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SERIES L: ENVIRONMENT AND ICTS, CLIMATE
CHANGE, E-WASTE, ENERGY EFFICIENCY;
CONSTRUCTION, INSTALLATION AND PROTECTION
OF CABLES AND OTHER ELEMENTS OF OUTSIDE
PLANT

Framework of climate change risk assessment for telecommunication and electrical facilities

Recommendation ITU-T L.1506

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ITU-T L-SERIES RECOMMENDATIONS

ENVIRONMENT AND ICTS, CLIMATE CHANGE, E-WASTE, ENERGY EFFICIENCY; CONSTRUCTION, INSTALLATION AND PROTECTION OF CABLES AND OTHER ELEMENTS OF OUTSIDE PLANT

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Recommendation ITU-T L.1506

Framework of climate change risk assessment for telecommunication and electrical facilities

Summary

Recommendation ITU-T L.1506 describes the framework for assessing climate change risk to telecommunication and electrical facilities. The framework consists of a risk assessment methodology and considerations for applying the defined methodology. The methodology specified in this Recommendation provides a climate change risk assessment that integrates multiple climate change risk factors into a single metric and shows the assessment result from an overall perspective.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T L.1506	2018-01-13	5	11.1002/1000/13461

Keywords

Climate change, climate change adaptation, risk assessment.

* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Recommendation ITU-T L.1506

Framework of climate change risk assessment for telecommunication and electrical facilities

1 Scope

This Recommendation describes a framework for assessing climate change risks to telecommunication and electrical facilities. This Recommendation includes an overview of climate change-related risks, requirements for climate change risk assessment methodology, risk assessment methodology and considerations for using the defined methodology.

Development of climate change risk factors or of a weighting scheme for an individual risk factor is outside the scope of this Recommendation, as is the development of interpretation criteria for assessment results.

It should be noted that the methodology defined in this Recommendation is not intended for comparison among different organizations, but is mainly targeted at self-assessment purposes.

2 References

None.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following term defined elsewhere:

3.1.1 spider web chart [b-ISO/IEC TR 20913]: Chart that consists of multiple performance indicators which are set in a circle like a spider web.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 climate change risk factor: An environmental factor (temperature, humidity, precipitation, etc.) or natural disaster (hurricane, earthquake, etc.) that can impact telecommunication and electrical facilities.

NOTE – The terms "climate change risk factor" and "risk factor" are used interchangeably throughout this Recommendation.

3.2.2 climate change risk indicator: A defined measure for a risk factor.

NOTE – The terms "climate change risk indicator" and "risk indicator" are used interchangeably throughout this Recommendation.

3.2.3 climate change risk metric: An overall climate change-related risk metric integrating individual risk indicators by using the weighted spider web chart methodology.

NOTE – The terms "climate change risk metric" and "risk metric" are used interchangeably throughout this Recommendation.

3.2.4 overall climate change risk: The value of the overall climate change risk as calculated through the climate change risk metric.

3.2.5 weighted spider web chart: An extended spider web chart that allows different relative weights among multiple performance indicators of a spider web chart.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

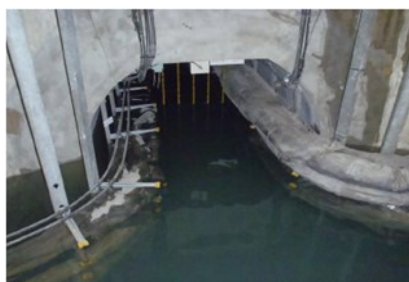
CPU	Central Processing Unit
RBS	Radio Base Station
SMOP	Surface Measure Overall Performance
SMOP _w	Weighted Surface Measure Overall Performance

5 Conventions

None.

6 Overview of climate change risks to telecommunication and electrical facilities

That global climate changes are likely to profoundly affect the global energy sector, which powers the world's society, is gradually being recognized. The energy sector provides the electricity and fuels that propel society and economy, including commerce, manufacturing, transportation, communications, healthcare, water supply and treatment, and other critical infrastructure and systems. That climate changes have a potential for disrupting normal economic operations and quality of life is becoming clear. In addition to efforts to reduce greenhouse gas emissions that may cause climate change, it is recognized that adaptation to and preparation for climate impacts can no longer be avoided. Among the various energy sources, electrical infrastructure is indispensable to daily life and is vulnerable to many types of natural disaster, such as earthquakes, extreme heat, thunderstorms, high winds, ice storms and floods. These climate-related risk factors include average and peak temperature changes; average, seasonal and peak precipitation and hydrology changes; more intense hurricanes; sea level rises and storm surges; as well as changes to ecosystems. Some of these phenomena have already become more frequent or severe because of climate change and these trends are expected to continue. Figure 1 shows some examples of damage to electrical facilities caused by climate change risk factors [b-NPG].



Underground pipe
(Flooding)



Telephone poles collapse
(Hurricane)



Underground cable duct collapse
(Heavy rain)

Figure 1 – Examples of damage to electrical facilities due to climate change risk factors

The effects of major climate change risk factors are summarized as follows [b-NPG].

- Temperature rise: Electrical current passing through electrical plant causes the equipment to heat up. The maximum current rating of electrical plant is generally governed by the equipment's maximum permissible operating temperature. This temperature is usually determined by the type of conductor or insulation material involved, but there may be other considerations. If the ambient temperature increases, the available temperature rise decreases and the maximum current rating is reduced. Reduced ratings can be a particular problem with transformer ratings in urban areas where air-conditioning load is likely to have a coincident