

11-13-96

# NATIONAL WEATHER SERVICE WSR-88D WEATHER SURVEILLANCE RADAR GUIDELINES FOR FUTURE DEVELOPMENT

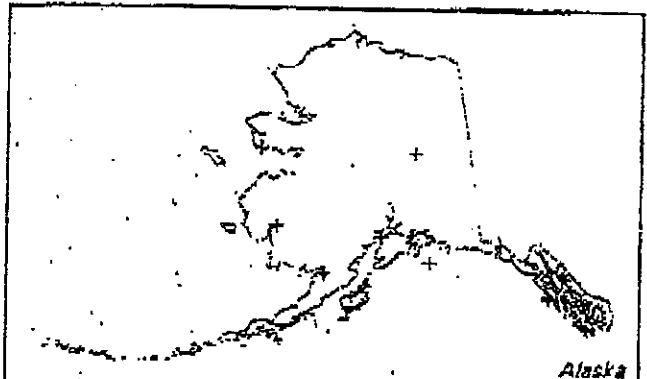
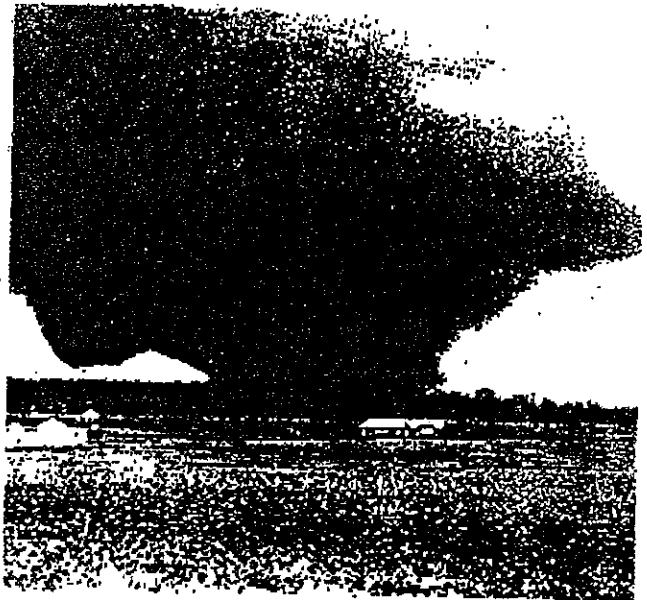
This information is intended to provide guidance for and propose limitations on construction of structures near WSR-88D Weather Surveillance Radars

The National Weather Service (NWS) is undergoing a major modernization program to improve the quality and reliability of its products and services. A key part of this modernization is the new Doppler weather surveillance radar - WSR-88D. The WSR-88D will increase advance warning time for catastrophic events such as tornadoes, severe thunderstorms, and flash floods.

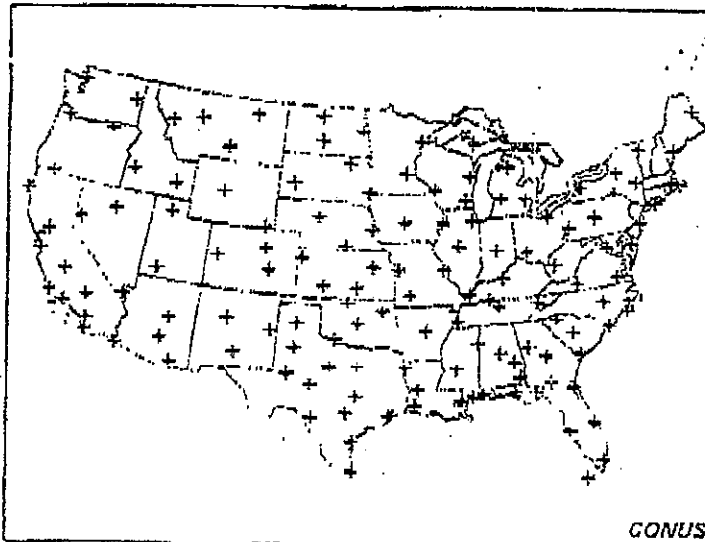
The WSR-88D measures the speed, the direction of motion, and the intensity of approaching weather. By measuring the wind patterns within developing storms, the WSR-88D identifies the conditions leading to severe weather. By combining measured rainfall data with river basin maps the WSR-88D provides improved flood forecasting and water resource management. The WSR-88D will dramatically enhance our ability to safeguard life, property, and commerce.

In a cooperative effort with the Federal Aviation Administration (FAA) and the Department of Defense (DoD), a total of over 160 radars will be deployed by 1996.

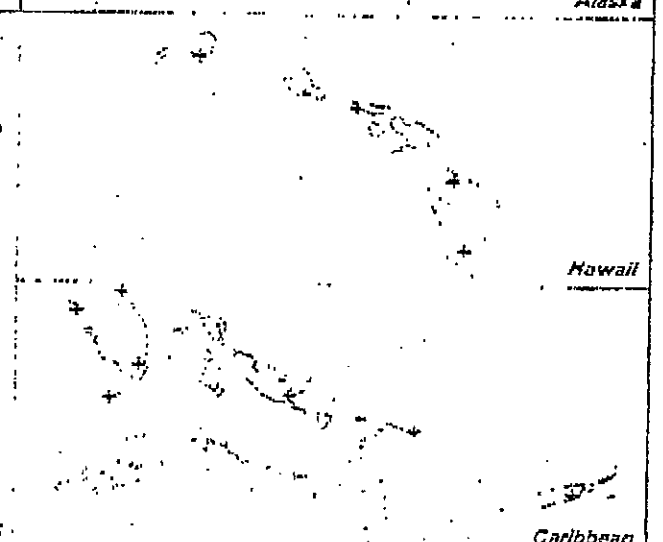
Radar locations are selected by considering radar coverage requirements of the NWS, the FAA and the DoD, compliance with the National Environmental Policy Act (NEPA), and construction and operational costs.



Alaska



CONUS



Hawaii

Caribbean

Locations of WSR-88Ds

Coverage requirements are the most important criteria. Blockage of the radar beam from buildings or towers can adversely affect the quality of the radar data, and hence the weather detection. Future construction around a WSR-88D should consider the height of the planned structures relative to the height of the radar beam. The following guidelines for future construction near the WSR-88D are provided as a resource for community planning and development.

The elevation ( $E$ ) of a structure is the sum of the ground elevation ( $H_1$ ) at the base of the structure, plus the height ( $H_2$ ) of the structure itself.

$$E = H_1 + H_2$$

- Within 1200 ft of the radar, no structure should block the radar beam. The maximum elevation ( $E_{max}$ ) of a structure should be less than the sum of the ground elevation ( $h_1$ ) at the base of the WSR-88D tower, plus the tower height ( $h_2$ ), where  $h_2$  is either 5, 10, 15, 20, 25, or 30 meters.

$$E_{max} < h_1 + h_2$$

- Beyond 1200 ft, structures should not block the beam more than 0.25 degrees in elevation or azimuth when measured from the center of the radar antenna. The maximum structure elevation should be less than the ground elevation ( $h_1$ ) at the base of the WSR-88D tower, plus the height to the center of the antenna ( $h_2 + 16$  ft), plus the tangent of 0.25 degrees (0.0044) times the distance ( $d$ ) from the radar.

$$E_{max} < h_1 + (h_2 + 16) + 0.0044d$$

$$680 + (98.4 + 16) + 0.0044d \quad d = 3310'$$

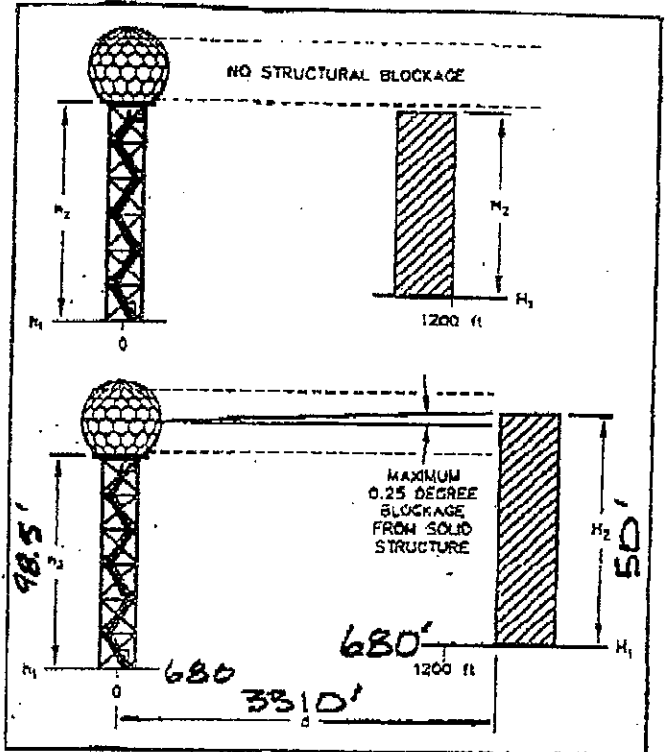
$$E_{max} < 809'$$

- The maximum width ( $W_{max}$ ) of a structure that is higher than the center of the antenna should be less than 0.0044 times the distance from the radar.

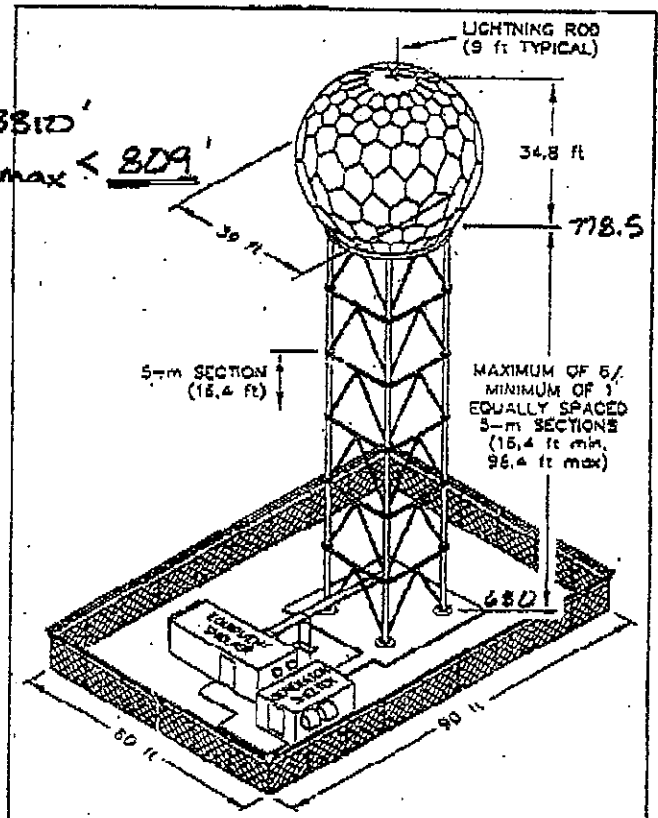
$$W_{max} < 0.0044d$$

N/A

The WSR-88D is an important weather forecasting tool. To prevent degradation to the WSR-88D's ability to collect weather data, please carefully consider future construction in the radar's vicinity. Your cooperation in avoiding blockage of the WSR-88D radar beam is appreciated and will help the NWS continue to provide the most accurate weather detection and forecasting possible.



Guidelines for Allowable Structural Blockage



Typical WSR-88D Radar Installation

For more information contact:



30-MINUTE AVERAGE EXPOSURE FOR VCP 31

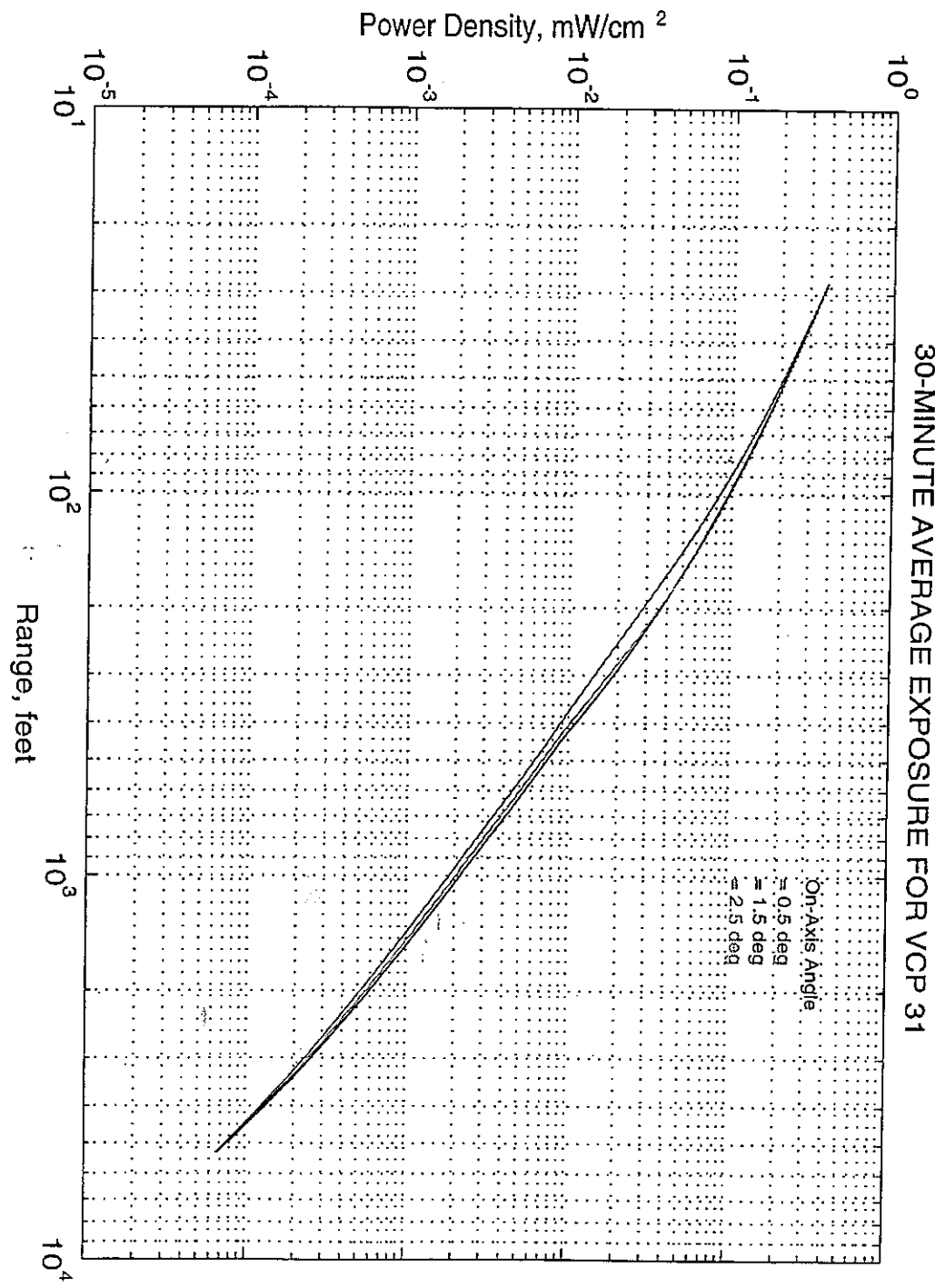


Figure 27 VCP 31 on-axis 30-minute biological system exposure for antenna tilts of 0.5, 1.5, and 2.5 degrees.

Bill A,  
Don't care  
Dob

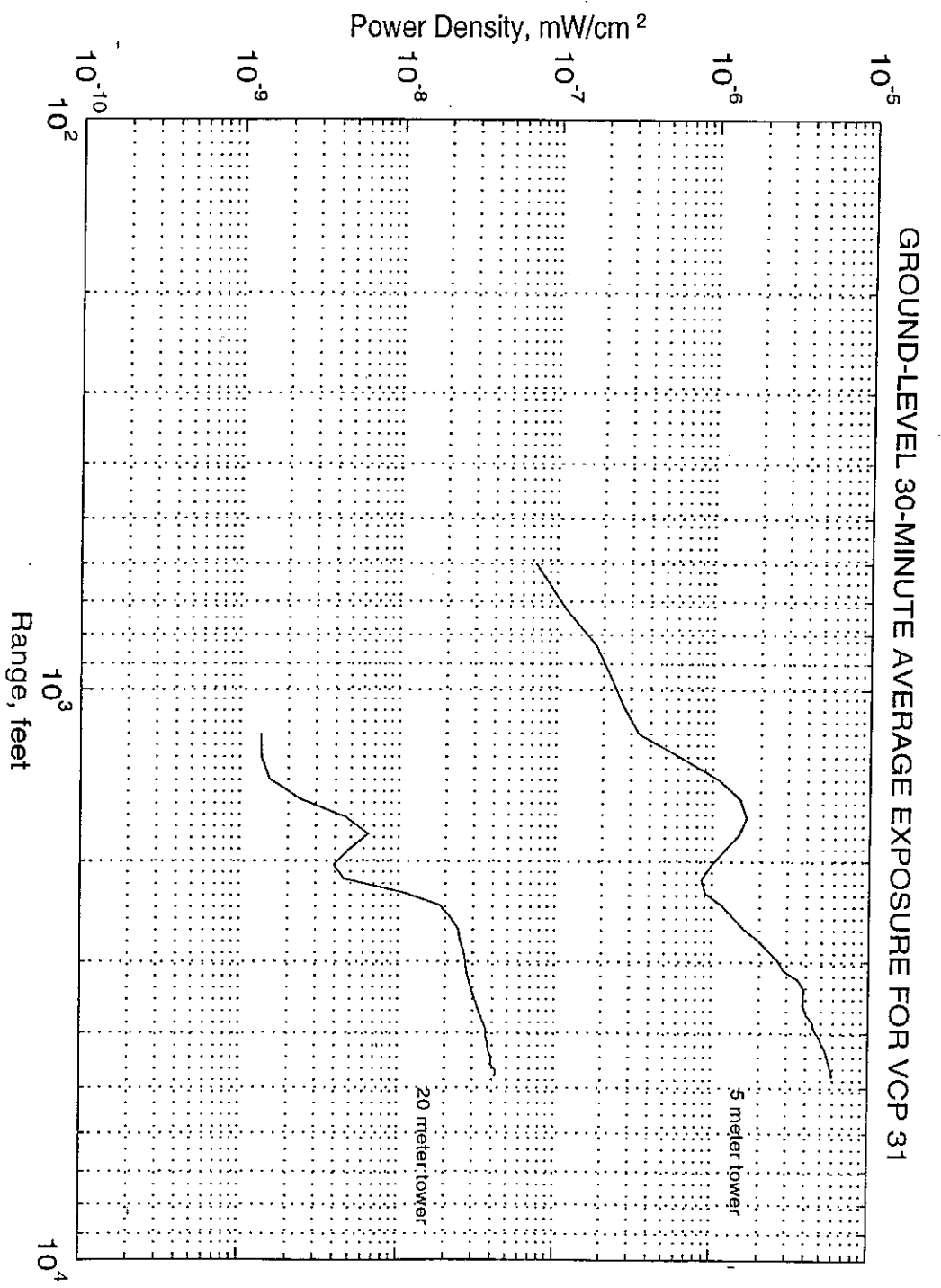


Figure 31 VCP 31 ground-level 30-minute biological system exposure for tower height of 5 and 20 meters.