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TECHNICAL REPORT

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Audio/video, information and communication technology equipment -
Part 2: Explanatory information related to IEC 62368-1:2023

ICS 33.160.01

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Audio/video, information and communication technology equipment - Part 2: Explanatory information related to IEC 62368-1:2023

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC TR 62368-2:2018. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC TR 62368-2 has been prepared by IEC technical committee TC 108: Safety of electronic equipment within the field of audio/video, information technology and communication technology. It is a Technical Report.

This fourth edition cancels and replaces the third edition published in 2018. This edition constitutes a technical revision.

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

a) It takes into account changes made in the fourth edition of IEC 62368-1 (IEC 62368-1:2023) as identified in the Foreword of IEC 62368-1:2023.

The text of this Technical Report is based on the following documents:

Draft	Report on voting
108/794/DTR	108/825/RVDTR

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

The language used for the development of this Technical Report is English.

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

In this document, the following print types are used:

– notes/explanatory matter: in smaller roman type;
– tables and figures that are included in the rationale have linked fields (shaded in grey if “field shading” is active);
– terms that are defined in IEC 62368-1: in **bold type**.

Where coloured shading is used:

– green colour stands for level 1 energy sources
– yellow/orange colour stands for level 2 energy sources
– red colour stands for level 3 energy sources.

In this document, where the term (HBSDT) is used, it stands for Hazard Based Standard Development Team, which is the Working Group of IEC TC 108 responsible for the development and maintenance of IEC 62368-1.

A list of all parts of the IEC 62368 series can be found, under the general title *Audio/video, information and communication technology equipment*, on the IEC website.

In this document, only those subclauses from IEC 62368-1 considered to need further background reference information or explanation to benefit the user in applying the relevant requirements are included. Therefore, not all numbered subclauses are cited. Unless otherwise noted, all references are to clauses, subclauses, annexes, figures or tables located in IEC 62368-1:2023.

The entries in this document can have one or two of the following subheadings in addition to the Rationale statement:

Source – where the source is known and is a document that is accessible to the general public, a reference is provided.

Purpose – where there is a need and when it can prove helpful to the understanding of the Rationale, a Purpose statement has been added.

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

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

IEC 62368-1 is based on the principles of hazard-based safety engineering, which is a different way of developing and specifying safety considerations than that of the current practice. While IEC 62368-1 is different from traditional IEC safety documents in its approach and while it is believed that IEC 62368-1 provides a number of advantages, its introduction and evolution are not intended to result in significant changes to the existing safety philosophy that led to the development of the safety requirements contained in IEC 60065 and IEC 60950-1. The predominant reason behind the creation of IEC 62368-1 is to simplify the problems created by the merging of the technologies of ITE and CE. The techniques used are novel, so a learning process ~~is required and experience is needed in its application~~ and experience in its application are needed. ~~Consequently, the committee recommends that this edition of the document be considered as an alternative to IEC 60065 or IEC 60950-1 at least over the recommended transition period.~~

0 Principles of this product safety standard

Clause 0 is ~~informational~~ informative and provides a rationale for the normative clauses of ~~the document~~ IEC 62368-1:2023.

0.5.1 General

ISO/IEC Guide 51:2014, 6.3.5 states:

"When reducing risks, the order of priority shall be as follows:

a) inherently safe design;

*b) guards and protective **devices**;*

c) information for end users.

*Inherently safe design measures are the first and most important step in the risk reduction process. This is because protective measures inherent to the characteristics of the product or system are likely to remain effective, whereas experience has shown that even well-designed guards and protective **devices** can fail or be violated and information for use might not be followed.*

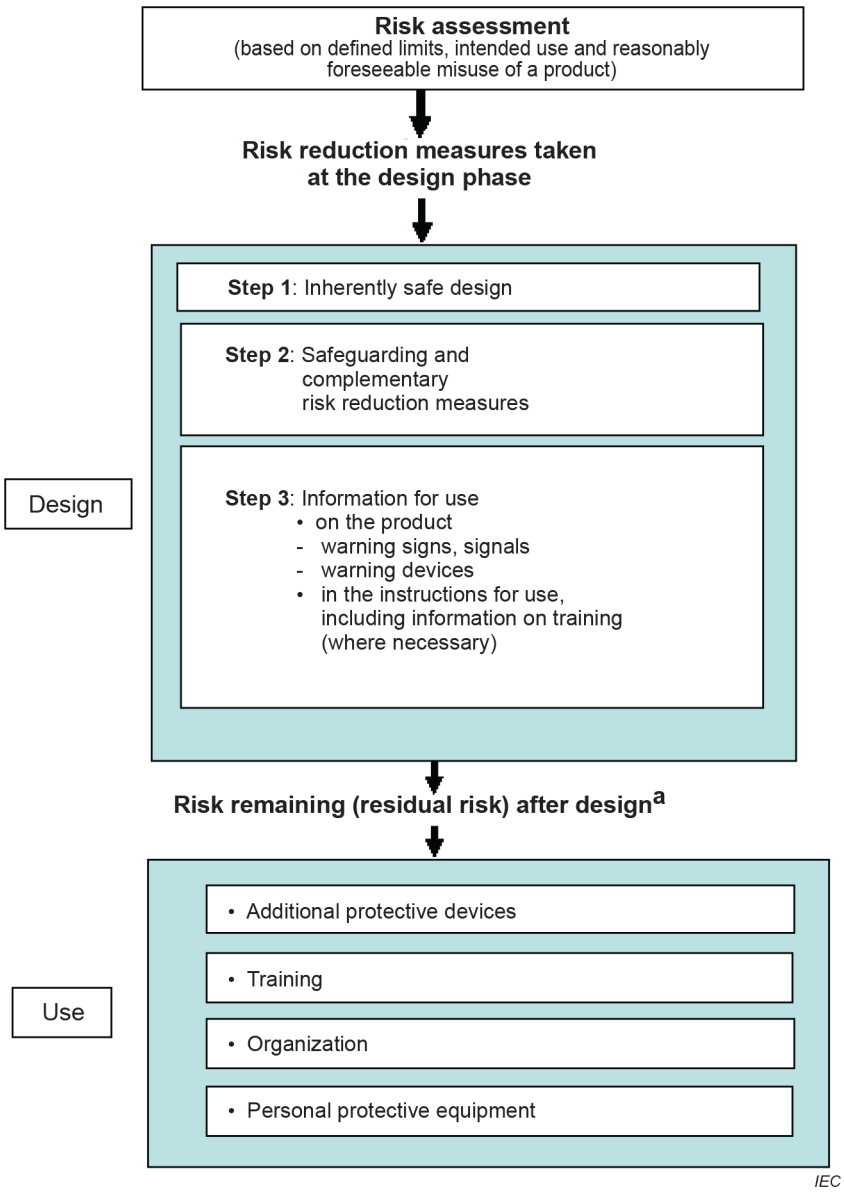
*Guards and protective **devices** shall be used whenever an inherently safe design measure does not reasonably make it possible either to remove hazards or to sufficiently reduce risks. Complementary protective measures involving additional equipment (for example, emergency stop equipment) might have to be implemented.*

The end user has a role to play in the risk reduction procedure by complying with the information provided by the designer/supplier. However, information for use shall not be a substitute for the correct application of inherently safe design measures, guards or complementary protective measures."

In general, this principle is used in IEC 62368-1. The table below shows a comparison between the hierarchy required in ISO/IEC Guide 51 and the hierarchy used in IEC 62368-1~~:2018~~.

ISO/IEC Guide 51	IEC 62368-1
a) inherently safe design	1. inherently safe design by limiting all energy hazards to class 1
b) guards and protective **devices**	2. **equipment safeguards**
	3. **installation safeguards**
	4. **personal safeguards**
c) information for end users	5. behavioural **safeguards**
	6. **instructional safeguards**

Risk assessment has been considered as part of the development of IEC 62368-1 as indicated in the following from ISO/IEC Guide 51 (Figure 1 in this document). See also the Hazard Based Safety Engineering (HBSE) Process Flow (Figure 2 in this document) that also provides additional details for the above comparison.



[a] An example is the risk remaining in a product or a system when supplied to a customer, or in a structural feature, after installation.

Figure 1 – Risk reduction as given in ISO/IEC Guide 51

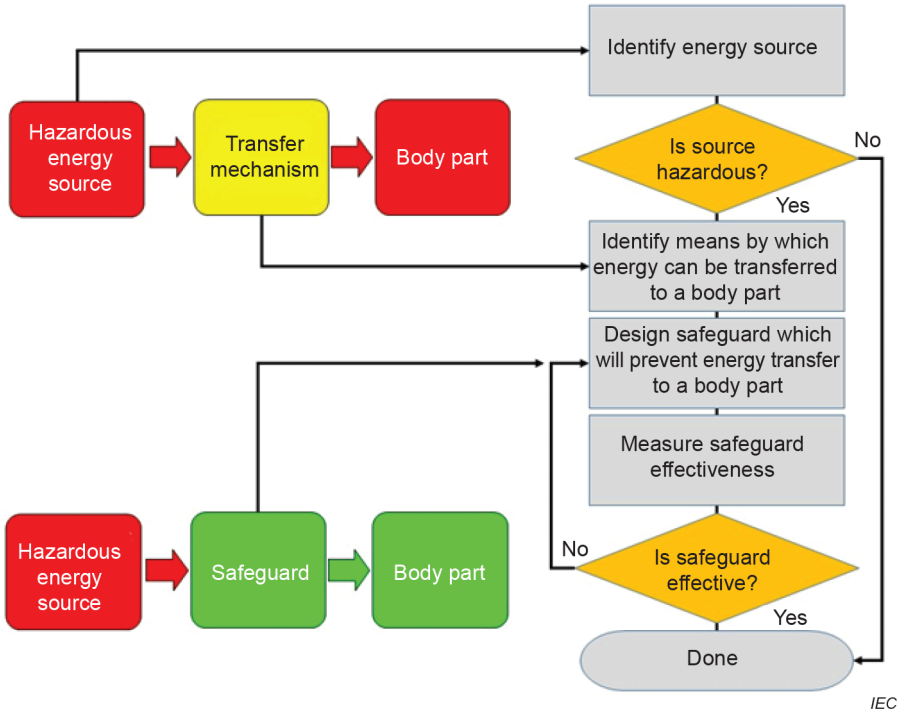


Figure 2 – HBSE Process Chart

0.5.7 Equipment safeguards during skilled person service conditions

Purpose: To explain the intent of requirements for providing **safeguards** against involuntary reaction.

Rationale: By definition, a **skilled person** has the education and experience to identify all class 3 energy sources to which he ~~may~~ can be exposed. However, while servicing one class 3 energy source in one location, a **skilled person** ~~may~~ can be exposed to another class 3 energy source in a different location.

In such a situation, either of two events is possible. First, something ~~may~~ can cause an involuntary reaction of the **skilled person** with the consequences of contact with the class 3 energy source in the different location. Second, the space in which the **skilled person** is located ~~may~~ can be small and cramped, and inadvertent contact with a class 3 energy source in the different location ~~may be~~ is likely.

In such situations, ~~this document may~~ IEC 62368-1:2023 can require an equipment **safeguard** solely for the protection of a **skilled person** while performing servicing activity.

0.10 Thermally-caused injury (skin burn)

Purpose: The requirements basically address **safeguards** against thermal energy transfer by conduction. They do not specifically address safeguards against thermal energy transfer by convection or radiation. However, as the temperatures from hot surfaces due to conduction are always higher than the radiated or convected temperatures, the requirements against convection and radiation are considered to be covered by the requirements against conducted energy transfer.

1 Scope

Purpose: To identify the purpose and applicability of ~~this document~~ IEC 62368-1:2023 and the exclusions from the scope.

Rationale: The scope excludes requirements for functional safety. Functional safety is addressed in IEC 61508-1. Because the scope includes computers that ~~may~~ can control safety systems, functional safety requirements would necessarily include requirements for computer processes and software.

The requirements provided in IEC 60950-23 ~~could~~ can be modified and added to IEC 62368 as another –X document. However, because of the hazard-based nature of IEC 62368-1, the requirements from IEC 60950-23 have been incorporated into the body of IEC 62368-1 and made more generic.

The intent of the addition of the IEC 60950-23 requirements is to maintain the overall intent of the technical requirements from IEC 60950-23, incorporate them into IEC 62368-1 following the overall format of IEC 62368-1 and simplify and facilitate the application of these requirements.

Robots traditionally are covered under the scopes of ISO documents, typically maintained by ISO TC 299. ISO TC 299 has working groups for personal care robots and service robots, and produces for example, ISO 13482, *Robots and robotic devices – Safety requirements for personal care robots*.

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2 Normative references

The list of normative references is a list of all documents that have a normative reference to them in the body of the document. As such, referenced documents are indispensable for the application of ~~this document~~ IEC 62368-1. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Recently, there were some issues with test houses that wanted to use the latest edition as soon as it was published. As this creates serious problems for manufacturers, since they have no chance to prepare, it was felt to be important that a reasonable transition period ~~should~~ be taken into account. This is in line with earlier decisions taken by the SMB that allow transition periods to be mentioned in the foreword of the documents. Therefore IEC TC 108 decided to indicate this in the introduction of the normative references clause, to instruct test houses to take into account any transition period, effective date or date of withdrawal established for the document.

These documents are referenced, in whole, in part, or as alternative requirements to the requirements contained in ~~this document~~ IEC 62368-1. Their use is specified, where necessary, for the application of the requirements of ~~this document~~ IEC 62368-1. The fact that a standard is mentioned in the list does not mean that compliance with the document or parts of it is required.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Audio/video, information and communication technology equipment - Part 2: Explanatory information related to IEC 62368-1:2023

FOREWORD

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IEC TR 62368-2 has been prepared by IEC technical committee TC 108: Safety of electronic equipment within the field of audio/video, information technology and communication technology. It is a Technical Report.

This fourth edition cancels and replaces the third edition published in 2018. This edition constitutes a technical revision.

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

a) It takes into account changes made in the fourth edition of IEC 62368-1 (IEC 62368-1:2023) as identified in the Foreword of IEC 62368-1:2023.

The text of this Technical Report is based on the following documents:

Draft	Report on voting
108/794/DTR	108/825/RVDTR

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

The language used for the development of this Technical Report is English.

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

In this document, the following print types are used:

– notes/explanatory matter: in smaller roman type;
– tables and figures that are included in the rationale have linked fields (shaded in grey if “field shading” is active);
– terms that are defined in IEC 62368-1: in **bold type**.

Where coloured shading is used:

– green colour stands for level 1 energy sources
– yellow/orange colour stands for level 2 energy sources
– red colour stands for level 3 energy sources.

In this document, where the term (HBSDT) is used, it stands for Hazard Based Standard Development Team, which is the Working Group of IEC TC 108 responsible for the development and maintenance of IEC 62368-1.

A list of all parts of the IEC 62368 series can be found, under the general title *Audio/video, information and communication technology equipment*, on the IEC website.

In this document, only those subclauses from IEC 62368-1 considered to need further background reference information or explanation to benefit the user in applying the relevant requirements are included. Therefore, not all numbered subclauses are cited. Unless otherwise noted, all references are to clauses, subclauses, annexes, figures or tables located in IEC 62368-1:2023.

The entries in this document can have one or two of the following subheadings in addition to the Rationale statement:

Source – where the source is known and is a document that is accessible to the general public, a reference is provided.

Purpose – where there is a need and when it can prove helpful to the understanding of the Rationale, a Purpose statement has been added.

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

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

IEC 62368-1 is based on the principles of hazard-based safety engineering, which is a different way of developing and specifying safety considerations than that of the current practice. While IEC 62368-1 is different from traditional IEC safety documents in its approach and while it is believed that IEC 62368-1 provides a number of advantages, its introduction and evolution are not intended to result in significant changes to the existing safety philosophy that led to the development of the safety requirements contained in IEC 60065 and IEC 60950-1. The predominant reason behind the creation of IEC 62368-1 is to simplify the problems created by the merging of the technologies of ITE and CE. The techniques used are novel, so a learning process and experience in its application are needed.

0 Principles of this product safety standard

Clause 0 is informative and provides a rationale for the normative clauses of IEC 62368-1:2023.

0.5.1 General

ISO/IEC Guide 51:2014, 6.3.5 states:

"When reducing risks, the order of priority shall be as follows:

a) inherently safe design;

*b) guards and protective **devices**;*

c) information for end users.

*Inherently safe design measures are the first and most important step in the risk reduction process. This is because protective measures inherent to the characteristics of the product or system are likely to remain effective, whereas experience has shown that even well-designed guards and protective **devices** can fail or be violated and information for use might not be followed.*

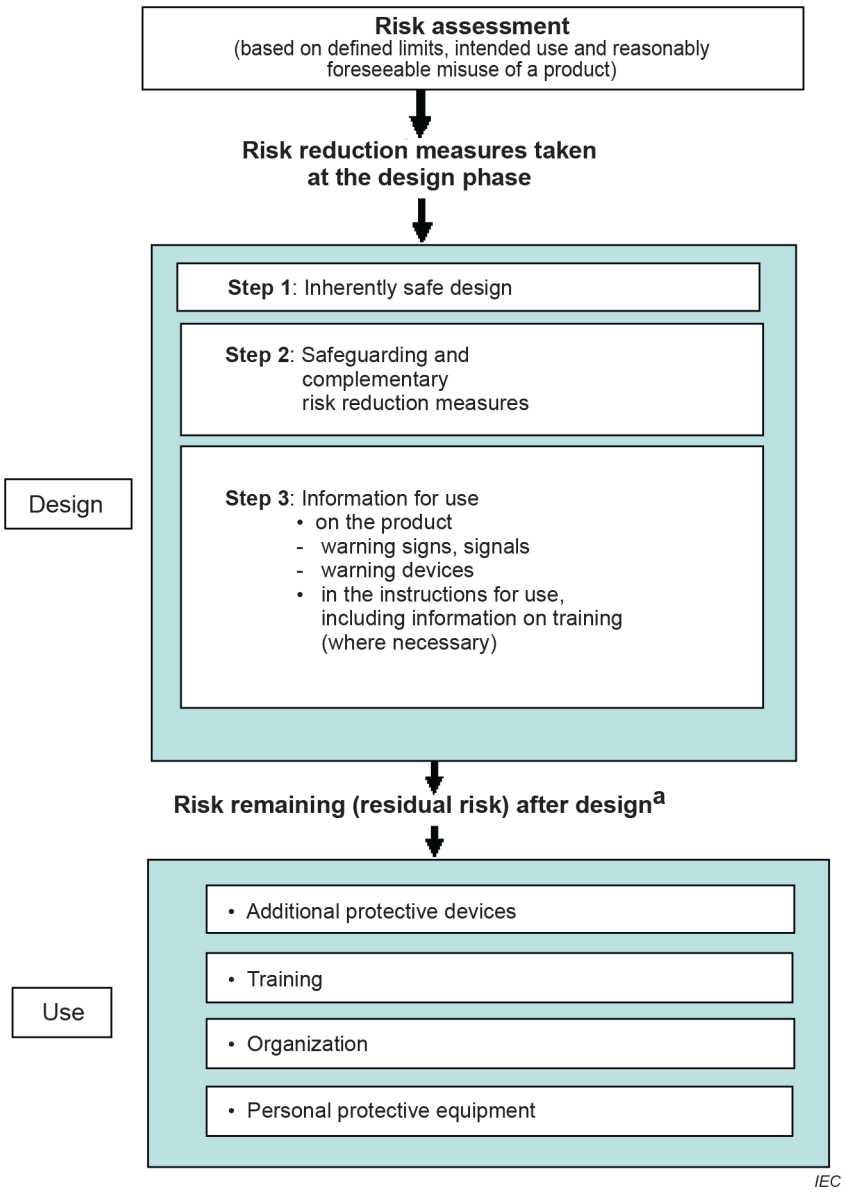
*Guards and protective **devices** shall be used whenever an inherently safe design measure does not reasonably make it possible either to remove hazards or to sufficiently reduce risks. Complementary protective measures involving additional equipment (for example, emergency stop equipment) might have to be implemented.*

The end user has a role to play in the risk reduction procedure by complying with the information provided by the designer/supplier. However, information for use shall not be a substitute for the correct application of inherently safe design measures, guards or complementary protective measures."

In general, this principle is used in IEC 62368-1. The table below shows a comparison between the hierarchy required in ISO/IEC Guide 51 and the hierarchy used in IEC 62368-1.

ISO/IEC Guide 51	IEC 62368-1
a) inherently safe design	1. inherently safe design by limiting all energy hazards to class 1
b) guards and protective **devices**	2. **equipment safeguards**
	3. **installation safeguards**
	4. **personal safeguards**
c) information for end users	5. behavioural **safeguards**
	6. **instructional safeguards**

Risk assessment has been considered as part of the development of IEC 62368-1 as indicated in the following from ISO/IEC Guide 51 (Figure 1 in this document). See also the Hazard Based Safety Engineering (HBSE) Process Flow (Figure 2 in this document) that also provides additional details for the above comparison.



[a] An example is the risk remaining in a product or a system when supplied to a customer, or in a structural feature, after installation.

Figure 1 – Risk reduction as given in ISO/IEC Guide 51

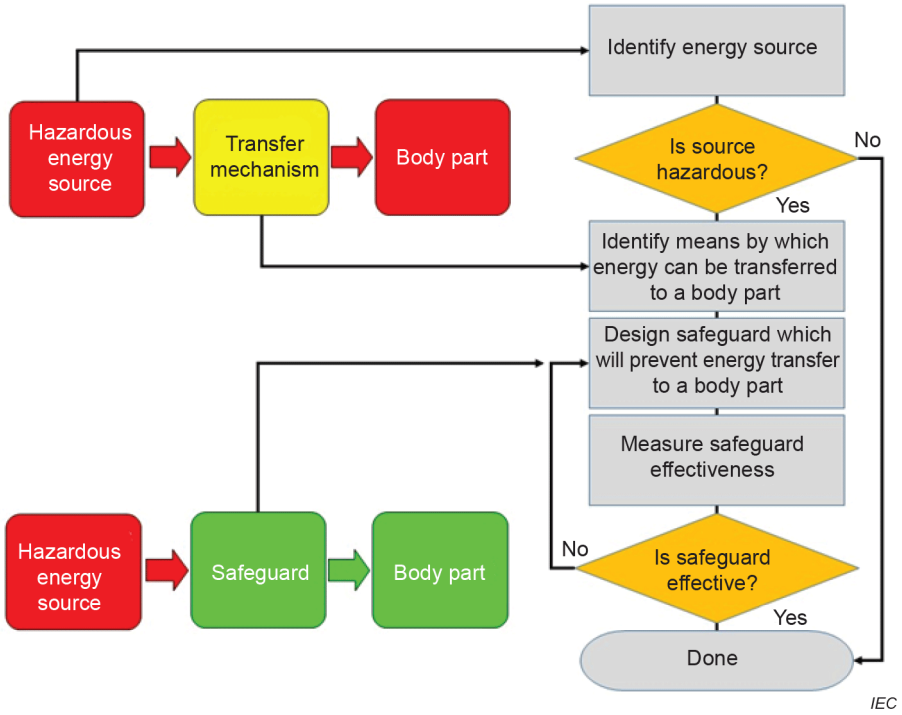


Figure 2 – HBSE Process Chart

0.5.7 Equipment safeguards during skilled person service conditions

Purpose: To explain the intent of requirements for providing **safeguards** against involuntary reaction.

Rationale: By definition, a **skilled person** has the education and experience to identify all class 3 energy sources to which he can be exposed. However, while servicing one class 3 energy source in one location, a **skilled person** can be exposed to another class 3 energy source in a different location.

In such a situation, either of two events is possible. First, something can cause an involuntary reaction of the **skilled person** with the consequences of contact with the class 3 energy source in the different location. Second, the space in which the **skilled person** is located can be small and cramped, and inadvertent contact with a class 3 energy source in the different location is likely.

In such situations, IEC 62368-1:2023 can require an equipment **safeguard** solely for the protection of a **skilled person** while performing servicing activity.

0.10 Thermally-caused injury (skin burn)

Purpose: The requirements basically address **safeguards** against thermal energy transfer by conduction. They do not specifically address safeguards against thermal energy transfer by convection or radiation. However, as the temperatures from hot surfaces due to conduction are always higher than the radiated or convected temperatures, the requirements against convection and radiation are considered to be covered by the requirements against conducted energy transfer.

1 Scope

Purpose: To identify the purpose and applicability of IEC 62368-1:2023 and the exclusions from the scope.

Rationale: The scope excludes requirements for functional safety. Functional safety is addressed in IEC 61508-1. Because the scope includes computers that can control safety systems, functional safety requirements would necessarily include requirements for computer processes and software.

The requirements provided in IEC 60950-23 can be modified and added to IEC 62368 as another –X document. However, because of the hazard-based nature of IEC 62368-1, the requirements from IEC 60950-23 have been incorporated into the body of IEC 62368-1 and made more generic.

The intent of the addition of the IEC 60950-23 requirements is to maintain the overall intent of the technical requirements from IEC 60950-23, incorporate them into IEC 62368-1 following the overall format of IEC 62368-1 and simplify and facilitate the application of these requirements.

Robots traditionally are covered under the scopes of ISO documents, typically maintained by ISO TC 299. ISO TC 299 has working groups for personal care robots and service robots, and produces for example, ISO 13482, *Robots and robotic devices – Safety requirements for personal care robots*.

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2 Normative references

The list of normative references is a list of all documents that have a normative reference to them in the body of the document. As such, referenced documents are indispensable for the application of IEC 62368-1. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Recently, there were some issues with test houses that wanted to use the latest edition as soon as it was published. As this creates serious problems for manufacturers, since they have no chance to prepare, it was felt to be important that a reasonable transition period be taken into account. This is in line with earlier decisions taken by the SMB that allow transition periods to be mentioned in the foreword of the documents. Therefore IEC TC 108 decided to indicate this in the introduction of the normative references clause, to instruct test houses to take into account any transition period, effective date or date of withdrawal established for the document.

These documents are referenced, in whole, in part, or as alternative requirements to the requirements contained in IEC 62368-1. Their use is specified, where necessary, for the application of the requirements of IEC 62368-1. The fact that a standard is mentioned in the list does not mean that compliance with the document or parts of it is required.

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