IEC 63048-2

Edition 1.0 2026-09

INTERNATIONAL STANDARD

Mobile remotely controlled systems (MRCSs) for nuclear and radiological applications -
Part 2: Particular requirements for aerial surveillance

ICS 27.120; 25.040.30; 25.040.01

ISBN 978-2-8327-1456-0

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Mobile remotely controlled systems (MRCSs) for nuclear and radiological applications - Part 2: Particular requirements for aerial surveillance

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IEC 63048-2 has been prepared by IEC technical committee 45: Nuclear instrumentation. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
45/1056/FDIS	45/1066/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of the IEC 63048 series of standards, published under the general title *Mobile remotely controlled systems (MRCSs) for nuclear and radiological applications*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,

– withdrawn, or

– revised.

INTRODUCTION

IEC 63048 provides the general requirements for mobile remotely controlled systems (MRCS) intended for various missions at nuclear facilities. Depending on the given missions, different types of MRCSs can be used, and the requirements of the MRCSs are applied in different level.

Nuclear facilities are strictly regulated to prevent leakage of radioactive materials, and surveillance is an important mission for all nuclear facilities. A nuclear power plant, which is a representative nuclear facility, is operated in different situations, such as normal operation, transient, accident conditions and decommission. Whereas various missions of MRCSs are required in different situations, the surveillance mission of MRCSs is essential for all operation situations.

All types of MRCSs (i.e. unmanned ground vehicles, remotely operated mobile manipulators, aerial drones, underwater drones, etc.) are useful for surveillance of nuclear facilities. However, aerial MRCSs are faster than other types of MRCS and are effective for surveillance of large areas.

This document establishes the particular requirements for MRCSs used for aerial surveillance.

1 Scope

This part of IEC 63048 establishes the particular requirements of aerial MRCSs used for aerial surveillance mission for nuclear and radiological applications, such as rapid radiation mapping, structural damage monitoring, monitoring of radioactive plume transport, or finding a radioactive material. It provides the functional and operational requirements of aerial MRCS.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 63048:2020, *Mobile remotely controlled systems for nuclear and radiological applications - General requirements*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

– IEC Electropedia: available at https://www.electropedia.org/
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3.1.1
mission
objective description of the fundamental task performed by a system

[SOURCE: IEC 63048:2020, 3.3]

3.1.2
mobile remotely controlled system
MRCS
robotics in nuclear instrumentation that are mobile, remotely controlled by an operator, and consisting of sub-systems, modules or assemblies

EXAMPLE Subsystems, modules or assemblies are, for example, mechanical and electrical/electronical controls, communications (between the operator and the robotic, and some robotic subsystems, modules or assemblies), lighting and possibly audio subsystems, modules or assemblies, sampling and monitoring subsystems, modules or assemblies, used for photographing the environment with video or still photos, sampling or monitoring the contacted air or surfaces for radioactive materials, noxious gases and particulates such as asbestos, and performing other designed activities, all controlled by the operator.

[SOURCE: IEC 63048:2020, 3.4]