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NORME INTERNATIONALE

Predictive maintenance of industrial automation equipment and systems – Part 1: General requirements

Maintenance predictive des équipements et systèmes d'automatisation industrielle – Partie 1 : Exigences générales

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Predictive maintenance of industrial automation equipment and systems – Part 1: General requirements

Maintenance predictive des équipements et systèmes d'automatisation industrielle – Partie 1 : Exigences générales

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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PREDICTIVE MAINTENANCE OF INDUSTRIAL AUTOMATION EQUIPMENT AND SYSTEMS –

Part 1: General requirements

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IEC 63270-1 has been prepared by subcommittee SC 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial process measurement, control and automation. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
65E/1148/FDIS	65E/1159/RVD

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 International Standard 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.

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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- withdrawn, or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

Efficient production significantly depends on the availability of production equipment. The status of the equipment and its components, further referred to as “assets” can be monitored and assessed in order to guarantee the intended usage of equipment and to avoid unplanned downtimes. The results of the predictive maintenance assessment are, for example, the remaining useful lifetime prediction, necessary maintenance activities, etc. The results can also lead to the optimization of production workflow by targeting the reorganization of equipment usage. The work process of PM (predictive maintenance) is depicted in Figure 1.

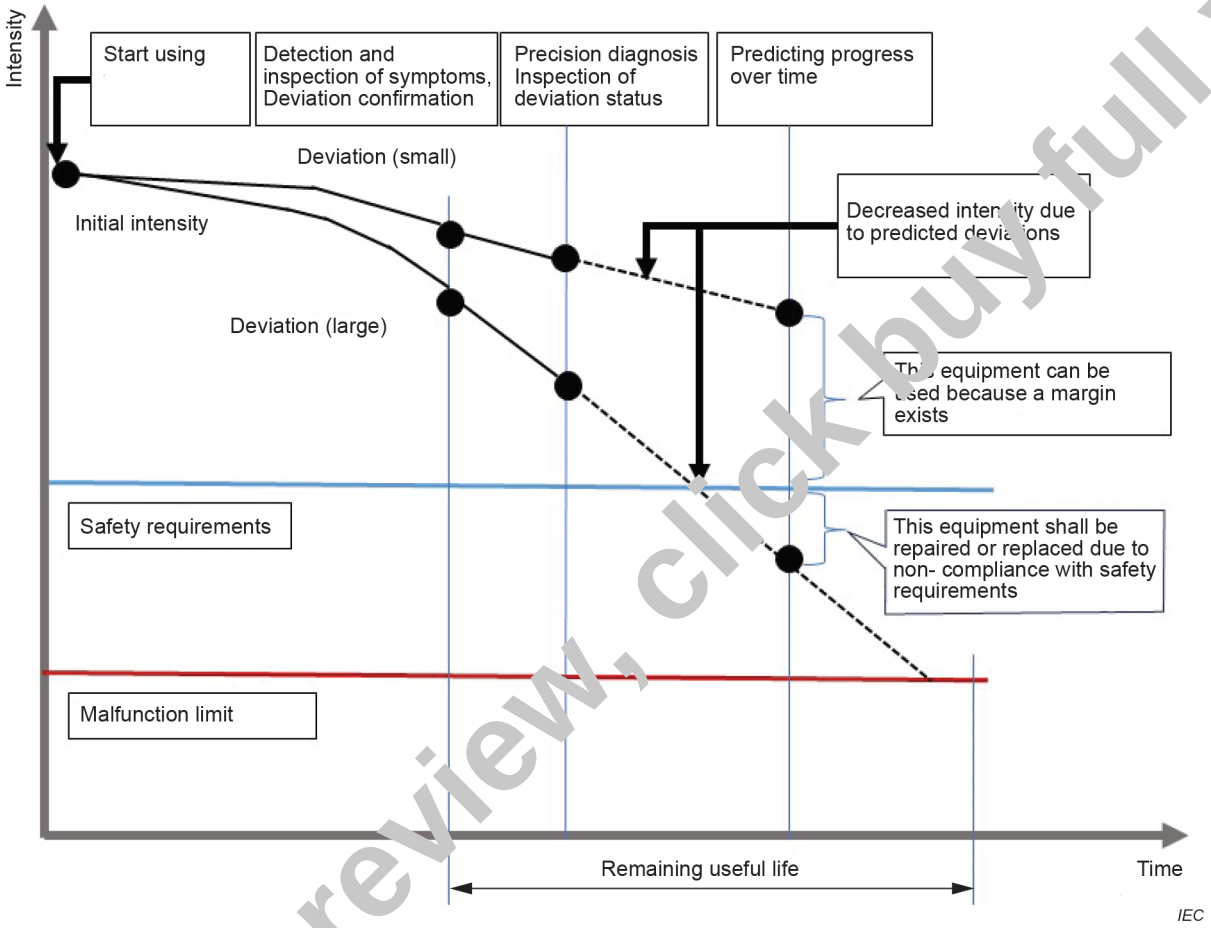

Figure 1 – Predictive maintenance work process

The availability of status information is the main prerequisite for such a prediction. Modern automation equipment is often equipped with sensors and self-monitoring capabilities. These functions can gather data that can be used to determine the status of the equipment. However, the equipment is delivered from different suppliers and is based on different technologies. Therefore there is currently no uniform solution for accessing the data and calculating status information. Access to data is a prerequisite for predictive maintenance solutions. Therefore, an integration project is often an integral part of the solution. This significantly hinders efforts to implement solutions for predictive maintenance.

In addition, standards can define the definition, scope, procedure, and functional structure of PM, as well as the relationship between PM and CBM. In predictive maintenance, industrial automation equipment and systems play two different roles: "measuring tool" and " object of prediction". Condition monitoring, fault diagnosis and remaining useful life prediction methods can be based on a data-driven model, a mechanism-based model, or both. Without standardization, it is difficult to maintain accuracy and be able to compare the PM results.

From the description above, a need for standardization can be deduced. Providing an appropriate method and infrastructure, comprised of a uniform ontology, predictive methods, and system interfaces. Such an approach will facilitate the easy composition of complex condition monitoring and predictive maintenance solutions. It will also provide critical information for equipment and factories based on original data and analytical methods.

PREDICTIVE MAINTENANCE OF INDUSTRIAL AUTOMATION EQUIPMENT AND SYSTEMS –

Part 1: General requirements

1 Scope

This part of IEC 63270 provides guidance on the functional structure model, procedure, method, interface of function blocks. It also offers guidance on data requirements for predictive maintenance of equipment, devices and systems for industrial automation applications.

Condition monitoring is not only within the scope of this document but can also be an important input for predictive maintenance.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 TR 62390, *Common automation device – Profile guideline*

ISO/IEC/IEEE 42010:2022, *Software, systems and enterprise – Architecture description*

3 Terms, definitions, and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1.1
predictive maintenance
form of preventive maintenance performed continuously or at intervals governed by observed conditions to monitor, diagnose or trend a structure, system or component's condition indicators

Note 1 to entry: Results indicate present and future functional ability or the nature of, and schedule for, planned maintenance.

[SOURCE: IEC 62342:2007, 3.14, modified – The note has been deleted.]

3.1.2
preventive maintenance
maintenance carried out at predetermined intervals or according to prescribed criteria and intended to reduce the probability of failure or the degradation of the functioning of an item

[SOURCE: IEC 61918:2018, 3.1.62]