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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



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Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.

FUNCTIONS CONCERNED:

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TITLE:

Managing risk in projects - Application guidelines

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

MANAGING RISK IN PROJECTS – APPLICATION GUIDELINES

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International Standard IEC 62198 has been prepared by IEC technical committee 56: Dependability.

This third edition cancels and replaces the second edition, published in 2013, and constitutes a technical revision.

This edition includes the following technical changes with respect to the previous edition:

- a) now aligned with ISO 31000, *Risk management – Guidelines* and ISO 21502 *Project, programme and portfolio management – Guidance on project management*.

141 The text of this standard is based on the following documents:

FDIS	Report on voting

142
143 Full information on the voting for the approval of this standard can be found in the report on
144 voting indicated in the above table.

145 This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

146 The committee has decided that the contents of this publication will remain unchanged until the
147 stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to
148 the specific publication. At this date, the publication will be

- 149 • reconfirmed,
- 150 • withdrawn,
- 151 • replaced by a revised edition, or
- 152 • amended.

153

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154

155

156

INTRODUCTION

157 Every project involves uncertainty and risk. Project risks can be related to the objectives of the
158 project itself or to the objectives of the assets, products or services the project creates. This
159 International Standard provides guidelines for managing risks in a project in a systematic and
160 consistent way.

161 Risk management includes the coordinated activities to direct and control an organization with
162 regard to risk. ISO 31000, *Risk management – Guidelines*, describes the principles for effective
163 risk management, the framework that provides the foundations and organizational
164 arrangements for designing, implementing, monitoring, reviewing and continually improving risk
165 management throughout an organization and a process for managing risk that can be applied
166 to all types of risk in any organization. This standard shows how those general principles and
167 guidelines apply to managing uncertainty in projects.

168 This standard is relevant to individuals and organizations concerned with any or all phases in
169 the life cycle of projects. It can also be applied to sub-projects and to sets of inter-related
170 projects and programmes.

171 The application of this standard needs to be tailored to each specific project. Therefore, it is
172 considered inappropriate to impose a certification system for risk management practitioners.

173 The guidance provided in this standard is not intended to override existing industry-specific
174 standards, although the guidance can be helpful in such instances.

175

MANAGING RISK IN PROJECTS – APPLICATION GUIDELINES

1 Scope

This International Standard provides principles and generic guidelines on managing risk and uncertainty in projects. In particular it describes a systematic approach to managing risk in projects based on ISO 31000, *Risk management – Guidelines*.

Guidance is provided on the principles for managing risk in projects, the framework and organizational requirements for implementing risk management and the process for conducting effective risk management.

This standard is not intended for the purpose of certification.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 31000, *Risk management – Guidelines*

3 Terms and definitions

For the purpose of this document, the following terms or definitions apply.

3.1

event

occurrence or change of a particular set of circumstances

Note 1 to entry: An event can have one or more occurrences, and can have several causes and several consequences.

Note 2 to entry: An event can also be something that is expected which does not happen, or something that is not expected which does happen.

Note 3 to entry: An event can be a risk source.

[Source: ISO 31000:2018, 3.5]

3.2

opportunity

combination of circumstances expected to be favourable to objectives

Note 1 to entry: An opportunity is a positive situation in which gain is likely and over which one has a fair level of control.

Note 2 to entry: An opportunity to one party may pose a threat to another.

Note 3 to entry: Taking or not taking an opportunity are both sources of risk.

213 [SOURCE: IEC 31010: 2019, 3.2]

214 **3.3**

215 **project**

216 temporary endeavour to achieve one or more defined objectives

217 [SOURCE: ISO 21502:2020, 3.20]

218 **project management**

219 coordinated activities to direct and control the accomplishment of agreed objectives

220 [SOURCE: ISO 21502:2020, 3.24]

221 **3.4**

222 **project plan**

223 documented description of the technical and management baselines to be followed for a
224 project

225 [SOURCE: ISO TR 21506:2018, 3.64]

226 **3.5**

227 **resilience**

228 adaptive capacity of an organization in a complex and changing environment

229 [SOURCE: ISO 31073:2022, 3.3.39]

230 **3.6**

231 **risk**

232 effect of uncertainty on objectives

233 Note 1 to entry: An effect is a deviation from the expected. It can be positive, negative or
234 both, and can address, create or result in opportunities and threats.

235 Note 2 to entry: Objectives can have different aspects and categories, and can be applied at
236 different levels.

237 Note 3 to entry: Risk is usually expressed in terms of risk sources, potential events, their
238 consequences and their likelihood.

239 [SOURCE: ISO 31000:2018, 3.1]

240 **3.7**

241 **risk management**

242 coordinated activities to direct and control an organization with regard to risk

243 [SOURCE: ISO 31000:2018, 3.2]

244 **3.8**

245 **risk management framework**

246 set of components that provide the foundations and organizational arrangements for
247 designing, implementing, monitoring, reviewing and continually improving risk management
248 throughout the organization

249 Note 1 to entry: The foundations include the policy, objectives, mandate and commitment to manage risk (3.6).

250 Note 2 to entry: The organizational arrangements include plans, relationships, accountabilities, resources,
251 processes and activities.

252 Note 3 to entry: The risk management framework is embedded within the organization's overall strategic and
253 operational policies and practices.

254 [SOURCE: ISO Guide 73:2009, 2.1.1]

255 **3.9**

256 **risk management policy**

257 statement of the overall intentions and direction of an organization related to risk
258 management

259 [SOURCE: ISO 31073:2022, 3.2.2]

260 **3.10**

261 **risk management plan**

262 scheme within the risk management framework specifying the approach, the management
263 components and resources to be applied to the management of risk

264 Note 1 to entry: Management components typically include procedures, practices, assignment of responsibilities,
265 sequence and timing of activities.

266 Note 2 to entry: The risk management plan can be applied to a particular product, process and project (3.3), and
267 part or whole of the organization.

268 [SOURCE: ISO 31073:2022, 3.2.3]

269 **3.11**

270 **risk management process**

271 systematic application of management policies, procedures and practices to the activities of
272 communicating, consulting, establishing the context, and identifying, analysing, evaluating,
273 treating, monitoring and reviewing risk

274 [SOURCE: ISO 31073:2022, 3.3.1]

275 **3.12**

276 **risk treatment**

277 process to modify risk

278 Note 1 to entry: Risk treatment can involve:

279 avoiding the risk by deciding not to start or continue with the activity that gives rise to the risk;

280 taking or increasing risk in order to pursue an opportunity;

281 removing the risk source;

282 changing the likelihood;

283 changing the consequences;

284 sharing the risk with another party or parties (including contracts and risk financing); and

285 retaining the risk by informed decision.

286 Note 2 to entry: Risk treatments that deal with negative consequences are sometimes referred to as “risk
287 mitigation”, “risk elimination”, “risk prevention” and “risk reduction”.

288 Note 3 to entry: Risk treatment can create new risks or modify existing risks.

289 [SOURCE: ISO 31073:2022, 3.3.32]

290 **3.13**

291 **work breakdown structure**

292 decomposition of the defined scope of a project or programme into progressively lower levels
293 consisting of elements of work

294 [SOURCE: ISO 21502:2020, 3.29]

295 **4 Managing risks in projects**

296 Every project involves uncertainty that can lead to risk. These risks can relate to the objectives
297 of the project itself (for example to complete the project within a specified time frame and
298 budget) or to the requirements of the assets, products or services that the project creates (for
299 example for a product to be safe, dependable and environmentally sustainable).

300 The consequences that could arise from uncertainty in a project can be beneficial as well as
301 detrimental, so project risk management is directed not only to avoiding or reacting to problems
302 but also to identifying and capturing opportunities. Taking account of project risks contributes
303 to better decisions, better project outcomes and increased value for the stakeholders.

304 This standard is relevant to individuals and organizations concerned with any or all phases in
305 the life cycle of projects. To obtain maximum benefit, risk management activities should be
306 initiated at the earliest possible phase of a project and continued through subsequent phases.
307 However, project risk management can be initiated successfully at any point in the life cycle. It
308 is scalable, so it can be used with both small and large projects and to individual phases of
309 projects. It can also be applied to sub-projects and to sets of inter-related projects and
310 programmes.

311 A typical set of project phases and their characteristics is shown in Table 1.

312 **Table 1 – Typical phases in a project**

Phase	Phase 1	Phase 2	Phase 3	Phase 4	Additional activities	
Phase label	Identify Concept	Select Pre- feasibility	Design and develop Feasibility	Deliver Implement Install and commission	Operate and maintain	Abandon Dispose
Purpose	Appraising opportunities: determine whether the project could be worthwhile and its alignment with business strategy	Selecting options: identify and appraise project development options and select the preferred one	Defining the project: finalize the scope and detail of the preferred option	Delivering the project: produce an operating asset, product or service, consistent with the agreed scope	Realising the benefits: evaluate the project outcome to ensure performance	Closure: ensure safe and acceptable closure or disposal
Focus of risk management activities	Strategic threats and opportunities	Risk-based options selection	Design and delivery strategy	Project delivery, test and handover	Operation and maintenance	Disposal and rehabilitation

313 Note to Table 1: The additional activities in the two right-hand columns might correspond to phases in the life cycle
314 of an asset, product or service that is created by a project. They are not project phases, but they are included here
315 because they must be considered by project managers as they proceed through phases 1 to 4.

316 It is common for each phase to culminate in a decision point (sometimes called a gate) at which
317 executive approval is provided for progression and entry to the next phase. Information on risks
318 and risk management is an important part of the information provided to executives to support
319 their decisions. Information on risks and controls in each phase should also be handed over to
320 the team managing the next phase of the project.

321 All executives and managers in the organizations associated with a project have a role in
322 managing the risks associated with their decisions. This standard is intended for use by:

- 323 a) project directors and project managers who are part of an organization that owns or
324 commissions the project or that will own or manage the assets, products or services the
325 project will create;

- b) members of project teams who are responsible for significant sub-projects, groups of activities or packages of work;
- c) project owners or sponsors who are responsible for ensuring that the sponsoring organization's business interests in the project are maintained and that the expected outcomes and benefits are realised;
- d) executives who have to approve the progression of the project at each decision point and the expenditure, resource allocation and objectives associated with the subsequent phase;
- e) peer reviewers who provide assurance to the executives who make approval decisions that the supporting information is comprehensive, accurate, valid and reliable;
- f) project directors and project managers who are part of a contracting organization, or a sub-contractor or supplier, that bids for or delivers some or all of the project and its associated assets, products or services;
- g) financiers and insurers who provide financial and related support for the project;
- h) regulators of project-related activities or the assets, products or services that can be created by the project; and
- i) other stakeholders, including sub-contractors, suppliers, users or beneficiaries of the assets, products or services that can be created by the project, and other parties who could have an interest in the project and its outcomes (including the wider public).

5 Principles

For project risk management to be effective, an organization should at all levels comply with the principles as shown below.

- a) Risk management creates and protects value
Risk management contributes to the demonstrable achievement of objectives and improvement of performance and quality in projects and the assets, products and services they create. The objectives shall be understood clearly by all parties.
- b) Risk management is part of decision-making
Risk management helps decision makers make informed choices about the project, within each stage of its life, prioritize actions and distinguish among alternative courses of action. This implies that all decisions should consider risk.
- c) Risk management is an integral part of all organizational processes associated with a project
Risk management is not a stand-alone activity that is separate from the main activities and processes of the project or the organization. Risk management is part of the responsibilities of project managers and of staff at all levels. It is an integral part of all the organizational processes associated with a project, including strategic project and investment planning, project management and management of project change.
- d) Risk management explicitly addresses uncertainty
All managers should explicitly take account of uncertainty, the nature of that uncertainty, and how it can be addressed, particularly in critical processes.
- e) Risk management is systematic, structured and timely
A systematic, timely and structured approach to risk management contributes to consistent, comparable and reliable project decisions, to the efficiency of project management processes and to the benefits of the project. A sound framework for risk management should be applied from the beginning of a project.

f) Risk management is based on the best available information

The inputs to the process of managing risk in a project are based on information sources such as technical and engineering analyses, physical site and equipment inspections, test results and progress reports, supplemented with historical data, experience, stakeholder feedback, forecasts and expert judgement. However, those involved with managing risks in a project should inform themselves of, and should take into account, any limitations of the data or modelling used, uncertainty in the information available or the possibility of divergence among experts.

g) Risk management is tailored

Risk management activities are adapted to the kind of project, the project's external and internal context and those of the organizations involved, and the level of uncertainty and complexity associated with the project. The level of risk management effort is proportionate to the situation.

h) Risk management takes human and cultural factors into account

The capabilities, perceptions and intentions of people and organizations that can facilitate or hinder achievement of the project's objectives are taken into account when managing risk.

i) Risk management is transparent and inclusive

Appropriate and timely involvement of stakeholders and, in particular, decision makers at all levels of the organization, ensures that risk management remains relevant and up-to-date. Involvement also allows stakeholders to be properly represented and to have their views taken into account in determining risk criteria.

j) Risk management is dynamic, iterative and responsive to change

As a project progresses and as related external and internal events occur, context and knowledge change, monitoring and review take place, new risks emerge, some risks change, and other risks disappear. Therefore, risk management activities in a project help project decision-makers to continually identify, understand and respond to change.

k) Risk management facilitates continual improvement of the organization

Organizations should develop and implement strategies to improve the maturity of their project risk management alongside all other aspects of their organizational processes.

6 Project risk management framework

6.1 General

Project risk management processes should be integrated with project management processes. The project management framework – the way in which the project management process will be organized, structured and controlled – should provide the foundations and arrangements that will embed project risk management throughout the project through all phases, at all levels and across all the organizations involved. The success of project risk management will depend in part on the effectiveness of the integration.

The project risk management framework assists in managing project risks. It does this through consistent and effective project risk management processes (see Clause 7), applied at varying levels and within the specific context of the project. The framework and processes ensure that information about project risk is adequately reported and used as a basis for governance, decision making and accountability at all relevant organizational and project levels.

This clause describes the necessary components of the framework for managing project risk and the way in which they interrelate in an iterative manner. Figure 1 shows the risk management framework specified in ISO 31000 applied to managing risk in projects.

This framework is not intended to prescribe a management system, but rather to assist the organizations involved in a project to integrate project risk management into the overall project