

Radar Safety Guidelines

Introduction

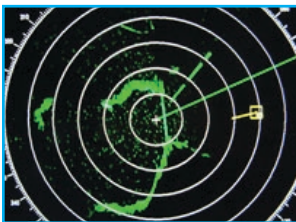
The health risks associated with the use of ship's radar equipment in BC ports has been a recurring question for our long shore workers and member companies. This Quick Card is designed to provide information on ships radar equipment including the potential health effects and the required safe working distances from radar transmissions.

About Radar Systems

Radar is an acronym that stands for **RA**dio **D**etection **A**nd **R**anging. It is a system which uses electromagnetic waves – specifically radio waves – to determine the range and direction of both moving and fixed objects in the surrounding area.

A ship's radar equipment has three major components; the generator itself, the monitoring screen, usually on the ship's bridge, and the antenna or scanner, usually mounted high up on the superstructure.

The radar antenna transmits pulses of radio waves almost horizontally in a narrow beam as the antenna rotates. The waves will bounce off any object in their path and a small portion of the wave's energy will return to the antenna for interpretation. When the ship is entering ports the radio waves will encounter dock buildings and equipment such as cranes, gantries etc. The beam will not normally spread down to pick up the ship superstructure or deck.



Radar Monitoring Screen



Rotating Antenna Scanner

Inclement Weather

It is common to see a vessel's radar scanning antenna turning during cold weather but not transmitting. This is called the "standby" mode which ensures that the scanner does not freeze during inclement conditions.

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More information regarding radio frequency exposure limits can be found at: **Health and Welfare Canada, Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz - Safety Code 6 (2009)**, located at <http://www.hc-sc.gc.ca>.



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Type of Radiation

Radiation has a wide range of energies that form the electromagnetic spectrum. The spectrum has two major divisions: non-ionizing radiation and ionizing radiation.

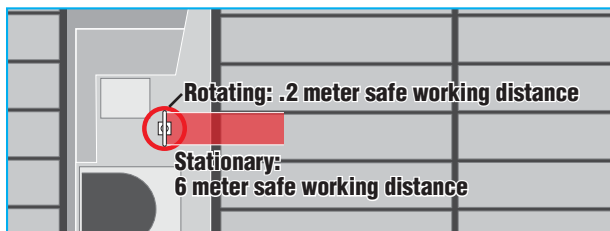
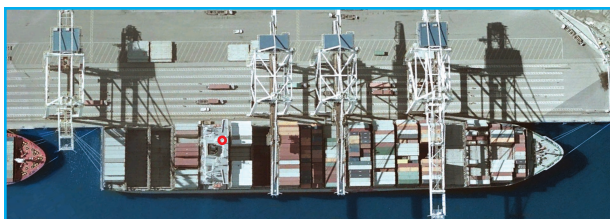
Marine Radar Radiation

Marine radar systems operate in the high radio frequency (RF) and microwave range. Unlike X-rays and nuclear radiation the emissions from marine radar are **non-ionizing** radiation and do not penetrate the human body but can cause heating of the surface, particularly of the skin and eyes (cornea).

Safe Working Distances

The Canadian Coast Guard has completed calculations on both rotating and fixed scanning antennas which are commonly used in our ports. They concluded that:

**When a scanning antenna is rotating
the safe working distance is:
0.2 meters away from the antenna.**



Since a rotating antenna only radiates in a fixed place for a brief moment at a time there is less danger of continuous exposure over a long period. The safe working distance will increase to **6 meters** if the radar scanning antenna is transmitting while in a stationary position. However, this will only occur if technicians have intentionally locked the antenna in place. Modern technology prohibits a radar scanning antenna from transmitting while stationary.

A copy of the Transport Canada Radar Safety Proximity Calculations can be found at:

http://www.bcmea.com/hs_bulletins.aspx



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