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Docket No. 50-503

JUN 21 1983

MEMORANDUM FOR: Thomas M. Novak, Assistant Director
for Licensing, DL

FROM: Daniel R. Muller, Assistant Director
for Radiation Protection, DSI

SUBJECT: METEOROLOGY SECTIONS FOR THE WNP-3 DES - OL STAGE

The following sections regarding meteorology conditions at the WNP-3 site are included in the enclosure: meteorology, air quality, atmospheric monitoring, and annual average dispersion discussion for inclusion in an appendix describing the site specific dose assessment calculations.

These sections were prepared by J. Levine (x29433), Meteorology Section, METB, and any questions should be directed to him.

Original signed by
Daniel R. Muller

Daniel R. Muller, Assistant Director
for Radiation Protection
Division of Systems Integration

Enclosure:
As stated

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DATE	06/20/83	06/ /83	06/20/83	06/21/83			

METEOROLOGY CONDITIONS AT THE WNP-3 SITE

4.3.3 Meteorology

WNP-3 is situated in Western Washington State where the climate is comprised of warm, dry summers and wet, mild winters. These conditions are the result of the proximity to the Pacific Ocean and the presence of semi-permanent high and low pressure centers off the coast which migrate in a north-south manner[1]. Temperatures normally vary from an average January minimum of approximately 30°F to an average July maximum in the middle 70°F range[2]. Temperature extremes observed at Olympia, WA, were -8°F and 104°F during the 40 year period ending in 1981[3, 4]. Precipitation is normally observed every month, although the greatest portion of the nearly 51 inches annually is observed from October through March.

Included in the precipitation total is the water equivalent of the snowfall that occurs from November through April. Thunderstorms are infrequently recorded and primarily occur in spring and summer, with a corresponding very low frequency tornado events, as seen by only one tornado occurring in the one degree square including the site during the period 1916-1979. Although the tornado strike probability is approximately 1.4×10^{-7} years^{-1} [5], the plant has been designed to exceed the requirements in NRC Regulatory Guide 1.76[6] Region III criteria for wind speed, pressure drop, and rate of pressure drop (240 mph, 1.5 psi and 0.6 psi/sec, respectively).

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Another meteorological phenomenon of note in the area is the general cloudiness that results in less than 60 clear days per year. Similarly, heavy fog with visibility .25 miles or less is observed 60-80 days annually in the region.

Prevailing winds in the area, as measured at Olympia, WA, are from the southwest quadrant and average about 7 mph. Onsite 10 meter wind observations illustrated in Figure 4.3.3-1 present the annual wind frequency distribution measured during the period October 1979 through September 1981. The maximum fastest mile wind speed observed at Olympia, WA, was 60 mph.

5.14.3 Atmospheric Monitoring

A pre-operational meteorological monitoring program was begun in 1973 and continued through February 1975, at which time it was stopped. A second monitoring program was begun in September 1979 and continued through September 1981[5].

The measurements were made on a 60 m tower and include wind speed and wind direction at the 10 and 60 meter levels, ambient air temperature at 10 meters, dew point temperature at 60 meters, and vertical temperature difference between the 10 and 60 meter levels. Relative humidity is also measured at 10 meters while precipitation is measured at ground level near the tower.

This tower, located approximately 1130 meters north-northwest of the plant, will provide operational data on meteorological conditions to the control room.

In addition, a 10 m tower will be installed as a backup for use in emergency preparedness to provide wind speed and wind direction, as well as the standard deviation of the wind direction (sigma theta) to indicate atmospheric stability.

5.4 Air Quality

5.4.1 Fog and Ice Effects

The impacts of the operation of the natural draft cooling tower, described in the CP stage DES, NUREG-75/009[7], is still applicable relative to the potential occurrence of ground fog or icing.

5.4.2 Emissions and Dust

Non-radioactive emissions from the plant, excluding cooling tower emissions, will include exhaust gases from the monthly testing of diesel engines. This testing, which is planned for two hours per month, will produce limited amounts of NO_x, S and ash, and should not contribute significantly to regional air pollution, as described in the Environmental Quality annual report for the year 1978[8].

Appendix D

Dose Commitments from Radioactive Effluent Releases

The NRC staff's estimates of the expected gaseous and particulate releases (listed in Table D-1), along with the site meteorological considerations (summarized in Table D-2), were used to estimate radiation doses and dose commitments for airborne effluents. Individual receptor and pathway locations considered for the maximally exposed individual in these calculations are listed in Table D-3.

Two years of meteorological data were used in the calculation of long-term dispersion estimates. The data were collected onsite from October 1979 to September 1981. The long-term atmospheric dispersion estimates were made using the considerations described in Regulatory Guide 1.111, Revision 1, and methods described in NUREG/CR-2919. Open terrain recirculation factors were used by the staff in the computer model.

Table D.2. Summary of Maximum Annual Average Relative Concentration Atmospheric Dispersion Factors (X/Q) and Relative Deposition Values (D/Q) for the Site Boundary and Other Receptor Locations near the WNP-3 Plant*

Location (Miles/Direction)	Continuous Release	
	X/Q (sec/m^3)	Relative Deposition (m^{-2})
Site boundary (1.04 NNE)	1.1×10^{-5}	3.5×10^{-8}
Residence and garden (1.0 N)	6.9×10^{-6}	1.5×10^{-8}
Milk cow (1.5 NNE)	5.2×10^{-6}	1.4×10^{-8}
Goat (1.7 NE)	2.2×10^{-6}	5.2×10^{-9}
Meat animal (1.6 NNE)	4.6×10^{-6}	1.2×10^{-8}

*The values presented in this table are not corrected for radioactive decay and cloud depletion from deposition, where appropriate, in accordance with Regulatory Guide 1.111, Rev. 1, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light Water Reactors," July 1977.

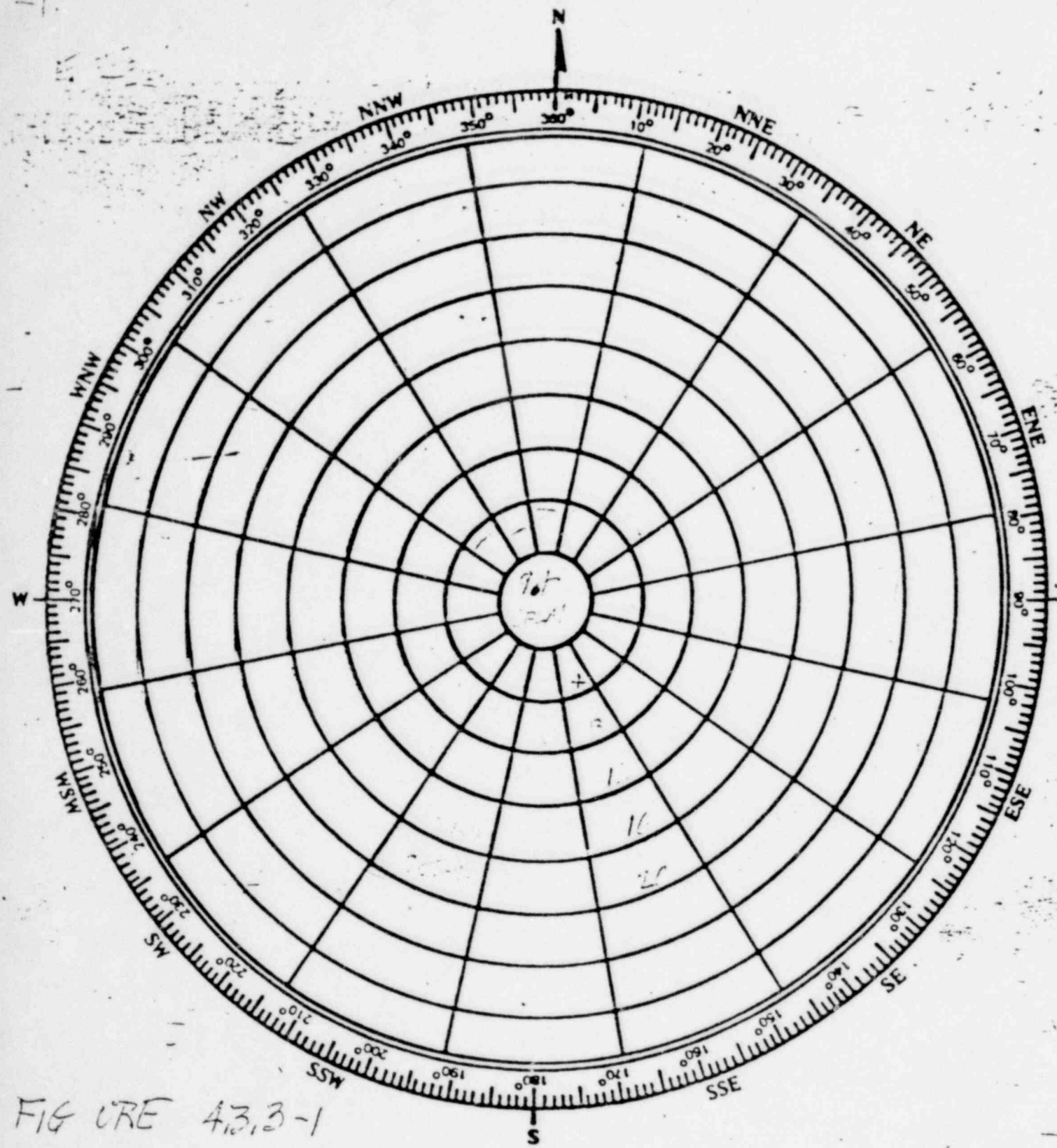

FIGURE 43.3-1

WNP3 ON SITE 10 METER WIND ROSE - PERCENT OF TIME WIND FLEW FROM DIRECTION SHOWN (OCTOBER 1977 - SEPTEMBER 19

REFERENCES

		DES Section
(1)	Climates of the States, Vol. 2 - Western States, Water Information Center, Port Washington, NY, 1974.	4.3.3
(2)	"Climates of the United States," Baldwin, J. L., U.S. Department of Commerce, Washington, DC, 1973.	4.3.3
(3)	Washington - Climatography of the United States, "Monthly Normals of Temperature, Precipitation and Heating and Cooling Degree Days 1941-1970," National Climatic Center, Asheville, NC, August 1973.	4.3.3
(4)	Local Climatological Data, 1981, Olympia, WA, National Climatic Center, Asheville, NC.	4.3.3
(5)	Washington Public Power Supply System Project 3 FSAR (WPPSS 3).	5.14.3
(6)	Regulatory Guide 1.76, "Design Basis Tornado for Nuclear Power Plants," Office of Standards Development, U.S. Nuclear Regulatory Commission, Washington, DC, April 1974.	4.3.3
(7)	WPPSS-3 DES, CP Stage, NUREG-75/009	5.4.1
(8)	Environmental Quality - The Ninth Annual Report of the Council on Environmental Quality, Washington, DC, December 1978.	5.4.2