



## Cyber Physical System based Proactive Collaborative Maintenance

# D1.2 Consolidated State-of-the-Art of Sensor-based Proactive Maintenance Appendix 22: Existing Relevant Standards

Work Package	WP1 - Service platform architecture requirement definition. Scenarios and use cases descriptions
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Responsible	Erkki Jantunen
Contributors	Riku Salokangas
Reviewers	Consortium

The MANTIS consortium consists of:

Num.	Short Name	Legal Name	Role	Country
1	MGEP	Mondragon Goi Eskola Politeknikoa J.M.A. S.Coop.	CO	ES
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5	FARR	Fagor Arrasate S.Coop.	BEN	ES
5.1	KONIKER	Koniker S.Coop.	TP	ES
6	GOIZPER	Goizper S.Coop.	BEN	ES
7	ACCIONA	Acciona Infraestructuras S.A.	BEN	ES
8	MSI	Mondragon Sistemas De Informacion S.Coop.	BEN	ES
9	VTT	Teknologian Tutkimuskeskus VTT Oy	BEN	FI
10	LUAS	Lapin Ammattikorkeakoulu Oy	BEN	FI
11	NOME	Nome Oy	BEN	FI
12	FORTUM	Fortum Power And Heat Oy	BEN	FI
13	SQ	Solteq Oyj	BEN	FI
14	WAPICE	Wapice Oy	BEN	FI
15	AAU	Aalborg Universitet	BEN	DK
16	DANFOSS	Danfoss A/S	BEN	DK
17	UNIV	Universal Foundation A/S	BEN	DK
18	HGE	Hg Electric A/S	BEN	DK
19	VESTAS	Vestas Wind Systems A/S	BEN	DK
20	SIRRIS	Sirris Het Collectief Centrum Van De Technologische Industrie	BEN	BE
21	ILIAS	Ilias Solutions Nv	BEN	BE
22	ATLAS	Atlas Copco Airpower Nv	BEN	BE
23	3E	3e Nv	BEN	BE
24	PCL	Philips Consumer Lifestyle B.V.	BEN	NL
25	PHC	Philips Medical Systems Nederland B.V.	BEN	NL
26	PHILIPS	Philips Electronics Nederland B.V.	BEN	NL
27	S&T	Science and Technology B.V.	BEN	NL
28	TU/E	Technische Universiteit Eindhoven	BEN	NL
29	RUG	Rijksuniversiteit Groningen	BEN	NL
30	UNINOVA	UNINOVA - Instituto de Desenvolvimento de Novas Tecnologias	BEN	PT
31	ISEP	Instituto Superior de Engenharia do Porto	BEN	PT
32	INESC	Instituto de Engenharia de Sistemas e Computadores do Porto	BEN	PT
33	ADIRA	ADIRA - Metal Forming Solutions S.A.	BEN	PT
34	ASTS	Ansaldo STS S.p.A.	BEN	IT
35	CINI	Consorzio Interuniversitario Nazionale per l'Informatica	BEN	IT
36	AIT	Austrial Institute of Technology GmbH	BEN	AT
37	HBM	Hottinger Baldwni Messtechnik GmbH	BEN	AT
38	INNOTEC	Innovative Technology and Science Limited	BEN	UK
39	AITIA	AITIA International Inc.	BEN	HU
40	BME	Budapest University of Technology and Economics	BEN	HU
41	JSI	Josef Stefan Institute	BEN	SI
42	XLAB	XLAB d.o.o.	BEN	SI
43	FHG	Fraunhofer Institute for Experimental Software Engineering IESE	BEN	DE
44	M2X	M2Xpert GmbH & Co KG	BEN	DE
45	STILL	STILL GMBH	BEN	DE
46	BOSCH	Robert Bosch GmbH	BEN	DE
47	LIEBHERR	Liebherr-Hydraulikbagger GmbH	BEN	DE

## Abbreviations of Standard Organizations:

Initials	Standard Organisation	Country	Area type
ABNT	Brazilian National Standards Organization ABNT Brazil	Brazil	National
AEEC	Airline Electronic Engineering Committee	U.S.	International
AENOR	Spanish Association for Standardization and Certification AENOR Spain	Spain	National
AFNOR	French association for Standardization AFNOR France	France	National
AIDMO	Arabic Industrial Development and Mining Organization	Arabic	Regional
AMN	MERCOSUR Standardization Association	Brazil	Regional
ANSI	American National Standards Institute ANSI U.S.	U.S.	National
ARINC	Aeronautical Radio, Incorporated	U.S.	International
ARSO	African Organization for Standardization	African	Regional
ASME	American Society of Mechanical Engineers	U.S.	International
ASTM International	American Society for Testing and Materials	U.S.	International
BIS	Bureau of Indian Standards BIS India	India	National
BSI	British Standards Institution BSI U.K.	U.K.	National
BSJ	Bureau of Standards of Jamaica BSJ Jamaica	Jamaica	National
BSN	Badan Standardisasi Nasional BSN Indonesia	Indonesia	National
CDM	Clean Development Mechanism	U.S.	International
CEN	European Committee for Standardization	Europe	Regional
CENELEC	European Committee for Electrotechnical Standardization	Europe	Regional
COPANT	Pan American Standards Commission	Pan American	Regional
CROSQ	CARICOM Regional organisation for Standards and Quality	Barbados	Regional
DEF	Defence Standard	U.K.	International
DGN	Dirección General de Normas DGN Mexico	Mexico	National
DIN	Deutsches Institut für Normung DIN Germany	Germany	National
DSM	Jabatan Standard Malaysia DSM Malaysia	Malaysia	National
ETSI	European Telecommunications Standards Institute	Europe	Regional
EUROCAE	The European Organisation for Civil Aviation Equipment	Europe	International
EVS	et:Eesti Standardikeskus EVS Estonia	Estonia	National
GOST	Euro-Asian Council for Standardization, Metrology and Certification GOST Russia (Soviet Union)	Russia	National
ICAO	International Civil Aviation Organization	Canada	International
ICONTEC	Colombian Institute of Technical Standards and Certification ICONTEC Colombia	Colombia	National
IEC	International Electrotechnical Commission	Switzerland	International
IEEE	Institute of Electrical and Electronics Engineers	U.S.	International
IETF	Internet Engineering Task Force	U.S.	International
ILNAS	Luxembourg Institute for Standardization, Accreditation, Security, and Quality of Products and Services ILNAS Luxembourg	Luxembourg	National

ILO-OSH	International Labour Organisation-Occupational Safety and Health	Europe	International
IRAM	Instituto Argentino de Normalizaci3n y Certificaci3n IRAM Argentina	Argentina	National
IRMM	Institute of Reference Materials and Measurements	Belgium	Regional
ISO	International Organization for Standardization	Switzerland	International
ITU	International Telecommunication Union	Switzerland	International
JISC	Japanese Industrial Standards Committee JISC Japan	Japan	National
KATS	Korean Agency for Technology and Standards KATS Korea (Republic)	Korea	National
MASE	Manuel d'Am3lioration S3curit3 Sant3 Environnement des Entreprises	France	National
NEN	Nederlandse Norm NEN Netherlands	Netherlands	National
NF	National France	France	National
OHSAS	Occupational Health and Safety Assessment Series	U.K.	International
PAS	Publicly Available Specification	U.K.	National
PASC	Pacific Area Standards Congress	Pacific area	Regional
PSK	PSK Standards Association	Finland	National
RTCA	Radio Technical Commission for Aeronautics	U.S.	International
SABS	South African Bureau of Standards SABS South Africa	South Africa	National
SAC	Standardization Administration of China SAC China	China	National
SAE International	Society of Automotive Engineers	U.S.	International
SAI	Standards Australia SAI Australia	Australia	National
SCC	Standards Council of Canada SCC Canada	Canada	National
SFS	Finnish Standards Association SFS Finland	Finland	National
SIS	Swedish Standards Institute SIS Sweden	Sweden	National
SN	Standards Norway SN Norway	Norway	National
SNV	Swiss Association for Standardization SNV Switzerland	Switzerland	National
SNZ	Standards New Zealand SNZ New Zealand	New Zealand	National
TAPPI	Technical Association of the Pulp and Paper Industry	U.S.	International
UNE	Una Norma Espa3ola	Spain	National
UNI	Ente nazionale italiano di unificazione UNI Italy	Italy	National
UPU	Universal Postal Union	Switzerland	International
W3C	World Wide Web Consortium	U.S.	International
VDI	Verein Deutscher Ingenieure e.V.	Germany	National

## Document Revisions & Quality Assurance

Revisions:

Version	Date	By	Overview
0.1	16.11.2015	Riku Salokangas	First Draft
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0.4	04.01.2016	Riku Salokangas	Forth Draft
0.5	05.01.2016	Riku Salokangas	Fifth Draft
0.6	07.01.2016	Riku Salokangas	Sixth Draft
0.7	11.01.2016	Riku Salokangas	Seventh Draft
0.8	29.03.2016	Riku Salokangas	Eight Draft
0.9	13.04.2016	Riku Salokangas	Ninth Draft
1.0	02/06/2016	Mikel Muxika (MGEP)	Format correction Deliverable info update

## Abstract

This report presents a short list of standards that are considered potentially valuable for carrying out research work in Mantis project. It has been collected mainly by searching with certain key words that represent the technologies used In Mantis project. The standards are tabulated in different ways in order to make it easier to find them based on the subject or area of interest of the reader. Obviously, there is great variation in how valuable each of the standards is from the point of view of Mantis project. It can be assumed that the ISO standards focused on condition monitoring, diagnosis, and prognosis are of highest value and so are also the IEEE standards focused on programming. However, the report also lists standards which might be focused on one industrial sector or the discussed technology is only used by a marginal number of partners but hopefully it is still of value to the whole consortium.

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# 1 Introduction

This report presents a short list of standards that are considered potentially valuable for carrying out research work in Mantis project. It is realised that the list is far from complete. It has been collected mainly by searching with certain key words that represent the technologies used In Mantis project. In order to make the report easy to use the list of standards has been arranged in a number of tables. First are presented tables that represent the standards which are focused at a certain technology such as □Acoustic emission□ or □Condition monitoring□ etc. The following set of tables is collected so that standards that are considered valuable in different work packages are collected together so that there is a table for work package one related standards, work package two related standard etc. However, it should be noted that this kind of dividing into work package categories is mainly based on guessing not real technological facts and should therefore be used with great care. In the last table of the report are then shown all the standards that the authors have come across in the research area of Mantis project. In order to make it easier to use this final table an index list has been added in the end of the report. The authors are happy to take any comments and additions in order to improve the short list summary report. In the next phase the authors of the State of the Art (SotA) reports (Deliverable 1.1) are asked to pick up the most important standards for each of these SotA reports.

## 2 Standards related to different topics

Table 1. Acoustic emission related standards.

Standard Organization	Number	Title	Publishing Year
ISO	18436-6	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 6: Acoustic emission	2014
ISO	22096	Condition monitoring and diagnostics of machines -- Acoustic emission	2007

Table 2. Analysis related standards.

Standard Organization	Number	Title	Publishing Year
BSI	1325-1	Value management, value analysis, functional analysis vocabulary. Value analysis and functional analysis	1997
ISO	13373-2	Condition monitoring and diagnostics of machines -- Vibration condition monitoring -- Part 2: Processing, analysis and presentation of vibration data	2005
ISO	18436-4	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 4: Field lubricant analysis	2014
ISO	20958	Condition monitoring and diagnostics of machine systems -- Electrical signature analysis of three-phase induction motors	2013
ISO	9241-307	Ergonomics of human-system interaction -- Part 307: Analysis and compliance test methods for electronic visual displays	2008
IEC	60300-3-1	Dependability management □ Part 3-1: Application guide □ Analysis techniques for dependability □ Guide on methodology	2003
IEC	60706-3	Maintainability of equipment - Part 3: Verification and collection, analysis and presentation of data	2006
IEC	60812	Analysis techniques for system reliability - Procedure for failure mode and effects analysis (FMEA)	2006
IEC	61025	Fault tree analysis (FTA)	2006

IEC	61078	Analysis techniques for dependability - Reliability block diagram and boolean methods	2006
IEC	61649	Weibull analysis	2008
IEC	61650	Reliability data analysis techniques - Procedures for comparison of two constant failure rates and two constant failure (event) intensities	1997
IEEE	1415	IEEE Guide for Induction Machinery Maintenance Testing and Failure Analysis	2006
IEEE	1636	IEEE Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA)	2009
IEEE	1636.1	IEEE Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA): Exchanging Test Results and Session Information via the eXtensible Markup Language (XML)	2013
IEEE	1636.2	Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA): Exchanging Maintenance Action Information via the Extensible Markup Language (XML)	2010
IEEE	1636.99	IEEE Std 1636.99-2013, IEEE Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA): Common Information Elements.	2013
IEEE	C57.125	IEEE Approved Draft Guide for Failure Investigation, Documentation, Analysis, and Reporting for Power Transformers and Shunt Reactors	2015
CENELEC	25	Analysis techniques for system reliability - Procedure for failure mode and effects analysis (FMEA)	2006
CENELEC	EN 60300-3-1	Dependability management - Part 3-1: Application guide - Analysis techniques for dependability - Guide on methodology	2004
CENELEC	EN 60706-3	Maintainability of equipment - Part 3: Verification and collection, analysis and presentation of data	2006
CENELEC	EN 61025	Fault tree analysis (FTA)	2007
CENELEC	EN 61078	Analysis techniques for dependability - Reliability block diagram and boolean methods	2006

ETSI	TR 103 167	Machine to Machine (M2M); Threat analysis and counter measures to M2M service layer	2011
UNE	EN 16602-30-02	Space product assurance - Failure modes, effects (and criticality) analysis (FMEA/FMECA)	2014
UNE	EN 16602-40-12	Space product assurance - Fault tree analysis - Adoption notice ECSS/IEC 61025	2014

**Table 3. Asset management related standards.**

Standard Organization	Number	Title	Publishing Year
BSI	55000	Asset management. Overview, principles and terminology	2014
BSI	55001	Asset management. Management systems. Requirements	2014
BSI	55002	Asset management. Management systems. Guidelines for the application of ISO 55001	2014
ISO	55000	Asset Management Standard: What Maintenance Reliability Professionals Should Expect	2015
IEC	61968-4	Application integration at electric utilities - System interfaces for distribution management - Part 4: Interfaces for records and asset management	2007
CEN	EN 16646:2014	Maintenance - Maintenance within physical asset management	2014

**Table 4. Condition monitoring related standards.**

Standard Organization	Number	Title	Publishing Year
ISO	13372	Condition monitoring and diagnostics of machines -- Vocabulary	2012
ISO	13373-1	Condition monitoring and diagnostics of machines -- Vibration condition monitoring -- Part 1: General procedures	2002
ISO	13373-2	Condition monitoring and diagnostics of machines -- Vibration condition monitoring -- Part 2: Processing, analysis and presentation of vibration data	2005

ISO	13374-1	Condition monitoring and diagnostics of machines -- Data processing, communication and presentation -- Part 1: General guidelines	2003
ISO	13374-2	Condition monitoring and diagnostics of machines -- Data processing, communication and presentation -- Part 2: Data processing	2007
ISO	13374-3	Condition monitoring and diagnostics of machines -- Data processing, communication and presentation -- Part 3: Communication	2012
ISO	13374-4	Condition monitoring and diagnostics of machine systems -- Data processing, communication and presentation -- Part 4: Presentation	2015
ISO	13379-1	Condition monitoring and diagnostics of machines -- Data interpretation and diagnostics techniques -- Part 1: General guidelines	2012
ISO	13379-2	Condition monitoring and diagnostics of machines -- Data interpretation and diagnostics techniques -- Part 2: Data-driven applications	2015
ISO	13380	Condition monitoring and diagnostics of machines -- General guidelines on using performance parameters	2002
ISO	13381-1	Condition monitoring and diagnostics of machines -- Prognostics -- Part 1: General guidelines	2015
ISO	17359	Condition monitoring and diagnostics of machines -- General guidelines	2011
ISO	18129	Condition monitoring and diagnostics of machines -- Approaches for performance diagnosis	2015
ISO	18434-1	Condition monitoring and diagnostics of machines -- Thermography -- Part 1: General procedures	2008
ISO	18436-1	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 1: Requirements for assessment bodies and the assessment process	2012

ISO	18436-2	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 2: Vibration condition monitoring and diagnostics	2014
ISO	18436-3	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 3: Requirements for training bodies and the training process	2012
ISO	18436-4	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 4: Field lubricant analysis	2014
ISO	18436-5	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 5: Lubricant laboratory technician/analyst	2012
ISO	18436-6	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 6: Acoustic emission	2014
ISO	18436-7	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 7: Thermography	2014
ISO	18436-8	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 8: Ultrasound	2013
ISO	2041	Mechanical vibration, shock and condition monitoring -- Vocabulary	2009
ISO	20958	Condition monitoring and diagnostics of machine systems -- Electrical signature analysis of three-phase induction motors	2013
ISO	22096	Condition monitoring and diagnostics of machines -- Acoustic emission	2007
ISO	29821-1	Condition monitoring and diagnostics of machines -- Ultrasound -- Part 1: General guidelines	2011
IEC	61400-25-6	Wind turbines - Part 25-6: Communications for monitoring and control of wind power plants - Logical node classes and data classes for condition monitoring	2010

PSK	5704	Condition monitoring. Vibration measurement. Acceptance test and vibration severity limits	2013
VDI	2888	Maintenance condition monitoring	1999

Table 5. Diagnostics related standards.

Standard Organization	Number	Title	Publishing Year
ISO	13372	Condition monitoring and diagnostics of machines -- Vocabulary	2012
ISO	13373-1	Condition monitoring and diagnostics of machines -- Vibration condition monitoring -- Part 1: General procedures	2002
ISO	13373-2	Condition monitoring and diagnostics of machines -- Vibration condition monitoring -- Part 2: Processing, analysis and presentation of vibration data	2005
ISO	13374-1	Condition monitoring and diagnostics of machines -- Data processing, communication and presentation -- Part 1: General guidelines	2003
ISO	13374-2	Condition monitoring and diagnostics of machines -- Data processing, communication and presentation -- Part 2: Data processing	2007
ISO	13374-3	Condition monitoring and diagnostics of machines -- Data processing, communication and presentation -- Part 3: Communication	2012
ISO	13374-4	Condition monitoring and diagnostics of machine systems -- Data processing, communication and presentation -- Part 4: Presentation	2015
ISO	13379-1	Condition monitoring and diagnostics of machines -- Data interpretation and diagnostics techniques -- Part 1: General guidelines	2012
ISO	13379-2	Condition monitoring and diagnostics of machines -- Data interpretation and diagnostics techniques -- Part 2: Data-driven applications	2015
ISO	13380	Condition monitoring and diagnostics of machines -- General guidelines on using performance parameters	2002
ISO	13381-1	Condition monitoring and diagnostics of machines -- Prognostics -- Part 1: General guidelines	2015

ISO	17359	Condition monitoring and diagnostics of machines -- General guidelines	2011
ISO	18129	Condition monitoring and diagnostics of machines -- Approaches for performance diagnosis	2015
ISO	18434-1	Condition monitoring and diagnostics of machines -- Thermography -- Part 1: General procedures	2008
ISO	18436-1	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 1: Requirements for assessment bodies and the assessment process	2012
ISO	18436-2	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 2: Vibration condition monitoring and diagnostics	2014
ISO	18436-3	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 3: Requirements for training bodies and the training process	2012
ISO	18436-4	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 4: Field lubricant analysis	2014
ISO	18436-5	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 5: Lubricant laboratory technician/analyst	2012
ISO	18436-6	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 6: Acoustic emission	2014
ISO	18436-7	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 7: Thermography	2014
ISO	18436-8	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 8: Ultrasound	2013
ISO	20958	Condition monitoring and diagnostics of machine systems -- Electrical signature analysis of three-phase induction motors	2013



ISO	22096	Condition monitoring and diagnostics of machines -- Acoustic emission	2007
ISO	29821-1	Condition monitoring and diagnostics of machines -- Ultrasound -- Part 1: General guidelines	2011

Table 6. Failure related standards.

Standard Organization	Number	Title	Publishing Year
GOST	27.402-95	Reliability in technics. Compliance test plans for mean time between failures (to failure). Part 1. Exponential case	1997
IEC	60605-6	Equipment reliability testing - Part 6: Tests for the validity and estimation of the constant failure rate and constant failure intensity	2007
IEC	60812	Analysis techniques for system reliability - Procedure for failure mode and effects analysis (FMEA)	2006
IEC	61124	Reliability testing - Compliance tests for constant failure rate and constant failure intensity	2012
IEC	61650	Reliability data analysis techniques - Procedures for comparison of two constant failure rates and two constant failure (event) intensities	1997
IEC	61709	Electric components - Reliability - Reference conditions for failure rates and stress models for conversion	2011
IEC	62429	Reliability growth - Stress testing for early failures in unique complex systems	2007
IEEE	1415	IEEE Guide for Induction Machinery Maintenance Testing and Failure Analysis	2006
IEEE	C57.125	IEEE Approved Draft Guide for Failure Investigation, Documentation, Analysis, and Reporting for Power Transformers and Shunt Reactors	2015
CENELEC	25	Analysis techniques for system reliability - Procedure for failure mode and effects analysis (FMEA)	2006
CENELEC	EN 61124	Reliability testing - Compliance tests for constant failure rate and constant failure intensity	2012
UNE	EN 16602-30-02	Space product assurance - Failure modes, effects (and criticality) analysis (FMEA/FMECA)	2014

Table 7. Fault related standards.

Standard Organization	Number	Title	Publishing Year
NEN	2767-2	Condition Assessment of Building and Installation Components □ Part 2: List of Faults	2008
IEC	61025	Fault tree analysis (FTA)	2006
CENELEC	EN 61025	Fault tree analysis (FTA)	2007
UNE	EN 16602-40-12	Space product assurance - Fault tree analysis - Adoption notice ECSS/IEC 61025	2014

Table 8. Interface related standards.

Standard Organization	Number	Title	Publishing Year
ISO	15118-1	Road vehicles -- Vehicle to grid communication interface -- Part 1: General information and use-case definition	2013
ISO	17826	Information technology -- Cloud Data Management Interface (CDMI)	2012
ISO	19831	Cloud Infrastructure Management Interface (CIMI) Model and RESTful HTTP-based Protocol -- An Interface for Managing Cloud Infrastructure	2015
ISO	20005	Information technology -- Sensor networks -- Services and interfaces supporting collaborative information processing in intelligent sensor networks	2013
ISO	29182-5	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 5: Interface definitions	2013
ISO	30101	Information technology -- Sensor networks: Sensor network and its interfaces for smart grid system	2014
ISO	30128	Information technology -- Sensor networks -- Generic Sensor Network Application Interface	2014
IEC	61131-9	Programmable controllers - Part 9: Single-drop digital communication interface for small sensors and actuators (SDCI)	2013

IEC	61850-7-2	Communication networks and systems for power utility automation - Part 7-2: Basic information and communication structure - Abstract communication service interface (ACSI)	2010
IEC	61968-3	Application integration at electric utilities - System interfaces for distribution management - Part 3: Interface for network operations	2004
IEC	61968-4	Application integration at electric utilities - System interfaces for distribution management - Part 4: Interfaces for records and asset management	2007
IEC	61968-8	Application integration at electric utilities - System interfaces for distribution management - Part 8: Interfaces for customer operations	2015
IEC	61970-1	Energy management system application program interface (EMS-API) - Part 1: Guidelines and general requirements	2005
IEC	61970-301	Energy management system application program interface (EMS-API) - Part 301: Common information model (CIM) base	2009
IEC	61970-501	Energy management system application program interface (EMS-API) - Part 501: Common Information Model Resource Description Framework (CIM RDF) schema	2006
IEC	TS 61970-2	Energy management system application program interface (EMS-API) - Part 2: Glossary	2004
IEC	TS 61970-401	Energy management system application program interface (EMS-API) - Part 401: Component interface specification (CIS) framework	2005
IEEE	1451.1	IEEE Standard for a Smart Transducer Interface for Sensors and Actuators - Network Capable Application Processor Information Model	1999
IEEE	1451.7	IEEE Standard for Smart Transducer Interface for Sensors and Actuators-- Transducers to Radio Frequency Identification (RFID) Systems Communication Protocols and Transducer Electronic Data Sheet Formats	2010
IEEE	1636	IEEE Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA)	2009

IEEE	1636.1	IEEE Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA): Exchanging Test Results and Session Information via the eXtensible Markup Language (XML)	2013
IEEE	1636.2	Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA): Exchanging Maintenance Action Information via the Extensible Markup Language (XML)	2010
IEEE	1636.99	IEEE Std 1636.99-2013, IEEE Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA): Common Information Elements.	2013
IEEE	21451-7	Information technology--Smart transducer interface for sensors and actuators--Part 7: Transducers to radio frequency identification (RFID) systems communication protocols and transducer electronic data sheet (TEDS) formats	2011
IEEE	802.16.1a	IEEE Standard for WirelessMAN-Advanced Air Interface for Broadband Wireless Access Systems --Amendment 2: Higher Reliability Networks	2013
CENELEC	CLC/TR 50459-7	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine interface - Part 7: Specific Transmission Modules	2007
CENELEC	CLC/TS 50459-1	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 1: General principles for the presentation of ERTMS/ETCS/GSM-R information	2015
CENELEC	CLC/TS 50459-2	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 2: Ergonomic arrangements of ERTMS/ETCS information	2005
CENELEC	CLC/TS 50459-3	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 3: Ergonomic arrangements of ERTMS/GSM-	2005

			R information	
CENELEC	CLC/TS 4:2005	50459-	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 4: Data entry for the ERTMS/ETCS/GSM-R systems	2005
CENELEC	CLC/TS 5:2005	50459-	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 5: Symbols	2005
CENELEC	CLC/TS 50459-6		Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 6: Audible information	2005
ETSI	TS 102 921		Machine-to-Machine communications (M2M); mla, dla and mld interfaces	2014
UNE	EN 61131-9		Programmable controllers - Part 9: Single-drop digital communication interface for small sensors and actuators (SDCI)	2013

Table 9. Maintenance related standards.

Standard Organization	Number	Title	Publishing Year
BSI	13269	Maintenance. Guideline on preparation of maintenance contracts	2006
BSI	13306	Maintenance terminology	2001
BSI	13460	Maintenance. Documentation for maintenance	2009
BSI	15341	Maintenance. Maintenance key performance indicators	2007
BSI	60079-17	Explosive atmospheres. Electrical installations inspection and maintenance	2007
DIN	2891	MAINTENANCE RELEVANT CRITERIA FOR PURCHASE OF MACHINES	2008
DIN	31051	Fundamentals of maintenance. (Grundlagen der Instandhaltung)	2012
SFS	13306	Maintenance. Maintenance terminology	2010

SFS	15341	Maintenance. Maintenance Key Performance Indicators	2007
SFS	60300-3-14	Dependability management - Part 3-14: Application guide - Maintenance and maintenance support	2004
UNI	10144	Classification of maintenance services	2006
UNI	10145	Definition of evaluation factors of services maintenance firms	2007
UNI	10146	Criteria to prepare a contract for supplying maintenance finalized services	2007
UNI	10147	Maintenance - Additional terms and definitions to EN 13306	2003
UNI	10148	Maintenance - Management of a maintenance contract	2007
UNI	10224	Maintenance - Process, sub-processes and main activities - Fundamental principles	2007
UNI	10366	Maintenance - Design criteria of maintenance	2007
UNI	10449	Maintenance - Criteria to prepare and to manage the permit to work	2008
UNI	10584	Maintenance. Systems of information of maintenance	1997
UNI	10604	Maintenance. Criteria for design, management and control of the maintenance services of building	1997
UNI	10652	Maintenance - Appraisal and evaluation of the goods condition	2009
UNI	10749-1	Maintenance - Guidelines for management of maintenance materials - General aspects and organizational problems	2003
UNI	10749-2	Maintenance - Guidelines for management of maintenance materials - Criteria for classification, codification, standardization and support	2003
UNI	10749-3	Maintenance - Guidelines for management of maintenance materials - Criteria for the choice of materials to be managed	2003
UNI	10749-4	Maintenance - Guidelines for management of maintenance materials - Criteria for operational management	2003
UNI	10749-5	Maintenance - Guidelines for management of maintenance materials - Criteria for purchasing, tests and final check	2003
UNI	10749-6	Maintenance - Guidelines for management of maintenance materials - Administration criteria	2003

UNI	10831-1	Maintenance of buildings - Documentation and basic information for maintenance services of projects approved and executed - Structure, contents and levels of documentation	1999
UNI	10831-2	Maintenance of buildings - Documentation and basic information for maintenance services of projects approved and executed - Details of content of technical documentation and lay-out models	2001
UNI	10874	Maintenance of buildings - Criteria in order to write maintenance and use manuals	2000
UNI	10992	Maintenance budget for manufacturers and suppliers of products and services - Guidelines for the definition, approval, management and check	2002
UNI	11063	Maintenance - Definitions of ordinary and extraordinary maintenance	2003
UNI	11069	Maintenance - Maintenance ratios for the vehicles in service on road, with limited distances to be covered and frequent stops	2003
UNI	11082	Maintenance - Specific terminology for the group transportation field	2003
UNI	11126	Telemaintenance - Criteria for the suitability of the items and for the definition of the related service	2004
UNI	11134	Maintenance - Maintenance ratios for the group transportation field	2005
UNI	11136	Global service for maintenance of buildings - Guidelines	2004
UNI	11178	Maintenance - Maintenance ratios - Guidance for the application of UNI 10388 in the field of the infrastructures of the group transportation on railways	2006
UNI	11257	Maintenance of buildings - Criteria for the drafting of plan and programme of maintenance of buildings □ Guidelines	2007
UNI	11282	Maintenance of the group transportation vehicles - Appraisal and evaluation of the condition of the vehicles in service on road	2008
UNI	11414	Maintenance - Guidelines for qualification of maintenance system	2011
UNI	11420	Maintenance - Qualification of maintenance personnel	2011

ISO	14224	Petroleum, petrochemical and natural gas industries - Collection and exchange of reliability and maintenance data for equipment	2006
ISO	14764	Software Life Cycle Processes -- Maintenance	2006
ISO	55000	Asset Management Standard: What Maintenance Reliability Professionals Should Expect	2015
IEC	60300-3-11	Dependability management - Part 3-11: Application guide - Reliability centred maintenance	2009
IEC	60300-3-14	Dependability management - Part 3-14: Application guide - Maintenance and maintenance support	2004
IEC	60300-3-16	Dependability management - Part 3-16: Application guide - Guidelines for specification of maintenance support services	2008
IEC	61703	Mathematical expressions for reliability, availability, maintainability and maintenance support terms	2001
IEEE	1415	IEEE Guide for Induction Machinery Maintenance Testing and Failure Analysis	2006
IEEE	14764	ISO/IEC International Standard for Software Engineering - Software Life Cycle Processes - Maintenance	2006
IEEE	1636	IEEE Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA)	2009
IEEE	1636.1	IEEE Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA): Exchanging Test Results and Session Information via the eXtensible Markup Language (XML)	2013
IEEE	1636.2	Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA): Exchanging Maintenance Action Information via the Extensible Markup Language (XML)	2010
IEEE	1636.99	IEEE Std 1636.99-2013, IEEE Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA): Common Information Elements.	2013



IEEE	1808	IEEE Guide for Collecting and Managing Transmission Line Inspection and Maintenance Data	2011
SAE International	JA1011'200908	Evaluation Criteria for Reliability-Centered Maintenance (RCM) Processes	2009
SAE International	JA1012'201108	A Guide to the Reliability-Centered Maintenance (Rcm) Standard	2011
TAPPI	10685	Maintenance - Criteria to prepare a maintenance global service	2007
CEN	15331	Criteria for design, management and control of maintenance services for buildings	2005
CEN	15628	Maintenance - Qualification of Maintenance personnel	2007
CEN	EN 16646:2014	Maintenance - Maintenance within physical asset management	2014
CENELEC	EN 60300-3-11	Dependability management - Part 3-11: Application guide - Reliability centred maintenance	2009
CENELEC	EN 60300-3-14	Dependability management - Part 3-14: Application guide - Maintenance and maintenance support	2004
CENELEC	EN 60300-3-16	Dependability management - Part 3-16: Application guide - Guidelines for specification of maintenance support services	2008
PSK	6201	Maintenance. Terms and definitions	2011
PSK	7501	Key performance indicators of maintenance for use in process industry	2010
PSK	7901	Maintenance in industry. Service agreement	2001
NF	NF X 50-501	Maintenance - Reference conditions for items : Vocabulary of renovation and reconstruction activities (Durée de vie et durabilité des biens - Vocabulaire des activités de rénovation et de reconstruction - États de référence des biens de réemploi)	2007
NF	NF X 60-212	Maintenance - Handbook of instructions maintenance -Definitions and general principles for the wording and layout	1983
NF	NF X60-000	Maintenance function	2002
NF	NF X60-008	Industrial maintenance - Maintenance outsourcing draft guide - Pre-contractual approach	2013

NF	NF X60-100	Maintenance □ Preconditions to the maintenance contracts □ Inventories and evaluation for the states of items	2007
VDI	2885	Standardized data for maintenance planning and determination of maintenance costs - Data and data determination	2003
VDI	2886	Benchmarking applied to maintenance	2003
VDI	2888	Maintenance condition monitoring	1999
VDI	2889	Methods and systems for condition and process monitoring in maintenance	1998
VDI	2892	Management of maintenance spare parts	2006
VDI	2893	Selection and formation of indicators for maintenance	2006
UNE	60079-17	Explosive atmospheres - Part 17: Electrical installations inspection and maintenance	2014

Table 10. Prognostics related standards.

Standard Organization	Number	Title	Publishing Year
ISO	13381-1	Condition monitoring and diagnostics of machines -- Prognostics -- Part 1: General guidelines	2015

Table 11. Reliability related standards.

Standard Organization	Number	Title	Publishing Year
GOST	27.402-95	Reliability in technics. Compliance test plans for mean time between failures (to failure). Part 1. Exponential case	1997
ISO	14224	Petroleum, petrochemical and natural gas industries - Collection and exchange of reliability and maintenance data for equipment	2006
ISO	55000	Asset Management Standard: What Maintenance Reliability Professionals Should Expect	2015
IEC	60300-3-11	Dependability management - Part 3-11: Application guide - Reliability centred maintenance	2009

IEC	60300-3-5	Dependability management - Part 3-5: Application guide - Reliability test conditions and statistical test principles	2001
IEC	60319	Presentation and specification of reliability data for electronic components	1999
IEC	60605-2	Equipment reliability testing - Part 2: Design of test cycles	1994
IEC	60605-4	Equipment reliability testing - Part 4: Statistical procedures for exponential distribution - Point estimates, confidence intervals, prediction intervals and tolerance intervals	2001
IEC	60605-6	Equipment reliability testing - Part 6: Tests for the validity and estimation of the constant failure rate and constant failure intensity	2007
IEC	60812	Analysis techniques for system reliability - Procedure for failure mode and effects analysis (FMEA)	2006
IEC	61014	Programmes for reliability growth	2003
IEC	61078	Analysis techniques for dependability - Reliability block diagram and boolean methods	2006
IEC	61123	Reliability testing - Compliance test plans for success ratio	1991
IEC	61124	Reliability testing - Compliance tests for constant failure rate and constant failure intensity	2012
IEC	61163-1	Reliability stress screening - Part 1: Repairable assemblies manufactured in lots	2006
IEC	61163-1	Reliability stress screening - Part 1: Repairable assemblies manufactured in lots	2006
IEC	61163-2	Reliability stress screening - Part 2: Electronic components	1998
IEC	61164	Reliability growth - Statistical test and estimation methods	2004
IEC	61650	Reliability data analysis techniques - Procedures for comparison of two constant failure rates and two constant failure (event) intensities	1997
IEC	61703	Mathematical expressions for reliability, availability, maintainability and maintenance support terms	2001
IEC	61709	Electric components - Reliability - Reference conditions for failure rates and stress models for conversion	2011

IEC	61810-2	Electromechanical elementary relays - Part 2: Reliability	2011
IEC	62059-31-1	Electricity metering equipment - Dependability - Part 31-1: Accelerated reliability testing - Elevated temperature and humidity	2008
IEC	62308	Equipment reliability - Reliability assessment methods	2006
IEC	62429	Reliability growth - Stress testing for early failures in unique complex systems	2007
IEEE	3006.7	IEEE Recommended Practice for Determining the Reliability of 7x24 Continuous Power Systems in Industrial and Commercial Facilities	2013
IEEE	802.16.1a	IEEE Standard for WirelessMAN-Advanced Air Interface for Broadband Wireless Access Systems --Amendment 2: Higher Reliability Networks	2013
SAE International	JA1011'200908	Evaluation Criteria for Reliability-Centered Maintenance (RCM) Processes	2009
SAE International	JA1012'201108	A Guide to the Reliability-Centered Maintenance (Rcm) Standard	2011
CENELEC	25	Analysis techniques for system reliability - Procedure for failure mode and effects analysis (FMEA)	2006
CENELEC	EN 60300-3-11	Dependability management - Part 3-11: Application guide - Reliability centred maintenance	2009
CENELEC	EN 61014	Programmes for reliability growth	2003
CENELEC	EN 61078	Analysis techniques for dependability - Reliability block diagram and boolean methods	2006
CENELEC	EN 61124	Reliability testing - Compliance tests for constant failure rate and constant failure intensity	2012

Table 12. Safety related standards.

Standard Organization	Number	Title	Publishing Year
ISO	26262-1	Road vehicles -- Functional safety -- Part 1: Vocabulary	2011
IEC	61131-6	Programmable controllers - Part 6: Functional safety	2012

IEC	61508-2	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems	2010
IEC	61508-3	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 3: Software requirements	2010
IEC	61508-4	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 4: Definitions and abbreviations	2010
IEC	61508-5	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 5: Examples of methods for the determination of safety integrity levels	2010
IEC	61508-6	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 6: Guidelines on the application of IEC 61508-2 and IEC 61508-3	2010
IEC	61508-7	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 7: Overview of techniques and measures	2010
IEC	61511-1	Functional safety □ Safety instrumented systems for the process industry sector □ Part 1: Framework, definitions, system, hardware and software requirement	2003
IEC	61784-3	Industrial communication networks - Profiles - Part 3: Functional safety fieldbuses - General rules and profile definitions	2010
IEC	61810-1	Electromechanical elementary relays - Part 1: General and safety requirements	2015
IEC	62061:2005+AMD 1:2012+AMD2	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems	2015
CENELEC	CLC/TR 50451:2007	Railway applications - Systematic allocation of safety integrity requirements	2007
CENELEC	CLC/TR 50506-2	Railway applications - Communication, signalling and processing systems - Application Guide for EN 50129 - Part 2: Safety assurance	2009

CENELEC	EN 50129:2003/corrigendum May 2010	Railway applications - Communication, signalling and processing systems - Safety related electronic systems for signalling	2003
CENELEC	EN 50159	Railway applications - Communication, signalling and processing systems - Safety-related communication in transmission systems	2010
OSHAS	18001	Occupational Health and safety management systems - requirements	1999
OSHAS	18002	Occupational Health and safety management systems - Guidelines for implementation of OSHA 18001	1999
MASE		Guideline for improvement of health and safety at work	2013
ILO-OSH	Second Edition	Guidelines on occupational safety and health management systems	2001

Table 13. Sensor related standards.

Standard Organization	Number	Title	Publishing Year
ISO	20005	Information technology -- Sensor networks -- Services and interfaces supporting collaborative information processing in intelligent sensor networks	2013
ISO	29182-1	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 1: General overview and requirements	2013
ISO	29182-2	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 2: Vocabulary and terminology	2013
ISO	29182-3	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 3: Reference architecture views	2014
ISO	29182-4	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 4: Entity models	2013
ISO	29182-5	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 5: Interface definitions	2013
ISO	29182-6	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 6: Applications	2014

ISO	29182-7	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 7: Interoperability guidelines	2015
ISO	30101	Information technology -- Sensor networks: Sensor network and its interfaces for smart grid system	2014
ISO	30128	Information technology -- Sensor networks -- Generic Sensor Network Application Interface	2014
IEC	61131-9	Programmable controllers - Part 9: Single-drop digital communication interface for small sensors and actuators (SDCI)	2013
IEEE	1451.1	IEEE Standard for a Smart Transducer Interface for Sensors and Actuators - Network Capable Application Processor Information Model	1999
IEEE	1451.7	IEEE Standard for Smart Transducer Interface for Sensors and Actuators--Transducers to Radio Frequency Identification (RFID) Systems Communication Protocols and Transducer Electronic Data Sheet Formats	2010
IEEE	21451-7	Information technology--Smart transducer interface for sensors and actuators--Part 7: Transducers to radio frequency identification (RFID) systems communication protocols and transducer electronic data sheet (TEDS) formats	2011
IEEE	2700	IEEE Standard for Sensor Performance Parameter Definitions	2014
UNE	EN 61131-9	Programmable controllers - Part 9: Single-drop digital communication interface for small sensors and actuators (SDCI)	2013
UNE	EN 61757-1	Fibre optic sensors - Part 1: Generic specification	2012

Table 14. Vibration related standards.

Standard Organization	Number	Title	Publishing Year
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ISO	10816-1	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 1: General guidelines	1995
ISO	10816-2	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 2: Land-based steam turbines and generators in excess of 50 MW with normal operating speeds of 1 500 r/min, 1 800 r/min, 3 000 r/min and 3 600 r/min	2009
ISO	10816-3	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 3: Industrial machines with nominal power above 15 kW and nominal speeds between 120 r/min and 15 000 r/min when measured in situ	2009
ISO	10816-4	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 4: Gas turbine sets with fluid-film bearings	2009
ISO	10816-5	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 5: Machine sets in hydraulic power generating and pumping plants	2000
ISO	10816-6	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 6: Reciprocating machines with power ratings above 100 kW	1995
ISO	10816-7	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 7: Rotodynamic pumps for industrial applications, including measurements on rotating shafts	2009
ISO	10817-1	Rotating shaft vibration measuring systems -- Part 1: Relative and absolute sensing of radial vibration	1998
ISO	11342	Mechanical vibration -- Methods and criteria for the mechanical balancing of flexible rotors	1998
ISO	13373-1	Condition monitoring and diagnostics of machines -- Vibration condition monitoring -- Part 1: General procedures	2002
ISO	13373-2	Condition monitoring and diagnostics of machines -- Vibration condition monitoring -- Part 2: Processing, analysis and presentation of vibration data	2005



ISO	14694	Industrial fans -- Specifications for balance quality and vibration levels	2003
ISO	14695	Industrial fans -- Method of measurement of fan vibration	2003
ISO	18436-2	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 2: Vibration condition monitoring and diagnostics	2014
ISO	1925	Mechanical vibration -- Balancing -- Vocabulary	2001
ISO	1940-1	Mechanical vibration -- Balance quality requirements for rotors in a constant (rigid) state -- Part 1: Specification and verification of balance tolerances	2003
ISO	2017-1	Mechanical vibration and shock -- Resilient mounting systems -- Part 1: Technical information to be exchanged for the application of isolation systems	2005
ISO	2017-2	Mechanical vibration and shock -- Resilient mounting systems -- Part 2: Technical information to be exchanged for the application of vibration isolation associated with railway systems	2007
ISO	20283-2	Mechanical vibration -- Measurement of vibration on ships -- Part 2: Measurement of structural vibration	2008
ISO	2041	Mechanical vibration, shock and condition monitoring -- Vocabulary	2009
ISO	21940-14	Mechanical vibration -- Rotor balancing -- Part 14: Procedures for assessing balance errors	2012
ISO	21940-31	Mechanical vibration -- Rotor balancing -- Part 31: Susceptibility and sensitivity of machines to unbalance	2013
ISO	21940-32	Mechanical vibration -- Rotor balancing -- Part 32: Shaft and fitment key convention	2012
ISO	22266-1	Mechanical vibration -- Torsional vibration of rotating machinery -- Part 1: Land-based steam and gas turbine generator sets in excess of 50 MW	2009
ISO	2954	Mechanical vibration of rotating and reciprocating machinery -- Requirements for instruments for measuring vibration severity	2012

ISO	5348	Mechanical vibration and shock -- Mechanical mounting of accelerometers	1998
ISO	7626-1	Mechanical vibration and shock -- Experimental determination of mechanical mobility -- Part 1: Basic terms and definitions, and transducer specifications	2011
ISO	7626-2	Mechanical vibration and shock -- Experimental determination of mechanical mobility -- Part 2: Measurements using single-point translation excitation with an attached vibration exciter	2015
ISO	7626-5	Vibration and shock -- Experimental determination of mechanical mobility -- Part 5: Measurements using impact excitation with an exciter which is not attached to the structure	1994
ISO	7919-1	Mechanical vibration of non-reciprocating machines -- Measurements on rotating shafts and evaluation criteria -- Part 1: General guidelines	1996
ISO	7919-2	Mechanical vibration -- Evaluation of machine vibration by measurements on rotating shafts -- Part 2: Land-based steam turbines and generators in excess of 50 MW with normal operating speeds of 1 500 r/min, 1 800 r/min, 3 000 r/min and 3 600 r/min	2009
ISO	7919-3	Mechanical vibration -- Evaluation of machine vibration by measurements on rotating shafts -- Part 3: Coupled industrial machines	2009
ISO	7919-4	Mechanical vibration -- Evaluation of machine vibration by measurements on rotating shafts -- Part 4: Gas turbine sets with fluid-film bearings	2009
ISO	7919-5	Mechanical vibration -- Evaluation of machine vibration by measurements on rotating shafts -- Part 5: Machine sets in hydraulic power generating and pumping plants	2005
ISO	8528-9	Reciprocating internal combustion engine driven alternating current generating sets -- Part 9: Measurement and evaluation of mechanical vibrations	1995
ISO	8569	Mechanical vibration and shock -- Measurement and evaluation of shock and vibration effects on sensitive equipment in buildings	1996

ISO	8579-2	Acceptance code for gears -- Part 2: Determination of mechanical vibrations of gear units during acceptance testing	1993
ISO	8626	Servo-hydraulic test equipment for generating vibration -- Method of describing characteristics	1989
CENELEC	EN 60034-14:2004/A1	Rotating electrical machines - Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of vibration severity	2007
PSK	5704	Condition monitoring. Vibration measurement. Acceptance test and vibration severity limits	2013
UNE	EN 60068-2-65	Environmental testing - Part 2-65: Tests - Test Fg: Vibration - Acoustically induced method	2013
UNE	EN 60721-2-9	Classification of environmental conditions - Part 2-9: Environmental conditions appearing in nature - Measured shock and vibration data - Storage, transportation and in-use	2014

### 3 Standards according to work packages

### 3.1 Standards related to WP1

Table 15. Possible standards related to WP1.

Standard Organization	Number	Title	Publishing Year	Work Package	Task
IEC	60300-3-16	Dependability management - Part 3-16: Application guide - Guidelines for specification of maintenance support services	2008	WP1	Task 1.1
IEEE	830	Software requirements specification		WP1	Task 1.3
IEC	62061:2005+AMD1:2012+AMD2	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems	2015	WP1	Use-case 1.4

### 3.2 Standards related to WP2

Table 16. Possible standards related to WP2.

Standard Organization	Number	Title	Publishing Year	Work Package	Task
ETSI	TR 103 167	Machine to Machine (M2M); Threat analysis and counter measures to M2M service layer	2011	WP2	Task 2.1
IEEE	1016	Software design description		WP2	Task 2.1
IEC	62059-31-1	Electricity metering equipment - Dependability - Part 31-1: Accelerated reliability testing - Elevated temperature and humidity	2008	WP2	Task 2.1
IEC	62308	Equipment reliability - Reliability assessment methods	2006	WP2	Task 2.1
ISO	17963	Web Services for Management (WS-Management) Specification	2013	WP2	Task 2.1
ISO	17826	Information technology -- Cloud Data Management Interface (CDMI)	2012	WP2	Task 2.1
ISO	17789	Information technology -- Cloud computing -- Reference architecture	2014	WP2	Task 2.1
ETSI	TS 102 690	Machine-to-Machine communications (M2M); Functional architecture	2013	WP2	Task 2.1
ISO	17203	Information technology -- Open Virtualization Format (OVF) specification	2011	WP2	Task 2.1
UNI	11126	Telemaintenance - Criteria for the suitability of the items and for the definition of the related service	2004	WP2	Task 2.1
ETSI	TR 102 935	Machine-to-Machine communications (M2M); Applicability of M2M architecture to Smart Grid Networks; Impact of Smart Grids on M2M platform	2012	WP2	Task 2.1
ETSI	TS 103 092	Machine-to-Machine communications (M2M); OMA DM compatible Management Objects for ETSI M2M	2013	WP2	Task 2.1
ETSI	TS 103 093	Machine-to-Machine communications (M2M); BBF TR-069 compatible Management Objects for ETSI M2M	2013	WP2	Task 2.1
ETSI	TR 102 725	Machine-to-Machine communications (M2M);	2013	WP2	Task 2.1

		Definitions			
ETSI	TS 102 689	Machine-to-Machine communications (M2M); M2M service requirements	2013	WP2	Task 2.1
IEC	61850-4	Communication networks and systems in substations - Part 4: System and project management	2002	WP2	Task 2.1
ISO	17788	Information technology -- Cloud computing -- Overview and vocabulary	2014	WP2	Task 2.1
ISO	13374-3	Condition monitoring and diagnostics of machines -- Data processing, communication and presentation -- Part 3: Communication	2012	WP2	Task 2.1
IEC	61850-3	Communication networks and systems in substations - Part 3: General requirements	2002	WP2	Task 2.1
IEC	TS 61850-2	Communication networks and systems in substations - Part 2: Glossary	2003	WP2	Task 2.1
IEC	TR 61850-1	Communication networks and systems in substations - Part 1: Introduction and overview	2003	WP2	Task 2.1
IEEE	1232	IEEE Standard for Artificial Intelligence and Expert System Tie to Automatic Test Equipment (AI-ESTATE): Overview and Architecture	1995	WP2	Task 2.1
UNE	EN 16656	Information technology - Radio frequency identification for item management - RFID Emblem (ISO/IEC 29160:2012, modified)	2014	WP2	Task 2.1
UNE	EN ISO/IEC 19762-3	Information technology - Automatic identification and data capture (AIDC) techniques - Harmonized vocabulary - Part 3: Radio frequency identification (RFID) (ISO/IEC 19762-3:2008)	2012	WP2	Task 2.1
UNI	10584	Maintenance. Systems of information of maintenance	1997	WP2	Task 2.1
IEEE	1063	Software user documentation		WP2	Task 2.1
UNI	11414	Maintenance - Guidelines for qualification of maintenance system	2011	WP2	Task 2.1
VDI	2893	Selection and formation of indicators for maintenance	2006	WP2	Task 2.1

ILO-OSH	Second Edition	Guidelines on occupational safety and health management systems	2001	WP2	Task 2.1
ANSI	62443-1-1	Security for Industrial Automation and Control Systems Part 1: Terminology, Concepts, and Models	2007	WP2	Task 2.1
OSHAS	18002	Occupational Health and safety management systems - Guidelines for implementation of OSHA 18001	1999	WP2	Task 2.1
OSHAS	18001	Occupational Health and safety management systems - requirements	1999	WP2	Task 2.1
BSI	60079-17	Explosive atmospheres. Electrical installations inspection and maintenance	2007	WP2	Task 2.1
ETSI	TR 101 584	Machine-to-Machine communications (M2M); Study on Semantic support for M2M Data	2013	WP2	Task 2.1
ISO	13374-4	Condition monitoring and diagnostics of machine systems -- Data processing, communication and presentation -- Part 4: Presentation	2015	WP2	Task 2.1
ANSI	TR62443-1-2	Security for Industrial Automation and Control Systems - Glossary of Terms and Abbreviations	2014	WP2	Task 2.1
ISO	27001	Information technology -- Security techniques -- Information security management systems -- Requirements	2013	WP2	Task 2.1
ISO	27000	Information technology -- Security techniques -- Information security management systems -- Overview and vocabulary	2014	WP2	Task 2.1
IEC	62443-3-3	Industrial communication networks - Network and system security - Part 3-3: System security requirements and security levels	2013	WP2	Task 2.1
IEC	TR 62443-3-1	Industrial communication networks - Network and system security - Part 3-1: Security technologies for industrial automation and control systems	2009	WP2	Task 2.1
IEC	62443-2-4	Security for industrial automation and control systems - Part 2-4: Security program requirements for IACS service providers	2015	WP2	Task 2.1
ANSI	62443-2-1	Security for industrial automation and control systems - Requirements for an IACS Security	2009	WP2	Task 2.1



		Management Control System			
ETSI	TR 102 857	Machine-to-Machine communications (M2M); Use Cases of M2M applications for Connected Consumer	2013	WP2	Task 2.1
ANSI	62443-1-3	System security compliance metrics		WP2	Task 2.1
ISO	27004	Information technology -- Security techniques -- Information security management -- Measurement	2009	WP2	Task 2.1
ANSI	62443-1-1	Security for Industrial Automation and Control Systems - Models and Concepts	2007	WP2	Task 2.1
ANSI	TR99.02.03	Patch Management in the IACS Environment		WP2	Task 2.1
ANSI	99.02.02	Operating an Industrial Automation and Control Systems Security Program		WP2	Task 2.1
ANSI	62443-3-3	Security for industrial automation and control systems Part 3-3: System security requirements and security levels	2013	WP2	Task 2.1
ANSI	99.03.02	Security for Industrial Automation and Control Systems, Technical Requirements, Target Security Levels	2009	WP2	Task 2.1
ANSI	99.02.01	Security for Industrial Automation and Control Systems: Establishing an Industrial Automation and Control Systems Security Program	2009	WP2	Task 2.1
ANSI	TR62443-1-4	Security for industrial automation and control systems Security Life Cycle and Use Cases		WP2	Task 2.1
IEEE	802.15.3	IEEE Standard for Information technology-- Local and metropolitan area networks-- Specific requirements-- Part 15.3: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for High Rate Wireless Personal Area Networks (WPAN)	2003	WP2	Task 2.1
ETSI	TR 102 966	Machine-to-Machine communications (M2M); Interworking between the M2M Architecture and M2M Area Network technologies	2014	WP2	Task 2.1
ETSI	TS 102 921	Machine-to-Machine communications (M2M); mla, dla	2014	WP2	Task 2.1

		and mld interfaces			
ETSI	TR 103 118	Machine-to-Machine communications (M2M); Smart Energy Infrastructures security; Review of existing security measures and convergence investigations	2015	WP2	Task 2.1
IEEE	802.7	Local Area Networks: IEEE Recommended Practice: Broadband Local Area Networks	1989	WP2	Task 2.1
IEEE	802.22.2	IEEE Recommended Practice for Information Technology - Telecommunications and information exchange between systems Wireless Regional Area Networks (WRAN) - Specific requirements - Part 22.2: Installation and Deployment of IEEE 802.22 Systems	2012	WP2	Task 2.1
IEEE	802.3	IEEE Standard for Ethernet	2012	WP2	Task 2.1
ISO	27002	Information technology -- Security techniques -- Code of practice for information security controls	2013	WP2	Task 2.1
IEEE	802.15.4	IEEE Standard for Local and metropolitan area networks--Part 15.4: Low-Rate Wireless Personal Area Networks (LR-WPANs)	2011	WP2	Task 2.1
ISO	27003	Information technology -- Security techniques -- Information security management system implementation guidance	2010	WP2	Task 2.1
IEEE	802.15.4m	IEEE Standard for Local and metropolitan area networks - Part 15.4: Low-Rate Wireless Personal Area Networks (LR-WPANs) - Amendment 6: TV White Space Between 54 MHz and 862 MHz Physical Layer	2014	WP2	Task 2.1
IEEE	802.11	IEEE Standard for Information technology--Telecommunications and information exchange between systems Local and metropolitan area networks--Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications	2012	WP2	Task 2.1

IEEE	802.15.1	IEEE Standard for Telecommunications and Information Exchange Between Systems - LAN/MAN - Specific Requirements - Part 15: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Wireless Personal Area Networks (WPANs)	2002	WP2	Task 2.1
ISO	27007	Information technology -- Security techniques -- Guidelines for information security management systems auditing	2011	WP2	Task 2.1
ISO	27006	Information technology -- Security techniques -- Requirements for bodies providing audit and certification of information security management systems	2015	WP2	Task 2.1
ISO	27005	Information technology -- Security techniques -- Information security risk management	2011	WP2	Task 2.1
VDI	2885	Standardized data for maintenance planning and determination of maintenance costs - Data and data determination	2003	WP2	Task 2.1
IEEE	802.16.1a	IEEE Standard for WirelessMAN-Advanced Air Interface for Broadband Wireless Access Systems --Amendment 2: Higher Reliability Networks	2013	WP2	Task 2.1
IEC	TS 61970-2	Energy management system application program interface (EMS-API) - Part 2: Glossary	2004	WP2	Task 2.1
IEC	61400-25-5	Communications for monitoring and control of wind power plants □ Conformance testing	2006	WP2	Task 2.1
IEC	61400-25-4	Wind turbines - Part 25-4: Communications for monitoring and control of wind power plants - Mapping to communication profile	2008	WP2	Task 2.1
IEC	61400-25-3	Wind turbines - Part 25-3: Communications for monitoring and control of wind power plants - Information exchange models	2015	WP2	Task 2.1
IEC	61968-8	Application integration at electric utilities - System interfaces for distribution management - Part 8: Interfaces for customer operations	2015	WP2	Task 2.1

IEEE	802.19.1	IEEE Standard for Information technology--Telecommunications and information exchange between systems -- Local and metropolitan area networks -- Specific requirements -- Part 19: TV White Space Coexistence Methods	2014	WP2	Task 2.1
IEC	61968-3	Application integration at electric utilities - System interfaces for distribution management - Part 3: Interface for network operations	2004	WP2	Task 2.1
IEC	61970-501	Energy management system application program interface (EMS-API) - Part 501: Common Information Model Resource Description Framework (CIM RDF) schema	2006	WP2	Task 2.1
IEC	TR 62541-1	OPC Unified Architecture - Part 1: Overview and Concepts	2010	WP2	Task 2.1
ISO	19831	Cloud Infrastructure Management Interface (CIMI) Model and RESTful HTTP-based Protocol -- An Interface for Managing Cloud Infrastructure	2015	WP2	Task 2.1
IEC	61970-301	Energy management system application program interface (EMS-API) - Part 301: Common information model (CIM) base	2009	WP2	Task 2.1
IEC	61400-25-2	Wind turbines - Part 25-2: Communications for monitoring and control of wind power plants - Information models	2015	WP2	Task 2.1
IEC	TR 62357-1	Power systems management and associated information exchange - Part 1: Reference architecture	2012	WP2	Task 2.1
IEC	62347	Guidance on system dependability specifications	2006	WP2	Task 2.1
IEEE	14764	ISO/IEC International Standard for Software Engineering - Software Life Cycle Processes - Maintenance	2006	WP2	Task 2.1
ISO	14764	Software Life Cycle Processes -- Maintenance	2006	WP2	Task 2.1
IEEE	1149.1	IEEE Standard Test Access Port and Boundary Scan Architecture	2001	WP2	Task 2.1
IEEE	1149.4	IEEE Standard for a Mixed-Signal Test Bus	2010	WP2	Task 2.1

IEEE	802.1AB-2009/Cor 2	IEEE Standard for Local and metropolitan area networks-- Station and Media Access Control Connectivity Discovery Corrigendum 2: Technical and Editorial Corrections	2015	WP2	Task 2.1
IEEE	802.21	IEEE Standard for Local and metropolitan area networks - Media Independent Handover Services	2008	WP2	Task 2.1
IEEE	802.20.2	IEEE Standard for Conformance to IEEE 802.20 Systems--Protocol Implementation Conformance Statement (PICS) Proforma	2010	WP2	Task 2.1
IEC	TS 61970-401	Energy management system application program interface (EMS-API) - Part 401: Component interface specification (CIS) framework	2005	WP2	Task 2.1
ISO	FDIS 18384-1	Information technology -- Reference Architecture for Service Oriented Architecture (SOA RA) - - Part 1: Terminology and Concepts for SOA	2015	WP2	Task 2.1
IEC	61508-5	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 5: Examples of methods for the determination of safety integrity levels	2010	WP2	Task 2.1
IEC	61508-6	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 6: Guidelines on the application of IEC 61508-2 and IEC 61508-3	2010	WP2	Task 2.1
IEC	61508-3	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 3: Software requirements	2010	WP2	Task 2.1
IEC	61508-7	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 7: Overview of techniques and measures	2010	WP2	Task 2.1
IEC	61968-4	Application integration at electric utilities - System interfaces for distribution management - Part 4: Interfaces for records and asset management	2007	WP2	Task 2.1
IEC	61784-3	Industrial communication networks - Profiles - Part 3: Functional safety fieldbuses - General rules	2010	WP2	Task 2.1

		and profile definitions			
ISO	TR 30102	Information technology -- Distributed Application Platforms and Services (DAPS) -- General technical principles of Service Oriented Architecture	2012	WP2	Task 2.1
IEC	61508-2	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems	2010	WP2	Task 2.1
IEC	61508-4	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 4: Definitions and abbreviations	2010	WP2	Task 2.1
IEC	TS 61400-26-2	Wind turbines - Part 26-2: Production-based availability for wind turbines	2014	WP2	Task 2.1
ISO	FDIS 18384-2	Information technology -- Reference Architecture for Service Oriented Architecture (SOA RA) - - Part 2: Reference Architecture for SOA Solutions	2015	WP2	Task 2.1
ISO	FDIS 18384-3	Information Technology -- Reference Architecture for Service Oriented Architecture (SOA) -- Part 3: Service Oriented Architecture Ontology	2015	WP2	Task 2.1
IEC	61131-6	Programmable controllers - Part 6: Functional safety	2012	WP2	Task 2.1
ISO	DIS 19086-1	Information technology -- Cloud computing -- Service level agreement (SLA) framework -- Part 1: Overview and concepts	2015	WP2	Task 2.1
ISO	NP 19086-2	Information technology -- Cloud computing -- Service level agreement (SLA) framework -- Part 2: Metrics	2014	WP2	Task 2.1
ISO	NP 19086-3	Information technology -- Cloud computing -- Service level agreement (SLA) framework -- Part 3: Core conformance requirements	2014	WP2	Task 2.1
ETSI	TS 103 264	SmartM2M; Smart Appliances; Reference Ontology and oneM2M Mapping	2015	WP2	Task 2.1

IEC	TS 61400-26-1	Wind turbines □Part 26-1: Time-based availability for wind turbine generating system	2011	WP2	Task 2.1
IEC	61400-25-6	Wind turbines - Part 25-6: Communications for monitoring and control of wind power plants - Logical node classes and data classes for condition monitoring	2010	WP2	Task 2.1
ISO	WD 19944	Information Technology - Cloud Computing - Data and their Flow across Devices and Cloud Services	2015	WP2	Task 2.1
IEC	61511-1	Functional safety □Safety instrumented systemsfor the process industry sector □Part 1:Framework, definitions, system,hardware and software requirement	2003	WP2	Task 2.1
IEC	61850-10	Communication networks and systems in substations - Part 10: Conformance testing	2005	WP2	Task 2.2
ETSI	TS 103 104	Machine-to-Machine communications (M2M); Interoperability Test Specification for CoAP Binding of ETSI M2M Primitives	2013	WP2	Task 2.2
IEEE	1636.1	IEEE Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA): Exchanging Test Results and Session Information via the eXtensible Markup Language (XML)	2013	WP2	Task 2.2
IEEE	1636	IEEE Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA)	2009	WP2	Task 2.2
IEEE	1636.99	IEEE Std 1636.99-2013, IEEE Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA): Common Information Elements.	2013	WP2	Task 2.2
IEC	61850-9-2	Communication networks and systems for power utility automation - Part 9-2: Specific communication service mapping (SCSM) - Sampled values over ISO/IEC 8802-3	2011	WP2	Task 2.2
IEC	61850-9-2	Communication networks and systems in substations - Part 9-2: Specific Communication Service Mapping (SCSM) - Sampled values over ISO/IEC 8802-3	2004	WP2	Task 2.2
IEEE	828	Software configuration		WP2	Task

		management			2.2
ISO	29363	Information technology -- Web Services Interoperability -- WS-I Simple SOAP Binding Profile Version 1.0	2008	WP2	Task 2.2
ETSI	TS 103 315	SmartM2M; Machine-to-Machine communications (M2M); Interoperability Test Specification for ETSI M2M Primitive	2015	WP2	Task 2.2
IEEE	1420.1	IEEE Standard for Information Technology - Software Reuse - Data Model for Reuse Library Interoperability: Basic Interoperability Data Model (BIDM)	1995	WP2	Task 2.2
ISO	29362	Information technology -- Web Services Interoperability -- WS-I Attachments Profile Version 1.0	2008	WP2	Task 2.2
ISO	29361	Information technology -- Web Services Interoperability -- WS-I Basic Profile Version 1.1	2008	WP2	Task 2.2
ISO	AWI 19941	Information Technology -- Cloud Computing -- Interoperability and Portability	2014	WP2	Task 2.2
ISO	29182-7	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 7: Interoperability guidelines	2015	WP2	Task 2.2
IEEE	2030.2	IEEE Guide for the Interoperability of Energy Storage Systems Integrated with the Electric Power Infrastructure	2015	WP2	Task 2.2
IEEE	1904.1	IEEE Standard for Service Interoperability in Ethernet Passive Optical Networks (SIEPON)	2013	WP2	Task 2.2
DEF	23-09	Generic Vehicle Architecture (GVA)	2010	WP2	Task 2.2
ISO	8802-3	Standard for Ethernet	2014	WP2	Task 2.2
ISO	9506-2	Industrial automation systems -- Manufacturing Message Specification -- Part 2: Protocol specification	2003	WP2	Task 2.2
ISO	9506-1	Industrial automation systems -- Manufacturing Message Specification -- Part 1: Service definition	2003	WP2	Task 2.2



IEC	61850-8-1	Communication networks and systems in substations - Part 8-1: Specific Communication Service Mapping (SCSM) - Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3	2004	WP2	Task 2.2
IEC	61850-7-2	Communication networks and systems for power utility automation - Part 7-2: Basic information and communication structure - Abstract communication service interface (ACSI)	2010	WP2	Task 2.2
IEC	61850-7-3	Communication networks and systems in substations - Part 7-3: Basic communication structure for substation and feeder equipment - Common data classes	2003	WP2	Task 2.2
IEC	61850-5	Communication networks and systems in substations - Part 5: Communication requirements for functions and device models	2003	WP2	Task 2.2
IEC	61850-6	Communication networks and systems for power utility automation - Part 6: Configuration description language for communication in electrical substations related to IEDs	2009	WP2	Task 2.2
IEC	61850-7-1	Communication networks and systems in substations - Part 7-1: Basic communication structure for substation and feeder equipment - Principles and models	2003	WP2	Task 2.2
IEEE	1636.2	Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA): Exchanging Maintenance Action Information via the Extensible Markup Language (XML)	2010	WP2	Task 2.2
IEC	61970-1	Energy management system application program interface (EMS-API) - Part 1: Guidelines and general requirements	2005	WP2	Task 2.3
ISO	14224	Petroleum, petrochemical and natural gas industries - Collection and exchange of reliability and maintenance data for equipment	2006	WP2	Task 2.3
IEEE	730	Software quality assurance		WP2	Task 2.4
IEEE	829	Software test documentation		WP2	Task 2.4

IEEE	1012	IEEE Standard for Software Verification and Validation	2004	WP2	Task 2.4
UNI	11069	Maintenance - Maintenance ratios for the vehicles in service on road, with limited distances to be covered and frequent stops	2003	WP2	Use-case 2.1
ISO	26262-1	Road vehicles -- Functional safety -- Part 1: Vocabulary	2011	WP2	Use-case 2.1
ETSI	TR 102 898	Machine to Machine communications (M2M); Use cases of Automotive Applications in M2M capable networks	2013	WP2	Use-case 2.1
ISO	15118-1	Road vehicles -- Vehicle to grid communication interface -- Part 1: General information and use-case definition	2013	WP2	Use-case 2.1
ETSI	EN 302 515	Global System for Mobile communication (GSM);Requirements for GSM operation on railways	2005	WP2	Use-case: 2.2
CENELEC	EN 50239:1999/AC:2012	Railway applications - Radio remote control system of traction vehicle for freight traffic	1999	WP2	Use-case: 2.2
CENELEC	CLC/TR 50451:2007	Railway applications - Systematic allocation of safety integrity requirements	2007	WP2	Use-case: 2.2
CENELEC	EN 50125-3:2003/corrigendum May 2010	Railway applications - Environmental conditions for equipment - Part 3: Equipment for signalling and telecommunications	2003	WP2	Use-case: 2.2
ETSI	TR 102 281	Railways Telecommunications (RT);Global System for Mobile communications (GSM);Detailed requirements for GSM operation on Railways	2015	WP2	Use-case: 2.2
CENELEC	EN 50159	Railway applications - Communication, signalling and processing systems - Safety-related communication in transmission systems	2010	WP2	Use-case: 2.2
CENELEC	CLC/TS 50459-1	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 1: General principles for the presentation of ERTMS/ETCS/GSM-R information	2015	WP2	Use-case: 2.2

IEC	62279	Railway applications - Communications, signalling and processing systems - Software for railway control and protection systems	2002	WP2	Use-case: 2.2
CENELEC	CLC/TS 50459-3	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 3: Ergonomic arrangements of ERTMS/GSM-R information	2005	WP2	Use-case: 2.2
ISO	2017-2	Mechanical vibration and shock -- Resilient mounting systems -- Part 2: Technical information to be exchanged for the application of vibration isolation associated with railway systems	2007	WP2	Use-case: 2.2
CENELEC	CLC/TS 50459-2	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 2: Ergonomic arrangements of ERTMS/ETCS information	2005	WP2	Use-case: 2.2
CENELEC	CLC/TR 50459-7	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine interface - Part 7: Specific Transmission Modules	2007	WP2	Use-case: 2.2
CENELEC	EN 50578	Railways applications - Direct current signalling relays	2013	WP2	Use-case: 2.2
CENELEC	EN 50617-1	Railway applications - Technical parameters of train detection systems for the interoperability of the trans-European railway system - Part 1: Track circuits	2015	WP2	Use-case: 2.2
CENELEC	EN 50617-2	Railway Applications - Technical parameters of train detection systems for the interoperability of the trans-European railway system - Part 2: Axle counters	2015	WP2	Use-case: 2.2
CENELEC	CLC/TR 50507	Railway applications - Interference limits of existing track circuits used on European railways	2007	WP2	Use-case: 2.2
CENELEC	CLC/TR 50506-2	Railway applications - Communication, signalling and processing systems - Application Guide for EN 50129 - Part 2: Safety assurance	2009	WP2	Use-case: 2.2

CENELEC	CLC/TS 50459-4:2005	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 4: Data entry for the ERTMS/ETCS/GSM-R systems	2005	WP2	Use-case: 2.2
CENELEC	EN 50129:2003/corrigendum May 2010	Railway applications - Communication, signalling and processing systems - Safety related electronic systems for signalling	2003	WP2	Use-case: 2.2
CENELEC	CLC/TS 50459-5:2005	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 5: Symbols	2005	WP2	Use-case: 2.2
CENELEC	EN 50128:2011/AC	Railway applications - Communication, signalling and processing systems - Software for railway control and protection systems	2014	WP2	Use-case: 2.2
CENELEC	EN 50128:2011	Railway applications - Communication, signalling and processing systems - Software for railway control and protection systems	2011	WP2	Use-case: 2.2
CENELEC	CLC/TS 50459-6	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 6: Audible information	2005	WP2	Use-case: 2.2
UNI	11134	Maintenance - Maintenance ratios for the group transportation field	2005	WP2	Use-case: 2.2
UNI	11178	Maintenance - Maintenance ratios - Guidance for the application of UNI 10388 in the field of the infrastructures of the group transportation on railways	2006	WP2	Use-case: 2.2
CENELEC	CLC/TR 50511	Railway applications - Communications, signalling and processing systems - ERTMS/ETCS - External signalling for lines equipped with ERTMS/ETCS Level 2	2007	WP2	Use-case: 2.2
CENELEC	CLC/TR 50506-1	Railway applications - Communication, signalling and processing systems - Application Guide for EN 50129 - Part 1: Cross-acceptance	2007	WP2	Use-case: 2.2

### 3.3 Standards related to WP3

Table 17. Possible standards related to WP3.

Standard Organization	Number	Title	Publishing Year	Work Package	Task
ISO	2017-1	Mechanical vibration and shock -- Resilient mounting systems -- Part 1: Technical information to be exchanged for the application of isolation systems	2005	WP3	Task 3.1
ETSI	ES 202 951	Methods for Testing and Specification (MTS); Model-Based Testing (MBT); Requirements for Modelling Notations	2011	WP3	Task 3.1
NF	NF X 50-501	Maintenance - Reference conditions for items : Vocabulary of renovation and reconstruction activities (Durée de vie et durabilité des biens - Vocabulaire des activités de rénovation et de reconstruction - États de référence des biens de r�emploi)	2007	WP3	Task 3.1
ISO	29182-5	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 5: Interface definitions	2013	WP3	Task 3.2
IEC	61163-2	Reliability stress screening - Part 2: Electronic components	1998	WP3	Task 3.2
ISO	29182-3	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 3: Reference architecture views	2014	WP3	Task 3.2
ISO	29182-2	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 2: Vocabulary and terminology	2013	WP3	Task 3.2
ISO	29182-1	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 1: General overview and requirements	2013	WP3	Task 3.2
ISO	7626-1	Mechanical vibration and shock -- Experimental determination of mechanical mobility -- Part 1: Basic terms and definitions, and transducer specifications	2011	WP3	Task 3.2
ISO	30128	Information technology -- Sensor networks -- Generic Sensor Network Application Interface	2014	WP3	Task 3.2
IEC	61131-9	Programmable controllers - Part 9: Single-drop digital communication interface for small sensors and	2013	WP3	Task 3.2

		actuators (SDCI)			
ISO	2954	Mechanical vibration of rotating and reciprocating machinery -- Requirements for instruments for measuring vibration severity	2012	WP3	Task 3.2
ISO	29182-6	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 6: Applications	2014	WP3	Task 3.2
UNE	EN 61131-9	Programmable controllers - Part 9: Single-drop digital communication interface for small sensors and actuators (SDCI)	2013	WP3	Task 3.2
UNE	EN 61757-1	Fibre optic sensors - Part 1: Generic specification	2012	WP3	Task 3.2
IEEE	1451.7	IEEE Standard for Smart Transducer Interface for Sensors and Actuators-- Transducers to Radio Frequency Identification (RFID) Systems Communication Protocols and Transducer Electronic Data Sheet Formats	2010	WP3	Task 3.2
IEEE	2700	IEEE Standard for Sensor Performance Parameter Definitions	2014	WP3	Task 3.2
ISO	5348	Mechanical vibration and shock -- Mechanical mounting of accelerometers	1998	WP3	Task 3.2
ISO	30101	Information technology -- Sensor networks: Sensor network and its interfaces for smart grid system	2014	WP3	Task 3.2
ISO	20005	Information technology -- Sensor networks -- Services and interfaces supporting collaborative information processing in intelligent sensor networks	2013	WP3	Task 3.2
ISO	29182-4	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 4: Entity models	2013	WP3	Task 3.2
IEEE	21451-7	Information technology--Smart transducer interface for sensors and actuators--Part 7: Transducers to radio frequency identification (RFID) systems communication protocols and transducer electronic data sheet (TEDS) formats	2011	WP3	Task 3.3
ETSI	TR 102 691	Machine-to-Machine communications (M2M); Smart Metering Use Cases	2010	WP3	Task 3.4
IEEE	1902.1	IEEE Standard for Long Wavelength Wireless Network Protocol	2009	WP3	Task 3.5

IEC	61400-25-1	Wind turbines - Part 25-1: Communications for monitoring and control of wind power plants - Overall description of principles and models	2006	WP3	Task 3.6
IEEE	1451.1	IEEE Standard for a Smart Transducer Interface for Sensors and Actuators - Network Capable Application Processor Information Model	1999	WP3	Task 3.6
IEC	61400-21	Wind turbines - Part 21: Measurement and assessment of power quality characteristics of grid connected wind turbines	2008	WP3	Use-case 3.1
IEC	TS 61400-14	Wind turbines - Part 14: Declaration of apparent sound power level and tonality values	2005	WP3	Use-case 3.1
IEC	61400-23	Wind turbines - Part 23: Full-scale structural testing of rotor blades	2014	WP3	Use-case 3.1
IEC	61400-1	Wind turbines - Part 1: Design requirements	2005	WP3	Use-case 3.1
IEC	61400-22	Wind turbines - Part 22: Conformity testing and certification	2010	WP3	Use-case 3.1
IEC	TS 61400-13	Wind turbine generator systems - Part 13: Measurement of mechanical loads	2001	WP3	Use-case 3.1
IEC	61400-12-2	Wind turbines - Part 12-2: Power performance of electricity-producing wind turbines based on nacelle anemometry	2013	WP3	Use-case 3.1
IEC	61400-12-1	Wind turbines - Part 12-1: Power performance measurements of electricity producing wind turbines	2005	WP3	Use-case 3.1
IEC	61400-11	Wind turbines - Part 11: Acoustic noise measurement techniques	2012	WP3	Use-case 3.1
IEC	61400-4	Wind turbines -- Part 4: Design requirements for wind turbine gearboxes	2012	WP3	Use-case 3.1
IEC	61400-3	Wind turbines - Part 3: Design requirements for offshore wind turbines	2009	WP3	Use-case 3.1
IEC	61400-2	Wind turbines - Part 2: Small wind turbines	2013	WP3	Use-case 3.1
IEC	61400-24	Wind turbines - Part 24: Lightning protection	2010	WP3	Use-case 3.1

### 3.4 Standards related to WP4

Table 18. Possible standards related to WP4.

Standard Organization	Number	Title	Publishing Year	Work Package	Task
UNE	EN 16602-40-12	Space product assurance - Fault tree analysis - Adoption notice ECSS/IEC 61025	2014	WP4	Task 4.1
IEC	61709	Electric components - Reliability - Reference conditions for failure rates and stress models for conversion	2011	WP4	Task 4.1
ISO	7919-1	Mechanical vibration of non-reciprocating machines -- Measurements on rotating shafts and evaluation criteria -- Part 1: General guidelines	1996	WP4	Task 4.1
IEEE	1415	IEEE Guide for Induction Machinery Maintenance Testing and Failure Analysis	2006	WP4	Task 4.1
IEC	61649	Weibull analysis	2008	WP4	Task 4.1
IEEE	C57.125	IEEE Approved Draft Guide for Failure Investigation, Documentation, Analysis, and Reporting for Power Transformers and Shunt Reactors	2015	WP4	Task 4.1
CENELEC	EN 61025	Fault tree analysis (FTA)	2007	WP4	Task 4.1
ISO	13373-2	Condition monitoring and diagnostics of machines -- Vibration condition monitoring -- Part 2: Processing, analysis and presentation of vibration data	2005	WP4	Task 4.1
ISO	13374-1	Condition monitoring and diagnostics of machines -- Data processing, communication and presentation -- Part 1: General guidelines	2003	WP4	Task 4.1
ISO	13374-2	Condition monitoring and diagnostics of machines -- Data processing, communication and presentation -- Part 2: Data processing	2007	WP4	Task 4.1
VDI	2889	Methods and systems for condition and process monitoring in maintenance	1998	WP4	Task 4.1
PSK	5704	Condition monitoring. Vibration measurement. Acceptance test and vibration severity limits	2013	WP4	Task 4.1
IEC	61124	Reliability testing - Compliance tests for constant failure rate and constant failure intensity	2012	WP4	Task 4.1



ISO	17359	Condition monitoring and diagnostics of machines -- General guidelines	2011	WP4	Task 4.1
IEC	61025	Fault tree analysis (FTA)	2006	WP4	Task 4.1
NF	NF X60-000	Maintenance function	2002	WP4	Task 4.2
VDI	2888	Maintenance condition monitoring	1999	WP4	Task 4.2
ISO	13381-1	Condition monitoring and diagnostics of machines -- Prognostics -- Part 1: General guidelines	2015	WP4	Task 4.2
IEC	61165	Application of Markov techniques	2006	WP4	Task 4.2
ISO	13372	Condition monitoring and diagnostics of machines -- Vocabulary	2012	WP4	Task 4.2
ISO	13373-1	Condition monitoring and diagnostics of machines -- Vibration condition monitoring -- Part 1: General procedures	2002	WP4	Task 4.2
IEC	61070	Compliance test procedures for steady-state availability	1991	WP4	Task 4.2
ISO	10816-3	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 3: Industrial machines with nominal power above 15 kW and nominal speeds between 120 r/min and 15 000 r/min when measured in situ	2009	WP4	Task 4.3
ISO	13379-1	Condition monitoring and diagnostics of machines -- Data interpretation and diagnostics techniques -- Part 1: General guidelines	2012	WP4	Task 4.3
ISO	1940-1	Mechanical vibration -- Balance quality requirements for rotors in a constant (rigid) state -- Part 1: Specification and verification of balance tolerances	2003	WP4	Task 4.3
CENELEC	EN 60034-14:2004/A1	Rotating electrical machines - Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of vibration severity	2007	WP4	Task 4.3
ISO	22266-1	Mechanical vibration -- Torsional vibration of rotating machinery -- Part 1: Land-based steam and gas turbine generator sets in excess of 50 MW	2009	WP4	Task 4.3
ISO	14694	Industrial fans -- Specifications for balance quality and vibration levels	2003	WP4	Task 4.3

ISO	14695	Industrial fans -- Method of measurement of fan vibration	2003	WP4	Task 4.3
ISO	10816-7	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 7: Rotodynamic pumps for industrial applications, including measurements on rotating shafts	2009	WP4	Task 4.3
ISO	8579-2	Acceptance code for gears -- Part 2: Determination of mechanical vibrations of gear units during acceptance testing	1993	WP4	Task 4.3
ISO	13380	Condition monitoring and diagnostics of machines -- General guidelines on using performance parameters	2002	WP4	Task 4.3
ISO	2041	Mechanical vibration, shock and condition monitoring -- Vocabulary	2009	WP4	Task 4.3
ISO	18434-1	Condition monitoring and diagnostics of machines -- Thermography -- Part 1: General procedures	2008	WP4	Task 4.3
ISO	1996-2	Acoustics -- Description, measurement and assessment of environmental noise -- Part 2: Determination of environmental noise levels	2007	WP4	Task 4.3
ISO	1680	Acoustics -- Test code for the measurement of airborne noise emitted by rotating electrical machines	2013	WP4	Task 4.3
ISO	21940-14	Mechanical vibration -- Rotor balancing -- Part 14: Procedures for assessing balance errors	2012	WP4	Task 4.3
ISO	1925	Mechanical vibration -- Balancing -- Vocabulary	2001	WP4	Task 4.3
CEN	EN 16646:2014	Maintenance - Maintenance within physical asset management	2014	WP4	Task 4.3
IEEE	307	IEEE Standard Definitions of Terms For Solar Cells	1969	WP4	Task 4.3
UNE	EN 16602-30-02	Space product assurance - Failure modes, effects (and criticality) analysis (FMEA/FMECA)	2014	WP4	Task 4.3
UNE	EN 60068-2-65	Environmental testing - Part 2-65: Tests - Test Fg: Vibration - Acoustically induced method	2013	WP4	Task 4.3
ISO	29821-1	Condition monitoring and diagnostics of machines -- Ultrasound -- Part 1: General guidelines	2011	WP4	Task 4.3

ISO	20958	Condition monitoring and diagnostics of machine systems -- Electrical signature analysis of three-phase induction motors	2013	WP4	Task 4.3
ISO	18129	Condition monitoring and diagnostics of machines -- Approaches for performance diagnosis	2015	WP4	Task 4.3
ISO	13379-2	Condition monitoring and diagnostics of machines -- Data interpretation and diagnostics techniques -- Part 2: Data-driven applications	2015	WP4	Task 4.3
ISO	1996-1	Acoustics -- Description, measurement and assessment of environmental noise -- Part 1: Basic quantities and assessment procedures	2003	WP4	Task 4.3
IEC	61650	Reliability data analysis techniques - Procedures for comparison of two constant failure rates and two constant failure (event) intensities	1997	WP4	Task 4.3
ISO	8569	Mechanical vibration and shock -- Measurement and evaluation of shock and vibration effects on sensitive equipment in buildings	1996	WP4	Task 4.3
IEEE	1522	IEEE Standard for Testability and Diagnosability Characteristics and Metrics	2004	WP4	Task 4.3
ISO	22096	Condition monitoring and diagnostics of machines -- Acoustic emission	2007	WP4	Task 4.3
ISO	21940-31	Mechanical vibration -- Rotor balancing -- Part 31: Susceptibility and sensitivity of machines to unbalance	2013	WP4	Task 4.3
ISO	10816-1	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 1: General guidelines	1995	WP4	Task 4.3
IEC	60300-3-2	Dependability management - Part 3-2: Application guide - Collection of dependability data from the field	2004	WP4	Task 4.3
ISO	8528-9	Reciprocating internal combustion engine driven alternating current generating sets -- Part 9: Measurement and evaluation of mechanical vibrations	1995	WP4	Task 4.3
ISO	10816-4	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 4: Gas turbine sets with fluid-film bearings	2009	WP4	Task 4.3

ISO	10816-5	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 5: Machine sets in hydraulic power generating and pumping plants	2000	WP4	Task 4.3
ISO	10816-6	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 6: Reciprocating machines with power ratings above 100 kW	1995	WP4	Task 4.3
ISO	20283-2	Mechanical vibration -- Measurement of vibration on ships -- Part 2: Measurement of structural vibration	2008	WP4	Task 4.3
ISO	10817-1	Rotating shaft vibration measuring systems -- Part 1: Relative and absolute sensing of radial vibration	1998	WP4	Task 4.3
ISO	11342	Mechanical vibration -- Methods and criteria for the mechanical balancing of flexible rotors	1998	WP4	Task 4.3
IEC	60605-4	Equipment reliability testing - Part 4: Statistical procedures for exponential distribution - Point estimates, confidence intervals, prediction intervals and tolerance intervals	2001	WP4	Task 4.3
IEC	60605-6	Equipment reliability testing - Part 6: Tests for the validity and estimation of the constant failure rate and constant failure intensity	2007	WP4	Task 4.3
IEC	60812	Analysis techniques for system reliability - Procedure for failure mode and effects analysis (FMEA)	2006	WP4	Task 4.3
ISO	10816-2	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 2: Land-based steam turbines and generators in excess of 50 MW with normal operating speeds of 1 500 r/min, 1 800 r/min, 3 000 r/min and 3 600 r/min	2009	WP4	Task 4.3
ISO	7919-5	Mechanical vibration -- Evaluation of machine vibration by measurements on rotating shafts -- Part 5: Machine sets in hydraulic power generating and pumping plants	2005	WP4	Task 4.3
ISO	7919-4	Mechanical vibration -- Evaluation of machine vibration by measurements on rotating shafts -- Part 4: Gas turbine sets with fluid-film bearings	2009	WP4	Task 4.3

ISO	7919-3	Mechanical vibration -- Evaluation of machine vibration by measurements on rotating shafts -- Part 3: Coupled industrial machines	2009	WP4	Task 4.3
ISO	8297	Acoustics -- Determination of sound power levels of multisource industrial plants for evaluation of sound pressure levels in the environment -- Engineering method	1994	WP4	Task 4.3
IEEE	1232.3	IEEE Guide for the Use of Artificial Intelligence Exchange and Service Tie to All Test Environments (AI-ESTATE)	2014	WP4	Task 4.3
IEC	60706-3	Maintainability of equipment - Part 3: Verification and collection, analysis and presentation of data	2006	WP4	Task 4.3
ISO	7919-2	Mechanical vibration -- Evaluation of machine vibration by measurements on rotating shafts -- Part 2: Land-based steam turbines and generators in excess of 50 MW with normal operating speeds of 1 500 r/min, 1 800 r/min, 3 000 r/min and 3 600 r/min	2009	WP4	Task 4.3
IEC	61710	Power law model - Goodness-of-fit tests and estimation methods	2013	WP4	Task 4.3
IEC	61164	Reliability growth - Statistical test and estimation methods	2004	WP4	Task 4.4
UNI	10144	Classification of maintenance services	2006	WP4	Task 4.4
BSI	15221-2	Facility management. Guidance on how to prepare facility management agreements	2006	WP4	Task 4.4
UNI	10224	Maintenance - Process, sub-processes and main activities - Fundamental principles	2007	WP4	Task 4.4
UNI	10145	Definition of evaluation factors of services maintenance firms	2007	WP4	Task 4.4
NEN	2767-3	Condition Assessment of Building and Installation Components □ Part 3: Aggregation of Condition Scores	2009	WP4	Task 4.4
NEN	2767-2	Condition Assessment of Building and Installation Components □ Part 2: List of Faults	2008	WP4	Task 4.4
IEC	61810-1	Electromechanical elementary relays - Part 1: General and safety requirements	2015	WP4	Task 4.4
DIN	2891	MAINTENANCE RELEVANT CRITERIA FOR PURCHASE OF MACHINES	2008	WP4	Task 4.4

UNI	10147	Maintenance - Additional terms and definitions to EN 13306	2003	WP4	Task 4.4
NEN	2767-1	Condition Assessment of Building and Installation Components □ Part 1: Methodology	2011	WP4	Task 4.4
UNI	11082	Maintenance - Specific terminology for the group transportation field	2003	WP4	Task 4.4
IEC	61163-1	Reliability stress screening - Part 1: Repairable assemblies manufactured in lots	2006	WP4	Task 4.4
BSI	15221-1	Facility Management - Part 1: Terms and definitions	2006	WP4	Task 4.4
UNI	10749-1	Maintenance - Guidelines for management of maintenance materials - General aspects and organizational problems	2003	WP4	Task 4.4
UNI	10749-2	Maintenance - Guidelines for management of maintenance materials - Criteria for classification, codification, standardization and support	2003	WP4	Task 4.4
UNI	10749-3	Maintenance - Guidelines for management of maintenance materials - Criteria for the choice of materials to be managed	2003	WP4	Task 4.4
UNI	10749-4	Maintenance - Guidelines for management of maintenance materials - Criteria for operational management	2003	WP4	Task 4.4
UNI	10749-5	Maintenance - Guidelines for management of maintenance materials - Criteria for purchasing, tests and final check	2003	WP4	Task 4.4
UNI	10749-6	Maintenance - Guidelines for management of maintenance materials - Administration criteria	2003	WP4	Task 4.4
UNI	11063	Maintenance - Definitions of ordinary and extraordinary maintenance	2003	WP4	Task 4.4
IEC	62402	Obsolescence management - Application guide	2007	WP4	Task 4.4
CENELEC	EN 60300-3-16	Dependability management - Part 3-16: Application guide - Guidelines for specification of maintenance support services	2008	WP4	Task 4.4
CENELEC	EN 60706-2	Maintainability of equipment - Part 2: Maintainability requirements and studies during the design and development phase	2006	WP4	Task 4.4

CENELEC	EN 60706-3	Maintainability of equipment - Part 3: Verification and collection, analysis and presentation of data	2006	WP4	Task 4.4
CENELEC	EN 60706-5	Maintainability of equipment - Part 5: Testability and diagnostic testing	2007	WP4	Task 4.4
CENELEC	25	Analysis techniques for system reliability - Procedure for failure mode and effects analysis (FMEA)	2006	WP4	Task 4.4
CENELEC	EN 61014	Programmes for reliability growth	2003	WP4	Task 4.4
CENELEC	EN 60300-3-15:2009	Dependability management - Part 3-15: Application guide - Engineering of system dependability	2009	WP4	Task 4.4
UNI	10831-1	Maintenance of buildings - Documentation and basic information for maintenance services of projects approved and executed - Structure, contents and levels of documentation	1999	WP4	Task 4.4
IEEE	3006.7	IEEE Recommended Practice for Determining the Reliability of 7x24 Continuous Power Systems in Industrial and Commercial Facilities	2013	WP4	Task 4.4
IEC	61123	Reliability testing - Compliance test plans for success ratio	1991	WP4	Task 4.4
IEEE	1808	IEEE Guide for Collecting and Managing Transmission Line Inspection and Maintenance Data	2011	WP4	Task 4.4
UNI	10604	Maintenance. Criteria for design, management and control of the maintenance services of building	1997	WP4	Task 4.4
IEC	61882	Hazard and operability studies (HAZOP studies) - Application guide	2001	WP4	Task 4.4
SAE International	JA1012'201108	A Guide to the Reliability-Centered Maintenance (Rcm) Standard	2011	WP4	Task 4.4
IEC	61810-2	Electromechanical elementary relays - Part 2: Reliability	2011	WP4	Task 4.4
UNI	10366	Maintenance - Design criteria of maintenance	2007	WP4	Task 4.4
UNI	10992	Maintenance budget for manufacturers and suppliers of products and services - Guidelines for the definition, approval, management and check	2002	WP4	Task 4.4
UNI	11282	Maintenance of the group transportation vehicles - Appraisal and evaluation of the condition of the	2008	WP4	Task 4.4

		vehicles in service on road			
UNI	11257	Maintenance of buildings - Criteria for the drafting of plan and programme of maintenance of buildings □ Guidelines	2007	WP4	Task 4.4
SAE International	JA1011'200908	Evaluation Criteria for Reliability-Centered Maintenance (RCM) Processes	2009	WP4	Task 4.4
IEC	61078	Analysis techniques for dependability - Reliability block diagram and boolean methods	2006	WP4	Task 4.4
CENELEC	EN 61078	Analysis techniques for dependability - Reliability block diagram and boolean methods	2006	WP4	Task 4.4
CENELEC	EN 60300-3-4	Dependability management - Part 3-4: Application guide - Guide to the specification of dependability requirements	2008	WP4	Task 4.4
ISO	21940-32	Mechanical vibration -- Rotor balancing -- Part 32: Shaft and fitment key convention	2012	WP4	Task 4.4
ISO	8626	Servo-hydraulic test equipment for generating vibration -- Method of describing characteristics	1989	WP4	Task 4.4
ISO	7626-5	Vibration and shock -- Experimental determination of mechanical mobility -- Part 5: Measurements using impact excitation with an exciter which is not attached to the structure	1994	WP4	Task 4.4
ISO	7626-2	Mechanical vibration and shock -- Experimental determination of mechanical mobility -- Part 2: Measurements using single-point translation excitation with an attached vibration exciter	2015	WP4	Task 4.4
CENELEC	EN 61160	Design review	2005	WP4	Task 4.4
CENELEC	EN 31010	Risk management - Risk assessment techniques	2010	WP4	Task 4.4
CENELEC	EN 60300-3-14	Dependability management - Part 3-14: Application guide - Maintenance and maintenance support	2004	WP4	Task 4.4
BSI	13460	Maintenance. Documentation for maintenance	2009	WP4	Task 4.4



CENELEC	EN 60300-3-11	Dependability management - Part 3-11: Application guide - Reliability centred maintenance	2009	WP4	Task 4.4
IEC	60300-3-1	Dependability management □ Part 3-1: Application guide □ Analysis techniques for dependability □ Guide on methodology	2003	WP4	Task 4.4
CENELEC	EN 60300-3-3	Dependability management - Part 3-3: Application guide - Life cycle costing	2004	WP4	Task 4.4
CENELEC	EN 60300-3-2	Dependability management - Part 3-2: Application guide - Collection of dependability data from the field	2005	WP4	Task 4.4
CENELEC	EN 60300-3-1	Dependability management - Part 3-1: Application guide - Analysis techniques for dependability - Guide on methodology	2004	WP4	Task 4.4
CENELEC	EN 60300-1	Dependability management - Part 1: Guidance for management and application	2014	WP4	Task 4.4
GOST	27.402-95	Reliability in technics. Compliance test plans for mean time between failures (to failure). Part 1. Exponential case	1997	WP4	Task 4.4
CENELEC	EN 61124	Reliability testing - Compliance tests for constant failure rate and constant failure intensity	2012	WP4	Task 4.4
VDI	2892	Management of maintenance spare parts	2006	WP4	Task 4.4
CENELEC	EN 60300-3-12	Dependability management - Part 3-12: Application guide - Integrated logistic support	2011	WP4	Task 4.4
IEC	60300-3-10	Dependability management - Part 3-10: Application guide - Maintainability	2001	WP4	Task 4.4
ISO	55000	Asset Management Standard: What Maintenance Reliability Professionals Should Expect	2015	WP4	Task 4.4
IEC	60605-2	Equipment reliability testing - Part 2: Design of test cycles	1994	WP4	Task 4.4
IEC	61163-1	Reliability stress screening - Part 1: Repairable assemblies manufactured in lots	2006	WP4	Task 4.4
IEC	60300-3-5	Dependability management - Part 3-5: Application guide - Reliability test conditions and statistical test principles	2001	WP4	Task 4.4
IEC	60300-3-12	Dependability management - Part 3-12: Application guide - Integrated	2011	WP4	Task 4.4

		logistic support			
IEC	60300-3-14	Dependability management - Part 3-14: Application guide - Maintenance and maintenance support	2004	WP4	Task 4.4
IEC	60300-3-11	Dependability management - Part 3-11: Application guide - Reliability centred maintenance	2009	WP4	Task 4.4
IEC	60300-1	Dependability management - Part 1: Guidance for management and application	2014	WP4	Task 4.4
IEC	60706-2	Maintainability of equipment - Part 2: Maintainability requirements and studies during the design and development phase	2006	WP4	Task 4.4
IEC	60050-191	International Electrotechnical Vocabulary. Chapter 191: Dependability and quality of service	1990	WP4	Task 4.4
IEC	61014	Programmes for reliability growth	2003	WP4	Task 4.4
IEC	62309	Dependability of products containing reused parts - Requirements for functionality and tests	2004	WP4	Task 4.4
IEC	60300-3-15	Dependability management - Part 3-15: Application guide - Engineering of system dependability	2009	WP4	Task 4.4
IEC	61703	Mathematical expressions for reliability, availability, maintainability and maintenance support terms	2001	WP4	Task 4.4
IEC	61160	Design review	2005	WP4	Task 4.4
IEC	60319	Presentation and specification of reliability data for electronic components	1999	WP4	Task 4.4
IEC	60300-3-4	Dependability management - Part 3-4: Application guide - Guide to the specification of dependability requirements	2007	WP4	Task 4.4
BSI	13306	Maintenance terminology	2001	WP4	Task 4.4
IEC	60706-5	Maintainability of equipment - Part 5: Testability and diagnostic testing	2007	WP4	Task 4.4
IEC	62508	Guidance on human aspects of dependability	2010	WP4	Task 4.4
NF	NF X60-200	Technical documentations associated with an item throughout its life cycle	2008	WP4	Task 4.4
PAS	55-2	Guidelines for the application of PAS	2008	WP4	Task

		55-1			4.4
PAS	55-1	Specification for the optimized management of physical assets	2008	WP4	Task 4.4
CDM	9780717666263	The Construction (Design & Management) Regulations	2015	WP4	Task 4.4
UNI	10449	Maintenance - Criteria to prepare and to manage the permit to work	2008	WP4	Task 4.4
DIN	31051	Fundamentals of maintenance. (Grundlagen der Instandhaltung)	2012	WP4	Task 4.4
PSK	6202	Condition audit in process industry	2003	WP4	Task 4.4
BSI	15341	Maintenance. Maintenance key performance indicators	2007	WP4	Task 4.4
TAPPI	10685	Maintenance - Criteria to prepare a maintenance global service	2007	WP4	Task 4.4
VDI	2886	Benchmarking applied to maintenance	2003	WP4	Task 4.4
UNI	10652	Maintenance - Appraisal and evaluation of the goods condition	2009	WP4	Task 4.4
PSK	7901	Maintenance in industry. Service agreement	2001	WP4	Task 4.4
UNI	11136	Global service for maintenance of buildings - Guidelines	2004	WP4	Task 4.4
UNI	10148	Maintenance - Management of a maintenance contract	2007	WP4	Task 4.4
UNI	10146	Criteria to prepare a contract for supplying maintenance finalized services	2007	WP4	Task 4.4
UNI	11420	Maintenance - Qualification of maintenance personnel	2011	WP4	Task 4.4
UNI	10874	Maintenance of buildings - Criteria in order to write maintenance and use manuals	2000	WP4	Task 4.4
PSK	7502	Key performance indicators of logistics. Material function	2002	WP4	Task 4.4
UNI	10831-2	Maintenance of buildings - Documentation and basic information for maintenance services of projects approved and executed - Details of content of technical documentation and lay-out models	2001	WP4	Task 4.4
NF	NF X 60-012	Vocabulary of components of items and their supply (Termes et définitions des éléments constitutifs et de leurs approvisionnements pour les biens durables)	2006	WP4	Task 4.4

NF	NF X60-008	Industrial maintenance - Maintenance outsourcing draft guide - Pre-contractual approach	2013	WP4	Task 4.4
UNE	60079-17	Explosive atmospheres - Part 17: Electrical installations inspection and maintenance	2014	WP4	Task 4.4
ISO	18436-5	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 5: Lubricant laboratory technician/analyst	2012	WP4	Task 4.4
ISO	18436-8	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 8: Ultrasound	2013	WP4	Task 4.4
UNE	EN 60721-2-9	Classification of environmental conditions - Part 2-9: Environmental conditions appearing in nature - Measured shock and vibration data - Storage, transportation and in-use	2014	WP4	Task 4.4
UNE	EN 61850-7-410	Communication networks and systems for power utility automation - Part 7-410: Basic communication structure - Hydroelectric power plants - Communication for monitoring and control	2013	WP4	Task 4.4
NF	NF X60-100	Maintenance □ Preconditions to the maintenance contracts □ Inventories and evaluation for the states of items	2007	WP4	Task 4.4
BSI	13269	Maintenance. Guideline on preparation of maintenance contracts	2006	WP4	Task 4.4
NF	NF X 60-212	Maintenance - Handbook of instructions maintenance -Definitions and general principles for the wording and layout	1983	WP4	Task 4.4
CEN	15331	Criteria for design, management and control of maintenance services for buildings	2005	WP4	Task 4.4
CEN	15628	Maintenance - Qualification of Maintenance personnel	2007	WP4	Task 4.4
ISO	2314	Gas turbines -- Acceptance tests	2009	WP4	Task 4.4
ISO	18436-1	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 1: Requirements for assessment bodies and the assessment process	2012	WP4	Task 4.5

ISO	18436-7	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 7: Thermography	2014	WP4	Task 4.5
ISO	18436-6	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 6: Acoustic emission	2014	WP4	Task 4.5
ISO	18436-4	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 4: Field lubricant analysis	2014	WP4	Task 4.5
ISO	18436-2	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 2: Vibration condition monitoring and diagnostics	2014	WP4	Task 4.5
ISO	18436-3	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 3: Requirements for training bodies and the training process	2012	WP4	Task 4.5

### 3.5 Standards related to WP5

**Table 19. Possible standards related to WP5.**

Standard Organization	Number	Title	Publishing Year	Work Package	Task
ISO	9241-13	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 13: User guidance	1998	WP5	Task 5.3
ISO	9241-400	Ergonomics of human--system interaction - - Part 400: Principles and requirements for physical input devices	2007	WP5	Task 5.4
ISO	9241-110	Ergonomics of human-system interaction -- Part 110: Dialogue principles	2006	WP5	Task 5.4
ISO	9241-210	Ergonomics of human-system interaction -- Part 210: Human-centred design for interactive systems	2010	WP5	Task 5.4
ISO	9241-2	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 2: Guidance on task requirements	1992	WP5	Task 5.4
ISO	9241-143	Ergonomics of human-system interaction -- Part 143: Forms	2012	WP5	Task 5.4
ISO	9241-6	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 6: Guidance on the work environment	1999	WP5	Task 5.4
ISO	9241-5	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 5: Workstation layout and postural requirements	1998	WP5	Task 5.4
ISO	9241-12	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 12: Presentation of information	1998	WP5	Task 5.4
ISO	9241-14	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 14: Menu dialogues	1997	WP5	Task 5.4
ISO	9241-15	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 15: Command dialogues	1997	WP5	Task 5.4
ISO	9241-16	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 16: Direct manipulation dialogues	1999	WP5	Task 5.4
ISO	9241-1	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 1: General introduction	1997	WP5	Task 5.4

ISO	9241-11	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 11: Guidance on usability	1998	WP5	Task 5.5
IEC	62429	Reliability growth - Stress testing for early failures in unique complex systems	2007	WP5	Task 5.5
MASE		Guideline for improvement of health and safety at work	2013	WP5	Task 5.5
ISO	9241-307	Ergonomics of human-system interaction -- Part 307: Analysis and compliance test methods for electronic visual displays	2008	WP5	Task 5.6
ISO	9241-305	Ergonomics of human-system interaction -- Part 305: Optical laboratory test methods for electronic visual displays	2008	WP5	Task 5.6
ISO	9241-303	Ergonomics of human-system interaction -- Part 303: Requirements for electronic visual displays	2011	WP5	Task 5.6
ISO	9241-302	Ergonomics of human-system interaction -- Part 302: Terminology for electronic visual displays	2008	WP5	Task 5.6

### 3.6 Standards related to WP6

Table 20. Possible standards related to WP6.

Standard Organization	Number	Title	Publishing Year	Work Package	Task
BSI	55002	Asset management. Management systems. Guidelines for the application of ISO 55001	2014	WP6	Task 6.1
BSI	1325	Value Management. Vocabulary. Terms and definitions	2014	WP6	Task 6.1
BSI	1325-1	Value management, value analysis, functional analysis vocabulary. Value analysis and functional analysis	1997	WP6	Task 6.1
IEC	62550	Spare parts provisioning	2015	WP6	Task 6.1
PSK	7501	Key performance indicators of maintenance for use in process industry	2010	WP6	Task 6.1
PSK	6201	Maintenance. Terms and definitions	2011	WP6	Task 6.1
SFS	13306	Maintenance. Maintenance terminology	2010	WP6	Task 6.1
BSI	55001	Asset management. Management systems. Requirements	2014	WP6	Task 6.2
SFS	15341	Maintenance. Maintenance Key Performance Indicators	2007	WP6	Task 6.2
IEC	60300-3-3	Dependability management □ Part 3-3: Application guide	2004	WP6	Task 6.3
BSI	55000	Asset management. Overview, principles and terminology	2014	WP6	Task 6.3
SFS	60300-3-14	Dependability management - Part 3-14: Application guide - Maintenance and maintenance support	2004	WP6	Task 6.3



### 3.7 Standards related to WP9

Table 21. Possible standards related to WP9.

Standard Organization	Number	Title	Publishing Year	Work Package	Task
IEC	62198	Managing risk in projects - Application guidelines	2013	WP9	Task 9.3
IEC	31010	Risk management -- Risk assessment techniques	2009	WP9	Task 9.3

## 4 Standards grouped according to standards organizations.

Table 22. All standards grouped according to standards organizations.

Standard Organization	Number	Title	Publishing Year
ANSI	62443-1-1	Security for Industrial Automation and Control Systems Part 1: Terminology, Concepts, and Models	2007
ANSI	62443-1-1	Security for Industrial Automation and Control Systems - Models and Concepts	2007
ANSI	62443-1-3	System security compliance metrics	
ANSI	62443-2-1	Security for industrial automation and control systems - Requirements for an IACS Security Management Control System	2009
ANSI	62443-3-3	Security for industrial automation and control systems Part 3-3: System security requirements and security levels	2013
ANSI	99.02.01	Security for Industrial Automation and Control Systems: Establishing an Industrial Automation and Control Systems Security Program	2009
ANSI	99.02.02	Operating an Industrial Automation and Control Systems Security Program	
ANSI	99.03.02	Security for Industrial Automation and Control Systems, Technical Requirements, Target Security Levels	2009
ANSI	TR62443-1-2	Security for Industrial Automation and Control Systems - Glossary of Terms and Abbreviations	2014
ANSI	TR62443-1-4	Security for industrial automation and control systems Security Life Cycle and Use Cases	
ANSI	TR99.02.03	Patch Management in the IACS Environment	
BSI	1325	Value Management. Vocabulary. Terms and definitions	2014
BSI	1325-1	Value management, value analysis, functional analysis vocabulary. Value analysis and functional analysis	1997
BSI	13269	Maintenance. Guideline on preparation of maintenance contracts	2006
BSI	13306	Maintenance terminology	2001
BSI	13460	Maintenance. Documentation for maintenance	2009

BSI	15221-1	Facility Management - Part 1: Terms and definitions	2006
BSI	15221-2	Facility management. Guidance on how to prepare facility management agreements	2006
BSI	15341	Maintenance. Maintenance key performance indicators	2007
BSI	55000	Asset management. Overview, principles and terminology	2014
BSI	55001	Asset management. Management systems. Requirements	2014
BSI	55002	Asset management. Management systems. Guidelines for the application of ISO 55001	2014
BSI	60079-17	Explosive atmospheres. Electrical installations inspection and maintenance	2007
CDM	9780717666263	The Construction (Design & Management) Regulations	2015
CEN	15331	Criteria for design, management and control of maintenance services for buildings	2005
CEN	15628	Maintenance - Qualification of Maintenance personnel	2007
CEN	EN 16646:2014	Maintenance - Maintenance within physical asset management	2014
CENELEC	25	Analysis techniques for system reliability - Procedure for failure mode and effects analysis (FMEA)	2006
CENELEC	CLC/TR 50451:2007	Railway applications - Systematic allocation of safety integrity requirements	2007
CENELEC	CLC/TR 50459-7	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine interface - Part 7: Specific Transmission Modules	2007
CENELEC	CLC/TR 50506-1	Railway applications - Communication, signalling and processing systems - Application Guide for EN 50129 - Part 1: Cross-acceptance	2007
CENELEC	CLC/TR 50506-2	Railway applications - Communication, signalling and processing systems - Application Guide for EN 50129 - Part 2: Safety assurance	2009
CENELEC	CLC/TR 50507	Railway applications - Interference limits of existing track circuits used on European railways	2007

CENELEC	CLC/TR 50511	Railway applications - Communications, signalling and processing systems - ERTMS/ETCS - External signalling for lines equipped with ERTMS/ETCS Level 2	2007
CENELEC	CLC/TS 50459-1	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 1: General principles for the presentation of ERTMS/ETCS/GSM-R information	2015
CENELEC	CLC/TS 50459-2	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 2: Ergonomic arrangements of ERTMS/ETCS information	2005
CENELEC	CLC/TS 50459-3	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 3: Ergonomic arrangements of ERTMS/GSM-R information	2005
CENELEC	CLC/TS 50459-4:2005	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 4: Data entry for the ERTMS/ETCS/GSM-R systems	2005
CENELEC	CLC/TS 50459-5:2005	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 5: Symbols	2005
CENELEC	CLC/TS 50459-6	Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 6: Audible information	2005
CENELEC	EN 31010	Risk management - Risk assessment techniques	2010
CENELEC	EN 50125-3:2003/corrigendum May 2010	Railway applications - Environmental conditions for equipment - Part 3: Equipment for signalling and telecommunications	2003
CENELEC	EN 50128:2011	Railway applications - Communication, signalling and processing systems - Software for railway control and protection systems	2011

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CENELEC	EN 50129:2003/corrigendum May 2010	Railway applications - Communication, signalling and processing systems - Safety related electronic systems for signalling	2003
CENELEC	EN 50159	Railway applications - Communication, signalling and processing systems - Safety-related communication in transmission systems	2010
CENELEC	EN 50239:1999/AC:2012	Railway applications - Radio remote control system of traction vehicle for freight traffic	1999
CENELEC	EN 50578	Railways applications - Direct current signalling relays	2013
CENELEC	EN 50617-1	Railway applications - Technical parameters of train detection systems for the interoperability of the trans-European railway system - Part 1: Track circuits	2015
CENELEC	EN 50617-2	Railway Applications - Technical parameters of train detection systems for the interoperability of the trans-European railway system - Part 2: Axle counters	2015
CENELEC	EN 60034-14:2004/A1	Rotating electrical machines - Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of vibration severity	2007
CENELEC	EN 60300-1	Dependability management - Part 1: Guidance for management and application	2014
CENELEC	EN 60300-3-1	Dependability management - Part 3-1: Application guide - Analysis techniques for dependability - Guide on methodology	2004
CENELEC	EN 60300-3-11	Dependability management - Part 3-11: Application guide - Reliability centred maintenance	2009
CENELEC	EN 60300-3-12	Dependability management - Part 3-12: Application guide - Integrated logistic support	2011
CENELEC	EN 60300-3-14	Dependability management - Part 3-14: Application guide - Maintenance and maintenance support	2004
CENELEC	EN 60300-3-15:2009	Dependability management - Part 3-15: Application guide - Engineering of system dependability	2009

CENELEC	EN 60300-3-16	Dependability management - Part 3-16: Application guide - Guidelines for specification of maintenance support services	2008
CENELEC	EN 60300-3-2	Dependability management - Part 3-2: Application guide - Collection of dependability data from the field	2005
CENELEC	EN 60300-3-3	Dependability management - Part 3-3: Application guide - Life cycle costing	2004
CENELEC	EN 60300-3-4	Dependability management - Part 3-4: Application guide - Guide to the specification of dependability requirements	2008
CENELEC	EN 60706-2	Maintainability of equipment - Part 2: Maintainability requirements and studies during the design and development phase	2006
CENELEC	EN 60706-3	Maintainability of equipment - Part 3: Verification and collection, analysis and presentation of data	2006
CENELEC	EN 60706-5	Maintainability of equipment - Part 5: Testability and diagnostic testing	2007
CENELEC	EN 61014	Programmes for reliability growth	2003
CENELEC	EN 61025	Fault tree analysis (FTA)	2007
CENELEC	EN 61078	Analysis techniques for dependability - Reliability block diagram and boolean methods	2006
CENELEC	EN 61124	Reliability testing - Compliance tests for constant failure rate and constant failure intensity	2012
CENELEC	EN 61160	Design review	2005
DEF	23-09	Generic Vehicle Architecture (GVA)	2010
DIN	2891	MAINTENANCE RELEVANT CRITERIA FOR PURCHASE OF MACHINES	2008
DIN	31051	Fundamentals of maintenance. (Grundlagen der Instandhaltung)	2012
ETSI	EN 302 515	Global System for Mobile communication (GSM); Requirements for GSM operation on railways	2005
ETSI	ES 202 951	Methods for Testing and Specification (MTS); Model-Based Testing (MBT); Requirements for Modelling Notations	2011
ETSI	TR 101 584	Machine-to-Machine communications (M2M); Study on Semantic support for M2M Data	2013

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ETSI	TR 102 691	Machine-to-Machine communications (M2M); Smart Metering Use Cases	2010
ETSI	TR 102 725	Machine-to-Machine communications (M2M); Definitions	2013
ETSI	TR 102 857	Machine-to-Machine communications (M2M); Use Cases of M2M applications for Connected Consumer	2013
ETSI	TR 102 898	Machine to Machine communications (M2M); Use cases of Automotive Applications in M2M capable networks	2013
ETSI	TR 102 935	Machine-to-Machine communications (M2M); Applicability of M2M architecture to Smart Grid Networks; Impact of Smart Grids on M2M platform	2012
ETSI	TR 102 966	Machine-to-Machine communications (M2M); Interworking between the M2M Architecture and M2M Area Network technologies	2014
ETSI	TR 103 118	Machine-to-Machine communications (M2M); Smart Energy Infrastructures security; Review of existing security measures and convergence investigations	2015
ETSI	TR 103 167	Machine to Machine (M2M); Threat analysis and counter measures to M2M service layer	2011
ETSI	TS 102 689	Machine-to-Machine communications (M2M); M2M service requirements	2013
ETSI	TS 102 690	Machine-to-Machine communications (M2M); Functional architecture	2013
ETSI	TS 102 921	Machine-to-Machine communications (M2M); mla, dla and mld interfaces	2014
ETSI	TS 103 092	Machine-to-Machine communications (M2M); OMA DM compatible Management Objects for ETSI M2M	2013
ETSI	TS 103 093	Machine-to-Machine communications (M2M); BBF TR-069 compatible Management Objects for ETSI M2M	2013
ETSI	TS 103 104	Machine-to-Machine communications (M2M); Interoperability Test Specification for CoAP Binding of ETSI M2M Primitives	2013

ETSI	TS 103 264	SmartM2M; Smart Appliances; Reference Ontology and oneM2M Mapping	2015
ETSI	TS 103 315	SmartM2M; Machine-to-Machine communications (M2M); Interoperability Test Specification for ETSI M2M Primitive	2015
GOST	27.402-95	Reliability in technics. Compliance test plans for mean time between failures (to failure). Part 1. Exponential case	1997
IEC	31010	Risk management -- Risk assessment techniques	2009
IEC	60050-191	International Electrotechnical Vocabulary. Chapter 191: Dependability and quality of service	1990
IEC	60300-1	Dependability management - Part 1: Guidance for management and application	2014
IEC	60300-3-1	Dependability management □ Part 3-1: Application guide □ Analysis techniques for dependability □ Guide on methodology	2003
IEC	60300-3-10	Dependability management - Part 3-10: Application guide - Maintainability	2001
IEC	60300-3-11	Dependability management - Part 3-11: Application guide - Reliability centred maintenance	2009
IEC	60300-3-12	Dependability management - Part 3-12: Application guide - Integrated logistic support	2011
IEC	60300-3-14	Dependability management - Part 3-14: Application guide - Maintenance and maintenance support	2004
IEC	60300-3-15	Dependability management - Part 3-15: Application guide - Engineering of system dependability	2009
IEC	60300-3-16	Dependability management - Part 3-16: Application guide - Guidelines for specification of maintenance support services	2008
IEC	60300-3-2	Dependability management - Part 3-2: Application guide - Collection of dependability data from the field	2004
IEC	60300-3-3	Dependability management □ Part 3-3: Application guide	2004
IEC	60300-3-4	Dependability management - Part 3-4: Application guide - Guide to the specification of dependability requirements	2007



IEC	60300-3-5	Dependability management - Part 3-5: Application guide - Reliability test conditions and statistical test principles	2001
IEC	60319	Presentation and specification of reliability data for electronic components	1999
IEC	60605-2	Equipment reliability testing - Part 2: Design of test cycles	1994
IEC	60605-4	Equipment reliability testing - Part 4: Statistical procedures for exponential distribution - Point estimates, confidence intervals, prediction intervals and tolerance intervals	2001
IEC	60605-6	Equipment reliability testing - Part 6: Tests for the validity and estimation of the constant failure rate and constant failure intensity	2007
IEC	60706-2	Maintainability of equipment - Part 2: Maintainability requirements and studies during the design and development phase	2006
IEC	60706-3	Maintainability of equipment - Part 3: Verification and collection, analysis and presentation of data	2006
IEC	60706-5	Maintainability of equipment - Part 5: Testability and diagnostic testing	2007
IEC	60812	Analysis techniques for system reliability - Procedure for failure mode and effects analysis (FMEA)	2006
IEC	61014	Programmes for reliability growth	2003
IEC	61025	Fault tree analysis (FTA)	2006
IEC	61070	Compliance test procedures for steady-state availability	1991
IEC	61078	Analysis techniques for dependability - Reliability block diagram and boolean methods	2006
IEC	61123	Reliability testing - Compliance test plans for success ratio	1991
IEC	61124	Reliability testing - Compliance tests for constant failure rate and constant failure intensity	2012
IEC	61131-6	Programmable controllers - Part 6: Functional safety	2012
IEC	61131-9	Programmable controllers - Part 9: Single-drop digital communication interface for small sensors and actuators (SDCI)	2013
IEC	61160	Design review	2005

IEC	61163-1	Reliability stress screening - Part 1: Repairable assemblies manufactured in lots	2006
IEC	61163-1	Reliability stress screening - Part 1: Repairable assemblies manufactured in lots	2006
IEC	61163-2	Reliability stress screening - Part 2: Electronic components	1998
IEC	61164	Reliability growth - Statistical test and estimation methods	2004
IEC	61165	Application of Markov techniques	2006
IEC	61400-1	Wind turbines - Part 1: Design requirements	2005
IEC	61400-11	Wind turbines - Part 11: Acoustic noise measurement techniques	2012
IEC	61400-12-1	Wind turbines - Part 12-1: Power performance measurements of electricity producing wind turbines	2005
IEC	61400-12-2	Wind turbines - Part 12-2: Power performance of electricity-producing wind turbines based on nacelle anemometry	2013
IEC	61400-2	Wind turbines - Part 2: Small wind turbines	2013
IEC	61400-21	Wind turbines - Part 21: Measurement and assessment of power quality characteristics of grid connected wind turbines	2008
IEC	61400-22	Wind turbines - Part 22: Conformity testing and certification	2010
IEC	61400-23	Wind turbines - Part 23: Full-scale structural testing of rotor blades	2014
IEC	61400-24	Wind turbines - Part 24: Lightning protection	2010
IEC	61400-25-1	Wind turbines - Part 25-1: Communications for monitoring and control of wind power plants - Overall description of principles and models	2006
IEC	61400-25-2	Wind turbines - Part 25-2: Communications for monitoring and control of wind power plants - Information models	2015
IEC	61400-25-3	Wind turbines - Part 25-3: Communications for monitoring and control of wind power plants - Information exchange models	2015
IEC	61400-25-4	Wind turbines - Part 25-4: Communications for monitoring and control of wind power plants - Mapping	2008

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IEC	61400-25-6	Wind turbines - Part 25-6: Communications for monitoring and control of wind power plants - Logical node classes and data classes for condition monitoring	2010
IEC	61400-3	Wind turbines - Part 3: Design requirements for offshore wind turbines	2009
IEC	61400-4	Wind turbines -- Part 4: Design requirements for wind turbine gearboxes	2012
IEC	61508-2	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems	2010
IEC	61508-3	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 3: Software requirements	2010
IEC	61508-4	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 4: Definitions and abbreviations	2010
IEC	61508-5	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 5: Examples of methods for the determination of safety integrity levels	2010
IEC	61508-6	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 6: Guidelines on the application of IEC 61508-2 and IEC 61508-3	2010
IEC	61508-7	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 7: Overview of techniques and measures	2010
IEC	61511-1	Functional safety <input type="checkbox"/> Safety instrumented systems for the process industry sector <input type="checkbox"/> Part 1: Framework, definitions, system, hardware and software requirement	2003

IEC	61649	Weibull analysis	2008
IEC	61650	Reliability data analysis techniques - Procedures for comparison of two constant failure rates and two constant failure (event) intensities	1997
IEC	61703	Mathematical expressions for reliability, availability, maintainability and maintenance support terms	2001
IEC	61709	Electric components - Reliability - Reference conditions for failure rates and stress models for conversion	2011
IEC	61710	Power law model - Goodness-of-fit tests and estimation methods	2013
IEC	61784-3	Industrial communication networks - Profiles - Part 3: Functional safety fieldbuses - General rules and profile definitions	2010
IEC	61810-1	Electromechanical elementary relays - Part 1: General and safety requirements	2015
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IEC	61850-10	Communication networks and systems in substations - Part 10: Conformance testing	2005
IEC	61850-3	Communication networks and systems in substations - Part 3: General requirements	2002
IEC	61850-4	Communication networks and systems in substations - Part 4: System and project management	2002
IEC	61850-5	Communication networks and systems in substations - Part 5: Communication requirements for functions and device models	2003
IEC	61850-6	Communication networks and systems for power utility automation - Part 6: Configuration description language for communication in electrical substations related to IEDs	2009
IEC	61850-7-1	Communication networks and systems in substations - Part 7-1: Basic communication structure for substation and feeder equipment - Principles and models	2003

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IEC	61850-7-3	Communication networks and systems in substations - Part 7-3: Basic communication structure for substation and feeder equipment - Common data classes	2003
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IEC	61882	Hazard and operability studies (HAZOP studies) - Application guide	2001
IEC	61968-3	Application integration at electric utilities - System interfaces for distribution management - Part 3: Interface for network operations	2004
IEC	61968-4	Application integration at electric utilities - System interfaces for distribution management - Part 4: Interfaces for records and asset management	2007
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IEC	62061:2005+AMD1:2012+AMD 2	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems	2015
IEC	62198	Managing risk in projects - Application guidelines	2013
IEC	62279	Railway applications - Communications, signalling and processing systems - Software for railway control and protection systems	2002
IEC	62308	Equipment reliability - Reliability assessment methods	2006
IEC	62309	Dependability of products containing reused parts - Requirements for functionality and tests	2004
IEC	62347	Guidance on system dependability specifications	2006
IEC	62402	Obsolescence management - Application guide	2007
IEC	62429	Reliability growth - Stress testing for early failures in unique complex systems	2007
IEC	62443-2-4	Security for industrial automation and control systems - Part 2-4: Security program requirements for IACS service providers	2015
IEC	62443-3-3	Industrial communication networks - Network and system security - Part 3-3: System security requirements and security levels	2013
IEC	62508	Guidance on human aspects of dependability	2010
IEC	62550	Spare parts provisioning	2015
IEC	TR 61850-1	Communication networks and systems in substations - Part 1: Introduction and overview	2003
IEC	TR 62357-1	Power systems management and associated information exchange - Part 1: Reference architecture	2012

IEC	TR 62443-3-1	Industrial communication networks - Network and system security - Part 3-1: Security technologies for industrial automation and control systems	2009
IEC	TR 62541-1	OPC Unified Architecture - Part 1: Overview and Concepts	2010
IEC	TS 61400-13	Wind turbine generator systems - Part 13: Measurement of mechanical loads	2001
IEC	TS 61400-14	Wind turbines - Part 14: Declaration of apparent sound power level and tonality values	2005
IEC	TS 61400-26-1	Wind turbines □Part 26-1: Time-based availability for wind turbine generating system	2011
IEC	TS 61400-26-2	Wind turbines - Part 26-2: Production-based availability for wind turbines	2014
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IEEE	1012	IEEE Standard for Software Verification and Validation	2004
IEEE	1016	Software design description	
IEEE	1058	Software project management	
IEEE	1063	Software user documentation	
IEEE	1149.1	IEEE Standard Test Access Port and Boundary Scan Architecture	2001
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IEEE	1232	IEEE Standard for Artificial Intelligence and Expert System Tie to Automatic Test Equipment (AI-ESTATE): Overview and Architecture	1995
IEEE	1232.3	IEEE Guide for the Use of Artificial Intelligence Exchange and Service Tie to All Test Environments (AI-ESTATE)	2014
IEEE	1415	IEEE Guide for Induction Machinery Maintenance Testing and Failure Analysis	2006

IEEE	1420.1	IEEE Standard for Information Technology - Software Reuse - Data Model for Reuse Library Interoperability: Basic Interoperability Data Model (BIDM)	1995
IEEE	1451.1	IEEE Standard for a Smart Transducer Interface for Sensors and Actuators - Network Capable Application Processor Information Model	1999
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IEEE	14764	ISO/IEC International Standard for Software Engineering - Software Life Cycle Processes - Maintenance	2006
IEEE	1522	IEEE Standard for Testability and Diagnosability Characteristics and Metrics	2004
IEEE	1636	IEEE Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA)	2009
IEEE	1636.1	IEEE Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA): Exchanging Test Results and Session Information via the eXtensible Markup Language (XML)	2013
IEEE	1636.2	Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA): Exchanging Maintenance Action Information via the Extensible Markup Language (XML)	2010
IEEE	1636.99	IEEE Std 1636.99-2013, IEEE Standard for Software Interface for Maintenance Information Collection and Analysis (SIMICA): Common Information Elements.	2013
IEEE	1808	IEEE Guide for Collecting and Managing Transmission Line Inspection and Maintenance Data	2011
IEEE	1902.1	IEEE Standard for Long Wavelength Wireless Network Protocol	2009
IEEE	1904.1	IEEE Standard for Service Interoperability in Ethernet Passive Optical Networks (SIEPON)	2013



IEEE	2030.2	IEEE Guide for the Interoperability of Energy Storage Systems Integrated with the Electric Power Infrastructure	2015
IEEE	21451-7	Information technology--Smart transducer interface for sensors and actuators--Part 7: Transducers to radio frequency identification (RFID) systems communication protocols and transducer electronic data sheet (TEDS) formats	2011
IEEE	2700	IEEE Standard for Sensor Performance Parameter Definitions	2014
IEEE	3006.7	IEEE Recommended Practice for Determining the Reliability of 7x24 Continuous Power Systems in Industrial and Commercial Facilities	2013
IEEE	307	IEEE Standard Definitions of Terms For Solar Cells	1969
IEEE	730	Software quality assurance	
IEEE	802.11	IEEE Standard for Information technology--Telecommunications and information exchange between systems Local and metropolitan area networks--Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications	2012
IEEE	802.15.1	IEEE Standard for Telecommunications and Information Exchange Between Systems - LAN/MAN - Specific Requirements - Part 15: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Wireless Personal Area Networks (WPANs)	2002
IEEE	802.15.3	IEEE Standard for Information technology-- Local and metropolitan area networks-- Specific requirements-- Part 15.3: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for High Rate Wireless Personal Area Networks (WPAN)	2003
IEEE	802.15.4	IEEE Standard for Local and metropolitan area networks--Part 15.4: Low-Rate Wireless Personal Area Networks (LR-WPANs)	2011
IEEE	802.15.4m	IEEE Standard for Local and metropolitan area networks - Part 15.4: Low-Rate Wireless Personal Area Networks (LR-WPANs) - Amendment 6: TV White Space Between 54 MHz and 862 MHz Physical Layer	2014

IEEE	802.16.1a	IEEE Standard for WirelessMAN-Advanced Air Interface for Broadband Wireless Access Systems --Amendment 2: Higher Reliability Networks	2013
IEEE	802.19.1	IEEE Standard for Information technology--Telecommunications and information exchange between systems -- Local and metropolitan area networks -- Specific requirements -- Part 19: TV White Space Coexistence Methods	2014
IEEE	802.11AB-2009/Cor 2	IEEE Standard for Local and metropolitan area networks-- Station and Media Access Control Connectivity Discovery Corrigendum 2: Technical and Editorial Corrections	2015
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IEEE	829	Software test documentation	
IEEE	830	Software requirements specification	
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ILO-OSH	Second Edition	Guidelines on occupational safety and health management systems	2001
ISO	10816-1	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 1: General guidelines	1995

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ISO	10816-6	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 6: Reciprocating machines with power ratings above 100 kW	1995
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ISO	10817-1	Rotating shaft vibration measuring systems -- Part 1: Relative and absolute sensing of radial vibration	1998
ISO	11342	Mechanical vibration -- Methods and criteria for the mechanical balancing of flexible rotors	1998
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ISO	13373-1	Condition monitoring and diagnostics of machines -- Vibration condition monitoring -- Part 1: General procedures	2002
ISO	13373-2	Condition monitoring and diagnostics of machines -- Vibration condition monitoring -- Part 2: Processing, analysis and presentation of vibration data	2005

ISO	13374-1	Condition monitoring and diagnostics of machines -- Data processing, communication and presentation -- Part 1: General guidelines	2003
ISO	13374-2	Condition monitoring and diagnostics of machines -- Data processing, communication and presentation -- Part 2: Data processing	2007
ISO	13374-3	Condition monitoring and diagnostics of machines -- Data processing, communication and presentation -- Part 3: Communication	2012
ISO	13374-4	Condition monitoring and diagnostics of machine systems -- Data processing, communication and presentation -- Part 4: Presentation	2015
ISO	13379-1	Condition monitoring and diagnostics of machines -- Data interpretation and diagnostics techniques -- Part 1: General guidelines	2012
ISO	13379-2	Condition monitoring and diagnostics of machines -- Data interpretation and diagnostics techniques -- Part 2: Data-driven applications	2015
ISO	13380	Condition monitoring and diagnostics of machines -- General guidelines on using performance parameters	2002
ISO	13381-1	Condition monitoring and diagnostics of machines -- Prognostics -- Part 1: General guidelines	2015
ISO	14224	Petroleum, petrochemical and natural gas industries - Collection and exchange of reliability and maintenance data for equipment	2006
ISO	14694	Industrial fans -- Specifications for balance quality and vibration levels	2003
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ISO	14764	Software Life Cycle Processes -- Maintenance	2006
ISO	15118-1	Road vehicles -- Vehicle to grid communication interface -- Part 1: General information and use-case definition	2013
ISO	1680	Acoustics -- Test code for the measurement of airborne noise emitted by rotating electrical machines	2013

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ISO	17359	Condition monitoring and diagnostics of machines -- General guidelines	2011
ISO	17788	Information technology -- Cloud computing -- Overview and vocabulary	2014
ISO	17789	Information technology -- Cloud computing -- Reference architecture	2014
ISO	17826	Information technology -- Cloud Data Management Interface (CDMI)	2012
ISO	17963	Web Services for Management (WS-Management) Specification	2013
ISO	18129	Condition monitoring and diagnostics of machines -- Approaches for performance diagnosis	2015
ISO	18434-1	Condition monitoring and diagnostics of machines -- Thermography -- Part 1: General procedures	2008
ISO	18436-1	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 1: Requirements for assessment bodies and the assessment process	2012
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ISO	18436-3	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 3: Requirements for training bodies and the training process	2012
ISO	18436-4	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 4: Field lubricant analysis	2014
ISO	18436-5	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 5: Lubricant laboratory technician/analyst	2012
ISO	18436-6	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 6: Acoustic emission	2014

ISO	18436-7	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 7: Thermography	2014
ISO	18436-8	Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 8: Ultrasound	2013
ISO	1925	Mechanical vibration -- Balancing -- Vocabulary	2001
ISO	1940-1	Mechanical vibration -- Balance quality requirements for rotors in a constant (rigid) state -- Part 1: Specification and verification of balance tolerances	2003
ISO	19831	Cloud Infrastructure Management Interface (CIMI) Model and RESTful HTTP-based Protocol -- An Interface for Managing Cloud Infrastructure	2015
ISO	1996-1	Acoustics -- Description, measurement and assessment of environmental noise -- Part 1: Basic quantities and assessment procedures	2003
ISO	1996-2	Acoustics -- Description, measurement and assessment of environmental noise -- Part 2: Determination of environmental noise levels	2007
ISO	20005	Information technology -- Sensor networks -- Services and interfaces supporting collaborative information processing in intelligent sensor networks	2013
ISO	2017-1	Mechanical vibration and shock -- Resilient mounting systems -- Part 1: Technical information to be exchanged for the application of isolation systems	2005
ISO	2017-2	Mechanical vibration and shock -- Resilient mounting systems -- Part 2: Technical information to be exchanged for the application of vibration isolation associated with railway systems	2007
ISO	20283-2	Mechanical vibration -- Measurement of vibration on ships -- Part 2: Measurement of structural vibration	2008
ISO	2041	Mechanical vibration, shock and condition monitoring -- Vocabulary	2009
ISO	20958	Condition monitoring and diagnostics of machine systems -- Electrical signature analysis of three-phase induction motors	2013

ISO	21940-14	Mechanical vibration -- Rotor balancing - - Part 14: Procedures for assessing balance errors	2012
ISO	21940-31	Mechanical vibration -- Rotor balancing - - Part 31: Susceptibility and sensitivity of machines to unbalance	2013
ISO	21940-32	Mechanical vibration -- Rotor balancing - - Part 32: Shaft and fitment key convention	2012
ISO	22096	Condition monitoring and diagnostics of machines -- Acoustic emission	2007
ISO	22266-1	Mechanical vibration -- Torsional vibration of rotating machinery -- Part 1: Land-based steam and gas turbine generator sets in excess of 50 MW	2009
ISO	2314	Gas turbines -- Acceptance tests	2009
ISO	26262-1	Road vehicles -- Functional safety -- Part 1: Vocabulary	2011
ISO	27000	Information technology -- Security techniques -- Information security management systems -- Overview and vocabulary	2014
ISO	27001	Information technology -- Security techniques -- Information security management systems -- Requirements	2013
ISO	27002	Information technology -- Security techniques -- Code of practice for information security controls	2013
ISO	27003	Information technology -- Security techniques -- Information security management system implementation guidance	2010
ISO	27004	Information technology -- Security techniques -- Information security management -- Measurement	2009
ISO	27005	Information technology -- Security techniques -- Information security risk management	2011
ISO	27006	Information technology -- Security techniques -- Requirements for bodies providing audit and certification of information security management systems	2015
ISO	27007	Information technology -- Security techniques -- Guidelines for information security management systems auditing	2011

ISO	29182-1	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 1: General overview and requirements	2013
ISO	29182-2	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 2: Vocabulary and terminology	2013
ISO	29182-3	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 3: Reference architecture views	2014
ISO	29182-4	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 4: Entity models	2013
ISO	29182-5	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 5: Interface definitions	2013
ISO	29182-6	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 6: Applications	2014
ISO	29182-7	Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 7: Interoperability guidelines	2015
ISO	29361	Information technology -- Web Services Interoperability -- WS-I Basic Profile Version 1.1	2008
ISO	29362	Information technology -- Web Services Interoperability -- WS-I Attachments Profile Version 1.0	2008
ISO	29363	Information technology -- Web Services Interoperability -- WS-I Simple SOAP Binding Profile Version 1.0	2008
ISO	2954	Mechanical vibration of rotating and reciprocating machinery -- Requirements for instruments for measuring vibration severity	2012
ISO	29821-1	Condition monitoring and diagnostics of machines -- Ultrasound -- Part 1: General guidelines	2011
ISO	30101	Information technology -- Sensor networks: Sensor network and its interfaces for smart grid system	2014
ISO	30128	Information technology -- Sensor networks -- Generic Sensor Network Application Interface	2014



ISO	5348	Mechanical vibration and shock -- Mechanical mounting of accelerometers	1998
ISO	55000	Asset Management Standard: What Maintenance Reliability Professionals Should Expect	2015
ISO	7626-1	Mechanical vibration and shock -- Experimental determination of mechanical mobility -- Part 1: Basic terms and definitions, and transducer specifications	2011
ISO	7626-2	Mechanical vibration and shock -- Experimental determination of mechanical mobility -- Part 2: Measurements using single-point translation excitation with an attached vibration exciter	2015
ISO	7626-5	Vibration and shock -- Experimental determination of mechanical mobility -- Part 5: Measurements using impact excitation with an exciter which is not attached to the structure	1994
ISO	7919-1	Mechanical vibration of non-reciprocating machines -- Measurements on rotating shafts and evaluation criteria -- Part 1: General guidelines	1996
ISO	7919-2	Mechanical vibration -- Evaluation of machine vibration by measurements on rotating shafts -- Part 2: Land-based steam turbines and generators in excess of 50 MW with normal operating speeds of 1 500 r/min, 1 800 r/min, 3 000 r/min and 3 600 r/min	2009
ISO	7919-3	Mechanical vibration -- Evaluation of machine vibration by measurements on rotating shafts -- Part 3: Coupled industrial machines	2009
ISO	7919-4	Mechanical vibration -- Evaluation of machine vibration by measurements on rotating shafts -- Part 4: Gas turbine sets with fluid-film bearings	2009
ISO	7919-5	Mechanical vibration -- Evaluation of machine vibration by measurements on rotating shafts -- Part 5: Machine sets in hydraulic power generating and pumping plants	2005
ISO	8297	Acoustics -- Determination of sound power levels of multisource industrial plants for evaluation of sound pressure levels in the environment -- Engineering method	1994

ISO	8528-9	Reciprocating internal combustion engine driven alternating current generating sets -- Part 9: Measurement and evaluation of mechanical vibrations	1995
ISO	8569	Mechanical vibration and shock -- Measurement and evaluation of shock and vibration effects on sensitive equipment in buildings	1996
ISO	8579-2	Acceptance code for gears -- Part 2: Determination of mechanical vibrations of gear units during acceptance testing	1993
ISO	8626	Servo-hydraulic test equipment for generating vibration -- Method of describing characteristics	1989
ISO	8802-3	Standard for Ethernet	2014
ISO	9241-1	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 1: General introduction	1997
ISO	9241-11	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 11: Guidance on usability	1998
ISO	9241-110	Ergonomics of human-system interaction -- Part 110: Dialogue principles	2006
ISO	9241-12	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 12: Presentation of information	1998
ISO	9241-13	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 13: User guidance	1998
ISO	9241-14	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 14: Menu dialogues	1997
ISO	9241-143	Ergonomics of human-system interaction -- Part 143: Forms	2012
ISO	9241-15	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 15: Command dialogues	1997
ISO	9241-16	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 16: Direct manipulation dialogues	1999
ISO	9241-2	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 2: Guidance on task requirements	1992
ISO	9241-210	Ergonomics of human-system interaction -- Part 210: Human-centred design for interactive systems	2010

ISO	9241-302	Ergonomics of human-system interaction -- Part 302: Terminology for electronic visual displays	2008
ISO	9241-303	Ergonomics of human-system interaction -- Part 303: Requirements for electronic visual displays	2011
ISO	9241-305	Ergonomics of human-system interaction -- Part 305: Optical laboratory test methods for electronic visual displays	2008
ISO	9241-307	Ergonomics of human-system interaction -- Part 307: Analysis and compliance test methods for electronic visual displays	2008
ISO	9241-400	Ergonomics of human--system interaction -- Part 400: Principles and requirements for physical input devices	2007
ISO	9241-5	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 5: Workstation layout and postural requirements	1998
ISO	9241-6	Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 6: Guidance on the work environment	1999
ISO	9506-1	Industrial automation systems -- Manufacturing Message Specification -- Part 1: Service definition	2003
ISO	9506-2	Industrial automation systems -- Manufacturing Message Specification -- Part 2: Protocol specification	2003
ISO	AWI 19941	Information Technology -- Cloud Computing -- Interoperability and Portability	2014
ISO	DIS 19086-1	Information technology -- Cloud computing -- Service level agreement (SLA) framework -- Part 1: Overview and concepts	2015
ISO	FDIS 18384-1	Information technology -- Reference Architecture for Service Oriented Architecture (SOA RA) -- Part 1: Terminology and Concepts for SOA	2015
ISO	FDIS 18384-2	Information technology -- Reference Architecture for Service Oriented Architecture (SOA RA) -- Part 2: Reference Architecture for SOA Solutions	2015

ISO	FDIS 18384-3	Information Technology -- Reference Architecture for Service Oriented Architecture (SOA) -- Part 3: Service Oriented Architecture Ontology	2015
ISO	NP 19086-2	Information technology -- Cloud computing -- Service level agreement (SLA) framework -- Part 2: Metrics	2014
ISO	NP 19086-3	Information technology -- Cloud computing -- Service level agreement (SLA) framework -- Part 3: Core conformance requirements	2014
ISO	TR 30102	Information technology -- Distributed Application Platforms and Services (DAPS) -- General technical principles of Service Oriented Architecture	2012
ISO	WD 19944	Information Technology - Cloud Computing - Data and their Flow across Devices and Cloud Services	2015
MASE		Guideline for improvement of health and safety at work	2013
NEN	2767-1	Condition Assessment of Building and Installation Components □ Part 1: Methodology	2011
NEN	2767-2	Condition Assessment of Building and Installation Components □ Part 2: List of Faults	2008
NEN	2767-3	Condition Assessment of Building and Installation Components □ Part 3: Aggregation of Condition Scores	2009
NF	NF X 50-501	Maintenance - Reference conditions for items : Vocabulary of renovation and reconstruction activities (Durée de vie et durabilité des biens - Vocabulaire des activités de rénovation et de reconstruction - États de référence des biens de réemploi)	2007
NF	NF X 60-012	Vocabulary of components of items and their supply (Termes et définitions des éléments constitutifs et de leurs approvisionnements pour les biens durables)	2006
NF	NF X 60-212	Maintenance - Handbook of instructions maintenance -Definitions and general principles for the wording and layout	1983
NF	NF X60-000	Maintenance function	2002
NF	NF X60-008	Industrial maintenance - Maintenance outsourcing draft guide - Pre-contractual approach	2013

NF	NF X60-100	Maintenance □ Preconditions to the maintenance contracts □ Inventories and evaluation for the states of items	2007
NF	NF X60-200	Technical documentations associated with an item throughout its life cycle	2008
OSHAS	18001	Occupational Health and safety management systems - requirements	1999
OSHAS	18002	Occupational Health and safety management systems - Guidelines for implementation of OSHA 18001	1999
PAS	55-1	Specification for the optimized management of physical assets	2008
PAS	55-2	Guidelines for the application of PAS 55-1	2008
PSK	5704	Condition monitoring. Vibration measurement. Acceptance test and vibration severity limits	2013
PSK	6201	Maintenance. Terms and definitions	2011
PSK	6202	Condition audit in process industry	2003
PSK	7501	Key performance indicators of maintenance for use in process industry	2010
PSK	7502	Key performance indicators of logistics. Material function	2002
PSK	7901	Maintenance in industry. Service agreement	2001
SAE International	JA1011'200908	Evaluation Criteria for Reliability-Centered Maintenance (RCM) Processes	2009
SAE International	JA1012'201108	A Guide to the Reliability-Centered Maintenance (Rcm) Standard	2011
SFS	13306	Maintenance. Maintenance terminology	2010
SFS	15341	Maintenance. Maintenance Key Performance Indicators	2007
SFS	60300-3-14	Dependability management - Part 3-14: Application guide - Maintenance and maintenance support	2004
TAPPI	10685	Maintenance - Criteria to prepare a maintenance global service	2007
UNE	60079-17	Explosive atmospheres - Part 17: Electrical installations inspection and maintenance	2014
UNE	EN 16602-30-02	Space product assurance - Failure modes, effects (and criticality) analysis (FMEA/FMECA)	2014

UNE	EN 16602-40-12	Space product assurance - Fault tree analysis - Adoption notice ECSS/IEC 61025	2014
UNE	EN 16656	Information technology - Radio frequency identification for item management - RFID Emblem (ISO/IEC 29160:2012, modified)	2014
UNE	EN 60068-2-65	Environmental testing - Part 2-65: Tests - Test Fg: Vibration - Acoustically induced method	2013
UNE	EN 60721-2-9	Classification of environmental conditions - Part 2-9: Environmental conditions appearing in nature - Measured shock and vibration data - Storage, transportation and in-use	2014
UNE	EN 61131-9	Programmable controllers - Part 9: Single-drop digital communication interface for small sensors and actuators (SDCI)	2013
UNE	EN 61757-1	Fibre optic sensors - Part 1: Generic specification	2012
UNE	EN 61850-7-410	Communication networks and systems for power utility automation - Part 7-410: Basic communication structure - Hydroelectric power plants - Communication for monitoring and control	2013
UNE	EN ISO/IEC 19762-3	Information technology - Automatic identification and data capture (AIDC) techniques - Harmonized vocabulary - Part 3: Radio frequency identification (RFID) (ISO/IEC 19762-3:2008)	2012
UNI	10144	Classification of maintenance services	2006
UNI	10145	Definition of evaluation factors of services maintenance firms	2007
UNI	10146	Criteria to prepare a contract for supplying maintenance finalized services	2007
UNI	10147	Maintenance - Additional terms and definitions to EN 13306	2003
UNI	10148	Maintenance - Management of a maintenance contract	2007
UNI	10224	Maintenance - Process, sub-processes and main activities - Fundamental principles	2007
UNI	10366	Maintenance - Design criteria of maintenance	2007
UNI	10449	Maintenance - Criteria to prepare and to manage the permit to work	2008

UNI	10584	Maintenance. Systems of information of maintenance	1997
UNI	10604	Maintenance. Criteria for design, management and control of the maintenance services of building	1997
UNI	10652	Maintenance - Appraisal and evaluation of the goods condition	2009
UNI	10749-1	Maintenance - Guidelines for management of maintenance materials - General aspects and organizational problems	2003
UNI	10749-2	Maintenance - Guidelines for management of maintenance materials - Criteria for classification, codification, standardization and support	2003
UNI	10749-3	Maintenance - Guidelines for management of maintenance materials - Criteria for the choice of materials to be managed	2003
UNI	10749-4	Maintenance - Guidelines for management of maintenance materials - Criteria for operational management	2003
UNI	10749-5	Maintenance - Guidelines for management of maintenance materials - Criteria for purchasing, tests and final check	2003
UNI	10749-6	Maintenance - Guidelines for management of maintenance materials - Administration criteria	2003
UNI	10831-1	Maintenance of buildings - Documentation and basic information for maintenance services of projects approved and executed - Structure, contents and levels of documentation	1999
UNI	10831-2	Maintenance of buildings - Documentation and basic information for maintenance services of projects approved and executed - Details of content of technical documentation and lay-out models	2001
UNI	10874	Maintenance of buildings - Criteria in order to write maintenance and use manuals	2000
UNI	10992	Maintenance budget for manufacturers and suppliers of products and services - Guidelines for the definition, approval, management and check	2002
UNI	11063	Maintenance - Definitions of ordinary and extraordinary maintenance	2003

UNI	11069	Maintenance - Maintenance ratios for the vehicles in service on road, with limited distances to be covered and frequent stops	2003
UNI	11082	Maintenance - Specific terminology for the group transportation field	2003
UNI	11126	Telemaintenance - Criteria for the suitability of the items and for the definition of the related service	2004
UNI	11134	Maintenance - Maintenance ratios for the group transportation field	2005
UNI	11136	Global service for maintenance of buildings - Guidelines	2004
UNI	11178	Maintenance - Maintenance ratios - Guidance for the application of UNI 10388 in the field of the infrastructures of the group transportation on railways	2006
UNI	11257	Maintenance of buildings - Criteria for the drafting of plan and programme of maintenance of buildings □ Guidelines	2007
UNI	11282	Maintenance of the group transportation vehicles - Appraisal and evaluation of the condition of the vehicles in service on road	2008
UNI	11414	Maintenance - Guidelines for qualification of maintenance system	2011
UNI	11420	Maintenance - Qualification of maintenance personnel	2011
VDI	2885	Standardized data for maintenance planning and determination of maintenance costs - Data and data determination	2003
VDI	2886	Benchmarking applied to maintenance	2003
VDI	2888	Maintenance condition monitoring	1999
VDI	2889	Methods and systems for condition and process monitoring in maintenance	1998
VDI	2892	Management of maintenance spare parts	2006
VDI	2893	Selection and formation of indicators for maintenance	2006



## 5 Conclusions

In this report a short list of standards that might be of value when carrying out research in Mantis project have been collected. The standards are tabulated in different ways in order to make it easier to find them based on the subject or area of interest of the reader. Obviously, there is great variation in how valuable each of the standards is from the point of view of Mantis project. For example, it can be assumed that the ISO standards 13372, 13373-1, 13373-2, 13374-1, 13374-2, 13379, 13380 and 13381-1 focused on condition monitoring, diagnosis, and prognosis are of highest value and so are also the IEEE standards 1012, 1016, 1058, 1063, 1232, 1232.3, 1420.1, 1451.1, 1451.7, 14764, 1522 and 1636 focused on programming. It is clear that it would not be efficient if the basics presented in these standards regarding the mentioned technologies would be reinvented in the project and that has naturally been the motivation for collecting the material presented in this report. However, the report also lists standards which might be focused on one industrial sector or the discussed technology is only used by a marginal number of partners. This is the drawback of the report which the authors have not been able to solve but hopefully it is still of value to the whole consortium.

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