

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

Dependability management –  
Part 3-12: Application guide – Integrated logistic support

Gestion de la sûreté de fonctionnement –  
Partie 3-12: Guide d'application – Soutien logistique intégré

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**Partie 3-12: Guide d'application – Soutien logistique intégré**

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**DEPENDABILITY MANAGEMENT –****Part 3-12: Application guide –  
Integrated logistic support**

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International Standard IEC 60300-3-12 has been prepared by IEC technical committee 56: Dependability.

This second edition cancels and replaces the first edition published in 2001 and constitutes a technical revision.

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

- provision of a better overview of the whole ILS process;
- updating of the document to align with associated dependability standards that were introduced after the previous edition.

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

FDIS	Report on voting
56/1398/FDIS	56/1410/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.

A list of all the parts in the IEC 60300 series, under the general title, *Dependability management*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability 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

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- withdrawn,
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## INTRODUCTION

The successful operation of an item in service depends to a large extent upon the effective acquisition and management of logistic support in order to achieve and sustain the required levels of performance and customer satisfaction over the entire life cycle.

Logistic support encompasses the activities and resources required to permit operation and maintain an item (hardware and software) in service. Logistic support covers maintenance, manpower and personnel, training, spares, technical documentation, packaging, handling, storage and transportation, logistic support resources and disposal. In most cases, maintenance support is considered to be synonymous with logistic support. Logistic support may also include operational tasks but the differentiation between operational and maintenance tasks varies with industry and individual practices.

The cost of logistic support is a major contributor to the life cycle costing (LCC) of an item and increasingly, customers are making purchase decisions based on life cycle cost rather than initial purchase price alone. Logistic support considerations may therefore have a major impact on item sales by ensuring that the item can be operated and supported at an affordable cost and that all the necessary resources have been provided to fully support the item so that it meets the customer requirements.

Quantification of logistic support costs allows the manufacturer to define the logistic support cost elements and evaluate the warranty implications. This provides the opportunity to reduce risk and allows logistic support costs to be set at competitive rates.

Integrated logistic support (ILS) is a management method by which all the logistic support services required by a customer can be brought together in a structured way and in harmony with an item. ILS should be applied to ensure that supportability considerations influence the concept and design of an item and to ensure that logistic support arrangements are consistent with the design and each other throughout the item's life.

The successful application of ILS will result in a number of customer and supplier benefits. For the customer, these can include increased satisfaction, lower logistic support costs, greater availability and lower life cycle costs. For the supplier, benefits can include lower logistic support costs, a better and more saleable item with fewer item modifications due to supportability deficiencies.

This part of IEC 60300 provides guidance on the minimum activities necessary to implement an effective ILS management system for a wide range of commercial suppliers.

## DEPENDABILITY MANAGEMENT –

### Part 3-12: Application guide – Integrated logistic support

#### 1 Scope

This part of IEC 60300 is an application guide for establishing an integrated logistic support (ILS) management system.

It is intended to be used by a wide range of suppliers including large and small companies wishing to offer a competitive and quality item which is optimized for the purchaser and supplier for the complete life cycle of the item.

It also includes common practices and logistic data analyses that are related to ILS.

#### 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, *International Electrotechnical Vocabulary – Chapter 191: Dependability and quality of service*  
[IEC 60300-3-12:2011](https://standards.iteh.ai/catalog/standards/sist/b7c50b3c-e8f3-42ce-932d-561e6436c2b7/iec-60300-3-12-2011)

IEC 60300-3-1, *Dependability management – Part 3-1: Application guide – Analysis techniques for dependability - Guide on methodology*

IEC 60300-3-2, *Dependability management – Part 3-2: Application guide – Collection of dependability data from the field*

IEC 60300-3-3, *Dependability management – Part 3-3: Application guide – Life cycle costing*

IEC 60300-3-4, *Dependability management – Part 3-4: Application guide – Guide to the specification of dependability requirements*

IEC 60300-3-10, *Dependability management – Part 3-10: Application guide – Maintainability*

IEC 60300-3-11, *Dependability management – Part 3-11: Application guide – Reliability centred maintenance*

IEC 60300-3-14, *Dependability management – Part 3-14: Application guide – Maintenance and maintenance support*

IEC 60300-3-16, *Dependability management – Part 3-16: Application guide – Guidelines for specification of maintenance support services*

IEC 60706-2, *Maintainability of equipment – Part 2: Maintainability requirements and studies during the design and development phase*

IEC 60706-3, *Maintainability of equipment – Part 3: Verification and collection, analysis and presentation of data*

IEC 60706-5, *Maintainability of equipment – Part 5: Testability and diagnostic testing*

IEC 60812, *Analysis techniques for system reliability – Procedure for failure mode and effects analysis (FMEA)*

IEC 61160, *Design review*

IEC 62402, *Obsolescence management – Application guide*

IEC 62508, *Guidance on human aspects of dependability*

### 3 Terms, definitions and abbreviations

For the purposes of this document, the terms and definitions given in IEC 60050-191, as well as the following terms and definitions, apply.

#### 3.1 Terms and definitions

##### 3.1.1

##### **design life**

period during which an item is expected to perform according to the technical specifications to which it was produced

NOTE The specification should define the environment, usage and level of logistic support. The period may be time related, distance related or number of cycles related.

##### 3.1.2

##### **integrated logistic support**

##### **ILS**

management method by which all the logistic support services required by a customer can be brought together in a structured way and in harmony with an item

##### 3.1.3

##### **item**

part, component, device, functional unit, equipment, subsystem or system that can be individually considered

NOTE 1 An item may consist of hardware, software, people or any combination thereof.

NOTE 2 In French the term "individu" is used mainly in statistics.

NOTE 3 A group of items, e.g. a population of items or a sample, may itself be considered as an item.

##### 3.1.4

##### **line replaceable item**

##### **LRI**

replaceable hardware or software item which can be replaced directly on the equipment.

NOTE LRI is sometimes referred to as line replaceable unit (LRU).

##### 3.1.5

##### **logistic support**

all material and resources required to permit the operation and undertake the maintenance of an item including both hardware and software

##### 3.1.6

##### **logistic support analysis**

##### **LSA**

selective application of a range of activities undertaken to assist in complying with supportability and other ILS objectives

NOTE 1 Data generated during LSA are normally stored in a dedicated software application for calculating, determining and optimising the adapted logistic elements which are identified to perform the logistic support for a system during its life cycle. Such an application is often referred to as an LSA database.

**3.1.7  
maintenance support**

resources required to maintain an item under a given maintenance concept and guided by a maintenance policy

NOTE Resources include human resources, support equipment, materials and spare parts, maintenance facilities, documentation, information and maintenance information systems.

**3.1.8  
provisioning**

process of determining and acquiring the range and quantity of spares (consumables or repairable items) required to operate and maintain the item

**3.1.9  
supportability**

extent to which item design characteristics and planned logistic support resources meet operational utilization requirements

**3.1.10  
support concept**

recommended support policy and procedure for a particular item, specific to a particular user or application

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**3.1.11  
trade-off**

determination of the optimum balance between item characteristics (cost, performance and supportability)

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**3.2 Abbreviations**

AR&M	Availability, reliability and maintainability
BITE	Built-in test equipment
CP&S	Customer profile and supportability
EDI	Electronic data interchange
FMEA	Failure mode and effects analysis
FMECA	Failure mode, effects and criticality analysis
FRI	Functional requirement identification
ILS	Integrated logistic support
LCC	Life cycle costing
LORA	Level of repair analysis
LRI	Line replaceable item
LSA	Logistic support analysis
LSI	Logistic support improvement
MDT	Mean down time
MTBF	Mean time between failures
MTTR	Mean time to repair
MST	Maintenance support task
PHS&T	Packaging, handling, storage and transportation

PPS	Post production support
R&M	Reliability and maintainability
RCM	Reliability centred maintenance
REACH	Registration, evaluation, authorization and restriction of chemicals. European Directive
RoHS	Restriction of hazardous substances. Directive 2002/95/EC
STTE	Special tools and test equipment
T&E	Test and evaluation
WEEE	Waste from electrical and electronic equipment. Directive 2002/96/EC

## 4 Principles of integrated logistic support (ILS)

### 4.1 ILS objectives

The integrated logistic support (ILS) should ensure that

- logistic support considerations are integrated into item design at a very early stage in the design process – preferably at the concept stage,
- logistic support arrangements are developed that are consistently related to design (including intended use and intended environment of the item) and to each other,
- the necessary logistic support is provided at the beginning and during customer use and disposal at optimum cost,
- improvements are allowed to be made in the logistic support of an item throughout its life – and to support necessary modifications, for example, changes required to deal with obsolescence.

ILS should improve the item (by influencing the design to provide the most economic and efficient logistic support solution), improve the logistic support system and minimize the life cycle cost while ensuring that the needs of the customer and business are met.

### 4.2 Application of ILS

ILS should be applied to the design and development of an item to ensure that all the logistic implications of introducing the item have been properly considered so that it can be supported in the most cost effective manner.

ILS is applicable to all items, including very large items (such as a power plant or a paper mill) and provides a methodology for the identification and optimization of the logistic support requirements for the individual items that constitute the plant.

The degree of application of ILS and the associated LSA will vary accordingly with regard to the degree of design freedom, technical complexity, cost of the item and other factors.

A logistic support analysis (LSA), which comprises the selective application of a series of analysis activities, should be used to assist the design in complying with supportability and other ILS objectives.

If an item is a completely new development it may be necessary to apply most of the LSA activities, but where an item is identified as an existing item, it may not be necessary to apply all the activities. This is referred to as tailoring and addresses the depth of analysis to a cost-effective level based on maturity and the type of item.

ILS results usually have to be modified and updated over the life cycle since changes are likely to occur due to

- experience gained from failures,
- changes in logistic support resources such as suppliers of spare parts,
- improvements in maintenance technology and procedures,
- changes in failure modes and resultant maintenance tasks as equipment ages,
- modifications incorporated in the items,
- human aspects associated with operation and maintenance activities (IEC 62508),
- changes in operating conditions or environment.

### 4.3 Elements of ILS

The following elements of logistic support are covered by ILS, and may include, but are not limited to:

- maintenance planning;
- spares/materials;
- support equipment (including tools and test equipment);
- technical documentation;
- manpower and personnel;
- training;
- packaging, handling, storage and transportation;
- facilities;
- software support.

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Key areas that interface with ILS

- systems and design engineering;
- reliability analysis (IEC 60300-3-1);
- maintainability of equipment (IEC 60300-3-10 , IEC 60706-2 and IEC 60706-3);
- maintenance and maintenance support (IEC 60300-3-14);
- testability and diagnostic testing (IEC 60706-5);
- life cycle costing (LCC) analysis (IEC 60300-3-3);
- reliability centred maintenance (IEC 60300-3-11);
- specification of maintenance support services (IEC 60300-3-16);
- dependability requirements (IEC 60300-3-4).

In addition, ILS interfaces with

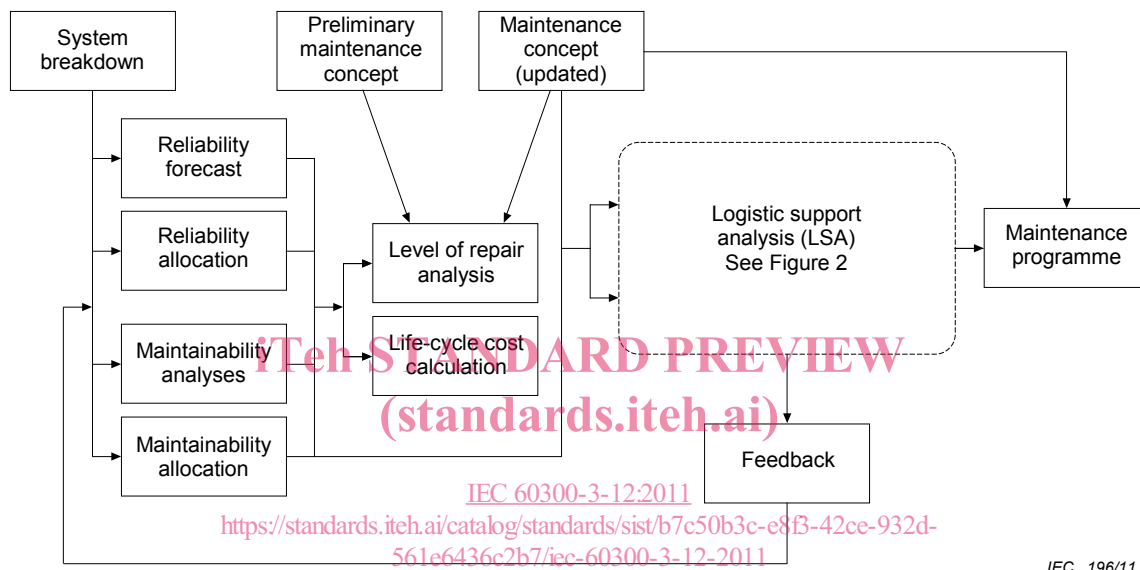
- project management,
- risk management,
- safety and hazard analysis,
- human factors analysis,
- trials and acceptance,
- configuration management,
- quality,
- environmental requirements,
- design reviews (IEC 61160) ,

– contracting of maintenance support services (IEC 60300-3-16),  
and will reflect and contribute to the approach in these areas.

The activities and procedures for these interface areas are covered in other IEC standards.

#### 4.4 Structure of ILS

ILS is structured so that it can assimilate key areas and logistic support elements to optimize the logistic support required for a system. A simplified diagram illustrating this structure is shown in Figure 1.



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**Figure 1 – Structure of ILS**

The initial stages involve the breakdown of the system into LRIs and the identification of LRIs which require detailed analysis (sometimes referred to as LSA candidates or maintenance candidates). In some cases, the selected LRI is composed of numerous items and it may be necessary to conduct further analyses to optimize maintenance.

Figure 2 illustrates at a high level how the LSA activities interrelate with each other and with the design activities.