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Design review

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

DESIGN REVIEW

FOREWORD

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

This second edition cancels and replaces the first edition published in 1992 and its amendment 1(1994) and constitutes a technical revision.

The major changes with regard to the previous edition concerns the inclusion of the previous amendment which dealt with environmental effects (10.2.7), human factors (19.2.9) and legal matters (10.2.10), as well as clarification of responsibilities for the design review process and the design review process itself.

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

FDIS	Report on voting
56/1044/FDIS	56/1064/RVD

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

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

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

The dependability of a product is enhanced through implementation of necessary disciplines during the design and development phases of a product's life cycle. Like other technical and engineering disciplines, a design review needs to be properly managed in order to achieve its objectives.

Properly implemented, design reviews enhance the potential for delivering a product of the required dependability, quality, performance, safety and potential for reduction in costs and delivery schedule. Both supplier and customer can utilize it.

A design review is an advisory activity. It is intended primarily to provide verification of the work of the design development team, and to provide recommendations, where possible, to improve the product or process and its realization. Thus design reviews should be considered as a confirmation and refining procedure and not a creative one.

Design reviews, regardless of frequency or depth cannot replace good product definitions, design specifications, and management of the design and development process. Used as a control process, design reviews can provide the necessary verification of the successful outcome of the design effort at a given time.

Design reviews should not be confused with day-to-day management of a design project. The design manager carries the responsibility for the design and the final decisions for the response to a design review's actions and recommendations. Design reviews when properly conducted, increase confidence that design and development activities were carried out with due regard to all pertinent requirements for a product throughout its life cycle.

The application of this standard needs to be tailored to the needs of the design and development project or task in question and the organization preparing the design.

DESIGN REVIEW

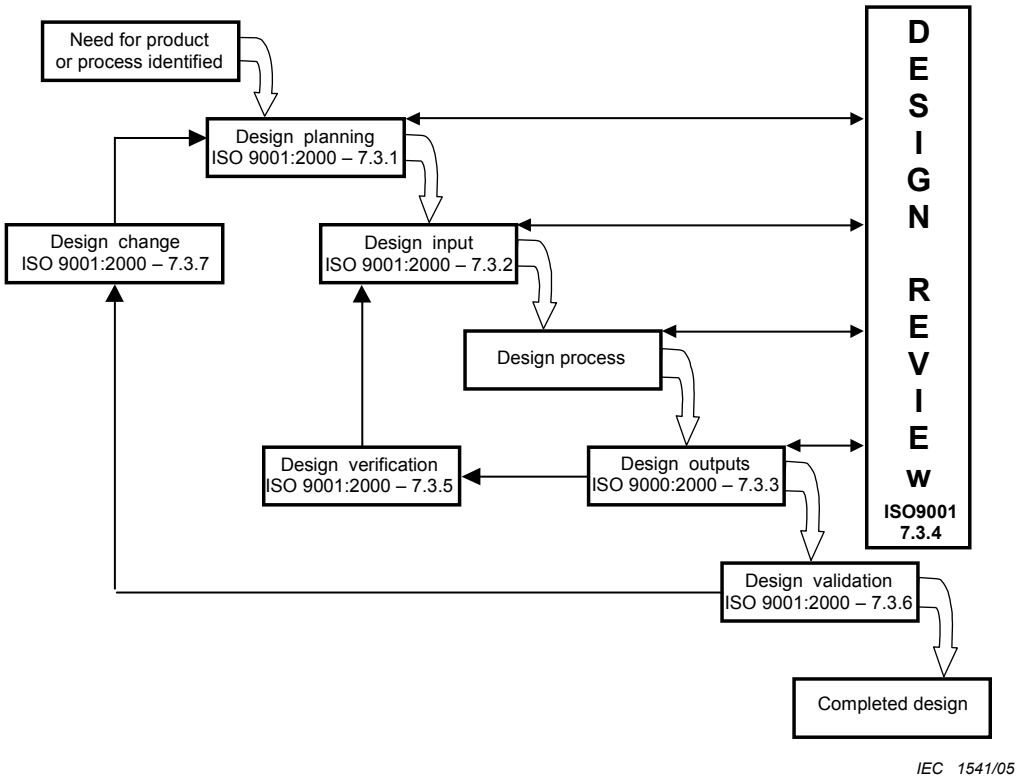
1 Scope

1.1 General

This International Standard makes recommendations for the implementation of design review as a means of verifying that the design input requirements have been met and stimulating the improvement of the product's design. The intention is for it to be applied during the design and development phase of a product's life cycle.

It provides guidelines for planning and conducting a design review and specific details concerning contributions by specialists in reliability, maintenance, maintenance support and availability.

The process for design and development is outlined in Figure 1 and requirements for management of the design and development process overall are given in ISO 9001:2000. The stages at which the design review or reviews are to be held should be determined during the development of the plan for the design.



NOTE Reference to the clauses of ISO 9001:2000 is for information only.

Figure 1 – Design and development process

The objectives of a design review include:

- assessing whether the proposed solution meets the design input requirements that include, but are not limited to: specified general performance requirements, dependability, lifecycle costs, safety, endurance, environment, electromagnetic compatibility, human factors;
- assessing whether the proposed solution is the most robust, efficient and effective solution to achieve the product requirements;
- providing recommendations as required for achieving the design input requirements;
- assessing the status of the design in terms of the completeness of the drawings and specifications;
- assessing the evidence to support the verification of the design performance;
- proposing improvements.

Design review facilitates assessment of the status of the design against the input requirements, identification of opportunities for improvement and guides the design manager towards appropriate action. It accelerates maturing of the product by reducing the time needed to stabilize design details, and allows product realization to proceed without frequent interruptions. Design review can also stimulate early product improvement.

1.2 Application

The stage or stages at which a design review is to be performed should be determined in the design and development planning stage of a project or a design task. Influencing factors should include customer requirements, regulatory requirements, the size and complexity of the product, the use to which the product is to be put, and the consequences of failure.

The cost to correct deficiencies in a design and the potential consequences increase as the design nears completion. Also, as the design progresses towards completion, so the flexibility to implement a change to correct a deficiency or to optimize the design decreases.

Each organization undertaking design and development should adopt either a comprehensive design review programme as presented in this standard, or tailor a more limited one to meet specific product and/or process needs.

The design review should be incorporated into the organization’s overall management system and, as applicable, each project’s schedule.

Limitations of size and resources of the organization, project value, product benefits, risks and complexity, all influence the size and frequency of design reviews. In smaller organizations, it could be necessary to supplement staff with personnel from suppliers, consultants and other outside advisors.

1.3 Types of application

There are two types of application: either an in-house created requirement for a new design, or a design requirement from an external source. In the case of the latter, the risk of a misunderstanding is much greater. Any misunderstanding could become a contractual issue and design review meetings with the client will be of primary importance to ensure that the emerging design meets the client's requirements.

A design review should be held:

- prior to order acceptance to ensure that the scope of work is established together with all the parameters that need to be met for an acceptable design;

- prior to detail design to ensure that the members of the design team have first-hand knowledge of all detail requirements. Interface provisions should be established and a list of defining documentation scheduled for submission and approval between the parties;
- at suitable points during detail design to review all interface provisions and agree on the test procedures for verifying that the design meets contract requirements.

2 Normative references

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

IEC 60050-191:1990, *International Electrotechnical Vocabulary (IEV) – Chapter 191: Dependability and quality of service*

IEC 62198:2001, *Project risk management – Application guidelines*