



# INTERNATIONAL STANDARD



**Maritime navigation and radiocommunication equipment and systems –  
Digital interfaces –  
Part 460: Multiple talkers and multiple listeners – Ethernet interconnection –  
Safety and security**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## CONTENTS

FOREWORD .....	6
1 Scope .....	8
2 Normative references .....	8
3 Terms and definitions .....	9
4 High-level requirements .....	15
4.1 Overview .....	15
4.2 Description .....	15
4.3 General requirements .....	16
4.3.1 Equipment and system requirements .....	16
4.3.2 Physical composition requirements .....	16
4.3.3 Logical composition requirements .....	17
4.4 Physical component requirements .....	17
4.4.1 450-Node .....	17
4.4.2 460-Node .....	17
4.4.3 460-Switch .....	18
4.4.4 460-Forwarder .....	18
4.4.5 460-Gateway and 460-Wireless gateway .....	18
4.5 Logical component requirements .....	18
4.5.1 Network monitoring function .....	18
4.5.2 System management function .....	19
4.6 System documentation requirements .....	19
4.7 Secure area requirements .....	19
5 Network traffic management requirements .....	19
5.1 460-Node requirements .....	19
5.2 460-Switch requirements .....	20
5.2.1 Resource allocation .....	20
5.2.2 Loop prevention .....	20
5.3 460-Forwarder requirements .....	21
5.3.1 Traffic separation .....	21
5.3.2 Resource allocation .....	21
5.3.3 Traffic prioritization .....	21
5.4 System design requirements .....	22
5.4.1 Documentation .....	22
5.4.2 Traffic .....	23
5.4.3 Connections between secure and non-secure areas .....	23
6 Security requirements .....	23
6.1 Security scenarios .....	23
6.1.1 Threat scenarios .....	23
6.1.2 Internal threats .....	23
6.1.3 External threats .....	23
6.2 Internal security requirements .....	24
6.2.1 General .....	24
6.2.2 Denial of service protection .....	24
6.2.3 REDS security .....	24
6.2.4 Access control .....	25
6.3 External security requirements .....	26

6.3.1	Overview .....	26
6.3.2	Firewalls .....	26
6.3.3	Direct communication .....	27
	<del>Communication security .....</del>	
6.3.4	460-Node .....	27
6.3.5	460-Gateway .....	28
6.3.6	460-Wireless gateway .....	29
6.4	Additional security issues .....	29
7	Redundancy requirements .....	29
7.1	General requirements .....	29
7.1.1	General .....	30
7.1.2	Interface redundancy .....	30
7.1.3	Device redundancy .....	31
7.2	460-Node requirements .....	31
7.3	460-Switch requirements .....	31
7.4	460-Forwarder requirements .....	31
7.5	460-Gateway and 460-Wireless gateway requirements .....	31
7.6	Network monitoring function requirements .....	31
7.7	System design requirements .....	31
8	Network monitoring requirements .....	32
8.1	Network status monitoring .....	32
8.1.1	460-Network .....	32
8.1.2	460-Node .....	32
8.1.3	460-Switch .....	32
8.1.4	460-Forwarder .....	32
	<del>460-Gateway and 460-Wireless gateway .....</del>	
8.2	Network monitoring function .....	33
8.2.1	General .....	33
8.2.2	Network load monitoring function .....	34
8.2.3	Redundancy monitoring function .....	34
8.2.4	Network topology monitoring function .....	35
8.2.5	Syslog recording function .....	36
8.2.6	Redundancy of network monitoring function .....	36
8.2.7	Alert management .....	37
9	Controlled network requirements .....	38
10	Methods of testing and required test results .....	38
10.1	Subject of tests .....	38
10.2	Test site .....	38
10.3	General requirements .....	39
10.4	450-Node .....	39
10.5	460-Node .....	40
10.5.1	Network traffic management .....	40
10.5.2	Security .....	40
10.5.3	Redundancy .....	42
10.5.4	Monitoring .....	42
10.6	460-Switch .....	43
10.6.1	Resource allocation .....	43
10.6.2	Loop prevention .....	43

10.6.3	Security .....	44
10.6.4	Monitoring .....	45
10.7	460-Forwarder .....	45
10.7.1	Traffic separation.....	45
10.7.2	Resource allocation .....	46
10.7.3	Traffic prioritisation.....	46
10.7.4	Security .....	46
10.7.5	Monitoring .....	47
10.8	460-Gateway .....	48
10.8.1	Denial of service behaviour.....	48
10.8.2	Access control to configuration setup.....	48
10.8.3	Communication security.....	49
10.8.4	Firewall.....	49
10.8.5	Application server.....	50
10.8.6	Interoperable access to file storage of DMZ.....	50
10.8.7	Additional security .....	50
<hr/>		
<del>Monitoring .....</del>		
10.9	460-Wireless gateway.....	51
10.9.1	General .....	51
10.9.2	Security .....	51
<hr/>		
<del>Monitoring .....</del>		
10.10	Controlled network.....	52
10.11	Network monitoring function .....	52
10.11.1	General .....	52
10.11.2	Network load monitoring function.....	53
10.11.3	Redundancy monitoring function.....	53
10.11.4	Network topology monitoring function .....	53
10.11.5	Syslog recording function.....	54
10.11.6	Alert management.....	54
10.12	System level.....	55
10.12.1	General.....	55
10.12.2	System management function.....	56
10.12.3	System design.....	56
10.12.4	Network monitoring function .....	58
10.12.5	Network load monitoring function.....	58
10.12.6	Redundancy monitoring function.....	58
10.12.7	Network topology monitoring function .....	59
Annex A (informative) Communication scenarios between an IEC 61162-460 network and uncontrolled networks .....		
60		
A.1	General.....	60
A.2	Routine off-ship .....	60
A.3	Routine on-ship.....	61
A.4	460-Gateway usage for direct connection with equipment .....	61
Annex B (informative) Summary of redundancy protocols in IEC 62439 (all parts).....		
62		
<del>B.1 Summary of redundancy protocols .....</del>		
<del>B.2 RSTP recovery time.....</del>		
Annex C (informative) Guidance for testing.....		
64		
C.1	Methods of test .....	64
C.2	Observation .....	64

C.3	Inspection of documented evidence .....	64
C.4	Measurement .....	64
C.5	Analytical evaluation .....	65
Annex D (informative)	Some examples to use this document .....	66
Annex E (normative)	IEC 61162 interfaces for the network monitoring function .....	70
Annex F (informative)	Distribution of functions around 460-Network.....	71
Bibliography	.....	73
Figure 1	– Functional overview of IEC 61162-460 requirement applications .....	16
Figure 2	– 460-Network with 460-Gateway.....	26
Figure 3	–Example of redundancy.....	30
Figure 4	– Example of network status recording information .....	34
Figure A.1	– Usage model for communication between a IEC <del>61162-450</del> 61162-460 network and shore networks .....	60
Figure D.1	– 460-Forwarder used between two networks .....	66
Figure D.2	– 460-Forwarder used between two networks .....	66
Figure D.3	– 460-Gateway used for e-Navigation services .....	67
Figure D.4	– 460-Gateway used for remote maintenance .....	67
Figure D.5	– 460-Forwarder used to separate an INS system based on its own controlled network from a network of -460 devices.....	68
Figure D.6	– 460-Forwarder used to separate a radar system based on its own controlled network from a network of -460 devices.....	69
Figure E.1	– Network monitoring function logical interfaces .....	70
Table 1	– Traffic prioritization with CoS and DSCP .....	22
Table 2	– Summary of alert of network monitoring .....	37
Table B.1	– Redundancy protocols and recovery times .....	62
Table E.1	– Sentences received by the network monitoring function .....	70
Table E.2	– Sentences transmitted by the network monitoring function .....	70
Table F.1	– Distribution of functions around 460-Network .....	71
Table F.2	– Equipment standards referencing IEC 61162-460.....	72

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – DIGITAL INTERFACES –

#### Part 460: Multiple talkers and multiple listeners – Ethernet interconnection – Safety and security

#### FOREWORD

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International Standard IEC 61162-460 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

This second edition of IEC 61162-460 cancels and replaces the first edition published in 2015. This edition constitutes a technical revision.

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

- a) 460-Switches and 460-Forwarders are required to implement IGMP snooping;
- b) connection between secure and non-secure areas requires a 460-Forwarder as an isolation element;
- c) SFI collision detection added as function of network monitoring;
- d) 460-Gateway and 460-Wireless gateway are no longer required to report to the network monitoring;
- e) all alerts from network monitoring have standardized alert identifiers.

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

FDIS	Report on voting
80/879/FDIS	80/884/RVD

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

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

This International Standard is to be used in conjunction with IEC 61162-450:2018.

A list of all parts in the IEC 61162 series, published under the general title *Maritime navigation and radiocommunication equipment and systems – Digital interfaces*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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

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# MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – DIGITAL INTERFACES –

## Part 460: Multiple talkers and multiple listeners – Ethernet interconnection – Safety and security

### 1 Scope

This part of IEC 61162 is an add-on to IEC 61162-450 where higher safety and security standards are needed, for example due to higher exposure to external threats or to improve network integrity. This document provides requirements and test methods for equipment to be used in an IEC 61162-460 compliant network as well as requirements for the network itself and requirements for interconnection from the network to other networks. This document also contains requirements for a redundant IEC 61162-460 compliant network.

~~This standard extends the informative guidance given in Annex D of IEC 61162-450:2011.~~  
This document does not introduce new application level protocol requirements to those that are defined in IEC 61162-450.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60945, *Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results*

IEC 61162-450:2014 2018, *Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 450: Multiple talkers and multiple listeners – Ethernet interconnection*

IEC 61924-2:2012, *Maritime navigation and radiocommunication equipment and systems – Integrated navigation systems – Part 2: Modular structure for INS – Operational and performance requirements, methods of testing and required test results*

IEC 62288:2014, *Maritime navigation and radiocommunication equipment and systems – Presentation of navigation-related information on shipborne navigational displays – General requirements, methods of testing and required test results*

IEEE 802.1D-2004, *IEEE Standard for Local and metropolitan area networks: Media Access Control (MAC) Bridges*

IEEE 802.1Q-2005, *IEEE Standard for Local and metropolitan area networks: Virtual Bridged Local Area Networks*

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INTERNET SOCIETY (ISOC). RFC 5424, *The Syslog Protocol* [online]. Edited by R. Gerhards. March 2009 [viewed 2018-01-08]. Available at <https://tools.ietf.org/html/rfc5424>

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**Maritime navigation and radiocommunication equipment and systems – Digital interfaces –  
Part 460: Multiple talkers and multiple listeners – Ethernet interconnection –  
Safety and security**

**Matériels et systèmes de navigation et de radiocommunication maritimes –  
Interfaces numériques –  
Partie 460: Émetteurs multiples et récepteurs multiples – Interconnexion  
Ethernet – Sûreté et sécurité**

## CONTENTS

FOREWORD .....	6
1 Scope .....	8
2 Normative references .....	8
3 Terms and definitions .....	9
4 High-level requirements .....	15
4.1 Overview .....	15
4.2 Description .....	15
4.3 General requirements .....	16
4.3.1 Equipment and system requirements .....	16
4.3.2 Physical composition requirements .....	16
4.3.3 Logical composition requirements .....	17
4.4 Physical component requirements .....	17
4.4.1 450-Node .....	17
4.4.2 460-Node .....	17
4.4.3 460-Switch .....	18
4.4.4 460-Forwarder .....	18
4.4.5 460-Gateway and 460-Wireless gateway .....	18
4.5 Logical component requirements .....	18
4.5.1 Network monitoring function .....	18
4.5.2 System management function .....	18
4.6 System documentation requirements .....	19
4.7 Secure area requirements .....	19
5 Network traffic management requirements .....	19
5.1 460-Node requirements .....	19
5.2 460-Switch requirements .....	20
5.2.1 Resource allocation .....	20
5.2.2 Loop prevention .....	20
5.3 460-Forwarder requirements .....	20
5.3.1 Traffic separation .....	20
5.3.2 Resource allocation .....	21
5.3.3 Traffic prioritization .....	21
5.4 System design requirements .....	22
5.4.1 Documentation .....	22
5.4.2 Traffic .....	22
5.4.3 Connections between secure and non-secure areas .....	22
6 Security requirements .....	23
6.1 Security scenarios .....	23
6.1.1 Threat scenarios .....	23
6.1.2 Internal threats .....	23
6.1.3 External threats .....	23
6.2 Internal security requirements .....	24
6.2.1 General .....	24
6.2.2 Denial of service protection .....	24
6.2.3 REDS security .....	24
6.2.4 Access control .....	25
6.3 External security requirements .....	26

6.3.1	Overview .....	26
6.3.2	Firewalls .....	26
6.3.3	Direct communication .....	26
6.3.4	460-Node .....	27
6.3.5	460-Gateway .....	27
6.3.6	460-Wireless gateway .....	28
6.4	Additional security issues .....	29
7	Redundancy requirements .....	29
7.1	General requirements .....	29
7.1.1	General .....	29
7.1.2	Interface redundancy .....	30
7.1.3	Device redundancy .....	30
7.2	460-Node requirements .....	30
7.3	460-Switch requirements .....	31
7.4	460-Forwarder requirements .....	31
7.5	460-Gateway and 460-Wireless gateway requirements .....	31
7.6	Network monitoring function requirements .....	31
7.7	System design requirements .....	31
8	Network monitoring requirements .....	31
8.1	Network status monitoring .....	31
8.1.1	460-Network .....	31
8.1.2	460-Node .....	31
8.1.3	460-Switch .....	32
8.1.4	460-Forwarder .....	32
8.2	Network monitoring function .....	32
8.2.1	General .....	32
8.2.2	Network load monitoring function .....	33
8.2.3	Redundancy monitoring function .....	34
8.2.4	Network topology monitoring function .....	34
8.2.5	Syslog recording function .....	35
8.2.6	Redundancy of network monitoring function .....	36
8.2.7	Alert management .....	36
9	Controlled network requirements .....	37
10	Methods of testing and required test results .....	38
10.1	Subject of tests .....	38
10.2	Test site .....	38
10.3	General requirements .....	38
10.4	450-Node .....	39
10.5	460-Node .....	39
10.5.1	Network traffic management .....	39
10.5.2	Security .....	40
10.5.3	Redundancy .....	41
10.5.4	Monitoring .....	42
10.6	460-Switch .....	42
10.6.1	Resource allocation .....	42
10.6.2	Loop prevention .....	42
10.6.3	Security .....	43
10.6.4	Monitoring .....	44

10.7	460-Forwarder .....	44
10.7.1	Traffic separation.....	44
10.7.2	Resource allocation .....	45
10.7.3	Traffic prioritisation.....	45
10.7.4	Security .....	46
10.7.5	Monitoring .....	47
10.8	460-Gateway .....	47
10.8.1	Denial of service behaviour.....	47
10.8.2	Access control to configuration setup.....	47
10.8.3	Communication security.....	47
10.8.4	Firewall.....	48
10.8.5	Application server .....	49
10.8.6	Interoperable access to file storage of DMZ.....	49
10.8.7	Additional security .....	49
10.9	460-Wireless gateway.....	49
10.9.1	General .....	49
10.9.2	Security .....	49
10.10	Controlled network.....	50
10.11	Network monitoring function.....	50
10.11.1	General .....	50
10.11.2	Network load monitoring function.....	51
10.11.3	Redundancy monitoring function.....	51
10.11.4	Network topology monitoring function.....	51
10.11.5	Syslog recording function .....	52
10.11.6	Alert management .....	52
10.12	System level .....	53
10.12.1	General.....	53
10.12.2	System management function.....	54
10.12.3	System design.....	54
10.12.4	Network monitoring function .....	56
10.12.5	Network load monitoring function.....	56
10.12.6	Redundancy monitoring function.....	56
10.12.7	Network topology monitoring function .....	56
Annex A (informative)	Communication scenarios between an IEC 61162-460 network and uncontrolled networks .....	57
A.1	General.....	57
A.2	Routine off-ship .....	57
A.3	Routine on-ship.....	58
A.4	460-Gateway usage for direct connection with equipment .....	58
Annex B (informative)	Summary of redundancy protocols in IEC 62439 (all parts).....	59
Annex C (informative)	Guidance for testing.....	60
C.1	Methods of test .....	60
C.2	Observation .....	60
C.3	Inspection of documented evidence .....	60
C.4	Measurement.....	60
C.5	Analytical evaluation .....	61
Annex D (informative)	Some examples to use this document .....	62
Annex E (normative)	IEC 61162 interfaces for the network monitoring function .....	66

Annex F (informative) Distribution of functions around 460-Network.....	67
Bibliography.....	69
Figure 1 – Functional overview of IEC 61162-460 requirement applications .....	16
Figure 2 – 460-Network with 460-Gateway.....	26
Figure 3 –Example of redundancy.....	30
Figure 4 – Example of network status recording information .....	33
Figure A.1 – Usage model for communication between a IEC 61162-460 network and shore networks .....	57
Figure D.1 – 460-Forwarder used between two networks .....	62
Figure D.2 – 460-Forwarder used between two networks .....	62
Figure D.3 – 460-Gateway used for e-Navigation services .....	63
Figure D.4 – 460-Gateway used for remote maintenance .....	63
Figure D.5 – 460-Forwarder used to separate an INS system based on its own controlled network from a network of -460 devices.....	64
Figure D.6 – 460-Forwarder used to separate a radar system based on its own controlled network from a network of -460 devices.....	65
Figure E.1 – Network monitoring function logical interfaces .....	66
Table 1 – Traffic prioritization with CoS and DSCP .....	21
Table 2 – Summary of alert of network monitoring .....	36
Table B.1 – Redundancy protocols and recovery times .....	59
Table E.1 – Sentences received by the network monitoring function .....	66
Table E.2 – Sentences transmitted by the network monitoring function .....	66
Table F.1 – Distribution of functions around 460-Network .....	67
Table F.2 – Equipment standards referencing IEC 61162-460.....	68

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – DIGITAL INTERFACES –

#### Part 460: Multiple talkers and multiple listeners – Ethernet interconnection – Safety and security

#### FOREWORD

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International Standard IEC 61162-460 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

This second edition of IEC 61162-460 cancels and replaces the first edition published in 2015. This edition constitutes a technical revision.

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

- a) 460-Switches and 460-Forwarders are required to implement IGMP snooping;
- b) connection between secure and non-secure areas requires a 460-Forwarder as an isolation element;



- c) SFI collision detection added as function of network monitoring;
- d) 460-Gateway and 460-Wireless gateway are no longer required to report to the network monitoring;
- e) all alerts from network monitoring have standardized alert identifiers.

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

FDIS	Report on voting
80/879/FDIS	80/884/RVD

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

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

This International Standard is to be used in conjunction with IEC 61162-450:2018.

A list of all parts in the IEC 61162 series, published under the general title *Maritime navigation and radiocommunication equipment and systems – Digital interfaces*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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- withdrawn,
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# MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – DIGITAL INTERFACES –

## Part 460: Multiple talkers and multiple listeners – Ethernet interconnection – Safety and security

### 1 Scope

This part of IEC 61162 is an add-on to IEC 61162-450 where higher safety and security standards are needed, for example due to higher exposure to external threats or to improve network integrity. This document provides requirements and test methods for equipment to be used in an IEC 61162-460 compliant network as well as requirements for the network itself and requirements for interconnection from the network to other networks. This document also contains requirements for a redundant IEC 61162-460 compliant network.

This document does not introduce new application level protocol requirements to those that are defined in IEC 61162-450.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60945, *Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results*

IEC 61162-450:2018, *Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 450: Multiple talkers and multiple listeners – Ethernet interconnection*

IEC 61924-2:2012, *Maritime navigation and radiocommunication equipment and systems – Integrated navigation systems – Part 2: Modular structure for INS – Operational and performance requirements, methods of testing and required test results*

IEC 62288:2014, *Maritime navigation and radiocommunication equipment and systems – Presentation of navigation-related information on shipborne navigational displays – General requirements, methods of testing and required test results*

IEEE 802.1D-2004, *IEEE Standard for Local and metropolitan area networks: Media Access Control (MAC) Bridges*

IEEE 802.1Q, *IEEE Standard for Local and metropolitan area networks: Virtual Bridged Local Area Networks*

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INTERNET SOCIETY (ISOC). RFC 4604, *Using Internet Group Management Protocol Version 3 (IGMPv3) and Multicast Listener Discovery Protocol Version 2 (MLDv2) for Source-Specific Multicast* [online]. Edited by H. Holbrook et al. August 2006 [viewed 2018-01-08]. Available at <https://tools.ietf.org/html/rfc4604>

INTERNET SOCIETY (ISOC). RFC 5424, *The Syslog Protocol* [online]. Edited by R. Gerhards. March 2009 [viewed 2018-01-08]. Available at <https://tools.ietf.org/html/rfc5424>

## SOMMAIRE

AVANT-PROPOS .....	76
1 Domaine d'application .....	78
2 Références normatives .....	78
3 Termes et définitions .....	79
4 Exigences de haut niveau .....	85
4.1 Vue d'ensemble .....	85
4.2 Description .....	86
4.3 Exigences générales .....	86
4.3.1 Exigences relatives aux matériels et aux systèmes .....	86
4.3.2 Exigences relatives à la composition physique .....	87
4.3.3 Exigences relatives à la composition logique .....	87
4.4 Exigences relatives aux composants physiques .....	87
4.4.1 Nœud-450 .....	87
4.4.2 Nœud-460 .....	87
4.4.3 Commutateur-460 .....	88
4.4.4 Redirecteur-460 .....	88
4.4.5 Passerelle-460 et passerelle sans fil-460 .....	88
4.5 Exigences relatives aux composants logiques .....	89
4.5.1 Fonction de surveillance du réseau .....	89
4.5.2 Fonction de gestion du système .....	89
4.6 Exigences relatives à la documentation du système .....	89
4.7 Exigences relatives à la zone protégée .....	89
5 Exigences relatives à la gestion des trafics du réseau .....	89
5.1 Exigences relatives au nœud-460 .....	89
5.2 Exigences relatives aux commutateurs-460 .....	90
5.2.1 Affectation des ressources .....	90
5.2.2 Prévention de boucles .....	91
5.3 Exigences relatives aux redirecteurs-460 .....	91
5.3.1 Séparation du trafic .....	91
5.3.2 Affectation des ressources .....	91
5.3.3 Priorisation du trafic .....	92
5.4 Exigences relatives à la conception du système .....	93
5.4.1 Documentation .....	93
5.4.2 Trafic .....	93
5.4.3 Connexions entre les zones protégées et les zones non protégées .....	93
6 Exigences en matière de sécurité .....	93
6.1 Scénarios de sécurité .....	93
6.1.1 Scénarios de menaces .....	93
6.1.2 Menaces internes .....	93
6.1.3 Menaces externes .....	94
6.2 Exigences relatives à la sécurité interne .....	94
6.2.1 Généralités .....	94
6.2.2 Protection contre les dénis de service .....	95
6.2.3 Sécurité de la REDS .....	95
6.2.4 Contrôle d'accès .....	96
6.3 Exigences relatives à la sécurité externe .....	96

6.3.1	Vue d'ensemble .....	96
6.3.2	Pare-feu .....	97
6.3.3	Communication directe .....	97
6.3.4	Nœud-460 .....	98
6.3.5	Passerelle-460 .....	98
6.3.6	Passerelle sans fil-460 .....	100
6.4	Enjeux sécuritaires supplémentaires .....	100
7	Exigences relatives à la redondance .....	100
7.1	Exigences générales .....	100
7.1.1	Généralités .....	100
7.1.2	Redondance d'interface .....	101
7.1.3	Redondance de dispositif .....	101
7.2	Exigences relatives aux nœuds-460 .....	102
7.3	Exigences relatives aux commutateurs-460 .....	102
7.4	Exigences relatives aux redirecteurs-460 .....	102
7.5	Exigences relatives aux passerelles-460 et aux passerelles sans fil-460 .....	102
7.6	Exigences relatives à la fonction de surveillance du réseau .....	102
7.7	Exigences relatives à la conception du système .....	102
8	Exigences relatives à la surveillance du réseau .....	103
8.1	Surveillance de l'état du réseau .....	103
8.1.1	Réseau-460 .....	103
8.1.2	Nœud-460 .....	103
8.1.3	Commutateur-460 .....	103
8.1.4	Redirecteur-460 .....	104
8.2	Fonction de surveillance du réseau .....	104
8.2.1	Généralités .....	104
8.2.2	Fonction de surveillance de la charge de réseau .....	105
8.2.3	Fonction de surveillance de la redondance .....	106
8.2.4	Fonction de surveillance de la topologie du réseau .....	106
8.2.5	Fonction d'enregistrement syslog .....	107
8.2.6	Redondance de la fonction de surveillance du réseau .....	108
8.2.7	Gestion des alertes .....	108
9	Exigences relatives au réseau contrôlé .....	109
10	Méthodes d'essai et résultats d'essai exigés .....	110
10.1	Objet des essais .....	110
10.2	Site d'essai .....	110
10.3	Exigences générales .....	111
10.4	Nœud-450 .....	111
10.5	Nœud-460 .....	111
10.5.1	Gestion du trafic du réseau .....	111
10.5.2	Sécurité .....	112
10.5.3	Redondance .....	114
10.5.4	Surveillance .....	114
10.6	Commutateur-460 .....	114
10.6.1	Affectation des ressources .....	114
10.6.2	Prévention de boucles .....	115
10.6.3	Sécurité .....	115
10.6.4	Surveillance .....	116

10.7	Redirecteur-460 .....	117
10.7.1	Séparation du trafic .....	117
10.7.2	Affectation des ressources.....	117
10.7.3	Priorisation du trafic .....	118
10.7.4	Sécurité.....	118
10.7.5	Surveillance.....	119
10.8	Passerelle-460.....	120
10.8.1	Comportement de déni de service.....	120
10.8.2	Contrôle d'accès aux réglages de configuration .....	120
10.8.3	Sécurité relative à la communication.....	120
10.8.4	Pare-feu .....	121
10.8.5	Serveur d'applications .....	121
10.8.6	Accès interopérable au stockage de fichiers de la DMZ.....	122
10.8.7	Exigences complémentaires en matière de sécurité.....	122
10.9	Passerelle sans fil-460.....	122
10.9.1	Généralités.....	122
10.9.2	Sécurité.....	122
10.10	Réseau contrôlé.....	123
10.11	Fonction de surveillance du réseau .....	123
10.11.1	Généralités.....	123
10.11.2	Fonction de surveillance de la charge de réseau .....	123
10.11.3	Fonction de surveillance de la redondance .....	124
10.11.4	Fonction de surveillance de la topologie du réseau.....	124
10.11.5	Fonction d'enregistrement syslog.....	125
10.11.6	Gestion des alertes.....	125
10.12	Niveau du système.....	126
10.12.1	Généralités.....	126
10.12.2	Fonction de surveillance du système .....	127
10.12.3	Conception du système.....	127
10.12.4	Fonction de surveillance du réseau.....	129
10.12.5	Fonction de surveillance de la charge de réseau .....	130
10.12.6	Fonction de surveillance de la redondance .....	130
10.12.7	Fonction de surveillance de la topologie du réseau.....	130
Annexe A (informative) Scénarios de communication entre un réseau conforme à l'IEC 61162-460 et des réseaux non contrôlés .....		131
A.1	Généralités.....	131
A.2	Routine hors du navire.....	131
A.3	Routine sur le navire.....	132
A.4	Utilisation d'une passerelle-460 pour la connexion directe aux matériels.....	132
Annexe B (informative) Résumé des protocoles de redondance dans l'IEC 62439 (toutes les parties).....		133
Annexe C (informative) Recommandations pour les essais .....		134
C.1	Méthodes d'essai .....	134
C.2	Observation .....	134
C.3	Examen des preuves documentées.....	134
C.4	Mesurage.....	135
C.5	Évaluation analytique.....	135
Annexe D (informative) Quelques exemples d'utilisation du présent document.....		136
Annexe E (normative) Interfaces IEC 61162 pour la fonction de surveillance du réseau.....		140

Annexe F (informative) Répartition des fonctions relatives au réseau-460.....	141
Bibliographie.....	143
Figure 1 – Vue d'ensemble fonctionnelle des applications des exigences de l'IEC 61162-460 .....	86
Figure 2 – Réseau-460 avec passerelle-460 .....	97
Figure 3 – Exemple de redondance.....	101
Figure 4 – Exemple d'informations d'enregistrement de l'état du réseau .....	105
Figure A.1 – Modèle d'utilisation pour la communication entre un réseau conforme à l'IEC 61162-450 et les réseaux à quai.....	131
Figure D.1 – Redirecteur-460 utilisé entre deux réseaux.....	136
Figure D.2 – Redirecteur-460 utilisé entre deux réseaux.....	136
Figure D.3 – Passerelle-460 utilisée pour les services d'e-Navigation.....	137
Figure D.4 – Passerelle-460 utilisée pour la maintenance à distance.....	137
Figure D.5 – Redirecteur-460 utilisé pour séparer un système INS basé sur son propre réseau contrôlé à partir d'un réseau de dispositifs-460 .....	138
Figure D.6 – Redirecteur-460 utilisé pour séparer un système radar basé sur son propre réseau contrôlé à partir d'un réseau de dispositifs-460 .....	139
Figure E.1 – Interfaces logiques de la fonction de surveillance du réseau .....	140
Tableau 1 – Priorisation du trafic avec CoS et DSCP.....	92
Tableau 2 – Résumé des alertes de la surveillance du réseau .....	108
Tableau B.1 – Protocoles de redondance et temps de récupération .....	133
Tableau E.1 – Sentences reçues par la fonction de surveillance du réseau.....	140
Tableau E.2 – Sentences émises par la fonction de surveillance du réseau .....	140
Tableau F.1 – Répartition des fonctions relatives au réseau-460 .....	141
Tableau F.2 – Normes de matériels faisant référence à l'IEC 61162-460.....	142

## COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

### MATÉRIELS ET SYSTÈMES DE NAVIGATION ET DE RADIOCOMMUNICATION MARITIMES – INTERFACES NUMÉRIQUES –

#### Partie 460: Émetteurs multiples et récepteurs multiples – Interconnexion Ethernet – Sécurité et sécurité

##### AVANT-PROPOS

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La Norme internationale IEC 61162-460 a été établie par le comité d'études 80 de l'IEC: Matériels et systèmes de navigation et de radiocommunication maritimes.

Cette deuxième édition de l'IEC 61162-460 annule et remplace la première édition parue en 2015. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:



- a) les commutateurs-460 et les redirecteurs-460 sont exigés pour la mise en œuvre de la surveillance du trafic des protocoles Internet de gestion de groupe (IGMP – *Internet group management protocol*);
- b) le raccordement entre des zones protégées et des zones non protégées exige un redirecteur-460 en tant qu'élément isolant;
- c) ajout de la détection de collision par ID de fonction du système (SFI – *system function ID*) comme fonction de surveillance du réseau;
- d) la consignation de la passerelle-460 et de la passerelle sans fil-460 à la surveillance du réseau n'est plus exigée;
- e) toutes les alertes issues de la surveillance du réseau ont des identificateurs d'alerte normalisés.

Le texte de cette Norme internationale est issu des documents suivants:

FDIS	Rapport de vote
80/879/FDIS	80/884/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette norme.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

Cette Norme internationale doit être utilisée conjointement avec l'IEC 61162-450:2018.

Une liste de toutes les parties de la série IEC 61162, publiées sous le titre général *Matériels et systèmes de navigation et de radiocommunication maritimes – Interfaces numériques*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "<http://webstore.iec.ch>" dans les données relatives au document recherché. A cette date, le document sera

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## MATÉRIELS ET SYSTÈMES DE NAVIGATION ET DE RADIOCOMMUNICATION MARITIMES – INTERFACES NUMÉRIQUES –

### Partie 460: Émetteurs multiples et récepteurs multiples – Interconnexion Ethernet – Sûreté et sécurité

#### 1 Domaine d'application

La présente partie de l'IEC 61162 vient s'ajouter à la norme IEC 61162-450 lorsque des normes plus rigoureuses en matière de sûreté et de sécurité sont nécessaires, par exemple en raison d'une exposition plus importante aux menaces externes ou afin de renforcer l'intégrité du réseau. Le présent document spécifie des exigences et des méthodes d'essai pour les matériels à utiliser dans un réseau conforme à l'IEC 61162-460 ainsi que des exigences relatives au réseau proprement dit et des exigences relatives à l'interconnexion du réseau avec d'autres réseaux. Le présent document comprend également des exigences s'appliquant aux réseaux redondants conformes à l'IEC 61162-460.

Le présent document n'introduit pas de nouvelles exigences relatives aux protocoles des niveaux d'application par rapport à celles définies dans l'IEC 61162-450.

#### 2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60945, *Matériels et systèmes de navigation et de radiocommunication maritimes – Spécifications générales – Méthodes d'essai et résultats exigibles*

IEC 61162-450:2018, *Matériels et systèmes de navigation et de radiocommunication maritimes – Interfaces numériques – Partie 450: Émetteurs multiples et récepteurs multiples – Interconnexion Ethernet*

IEC 61924-2:2012, *Maritime navigation and radiocommunication equipment and systems – Integrated navigation systems – Part 2: Modular structure for INS – Operational and performance requirements, methods of testing and required test results* (disponible en anglais seulement)

IEC 62288:2014, *Matériels et systèmes de navigation et de radiocommunication maritimes – Présentation des informations relatives à la navigation sur des affichages de navigation de bord – Exigences générales, méthodes d'essai et résultats d'essai exigés*

IEEE 802.1D-2004, *IEEE Standards for Local Area Networks: Media Access Control (MAC) Bridges*

IEEE 802.1Q, *Virtual Bridged Local Area Networks*

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