



STRATEGIC BUSINESS PLAN (SBP)

IEC/TC or SC	Secretariat	Date
7	China	21 Jan 2015

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Title of TC

Overhead Electrical Conductors

A Background

TC 7 was set up in October 1928 to prepare recommendations for bare aluminium wires and conductors.

The scope of TC7 activities nowadays covers the preparation of international standards of all kinds of overhead electrical conductors (stranded with round or formed wires and with or without gaps between layers), variety of conductor wires and core wires applicable to the overhead stranded conductors, guidance for fabrication and utilization of overhead electrical conductors, test methods for assessment of overhead electrical conductor performance in operation, and standards on characteristics of the accessories and hardware for overhead lines.

Some innovative high performance wires (fiber or carbon reinforced) require the development of new types of overhead electrical conductors and the standards of these newly developed overhead conductors should be prepared accordingly by TC7.

Application of aerial optical cables used either for phase conductors or ground wires are still booming. TC7 is focusing on the preparation of these family specifications of overhead conductors incorporating optical fibres and making contribution to this work in cooperation with SC86A.

B Business Environment

B.1 General

In developing countries, there are many new overhead line constructions, in contrast to other countries, especially the developed countries where new constructions have slowed and older overhead lines started reaching the end of their life cycle and may need refurbishment, upgrading, or uprating, without having to replace supporting structures. This increases the pressure on TC 7 to offer standards of a variety of conductor types and sizes that meet such needs. The refurbishment of existing lines may require the availability of more conductor types (stranded with round or formed wires and with gap(s) or no gap), using new kinds of alloys (such as heat resistant aluminium alloy or aluminium alloy of optimized compromise of high strength and conductivity), and conductors of new types not covered in IEC 61089 (e.g. annealed aluminium conductor steel supported, ACSS).

The surge in optical needs for the purposes of communications, supervision, and control between substations in electrical transmission and distribution systems have already led to the development of a number of aerial optical cables to be installed on electrical power lines, and work is continuing in this area.

The annual gross production of overhead conductors is about 10 million tons, among which the America takes up 20%, Europe and Asia respectively take 20% and 35%, and the Africa and other areas take up 25%. Almost every country all over the world has manufacturers, and the total manufacturer number besides China estimated in the hundreds. Among hundreds of factories in China, most are small enterprises. There are only more than 10 Chinese factories whose annual production can reach 30,000 tons.

Business is affected by the fluctuant price of the metal, oil and other global indicators.

B.2 Market demand

The customers for TC 7 standards are electricity utilities, overhead line contractors, and conductor manufacturers, consultants. Many of these customers are well represented within TC 7 membership, except for manufacturers and utilities in developing countries. The latter should be encouraged to increase their active participation, at least at the WG level. This situation has somewhat improved in recent years.

IEC standards issued by TC7 enjoy a very good acceptance throughout the world. They are usually specified in projects financed by international lending agencies such as the World Bank.

There has been duplication of work by CENELEC on some standards. This duplication will be reduced in future by two developments. Firstly, published and forthcoming CENELEC TC 7 standards will be reviewed by TC 7, as potential replacements for, or revisions of, old standards, under the maintenance procedure. Secondly, the formation of related CENELEC and IEC JWGs allows improved coordination of work e.g. in IEC, JWG4/ SC 86A - TC 7 – Optical cables along power lines and in CENELEC, JWG: TC 86A/TC7 – Optical cables alongside electrical power lines.

And besides new IEC standards are offered for parallel voting by CENELEC.

The market demands new conductor standards as well as maintenance of existing ones. New materials for conductors are continuously proposed and TC7 has to decide if these material and customers demands warrant the development of new standards or not in such cases.

B.3 Trends in technology

The higher cost of energy losses is leading to larger conductor sizes as well as conductors with higher conductivities. There is also a need for conductors that can operate at high temperature to be used for upgrading existing lines.

And besides, new types of conductors feature in various aspects including for high temperature operation e.g. annealed aluminium conductor steel supported (ACSS) and conductors with coated steel or composite core wires instead of galvanized steel wire reinforcement. It is expected that such new conductors would have a worldwide market. TC 7 will face the challenge to develop the product standards including performance and test requirements to assist electrical utilities to procure and operate such conductors.

The medium-long work of TC7 is about:

- methods of testing and calculation;
- combination of the standards;
- developments for composite core wires and composite core conductors;
- use of other new technics and materials.

B.4 Market trends

The main function of overhead conductor is to transmit electricity to destination on the premise of safe and environment protection. The most frequently used overhead conductor nowadays in the market is the ordinary Aluminium Conductors Steel-Reinforced (ACSR or A1/S1A). The product of IEC 61089 could meet the requirement of most transmission projects. However, conductors with more reliable, safer, more energy-saving and more economical performance are expecting, hence various conductors

in B.3 are produced. The features of these new type conductors lie in the new materials and new techniques caused by the continuously improved conductive performance of aluminium and intensity of core. Therefore, TC7 should prepare new standards to meet these changes.

B.5 Ecological environment

The main components of bare conductors used throughout the world are aluminium, copper and steel. All these materials are fully recyclable and with very little impact on the environment. Scrap value of bare conductors is very high, which should ensure a lesser impact on the environment. However, with the developments of EHV and UHV lines, the corona and radio interference of lines should be concerned more.

C System approach aspects

TC7 will actively continue to promote the establishment of liaisons to other committees, there is the inter-dependence in areas below.

TC 7 as a customer for standards of other TCs

- TC 42 High-voltage testing techniques
- ISO TC17/ SC 17 Steel wire rod and wire products
- ISO TC 79 Light metals and their alloys
- ISO TC 79/SC 6 Wrought aluminium and aluminium alloys

TC 7 as a supplier of standards to other TCs

- TC 11 Overhead lines
- SC 18A Electric cables for ships and mobile and fixed offshore units
- TC 20 Electric cables
- TC 55 Winding wires
- TC 46 Cables,wires,waveguides,R.F.connectors,R.F.and microwave passive components and accessories
- SC 86A Fibres and cables

Other horizontal committees that produce standards used by TC 7

- TC 1 Terminology

Cooperation established:

- Liaison officers, experts participating in product/horizontal committees, TC 11
- Experts working in other TC/SCs and reporting to TC 7 for information, SC 86A, CIGRE/ B2
- A tight relationship between TC7 and CENELEC TC7X.

D Objectives and strategies (3 to 5 years)

D.1 Objectives

- 1 Maintain the time for development of TC 7 work within requested timescales;
- 2 Ensure the work is prioritised in relation to the available resources;

3 In view of the trends in the business environment and market demand greater involvement by developing countries should be encouraged;

4 Keep TC7 standards up to date to reflect new/changing technologies and user requirements both in the marketplace and customer IEC and ISO Technical committees;

5 Maintain and promote the awareness of TC 7 publications.

D.2 Strategies

1 Encourage Convenors and Project Leaders to use the collaboration tools for planning work, meetings and scheduling up to three years ahead;

2 Monitor the market and technology trends to assist the development of standard;

3 Engage with IEC Central Office at the earliest stage of any procedural or structural problems likely to cause delay;

4 Maximise consensus for both new work and amendments/revisions before formal entry into the procedures;

5 Regularly review target dates for all work.

E Action plan

1 Restart the work of IEC 62641 of the combination of the standards of aluminium and aluminium alloy , formed or round wires for overhead electrical conductors - Restart 2015;

2 Put forward the work of IEC 62774 of the combination of the standards of core wires for overhead electrical conductors - Complete CD 2015;

3 Put forward to the maintenance work regarding conductors standards after the combination of the wires - Complete 2017;

4 Put forward the work of PT62818 of non-metallic supporting member material for use in conductors - Complete 2016;

5 Prepare the new standard of carbon fiber core conductors - Start 2015;

6 Start the work of joint WG with TC11 to develop standard on hardware and fittings for high temperature conductors - Start 2015;

7 Start the work of revise of stress/strain test method in IEC 61089 - Start 2015.

F Useful links to IEC web site

[TC 7 dashboard](#) giving access to Membership, TC/SC Officers, Scope, Liaisons, WG/MT/PT structure, Publications issued along with their Stability Dates, Work Programme and similar information for SCs, if any.

Name or signature of the secretary

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