

WRAU-2120

Exhibit K - Radiation Exposure Information

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This section affirms compliance with respect to controlled and uncontrolled exposure limits for MPE/SAR.

Requirements:

The rules concerning RF radiation exposure are 1.1310, 2.1091 and 2.1093.

FCC Section 1.1310 Table 1 defines the Maximum Permissible Exposure (MPE) power density limits for the frequency range from 1500 to 100,000 MHz as follows:

(A) Controlled Exposures	5 mW/cm ²
(B) Uncontrolled Exposure	1 mW/cm ²

The WRAU-2120 Radar system antenna is mounted in the nose of air transport aircraft. This location is highly restricted to only airport maintenance personnel and is off limits to any general population. In addition, airline maintenance and ramp operating procedures do not allow the radar system to be powered up in the airport gate area where maintenance personnel have access to the aircraft. In addition, the nose of the aircraft is generally 8 to 10 feet above the ground and thus is inaccessible to any personnel without ladders or special lift equipment. These limited access restrictions place the WRAU-2120 under the definition of (A) Controlled Exposures which requires a MPE power density limit of 5 mW/cm² averaged over a 6 minute period.

Section 2.1091(b) defines a “mobile device” as “a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitters radiating structures and the body of the user(s) or nearby persons.”

Since the WRAU-2120 antenna mounting location is behind the aircraft radome and inaccessible in normal usage to any personnel and is located greater than 20 centimeters from any persons, it falls under the definition of mobile device in the Section 2.1091 (b).

The WRAU-2120 does not fall into any of the categories described in Section 2.1091(c) that are subject to routine environmental evaluation for RF exposure.

As such, the WRAU-2120 is “... categorically excluded from routine environmental evaluation for RF exposure prior to equipment authorization or use”.

Radiation Hazard Assessment:

The WRAU-2120 transmitter output is very low power. Under maximum operating conditions, the average power output of the radar is in the order of 1 watt, roughly equivalent to a small night light.

For the purposes of evaluating the Radiation Hazard for the WRAU-2120 a report will be used that evaluated RF radiation hazard for the WXR-700X. The WRAU-2120 transmitter is equivalent to the WXR-700X transmitter.

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Radiation Hazard Test Report:

A Radiation Hazard study was performed on the WXR-700X in 1996 for the Department of the Air Force - Armstrong Laboratory (AFMC). Ref. "Consultative Letter, AL/OE-CL-1996-0159, Report of a Radio Frequency (RF) Radiation Hazard Survey of Pacer Crag C/KC-135 E/R Weather Radar System, WXR-700X". The report is dated 10 May 1996.

The purpose of the study was to "establish the electromagnetic field strengths associated with the use, operation and testing of the new WXR-700X radar, and to establish safe operating distanced for Air Force employees working near the new radar."

The report contains both a theoretical assessment of the permissible exposure limits and actual measurements of the RF radiated power density from the system operating at maximum duty cycle.

The actual power density measurements were taken with the antenna scanning physically disabled to facilitate measurements. The antenna was fixed in a direction at zero degrees tilt pointing forward from the aircraft bulkhead. (In normal operation, the antenna would be scanning any time the transmitter were operating.)

Power density measurements were taken along the radar beam axis at distances from 0 to 150 feet with the radar operating at maximum duty cycle. The highest power density reading was 0.13 mW/cm^2 at a distance of less than 1 foot from the antenna radiating surface. All other measurements were less. A comment in the report states "The levels measured from the WXR-700X radar were barely distinguishable from the background noise in the area."

Report Conclusions for Normal Operating Conditions:

"Based on analysis of the equipment parameters, theoretical hazard evaluations, and the field power density measurements, the WXR-700X radar, equipped with a flat plate, slot array antenna, does not produce power density levels that could reasonably be expected to exceed the PEL (Permissible Exposure Limit) under normal operating conditions. Therefore, it is not necessary to establish restricted access zones in front of the antenna under these conditions."

Compliance Statement:

The WRAU-2120 does not exceed the Minimum Permissible Exposure (MPE) limits of 5 mW/cm^2 contained in FCC Section 1.1310 Table 1.

The Radiation Hazard Test Report referenced above may be obtained by permission of the US Department of the Air Force.