cc w/enclosures:
See next page

8101270150

OFFICE	SEPB:DL	SEPB:DL:SL	SEPB:DL:C	ORB#5:DL:PM	ORB#5:DL:C	AD:SA:DL
SURNAME	Cwalina:dk	CBerlinger	WRussell	RSnaider	DCrutchfield	GLainas
DATE	12/4/80	12/4/80	12/4/80	12/8/80	12/11/80	12/ /80

NRC FORM 318 (9-76) NRCM 0240 ☆U.S. GOVERNMENT PRINTING OFFICE: 1979-289-369



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

DEC 15 1980

Docket No. 50-244
LS05-80-12-016

Mr. Leon D. White, Jr.
Vice President
Rochester Gas & Electric Corporation
89 East Avenue
Rochester, New York 14649

Dear Mr. White:

SUBJECT: GINNA - SEP TOPIC II-2.A, SEVERE WEATHER PHENOMENA

The SEP review of Topic II-2.A, "Severe Weather Phenomena" has been completed. Enclosure 1 is the staff's safety evaluation (SE) for the site. The review was done in conformance with Standard Review Plan 2.3.1 and covers extreme temperatures, lightning strikes, snow and ice loads and wind and tornado loadings. The wind and tornado loadings analysis was performed by the Texas Tech. University, Institute for Disaster Research. Enclosure 2 is the Texas Tech. report. Please inform us if your as-built facility differs from the licensing basis assumed in our assessment within 30 days of receipt of this letter.

You will note that the SE identifies a design basis tornado with a probability of 10^{-7} per year and is consistent with a Regulatory Guide 1.76 design basis tornado. The staff intends to evaluate the structural characteristics of specific structures, systems and components important to safety to determine their ability to withstand the severe weather loadings. The plant design parameters will then be compared to the probability of occurrence of the wind as a part of our structural evaluation. This comparison will be used to evaluate the necessity of design changes.

Sincerely,

Dennis M. Crutchfield

Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
Division of Licensing

Enclosures:
As stated

cc w/enclosures:
See next page

8101270150

Mr. Leon D. White, Jr.

R. E. GINNA NUCLEAR
POWER PLANT
DOCKET NO. 50-244

cc
Harry H. Voigt, Esquire
LeBoeuf, Lamb, Leiby and MacRae
1333 New Hampshire Avenue, N. W.
Suite 1100
Washington, D. C. 20036

Mr. Michael Slade
12 Trailwood Circle
Rochester, New York 14618

Rochester Committee for
Scientific Information
Robert E. Lee, Ph.D.
P. O. Box 5236 River Campus
Station
Rochester, New York 14627

Jeffrey Cohen
New York State Energy Office
Swan Street Building
Core 1, Second Floor
Empire State Plaza
Albany, New York 12223

Director, Technical Development
Programs
State of New York Energy Office
Agency Building 2
Empire State Plaza
Albany, New York 12223

Rochester Public Library
115 South Avenue
Rochester, New York 14604

Supervisor of the Town
of Ontario
107 Ridge Road West
Ontario, New York 14519

Resident Inspector
R. E. Ginna Plant
c/o U. S. NRC
1503 Lake Road
Ontario, New York 14519

Director, Technical Assessment
Division
Office of Radiation Programs
(AW-459)
U. S. Environmental Protection
Agency
Crystal Mall #2
Arlington, Virginia 20460

U. S. Environmental Protection
Agency
Region II Office
ATTN: EIS COORDINATOR
26 Federal Plaza
New York, New York 10007

Herbert Grossman, Esq., Chairman
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dr. Richard F. Cole
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dr. Emmeth A. Luebke
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. Thomas B. Cochran
Natural Resources Defense Council, Inc.
1725 I Street, N. W.
Suite 600
Washington, D. C. 20006

Ezra I. Bialik
Assistant Attorney General
Environmental Protection Bureau
New York State Department of Law
2 World Trade Center
New York, New York 10047

ENCLOSURE 1

Systematic Evaluation Program

Meteorology

R. E. Ginna Nuclear Power Plant

Topic II-2.A Severe Weather Phenomena

Extreme meteorological conditions and severe weather phenomena in the Ginna site region were examined to determine if safety-related structures, systems, and components are designed to function under all severe weather conditions. Discussed below are the severe weather phenomena which could adversely affect the Ginna site and which should be examined relative to the current design.

Normal daily temperatures range from a minimum of 18 degrees Fahrenheit in January to a maximum of 82 degrees Fahrenheit in July. Measured extreme temperatures for the site region are 100 degrees Fahrenheit which occurred in June 1953 and -16 degrees Fahrenheit which occurred in February 1961. The extreme maximum and minimum temperatures appropriate at the Ginna site for general plant design (i.e., HVAC systems) are 91 degrees Fahrenheit (equalled or exceeded 1% of the time) and 2 degrees Fahrenheit (equalled or exceeded 99% of the time).

Thunderstorms occur an average of 29 days per year in the site region. Based on the annual number of thunderstorm days, the calculated annual flash density of ground lightning strikes is four flashes per square

kilometer. A structure with the approximate dimensions of the Ginna reactor building can be expected to be subjected, on the average, to one strike every 10 years.

The design wind speed (defined as the "fastest-mile" wind speed at a height of 30 feet above ground level with a return period of 100 years) acceptable for the site region is 85 miles per hour. On the average, hail storms occur about two days annually, and freezing rain occurs approximately 12 days per year. The maximum radial thickness of ice expected in the site region is about 0.75 inch.

Mean annual snowfall in the site region is approximately 86 inches. The normal winter precipitation snow load on a flat surface is about 90 pounds per square foot. In the site area, a maximum monthly snowfall occurred in February 1958 and totaled 72.6 inches. The maximum snowfall from a single storm totaled 43.5 inches in March 1900. The maximum measured snow depth on the ground for the site region is 48 inches. Based on the 100-year recurrence accumulated ground snowpack and the 48 hour probable maximum winter precipitation for the region, the snow load on a flat surface is about 150 pounds per square foot.

Tornadoes have been reported 15 times during the period 1950-1977 within an approximate 60-mile radius from the Ginna site, excluding the water area over Lake Ontario and the land area in Canada. On the average, one tornado can be expected to occur in the vicinity of the

Ginna site every two years. Based on the path length and width data from tornadoes occurring in the site region, the recurrence interval for a tornado at the site is calculated to be about 11,500 years.

The assumptions used in Regulatory Guide 1.76 provide an adequate design basis tornado for the site region. These characteristics include a maximum windspeed of 360 miles per hour with a maximum rotational windspeed of 290 miles per hour and a maximum translational windspeed of 70 miles per hour, a maximum pressure drop of three pounds per square inch, and rate of pressure drop of two pounds per square inch per second.

Based on actual tornado occurrences in the site region area and using the procedures discussed in WASH-1300, a "site-specific" design basis tornado (with a probability of occurrence of 10^{-7} per year) can be calculated. For the Ginna site, the characteristics of tornadoes occurring within a 60-mile radius are a maximum windspeed of 285 miles per hour (a maximum rotational windspeed of 225 miles per hour plus a maximum translational windspeed of 60 miles per hour), a maximum pressure drop of two pounds per square inch, and a rate of pressure drop of one pound per square inch per second. Because of the infrequent occurrence of tornadoes in the site region (only 10 tornadoes in 28 years had sufficient data for calculations), the site-specific tornado characteristics are based on a very small sample of data which we believe does not provide a reasonable degree of accuracy for calculations of safety-related structure design.

References

U.S. Department of Commerce, NOAA, "Climates of the States," Vol. 1, 1974.

U.S. Department of Commerce, "Climatic Atlas of the United States," June 1968.

U.S. Department of Commerce, NOAA, "Climates of the United States," 1973.

U.S. Department of Commerce, NOAA, "Local Climatological Data," Rochester, Syracuse, and Buffalo, New York, 1976.

H. C. S. Thom, "New Distributions of Extreme Winds in the United States," Journal of the Structural Division, ASCE, Vol. 94, No. ST7, July 1968.

"American National Standard Building Code Requirements for Minimum Design Loads in Buildings and Other Structures," ANSI, A58.1-1972.

"Seasonal Variation of the Probable Maximum Precipitation East of the 105th Meridian for Areas from 10 to 1,000 Square Miles and Durations of 6, 12, 24, and 48 Hours," Hydrometeorological Report No. 33, Washington, D. C., April 1956.

James A. Ruffner and Frank E. Baier, "The Weather Almanac," Gale Research Company, 1974.

David M. Ludlum, "Weather Record Book," Weatherwise, Inc., 1973.

J. L. Marshall, "Lightning Protection," John Wiley and Sons, New York, 1973.

"ASHRAE Handbook of Fundamentals," American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc., New York 1976.

Paul Tattleman and Irving I. Gringorten, "Estimated Glaze Ice and Wind Loads at the Earth's Surface for the Contiguous United States," Air Force Cambridge Research Laboratories, October 1973.

U.S. Housing and Home Finance Agency, "Snow Load Studies," Housing Research Paper No. 19, May 1952.

U.S. Naval Weather Service, "World-Wide Airfield Summaries," Vol. VIII, United States of America, Part 4, 1969.

Memo from Harold R. Denton (Assistant Director for Site Safety, Division of Technical Review, NRR) to R. R. Maccary (Assistant Director for

Engineering, Division of Technical Review, NRR) dated March 24, 1975, Subject: Site Analysis Branch Position - Winter Precipitation Loads.

Memo from Jerry Harbour (Chief, Site Safety Research Branch, Division of Reactor Safety Research, RES) to L. G. Hulman (Chief, Hydrology-Meteorology Branch, Division of Site Safety and Environmental Analysis, NRR) dated August 14, 1978, Subject: Tornado Frequency Data for SEP Review.

Regulatory Guide 1.76, "Design Basis Tornado for Nuclear Power Plants," U.S. Nuclear Regulatory Commission, Washington, D.C.

WASH-1300, "Technical Basis for Interim Regional Tornado Criteria," U.S. Atomic Energy Commission, May 1974.

Sterling Power Project - Nuclear Unit 1 (SNUPPS), Preliminary Safety Analysis Report, Docket No. 50-485.

H. C. S. Thom, "Tornado Probabilities," Monthly Weather Review, October-December 1963, pp. 730-736.