Standards Published by SC45A			
Sl No.	**Reference**	**Title**	**Description**
1	IEC 60231:1967	General principles of nuclear reactor instrumentation	Gives guidance on the provision of reactor instrumentation and recommends standards of good practice. Generally applicable to instruments which have a direct bearing on the overall safety and effective control of the reactor. The IEC 60231 series of
2	IEC 60515:2007	Nuclear power plants - Instrumentation important to safety - Radiation detectors - Characteristics and test	Describes characteristics and tests methods for gas-filled radiation detectors used for the protection of nuclear reactors. Applies to the radiation detectors which are installed external to the core of nuclear reactors and which provide electrical input
3	IEC 60568:2006	Nuclear power plants - Instrumentation important to safety - In-core instrumentation for neutron fluence rate (flux)	Provides guidance for the design of in-core instrumentation for neutron fluence rate measurements in thermal neutron reactors designed for power production. Applies to on-line in-core neutron detectors, together with associated components and
4	IEC 60671:2007	Nuclear power plants - Instrumentation and control systems important to safety - Surveillance testing	Lays down principles for testing I&C systems performing category A, B and C functions, per IEC 61226, during normal power operation and shutdown, so as to check the functional availability especially with regard to the detection of faults that
5	IEC 60709:2018	Nuclear power plants - Instrumentation, control and electrical power systems important to safety - Separation	IEC 60709:2018 is applicable to nuclear power plant instrumentation and control (I&C) and electrical systems and equipment, whose functions are required to be independent due to their contribution to: a redundant or diverse safety
6	IEC 60737:2010	Nuclear power plants - Instrumentation important to safety - Temperature sensors (in-core and primary coolant	IEC 60737:2010 deals with specific requirements for nuclear applications of temperature sensors. It provides guidance which will help to ensure that the reactor conditions do not damage the temperature sensors; it ensures that the in-core temperature

7	IEC 60744:2018	Nuclear power plants - Instrumentation and control systems important to safety - Safety logic assemblies used in	IEC 60744:2018 provides requirements and recommendations for the design, construction and test of safety logic assemblies used in safety systems to perform category A safety functions (in accordance with IEC 61226). Safety logic assemblies include
8	IEC 60768:2009	Nuclear power plants - Instrumentation important to safety - Equipment for continuous in-line or on-line	IEC 60768:2009 provides criteria for the design, selection, testing, calibration and functional location of equipment for the monitoring of radioactive substances within plant-process streams during normal operation conditions and anticipated
9	IEC 60772:2018	Nuclear power plants - Instrumentation systems important to safety - Electrical penetration assemblies in	IEC 60772:2018 applies to electrical penetration assemblies (EPAs) in containment structures of nuclear power plants. It covers the engineering safety requirements to be met in the design, calculation, qualification, fabrication, assembly, testing,
10	IEC/IEEE 60780-323:2016	Nuclear facilities - Electrical equipment important to safety - Qualification	IEC/IEEE 60780-323:2016 describes the basic requirements for qualifying electrical equipment important to safety and interfaces (electrical and mechanical) that are to be used in nuclear facilities. The principles, methods, and procedures described are
11	IEC 60880:2006	Nuclear power plants - Instrumentation and control systems important to safety - Software aspects for computer-	Provides requirements for the software of computer-based instrumentation and control (I&C) systems of nuclear power plants performing functions of safety category A as defined by IEC 61226. Provides requirements for the purpose of achieving
12	IEC 60910:2022	Nuclear power plants - Instrumentation important to safety - Containment monitoring for early detection	IEC 60910:2022 provides requirements for primary and secondary containment parameter monitoring that enable the operator to identify developing deviations from normal operation. The operator can then take corrective action at an
13	IEC 60911:1987	Measurements for monitoring adequate cooling within the core of pressurized light water reactors	Defines requirements for additional instrumentation to measure coolant parameters, which are of interest when abnormal conditions arise with either one or two phases of coolant or with gas included in the reactor vessel. The information obtained on
14	IEC 60951-1:2022	Nuclear facilities - Instrumentation systems important to safety - Radiation monitoring for accident and	<!-- NEW! -->IEC 60951-1:2022 is available as IEC 60951-1:2022 RLV which contains the International Standard and its Redline version, showing all changes of the technical content

15	IEC 60951-1:2022 RLV	Nuclear facilities - Instrumentation systems important to safety - Radiation monitoring for accident and	IEC 60951-1:2022 RLV contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the
16	IEC 60951-2:2009	Nuclear power plants - Instrumentation important to safety - Radiation monitoring for accident and post-accident	IEC 60951-2:2009 provides general guidance on the design principles and performance criteria for equipment for continuous off-line monitoring of radioactivity in gaseous effluents and ventilation air used in nuclear power plants for accident and post-
17	IEC 60951-3:2022 RLV	Nuclear facilities - Instrumentation systems important to safety - Radiation monitoring for accident and	IEC 60951-3:2022 RLV contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the
18	IEC 60951-3:2022	Nuclear facilities - Instrumentation systems important to safety - Radiation monitoring for accident and	<!-- NEW! -->IEC 60951-3:2022 is available as IEC 60951-3:2022 RLV which contains the International Standard and its Redline version, showing all changes of the technical content
19	IEC 60951-4:2009	Nuclear power plants - Instrumentation important to safety - Radiation monitoring for accident and post-accident	IEC 60951-4:2009 provides general guidance on the design principles and performance criteria for equipment for continuous in-line or on-line monitoring of radioactivity in process stream in nuclear power plants for accident and post-accident conditions.
20	IEC 60960:1988	Functional design criteria for a safety parameter display system for nuclear power stations	Considers the functional design criteria for a Safety Parameter Display System (SPDS) giving concise information to aid operating personnel, particularly in abnormal conditions. An SPDS is made up of instruments, displays, computer hardware
21	IEC 60964:2018 RLV	Nuclear power plants - Control rooms - Design	IEC 60964:2018 RLV contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the
22	IEC 60964:2018	Nuclear power plants - Control rooms - Design	<!-- NEW! -->IEC 60964:2018 is available as IEC 60964:2018 RLV which contains the International Standard and its Redline version, showing all changes of the technical

23	IEC 60965:2016	Nuclear power plants - Control rooms - Supplementary control room for reactor shutdown without access to the main	IEC 60965:2016 establishes requirements for the Supplementary Control Room provided to enable the operating staff of nuclear power plants to shut down the reactor, where previously operating, and maintain the plant in a safe shut-down state in the
24	IEC/IEEE 60980-344:2020	Nuclear facilities - Equipment important to safety - Seismic qualification	IEC/IEEE 60980-344:2020 describes methods for establishing seismic qualification procedures that will yield quantitative data to demonstrate that the equipment can meet its performance requirements. This document is applicable to electrical,
25	IEC 60987:2021	Nuclear power plants - Instrumentation and control important to safety - Hardware requirements	IEC 60987:2021 provides requirements and recommendations for the hardware aspects of I&C systems whatever the technology and applies for all safety classes in a graded manner (as defined by IEC 61513). The requirements defined within this
26	IEC 60988:2009	Nuclear power plants - Instrumentation important to safety - Acoustic monitoring systems for detection of loose	IEC 60988:2009 is applicable to on-site systems used for continuous monitoring of structure-borne sound measured at the reactor coolant pressure boundary of light water reactors for the purpose of detecting loose parts. The main technical changes
27	IEC 61031:2020	Nuclear facilities - Instrumentation and control systems - Design, location and application criteria for installed	IEC 61031:2020 applies to the design, location and application of installed equipment for monitoring local gamma radiation dose rates within nuclear facilities during normal operation and anticipated operational occurrences. High range area gamma
28	IEC 61225:2019	Nuclear power plants - Instrumentation, control and electrical power systems - Requirements for static	IEC 61225:2019 specifies the performance and the functional characteristics of the low voltage static uninterruptible power supply (SUPS) systems in a nuclear power plant and, for applicable parts, in general for nuclear facilities. An
29	IEC 61226:2020	Nuclear power plants - Instrumentation, control and electrical power systems important to safety -	IEC 61226:2020 establishes, for nuclear power plants , a method of assignment of the functions specified for the plant into categories according to their importance to safety. Subsequent classification of the I&C and electrical power systems
30	IEC 61227:2008	Nuclear power plants - Control rooms - Operator controls	IEC 61227:2008 identifies the Human-Machine Interface (HMI) requirements for discrete controls, multiplexed conventional systems, and soft control systems. To be used with IEC 60964 and IEC 61772. Is intended for application to the design of new

31	IEC 61250:1994	Nuclear reactors - Instrumentation and control systems important for safety - Detection of leakage in coolant	Defines the requirements for instrumentation needed to detect leakage from reactor coolant systems of light water nuclear reactors. Methods of leak detection are described, and characteristics of different methods of detection and of
32	IEC 61343:1996	Nuclear reactor instrumentation - Boiling light water reactors (BWR) - Measurements in the reactor vessel for monitoring	Gives requirements for core cooling monitoring instrumentation to ensure safe operation of BWRs during normal operation and during and after design basis accidents.
33	IEC 61468:2021	Nuclear power plants - Instrumentation systems important to safety - In-core instrumentation: Characteristics	IEC 61468:2021 applies to in-core neutron detectors, viz. self-powered neutron detectors (SPNDs), which are intended for application in systems important for nuclear reactor safety: protection, instrumentation and control. This document contains
34	IEC 61497:1998	Nuclear power plants - Electrical interlocks for functions important to safety - Recommendations for design	Provides recommendations for the design and implementation of electrical interlocks used actively or passively to prevent unsafe conditions or to ensure specific safe conditions and states during the operation of nuclear power plants.
35	IEC 61500:2018 RLV	Nuclear power plants - Instrumentation and control systems important to safety - Data communication in systems	IEC 61500:2018 RLV contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the
36	IEC 61500:2018	Nuclear power plants - Instrumentation and control systems important to safety - Data communication in systems	<!-- NEW -->IEC 61500:2018 is available as IEC 61500:2018 RLV which contains the International Standard and its Redline version, showing all changes of the technical
37	IEC 61501:1998	Nuclear reactor instrumentation - Wide range neutron fluence rate meter - Mean square voltage method	Describes the principles, the terminology, the characteristics, the requirements and the testing methods related to instrumentation and measurement of the neutron fluence rate using mean square voltage techniques for nuclear reactor control.
38	IEC 61502:1999	Nuclear power plants - Pressurized water reactors - Vibration monitoring of internal structures	Applies to systems used for monitoring the vibratory behaviour of the internal structures of pressurized water reactors (core barrel, thermal shield, upper and lower core support, etc.) and fuel assemblies on the basis of neutron fluctuations observed

39	IEC 61504:2017	Nuclear facilities - Instrumentation and control systems important to safety - Centralized systems for	IEC 61504:2017 supplements IEC 61559-1 and includes radiation monitoring functions important to safety that are outside the scope of IEC 61559-1. It applies to centralized systems having a direct role in the achievement or maintenance
40	IEC 61513:2011	Nuclear power plants - Instrumentation and control important to safety - General requirements for systems	Instrumentation and control (I&C) systems important to safety may be implemented using conventional hard-wired equipment, computer-based (CB) equipment or by using a combination of both types of equipment (see Note 1). IEC 61513:2011 provides
41	IEC 61771:1995	Nuclear power plants - Main control-room - Verification and validation of design	Specifies verification and validation procedures for the design of t he control-room system of nuclear power plants and gives verificatio n and validation criteria for the assignment of functions and for the integrated control-room system.
42	IEC 61772:2009	Nuclear power plants - Control rooms - Application of visual display units (VDUs)	IEC 61772:2009 supplements IEC 60964 and presents design requirements for the application of VDUs in main control rooms of nuclear power plants. Assists the designer in specifying VDU applications including displays on individual workstations and
43	IEC TR 61838:2009	Nuclear power plants - Instrumentation and control important to safety - Use of probabilistic safety assessment	IEC/TR 61838:2009 provides a survey of some of the methods by which probabilistic risk assessment results can be used to establish "risk-based" classification criteria, so as to allow FSEs to be placed within the four categories established within IEC
44	IEC 61839:2000	Nuclear power plants - Design of control rooms - Functional analysis and assignment	Specifies functional analysis and assignment procedures for the design of the control-room system for nuclear power plants and gives rules for developing criteria for the assignment of functions. Supplements IEC 60964. Is applicable to the design of
45	IEC 61888:2002	Nuclear power plants - Instrumentation important to safety - Determination and maintenance of trip setpoints	Defines the requirements for assuring that automatic setpoints for nuclear safety system instrumentation are established and maintained within specified limits in nuclear power plants and nuclear reactor facilities.
46	IEC 62003:2020	Nuclear power plants - Instrumentation, control and electrical power systems - Requirements for	IEC 62003:2020 establishes requirements for electromagnetic compatibility testing of instrumentation, control, and electrical equipment supplied for use in systems important to safety at nuclear power plants and other nuclear facilities. The document

47	IEC TR 62096:2009	Nuclear power plants - Instrumentation and control important to safety - Guidance for the decision on	IEC/TR 62096:2009 is intended to support owners of a nuclear power plant in the decision-making process and in the preparation for partial or complete modernization of the I&C. For this, it provides a summary of the motivating factors for I&C
48	IEC 62117:1999	Nuclear reactor instrumentation - Pressurized light water reactors (PWR) - Monitoring adequate cooling within the	Gives requirements for instrumentation to monitor core cooling for safe operation of PWRs during cold shutdown operations when the coolant temperature is below 100 °C. Summarizes good international practices to be used when designing new or
49	IEC 62138:2018	Nuclear power plants - Instrumentation and control systems important to safety - Software aspects for computer-	<!-- NEW -->IEC 62138:2018 is also available as IEC 62138:2018 RLV which contains the International Standard and its Redline version, showing all changes of the technical
50	IEC 62138:2018 RLV	Nuclear power plants - Instrumentation and control systems important to safety - Software aspects for computer-	IEC 62138:2018 RLV contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the
51	IEC TR 62235:2005	Nuclear facilities - Instrumentation and control systems important to safety - Systems of interim storage and	Gives guidelines for the instrumentation and control systems of interim storage and final repository of nuclear fuel and waste. Covers storage at all types of facilities, such as, fuel fabrication plants, nuclear power plants, reprocessing facilities, interim
52	IEC 62241:2004	Nuclear power plants - Main control room - Alarm functions and presentation	Provides the functional requirements for the alarm systems in the main control room of nuclear power plants. Establishes the human factors requirements and the design guidelines for alarm presentation for the main control room of nuclear power plants.
53	IEC 62340:2007	Nuclear power plants - Instrumentation and control systems important to safety - Requirements for coping with	Gives requirements related to the avoidance of CCF of I&C systems that perform category A functions; additionally requires the implementation of independent I&C systems to overcome CCF, while the likelihood of CCF is reduced by strictly applying
54	IEC 62342:2007	Nuclear power plants - Instrumentation and control systems important to safety - Management of ageing	Provides strategies, technical requirements, and recommendations for the management of ageing of nuclear power plant instrumentation and control systems and associated equipment. Also includes annexes on test methods, procedures,

55	IEC 62385:2007	Nuclear power plants - Instrumentation and control important to safety - Methods for assessing the performance	Defines the requirements for demonstrating acceptable performance of safety system instrument channels through response time testing, calibration verification, and other means. The same requirements may be adopted for demonstrating the
56	IEC 62397:2022	Nuclear power plants - Instrumentation and control important to safety - Resistance temperature detectors	IEC 62397:2022 describes the requirements for resistance temperature detectors (RTDs) suitable for applications in I&C systems important to safety of nuclear power plants. The requirements of RTDs include design, materials, manufacturing,
57	IEC 62465:2010	Nuclear power plants - Instrumentation and control important to safety - Management of ageing of	IEC 62465:2010 provides strategies, technical requirements, and recommended practices for the management of normal ageing of cabling systems that are important to safety in nuclear power plants. The main requirements are presented in the body of this
58	IEC 62566:2012	Nuclear power plants - Instrumentation and control important to safety - Development of HDL-	IEC 62566:2012 provides requirements for achieving highly reliable "HDL-Programmed Devices" (HPD), for use in I&C systems of nuclear power plants performing functions of safety category A as defined by IEC 61226. The programming of HPDs
59	IEC 62566-2:2020	Nuclear power plants - Instrumentation and control systems important to safety - Development of HDL-	IEC 62566-2:2020 provides requirements for achieving highly reliable HDL-Programmed Devices (HPDs), for use in I&C systems of nuclear power plants performing functions of safety category B or C as defined by IEC 61226. The
60	IEC/IEEE 62582-1:2011	Nuclear power plants - Instrumentation and control important to safety - Electrical equipment condition	IEC/IEEE 62582-1:2011 contains requirements for application of the other parts of IEC/IEEE 62582 related to specific methods for condition monitoring in electrical equipment important to safety of nuclear power plants. It also includes requirements
61	IEC/IEEE 62582-2:2022 RLV	Nuclear power plants - Instrumentation and control important to safety - Electrical equipment condition	IEC/IEEE 62582-2:2022 RLV contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the
62	IEC/IEEE 62582-2:2022	Nuclear power plants - Instrumentation and control important to safety - Electrical equipment condition	<!-- NEW! -->IEC/IEEE 62582-2:2022 is available as IEC/IEEE 62582-2:2022 RLV which contains the International Standard and its Redline version, showing all changes of the

63	IEC/IEEE 62582-3:2024	Nuclear power plants - Instrumentation and control important to safety - Electrical equipment condition	<!-- NEW! -->IEC/IEEE 62582-3:2024 is available as IEC/IEEE 62582-3:2024 RLV which contains the International Standard and its Redline version, showing all changes of the
64	IEC/IEEE 62582-3:2024 RLV	Nuclear power plants - Instrumentation and control important to safety - Electrical equipment condition	IEC/IEEE 62582-3:2024 RLV contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the
65	IEC/IEEE 62582-4:2022	Nuclear power plants - Instrumentation and control important to safety - Electrical equipment condition	<!-- NEW! -->IEC/IEEE 62582-4:2022 is available as IEC/IEEE 62582-4:2022 RLV which contains the International Standard and its Redline version, showing all changes of the
66	IEC/IEEE 62582-4:2022 RLV	Nuclear power plants - Instrumentation and control important to safety - Electrical equipment condition	IEC/IEEE 62582-4:2022 RLV contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the
67	IEC/IEEE 62582-5:2015	Nuclear power plants - Instrumentation and control important to safety - Electrical equipment condition	IEC/IEEE 62582-5:2015 contains methods for monitoring the attenuation condition of optical fibres and cables in instrumentation and control systems using optical time domain reflectometer measurements in the detail necessary to produce
68	IEC/IEEE 62582-6:2019	Nuclear power plants - Instrumentation and control important to safety - Electrical equipment condition	IEC/IEEE 62582-6:2019 contains methods for condition monitoring of organic and polymeric materials in instrumentation and control cables using insulation resistance measurements in the detail necessary to produce accurate and
69	IEC 62645:2019	Nuclear power plants - Instrumentation, control and electrical power systems - Cybersecurity requirements	IEC 62645:2019 establishes requirements and provides guidance for the development and management of effective computer security programmes for I&C programmable digital systems. Inherent to these requirements and guidance is the criterion that
70	IEC 62646:2016	Nuclear power plants - Control rooms - Computer-based procedures	IEC 62646:2016 establishes requirements for the whole life cycle of operating procedures that the designer wishes to computerise. It also provides guidance for making decisions about which types of procedures should be computerised and to

71	IEC 62651:2013	Nuclear power plants - Instrumentation important to safety - Thermocouples: characteristics and test methods	IEC 62651:2013 describes the requirements for thermocouples suitable for nuclear power plant (NPP) applications. Thermocouples are widely used in NPPs with other temperature measurement devices such as resistance temperature detectors.
72	IEC 62671:2013	Nuclear power plants - Instrumentation and control important to safety - Selection and use of industrial digital	IEC 62671:2013 addresses certain devices that contain embedded software or electronically-configured digital circuits that have not been produced to other IEC Standards which apply to systems and equipment important to safety in nuclear power
73	IEC 62671:2013/COR1:2016	Corrigendum 1 - Nuclear power plants - instrumentation and control important to safety - Selection and use of industrial	
74	IEC 62705:2022 RLV	Nuclear facilities - Instrumentation and control important to safety - Radiation monitoring systems (RMS):	IEC 62705:2022 RLV contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the
75	IEC 62705:2022	Nuclear facilities - Instrumentation and control important to safety - Radiation monitoring systems (RMS):	<!-- NEW! -->IEC 62705:2022 is available as IEC 62705:2022 RLV which contains the International Standard and its Redline version, showing all changes of the technical
76	IEC 62765-1:2015	Nuclear powers plants - Instrumentation and control important to safety - Management of ageing of	IEC 62765-1:2015 provides strategies, technical requirements, and recommended practices for the management of ageing to ensure that ageing of pressure transmitters important to safety in nuclear power plants (NPPs) can be identified and that suitable
77	IEC 62765-2:2019	Nuclear power plants - Instrumentation and control important to safety - Management of ageing of	IEC 62765-2:2019 identifies minimum requirements and applicable practices for correcting and preventing any potential impacts on nuclear power plant (NPP) safety due to the ageing of temperature sensors, such as NPP resistance temperature
78	IEC 62808:2015+AMD1:2018 CSV	Nuclear power plants - Instrumentation and control systems important to safety - Design and qualification of	IEC 62808:2015+A1:2018 establishes requirements for the design, analysis and qualification of isolation devices used to ensure electrical independence of redundant safety system circuits, or between safety and lower class circuits, as specified

79	IEC 62808:2015	Nuclear power plants - Instrumentation and control systems important to safety - Design and qualification of	IEC 62808:2015 establishes requirements for the design, analysis and qualification of isolation devices used to ensure electrical independence of redundant safety system circuits, or between safety and lower class circuits, as specified in IEC
80	IEC 62808:2015/AMD1:2018	Amendment 1 - Nuclear power plants - Instrumentation and control systems important to safety - Design and	
81	IEC 62855:2016	Nuclear power plants - Electrical power systems - Electrical power systems analysis	IEC 62855:2016 provides the electrotechnical engineering guidelines for analysis of AC and DC electrical power systems in nuclear power plants (NPPs) in order to demonstrate that the power sources and the distribution systems have the capability
82	IEC 62859:2016+AMD1:2019 CSV	Nuclear power plants - Instrumentation and control systems - Requirements for coordinating safety and	IEC 62859:2016+A1:2019 provides a framework to manage the interactions between safety and cybersecurity for nuclear power plant (NPP) systems, taking into account current IEC standards addressing these issues and the specifics of nuclear I&C
83	IEC 62859:2016	Nuclear power plants - Instrumentation and control systems - Requirements for coordinating safety and	IEC 62859:2016 provides a framework to manage the interactions between safety and cybersecurity for nuclear power plant (NPP) systems, taking into account current IEC standards addressing these issues and the specifics of nuclear I&C
84	IEC 62859:2016/AMD1:2019	Amendment 1 - Nuclear power plants - Instrumentation and control systems - Requirements for coordinating safety and	
85	IEC 62887:2018	Nuclear power plants - Instrumentation systems important to safety - Pressure transmitters: Characteristics	IEC 62887:2018 lays down specific requirements for nuclear applications of pressure transmitters including design, materials, manufacturing, testing, calibration and inspection. This document is applicable to general aspects of design,
86	IEC 62954:2019	Nuclear power plants - Control rooms - Requirements for emergency response facilities	IEC 62954:2019 presents the requirements for the on-site emergency response facilities (referred to hereinafter as the “ERF”) which are to be used in case of incidents or accidents occurring on the associated Nuclear Power Plant (NPP).

87	IEC TR 62987:2015	Nuclear power plants - Instrumentation and control systems important to safety - Use of Failure Mode and	IEC TR 62987:2015(E) provides guidance on nuclear-specific issues when applying failure modes and effects analysis (FMEA) and related methods to instrumentation and control systems important to safety in nuclear power plants. The information in
88	IEC 62988:2018	Nuclear power plants - Instrumentation and control systems important to safety - Selection and use of wireless	IEC 62988:2018 establishes requirements relevant to the selection and use of wireless devices in instrumentation and control (I&C) systems important to safety used in nuclear power plants (NPPs). Those I&C systems may fully consist of wireless
89	IEC 63046:2020	Nuclear power plants - Electrical power system - General requirements	IEC 63046:2020 provides requirements and recommendations for the overall Electrical Power System. In particular, it covers interruptible and uninterruptible Electrical Power Systems including the systems supplying the I&C systems; This
90	IEC TR 63084:2017	Nuclear power plants - Instrumentation and control important to safety - Platform qualification for systems	IEC TR 63084:2017(E) provides an assessment framework and activities for efficient and transparent qualification of I&C platforms for use in nuclear applications important to safety, according to nuclear standards and state of the art. The
91	IEC 63096:2020	Nuclear power plants - Instrumentation, control and electrical power systems - Security controls	IEC 63096:2020 provides a catalogue of highly recommended and optional security controls graded (see Clause 5 to Clause 20) in line with the security degrees defined by IEC 62645. These are intended for nuclear I&C programmable digital systems and
92	IEC/IEEE 63113:2021	Nuclear facilities - Instrumentation important to safety - Spent fuel pool instrumentation	IEC/IEEE 63113:2021 provides criteria for spent fuel pool instrumentation for nuclear power generating stations and other nuclear facilities. The document applies to water filled spent fuel pools where the water volume is necessary to prevent a release
93	IEC TR 63123:2017	Nuclear power plants - Instrumentation, control and electrical power systems - Guidance for the application of	IEC TR 63123:2017(E) gives guidance for the application in the IAEA / IEC framework of IEC 63147:2017/IEEE 497 corresponding to the adoption without modification of IEEE 497:2016.
94	IEC 63147:2017	Criteria for accident monitoring instrumentation for nuclear power generating stations	IEC 63147:2017(E) contains the functional and design criteria for accident monitoring instrumentation for new plant designs and nuclear power generating stations desiring to perform design modifications. The purpose of this standard is to establish

95	IEC 63186:2021	Nuclear power plants - Instrumentation and control systems important to safety - Criteria for seismic trip system	IEC 63186:2021 specifies the minimum requirements for the design of the seismic trip system, and the components thereof, used in a nuclear power plant to mitigate seismic effects. This system is intended to shut down the reactor in operation
96	IEC TR 63192:2019	Nuclear power plants - Instrumentation and control systems important to safety - Hazard analysis: A review of	IEC TR 63192:2019 provides the comparison of the hazard analysis requirements between IAEA framework and NRC-IEEE framework of standards and guidance. The hazard analysis requirements in the different standards were compared with a set
97	IEC TR 63214:2019	Nuclear power plants - Control rooms - Human factors engineering	IEC TR 63214:2019 provides a summary of arguments and a technical basis for the development of a new Human Factors Engineering IEC standard and the alignment of IEC 60964. Based on the provided argumentation, the participating members
98	IEC 63260:2020	Guide for incorporating human reliability analysis into probabilistic risk assessments for nuclear power generating	IEC 63260:2020 provides a structured framework for the incorporation of human reliability analysis (HRA) into probabilistic risk assessments (PRAs). This document is to enhance the analysis of human-system interactions in PRAs, to
99	IEC 63298:2024	Nuclear power plants - Electrical power systems - Coordination and interaction with electric grid	IEC 63298:2024 provide high level requirements and recommendations for the coordination of NPPs and the electric grid; see also item a) of the Introduction. The specific design requirements for components and equipment are covered by
100	IEC TR 63335:2021	Nuclear power plants - Instrumentation and control systems, control rooms and electrical power systems -	IEC TR 63335:2021 identifies a number of issues of particular importance to light water Small Modular Reactors (SMRs), which are not currently adequately addressed by existing IEC SC 45A standards, and that could be considered when revising
101	IEC TR 63400:2021	Nuclear facilities - Instrumentation, control and electrical power systems important to safety - Structure	IEC TR 63400:2021 is intended to augment that description to enable users of individual IEC SC 45A standards to obtain a more comprehensive understanding of the overall structure of the series and its relationship with other standards bodies and
102	IEC TR 63415:2023	Nuclear Power plants - Instrumentation and control systems - Use of formal security models for I&C	IEC TR 63415:2023 provides an overview over the formalized modelling and designing of cybersecure architectures to apply for I&C system cybersecurity enforcement at NPPs. The plant-specific risk assessment can use the techniques covered by this

103	IEC TR 63468:2023	Nuclear facilities - Instrumentation and control, and electrical power systems - Artificial Intelligence	IEC TR 63468:2023 overviews the fundamentals of artificial intelligence (AI) as it could potentially be applied within nuclear facilities and identifies proven or potential applications, with the objective to foster better understanding and adoption of AI
104	IEC 60231A:1969	Supplement A - General principles of nuclear reactor instrumentation	Includes Clause 5, Protection system, and Clause 9, General alarms. The IEC 60231 series of standards is no longer up-to-date and will not be revised by IEC. The standards are maintained for the time being for bibliographical purposes and
105	IEC 60231B:1972	Supplement B - General principles of nuclear reactor instrumentation - Principles of instrumentation of direct cycle	Applicable more particularly to instrumentation for direct cycle boiling water power reactors and includes a new clause concerning reactor control. The IEC 60231 series of standards is no longer up-to-date and will not be revised by IEC. The
106	IEC 60231C:1974	Third supplement: Instrumentation of gas-cooled graphite-moderated reactors	Applicable more particularly to instrumentation for gas-cooled graphite-moderated reactors, Type 1: reactors having metallic natural uranium fuel clad with magnesium alloy, and Type 2: reactors having enriched uranium oxide fuel clad with stainless
107	IEC 60231D:1975	Supplement D - General principles of nuclear reactor instrumentation - Principles of instrumentation for pressurized	Applicable more particularly to instrumentation for pressurized water reactors. Deals in particular with measurements of neutron fluence rate (flux). The IEC 60231 series of standards is no longer up-to-date and will not be revised by IEC. The standards
108	IEC 60231E:1977	Supplement E - General principles of nuclear reactor instrumentation - Principles of instrumentation of high	Deals more particularly with the measuring equipment for fluence rate of neutrons, fuel temperature, coolant temperature and flow, and with the protection system. The IEC 60231 series of standards is no longer up-to-date and will not be revised by
109	IEC 60231F:1977	Supplement F - General principles of nuclear reactor instrumentation - Steam generating, direct cycle, heavy-	Lays down additional standard requirements concerning neutron flux measurements, temperature measurements, measurements on the coolant, and the protection system. The IEC 60231 series of standards is no longer up-to-date and will not be revised by
110	IEC 60231G:1977	Supplement G - General principles of nuclear reactor instrumentation - Liquid-metal cooled fast reactors	Deals in particular with measurements: of neutron fluence rate (flux); of residual activity; of the temperature, flow rate, activity and purity of the sodium (or other liquid metal). Deals also with the protection and control systems. The IEC 60231 series of

Standards Published by SC45B			
Sl No.	**Reference**	**Title**	**Description**
1	IEC 60325:2002	Radiation protection instrumentation - Alpha, beta and alpha/beta (beta energy >60 keV) contamination meters and monitors	Lays down standard requirements and gives examples of acceptable methods, and also specifies general characteristics, general test conditions, radiation characteristics, electrical safety, environmental characteristics, and the requirements of the identification certificate for alpha, beta and alpha/beta contamination meters and monitors.
2	IEC 60532:2010	Radiation protection instrumentation - Installed dose rate meters, warning assemblies and monitors - X and gamma radiation of energy between 50 keV and 7 MeV	IEC 60532:2010 applies to installed dose rate meters, warning assemblies and monitors that are used to prevent or mitigate a minor radioactive release, or minor degradation of fuel, within the nuclear power plants/nuclear facility design basis, and to warn personnel or to ensure their safety during or following events that involve or result in release of radioactivity in the nuclear power plants/nuclear facility, or risk of radiation exposure. This equipment is typically classified as
3	IEC 60761-1:2002	Equipment for continuous monitoring of radioactivity in gaseous effluents - Part 1: General requirements	Lays down mandatory general requirements and gives examples of acceptable methods for equipment for continuous monitoring of radioactivity in gaseous effluents. Specifies general characteristics, general test procedures, radiation, electrical, safety and environmental characteristics and the identification and certification of the equipment.
4	IEC 60761-2:2002	Equipment for continuous monitoring of radioactivity in gaseous effluents - Part 2: Specific requirements for radioactive aerosol monitors including transuranic aerosols	Establishes specific standard requirements, including technical characteristics and general test conditions, and gives examples of acceptable methods for aerosol effluent monitors.

5	IEC 60761-3:2002	Equipment for continuous monitoring of radioactivity in gaseous effluents - Part 3: Specific requirements for radioactive noble gas monitors	Lays down specific standard requirements, including technical characteristics and general test conditions, and gives examples of acceptable methods for noble gas effluent monitors.
6	IEC 60761-4:2002	Equipment for continuous monitoring of radioactivity in gaseous effluents - Part 4: Specific requirements for radioactive iodine monitors	Lays down specific standard requirements, including technical characteristics and general test conditions, and gives examples of acceptable methods for iodine monitors.
7	IEC 60761-5:2002	Equipment for continuous monitoring of radioactivity in gaseous effluents - Part 5: Specific requirements for tritium monitors	Establishes specific standard requirements, including technical characteristics and general test conditions and gives examples of acceptable methods for the tritium effluent monitors.
8	IEC 60846-1:2009	Radiation protection instrumentation - Ambient and/or directional dose equivalent (rate) meters and/or monitors for beta, X and gamma radiation - Part 1: Portable workplace and environmental meters and monitors	IEC 60846-1:2009 specifies the design requirements and the performance characteristics of dose equivalent (rate) meters intended for the determination of ambient dose equivalent (rate) and directional dose equivalent (rate) as defined in ICRU Report 47. Applies to dose equivalent (rate) meters and/or monitors for the measurement of ambient dose equivalent (rate) and/or directional dose equivalent (rate) from external beta, X and gamma radiation.

9	IEC 60846-2:2015	Radiation protection instrumentation - Ambient and/or directional dose equivalent (rate) meters and/or monitors for beta, X and gamma radiation - Part 2: High range beta and photon dose and dose rate portable instruments for	IEC 60846-2:2015 applies to portable or transportable dose equivalent (rate) meters and/or monitors for the measurement of ambient and/or directional dose equivalent (rate) from external beta, X and gamma radiation for energies up to 10 MeV during emergency situations. The object of this International Standard is to specify the design requirements and the performance characteristics of dose equivalent (rate) meters intended for the determination of ambient and/or
10	IEC 60860:2014	Radiation protection instrumentation - Warning equipment for criticality accidents	IEC 60860:2014 prescribes general, radiation detection, environmental, mechanical, electromagnetic and documentation requirements and specifies acceptance criteria for criticality accident warning equipment. This International Standard applies to equipment intended to provide warning of a criticality accident by the detection of gamma radiation, neutrons or both from such an event. The main technical changes with regard to the previous edition are as
11	IEC 60861:2006	Equipment for monitoring of radionuclides in liquid effluents and surface waters	Defines technical requirements for equipment for monitoring of alpha-, beta- or gamma-emitting radionuclides in liquid effluents and surface waters, provides general guidance as to the possible detection capability of such equipment and indicates when and where its uses may be practicable.
12	IEC 61005:2014	Radiation protection instrumentation - Neutron ambient dose equivalent (rate) meters	IEC 61005:2014 specifies requirements for the performance characteristics of neutron ambient dose equivalent (rate) meters, and prescribes the methods of testing in order to determine compliance with this standard. This standard specifies general characteristics, general test procedures, radiation characteristics, electrical, mechanical, safety and environmental characteristics, and also the identification certificate (see 13.2). Requirements and test procedures

13	IEC 61017:2016	Radiation protection instrumentation - Transportable, mobile or installed equipment to measure photon radiation for environmental monitoring	IEC 61017:2016 is applicable to transportable, mobile or installed assemblies intended to measure environmental air kerma rates or air absorbed dose rates from 30 nGy·h⁻¹ to 30μGy·h⁻¹ or ambient dose equivalent rates from 30 nSv·h⁻¹ to 30 μSv·h⁻¹, or air kerma or air absorbed dose from 10 nGy to 10 mGy, or ambient dose equivalent from 10 nSv to 10 mSv, due to photon radiation of energy between 50 keV and 7
14	IEC 61098:2023	Radiation protection instrumentation - Installed personnel surface contamination monitors	IEC 61098:2023 applies to contamination monitors that include warning assembles and meters used for the monitoring of radioactive contamination on the surface of personnel whether they be clothed or not. The document is applicable only to that type of equipment where the user stays at the monitor. This document is applicable to the monitoring of the whole body (including the head), hands and feet, but parts of this document can be used for monitors designed for the
15	IEC 61171:1992	Radiation protection instrumentation - Monitoring equipment - Atmospheric radioactive iodines in the environment	Applies to equipment intended for transportable or installed use for monitoring, as a function of time, airborne radioactive iodines in the environment of a nuclear facility during normal operations, during anticipated operational occurrences or during accident conditions.
16	IEC 61172:1992	Radiation protection instrumentation - Monitoring equipment - Radioactive aerosols in the environment	Applies to transportable or installed equipment for continuous monitoring of radioactive aerosols in the environment for both normal and accident conditions.

17	IEC 61256:1996	Radiation protection instrumentation - Installed monitors for the detection of radioactive contamination of laundry	Relates to assemblies that are used to monitor clothing for radioactive contamination. Applies to monitoring that is performed after the clothing has been washed and prior to re-use to determine its acceptability for re-use.
18	IEC 61275:2013	Radiation protection instrumentation - Measurement of discrete radionuclides in the environment - In situ photon spectrometry system using a germanium detector	IEC 61275:2013 is applicable to a portable or transportable photon spectrometry assembly using a high purity germanium (HPGe) detector to survey, in situ, generally at 1 m above ground level, areas in the environment for discrete radionuclides. This standard specifies for such an assembly the general characteristics and test methods for evaluating radiation, electrical, mechanical, safety and environmental characteristics specific to the applications described above. Advice is
19	IEC 61322:2020	Radiation protection instrumentation - Installed ambient dose equivalent rate meters, warning and monitoring assemblies for neutrons with energies from thermal to 20 MeV	IEC 61322:2020 applies to installed dose equivalent rate meters, warning assemblies and monitors, as defined below. It covers equipment intended to measure neutron radiation in dose equivalent rates in the energy region between thermal and 20 MeV for the purposes of radiation protection. Assemblies of this type are commonly defined as area radiation monitors. They are normally employed to determine continuously the radiological situation in
20	IEC 61526:2024	Radiation protection instrumentation - Measurement of personal dose equivalents for X, gamma, neutron and beta radiations - Active personal dosemeters	IEC 61526:2024 applies to personal dosemeters with the following characteristics: a) They are worn on the trunk, close to the eye, or on the extremities. b) They measure the personal dose equivalents Hp(10), Hp(3), and Hp(0,07), from external X and gamma, neutron (not for Hp(3)), and beta radiations, and may measure the respective personal dose equivalent rates for the same radiations (for alarming purposes). c) They have a digital indication. This

21	IEC 61559-1:2009	Radiation protection instrumentation in nuclear facilities - Centralized systems for continuous monitoring of radiation and/or levels of radioactivity - Part 1: General requirements	IEC 61559-1:2009 specifies general characteristics, general test procedures, radiation, electrical, safety, and environmental characteristics and the identification certificate for centralized systems intended for continuous monitoring of radiation and/or levels of radioactivity installed in nuclear facilities, primarily in support of radiological protection in the working areas.
22	IEC 61560:1998	Radiation protection instrumentation - Apparatus for non-destructive radiation tests of fur and other cloth samples	Applies to apparatus for the non-destructive measurement of radioactive contamination of fur and other cloth samples for the presence of gamma emitting radionuclides.
23	IEC 61562:2001	Radiation protection instrumentation - Portable equipment for measuring specific activity of beta-emitting radionuclides in foodstuffs	Specifies the main performance characteristics of instruments intended for measurement of specific activity of beta-emitting radionuclides in foodstuffs, their methods of testing and documentation requirements.
24	IEC 61563:2019	Radiation protection instrumentation - Equipment for measuring the activity concentration of gamma-emitting radionuclides in foodstuffs	IEC 61563:2019 applies to instruments used to measure the activity and/or activity concentration of gamma-emitting radionuclides in food and/or foodstuffs. This document applies to instruments used both as gross count type instruments and pulse height analysing type instruments used in field conditions and in measurement facilities. This document does not apply to high-resolution spectrometers that use germanium detectors. The instruments to which this

25	IEC 61577-1:2006	Radiation protection instrumentation - Radon and radon decay product measuring instruments - Part 1: General principles	Addresses the instruments and associated methods for measuring isotopes 220 and 222 of radon and their subsequent short-lived decay products in gases. Helps to define type tests which have to be conducted in order to qualify these instruments.
26	IEC 61577-2:2014	Radiation protection instrumentation - Radon and radon decay product measuring instruments - Part 2: Specific requirements for ²²²Rn and ²²⁰Rn measuring	IEC 61577-2:2014 describes the specific requirements for instruments measuring the activity concentration of airborne ²²²Rn and ²²⁰Rn outdoors, in dwellings and in workplaces including underground mines. This standard applies practically to all types of electronic measuring instruments that are based on either spot or continuous measurements. The different types of instrumentation used for measurements are stated in IEC 61577-1. This new edition
27	IEC 61577-3:2011	Radiation protection instrumentation - Radon and radon decay product measuring instruments - Part 3: Specific requirements for radon decay product measuring instruments	IEC 61577-3:2011 describes the specific requirements for instruments measuring the volumetric activity of airborne short-lived radon decay products and/or their ambient potential alpha-energy concentration outdoors, in dwellings, and in workplaces including underground mines. This standard applies practically to all types of electronic instruments that are based on grab sampling, continuous sampling technique and electronic integrating measurement methods. This new
28	IEC 61577-4:2009	Radiation protection instrumentation - Radon and radon decay product measuring instruments - Part 4: Equipment for the production of reference atmospheres containing radon isotopes and their decay products	IEC 61577-4:2009 concerns the System for Test Atmospheres with Radon (STAR) needed for testing, in a reference atmosphere, the instruments measuring radon and RnDP. Provides guidance for those facing problems associated with the production of equipment for setting up reference atmospheres for radon and its decay products.

29	IEC TR 61577-5:2019	Radiation protection instrumentation - Radon and radon decay product measuring instruments - Part 5: General properties of radon and radon decay products and their measurement methods	IEC TR 61577-5:2019 provides basic data and technical information in order to support the design of instruments and their practical application for the measurement. The document covers 222Rn as well as 220Rn and the short-lived decay products of both. It is an accompanying document for the application of the technical standards series IEC 61577, and provides physical and technical fundamentals of the measurements methods.
30	IEC 61578:1997	Radiation protection instrumentation - Calibration and verification of the effectiveness of radon compensation for alpha and/or beta aerosol measuring instruments - Test methods	Defines type test methods permitting calibration and measurement of the effectiveness of radon daughters' compensation of radioactive aerosol monitors.
31	IEC 61582:2004	Radiation protection instrumentation - In vivo counters - Classification, general requirements and test procedures for portable, transportable and installed equipment	Specifies the classification, general design requirements, performance characteristics and test procedures for in vivo counting systems for detecting trace amounts of radionuclides in the bodies of persons working in nuclear power plants, laboratories and facilities handling radionuclides, and inhabitants living on territory which may be contaminated. The purpose is to determine the dose equivalent to organs and the effective dose of internal radiation for the whole body.
32	IEC 61584:2001	Radiation protection instrumentation - Installed, portable or transportable assemblies - Measurement of air kerma direction and air kerma rate	Specifies general characteristics, general test procedures, electrical, safety and environmental characteristics and the identification certificate for installed, portable or transportable assemblies intended to measure a) the direction of an X or gamma radiation source in terms of azimuth and elevation angles, b) the X or gamma air kerma rate at the equipment location; c) the attenuation coefficient in a given medium.

33	IEC 62022:2004	Installed monitors for the control and detection of gamma radiations contained in recyclable or non-recyclable materials transported by vehicles	Defines an installed monitor for the control and detection of radioactivity of gamma emitters contained in recyclable or non-recyclable materials transported by vehicle, the conceptual requirements, general characteristics, mechanical characteristics, environmental conditions, minimal requirements, test procedures and documentation.
34	IEC 62244:2019	Radiation protection instrumentation - Installed radiation portal monitors (RPMs) for the detection of illicit trafficking of radioactive and nuclear materials	IEC 62244:2019 defines the performance requirements of installed monitors used for the detection of gamma and neutron radiation emitters. These monitors are commonly known as radiation portal monitors or RPMs. They are used to monitor vehicles, cargo containers, people, or packages and are typically located at national and international border crossings. They may be used at any location where there is a need for this type of monitoring. This document
35	IEC 62302:2007	Radiation protection instrumentation - Equipment for sampling and monitoring radioactive noble gases	Is applicable to equipment used for sampling and continuous measurement of radioactive noble gases in the workplace, in gaseous effluents discharged into the environment as well as in the environment itself. Monitoring by definition is the process of continuous and real-time measurement. The processes of sampling or taking samples for retrospective laboratory analysis are covered as well.
36	IEC 62303:2008	Radiation protection instrumentation - Equipment for monitoring airborne tritium	IEC 62303:2008 is applicable to equipment used for sampling and continuous measurement of tritium in the workplace, in gaseous effluents discharged into the environment as well as in the environment itself and it is applicable to installed, portable and transportable equipment. The object is to establish mandatory general requirements and to present examples of acceptable methods and equipment for continuously monitoring and/or sampling airborne

37	IEC 62327:2017	Radiation protection instrumentation - Hand-held instruments for the detection and identification of radionuclides and for the estimation of ambient dose equivalent rate from photon radiation	IEC 62327:2017 specifies general characteristics, general test procedures, radiation characteristics, as well as electrical, mechanical, safety, and environmental characteristics. This document applies to hand-held instruments used to detect and identify radionuclides and radioactive material, to estimate ambient dose equivalent rate from photon radiation, and optionally, to detect neutron radiation. They are commonly known as radionuclide identification devices or RIDs.<br
38	IEC 62363:2008	Radiation protection instrumentation - Portable photon contamination meters and monitors	IEC 62363:2008 is applicable to portable and transportable contamination meters and monitors designed for the direct measurement or the direct detection of surface contamination by photon radiation emitting radionuclides. Lays down standard requirements and gives examples of acceptable methods, and also specifies general characteristics, general test conditions, radiation characteristics, electrical safety, environmental characteristics, and the
39	IEC 62387:2020	Radiation protection instrumentation - Dosimetry systems with integrating passive detectors for individual, workplace and environmental monitoring of photon and beta radiation	<!-- NEW! -->IEC 62387:2020 is available as IEC 62387:2020 RLV which contains the International Standard and its Redline version, showing all changes of the technical content compared to the previous edition. IEC 62387:2020 applies to all kinds of passive dosimetry systems that are used for measuring: - the personal dose equivalent Hp(10) (for individual whole body
40	IEC 62387:2020 RLV	Radiation protection instrumentation - Dosimetry systems with integrating passive detectors for individual, workplace and environmental monitoring of photon and beta radiation	IEC 62387:2020 RLV contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the official IEC Standard and its previous edition. IEC 62387:2020 applies to all kinds of passive dosimetry systems that are used for measuring: - the personal dose equivalent Hp(10) (for individual whole body monitoring),

41	IEC 62401:2017	Radiation protection instrumentation - Alarming personal radiation devices (PRDs) for the detection of illicit trafficking of radioactive material	IEC 62401:2017 describes design and functional criteria along with testing methods for evaluating the performance of Personal Radiation Devices (PRDs) used for detection of illicit trafficking of radioactive material (e. g., for border radiation monitoring). This document applies to alarming radiation detection instruments that are pocket-sized, carried on the body and used to detect and indicate the presence and general magnitude of gamma radiation fields. Neutron detection
42	IEC 62438:2010	Radiation protection instrumentation - Mobile instrumentation for the measurement of photon and neutron radiation in the environment	IEC 62438:2010 is applicable to mobile radiation detection systems used for the detection, quantification and identification of photon and/or neutron emitters in the environment. This includes point and distributed radiation sources. The object of this standard is to: - establish minimum requirements for the instrumentation; - establish requirements for deployment and operations; - provide test and calibration methods; and - provide guidance to
43	IEC TR 62461:2015	Radiation protection instrumentation - Determination of uncertainty in measurement	IEC TR 62461:2015(E) gives guidelines for the application of the uncertainty analysis according to ISO/IEC Guide 98-3:2008 and its Supplement 1:2008 for measurements covered by standards in the field of radiation protection instrumentation. It does not include the uncertainty associated with the concept of the measuring quantity. This Technical Report explains the principles of the ISO/IEC Guide 98-3:2008 (GUM), its Supplement 1:2008 (GUM S1) and the special
44	IEC 62463:2024	Radiation protection instrumentation - X-ray systems for the security screening of persons	IEC 62463:2024 is applicable to security screening systems designed to expose persons to X-rays. In particular, the document applies to systems where the body is exposed to the primary beam of X-rays. It is common to divide currently used systems into three types: backscatter systems, transmission systems and combination backscatter/transmission systems. The purpose of this document is to provide standardized requirements and test methods to ensure the safe

45	IEC 62484:2020	Radiation protection instrumentation - Spectrometric radiation portal monitors (SRPMs) used for the detection and identification of illicit trafficking of radioactive material	IEC 62484:2020 defines the performance requirements of installed monitors used for the detection and identification of gamma emitters and the detection of neutron radiation emitters. These monitors are commonly known as spectrometric radiation portal monitors or SRPMs. They are used to monitor vehicles, cargo containers, people, or packages and are typically used at national and international border crossings and ports of entry. SRPMs may be used at any location
46	IEC 62523:2010	Radiation protection instrumentation - Cargo/vehicle radiographic inspection system	IEC 62523:2010 applies to radiographic inspection systems with photon radiation energy of at least 500 keV for inspection of cargo, vehicles and cargo containers. Such inspection systems generally consist of radiation source(s), detectors, control system, image processing system, radiation safety system and other auxiliary devices/facilities. The object of this standard is to define the tests and the relevant testing methods for determining the performance
47	IEC 62533:2010	Radiation protection instrumentation - Highly sensitive hand-held instruments for photon detection of radioactive material	IEC 62533:2010 applies to hand-held instruments used for the detection and localization of radioactive photon emitting materials. These instruments are highly sensitive meaning that they are designed to detect slight variations in the range of usual photon background caused mainly by illicit trafficking or inadvertent movement of radioactive material. The object of this standard is to establish performance requirements including physical characteristics, general
48	IEC 62534:2010	Radiation protection instrumentation - Highly sensitive hand-held instruments for neutron detection of radioactive material	IEC 62534:2010 applies to hand-held instruments used for the detection and localization of neutron emitting radioactive material. These instruments are highly sensitive meaning that they are designed to detect slight variations in the range of usual background that may be caused by illicit trafficking or inadvertent movement of radioactive material. This high sensitivity allows scanning of larger volume items such as vehicles and containers. The object of this standard is to

49	IEC 62618:2022	Radiation protection instrumentation - Spectroscopy-based alarming personal radiation detectors (SPRD) for the detection of illicit trafficking of radioactive material	IEC 62618:2022 applies to Spectroscopy-based alarming Personal Radiation Detectors (SPRD). SPRDs detect and identify gamma radiation and may detect neutron radiation. SPRDs can be worn on a belt or in a pocket to alert the wearer of the presence of a radiation source. SPRDs provide search, similar to that of a Personal Radiation Device (PRD), and identification capability to identify radiation sources. They can discriminate between alarms caused by Naturally
50	IEC 62694:2022	Radiation protection instrumentation - Backpack-type radiation detector (BRD) for the detection of illicit trafficking of radioactive material	IEC 62694:2022 applies to backpack-type radiation detectors (BRDs) that are primarily used for the detection of illicit trafficking of radioactive material. BRDs are portable instruments designed to be worn during use. BRDs detect gamma radiation and may include neutron detection and the ability to identify gamma-ray emitting radionuclides. This document establishes the operational and testing requirements associated with radiation measurements and the
51	IEC 62706:2019	Radiation protection instrumentation - Recommended climatic, electromagnetic and mechanical performance requirements and methods of tests	IEC 62706:2019 recommends the climatic, mechanical and electromagnetic performance requirements and methods of test for radiation protection instrumentation. This document also provides guidance regarding the setup of test equipment and instruments under test (IUT) for certain tests. The object of this document is to define, for design and test purposes, the environments in which radiation protection instrumentation may be exposed. The
52	IEC 62709:2014	Radiation protection instrumentation - Security screening of humans - Measuring the imaging performance of X-ray systems	IEC 62709:2014 provides standard methods of measuring and reporting imaging quality characteristics that enable system manufacturers, potential system users and other interested parties to: - establish a consistent indicator of the expected technical performance of screening systems used for the inspection of individuals; - provide repeatable and verifiable imaging performance data that can be used to compare systems from different

53	IEC TS 62743:2012	Radiation protection instrumentation - Electronic counting dosemeters for pulsed fields of ionizing radiation	IEC/TS 62743:2012(E) applies to all types of counting dosemeters, irrespective of the measuring quantity and the type of radiation intended to be measured. It ensures that a single radiation pulse can be correctly measured even if the dosemeter is in the internal state relevant for measuring background or environmental radiation. The characteristics of the dosemeter for repeated pulses is expected to be better than for one single radiation pulse with the same parameters but
54	IEC 62755:2012+AM	Radiation protection instrumentation - Data format for radiation instruments used in the detection of illicit trafficking of radioactive materials	IEC 62755:2012+A1:2020 provides a uniform format for data to be output from radiation measurement instruments for use in detection of illicit trafficking of radioactive materials. This enables interpretation of data without reference to manufacturer's documentation. This standard specifies the data format used for both required and optional data available at the output of radiation measurement instruments that are used for the detection of illicit trafficking of radioactive materials.
55	IEC 62755:2012	Radiation protection instrumentation - Data format for radiation instruments used in the detection of illicit trafficking of radioactive materials	IEC 62755:2012(E) provides a uniform format for data to be output from radiation measurement instruments for use in detection of illicit trafficking of radioactive materials. This enables interpretation of data without reference to manufacturer's documentation. This standard specifies the data format used for both required and optional data available at the output of radiation measurement instruments that are used for the detection of illicit trafficking of radioactive materials.
56	IEC 62755:2012/AMD	Amendment 1 - Radiation protection instrumentation - Data format for radiation instruments used in the detection of illicit trafficking of radioactive materials	-

57	IEC 62945:2018	Radiation protection instrumentation - Measuring the imaging performance of X-ray computed tomography (CT) security-screening systems	IEC 62945:2018 provides test methods for the evaluation of image quality of computed tomography (CT) security-screening systems. The quality of data for automated analysis is the primary concern. Security screening systems are generally used to scan parcels, including luggage, for the presence of illicit items such as explosives, drugs, or other contraband. Many of the screening systems currently used, particularly in transportation security applications, are based on
58	IEC 62957-1:2017	Radiation protection instrumentation - Semi-empirical method for performance evaluation of detection and radionuclide identification - Part 1: Performance evaluation of the instruments, featuring radionuclide identification	IEC 62957-1:2017 specifies requirements for data preparation and data injection when using the semi-empirical method for performance evaluation of detection and radionuclide identification. This document recommends approaches for results interpretation and consolidation and establishes a method to share data and analysis results. This part of the standard is specific to the performance evaluation of radionuclide identification in static mode, i.e. when measurement
59	IEC 62963:2020	Radiation protection instrumentation - X-ray computed tomography (CT) inspection systems of bottled/canned liquids	IEC 62963:2020 describes the technical requirements, test methods, inspection requirements, markings and labelling, and requirements on the accompanying documents, packaging, shipping and storage for X-ray security inspection systems that inspect bottled or canned liquids (hereinafter referred to as "the system") based on X-ray computed tomography (CT). Here, the system is limited to those that feature tomographic scanning, not standard X-ray projection. This document
60	IEC TR 62971:2015	Radiation instrumentation - Radiation sources used in illicit trafficking detection standards - Guidance and recommendations	IEC TR 62971:2015(E) provides guidance and recommendations regarding the availability and use of radiation sources that are needed when testing and evaluating instruments used for the detection of illicit trafficking of radioactive material. Guidance includes the use of surrogate or replacement radioactive materials that could be more easily obtained. The object of this Technical Report is to provide guidance to instrument manufacturers, users, and testing organisations

61	IEC TS 63050:2019	Radiation protection instrumentation - Dosemeters for pulsed fields of ionizing radiation	IEC TS 63050:2019 applies to all types of dosemeters, irrespective of the type of radiation intended to be measured. Tests according to this document determine whether a single radiation pulse can be measured correctly even if the dosemeter is in the internal state relevant for measuring background or environmental radiation. The annex in the document gives some parameter values for typical workplaces where pulsed radiation occurs. This document considers the
62	IEC 63085:2021	Radiation protection instrumentation - System of spectral identification of liquids in transparent and semitransparent containers (Raman systems)	IEC 63085:2021 provides technical performance requirements, testing methods, requirements for operational performance and accompanying documents, packaging, transportation and storage conditions for the system of spectral identification of liquids in transparent and semitransparent containers (hereinafter referred to as “system”), based on the method of inelastic (Raman) light scattering by molecules. This document applies both to stationary and
63	IEC 63121:2020	Radiation protection instrumentation - Vehicle-mounted mobile systems for the detection of illicit trafficking of radioactive materials	IEC 63121:2020 applies to vehicle-mounted mobile systems (also known as mobile systems or mobile monitors) that are used for the detection of illicit trafficking of radioactive materials; these instruments may also be used for protection of major public events and for rapid screening of large areas. These vehicle-mounted mobile systems consist of one or more radiation detectors mounted in a vehicle, e.g., car or van, which travels predominantly on public roads.

Standards published by IEC/ TC 45			
Sl. No.	**Reference**	**Title**	**Description**
1	IEC 60313:2002	Coaxial connectors used in nuclear laboratory instrumentation	Recommends a limited family of preferred standard coaxial connectors for nuclear laboratory instruments. Applies to coaxial connectors for electrical instruments used in nuclear laboratories.
2	IEC 60412:2014	Nuclear instrumentation - Nomenclature (identification) of scintillators and scintillation detectors and standard dimensions of scintillators	IEC 60412:2014 gives guidelines for scintillation detectors and scintillators nomenclature (identification) and standard dimensions of scintillators. This International Standard is applicable to all types of solid organic and inorganic scintillators used in detectors for scintillation counting and spectrometry. The object of this standard is to define a standardized nomenclature for scintillation detectors in which most of the properties can be found. The object of this standard is also to standardize the dimensions of bare scintillators in order to facilitate interchangeability of non-encapsulated scintillators and to facilitate intercomparisons of measurements with encapsulated scintillators. The main technical changes with regard to the previous edition are as follows: - nomenclature of scintillation detectors was expanded by phoswich detector and single-line multi-channel detector; - some missing positions in the nomenclature of the previous edition were filled out.
3	IEC 60462:2010	Nuclear instrumentation - Photomultiplier tubes for scintillation counting - Test procedures	IEC 60462:2010(E) establishes test procedures for photomultiplier tubes (PMT) for scintillation and Cherenkov detectors. The tests described are supplementary to those described in IEC 60306-4. The main technical changes of this new edition with regard to the previous one are as follows: - the requirements have been revised and the terminology, - definitions and normative references have been brought up-to-date.
4	IEC 60498:1975	High-voltage coaxial connectors used in nuclear instrumentation	Applies to coaxial connectors associated with electrical measuring instruments used in nuclear instrumentation. Establishes standard dimensions of the mating parts, construction and mounting rules, voltage rating and test voltages, mininium insulation requirements, maximum contact

			resistances and operating conditions for two types of high-voltage connectors.
5	IEC 60600:1979	Equipment for minehead assay and sorting radioactive ores in containers	Establishes mandatory requirements and gives a list of characteristics of equipment for grading and sorting radioactive ores in containers at minehead and in opencast workings.
6	IEC 60692:1999	Nuclear instrumentation - Density gauges utilizing ionizing radiation - Definitions and test methods	Lays down definitions, test methods and procedures for density gauges utilizing ionizing radiation designed for measuring the density of liquids, gas vapours, slurries or fluidized solids. The output signals from density gauges may be either analogue or digital.
7	IEC 60759:1983	Standard test procedures for semiconductor X-ray energy spectrometers	Gives standard test procedures for semiconductor X-ray energy spectrometers consisting of a semiconductor radiation detector assembly and signal processing electronics interfaced to a pulse-height analyzer/computer.
8	IEC 60759:1983/AMD1:1991	Amendment 1 - Standard test procedures for semiconductor X-ray energy spectrometers	-
9	IEC 60912:1996	Nuclear instrumentation - ECL (emitter coupled logic) front panel interconnections in counter logic	Defines ECL front panel interconnections (signals, cables, connectors, terminators etc.) in counter logic for modular instruments used in nuclear instrumentation and other applications.
10	IEC 60973:1989	Test procedures for germanium gamma-ray detectors	Gives standard test methods for germanium detectors primarily used for the detection and high-resolution spectroscopy of gamma radiation. This publication supersedes IEC 60430 (1973), 60656 (1979) and 60697 (1981).

11	IEC 60982:1989	Level measuring systems utilizing ionizing radiation with continuous or switching output	Applies to all systems which utilize ionizing radiation for continuous measurement or detection of the level of materials in vessels. The process material may be a liquid or a solid in the form of grains or powder. The systems covered by this standard are generally built for industrial applications covering a very broad range of industries, applications and specifications. Supersedes IEC 60346 (1971).
12	IEC 61145:1992	Calibration and usage of ionization chamber systems for assay of radionuclides	Covers the techniques for the quantification of the activity of identified radionuclides using any of a variety of ionization chambers currently available for this purpose.
13	IEC 61239:1993	Nuclear instrumentation - Portable gamma radiation meters and spectrometers used for prospecting - Definitions, requirements and calibration	Applies to portable radiation meters using -scintillation detectors, solid-state detectors, etc. Includes instruments with total count readings only and spectrometers. This publication supersedes IEC 60460.
14	IEC 61301:1994	Nuclear instrumentation - Digital bus for NIM instruments	Defines a data-busing technique that is optimized for the class of applications for which NIM modules are typically utilized. Will be of use to both designers and users of NIM equipment.
15	IEC 61304:1994	Nuclear instrumentation - Liquid-scintillation counting systems - Performance verification	Provides the user with a means of verifying the performance of typical liquid-scintillation courting systems.
16	IEC 61335:1997	Nuclear instrumentation - Bore-hole apparatus for X-ray fluorescence analysis	Applies to prospecting and mining bore-hole apparatus for X-ray fluorescence analysis and logging intended for the measurement and recording of values characterizing the elemental composition of rocks.

17	IEC 61336:1996	Nuclear instrumentation - Thickness measurement systems utilizingionizing radiation - Definitions and test methods	Describes test methods and procedures for ionizing radiation measurement systems designed for either continuous or discrete measurements and checks of mass per unit of surface, mass per unit of length, or thickness of materials produced in industrial processes.
18	IEC 61435:2013	Nuclear instrumentation - High-purity germanium crystals for radiation detectors - Measurement methods of basic characteristics	IEC 61435:2013(E) is applicable to high-purity germanium crystals used for radiation detectors for gamma-rays and X-rays. Such germanium is monocrystalline and has a net concentration of fewer than 10¹¹ electrically active impurity centers per cm³. This International Standard specifies terminology and test methods for measurements of basic characteristics of high-purity germanium crystals. Test methods for completed assembled germanium detectors are given in IEC 60973 and IEC 60759. The main technical changes with regard to the previous edition are as follows: - review the existing requirements; - update the terminology and definitions.
19	IEC 61452:2021	Nuclear instrumentation - Measurement of activity or emission rate of gamma-ray emitting radionuclides - Calibration and use of germanium-based spectrometers	IEC 61452:2021 establishes methods for the calibration and use of high purity germanium spectrometers for the measurement of photon energies and emission rates over the energy range from 45 keV to approximately 3 000 keV and the calculation of radionuclide activities from these measurements. Minimum requirements for automated peak finding are stated. This document establishes methods for measuring the full-energy peak efficiency with calibrated sources. The object of this document is to provide a basis for the routine calibration and use of germanium (HPGe) semiconductor detectors for the measurement of gamma-ray emission rates and thereby the activities of the radionuclides in a sample. It is intended for use by persons who have an understanding of the principles of HPGe gamma-ray spectrometry and are responsible for the development of correct procedures for the calibration and use of such detectors. This document is primarily intended for routine analytical measurements. Related documents are IEC 60973 and ISO 20042. This second edition cancels and replaces the first edition published in 1995. This edition includes the following significant technical changes with respect to the previous edition: a. title modified; b. additional information on digital

			electronics; c. information on Monte Carlo simulations; d. reference to detection limits calculations.
20	IEC 61453:2007	Nuclear instrumentation - Scintillation gamma ray detector systems for the assay of radionuclides - Calibration and routine tests	Specifies methods of calibration and routine tests of scintillation detector systems for the measurement of gamma-ray energies and emission rates of radionuclides and the assay of radioactivity. Is applicable to scintillation detector systems based on inorganic scintillators for photon measurements. This second edition reflects an expansion of detector types considered.
21	IEC 61874:1998	Nuclear instrumentation - Geophysical borehole instrumentation to determine rock density ('density logging')	Specifies design requirements and performance characteristics of nuclear instrumentation used in boreholes to determine bulk rock density in situ.
22	IEC 62088:2001	Nuclear instrumentation - Photodiodes for scintillation detectors - Test procedures	Establishes standard test procedures for photodiodes used in scintillation detectors and defines the parameters which shall be provided by the supplier for each type of photodiode.
23	IEC 62089:2001	Nuclear instrumentation - Calibration and usage of alpha/beta gas proportional counters	Establishes standard methods for calibration and use of alpha/beta gas proportional counters, including measurement of their characteristics. Applies to alpha/beta gas proportional counting systems used for the determination of the alpha-ray or beta-ray emission rates of radionuclides in sample counting.
24	IEC 62372:2021	Nuclear instrumentation - Housed scintillators - Test methods of light output and intrinsic resolution	IEC 62372:2021 is applicable to housed scintillators for registration and spectrometry of alpha-, beta-, gamma-, X-ray and neutron radiation. This document specifies the requirements for the testing equipment and test methods of the basic parameters, of housed scintillators, such as: - the direct method is applicable to measure the light output of housed scintillators based on scintillation material. The housed scintillators certified by this method can be used as working standard of housed scintillators (hereinafter: working standard) when performing measurements by a relative method of comparison. - the relative method of comparison with the working standard is applicable to housed scintillators based on the same scintillation

			material as the working standard. This second edition cancels and replaces the first edition published in 2006. This edition includes the following significant technical changes with respect to the previous edition: - Title has been modified. - To review the existing requirements and to update the terminology, definitions and normative references.
25	IEC 62495:2011	Nuclear instrumentation - Portable X-ray fluorescence analysis equipment utilizing a miniature X-ray tube	IEC 62495:2011(E) is applicable to the radiological safety of portable handheld X-ray fluorescence (XRF) analysis equipment utilizing a miniature X-ray tube as the source of ionizing radiation for industrial applications. Establishes performance specifications for general radiation, electrical, safety and environmental characteristics of the design and operation, and test methods in relation to radiological safety for portable XRF analysis equipment utilizing a miniature X-ray tube. The proposed performance specifications are aimed at minimizing and avoiding the health risk associated with the use of these devices.
26	IEC 62598:2011	Nuclear instrumentation - Constructional requirements and classification of radiometric gauges	IEC 62598:2011 applies to the manufacture and installation of electrical measuring systems and instruments utilizing radioactive sources (radiometric gauges, hereinafter called gauges). It also applies to source housings intended for use in the aforementioned measuring systems. This standard applies to equipment, which is not related to power production or to the fuel cycle. It specifies constructional requirements for the design of instruments utilizing radioactive sources in regard of radiation protection. This standards cancels and replaces IEC 60405.
27	IEC 62976:2017+AMD1:2021 CSV	Industrial non-destructive testing equipment - Electron linear accelerator	IEC 62976:2017+A1:2021 gives the rules of naming, technical requirements, test methods, inspection, marking, packaging, transportation, storage and accompanying documents for electron linear accelerator equipment for Non-Destructive Testing (NDT). This document applies to NDT electron linear accelerator equipment in the X-ray energy range of 1 MeV to 15 MeV, including the accelerator equipment for radiographic film, computed radiography with imaging plates, real-time imaging, digital detector array and industrial computerized tomography.

28	IEC 62976:2017	Industrial non-destructive testing equipment - Electron linear accelerator	IEC 62976:2017 gives the rules of naming, technical requirements, test methods, inspection, marking, packaging, transportation, storage and accompanying documents for electron linear accelerator equipment for Non-Destructive Testing (NDT). This document applies to NDT electron linear accelerator equipment in the X-ray energy range of 1 MeV to 15 MeV, including the accelerator equipment for radiographic film, computed radiography with imaging plates, real-time imaging, digital detector array and industrial computerized tomography.
29	IEC 62976:2017/AMD1:2021	Amendment 1 - Industrial non-destructive testing equipment - Electron linear accelerator	-
30	IEC 63047:2018	Nuclear instrumentation - Data format for list mode digital data acquisition used in radiation detection and measurement	IEC 63047:2018 specifies the format of binary list-mode data at the output of digital data acquisition devices used for the detection and measurement of radiation. Such data acquisition devices may employ digital signal processors (DSPs) and field-programmable gate arrays (FPGAs) in combination with memory and a communication interface with a computer. This document is applicable to those data acquisition devices which are able to record and present interaction data of radiation in detectors on an event-per-event basis, with data stored in an output file or streamed to a remote computer. Such list-mode data typically contains timestamp and energy information, but may also contain digital signals or properties like rise time or sub-areas of signals computed by the DSP or FPGA from the signal samples. The contents of the corrigendum of April 2020 have been included in this copy.
31	IEC 63047:2018/COR1:2020	Corrigendum 1 - Nuclear instrumentation - Data format for list mode digital data acquisition used in radiation detection and measurement	-

32	IEC 63048:2020	Mobile remotely controlled systems for nuclear and radiological applications - General requirements	IEC 63048:2020 defines the general requirements for Mobile Remotely Controlled Systems (MRCSs) for nuclear and radiological applications such as integrity inspections, repair of components, handling of radioactive materials, and monitoring of physical conditions and radiation dose intensity in specific areas. This document applies to MRCSs that are used to support nuclear and radiological facilities. These general requirements encompass high-level performance requirements regarding sensors, monitoring devices, control devices, interfacing mechanisms, simulation methods, and verification methods thereof in a normal environment or extreme environmental conditions, such as high radiation, high temperature, and high humidity environments.
33	IEC 63148:2021	Tracking systems for radioactive materials - Requirements	IEC 63148:2021 specifies the requirements of tracking systems for radioactive materials. Such systems identify and locate the position of the radioactive materials transported using global navigation satellite systems (GNSS) and radio frequency identification (RFID). The system provides a set of safety controls of the radioactive material, by which the transporter can improve safety during transportation. This document may also be used as supplementary guidance to the regulatory body.
34	IEC 63175:2021	Fixed energy high intensity proton cyclotron within the energy range of 10 MeV to less than 30 MeV	IEC 63175:2021 is applicable to hydrogen ion H- acceleration proton cyclotrons with one or more fixed energies within the range of 10 MeV to less than 30 MeV and a beam intensity equal to or greater than 300 μA. This document specifies the performance and safety requirements, structure, technical requirements, test methods, identification, packing, transportation, storage and accompanying documents for such cyclotrons. This document is intended for manufacturers of high intensity proton cyclotron within the energy range of 10 MeV to less than 30 MeV, and responsible organizations where such cyclotrons are installed.