



International Telecommunication Union

ITU-T Study Group 5

Review of Study Group 5 Publications

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EMC, safety and EMF effects in
telecommunications



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Reference document

“Guide to the use of ITU-T Publications
produced by Study Group 5
aimed at achieving
Electromagnetic Compatibility and Safety”
(Supplement to the K-series Recommendations)

Documents Reproduced in the Workshop CD:

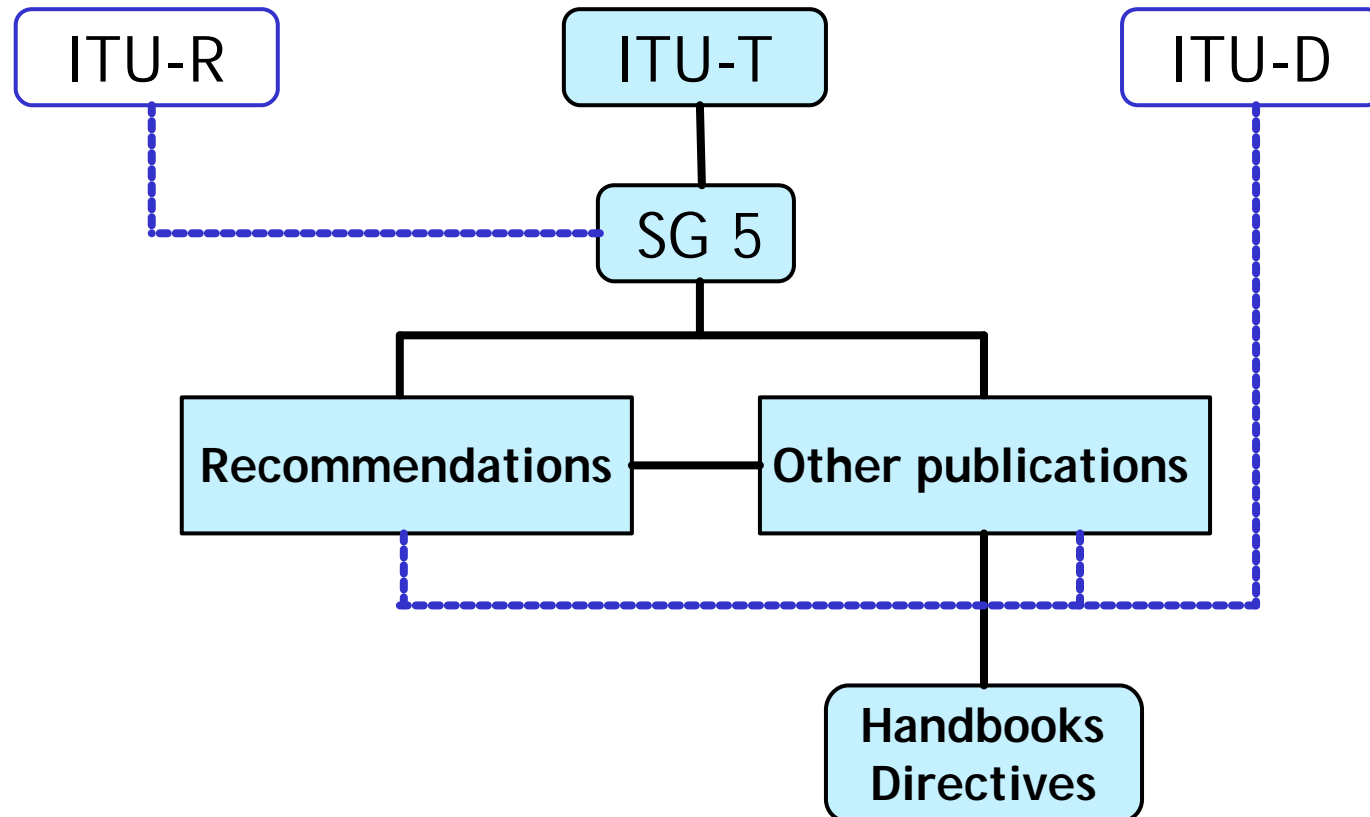
- Guide
- List of the Titles of K-series Recommendations
- Terminology
- Presentations



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Relationships between the ITU-T documents





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Classification of SG 5 Publications

Type and subject of Publications

- Basic
 - General
 - Calculation/estimation
 - Testing/measuring
- Generic
- Protection or mitigation oriented
 - General
 - Protection practice
 - Protection components
- Safety



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Classification of SG 5 Publications

Considered equipment and installations

- Equipment and installations located in telecommunications centres, at radio installations or at outdoor locations
- Telecommunication lines at outdoor locations
- Equipment located in Customer Premises



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Series K Recommendations

“Protection against interference”

- List: from K.1 (11/88) to K.54 (11/00)
 - K.1 to K.4, K.16, K.17 and K.32 deleted after its content became technically out of date
- Access:
 - K.1 to K. 26 in Blue Book Vol. IX (1960 /1988)
 - Individual issues: paper or electronic CD versions
 - Free access to List of Recommendations:
<http://www.itu.int/publibase/itu-t/ItutAllBySeries.asp?serie=K>
 - Free download up to three Recommendations:
<http://ecs.itu.ch/cgi-bin/dms-ebookshop>



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List of the
SG 5
Handbooks

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Handbooks

- Lightning Handbook
- Earthing Handbook
- Measuring Handbook



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Title

Handbooks

Lightning Handbook

The protection of telecommunication lines and equipment against lightning discharges

(Composed of three volumes)



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Handbooks

Lightning Handbook

- o The Chapters 1 to 5 (1974)
 - definitions of parameters related to lightning activity ;
 - the phenomenon of lightning discharges;
 - the generation of overvoltages on telecommunication lines;
 - the behaviour of different types of telecommunication lines (overhead lines, buried cable of various make-up);
 - suitable protective devices (e.g. overvoltage arresters, shield wires, cable of special design).



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Handbooks

Lightning Handbook

- The Chapters 6 to 8 (1978)
 - protective practices for specific parts of telecommunication networks (overhead lines, underground cables, switching and subscriber equipment, radio installations);
 - protective practice for personnel;
 - estimation of frequency of breakdowns for various types of installations (telecommunication towers, buried cables, overhead lines).



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Handbooks

Lightning Handbook

- o The Chapters 9 and 10 (1994)
 - Damage assessment of fibre optic cables:
 - damage mechanism in buried and overhead fibre optic cables;
 - estimation of the annual damage rate for buried and overhead fibre optic cables;
 - methods to improve the protection of fibre optic cable lines



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Chapters
9 and 10
(cont.)

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Handbooks

Lightning Handbook

- Measurement of overvoltages and overcurrents:
 - parameters of overvoltages and overcurrents (e.g. peak values, wave form parameters, statistical distribution);
 - measuring results in different environment (rural area, urban/suburban area).



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Versions

Handbooks

Earthing Handbook

- o Existing version (1974 edition)
“Earthing of Telecommunication Installation”
- o New version (under edition)



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Existing
(1974)
edition
Main items

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Handbooks

Earthing Handbook

Earthing of Telecommunication Installation

- Main purpose of earthing in telecom installation;
- Requirements for service and protection earthing;
- Earthing / bonding configurations, (star, mesh, mixed star-mesh);
- Characteristics / configurations of earth electrodes (trench, earth spikes, plates)
- Measuring the soil resistivity and earth electrode resistance;
- Maintenance of earthing installations.



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New
version
Scheduled
completion
2001

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Handbooks

Earthing Handbook

Structure and status of the new version

Chapt. no	Title	Status
1	Definition	finished
2	Basic concept of bonding and earthing	finished
3	Implementation method of earthing system	not yet finished
4	Implementation method of bonding system	not yet finished
5	Testing and maintenance method of bonding and earthing	finished



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Title

Handbooks

Measuring Handbook

“Handbook on interference measuring techniques”
(2000)

Contains supplementary information to the volume IX of the Directives



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Handbooks

Measuring Handbook

- o Part A: Principles of low-frequency longitudinal induction test
- o Part B: Measuring methods for screened enclosure
 - Design of adequate shields;
 - Screening effectiveness of sealing materials/cabinets;
 - Estimation of field strength
- o Part C: Application of basic EMC IEC/CISPR test methods to telecommunications equipment



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Title

Directives

DIRECTIVES

concerning the protection of
telecommunication lines
against harmful effects from
electric power and
electrified railway lines



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History

Directives

- The 1st Interference booklet about interference in 1927 (75 years)
(A precursor of the Directives, prepared by SG 1 of CCIF)
- The 1st (Rome) version of the Directives, in 1937 (65 years ago)
 - Revised editions:
 - Oslo 1938
 - Geneva 1952

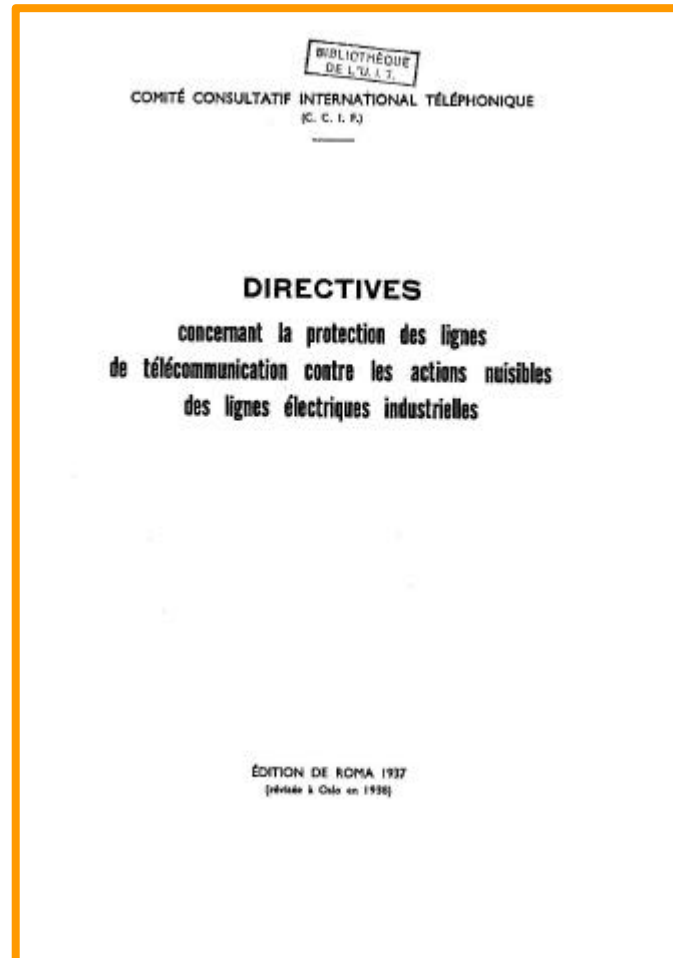


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Directives

Rome edition 1937
(Revised in Oslo 1938)



Rome edition 1937
(Revised in Geneva 1952)





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History

Directives

- The 2nd version of the Directives:
 - approved by the Plenary Assembly in New Delhi 1960
 - published 1963 (nearly 40 years ago).
- Complete renewal of the 1963 edition of the Directives:
 - the idea arose in 1977 (25 years ago)
 - project approved by Plenary Assembly in 1980
 - the series of nine volumes issued in Geneva, 1989
 - revised volumes II and V republished in Geneva, 1999

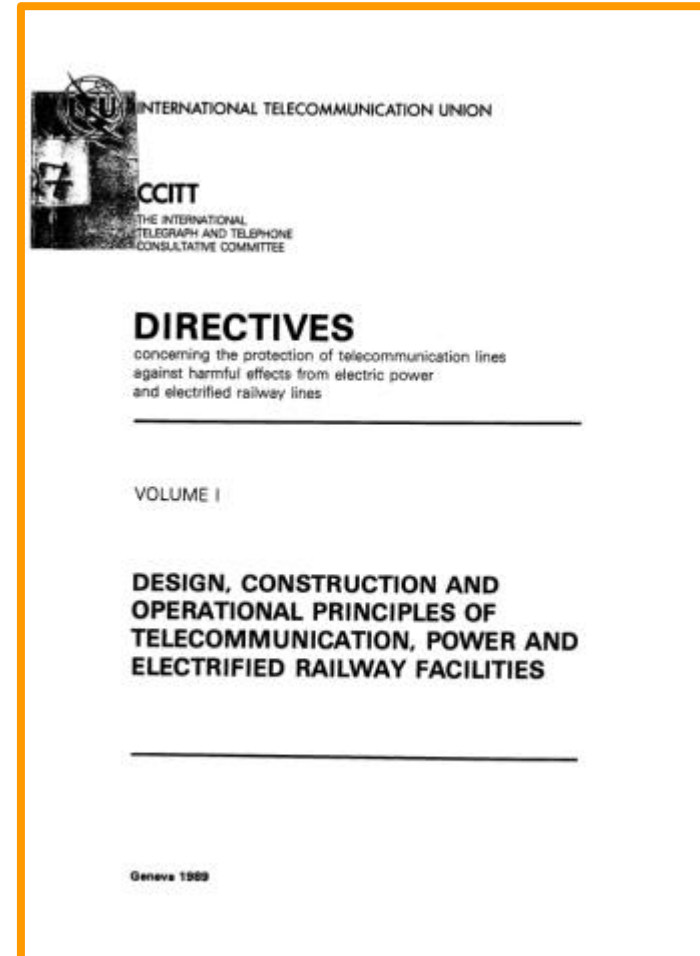
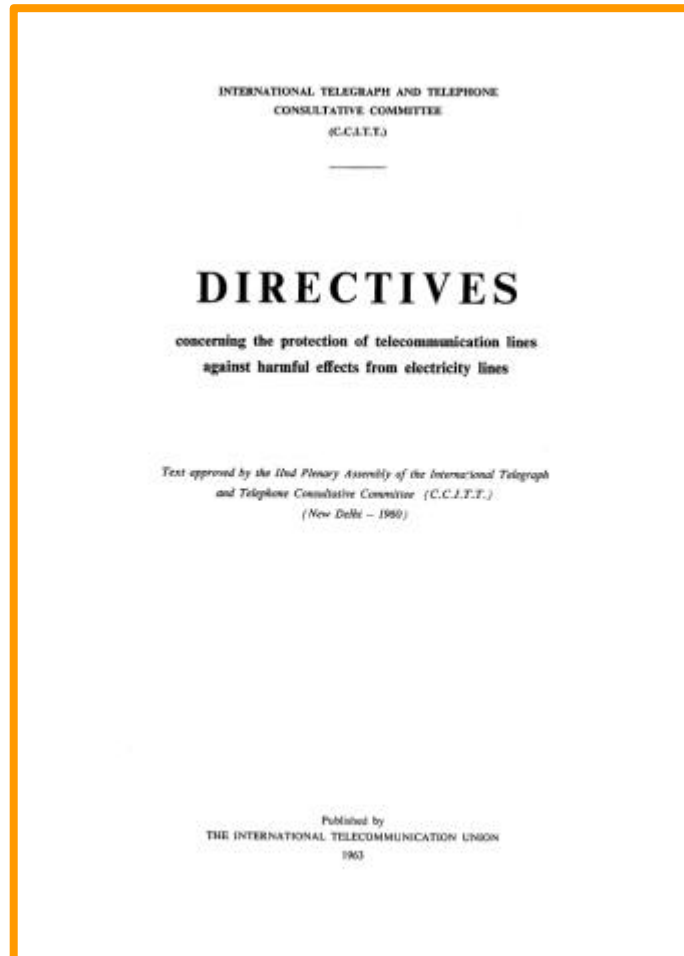


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Directives

Approved in New Delhi - 1960
(Published in Geneva - 1963)

Issue in Geneva - 1989
(Revised Vol. II and V in 1999)

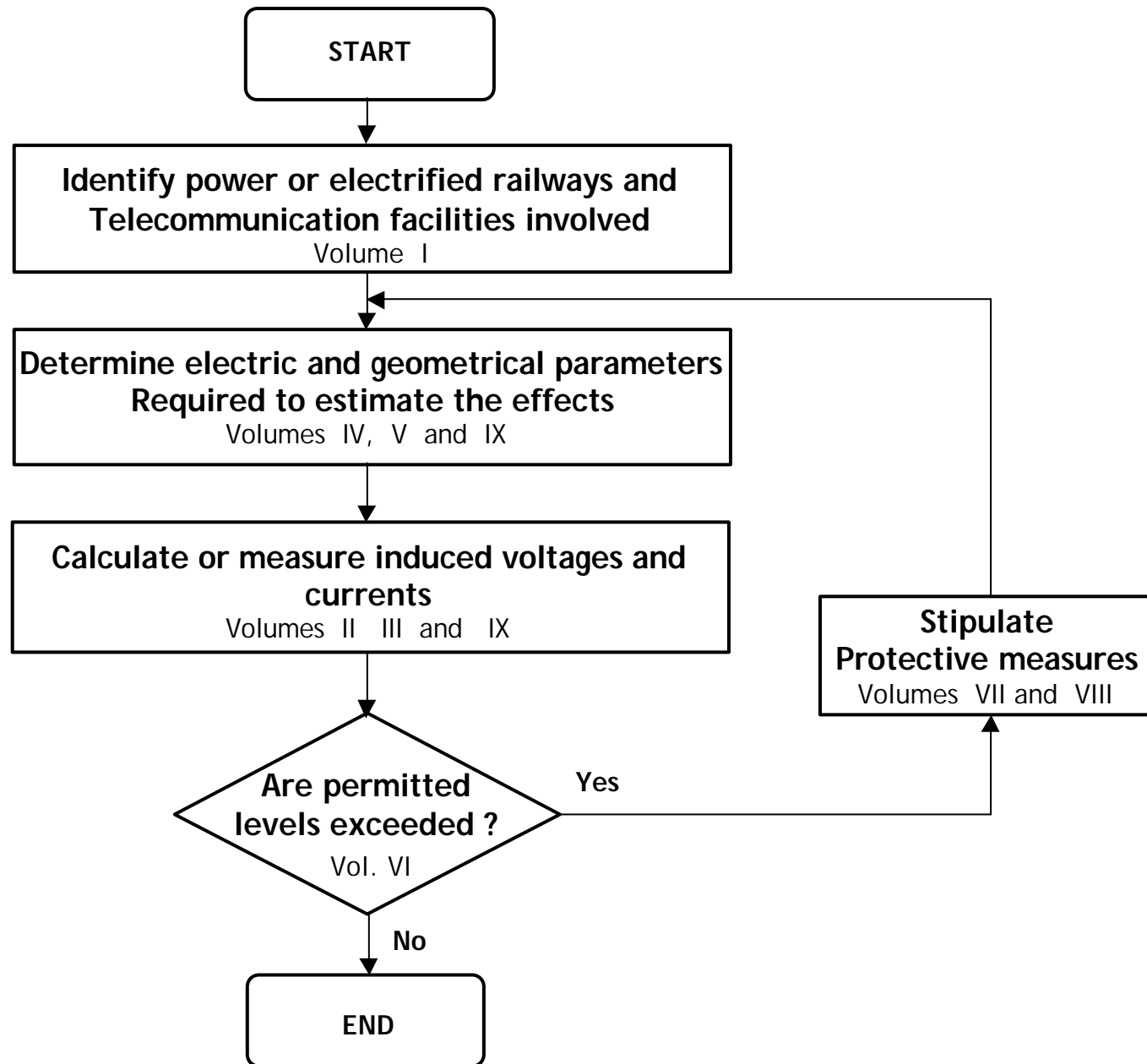




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Procedure for study of disturbing problems





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Directives

Scope and structure

0 Design, construction and operational principles of involved facilities; ***Volume I***

- Power,
- Electrified railway,
- Telecommunication





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Volumes:
II. & III.

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Directives

Scope and structure

- o Calculation methods
 - Capacitive, inductive and conductive coupling: physical ***theory*** and calculation methods; ***Volume III***
 - Calculating induced voltages and currents in ***practical*** cases; ***Volume II***



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Volumes:
IV. & V.

Directives

Scope and structure

- Inducing installations
 - Inducing currents and voltages in electrified ***railway*** systems; ***Vol. IV***
 - Inducing currents and voltages in ***power*** transmission and distribution systems; ***Volume V***



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Volumes:
VII., VIII.
& IX.

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Directives

Scope and structure

- Protection / mitigation
 - Protective measures and safety precautions; **Volume VII**
 - Protective devices; **Volume VIII**
- Testing methods and measuring apparatus; **Volume IX**



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Volume VI

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Scope and structure

- Danger and Disturbance; ***Volume VI***
 - Electrical safety considerations
 - Conditions which may result in danger and/or disturbance
 - Permissible voltages and current levels to limit:
 - Danger
 - Disturbance



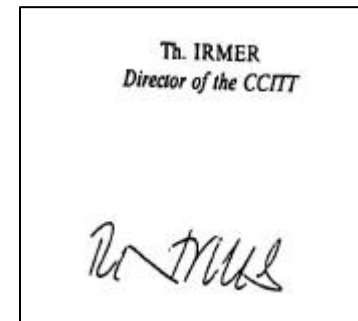
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Eligibility
of the
Directives

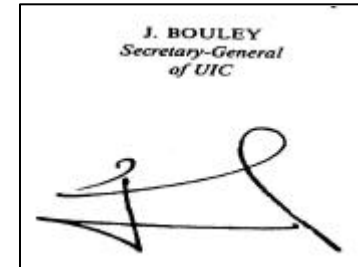
Directives

Co-operating international organizations

International Telegraph and
Telephone Consultative
Committee: CCITT
(Presently: ITU-T)



International Union of
Railways:
UIC



International Council on
Large Electric Systems:
CIGRE

