

UNCLASSIFIED - ~~CONTROLLED INFORMATION~~

Arctic Radar

Contact: D. McMorrow - dmccmorrow@mitre.org

November 2014

JSR-14-Task-003

Distribution approved to the Governments of Australia, Canada, New Zealand, the United Kingdom and the United States and their contractors; Contains Foreign Government Information. Other requests should be made to the Director, Space and Sensor Systems, Office of the Deputy Assistant Secretary, Alexandria, VA 22350

JASON
The MITRE Corporation
7515 Colshire Drive
McLean, Virginia 22102-7508
(703) 983-6997

UNCLASSIFIED - ~~CONTROLLED INFORMATION~~

Abstract

JASON was tasked by DOD/ASD(R&E) to examine scientific and technical issues for the possible use for over-the-horizon radar (OTHR) to surveil the Arctic and sub-Arctic for aircraft and surface ships. OTHRs currently operate in mid-latitude regions so a substantial basis of knowledge and operational experience exists; they have long range and near-daily availability. However the Arctic ionosphere is considerably more challenging than the mid-latitude ionosphere for reliable OTHR operations due to the effects of convective motion, absorption, and scattering for HF radio waves. The current knowledge base about the Arctic ionosphere is inadequate to confidently field a reliable Arctic OTHR system. A focused development program should be able to accumulate sufficient statistical knowledge about reliability of HF propagation in the Arctic, and demonstrate some mitigation of ionospheric effects, to plan an OTHR system, but system performance and availability cannot be projected at present.