



## FORM 1: PROPOSAL FOR A NEW FIELD OF TECHNICAL ACTIVITY

<b>Circulation date</b> 2021-08-27	<b>Reference number:</b> Enter Number (to be given by ISO Central Secretariat)
<b>Closing date for voting</b> 2021-11-19	
<b>Proposer</b> SAC	<b>ISO/TS/P 300</b>

A proposal for a new field of technical activity shall be submitted to the ISO Central Secretariat, which will assign it a reference number and process the proposal in accordance with the [ISO/IEC Directives Part 1, Clause 1.5](#). The proposer may be a member body of ISO, a technical committee, subcommittee or project committee, the Technical Management Board or a General Assembly committee, the Secretary-General, a body responsible for managing a certification system operating under the auspices of ISO, or another international organization with national body membership. Guidelines for proposing and justifying a new field of technical activity are given in the [ISO/IEC Directives Part 1, Annex C](#).

### Proposal (to be completed by the proposer)

<b>Title of the proposed new committee (The title shall indicate clearly yet concisely the new field of technical activity which the proposal is intended to cover).</b>
Small hydropower plants (SHP plants)
<b>Scope statement of the proposed new committee (The scope shall precisely define the limits of the field of activity. Scopes shall not repeat general aims and principles governing the work of the organization but shall indicate the specific area concerned).</b>
Standardization in the field of site selection planning, design (i.e. pre-feasibility study and feasibility study), construction and management for SHP plants development up to 30 MW.
Standardization of:
<ul style="list-style-type: none"><li>• professional technical terms and definitions commonly used for SHP plants;</li><li>• technical requirements, methodology and procedure relating to site selection planning of SHP plants;</li><li>• technical requirements for the design (i.e. pre-feasibility study and feasibility study) of SHP plants, mainly including hydrology, geology, energy calculations, project layout, hydraulics, electromechanical equipment selection, construction planning, project cost estimates, economic appraisal, social and environmental assessments;</li><li>• construction of SHP plants mainly including civil works, hydro mechanical structures and installation of electromechanical equipment;</li><li>• project acceptance, renovation, operation and maintenance of SHP plants.</li></ul>
Excluded:
<ul style="list-style-type: none"><li>• Standardization of electromechanical equipment for SHP plants covered by IEC/TC 4, IEC/TC 14, IEC/TC 17, IEC/TC 22 and IEC/TC 57, etc.</li><li>• Standardization of marine energy conversion systems covered by IEC/TC114</li></ul>

<p><input checked="" type="checkbox"/> <b>The proposer has checked whether the proposed scope of the new committee overlaps with the scope of any existing ISO committee</b></p> <p><input type="checkbox"/> <b>If an overlap or the potential for overlap is identified, the affected committee has been informed and consultation has taken place between proposer and committee on</b></p> <ul style="list-style-type: none"><li><b>i. modification/restriction of the scope of the proposal to eliminate the overlap,</b></li><li><b>ii. potential modification/restriction of the scope of the existing committee to eliminate the overlap.</b></li></ul> <p><input type="checkbox"/> <b>If agreement with the existing committee has not been reached, arguments are presented in this proposal (under question 7) as to why it should be approved.</b></p>
<p><b>Proposed initial programme of work. (The proposed programme of work shall correspond to and clearly reflect the aims of the standardization activities and shall, therefore, show the relationship between the subject proposed. Each item on the programme of work shall be defined by both the subject aspect(s) to be standardized (for products, for example, the items would be the types of products, characteristics, other requirements, data to be supplied, test methods, etc.). Supplementary justification may be combined with particular items in the programme of work. The proposed programme of work shall also suggest priorities and target dates.)</b></p> <p>The new TC prioritizes the following items to be standardized:</p> <ol style="list-style-type: none"><li>1. Terms and definitions for small hydropower plants</li><li>2. Technical requirements for site selection planning of small hydropower plants</li><li>3. Technical requirements for design of small hydropower plants</li><li>4. Guidance for construction of small hydropower plants, which will contain a series of 2 parts i.e. Part 1 Civil works and hydro mechanical structures and Part 2 Installation of electromechanical equipment</li><li>5. Guidance for project acceptance of small hydropower plants</li><li>6. Guidance for renovation of small hydropower plants</li><li>7. Guidance for operation &amp; maintenance of small hydropower plants</li></ol> <p>After this proposal is approved, the proposer will start working on Item 1 to Item 3 based on IWA 33 Technical Guidelines for The Development of Small Hydropower Plants-Part 1: Vocabulary (IWA 33-1), Part 2: Site selection planning (IWA 33-2), Part 3: Design principles and requirements (IWA 33-3), which were proposed by SAC and ASI and published in 2019 and 2021. The remaining Items will be completed within three to five years after the establishment of new TC.</p>
<p><b>Indication(s) of the preferred type or types of deliverable(s) to be produced under the proposal (This may be combined with the "Proposed initial programme of work" if more convenient).</b></p> <p>This TC develops all type of ISO deliverables such as IS, TS, PAS and TR.</p>
<p><b>A listing of relevant existing documents at the international, regional and national levels. (Any known relevant document (such as standards and regulations) shall be listed, regardless of their source and should be accompanied by an indication of their significance.)</b></p>

Except for the IWA 33 Technical Guidelines for The Development of Small Hydropower Plants- Part 1: Vocabulary (IWA 33-1), Part 2: Site selection planning (IWA 33-2), Part 3: Design principles and requirements (IWA 33-3), there currently exist no ISO standards in relation to SHP plants. IEC has established multiple Technical Committees allocated to electromechanical equipment allied with hydro-power development. For example:

1. IEC 60308, International code for testing of speed governing systems for hydraulic turbines
2. IEC 60545, Guide for Commissioning, Operation and Maintenance of Hydraulic Turbines.
3. IEC 61362: 2012 Guide to specification of hydro-turbine control systems
4. IEC 61116 (1992-10) Electromechanical equipment guide for small hydroelectric installations
5. IEC-62006-2010 Hydraulic Machines - Acceptance Tests of Small Hydroelectric Installations
6. IEC 62256-2017 Hydraulic turbines, storage pumps and pump-turbines – Rehabilitation and performance improvement
7. IEC: 60076 (Part1to5) (2011) Specifications for Power Transformer
8. IEC 62271-2012-Part 102 High voltage switch gear and controls

Some relevant standards or documents are as follows:

IEEE: 1010-2006 Guide for Control of Hydro Power Plants

IEEE; 492-1999 IEEE Guide for operation and maintenance of hydro generators

IEEE:1147-2005 Guide for rehabilitation of Hydro Electric Power Plants

ASME-1996 Guide to Hydropower Mechanical Design

ASCE-2007: Civil works for Hydroelectric Facility – Guidelines for life extension and upgrade

DIN 4048-2 Water engineering; terms; Part 2: Waterpower plants

DIN 19752 Hydropower plants - Planning, execution and operation

VDI 4620 Hydroelectric installations - Technology and design

V ESHA, 2004 Guide on How to Develop a Small Hydropower Plant

UNIDO: Small Hydropower Technical Guidelines

India: Guidelines for small hydropower plants (1-General, 2-Civil Works,3- Electro Mechanical works)

China has built up a relatively full set of standards for SHP plants, containing about 40 national standards (GB) and industrial standards (SL).For example:

1. GB/T50071-2002 Design code for small hydropower station
2. GB/T50700-2011 Technical renovation code for small hydropower station
3. GB/T50964-2014 Code for operation and maintenance of small hydropower stations
4. SL77-2013 Hydropower calculation code for small hydropower stations
5. SL76-2009 Hydro power design code for small hydro power projects
6. SL16-2010 Economic evaluation code for small hydropower projects

**A statement from the proposer as to how the proposed work may relate to or impact on existing work, especially existing ISO and IEC deliverables. (The proposer should explain how the work differs from apparently similar work, or explain how duplication and conflict will be minimized. If seemingly similar or related work is already in the scope of other committees of the organization or in other organizations, the proposed scope shall distinguish between the proposed work and the other work. The proposer shall indicate whether his or her proposal could be dealt with by widening the scope of an existing committee or by establishing a new committee.)**

The proposed TC aims to establish widely applicable standards for terms and definitions, design (i.e. pre-feasibility study and feasibility study), construction and management of SHP plants, excluding hydraulic turbine and associated equipment and other electromechanical

equipment for SHP plants covered by IEC/TC 4, IEC/TC 14, IEC/TC 17, IEC/TC 22, IEC/TC 57 as well as standardization of marine energy conversion systems covered by IEC/TC114. This new TC will not overlap with the existing work of ISO and IEC.

In order to avoid duplication and conflicts with other existing ISO/TCs and SCs, IEC/TCs and other organizations, this new TC will ensure to cooperate with them by establishment of liaison relationships as necessary.

**A listing of relevant countries where the subject of the proposal is important to their national commercial interests.**

The subject of the proposal is relevant to all countries, especially to developing countries with underdeveloped economy, low level of electrification and abundant SHP resources that are in urgent need of development while lack of technology and standard to develop SHP. The following organizations have sent representatives to participate in the IWA 33 Workshops in 2019 & 2020 and have indicated that the subject will have important national commercial interests for their member countries:

United Nations Industrial Development Organization (UNIDO)

International Network for Small Hydropower (INSHP)(including 554 members in 87 countries)

Common Market for Eastern & Southern Africa (COMESA) (including 20 countries in Eastern and Southern Africa.)

ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) (including 15 ECOWAS member countries in Western Africa.)

Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE) (including 15 member countries in the Caribbean community.)

Eastern Africa Centre for Renewable Energy and Energy Efficiency (EACREEE) (including 5 countries in East African region.)

Pacific Center for Renewable Energy and Energy Efficiency (PCREEE) (including 22 countries in Pacific region.)

In addition, the IWA 33 Workshops were attended by representatives from Argentina, Armenia, Austria, Barbados, Bolivia, Brazil, Burundi, Cabo Verde, China, Cuba, Guyana, India, Ivory Coast, Japan, Kenya, Madagascar, Malaysia, Mexico, Micronesia, Mozambique, Nepal, Netherland, Nigeria, Papua New Guinea, Slovakia, South Africa, Tanzania, Uganda and Zambia. The IWA33 Workshop has approved the Workshop Resolutions (see Annex A) which confirm there is a need to develop specific guidelines or standards for SHP plants and thereby recommend ISO to consider the constitution of a TC with the scope of developing standards for SHP development.

**A listing of relevant external international organizations or internal parties (other ISO and/or IEC committees) to be engaged as liaisons in the development of the deliverable(s). (In order to avoid conflict with, or duplication of efforts of, other bodies, it is important to indicate all points of possible conflict or overlap. The result of any communication with other interested bodies shall also be included.)**

A liaison with other ISO and/or IEC committees such as ISO/TC 59、ISO/TC 113、ISO/TC 211、ISO/TC 207、ISO/TC 301、IEC/TC 4, IEC/TC 14, IEC/TC 17, IEC/TC 22, IEC/TC 57 and IEC/TC 114 shall be created.

Since the IWA33 is the result of a collaborative effort between the United Nations Industrial Development Organization (UNIDO) and the International Network on Small Hydro Power (INSHP), both UNIDO and INSHP have confirmed full support to the constitution of this new TC in ISO (see Annex B and C). IEC/TC 4 has also indicated that it will work closely with the new TC (see annex D).

**A simple and concise statement identifying and describing relevant affected stakeholder categories (including small and medium sized enterprises) and how they will each benefit from or be impacted by the proposed deliverable(s).**

There are two groups of beneficiaries of the proposed deliverable(s):

The primary beneficiaries will be developing countries which do not have any standard to build and operate SHP plants. The existence of internationally recognized standards for SHP plants will lead to increased investment and benefit local businesses in and around rural areas where SHP potential resides. Through them, the benefits will accrue to individuals and enterprises that will be provided with reliable energy services and renewable energy as a stimulus to rural development and income generation activities. In the process, these communities, i.e. women, men and children, will have improved access to energy, and linking energy services to productive uses while achieving ISID.

The secondary beneficiaries will be manufacturers, investors of the industry who will gain certainty when the set international SHP plants standards are available for the SHP plants owners to follow, which will reduce piecemeal application of technical requirements and discrepancies among countries.

The proposed deliverable(s) is expected to reap indirect economic, social and environmental benefits as a result.

**An expression of commitment from the proposer to provide the committee secretariat if the proposal succeeds.**

China is willing to undertake the work of the new TC secretariat when the proposal is approved.

**Purpose and justification for the proposal. (The purpose and justification for the creation of a new technical committee shall be made clear and the need for standardization in this field shall be justified. Clause C.4.13.3 of [Annex C](#) of the ISO/IEC Directives, Part 1 contains a menu of suggestions or ideas for possible documentation to support and purpose and justification of proposals. Proposers should consider these suggestions, but they are not limited to them, nor are they required to comply strictly with them. What is most important is that proposers develop and provide purpose and justification information that is most relevant to their proposals and that makes a substantial business case for the market relevance and the need for their proposals. Thorough, well-developed and robust purpose and justification documentation will lead to more informed consideration of proposals and ultimately their possible success in the ISO IEC system.)**

Small hydropower (SHP) is well recognized as an important renewable energy solution to the challenge of increasing access to electricity in remote rural areas. However, while most countries in Europe, North and South America, China and India have high degree of installed capacity, the potential of SHP in many developing countries remains untapped and is hindered by a number of factors including the lack of best practices or standards for SHP development. According to

the World Small Hydropower Development Report 2019 <sup>1</sup> produced by UNIDO, the global installed SHP capacity for plants up to 10MW is around 78GW while that of the potential totals 220GW.

The SHP standards will be valuable for all countries, but also allow for sharing of experience and best practices between countries. Countries that have limited institutional and technical capacities will be able to enhance their knowledge base in developing SHP plants, thereby attracting more investment in SHP projects, encouraging favourable policies and subsequently assisting in economic development at a national level. These match UN Sustainable Development Goals 7, and closely link to SDG 9, 5, 13 and 17.

GOAL 5: Gender Equality

GOAL 7: Affordable and Clean Energy

GOAL 9: Industry, Innovation and Infrastructure

GOAL 13: Climate Action

GOAL 17: Partnerships to achieve the Goal

The selection of the standards directly impacts the project cost, benefit and construction period and sometimes it is even the key factor determines. Furthermore, unification of SHP standards can remove barriers to trade, improve international market access, support public procurement, and improve business efficiency.

The application of SHP standards can raise people's awareness of environmental protection. The impact to the surrounding ecological environment shall be sufficiently considered during the development of SHP to ensure a scientific, reasonable and orderly development. The changes in water resources management that occur upstream of a SHP plant during its long lifespan will alter the runoff regime. The discharge of ecological flow is particularly important to maintain river ecology, and the SHP standards should be clearly stipulated.

In summary, the purpose for the proposal is to promote the healthy and sustainable development of SHP globally through standardization activity.

**Signature of the proposer**

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*Further information to assist with understanding the requirements for the items above can be found in the [Directives, Part 1, Annex C](#).*

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<sup>1</sup> [https://www.unido.org/sites/default/files/files/2020-08/Global\\_overview.pdf](https://www.unido.org/sites/default/files/files/2020-08/Global_overview.pdf)