



IEC/TC or SC TC7	Secretariat CHINA	Date 2007-12
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Title of TC Overhead electrical conductors
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**A. Background**

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

The scope of TC7 activities 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 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 .The preparation of these family specifications of overhead conductors incorporating optical fibers should be sustained by the existing joint working group ,JWG4/SC86A-TC7.

TC7 has 36 National committees of which 20 are P members and 16 are O members:

**Participating countries**

- Australia (AU)
- Austria (AT)
- Belgium (BE)
- Canada (CA)
- China (CN)
- Finland (FI)
- France (FR)
- Germany (DE)
- India (IN)
- Italy (IT)
- Japan ( JP)
- Korea (KR)
- Norway (NO)
- Romania (RO)
- Russian Federation (RU)
- Serbia and Montenegro ( CS)
- South Africa (ZA)
- Spain ( ES)
- Sweden (SE)
- Switzerland (CH)

**Observer countries**

- Bulgaria (BG)
- Czech republic (CZ)
- Denmark (DK )
- Greece (GR)
- Hungary (HU)
- Indonesia (ID)
- Ireland (IE)
- Israel (IL)
- Malaysia (MY)
- New Zealand (NZ)
- Poland (PL)
- Portugal (PT)
- Slovakia (SK)
- Slovenia (SI)
- Ukraine (UA)
- United Kingdom (GB)

**Current working groups (WG) and maintenance teams (MT):**

**MT1: Maintenance** of publications within the scope of TC7

**JWG4 / SC 86 A –TC 7:** Aerial optical cables along electrical power lines

**PT1:** Thermal resistant aluminium alloy wires for overhead line conductors and

**PT2:** Concentric lay stranded line overhead conductors containing one or more gap(s)

PT1 was disbanded as approved at the 2007 TC 7 meeting because the assigned task was completed and resulted in publication of a new IEC standard IEC 62004 Ed.1.0: Thermal resistant aluminium alloy wire for overhead line conductor.

The publications developed by TC 7 are totaled 15.  
TC 7 has active liaison with TC 11 and SC86A as well as CIGRE/ B2.

## **B. Environment**

### **B.1 Business environment**

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.

### **B.2 Market demand**

The customers for TC 7 standards are electricity utilities, overhead line contractors, and conductor manufacturers. 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 JWG's 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 case.

### **B.3 Trends in technology and trade**

The higher cost of energy losses is leading to larger conductor sizes as well as conductors with higher conductivities. For example, conductors made of aluminium alloys, such as heat resistant aluminium alloy and aluminium alloy with optimized compromise between high strength and conductivity have been developed and are commercially available in some countries.

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.

#### B.4 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.

#### C. Work programme

##### C.1 Current work

The current work program of TC7 in accordance with the decisions of 2007 TC7 meeting is as follows:

- IEC 62420 Ed. 1.0: Concentric lay stranded line overhead conductors containing one or more gaps proceeds to FDIS stage.
- The two NPs, 7/577/NP: Methods for testing self-damping characteristics of stranded conductors for overhead lines and 578/NP: Method for fatigue testing of conductors for overhead lines are approved because of sufficient number of experts for the two NPs achieved.
- A new work item aiming at an IEC standard in combination of the standards of existing and new aluminium and aluminium alloy, formed or round wires for overhead electrical conductors has been started and an NP is urged to submit soon .
- A new work item aiming at an IEC standard in combination of the standards of existing and new core wires for overhead electrical conductors would be initiated from an NP to proceed .
- IEC 61394 Ed.1.0 : Requirements for greases for aluminium, aluminium alloy and steel bare conductors will be progressed to CDV stage.
- Revision of IEC 61089 to cover some new types of conductors, mainly the annealed aluminium conductor steel supported (ACSS) will proceed .
- Maintenance of TC 7 publications is pursued by MT1 as per the Column E of the updated SPS of TC7.

##### C.2 Resources/infrastructure needed

Current and planned future work will be accomplished using the resources currently available to TC 7 / MT1 and JWG 4/ SC 86A -TC7 and by collaboration with TC 11 and CIGRE /B2.

In view of the trends in the business environment and market demand (see B.1 and B.2 above) greater involvement by developing countries should be encouraged.

##### C.3 Safety aspects (only for committees which do not have a reference to safety in their scope)

#### D. Future work

- Development of IEC standard for covered overhead conductors in coordination with IEC /TC20

Use of non – metallic wires e.g. carbon fibers ,Kevlar and specific composite core wire in conductor design and manufacture and relevant standards to be developed accordingly

#### E. Maintenance cycle

Publication no.	Date of publication	Review date	Maintenance result date	Responsibility (Maintenance Team)
60028	1925	2010	2011	MT1
*60104	1987	2009	2010	MT1
60105	1958	2010	2011	MT1
60114	1959	2010	2011	MT1
*60121	1960	2009	2010	MT1
60468	1974	2010	2011	MT1
*60888	1987	2009	2010	MT1
*60889	1987	2009	2010	MT1
61089	1991	2009	2011	MT1
61232	1993	2008	2010	MT1

Publication no.	Date of publication	Review date	Maintenance result date	Responsibility (Maintenance Team)
**61394 TS	1997	IS in progress	2009*	MT1
*61395	1998	2011	2012	MT1
*61597 TR	1995	2011	2012	MT1
*62219	2002	2009	2011	MT1
62004	2007	2009	2011	MT1
<p>* MCRs for the concerned publications are being circulated for comments , to be closed on 2008-2-07  **61394 TS is progressed for conversion to an IS.</p>				

Name or signature of the secretary

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