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C/2167A/DV

2018-11-23

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COUNCIL

SUBJECT

Document for NC vote: Proposal for a new technical committee entitled *Personal e-Transporters (PeTs)*

This version includes a modification in the closing date deadline

BACKGROUND

The attached proposal from the Belgian NC is submitted to all IEC National Committees (NCs) in accordance with the ISO/IEC Directives Part 1, §1.5.6, and with the IEC Rules of Procedure, for reply within three months.

Sub-Clause 11.2 of the Rules of Procedure reads as follows:

11.2 Setting up of a technical committee

The Standardization Management Board shall create a technical committee if the following conditions are fulfilled:

- a) it is proposed in accordance with the Directives;
- b) all Full Member National Committees have been consulted by the Central Office;
- c) a two-third majority of Full Member National Committees having voted approves the proposal;
- d) at least five Full Member National Committees have expressed their intention to participate actively;
- e) the scope has been clearly defined.

ACTION

IEC National Committees are invited to vote on the establishment of the proposed new technical committee, providing a statement justifying their decision, using the Council voting/commenting system **by 2019-02-08**. **NCs not providing a statement justifying their decision will not have their votes taken into account.**

Those NCs intending to participate actively (P-Members) in the new TC, if approved, are invited to advise accordingly using the commenting system by the same date.

Secretariat note: *For administrative purposes it is requested that National Committees use the accompanying comment form in Word format when commenting.*

Attachment

Annex: presentation



PROPOSAL FOR A NEW FIELD OF TECHNICAL ACTIVITY

PROPOSER:
Belgian NC

DATE OF CIRCULATION:
16 November 2018

A proposal for a new field of technical activity shall be submitted to the Central Office, which will assign it a reference number and process the proposal in accordance with ISO/IEC Directives, Part 1, 1.5. Guidelines for proposing and justifying a new field of activity are given in the ISO/IEC Directives, Part 1, Annex C.

THE PROPOSAL (to be completed by the proposer):

TITLE (the title shall be described unambiguously and as concisely as possible)

Personal e-Transporters (PeTs)

SCOPE (the scope shall define precisely the limits of the proposed new field of activity and shall begin with "Standardization of ..." or "Standardization in the field of ...")

Standardization for use on the road or in the public space of electrically powered transport devices (ie no human (propulsion) power input) and where the speed control and/or the steering control is electrical/electronic.

This means, standardization in the field of Personal e-Transporters, including :

- SAFETY AND RELIABILITY (BOTH ELECTRICAL AND FUNCTIONAL)
- PROTECTION AGAINST HAZARDS (SA FIRE AND EXPLOSION HAZARDS, INGRESS OF WATER, ...)
- MAINTENANCE
- DOCKING STATIONS FOR PUBLIC USE
- RECHARGING
- RECYCLING

EXCLUSIONS :

STANDARDIZATION OF ELECTRICAL BICYCLES, MOTORBIKES, MOPEDS AND CARS ARE EXCLUDED FROM THE SCOPE BECAUSE THEY ARE HANDLED BY OTHER TC'S :

- IEC TC 69
- ISO TC 149
- ISO TC 22

STANDARDIZATION OF PETs FOR HOME USE ARE EXCLUDED BECAUSE THEY ARE HANDLED BY TC 59 AND TC 61.

PURPOSE AND JUSTIFICATION (the justification shall endeavour to assess the economic and social advantages which would result from the adoption of International Standards in the proposed new field)

For electrical bikes, motorbikes and cars there is standardization.

But for one wheel, 2-wheel (such as the Segway) or multiple wheel devices (e.g. Stint) used for personal mobility or possibly to transport goods or passengers, where there is often not even a steering wheel, there is little to no standardization. And just for these devices the safety issues are the greatest. And that is the issue which has been noticed by the Belgian institute responsible for the road safety (Vias institute).

Standardization for the safety of these e-assisted transport modes could greatly improve the issues seen by Vias instituteⁱ because :

- just placing some of these device on the ground is sometimes enough to make the device start to move forward by itself (without even someone being present on the device),
- none of these devices comply to the road safety requirements set by the Belgian government (whilst bikes etc do thanks to the standardization),
- the lack of test procedures for these devices due to the absence of well defined performance criteria causing a large difference in safety precautions.

Moreover, standardization for these devices is necessary because:

- The devices appear more and more on the public roads and are no longer only used on private property
- Several of these devices can obtain speeds up to 25 km/h or even more,
- In certain cities in the world these modes of transportation are already offered on a share-basis. Therefore public charging and storage stations standardization needs to be foreseen for these devices also to ensure public safety.
- If used on the public road, the devices should include safety precautions such as lighting, reflectors etc to make sure the user is visible to other conductors/road users as is applicable to other devices for road use. But also including safety precautions regarding resistance to weather circumstances (water, temperature, ...).
- More and more accidents are being seen/reported with these devices.

The currently existing standardization is scattered and insufficiently covering safety aspects :

In IEC TC 61 :

- IEC 60335-1 (2010): Household and similar electrical appliances – Safety – Part 1: General requirements
- IEC 60335-2-114 (2018): Household and similar electrical appliances – Safety – Part 2-114 Particular requirements for self-balancing personal transport devices for use with batteries containing alkaline or other non-acid electrolytes.

This standard has solid electrical safety, but because this standard was initially made to address hoverboards and some other devices, the scope is not covering the requested scope (sa road use, requirements depending on a speed classification and functional safety).

In CEN TC 354 (no link to work in an ISO TC):

- prEN 17128 (= to CDV stage): Non-approved light motorized vehicles for the transportation of persons and goods and related facilities – Personal light electric vehicles (PLEV) – safety requirements and test methods

This draft has good functional safety but is lacking decent electrical safety and the environmental testing is not sufficient for road use.

Future work in ISO TC 299:

- ISO 13482-4 (NWIP foreseen for launch end of 2019): Personal care robots safety – Part 4 – Person Carrier
Is foreseen to look at basic functions of self-balancing PC. Road use is not in the scope and in the majority of the devices in this new proposed TC, the self-balancing is done by the user, not by the device (which is also a different scope).

Having a single TC covering the above mentioned use and devices would:

- greatly help the manufacturers and users to clarify where to find standardization for these devices.
- make monitoring of the standardization around this topic possible, ensuring that
 - o there are no more gaps in the standardization (devices not being covered) due to the fragmentation of the standardization.
 - o there is no contradiction or divergence in the standardization of these devices
 - o all the safety issues are covered in the applicable standardization.

Avoiding all accidents is, off course, not possible, but setting minimal safety standards would greatly help to reduce them. And it could help to avoid accidents like in the Netherlands where public safety and the business of a manufacturer were jeopardized (train accident with a stunt, causing 4 children to die, a nation to grieve, a complete product range to be refused from use on the roads and the manufacturer to go bankrupt).

The reason why this new field for technical activity should be hosted by IEC is that these devices are all electrical:

- the steering/control is often thanks to sensors in the footrests (for the devices without a steering wheel)
- the steering/control is often thanks to sensors in the handle if there is a steering wheel (no mechanical transfer of the steering movement is present)
- the propulsion is thanks to an electrical engine powered by a battery (no human power input)
- the speed control is also electrical because the speed of the vehicle is (for the 1 and 2 wheel devices) controlled by sensors measuring the inclination of the device and as such controlling the speed of the device
 - o by leaning forward you accelerate
 - o by leaning backwards you slow down (slows the engine down and or breaks)

Therefore all possible safety controls need to be done through the electronic monitoring requiring good reliability of the components and the programming.

PROGRAMME OF WORK (list of principal questions which the proposer wishes to be included within the limits given in the proposed scope, indicating what aspects of the subject should be dealt with, e.g. terminology, test methods, dimensions and tolerances, performance requirements, technical specifications, etc.)

The standardization for Personal e-Transporters (PeTs) should focus on :

- Terminology of the different PeTs
- Reliability of the speed control (acceleration and braking) and steering
- Defining different safety and reliability levels dependent on the maximum speed of the device (toy, road worthy) and the subsequent different safety precautions; addressing the following questions :
 - o Should differences in the speed of the change of the inclination also result in different acceleration or deceleration speeds.?

- Should maximum acceleration and deceleration speeds be imposed to compensate for the inertia of the user?
- Should the weight of the user (child – adult) have an effect on the behavior of the device? (for a bike the size of the bike helps to make a distinction resulting in different possible maximum speeds of the device (ao through different gear ratio's for children and adult bikes)
- Visibility safety requirements dependent on where on the road or the public space the device is to be used. (such as lights, reflectors, horn/buzzer, ...) This is presumed to also be linked with the maximum attainable speed.
- Protection against hazards (such as fire and explosion hazards, environmental hazards like water ingress, ...)
- Recharging and public docking stations requirements/specifications for these devices
- Interfaces when necessary to ensure the above-mentioned functionality
- Testing methods for safety requirements.

Although the safety issues are common to all, the implementation will differ greatly on the amount of wheels and the position of the wheels in relation to each other. Therefore we propose to organize the work in different WG's/MT's according to the below classes :

- 1 wheel devices eg



- 2 wheel devices with parallel wheels



- 2 wheel devices with wheels behind each other (such as steps)



- Even more wheels (the device below left is based on the 2 parallel wheel devices, just adding 2 wheels for stability; the device below right (stint) has four wheels and is used to transport passengers or goods)



NS

IS, TS, TR; PAS

RELEVANT EXISTING DOCUMENTS AT THE INTERNATIONAL, REGIONAL AND NATIONAL LEVELS (relevant documents to be considered: national standards or other normative documents)

NORMATIVE DOCUMENTS: NATIONAL AND INTERNATIONAL ROAD SAFETY REQUIREMENTS

EXISTING STANDARDS:

- IEC 60335-1 series and specifically IEC 60335-2-114 (IEC TC 61)
- IEC 61851, IEC 61980 AND IEC 62480 SERIES (IEC TC 69)
- IEC/TS 61439-7 (IEC SC 121B)

STANDARDS IN DEVELOPMENT

- PRN 17128 (CEN TC 354)

STANDARDS IN THE PIPELINE TO BE DEVELOPED

- IEC 13482-4 (ISO TC 299)

RELATION TO AND IMPACT ON EXISTING WORK

The proposed TC, if established will need to set up liaisons with the relevant technical committees such as IEC : TC 21, TC 23, TC 40, TC 61, TC 64, TC 69, TC 77, TC 106, SC 121B, CIS/B and CIS/D
ISO : TC 22, TC 31/SC 10, TC 108/SC4, TC 149 and TC 299.

RELEVANT COUNTRY PARTICIPATION

SINCE THESE DEVICES ARE BEING USED IN MOST COUNTRIES IN THE WORLD AND THE PRODUCTION OF THESE DEVICES IS ALSO QUITE WIDE-SPREAD (US, EUROPE, ASIA), WE PRESUME A LOT OF NC'S WOULD BE INTERESTED TO BE INCLUDED.

LIAISON ORGANIZATIONS (list of organizations or external or internal bodies with which co-operation and liaison should be established)

Liaison with the following organizations is proposed. This new TC does not have the intent to create standardization in their fields of expertise but would like to make sure that components developed in these fields below are covering the requirements for the components necessary for the new TC.

IEC TC 21: Secondary cells and batteries

IEC TC 23: Electrical accessories

IEC TC 40: Capacitors and resistors for electronic equipment

IEC TC 77: Electromagnetic compatibility

IEC TC 106: Methods for assessment of electric, magnetic and electromagnetic fields associated with human exposure

IEC CIS/B: Interference relating to industrial, scientific and medical radio-frequency apparatus, to other (heavy) industrial equipment, to overhead power lines, to high voltage equipment and to electric traction

IEC CIS/D: Electromagnetic disturbances related to electric/electronic equipment on vehicles and internal combustion engine powered devices

IECEE : IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components

ISO TC 31/SC 10: Cycle, moped, motorcycle tyres and rims

ISO TC 108/SC4: Human exposure to mechanical vibration and shock

Although ISO has no committee with the scope (or a similar scope), there is the CEN TC 354: Non-type approved light motorized vehicles for the transportation of persons and goods and related facilities,

With the below organizations a more close collaboration is deemed necessary and therefore the creation of separate JWG's in the new TC with these other organizations is requested. The general motto for the cooperation is building upon existing work, because this TC has no intention to re-invent the wheel.

- A JWG on docking stations for public charging use with IEC TC 64, IEC TC 69 and IEC SC 121B
- A JWG with IEC TC 61 to make sure standardization is made to suit the needs of both TC's and to avoid double work.
- A JWG with ISO TC 22: to make sure that for higher speed devices no gaps in standardization will exist.
- A JWG with ISO TC 149 : to make sure that also towards bicycles there are no gaps in standardization. Also to align the new standardization as much as possible to the terminology and best practices/expertise in this ISO TC.

- A JWG with CEN TC 354 to align the work of both TC's and avoid duplication of the work

A connection to the IEC ahG81 (ad hoc Group 81: Electric vehicle and infrastructure landscaping) is already established, but this TC would like to continue this connection to be able to stay informed and implement the (future) proposals for improvement coming from the ahG 81.

Because also other organizations than IEC, ISO and CEN/CENELEC might have activities in the proposed scope, we would like to cooperate with any other organization also if they would have any expertise in this.

STAKEHOLDERS

Governments (traffic and road regulations), consumer organisations, E-device manufacturers, ...

LEADERSHIP COMMITMENT

If the proposed TC is established, the Belgian IEC NC would like to take the secretariat.

OTHER COMMENTS (if any)

COMMENTS OF THE GENERAL SECRETARY (to be completed by the Central Office):

This proposal was initially reviewed by the SMB at its meeting in Busan on 2018-10-22 and it decided to circulate the proposal for formal ballot, taking into account the comments made and following a webconference which took place on 2018-11-06 and to which some 35 participants from the SMB, NCs and TC/SCs concerned contributed. The webconference was organized in order to present the proposed new TC in further detail and to permit those concerned to pose questions and receive answers from the proposer.

ⁱ About VIAS Institute :

Improving road safety, along with mobility and safety in general: that is the aim of Vias institute as a major Belgian knowledge centre. To help reduce social risks, we intend to share our knowledge and implement our experience as broadly as possible – both for individual customers, as well as for society in general. The expertise of our team, which is 120 strong, extends far and wide, ranging from academic researchers and engineers, psychologists and field specialists, to legal advisers and consultants. It is precisely this diversity in the area of knowledge that makes us a specialized and much-appreciated partner for governments, social organizations, companies and research institutions that share our aims and aspirations – i.e. to create a better, safer environment.

As an independent and multidisciplinary knowledge centre, we take an integrated and innovative approach. For instance, we are able to provide solutions for local, national and international legislative, (infra)structural, technological and social problems.

Vias institute, known until recently as BRSI (Belgian Road Safety Institute), was established in 1986 by the Belgian government. It has been fully independent since 2016. We are known principally by the general public as the driving force behind the 'BOB' drinking-and-driving awareness-raising campaigns. Today, operating as Vias institute, we are expanding the fields we work in and putting our know-how to good use to promote better road safety, mobility and security in general.

The name 'Vias institute' is derived from the Latin word 'via', meaning 'road' as well as 'way in which'. It also reflects the broader role and interpretation that the revamped organization will be taking on. Changing people's behaviour on and off the road remains a constant in creating a better and safer environment for everyone



Personal e-Transporters (PeTs)

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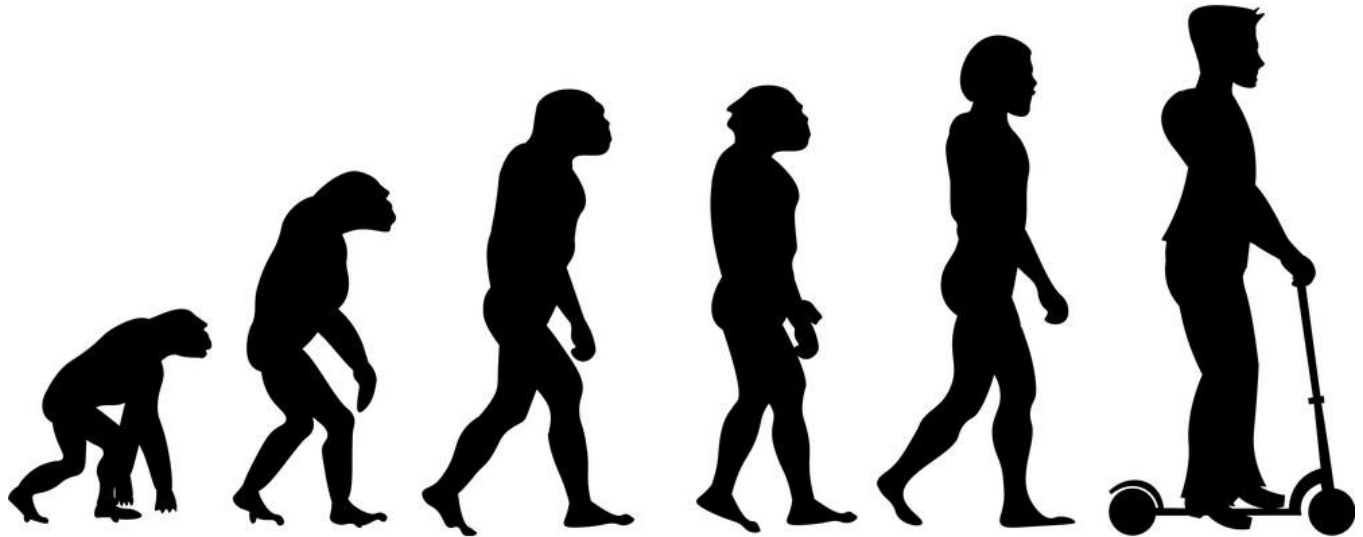
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International
Electrotechnical

Evolution of transport modes

Walk



Wheeled transport (bicycle, monocycle)

Wheeled transport with electrical motor

- For extra support
- As sole powersource
- Electrically steered/controlled

Evolution in the future

Wheeled transport with electrical motor

- Electrically steered/controlled by user
- Wifi steered/controlled by user (eg app on mobile)
- Remote/automatically steered/controlled (program start/end location and the device takes you there)

Standardisation (1)

Today the accidents with these devices are showing that there is a lack of safety coverage :

- Accident in the Netherlands where 4 children were killed as a train hits a stint because the conductor of the stint could not stop it.
- Reports from the Washington post :
 - Emergency rooms have seen a spike in incidents involving electric scooters/steps.
 - Steps catching fire
- Jim Heselden, owner of Segway, dies falling off a cliff using an off-road Segway product.



Standardisation (2)

There is a need for standardisation when these devices are used on the roads/public space to cover :

- **Safety and reliability (both electrical and functional)**
- **Protection against fire and explosion hazards**
- **Maintenance**
- **Docking stations for public use**
- **Recharging**
- **Recycling**

Because these products are becoming

- **more and more complex**
- **appearing more and more on the public roads without proper testing and safety precautions**
- **Speeds up to 25 km/h or even 40km/h (\approx 25 mph)**
- **more and more popular because they are a fast and an environmentally friendly mode of (public) transportation in big cities.**

Standardisation (3)

Scope : Standardisation for use on the road or in the public space of electrically powered transport devices (ie no human (propulsion) power input) and where the speed control and/or the steering control is electrical/electronical.

For electrical bicycles, motorbikes, mopeds and cars there is standardisation available. See standardisation in

- IEC TC 69,**
- ISO TC 149,**
- ISO TC 22**

And these have links to other IEC TC's also.

Standardisation (4)



But for the other devices under this scope like steps, monocycles, parallel wheel cycles, etc. there is only little standardisation, it is scattered and insufficiently covering the safety aspects, sa :

- IEC 60335-1 and IEC 60335-2-114 (IEC TC 61)
- prEN 17128 (CEN TC 354, but not circulating in ISO)



For Docking stations quite a lot is already available :

- IEC/TS 61439-7 (IEC SC 121B)
- IEC 61851, IEC 61980 and IEC 62840 series (IEC TC 69)



Standardisation (5)

Having standardisation covering also the other devices than the electrical bicycles, motorbikes, mopeds and cars would greatly help manufacturers to cover safety issues for their product.

To help manufacturers to find the applicable standardisation, keep the title of this TC large and then in the scope mention that the electrical bicycles, motorbikes, mopeds and cars are excluded, but give details of where to find the standardisation for these devices.

Why in IEC

The need to host this in IEC is that :

- The steering/control is done through sensors (no mechanical transfer of controls).
- The propulsion is through an electrical motor without any human power input
- The speed control is also electrical
 - for 1 and 2 parallel wheel devices by sensors measuring the angle of the footrests (lean forward to speed up, lean backward to slow down)
 - for the other devices by a throttle sensor

I.e. all functionality is electrically controlled

Program of work (1)

Standardisation should look at :

- **Terminology**
- **Safety and reliability of the speed controls and steering**
- **Safety and reliability levels dependent on the maximum attainable speed**
- **Protection against hazards (fire and explosion, water ingress, ...)**
- **Recharging and public docking stations (separate (J)WG)**
- **Testing methods for safety**

Program of work (2)

Although a lot of safety issues are common, the amount of wheels of the device requires a different implementation of these issues.

Therefore

- **a basic (part 1) standard**
- **and specific (part 2) standards depending on the amount of wheels.**

Program of work (3)

WG's for

1) 1 wheel devices



2) 2 parallel wheels



3) 2 serial wheels
(sa steps)



4) More wheels



Cooperation with other TC's

The proposed liaisons are :

- **IEC : TC 21, TC 23, TC 40, TC 61, TC 64, TC 69, TC 77, TC 106, SC 121B, CIS/B and CIS/D**
- **ISO : TC 22 (in particular SC 37 and SC 38), TC 31/SC 10, TC 108/SC4 and TC 149**

But because we do not want to double any work, we would propose to have JWG's with the following TC's :

- **TC 64, TC 69 and SC 121B: to work on docking stations**
- **TC 61 : regarding IEC 60335-2-114 and the shift from home to public place use**
- **ISO TC 22 /SC 37 and SC 38 : for higher speed devices**
- **ISO TC 149 : for obvious reasons**

Cooperation with other organisations

- **Link with CEN TC 354 (JWG ?) to continue the work on prEN 17128 and to lift the work of prEN 17128 above the European level.**
- **Other stakeholders are welcomed to participate and help in providing standardisation or develop future standardisation with IEC to improve product, road and user safety.**

Comments received in SMB/6533A/CC

- **Cooperation/overlap with other TC's and ISO (France, Germany, Spain, UK, Sweden)**
- **General scope specification (UK, France, Japan)**
- **More discussion in SMB (Canada, Italy)**
- **Include other (stakeholder) organisations (Spain, Korea)**
- **Cooperation with ahG81 (France, India)**
- **Scope : Usual practice of IEC to only focus on 'electrical safety and reliability' and not on 'functional safety and reliability' (Japan, Sweden)**
- **Inclusion of protection against fire and explosion hazards (France)**
- **Exclusion of bicycles, motorcycles and mopeds (Japan)**
- **Improve title for easier understanding (France)**

Conclusion

There is a need in IEC for the work of a TC to standardise the evolutions in this market and to guarantee public safety as these devices become more and more common in the public space.



Thank you

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