AFNeT Standards Days

Obsolescence management IEC 62402:2019

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• IEC 62402:2019

• IEC, TC 56 – Dependability
  • a) this document has now been written with requirements as a standard not a guide;
  • b) this document continues to have guidance in the informative annexes;
  • c) this document has been written as a general process for all technologies and items.

• Cancel IEC 62402:2007 : « Obsolescence management - Application guide»

  • IEC 62402:2019 May: « Obsolescence management »
Obsolescence

• **Merriem Webster**
  - the condition of *no longer being used* or *useful*; the condition of being obsolete: the obsolescence of the old technology

• **Cambridge dictionary**
  - the quality of being obsolete (not in use any more, having been replaced by something *newer* and *better* or more fashionable)
Government Technology, May 2 2017

• “Legacy Systems: They Are All Fundamentally Obsolete”

• Government at all levels remains shackled to legacy systems, which can account for 70 to 80 percent of IT dollars!
AirlineRatings: It seems the A380 was always more a burden than a vehicle of choice for Air France, do you agree?

Anne Rigail: I would not say that it was a burden from the beginning. I don’t know if anyone would have been able to forecast it at the time, but the A350 and the Dreamliner just made the A380 totally obsolete, too expensive, too big. Operationally ...
• Kaspersky 26 August 2019
  • “...The widespread use of Windows 7 is concerning, as there is less than six months to go until this version becomes unsupported.

• The reasons behind this lag vary
  1. depending on the software in place, which may be unable to run on the newest OS versions,
  2. to economic reasons,
  3. and even just down to habit.

Nonetheless, an old unpatched OS is a cybersecurity risk – the cost of an incident may be substantially higher than the cost of upgrading. ...” – Alexey Pankratov, Enterprise Solutions Manager, Kaspersky.
An item becomes no longer **useful**.

A component no longer offers its services to customers at their **expected performance**.

It deals with **characteristics of items**.

**OBSO**

La non-Adéquation à la demande

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The loss of manufacturers or suppliers of items, raw materials, or software.

**DMSMS**

La non-Disponibilité chez le fabricant

**Interruption** in supplying process throughout the value chain

It focuses on the **sourcing of items**.
Technology advancements (DVD vs videocassette)

Lack of support from vendors (Windows XP)

New regulations and rules (Freon)

Low market (Leisure suits)

Uncontrolled risks or natural disasters

Accidents

Geopolitical instability

Logistical problems

Adéquation à la demande

Disponibilité chez le fabricant

[Merola, 2006]
[Bradley and Dawson, 1998]
[Meahl, 2016]
[SD-22, 2016]
DMSMS problems with non-obsolete items

DMSMS problems with obsolete items out of production

IEC 62402

Micro-proc [1976 - 2000]

Obsolete items out of production that are not DMSMS problems

Obsolete items still in production

unAvailable from the OEM

unSuitable to demand
Context

Obso
Suitability to demand

DMSMS
Availability from OEM

Adéquation à la demande

Disponibilité chez le fabricant

Product/system design

Supply chain management
Context

Obso (Suitability)

DMSMS (Availability)

Innovation

R&D

10/09/2020

AFNeT Standards Days 2020: 6 & 7 October 2020

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... obsolescence management is a discipline used in all phases of an entity’s life cycle to ensure that the entity and its sub-entities meet applicable requirements throughout their expected useful life.

Obsolescence is considered in this document as the transition from the state of availability to the state of unavailability of an entity in use with its manufacturer.

Obsolescence manifests itself through the difficulty in obtaining supplies, spare parts and/or maintenance service.
IEC – 62402:2019

- **IEC 60300-1**: Dependability management - Part 1: guidance for management and application
- **IEC 31000:2018** Risk management — Guidelines
- **IEC/ISO 31010**, Risk management — Risk assessment techniques
- **IEC TS 62668-1**, Process management for avionics - **Counterfeit** prevention - Part 1: Avoiding the use of counterfeit, fraudulent and recycled electronic components
- **IEC 62435-1**, Electronic components - **Long-term storage** of electronic semiconductor devices - Part 1: General
- **IEC 62435-4**, Electronic components - **Long-term storage** of electronic semiconductor devices - Part 4: Storage
PLAN

• INTRODUCTION
• 1 Scope
• 2 Normative references
• 3 Terms, definitions and abbreviations
• 4 Obsolescence management
• 5 Obsolescence management policy
• 6 Infrastructure and organization
• 7 Development of an OMP (Obso Mgt Plan)
• 8 Strategies to minimize obsolescence during design
• 9 Obsolescence management approach
• 10 Obsolescence resolutions
• 11 Measurement and improvement of obsolescence management activities

Annex A (informative) Vocabulary relating to obsolescence
Annex B (informative) Obsolescence resolutions
B.1 Obsolescence management resolutions with EOP forecast
B.2 Obsolescence management resolutions with EOP announcement
B.3 Alternate manufacturers: example of a reactive approach in electronics
Annex C (informative) Guidance on the effects of obsolescence
Annex D (informative) Guidance on the OMP
Annex E (informative) Examples of an obsolescence risk assessment
Annex F (informative) Example of an obsolescence management decision process
Obsolescence management helps to prevent avoidable losses (e.g. financial, service or capacity losses) and to address the risks associated with obsolescence.

The assessment of the risks associated with obsolescence takes into account factors such as:

- the likelihood that an entity will become obsolete during its expected useful life,
- the likelihood that this obsolescence will have an impact during the expected useful life and the severity of that impact.
- Obsolescence management addresses the risks associated with obsolescence by reducing the likelihood and/or severity of the impact.

Although not a direct case of obsolescence, this document will also help to manage entities facing a reduction in the number of manufacturers or material shortages, which can lead to longer lead times, reduced availability and ultimately obsolescence.
1 Scope

Gives requirements and guidance for Obsolescence Management

Covers the following areas:

a) establishing Obsolescence Management policy;
b) establishing infrastructure and organization;
c) developing an Obsolescence Management Plan (OMP);
d) developing design strategies to minimise obsolescence;
e) determining and implementing Obsolescence Management activities;
f) selecting obsolescence resolutions;
g) measuring and improving the performance of the OMP;
• Obsolete <manufactured item [entité physique]> no longer in production from the manufacturer to the original specification
  • materials, chemicals, components, electronics, and mechanical hardware

• Obsolete <non-manufactured item [entité incorporelle]> no longer available from the manufacturer to the original specification
  • software, services, specifications, and processes
Obsolescence management is the activities required to ensure an item is available from the supply chain to enable a product to fulfil its purpose at a reasonable cost.

Items include but are not limited to:

• physical assets (products, equipment, sub-assemblies, components, manufacturing tooling, test equipment, spares);
• consumables (ink cartridges, adhesives, computer media, batteries);
• materials (metals, polymers, composites);
• software (operating environment, middleware, firmware, specific applications);
• systems (information systems, classification system),
• services (maintenance, communication)
Items may become obsolete:

- **market factors** (reduced demand, or introduction of new technologies);
- **changes** to the configured item (item updates);
- **obsolete sub-items** (raw materials);
- loss or change to **manufacturing capability** (process re-tooling, test or manufacturing equipment);
- loss of **skill** or **knowledge** to manufacture or support the item;
- **regulations** (export control), legislation (RoHS, REACH);
- natural or man-made **disasters**.
Obsolescence management aims to ensure that obsolescence is considered as an integral part of an entity's life cycle:

- **concept,**
- **development** (design),
- **realization** (production),
- **use** (in-service maintenance),
- **improvement** (back to design improvement), and
- **end of service** (return to design).
Obsolescence management process:

1. establish an Obsolescence Management policy (Article 5);
2. establish the infrastructure and organizational arrangements (Article 6);
3. develop an OMP (Article 7);
4. develop design strategies to minimise obsolescence (Article 8);
5. determine and implement the Obsolescence Management activities (Article 9);
6. select obsolescence resolutions (Article 10);
7. measure and improve performance of the OMP (Article 11).
Exigences de l'utilisateur final, environnement de l'application et réglementations

5 Stratégie de gestion de l'obsolescence

6.3 Organisation de la gestion de l'obsolescence

6.4 Gestion des clients/fabricants

6.5 Accords de partenariat

7 Établir un plan de gestion de l'obsolescence pour tout le cycle de vie de l'entité

8 Mettre en œuvre les activités de gestion de l'obsolescence aussi tôt que possible dans le cycle de vie de l'entité

8.6 Technologies durables

- Choix du fabricant
- Identifier complètement les entités des fabricants retenus
- Identifier les entités critiques

9.2 Suivi Notifications Fabricants Entités

Suivi et surveillance à toutes les étapes du cycle de vie afin de garantir une résolution rapide

Évaluations identifiant les risques et problèmes d'obsolescence et choix d'une approche

Voir Figure 2

Planifier l'obsolescence

Conception visant à réduire le plus possible l'obsolescence

Agir sur l'obsolescence

Contrôler l'obsolescence

10 Consulter le plan de gestion de l'obsolescence en mettant en œuvre les résolutions de gestion de l'obsolescence afin de gérer les risques et problèmes d'obsolescence

Suivi Nouvelle entité Modification de l'entité Etat de l'entité

Revue du plan de gestion de l'obsolescence

- Stratégies
- Approches
- Résolution
- Etat de l'entité
AFNeT Standards Days 2020 : 6 & 7 October 2020

Plan

7 Établir un plan de gestion de l'obsolescence pour tout le cycle de vie de l'entité

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Suivi et surveillance à toutes les étapes du cycle de vie afin de garantir une résolution rapide

Evaluations identifiant les risques et problèmes d'obsolescence et choix d'une approche

Voir Figure 2
Approche proactive

1. Exigences de l'utilisateur final, environnement de l'application et réglementations

2. Stratégie de gestion de l'obsolescence

3. Organisation de la gestion de l'obsolescence

4. Gestion des clients/fabricants
5. Accords de partenariat

7. Établir un plan de gestion de l'obsolescence pour tout le cycle de vie de l'entité

8. Mettre en œuvre les activités de gestion de l'obsolescence aussi tôt que possible dans le cycle de vie de l'entité

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Planifier l'obsolescence

Conception visant à réaliser le plus possible l'obsolescence

Agir sur l'obsolescence

Contrôler l'obsolescence

Suivi et surveillance à toutes les étapes du cycle de vie afin de garantir une résolution rapide

Suivi Nouvelle entité Modification de l'entité Etat de l'entité

Voir Figure 2
Exigences de l'utilisateur final, environnement de l'application et réglementations

- Planifier l'obsolescence
  - Conception visant à réduire le plus possible l'obsolescence

- Agir sur l'obsolescence

- Contrôler l'obsolescence
  - Suivi et surveillance à toutes les étapes du cycle de vie afin de garantir une résolution rapide

- Suivi
  - Nouvelle entité
  - Modification de l'entité
  - Etat de l'entité

7 Établir un plan de gestion de l'obsolescence pour tout le cycle de vie de l'entité

5 Stratégie de gestion de l'obsolescence

6.3 Organisation de la gestion de l'obsolescence

6.4 Gestion des clients/fabricants
  - 6.5 Accords de partenariat

8 Mettre en œuvre les activités de gestion de l'obsolescence aussi tôt que possible dans le cycle de vie de l'entité

8.6 Technologies durables
  - Choix du fabricant
  - Identifier complètement les entités des fabricants retenus
  - Identifier les entités critiques

9.2 Suivi
  - Notifications Fabricants
  - Entités

Evaluation identifiant les risques et problèmes d'obsolescence et choix d'une approche

Voir Figure 2
Select and implement resolution
Approach selection

Suivi et surveillance

Obtenir des données (notamment d'état) sur toutes les sous-entités de l'entité

Effectuer un suivi des sous-entités et de leurs fabricants

(9.2) Assurer le suivi pour l'obsolescence

Voir Figure 1

Activités de gestion de l'obsolescence

(9.1) Evaluer les risques pour chaque sous-entité

Le risque est-il faible?

Non

Approche proactive face au risque d'obsolescence de la sous-entité

Oui

Approche réactive face aux problèmes d'obsolescence de la sous-entité

(9.3) Choix de l'approche

(9.4)

(9.5)
PROACTIVE DMSMS Management Approach

- Item goes obsolete, no longer available for purchase
- Longer window of opportunity to address DMSMS issue before program is impacted; all or most resolution types available (i.e., lower cost) and more time to plan the resolution

Timeline

Program discovers through predictive tools, discontinuation notices, or vendor surveys that an item will be obsolete as of Date X

Date X

Program will be Impacted by DMSMS if Issue not Resolved

REACTIVE DMSMS Management Approach

- Item goes obsolete, unbeknownst to the program
- Program discovers that item can no longer be purchased
- Shorter window of opportunity to address DMSMS issue before program is impacted; limited resolution types available (likely higher cost) and less time to plan the resolution

Timeline

Date X

Compared to…

Program will be Impacted by DMSMS if Issue not Resolved

Extrait de (SD-22,2020)
A **proactive** approach would initiate:

- design factors:
  - modularity;
  - transparency of technologies
- planned design modifications/improvements;
- production expansion;
- maintenance by a manufacturer authorized to continue production
- Proactive **Life of Need Buy** (LNB) to avoid obsolescence and material shortages;
- preservation - **long-term storage** of technologies (e.g. chip banks)

A **reactive** approach may necessitate:

- search for existing stock
- processing an LNB purchase in response to a notification of obsolescence
- the substitution of entities:
  - **equivalent** entity;
  - **alternative** entity
- the search for a second market solution provider that can perform:
  - cession – the transfer of intellectual property;
  - recovery;
  - emulation/reverse engineering;
  - repair
- design modifications/improvements (**minor** design changes);
- introduction of a new entity (**major** design changes);
- no action - no consequences.
A comprehensive obsolescence management strategy should be put in place to guide all actions to manage obsolescence.

This strategy may include the integration of obsolescence into an existing supply chain, and supportability.

The obsolescence management strategy should identify:

- the roles, responsibilities and infrastructure for managing obsolescence in all disciplines within the organization;
- the level of obsolescence management competence and training required for the infrastructure;
- the organization's operational procedures for managing obsolescence, which may be part of a maintenance plan or life cycle management plan.
In order to implement the obsolescence management strategy, an obsolescence management infrastructure and organization should be in place:

1. Top management responsibilities;
   - should appoint a representative

2. Obsolescence management organization and authorities;
   - Define roles
   - communication between all levels of the supply chain
     - management,
     - customers,
     - manufacturers and their suppliers, sourcing/contracting
     - officers, engineering, quality, finance,
   - communication within the supply chain.
   - training and mentoring
3. Customer/Manufacturer management
   - **Exchange of timely information** about technologies and items
   - Use this information and **monitor the availability** of their supplied items at regular intervals.
   - **Contract** ? (traceability, warranties).

4. Partnering agreements between organizations
   - If applicable, contractual arrangements between manufacturers and/or integrators can be used to ensure that obsolescence information is actively moved up the supply chain by the manufacturer, in order to provide an appropriate and timely response by the manufacturer and/or eventual customer.
   - **Evitable counterfeits.**
IEC – 62402:2019 7 Develop obsolescence management plan

An OMP shall be developed and implemented to ensure adequate selection and timely implementation of relevant obsolescence activities.

The OMP describes the activities for prevention, detection/identification and treatment of the effects of obsolescence through all stages of the item life cycle to achieve the optimum compromise between life cycle costs for the items performance and item availability, maintainability and safety.

It should contain

- the scope (the items covered);
- objectives of the obsolescence activities;
- the roles and responsibilities.
- monitoring approach and schedule.
- obsolescence budgeting and resources for resolutions,
- ...
Where possible the threat of obsolescence should be reduced during design, whenever a design activity is undertaken. The choice and the selection of items (for example: materials, components and interfaces) should be made in order to minimize the risk of obsolescence.

A sustainable design strategy may consist of among other things:

• obtaining software source code,
• material characterization,
• modularity,
• transparency,
• the use of long life technologies,
• the use of open software standards, the use of open architecture protocols and interfaces,
• and obtaining intellectual property rights and licence to use.
1- Assessment of the risk of obsolescence

- It is necessary to assess the risk of obsolescence at all phases of the entity's life cycle, as early as possible, starting from the design and development phases during which the entity is selected.
- Assess the risk regularly.
- The results of the risk assessment include the choice of a proactive or reactive approach to managing obsolescence, or more likely a combination of both.

![Risk Assessment Diagram]

- Evaluate risks
  - Low?
    - No: Proactive
    - Yes: Reactive
  - Combination
Assessing the risk of obsolescence during the life cycle of the entity:

- the **likelihood** that an entity will become obsolete.

- **factors** that **may delay the impact** (current level of inventory);

- the impact of the obsolescence of an entity, for example:
  - the degree of **criticality** of the sub-entity;
  - the **time required** to resolve an obsolescence problem;

- the **impact of software obsolescence** and the underlying infrastructure.

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**Diagram:**

- **Evaluate risks**
  - **Low**
    - **non**
      - Proactive
    - **yes**
      - Reactive
Approche proactive. Actions to be taken prior to an item becoming obsolete and prior to an actual obsolescence impact.

- Proactive approaches are often appropriate for critical entities or entities with very short notice periods for LNB purchases.

Reactive approach. The reactive approach consists of doing nothing until obsolescence becomes a problem.

The reactive approach should be reserved for entities whose impact has been assessed as low, e.g.:

- entities designed to standards,
- entities with multiple manufacturers assessed,
- entities with a low likelihood of becoming obsolete (e.g., mechanical parts),
- ...
• **Replacements by the same entity;**
  - an existing stock
  - an extension of production
  - cession
  - repair or maintenance contract
  - Recovery
• **Substitutions**
  - Equivalent entities
  - Alternative entities
• **Emulation:** making an equivalent entity from the original specification
• **Reverse engineering**
• **Design modifications:**
  - Minor modifications (e.g. the next level of assembly)
  - Major changes (e.g. replacement of the entity)
Cycle de vie d'une sous-entité

Introduction | Maturité | Déclin | Suppression progressive

Notification de fin de fabrication | Fin de production | Plus disponible

APPROCHES PROACTIVES | APPROCHES RÉACTIVES

(8) Stratégies visant à réduire le plus possible l'obsolescence au cours de la conception
Stratégies
Maintien
(8.10) Acquisition de données
(8.3) Caractérisation des matériaux
(8.2) Code source
(8.8) Propriété intellectuelle
(8.9) Licences logicielles

Contrôler l'obsolescence
(9.2) Surveillance de l'obsolescence

Appliquer les actions prévues
(11.2) Résolutions basées sur un remplacement par la même entité
Stock existant
Extension de la production
(10.3) Achat pour le restant du cycle de vie
Cession
Réparation
Récupération

(10.1) Résolutions basées sur une entité différente
(10.4) Substitution
(10.5) Emulation/rétro-ingénierie
(10.6) Modification de conception

Légende: Moins probable | Proactif | Plus probable | Plus probable | Réactif | Moins probable
Improvement metrics should be included in the obsolescence management plan.

Examples of metrics:
- financial penalties;
- average cost of implementation;
- the respective percentages of proactive and reactive resolutions;
- Forecast accuracy;
- the number of active obsolescence issues currently open;
- the average length of time between the opening and closing of an obsolescence issue;
- the percentage of end-of-manufacture notifications not received and sent within the appropriate timeframe;
- ...
Questions & Answers

6th and 7th October

http://standardsdays.afnet.fr